# Trade Policy Sentiment and Corporate Investment*

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**PRELIMINARY DRAFT**

**Abstract**

We use large language models to construct firm-level sentiment toward tariffs from earnings call transcripts of publicly listed U.S. companies during 2024–2025. Average sentiment toward tariffs becomes negative in 2025, but there is substantial heterogeneity across firms and industries: while a small fraction express positive views, the majority report negative or neutral sentiment. We find that firms expressing negative tariff sentiment exhibit significantly lower investment growth, with the relationship particularly pronounced among large firms that account for substantial aggregate investment. A synthetic control analysis confirms that investment growth among concerned firms diverged sharply from a matched control group starting in early 2025. We calibrate a multi-sector open economy model to match this cross-sectional evidence alongside monetary policy benchmarks; the calibrated model implies a sizable decline in aggregate investment in response to higher tariffs.

KEYWORDS: Tariffs; Sentiment; Firm-level investment; Synthetic control;

JEL CLASSIFICATION: C30. D80. E31. F44.

*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 anyone else associated with the Federal Reserve System.

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# 1 Introduction

Beginning in early 2025, the United States imposed substantial new tariffs on imports from major trading partners, with rates varying across countries and products. By mid-2025, the average effective tariff rate had risen to levels not seen since the 1940s, representing one of the most significant shifts in U.S. trade policy in decades. Estimating the effects of these policies is difficult: the measures are heterogeneous, the transmission mechanisms are multiple, and macroeconomic and sector-specific conditions confound simple comparisons.

This paper uses quarterly earnings calls of U.S. public corporations—combined with firm-level balance sheet data—to measure how trade policy changes affect corporate investment. Using large language models (LLMs), we construct firm-level indicators of sentiment toward tariffs from earnings call transcripts, and show that firms expressing more negative tariff sentiment exhibited substantially lower investment growth in 2025 relative to 2024.

We build our sentiment measures from approximately 21,500 earnings calls covering about 3,000 U.S. publicly listed companies over 2024:Q1–2025:Q4.[1] These calls provide direct evidence on how firms perceive tariff policies and assess their implications for operations, supply chains, profitability, and strategic planning. We use LLMs to construct a quantitative, firm-specific tariff sentiment indicator that classifies the tone of tariff-related discussions as positive, negative, or neutral—capturing not merely whether firms mention tariffs, but how they characterize their impact.

The sentiment measures show heterogeneity across firms and industries. Average sentiment toward tariffs is negative, and deteriorates over time, particularly since April 2025. Yet averages conceal important variation: in the second half of 2025, between 5 and 10 percent of firms express positive sentiment, typically emphasizing competitive advantages for domestic manufacturers, while approximately 40 percent express negative sentiment, citing higher costs, supply chain disruptions, and operational difficulties. Industry differences are pronounced: sectors with deep exposure to international trade and global supply chains—such as textiles and apparel—display considerably more negative sentiment than less-exposed sectors such as healthcare and services.

Turning to investment, we estimate cross-sectional regressions of firm-level investment growth on tariff sentiment and find a positive, statistically significant relationship: firms with

[1]Earnings calls are quarterly conference calls in which senior executives review recent financial results, outline expectations for the upcoming period, and respond to questions from institutional analysts.

more negative tariff sentiment exhibit lower investment growth. This pattern is especially pronounced among the largest firms, which account for a disproportionate share of aggregate investment. A synthetic control analysis corroborates these results. We divide firms into a treated group with negative tariff sentiment and a control group with neutral or positive sentiment and construct a counterfactual investment path for the treated firms based on pre-2025 trajectories. Starting in 2025, investment growth among tariff-concerned firms falls sharply below the synthetic control, with an investment growth gap between the two group averaging around 7.5 percent during the year.

We also translate the micro-level estimates into aggregate implications using a two-country, two-sector New Keynesian open economy model. A model-based approach is necessary because cross-sectional estimates identify relative effects—how tariff-pessimistic firms invest compared to others—but not absolute effects that account for general equilibrium spillovers through prices, labor markets, and monetary policy (Wolf, 2023; Nakamura and Steinsson, 2014). To discipline our experiment, we build on the simple but central observation that monetary and tariff shocks affect investment through distinct channels. We use a monetary shock because there is a large literature on the investment effects of monetary shocks that we can use to discipline our exercise. A monetary shock generates a uniform investment decline across sectors—with the size governed by nominal rigidities and investment adjustment costs—but no differential. A tariff shock, instead, generates both a cross-sectional investment gap between an import-exposed goods sector and a more insulated services sector; the differential response depends primarily on investment adjustment costs, and is less dependent of nominal rigidities. This separation allows us to jointly calibrate two key model parameters: we set nominal rigidities and adjustment costs to match a 2 percent average decline in investment in response to a 100 basis-point monetary shock—in line with estimates from the monetary policy literature—and a 7.5 percent differential investment decline between goods and services firms in response to a tariff shock, consistent with our regressions and our synthetic control evidence. The calibrated model then implies aggregate effects: investment falls by about 5 percent and GDP declines by about 1 percent in the first year of the tariff shock.

Our contribution is both methodological and substantive. On the methodological side, we move beyond frequency-based measures of policy uncertainty—such as Baker, Bloom, and Davis (2016) and Caldara and Iacoviello (2022)—by constructing directional, sentiment-based indicators using LLMs. This distinction matters: firms anticipating benefits from tariffs may expand capacity, while those facing higher costs or demand uncertainty may defer investment, and a pure count of tariff mentions cannot distinguish the two. On the substantive side, we provide evidence on a salient and rapidly evolving policy episode. Recent work has used earnings call data to study responses to political risk (Hassan, Hollander, van Lent, and Tahoun, 2019), trade policy uncertainty (Caldara, Iacoviello, Molligo, Prestipino, and Raffo, 2019), geopolitical risks (Caldara and Iacoviello, 2022; Caldara, Iacoviello, McHenry, and Schott, 2025), and corporate discount rates (Gormsen and Huber, 2025). We extend this literature by linking tariff sentiment to capital expenditure during a period of exceptional trade policy activism. Closely related is the work by Clayton, Coppola, Maggiori, and Schreger (2025), who also extract tariff-related sentiment from earnings calls; our contribution relative to theirs is to establish the connection between expressed sentiment and actual investment outcomes, exploiting cross-sectional and time-series variation for identification.

The remainder of the paper proceeds as follows. Section 2 describes the data and construction of key variables. Section 3 explains our LLM-based approach to measuring tariff sentiment and presents descriptive patterns. Section 4 presents regression evidence, the synthetic control analysis, and a qualitative characterization of the investment channels. Section 5 develops the structural model. Section 6 concludes.

# 2 Data

Our objective is to link firms' sentiment regarding tariffs to their investment decisions. First, we construct firm-level measures of tariff sentiment from earnings call transcripts. Second, we merge the sentiment indicators with firm-level balance sheet information from Compustat (see Appendix B for details on data construction and coverage).

## 2.1 Earnings calls

We construct a firm-level measure of tariff sentiment using textual analysis of earnings call transcripts from publicly listed U.S. firms. Earnings calls are quarterly conference calls during which senior management presents recent financial results, outlines expectations for the upcoming period, and answers questions from financial analysts and institutional investors. Transcripts of these calls record remarks verbatim from executives (e.g., the CEO or CFO) and the questions posed by analysts, making them a rich source of qualitative information on firms' strategic priorities, perceived risks, and evolving outlooks (Frankel, Johnson, and Skinner, 1999). Because publicly listed firms are required to disclose material information, the content of these calls is publicly available through commercial databases. Our primary data source is the *S&P Global Machine-Readable Transcripts* database, which archives quarterly earnings calls for publicly traded firms worldwide (S&P Global Market Intelligence, 2025). Transcripts are consistently structured and timestamped. Our focus is on non-financial U.S. firms for the period 2024Q1–2025Q4, which includes approximately 21,500 earnings call transcripts for approximately 3,400 unique firms.

## 2.2 Balance Sheet Data

We merge the transcript-based sentiment measures with quarterly firm-level balance sheet data from Compustat and Capital IQ. For the period 2024Q1–2025Q4, we have approximately 29,700 firm-quarter observations with capital expenditure data and approximately 20,200 firm-quarter observations with tariff sentiment data. The difference reflects earnings call coverage.

Investment by listed firms represents a major part of official nonresidential fixed investment data in national accounts. A caveat of using Compustat is that it contains consolidated (global) balance sheets, meaning that we cannot distinguish between capital expenditures within and outside of the United States.I

Our key outcome variable is investment growth. Investment is based on the year-to-date capital expenditure variable `capxy` in Compustat, converted to quarterly frequency. Investment growth is the year-on-year growth of firm $i$'s capital expenditure from one year to the next.

$$\Delta I_i = 100 \cdot \left( \frac{\texttt{capex}_{i,2025}}{\texttt{capex}_{i,2024}} - 1 \right) \tag{1}$$

This construction follows standard practice in corporate finance and macroeconomic investment research.[2] For related methodologies, see Gutiérrez and Philippon (2017), among others.

[2] For details on data cleaning procedures and robustness checks using alternative investment measures, see Appendix A.

# 3 Measuring Tariff Sentiment

We use large language models (LLMs) to measure firms' tariff sentiment in two steps. First, we identify the keywords "tariff" and "tariffs" in the earnings call text and create text snippets that collect the 50 words that precede and the 50 words that follow each identified keyword. We separate text snippets with '. . . ' and combine all snippets into a single excerpt for each firm-date. In a second step, we use an LLM to evaluate the sentiment expressed toward tariffs for each excerpt, one at a time.[3] We designed a prompt to classify sentences mentioning tariffs as reflecting positive, negative, or neutral sentiment. The measure ranges from $-1$ to $+1$, in increments of 0.1, where $-1$ represents strongly negative sentiment (tariffs as a major threat or cost) and $+1$ represents strongly positive sentiment (tariffs as a major opportunity or advantage). The prompt is shown in Appendix A.

The sentiment-based measure improves upon simple mention counts of keywords. Pure frequency measures conflate positive and negative discussions, even though firms may perceive tariffs as either opportunities or threats. By classifying the *tone* of mentions, sentiment analysis captures this heterogeneity. Prior work has shown that polarity in financial text is predictive for outcomes in a way that raw counts are not (Tetlock, 2007; Loughran and Mcdonald, 2011). More generally, the recent text-as-data literature emphasizes moving beyond keyword frequencies toward measures that reflect semantic meaning and context (Gentzkow, Kelly, and Taddy, 2019).

We extensively validated the sentiment data through multiple approaches. First, several hundred relevant passages were manually reviewed to ensure correct classification—for example, distinguishing import tariffs from unrelated uses such as 'electricity tariffs' or 'mobile tariffs'. Second, we created a test dataset with constructed text snippets designed to capture varying degrees of tariff sentiment, confirming that the LLM classifies sentiment in line with our expectations. Third, we conducted a formal human validation exercise in which a team of research assistants scored 193 randomly sampled tariff-related snippets using the same prompt and scale as the LLM. The correlation between human and LLM scores was 0.68 ($p < 0.001$), with 72% of scores agreeing within $\pm 0.2$ and 75% of scores sharing the same sign. These results indicate that the LLM measure captures human-interpretable sentiment with excellent reliability.

[3] We use Claude Sonnet (claude-sonnet-4-5) with extended thinking enabled.

**Examples.** Below, we give two examples of U.S. companies that express a positive sentiment toward tariffs.

> *"We are pleased that an announcement was made related to tariffs on Mexico. Should these tariffs go into effect, they should have a positive impact on our business."*

> *"We at Cleveland-Cliffs appreciate the recently announced 25% tariffs on steel imports from all countries. These tariffs are critical to addressing the problem, and we thank the Trump administration to have had the courage to implement these tariffs."*

Firms with positive tariff sentiment typically mention tariffs in the context of creating competitive advantages for U.S. manufacturers and benefits from more integrated domestic supply chains. Firms with negative sentiment toward tariffs frequently mention financial and operational concerns and supply chain disruptions. We document two examples below.

> *"[T]he current tariff rates have driven us to delay about $375 million of Capex projects [. . . ]."*

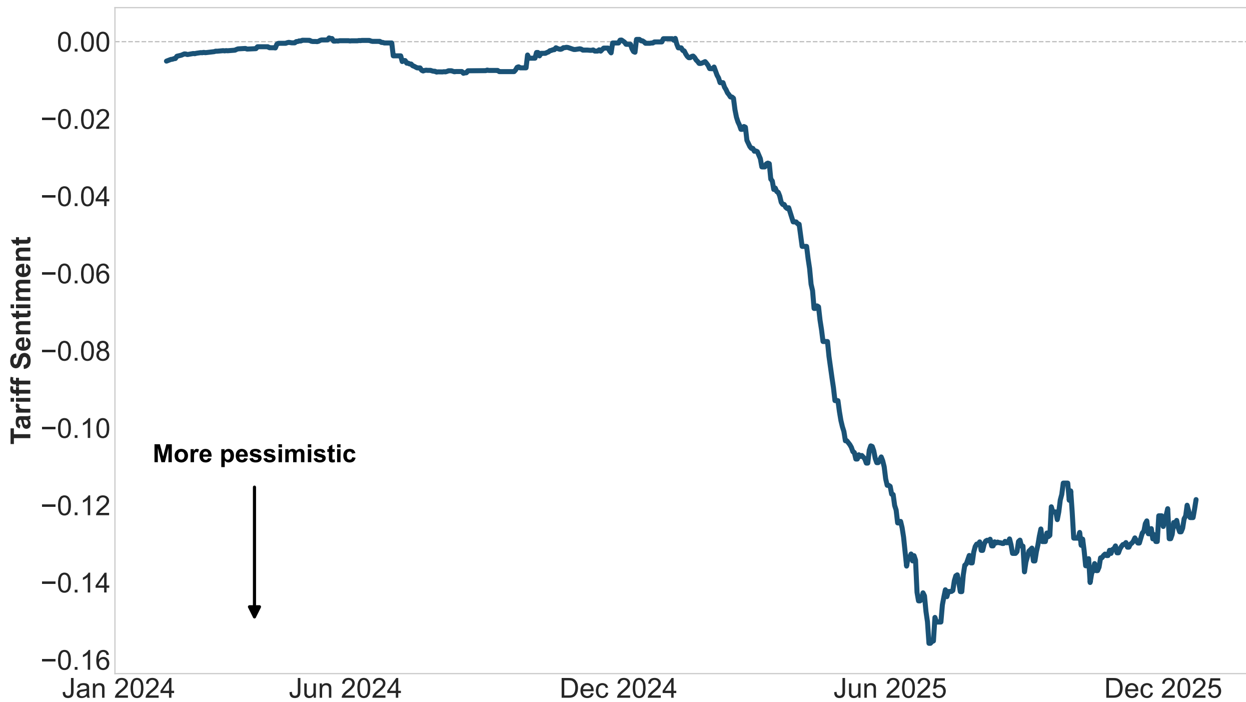
> *"I can definitely tell you that cadence changed pretty drastically for us with the tariffs. It definitely affects what we call the mega customer, which is really [our] customer."*

## 3.1 Tariff Sentiment Patterns

Figure 1 shows the evolution of average tariff sentiment for U.S. firms from the beginning of 2024 through the end of 2025. Average sentiment toward tariffs is negative and deteriorates markedly in early 2025, consistent with the escalation of tariff measures, before slowly reverting towards neutral.

Average sentiment masks important heterogeneity. Figure 2 shows the quarterly distribution of tariff sentiment across U.S. firms from 2024Q1 through 2025Q4. For each quarter, we classify firms as having negative sentiment (score $\leq -0.1$), neutral sentiment ($-0.1$ to $0.1$, split between firms that mention tariffs and those that do not), or positive sentiment (score $\geq 0.1$). Across all quarters, only a small share of firms express positive sentiment toward tariffs. The share of

Figure 1: Sentiment toward tariffs of U.S. firms.

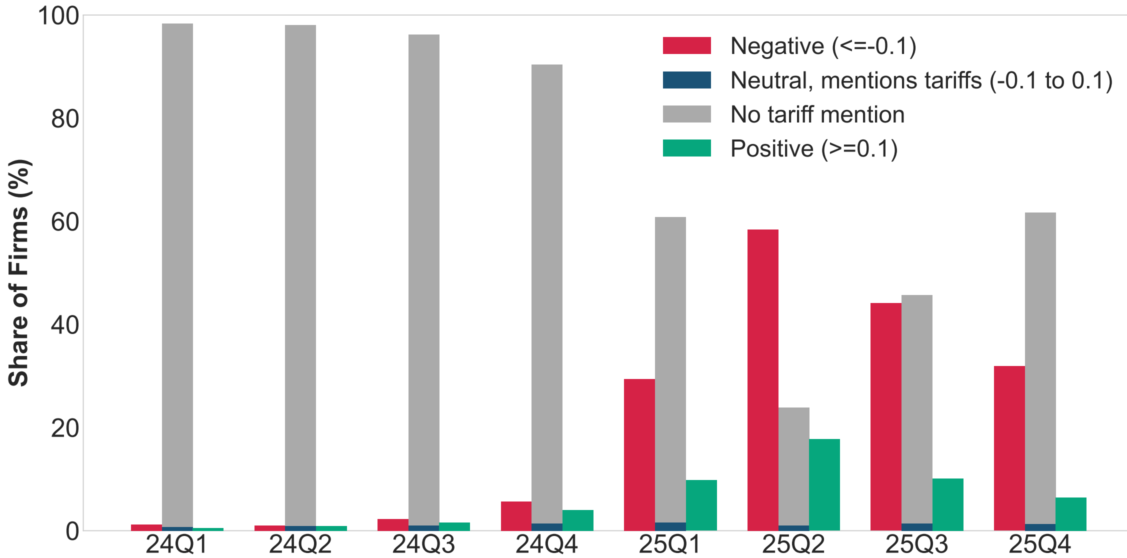



*Note:* Average sentiment toward trade policy of U.S. firms extracted from earnings calls, 90-day moving average. For each call, sentiment ranges from -1 to +1.

firms expressing negative sentiment rises sharply from around 5 percent in 2024Q1 to nearly 55 percent by 2025Q2, before stabilizing. The large gray segment—firms that do not mention tariffs—shrinks over the sample, suggesting that tariff concerns spread across the corporate sector during 2025.

We find substantial cross-industry heterogeneity in firms' expressed sentiment toward tariffs, as shown in Figure 3. Industries are sorted by average tariff sentiment and grouped into goods-producing and services sectors (we group shipping and supplies into goods because they are highly dependent on trade). Industries with greater exposure to international trade and global supply chains—such as textiles and apparel, and autos and transportation—exhibit more negative average sentiment than less trade-exposed sectors such as healthcare, real estate, energy, communications.

Figure 2: Quarterly distribution of tariff sentiment.




*Note:* U.S. firms, 2024Q1–2025Q4. For each quarter, bars show the share of firms with negative sentiment ($< -0.1$, red), neutral sentiment that mentions tariffs ($-0.1 \leq$ score $\leq 0.1$, blue), no tariff mention (assigned score $= 0$, gray), and positive sentiment ($> 0.1$, green). Firms with no tariff-related passages in their earnings calls are assigned a sentiment score of zero and appear in the neutral/no mention category.

# 4 Tariff Sentiment and Investment

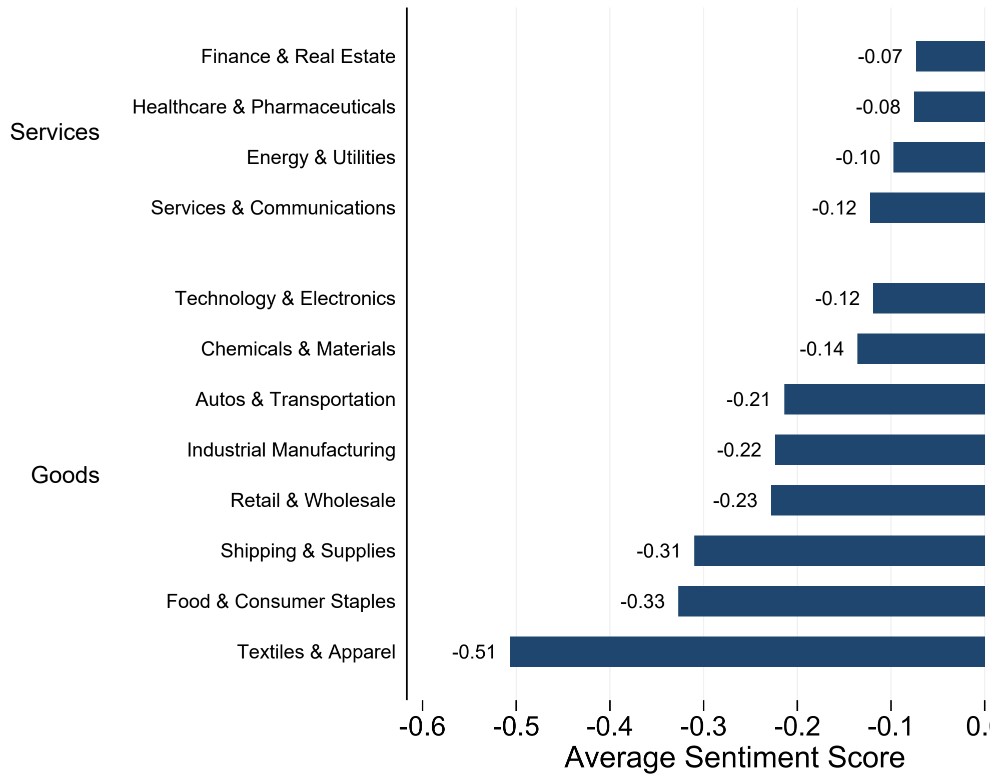
## 4.1 Investment Intentions from the Calls

Before matching earnings calls with balance sheet data, we first examine whether tariff sentiment predicts the investment *intentions* that firms report in the same call. This exercise tests internal consistency: if the sentiment classifier correctly captures how firms perceive tariffs, negative sentiment should translate into stated plans to cut or defer investment.

We apply a follow-up prompt to the same tariff-related text excerpts to score each firm-date's planned investment response. The prompt asks the model to rate, on a $-1$ to $+1$ scale in 0.1 increments, how a firm plans to adjust capital expenditure, capacity, or R&D spending *because of* tariffs. A score of $-1$ indicates a major cut or pause; 0 means no investment response is mentioned; and $+1$ means a strong planned increase. Because both the sentiment score and the intention score are extracted from the same earnings call passage, their co-movement is a direct test of whether the two LLM extractions are mutually consistent.

Among the 6,577 firm-quarter observations used in column (1) of Table 1, about 257

Figure 3: Average tariff sentiment by industry.

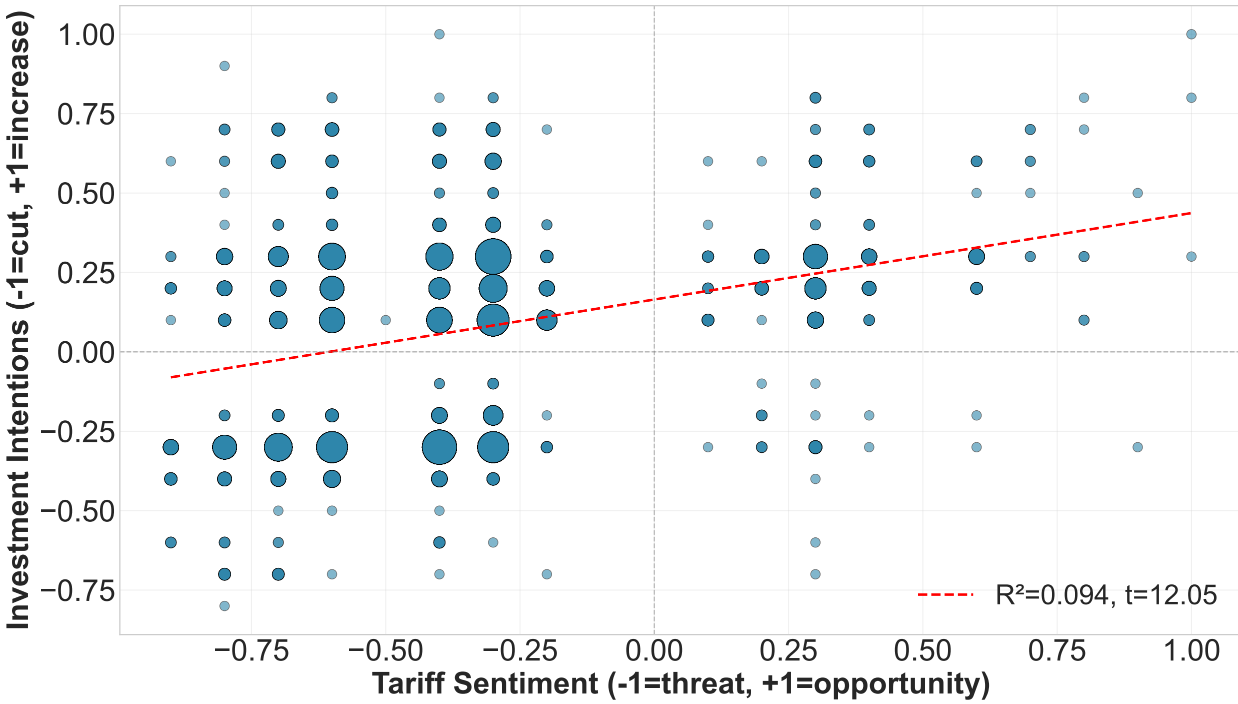



*Note:* U.S. firms. Industries sorted by average sentiment within goods and services groupings.

pair positive tariff sentiment with a non-zero investment intention score, while 1,226 pair negative tariff sentiment with a non-zero investment intention score.[4] The asymmetry is striking: among firms expressing positive tariff sentiment, roughly 90 percent report positive investment intentions. Among firms with negative tariff sentiment, about one-third report negative investment intentions and two-thirds positive—suggesting that even concerned firms often plan to invest, perhaps to adapt supply chains or substitute domestic for foreign inputs. Figure 4 plots these observations. The relationship between tariff sentiment and investment intentions is positive and statistically significant. Column (1) of Table 1 formalizes this: a one-unit increase in tariff sentiment is associated with a 0.55 standard deviation increase in investment intentions, confirming that the sentiment classification captures variation that firms themselves translate into investment signals. Section 4.4 returns to the earnings call text in more detail, examining the specific channels through which firms with negative and positive

[4]The regression includes all observations with non-missing tariff sentiment and investment intention scores, including firms with zero sentiment (no tariff mention in the call) and zero investment intention scores. The 257 and 1,226 counts refer to observations with both non-zero sentiment and non-zero investment intentions.

Figure 4: Tariff sentiment and investment intentions.




*Note:* U.S. firms, 2025. Each dot is a firm-quarter observation. The line is the best linear fit. $R^2$ and $t$-statistic for the slope are reported in the legend.

tariff sentiment describe their investment responses.

## 4.2 Regression Evidence

We now turn to actual capital expenditure data from Compustat. Our goal is to measure the extent to which changes in tariff sentiment at the firm level are associated with changes in investment decisions over the 2024-2025 period. We estimate cross-sectional regressions of the form:

$$\Delta I_i = \alpha + \beta\,\text{sentiment}_i + \gamma X_i + \varepsilon_i, \tag{2}$$

where $\Delta I_i$ is firm $i$'s investment growth defined in (1), $\text{sentiment}_i$ is the average tariff sentiment, and $X_i$ includes controls such as firm size and sector fixed effects. We also estimate variants using change in sentiment, lagged sentiment, and asset-weighted specifications.

Columns (2)–(4) of Table 1 show the relationship between investment growth and, respectively, the change in sentiment, current sentiment, and lagged sentiment, for the 2025Q4 cross-section. In all cases, the sentiment variable is positively associated with changes in

Table 1: Tariff Sentiment and Corporate Investment

| | 24:Q1–25:Q4 | 2025 Cross-section | | | | | |
|---|---|---|---|---|---|---|---|
| | (1) Intentions | (2) Δ I | (3) Δ I | (4) Δ I | (5) Δ I | (6) Δ I wtd | (7) Δ I top |
| Tariff Sent. | 0.55*** | | | | | | |
| | (0.06) | | | | | | |
| Δ Sent. | | 23.20** | | | 23.16** | 22.32*** | 46.36** |
| | | (9.16) | | | (9.16) | (4.66) | (17.81) |
| Current Sent. | | | 26.27*** | | | | |
| | | | (8.40) | | | | |
| Lagged Sent. | | | | 59.50** | | | |
| | | | | (23.29) | | | |
| Δ AI Sent. | | | | | -15.33 | | |
| | | | | | (10.12) | | |
| Observations | 6577 | 1812 | 1873 | 1917 | 1812 | 1812 | 100 |
| $R^2$ | 0.011 | 0.004 | 0.005 | 0.003 | 0.005 | 0.013 | 0.065 |

Standard errors in parentheses. * p<0.10, ** p<0.05, *** p<0.01.
Col. (1): investment intentions on tariff sentiment (all quarters).
Cols. (2)–(4): investment growth on change in sentiment, lagged sentiment, current sentiment.
Col. (5): col. (2) controlling for change in AI sentiment.
Col. (6): col. (2) weighted by total assets.
Col. (7): col. (2) restricted to 100 largest firms by capex.

investment.[5]

One factor that has often been reported as a contributing factor to investment growth in 2025 has been bullish AI sentiment. To address this possibility, we construct an AI-sentiment variable using a prompt that mirrors what we did to construct tariff sentiment.[6] The coefficient on AI sentiment in column (5) is not significant and is imprecisely estimated, while the tariff sentiment coefficient is essentially unchanged. Column (6) weights observations by total assets, and column (7) restricts the sample to the 100 largest firms by capital expenditure. The $\beta$ coefficient is positive and statistically significant across all specifications, implying that firms with more negative tariff sentiment exhibit lower investment growth. The relationship is particularly pronounced among large firms: column (7) shows a coefficient nearly twice as

[5]We control for lagged investment growth to capture firm or industry-specific trends in the regressions, and obtain nearly identical results.

[6]The AI-sentiment prompt scores each firm's attitude toward artificial intelligence on the same $-1$ to $+1$ scale in 0.1 increments, where $-1$ indicates AI is perceived as a major threat or cost and $+1$ that it represents a major opportunity or competitive advantage. Snippets are identified by keyword search for AI or artificial intelligence mentions in the transcript; the model returns 0 if the passage does not actually refer to artificial intelligence (e.g. if "AI" stands for avian influenza). All other aspects of the pipeline—transcript sourcing, snippet extraction, and model—are identical to those described in Section 3.

large as the baseline, consistent with large, trade-exposed firms being both more vocal about tariff concerns and more likely to act on them.

### 4.3 Synthetic Control

The regression analysis establishes a significant cross-sectional relationship between tariff sentiment and firm investment. We complement those results by examining the dynamics of investment over time. Following Abadie and Gardeazabal (2003), we divide firms into a "treated" group of firms that express negative tariff sentiment and a "control" group with neutral or positive sentiment.[7] The synthetic control requires a long, balanced panel: we retain only firms with 20 consecutive quarters of capital expenditure data, yielding a sample of 1,597 firms. We classify a firm as treated if its average tariff sentiment falls below $-0.1$, a threshold chosen to exclude firms with essentially neutral views while producing a treated group of similar size to the control group. This yields 830 treated and 767 control firms—a roughly even split—and the treated group accounts for approximately 51.5 percent of aggregate capital expenditure in the sample.

To implement the method, let $\mathcal{T}$ denote the set of treated firms (negative sentiment) and $\mathcal{C}$ the set of control firms (neutral or positive sentiment). We compute aggregate four-quarter investment growth for each group $g \in \{\mathcal{T}, \mathcal{C}\}$ by summing `capex` across member firms and then taking four-quarter growth rates to smooth the strong seasonality in firm-level investment data:[8]

$$\Delta I_{g,t} \;=\; 100 \cdot \left( \frac{\sum_{i \in g} \texttt{capex}_{i,t}}{\sum_{i \in g} \texttt{capex}_{i,t-4}} - 1 \right). \tag{3}$$

We then construct a synthetic control for the treated group by choosing non-negative weights $w_i$ ($\sum_{i \in \mathcal{C}} w_i = 1$) that minimize the root mean squared prediction error between treated investment and a weighted combination of individual control firms' investment over the pre-treatment period 2021:Q1–2024:Q4:

$$\min_{\{w_i\}_{i \in \mathcal{C}}} \sqrt{\frac{1}{T_0} \sum_{t=1}^{T_0} \left( \Delta I_{\mathcal{T},t} - \sum_{i \in \mathcal{C}} w_i \cdot \Delta I_{i,t} \right)^2}$$

[7] This approach is commonly used in comparative case studies where standard difference-in-differences techniques may be biased by time-varying confounders (Abadie, 2021). The original synthetic control literature typically studies one treated unit; in our case, we aggregate investment across many firms within each group.

[8] See, for instance, Xu and Zwick (2024)

[9] To avoid ex-post selection bias, when we restrict the donor pool to the $N$ largest control firms, we rank them by their capital expenditure in the quarter immediately preceding treatment (2024:Q4) rather than by their average capex over the full sample. The resulting synthetic control provides a counterfactual for the investment path that concerned firms would have followed in the absence of deteriorating tariff sentiment.

A practical concern with the Compustat sample is representativeness: publicly listed firms are larger and more capital-intensive than average, and the industry composition need not reflect the aggregate economy. To address this, we construct a second exercise in which each firm's capital expenditure is scaled by a firm-specific weight $\omega_i$ chosen so that the weighted sample aggregate tracks the four-quarter growth rate of real private nonresidential fixed investment (PNFI) from the National Income and Product Accounts:

$$\min_{\{\omega_i\}} \sum_t \left( \frac{\sum_i \omega_i \, \texttt{capex}_{i,t}}{\sum_i \omega_i \, \texttt{capex}_{i,t-4}} - \frac{\text{PNFI}_t}{\text{PNFI}_{t-4}} \right)^2 \tag{4}$$

To keep the reweighting interpretable, $\omega_i$ is restricted to a discrete grid $\{0.5, 1, 2\}$, so no firm is eliminated or amplified beyond a factor of two.[10] Each firm receives one weight for the entire sample, so the reweighting adjusts the cross-sectional composition of the panel without altering the time-series dynamics of individual firms. Note that the weights are estimated on the full sample combining treated and control firms, not separately by group: reweighting each group independently to the same aggregate target would equate their aggregate growth rates by construction, removing any basis for comparison.

Figure 5 presents our baseline synthetic control results, using raw Compustat capex with a donor pool of the 30 largest control firms ranked by pre-treatment capital expenditure.[11]

[9] We solve this nonlinear optimization problem using simulated annealing with 20,000 iterations. At each iteration, the algorithm randomly perturbs 1 to 20 percent of the weights and accepts the new weights if they improve the objective or with probability $\exp(-\Delta E/T)$ where $\Delta E$ is the change in objective value and $T$ is a temperature parameter that decays geometrically from 1.0 to $10^{-6}$. This stochastic search strategy avoids local minima while remaining computationally tractable for donor pools of 30–100 firms. The objective value is stable across multiple random initializations.

[10] This discrete optimization problem over approximately 1,600 firms and 3 weight values creates a combinatorial space of $3^{1597}$ possible solutions, which is infeasible to search exhaustively. We solve it using simulated annealing with 500,000 iterations. At each step, the algorithm randomly reassigns weights for 1 to 20 percent of firms from the discrete grid and accepts the new configuration if it reduces the mean squared error or with probability $\exp(-\Delta E/T)$ where $T$ decays geometrically from 1.0 to $10^{-6}$. This approach avoids local minima while respecting the discrete constraint. The final root mean squared prediction error is approximately 1.5 percentage points, and the objective value is stable across multiple random initializations.

[11] Restricting the donor pool to the largest firms limits the risk that the synthetic control assigns disproportionate weight to small firms whose investment dynamics may not be representative.

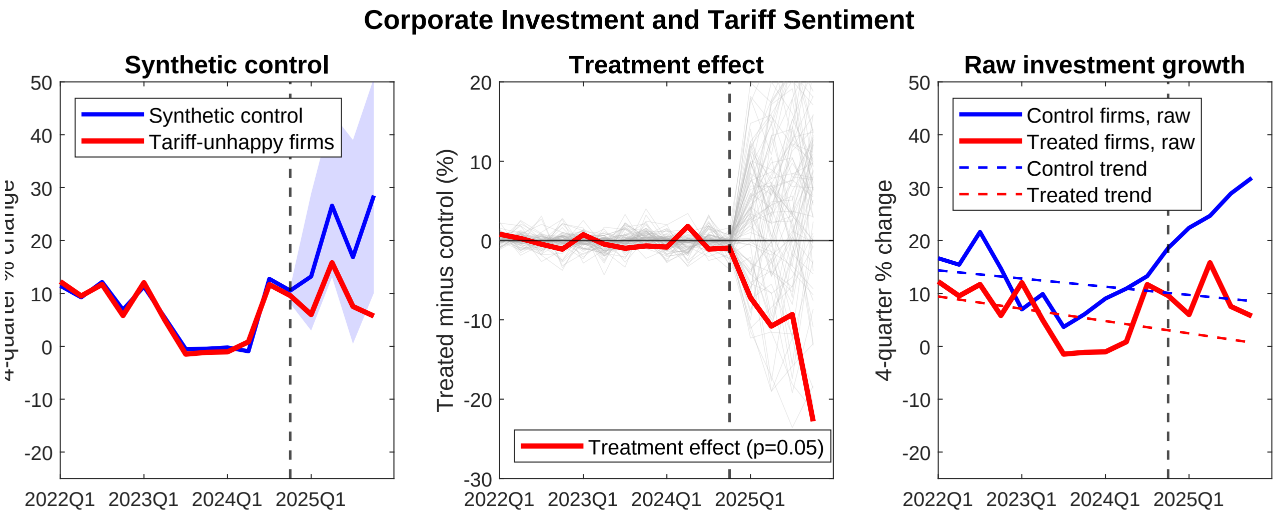
The left panel shows the treated and synthetic control investment paths: by construction the two series track each other closely through 2024, then starting in 2025 four-quarter investment growth of firms with negative tariff sentiment (red line) falls below the synthetic control path (blue line), with a gap of roughly 15 percentage points by end-2025. The pre-treatment root mean squared prediction error (RMSPE) is 0.92 percentage points, and the ratio of post-treatment to pre-treatment RMSPE is 15.1, indicating that the post-treatment divergence is substantially larger—by more than an order of magnitude—than typical pre-treatment deviations. The middle panel plots the treatment effect together with the distribution of placebo permutations in gray; the actual effect lies in the left tail of the placebo distribution. The right panel shows the raw (unoptimized) investment paths alongside linear trends estimated over 2022Q1–2024Q4 and extrapolated into 2025, illustrating that the divergence represents a clean break from the pre-tariff trajectory of both groups. Confidence intervals are constructed using a placebo-based permutation approach: we repeatedly reassign treatment at random, re-estimate the synthetic control, and use the distribution of placebo post-treatment gaps to form percentile-based confidence bands. Full details are in Appendix C.

Two considerations are in order. First, while the estimated gap is economically large—on the order of 15 percentage points of four-quarter investment growth—the confidence bands are also wide, reflecting genuine uncertainty about the counterfactual path. The point estimate should be read as a central tendency rather than a precise magnitude.

Second, the gap opened in a period of unusually strong aggregate investment by large listed U.S. corporations, driven in part by a wave of AI-related capital expenditure concentrated in the control group. A direct check is to compute the cross-firm correlation between AI sentiment and tariff sentiment: across more than 22,000 earnings calls this correlation is just 0.005, confirming that the treatment–control split is essentially orthogonal to AI optimism.

Figure 6 presents four robustness exercises. Panel (a) replaces 2025 average sentiment with 2024 average sentiment to classify firms, ensuring the treatment indicator is predetermined relative to the outcome period. Panel (b) applies a stricter cutoff of $-0.4$, restricting the treated group to firms expressing strongly negative sentiment. Panels (c) and (d) reweight firm-level capital expenditure to match aggregate NIPA private nonresidential fixed investment growth—with the baseline cutoff and the stricter cutoff respectively—using an expanded

Figure 5: Synthetic control baseline: comparing investment of tariff-pessimistic firms to a synthetic counterfactual.




*Note:* 30-firm donor pool, raw Compustat capex, cutoff = $-0.1$. *Left*: four-quarter investment growth for tariff-unhappy firms (red) versus synthetic control (blue); shaded area is 90% confidence interval from placebo permutations. *Middle*: treatment effect (red) against distribution of placebo effects (gray). *Right*: raw investment growth for treated (red) and control (blue), with dashed lines showing linear trends estimated over 2022Q1–2024Q4.

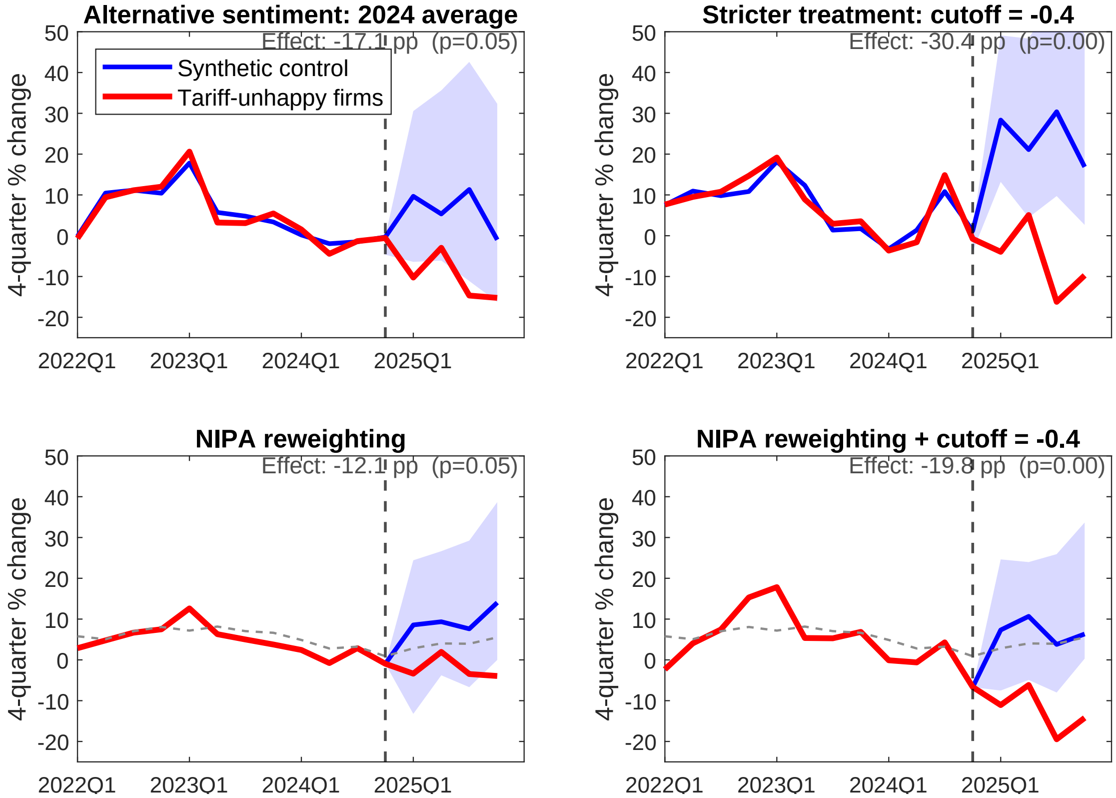
100-firm donor pool.[12] Across all four specifications, tariff-unhappy firms systematically reduce investment relative to the synthetic control, confirming that the baseline result is not sensitive to the choice of sentiment window, treatment threshold, or representativeness correction.

## 4.4 What Firms Talk about when they Talk about Tariffs and Investment

We further explore the text of the earnings call transcripts to characterize the mechanisms linking tariff policy sentiment to capital expenditure decisions. We identify passages mentioning tariff-related terms co-occurring with investment-related keywords (CapEx, investment, capital). We partition firms into two groups based on tariff sentiment: about 100 calls discuss investment while reporting positive tariff sentiment; about 1,100 calls discuss investment while reporting negative sentiment. The relative shares mirror the overall patterns across all earnings calls.

[12] In the NIPA-reweighted exercise, the $\omega_i$ weights already realign each firm's contribution to the aggregate, so a larger donor pool can be used without sacrificing representativeness.

Figure 6: Synthetic control robustness checks.




*Note:* *(a)* 2024 average sentiment used to classify firms. *(b)* Stricter treatment cutoff (−0.4). *(c)* NIPA reweighting, baseline cutoff. *(d)* NIPA reweighting, stricter cutoff. Each panel shows treated (red) vs. synthetic control (blue) four-quarter investment growth, with 90% confidence intervals.

Within each group, three broad channels emerge.

**Firms with Negative Tariff Sentiment.** Firms with negative tariff sentiment report plans to reduce investment through channels that reflect heightened policy uncertainty and higher expected cost pressures:

1. **Reallocation toward non-expansionary investment.** Firms report plans to shift away from capacity expansion toward cost reduction and efficiency improvements. Management reports redirecting capital toward "productivity initiatives and tariff mitigation strategies" and "high-return, low-risk strategic investments that will improve operational efficiencies." This reallocation appears to reflect heightened uncertainty about returns to investment when tariff-related cost pressures and demand uncertainty rise.

2. **Postponement of investment under policy uncertainty.** Tariff policy uncertainty

induces deferral as the option value of waiting rises. Management discloses that "increased tariffs and risk of further tariffs has resulted in customers pausing to reevaluate many larger investments" and that "the unpredictable environment has resulted in delays in our customers' investment plans." A smaller subset of firms reports pulling forward investment ahead of tariff implementation (approximately 8 percent of firms with negative sentiment), but language indicating outright postponement appears more frequently (approximately 10 percent), though the margin between the two is narrow and should be interpreted cautiously given the absence of formal coding reliability statistics.

3. **Supply chain reorganization investment.** Firms reorient investment toward supply chain adjustments—expanding domestic sourcing, diversifying manufacturing locations, and reallocating production toward lower-tariff jurisdictions. Unlike expansionary investment, these expenditures aim to reduce tariff exposure on existing volumes rather than increase productive capacity. This channel appears in a minority of negative-sentiment calls, and to the extent reorganization spending offsets reductions in expansionary capex, the measured investment decline in Table 1 understates the true reduction in capacity-expanding investment. However, we find no evidence of systematically higher capex growth among the subset of firms discussing reorganization, suggesting such offsetting effects are limited in the aggregate.

**Firms with Positive Tariff Sentiment.** Firms perceiving tariff policy as favorable report that they maintain or increase investment through channels that reflect improved competitive positioning:

1. **Gaining market share.** Firms with established domestic production view tariffs as raising entry costs for rivals and strengthening incumbent positions. Management characterizes the tariff environment enthusiastically—"insofar as the tariffs are concerned, fabulous. It almost couldn't be better"—reflecting expectations that tariffs raise competitors' costs.

2. **Concentrating investment in tariff-insulated segments.** Firms shift investment toward business segments with minimal tariff exposure or positive exposure to reshoring-driven demand shifts, rather than broad portfolio expansion.

3. **Government subsidies for domestic production.** Firms expand or maintain investment in domestic production to obtain tax credits and production subsidies for reshoring. Management states: "the production credits we are now receiving as a result of our continued investment in U.S. production are meaningful, expected to contribute $35 million to free cash flow on an annual basis."

In sum, investment responses reflect differences in firms' pre-existing characteristics. Firms with substantial domestic production capacity or tariff-protected market positions view tariffs favorably and maintain or expand investment. Firms dependent on imports or global supply chains face elevated costs and policy uncertainty, leading to investment restraint. Tariff policy appears to operate as a sorting mechanism, with import-intensive firms restraining investment while domestic-production incumbents maintain or expand it—though whether this differential reflects net reallocation or aggregate contraction requires aggregate-level evidence beyond the scope of this section.

**Reconciling the regression and synthetic control estimates.** The two approaches measure different objects and naturally yield different magnitudes; however, both point to a large investment differential between tariff-concerned and unaffected firms. The cross-sectional regressions estimate an unweighted average marginal effect across all firms in the sample: multiplying the coefficient by the average change in sentiment implies a differential effect of around 4 percentage points, on average, in year 2025. Regressions that focus on the top firms by capital expenditure already yield substantially larger estimates, around twice as large, (Table 1, column 7), suggesting that equal-weighted OLS—which assigns the same influence to a small firm as to a large one—understates the effect for the set of firms that matter most for aggregate investment. The synthetic control sidesteps this issue by aggregating investment in dollar terms, so that large, capital-intensive firms contribute in proportion to their actual expenditure,. In addition, the two approaches differ in timing: the regression estimates average investment growth over the year, while the synthetic control gap refers to the year-over-year growth rate as of the fourth quarter. Bearing these differences in mind, we summarize the evidence by noting that both the binary regression and the synthetic control point to a weighted differential of around 7.5 percentage points, on average for the first year, between tariff-concerned and unaffected firms when the comparison is made on a like-for-like basis. In Section 5 we use a calibrated two-sector model to translate this cross-sectional differential into aggregate investment and output effects, exploiting the fact that the relative investment response across sectors is primarily informative about investment adjustment costs, while the level response to monetary policy pins down nominal rigidities.

# 5 Trade Policy in a Multi-Sector Open Economy Model

The regression and synthetic control results document a strong association between tariff sentiment and firm investment at the cross-sectional level. While we cannot definitively rule out that firms with pre-existing weak investment prospects, deteriorating demand, or high leverage both express more negative tariff sentiment and cut investment for reasons unrelated to tariffs, several considerations support a causal interpretation. First, firms have a legal obligation to investors to disclose material information truthfully, limiting their ability to misattribute weak performance to tariff concerns. Second, the lagged sentiment specification and AI sentiment control in Table 1 help address some confounds, though endogeneity remains a concern. Nevertheless, translating these micro estimates into aggregate implications requires structure. As emphasized by Wolf (2023) and Nakamura and Steinsson (2014), research designs that exploit cross-sectional variation identify *relative* effects—how high-sentiment firms invest compared to low-sentiment firms—but not *absolute* effects that account for economy-wide spillovers. A naive aggregation that multiplies our estimated investment gap by the share of treated firms would suffer from the "missing intercept" problem: it would miss general equilibrium feedback through prices, labor reallocation, and monetary policy responses that affect all firms simultaneously. To recover these aggregate effects, we develop a two-sector open economy model disciplined by our micro estimates. The model allows us to decompose the investment response into direct effects (the relative component we identify in the data) and indirect effects (the missing intercept), and to quantify how the cross-sectional gap maps to the aggregate decline in investment and GDP.

The firm-level evidence in Figure 5 documents a sharp divergence in investment growth between firms concerned about tariffs and a matched control group. As shown in Figure 3, concerned firms are overwhelmingly concentrated in goods-producing industries with high exposure to imported inputs and capital goods, while neutral or positive-sentiment firms are predominantly in the services sector. This pattern motivates a structural model that distinguishes these two groups of firms explicitly and can speak to both the cross-sectional differential and the aggregate investment response.

We develop a two-country New Keynesian open economy model that features trade in consumption goods, intermediate materials and capital goods, and includes two production sectors: a goods sector ($k = 1$) and a services sector ($k = 2$). The two sectors differ in their exposure to trade—the goods sector sources a substantial share of its intermediate inputs and capital goods from abroad, while the services sector is largely self-sufficient domestically.

A key property of the model is that tariff shocks and monetary shocks affect investment through distinct channels. A monetary tightening reduces investment uniformly across sectors, with the magnitude determined—among other things—both by nominal rigidities $\kappa$ (which govern how much output and demand compress for a given rate increase) and investment adjustment costs $\psi$ (which determine the elasticity of investment to the user cost of capital). A tariff shock, in contrast, generates a differential investment response across sectors that is primarily driven by adjustment costs and the asymmetric import intensity of the two sectors, and is largely independent of the degree of nominal rigidity (the tariff shock affects the real cost of capital in the import-exposed sector independent of the degree of nominal rigidity). We exploit this separation to jointly calibrate $\kappa$ and $\psi$ to match the investment response to monetary policy shocks from the literature, and the cross-sectional investment differential from our empirical evidence. Once the model is disciplined this way, one can obtain an estimate of the aggregate effects of the observed tariff increases.

## 5.1 Model Setup

There are $N = 2$ countries ($i, j \in \{1, 2\}$) and $S = 2$ sectors ($k, l \in \{1, 2\}$), with country 1 representing the United States and country 2 the rest of the world. Within each country $i$, sector $k$ produces a differentiated good $Y_{i,k,t}$ that is sold domestically and exported. In addition to labor, firms use composites of materials and capital goods, which are sourced from different sectors and countries. Households consume a bundle of goods produced by different sectors in both countries. Nominal rigidities generate stickiness in the price set by each sector and in the wage paid to households. All cross-border flows of consumption goods, intermediate inputs, and investment goods can be subject to tariffs.

### 5.1.1 Households

Households in country $i$ choose consumption $C_{i,t}$ and savings. They can save in domestic government bonds $B_{ii,t}$, in US bonds $B_{i1,t}$, and in domestic capital, $K_{i,t}$. Households in country $i$ solve:

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

subject to

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

where $w_{i,t}$ is the real wage, $r_{i,t}^k$ is the real rental rate of capital, $Q_{i,t}^k$ is the real price of capital, $R_{i,t}^n$ is the nominal interest rate and $T_{i,t}$ are real taxes. CPI inflation and the real exchange rate are given by $\pi_{i,t} = \frac{P_{i,t}^c}{P_{i,t-1}^c}$ and $Q_{i1,t} = \frac{e_{i1,t}P_{1,t}^c}{P_{i,t}^c}$, respectively, where $P_{i,t}^c$ is the price of the consumption bundle and $e_{ij,t}$ is the nominal exchange rate (price of good from country $j$ in country $i$, so that $\varepsilon_{ii,t} = 1$). As is standard in open economy models we assume that holdings of US bonds are subject to adjustment costs captured by $\frac{\varphi_{i,t}}{2}\left(B_{i1,t} - \bar{b}_i\right)^2$. As described in the appendix, labor unions set wages subject to Rotemberg adjustment costs $\frac{\kappa^w}{2}\left(\frac{W_{i,t}}{W_{i,t-1}} - 1\right)^2$, giving rise to a standard wage Phillips curve.

### 5.1.2 Intermediate Goods Production

Sector $k$ in country $i$ produces gross output $Y_{i,k,t}$ with a CES technology combining value added $V_{i,k,t}$ and a composite of intermediate inputs $M_{i,k,t}$:

$$Y_{i,k,t} = A_{i,k,t}\left[ (1-\nu_{ik})^{1/\varepsilon_Y} V_{i,k,t}^{\frac{\varepsilon_Y - 1}{\varepsilon_Y}} + \nu_{ik}^{1/\varepsilon_Y} M_{i,k,t}^{\frac{\varepsilon_Y - 1}{\varepsilon_Y}} \right]^{\frac{\varepsilon_Y}{\varepsilon_Y - 1}} \tag{5}$$

where $\nu_{ik}$ is the intermediate input share of sector $k$ in country $i$ and $A_{i,k,t}$ is sector-level TFP.

Letting $mc_{i,k,t}$ be real marginal cost, $p_{i,k,t}^v = P_{i,k,t}^v / P_{i,t}^c$ and $p_{i,k,t}^m = P_{i,k,t}^m / P_{i,t}^c$ be the real prices of value added and the intermediate bundle in sector $k$, producers choose $Y_{i,k,t}$, $V_{i,k,t}$, and $M_{i,k,t}$ to solve

$$\max \; mc_{i,k,t}Y_{i,k,t} - p_{i,k,t}^v V_{i,k,t} - p_{i,k,t}^m M_{i,k,t}$$

subject to (A.12). The first order conditions imply

$$M_{i,k,t} = \nu_{ik} \left( \frac{p^m_{i,k,t}}{mc_{i,k,t}} \right)^{-\varepsilon_Y} Y_{i,k,t} \left(A_{i,k,t}\right)^{\varepsilon_Y - 1} \tag{6}$$

$$V_{i,k,t} = (1 - \nu_{ik}) \left( \frac{p^v_{i,k,t}}{mc_{i,k,t}} \right)^{-\varepsilon_Y} Y_{i,k,t} \left(A_{i,k,t}\right)^{\varepsilon_Y - 1} \tag{7}$$

Value added combines labor and capital in a CES technology:

$$V_{i,k,t} = \left[ (1 - \alpha_{ik})^{1/\varepsilon_k} L_{i,k,t}^{\frac{\varepsilon_k - 1}{\varepsilon_k}} + \alpha_{ik}^{1/\varepsilon_k} K_{i,k,t-1}^{\frac{\varepsilon_k - 1}{\varepsilon_k}} \right]^{\frac{\varepsilon_k}{\varepsilon_k - 1}} \tag{8}$$

where $\alpha_{ik}$ is the capital share and $\varepsilon_k$ is the elasticity of substitution between capital and labor.

Each sector $k$ in country $i$ accumulates its own capital stock $K_{i,k,t}$ according to

$$K_{i,k,t} = I_{i,k,t} + (1 - \delta_k) K_{i,k,t-1} \tag{9}$$

where $\delta_k$ is the depreciation rate. As described in the appendix, capital goods producers create sector-specific capital subject to convex adjustment costs, yielding a sector-specific Tobin's $q^k_{i,k,t}$ equation for the price of capital.

Finally, as described in the appendix, monopolistically competitive retailers in each sector purchase intermediate goods at cost $mc_i, k, t$ and re-sell them while setting prices under Rotemberg adjustment costs. This results in a price Phillips curve for domestic and exported products governed by the parameters $\kappa_i$ and $\kappa_i^*$.

### 5.1.3 Bundles of Consumption Goods, Materials and Investment Goods

The final consumption good, and the material and investment good used in production, are obtained as a bundle of goods produced by different sectors and countries. As we describe below, tariffs will affect the relative demand for imports in each of these bundles.

Consumption $C_{i,t}$ is a two-level CES aggregate. At the upper level, households combine goods from the two sectors with elasticity $\varepsilon_c$, using sector weights $\gamma^c_{ik}$:

$$C_{i,t} = \left( \sum_{k=1}^{S} (\gamma^c_{ik})^{\frac{1}{\varepsilon_c}} C_{i,k,t}^{\frac{\varepsilon_c - 1}{\varepsilon_c}} \right)^{\frac{\varepsilon_c}{\varepsilon_c - 1}}, \quad \sum_{k=1}^{S} \gamma^c_{ik} = 1 \tag{10}$$

This specification results in the standard relative demand function

$$C_{i,k,t} = \gamma_{ik}^{c} \left(p_{i,k,t}\right)^{-\varepsilon_c} C_{i,t} \tag{11}$$

where $p_{i,k,t} = P_{i,k,t}/P_{i,t}^{c}$ is the real price of the good produced in country $i$ and sector $k$.

At the lower level, sectoral consumption $C_{i,k,t}$ is a CES bundle of domestic and imported varieties with trade elasticity $\eta_c$:

$$C_{i,k,t} = \left( \sum_{j=1}^{N} \left(\omega_{ij,k}^{c}\right)^{\frac{1}{\eta_c}} C_{ij,k,t}^{\frac{\eta_c - 1}{\eta_c}} \right)^{\frac{\eta_c}{\eta_c - 1}}, \quad \sum_{j=1}^{N} \omega_{ij,k}^{c} = 1 \tag{12}$$

where $\omega_{ij,k}^{c}$ is the home-bias parameter for sector-$k$ consumption goods in country $i$, and $C_{ij,k,t}$ is consumption in country $i$ of sector-$k$ goods produced in country $j$. Cost minimization yields the demand functions

$$C_{ij,k,t} = \omega_{ij,k}^{c} \left( \frac{p_{ij,k,t}}{p_{i,k,t}} \tau_{ij,k,t}^{c} \right)^{-\eta_c} C_{i,k,t} \tag{13}$$

where $p_{ij,k,t} = P_{ij,k,t}/P_{i,t}^{c}$ is the ex-tariff real price of imports from country $j$ to country $i$ in sector $k$, and $\tau_{ij,k,t}^{c} \geq 1$ is the gross tariff rate on consumer goods.

The bundles of materials and of investment goods have a symmetric structure, which takes into account possible input/output linkages across sectors. The intermediate input bundle $M_{i,k,t}$ and the investment good bundle $I_{i,k,t}$ used in sector $k$ is a two-level CES aggregate. At the upper level, sector $k$ sources inputs from all sectors $l$ according to

$$M_{i,k,t} = \left( \sum_{l=1}^{S} \left(\gamma_{kl}^{m}\right)^{\frac{1}{\varepsilon_m}} M_{i,kl,t}^{\frac{\varepsilon_m - 1}{\varepsilon_m}} \right)^{\frac{\varepsilon_m}{\varepsilon_m - 1}}, \quad \sum_{l=1}^{S} \gamma_{kl}^{m} = 1 \tag{14}$$

$$I_{i,k,t} = \left( \sum_{l=1}^{S} \left(\gamma_{kl}^{I}\right)^{\frac{1}{\varepsilon_i}} I_{i,kl,t}^{\frac{\varepsilon_i - 1}{\varepsilon_i}} \right)^{\frac{\varepsilon_i}{\varepsilon_i - 1}}, \quad \sum_{l=1}^{S} \gamma_{kl}^{I} = 1 \tag{15}$$

where $M_{i,kl,t}$ and $I_{i,kl,t}$ denote the quantity of sector-$l$ input used in sector $k$ of country $i$. This specification implies the relative demands

$$M_{i,kl,t} = \gamma_{ik}^{m} \left( \frac{p_{i,k,t}}{p_{i,k,t}^{m}} \right)^{-\varepsilon_c} M_{i,k,t} \tag{16}$$

$$I_{i,kl,t} = \gamma^I_{ik} \left( \frac{p_{i,k,t}}{p^I_{i,k,t}} \right)^{-\varepsilon_c} I_{i,k,t} \tag{17}$$

where $p^m_{i,k,t}$ is the real price of bundle $M_{i,k,t}$ and $p^I_{i,k,t}$ is the real price of $I_{i,k,t}$.

At the lower level, each bundle $M_{i,kl,t}$ and $I_{i,kl,t}$ is a CES aggregate over countries with trade elasticity $\eta_m$ and $\eta_I$:

$$M_{i,kl,t} = \left( \sum_{j=1}^{N} \left( \omega^m_{ij,kl} \right)^{\frac{1}{\eta_m}} M_{ij,kl,t}^{\frac{\eta_m - 1}{\eta_m}} \right)^{\frac{\eta_m}{\eta_m - 1}}, \quad \sum_{j=1}^{N} \omega^m_{ij,kl} = 1 \tag{18}$$

$$I_{i,kl,t} = \left( \sum_{j=1}^{N} \left( \omega^I_{ij,kl} \right)^{\frac{1}{\eta_I}} I_{ij,kl,t}^{\frac{\eta_I - 1}{\eta_I}} \right)^{\frac{\eta_I}{\eta_I - 1}}, \quad \sum_{j=1}^{N} \omega^I_{ij,kl} = 1 \tag{19}$$

where $M_{ij,kl,t}$ and $I_{ij,kl,t}$ are the flow of sector-$l$ inputs produced in country $j$ and used in sector $k$ of country $i$, and $\omega^m_{ij,kl}, \omega^I_{ij,kl}$ are the corresponding home-bias parameter. Optimal demand implies:

$$M_{ij,kl,t} = \omega^m_{ij,kl} \left( p_{ij,l,t} \tau^m_{ij,l,t} \right)^{-\eta_m} M_{i,kl,t} \tag{20}$$

$$I_{ij,kl,t} = \omega^I_{ij,kl} \left( p_{ij,l,t} \tau^I_{ij,l,t} \right)^{-\eta_m} I_{i,kl,t} \tag{21}$$

where $\tau^m_{ij,l,t}$ and $\tau^I_{ij,l,t}$ are the gross tariff rate on imports of materials and of capital goods from country $i$ to country $j$.

#### 5.1.4 Monetary Policy and Market Clearing

The central bank follows an inertial Taylor rule:

$$\log R^n_{i,t} = (1 - \rho_{r,i}) \log R_{SS} + \rho_{r,i} \log R^n_{i,t-1} + (1 - \rho_{r,i}) \left[ \kappa_{\pi,i} \log \left( \pi^{4q}_{i,t} \right) + \kappa_{y,i} \log \left( \frac{GDP_{i,t}}{GDP_{i,SS}} \right) \right] + \xi^m_{i,t} \tag{22}$$

where $\pi^{4q}_{i,t}$ is four-quarter CPI inflation and $GDP_{i,t}$ is real GDP. We calibrate the monetary policy rules asymmetrically across countries: the U.S. rule ($i = 1$) responds to both inflation and the output gap with $\kappa_{y,1} = 0.25$, consistent with estimated Federal Reserve behavior, while the foreign (rest-of-world) rule ($i = 2$) responds only to inflation with $\kappa_{y,2} = 0$. Both countries feature interest rate smoothing with $\rho_{r,i} = 0.8$. This specification implies that following the tariff shocks, the U.S. policy rate rises gradually and reaches approximately 0.25 percentage points above baseline after six quarters—a magnitude consistent with the upward revision in the Summary of Economic Projections between the March 2025 FOMC projection (3.4% end-2026 median FFR) and the June 2025 projection (3.6%). Market clearing in sector $k$ of country $i$ requires

$$Y_{i,k,t} = \sum_{j=1}^{N} \frac{n_j}{n_i} \left(C_{ji,k,t} + I_{ji,k,t}\right) + \sum_{j=1}^{N} \sum_{l=1}^{S} \frac{n_j}{n_i} M_{ij,lk,t} \quad \text{for } i = 1, \ldots, N;\ k = 1, \ldots, S \tag{23}$$

where $n_i$ is country $i$'s population share.

Using the households budget constraints we can derive the balance of payment equation

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

Aggregate GDP in country $i$ can be defined as:

$$GDP_{i,t} = (C_{i,t} + I_{i,t}) + NX_{i,t} \tag{24}$$

where $I_{i,t} = \sum_{k=1}^{S} I_{i,k,t}$ is aggregate investment and $NX_{i,t}$ are net exports.

Finally, tariffs evolve according the following exogenous processes

$$\log \tau^c_{ij,k,t} = \rho_\tau \log \tau^c_{ij,k,t-1} + \varepsilon^\tau_{ij,t} + \tilde{\varepsilon}^\tau_{ij,t-1} \tag{25}$$

$$\log \tau^m_{ij,k,t} = \rho_\tau \log \tau^m_{ij,k,t-1} + \varepsilon^\tau_{ij,t} + \tilde{\varepsilon}^\tau_{ij,t-1} \tag{26}$$

$$\log \tau^I_{ij,k,t} = \rho_\tau \log \tau^I_{ij,k,t-1} + \varepsilon^\tau_{ij,t} + \tilde{\varepsilon}^\tau_{ij,t-1} \tag{27}$$

where $\varepsilon^\tau_{ij,t}$ represents an unanticipated tariff shock, whereas $\tilde{\varepsilon}^\tau_{ij,t-1}$ represents a one-period-ahead tariff news shock.

## 5.2 Calibration

Table A.1 in the Appendix reports the parameter values for the two-sector model. Aggregate parameters are fairly standard, The trade elasticities $\eta_c = \eta_m = \eta_I = 1.5$ are set to a standard value from the macro open-economy literature. We assume dominant currency pricing (DCP) by setting $\kappa^*_1 = 0$.

For the sectoral IO structure and trade shares, we select values consistent with the BEA National Income and Product Accounts, as in Comin, Johnson, and Jones (2024), while assuming that sector 1 is the goods sector whereas sector 2 is the services sector. Consumption weights $\gamma_{ik}^c$ are set so that goods account for 30 percent of consumption expenditure and services for 70 percent. The home-bias parameters for consumption follow Comin et al. (2024): the goods sector has a domestic consumption share of 0.80 (import penetration of 20 percent) while the services sector has a domestic share of 0.995. For intermediate inputs and investment goods, the home bias parameters in the goods sector are set to 0.75, consistent with the 25 percent goods import penetration in BEA input-output accounts, while the services sector home bias is 0.99 in both cases, reflecting the near-zero tradability of services inputs and capital. The sectoral IO matrices $\gamma_{kl}^m$ and $\gamma_{kl}^I$ govern the sourcing pattern for intermediates and investment. For intermediates, the IO structure follows the BEA Use of Commodities tables as summarized in Comin et al. (2024): the goods sector sources 70 percent of its intermediates from within the goods sector and 30 percent from services, while services sources 30 percent from goods and 70 percent from services. For investment, we follow a simpler structure in which goods sector investment is sourced entirely from the goods sector ($\gamma_{11}^I = 1$) and services sector investment is sourced entirely from services ($\gamma_{22}^I = 1$), consistent with the high share of equipment in goods investment and the high share of software and structures in services investment.

We jointly calibrate nominal rigidities $\kappa = \kappa_w$ and investment adjustment costs $\psi$ to match two moments. The first target is a 2 percent average decline in aggregate investment in the first year in response to a 100 basis-point monetary policy shock, consistent with estimates from the empirical monetary transmission literature.[13] The second target is a 7.5 percent average differential in investment growth between goods and services firms, over one year, in response to a tariff shock. This target is broadly in line with the regression and synthetic control evidence in Section 4. As discussed above, we target these two moments in order identify the two parameters. The monetary target primarily pins down the combination of $\kappa$ and $\psi$ that determines the aggregate investment elasticity: in particular, neither the adjustment cost nor price rigidity matter for the differential investment response to a common monetary shock, but they both matter for the overall investment response to a monetary shock (which is larger the lower price rigidity and the lower the adjustment cost). The differential tariff target pins down

[13] Christiano, Eichenbaum, and Evans (2005) estimate a decline in investment of around 1.5 percent in response to a monetary shock that is sized to raise the interest rate by 100 basis points (see Figure 1 in their paper). Iacoviello and Neri (2010) find larger responses, around 3 to 4 percent (see Figure 3). We pick a number in between the estimates of these two papers. Other papers find numbers in the same ballpark.

$\psi$ conditional on the import intensity of the two sectors: in particular, a low (high) value of the adjustment cost would generate a very large (small) response of aggregate and differential investment to a tariff shock, whereas the investment response depend little on the degree of nominal rigidity. The exercise yields $\kappa = \kappa_w = 110$ and $\psi = 1.1$. The calibrated Rotemberg cost parameter implies an average price duration of approximately 4 quarters under a standard Calvo interpretation. We assume that $\kappa_2^* = \kappa$, and we introduce dominant currency pricing (DCP) by setting $\kappa_1^* = 0$.[14]

## 5.3 Tariff Shocks and the Cross-Sectional Investment Gap

We now use the two-sector model to interpret the cross-sectional evidence in Figure 5. We discipline the tariff simulation using a filtering exercise over four quarters beginning in 2025Q1. The experiment feeds two types of shocks into the model: (i) unanticipated realized tariff shocks, and (ii) one-quarter-ahead tariff news shocks capturing shifts in expectations about future tariff policy.

For the realized tariff rate, we construct a quarterly series for the U.S. average effective tariff rate using federal customs duty receipts divided by the customs value of goods imports, drawn from Haver Analytics (`FTRU@GOVFIN` and `TMMCA@USINT`, respectively). Relative to a pre-2025 baseline of approximately 2.5%, the effective tariff rate rose to roughly 8% in 2025Q2, 10.7% in Q3, and 11.25% in Q4, yielding deviations from baseline of 5.5, 8.2, and 8.75 percentage points. These values are broadly consistent with the monthly effective tariff rate series reported by the Penn Wharton Budget Model, which documented an increase from 2.3% in January 2025 to approximately 9–10% by mid-year and 10.5–10.7% by September, reflecting the cumulative impact of tariffs on Chinese imports, Section 232 actions on steel, aluminum, automobiles, and copper, and the partial implementation of reciprocal tariffs following "Liberation Day" on April 2.

For the tariff news shocks, we introduce one-quarter-ahead news shocks to capture the forward-looking component of tariff policy, which proxies for a key driver of our sentiment measure. In Q1, we feed a 5 percentage point expected tariff increase for Q2 in deviation from steady state. This Q1 news shock reflects the rapid escalation of tariff announcements

[14] Appendix Figure A.1 shows the calibration loss surface over the $(\kappa, \psi)$ grid, along with the iso-curves for each target moment. Appendix Figure A.2 shows the model responses to a 100 basis-point monetary shock at the calibrated parameter values.

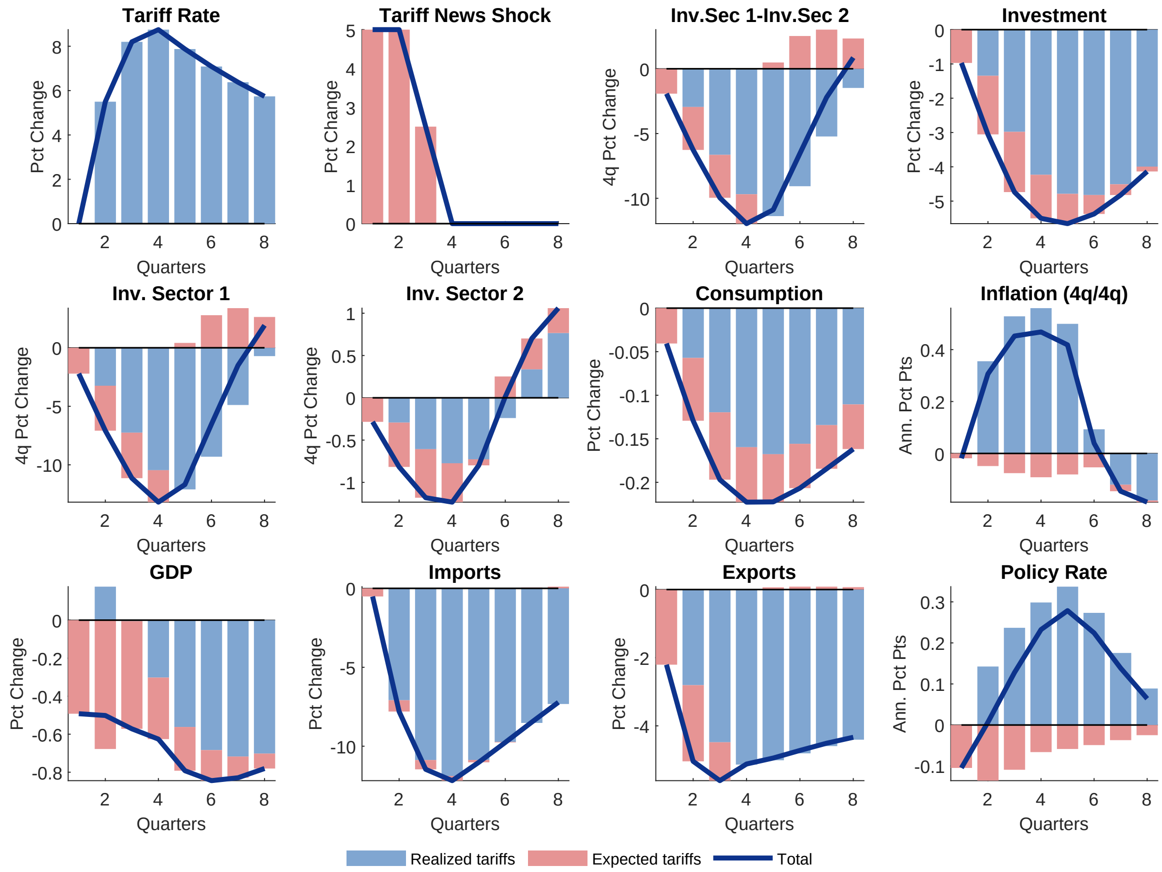
during the first quarter—including the February tariffs on China (10%, later raised to 20%), the 25% tariffs on steel and aluminum, threatened 25% duties on Canada and Mexico, which collectively signaled a substantial increase in the effective tariff rate for the following quarter. This magnitude is in line with scenario analysis produced in early 2025 (see, for example, Azzimonti, Edwards, Waddell, and Wyckoff (2025)). In Q2, we feed an additional 5 percentage point expected increase in tariffs for Q3. This shock broadly captures the difference between the realized tariff rate of 8 percent and the estimated tariff rate of 14 percent following the Liberation Day announcement and the subsequent pause on reciprocal tariff (see, for example, https://budgetlab.yale.edu/research/tracking-economic-effects-tariffs). Finally a last news shock in Q3 corresponds to the difference between the 14 percent effective tariff rate and the realized Q3 tariff rate of about 11.5 percent. All the news shocks do not materialize, as the model matches the realized tariff rate.

The filtering exercise decomposes the impulse responses into contributions from realized tariff shocks and expected tariff (news) shocks, allowing us to assess the relative importance of unanticipated versus anticipated tariff changes in driving macroeconomic dynamics.

Figure 7 reports the results. A first key finding concerns the relative importance of news versus realized shocks. The large Q1 news shock—representing firms' rapid upward revision of expected future tariff rates in response to Liberation Day and related announcements—accounts for the bulk of the investment response in the first two quarters. Specifically, anticipated tariff increases (red bars) dominate the early dynamics of goods-sector investment, the cross-sectional gap, and GDP, while realized shocks (blue bars) build gradually and take over as the primary driver from Q3 onward once tariff increases are fully in place. This pattern underscores that the investment declines documented in the firm-level evidence of Section 4 were driven primarily by a forward-looking response to anticipated policy changes rather than by the contemporaneous cost increases from tariffs already in place. Turning to the cross-sectional investment gap, the model generates a differential between goods- and services-sector investment that reaches approximately 12 percentage points on a four-quarter basis at its trough, close to the estimate from the synthetic control in Figure 5. The gap is driven almost entirely by the collapse in goods-sector investment, which falls by up to 15 percentage points, while services-sector investment declines by only about 2 percentage points—a much smaller response reflecting the near-zero import intensity of that sector.

At the aggregate level, total investment falls by approximately 6 percent at the trough,

Figure 7: Tariff shock in calibrated two-sector model.




*Note:* Bars show the contribution of realized tariff shocks (blue) and expected tariff news shocks (red) to each variable. Solid line is the total response.

with the news shock being a key driver in the initial decline. Consumption falls by about 0.2 percent, consistent with the tightening of real household budgets from higher import prices. Imports decline sharply following the tariff increases, while exports decline modestly, implying an improvement in the trade balance. All told, GDP declines by about 1 percent, as the decline in domestic absorption is larger than the increase in net exports.

On the price side, year-on-year inflation rises by approximately 0.5 percentage points at its peak in response to the tariff shocks, consistent with empirical estimates from the tariff hikes in 2025. Dvorkin, Leibovici, and Santacreu (2025) document that U.S. tariffs implemented in 2025 led to measurable increases in import prices and consumer inflation, with magnitudes in line with our calibrated model responses. The model's inflation dynamics reflect both the direct pass-through of higher import costs to consumer prices and the endogenous monetary policy response, which moderates but does not fully offset the inflationary pressure from tariffs.

Together, these results suggest that the firm-level sentiment evidence in this paper maps onto aggregate investment and output effects that are quantitatively significant, with the anticipatory channel—firms cutting investment in response to expected future tariff costs—accounting for a significant share of the near-term macroeconomic impact.

## 6 Conclusion

Our analysis documents a strong association between tariff sentiment and corporate investment during 2024–2025. Firms expressing more negative tariff sentiment exhibit substantially lower investment growth, with this relationship particularly pronounced among large firms that account for a disproportionate share of aggregate investment. Analysis of earnings call transcripts shows three recurring themes in how firms discuss tariff-related investment adjustments: shifting investment away from capacity expansion toward cost reduction, postponing capital expenditures amid policy uncertainty, and redirecting resources toward supply chain reorganization. While we cannot rule out all alternative explanations for these patterns, the evidence is consistent with trade policy concerns influencing investment decisions during this period.

To translate the cross-sectional evidence into aggregate implications, we calibrate a two-sector open economy model to match both our micro estimates and established monetary policy benchmarks. The calibrated model suggests a sizable decline in aggregate investment and output in response to the 2025 tariff increases, though these predictions reflect model structure and should be interpreted as illustrative rather than definitive forecasts. Our study illustrates the value of combining LLM-based sentiment analysis with firm-level data to provide a timely window into how trade policy developments are perceived by firms and associated with their investment behavior.

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# Appendix for: Trade Policy Sentiment and Corporate Investment

## A Data & Measurement

**LLM prompt used to extract tariff sentiment.** The following prompt is passed to Claude (claude-sonnet-4-5 with extended thinking enabled) for each firm-date excerpt. Snippets from the same earnings call are extracted within a 50-word window of tariff-related keywords, merged if overlapping, and concatenated with "…" separators before scoring.

`Companies in their earnings calls may talk about trade policy, import and export tariffs and barriers, customs and duties. You will be analyzing text from earnings calls that may mention topics related to trade tariffs, not complete transcripts.`

`Analyze this company's sentiment toward trade tariffs using a` $-1$ `to` $+1$ `scale, with values ranging all the way from` $-1.0$ `to` $+1.0$ `in` $0.1$ `increments, e.g.:`
$-1.0$`: Strongly negative (major threat/costs);`
$-0.5$`: Moderately negative (some concerns mentioned);`
$0.0$`: Neutral/unclear/balanced;`
$+0.5$`: Moderately positive (some benefits mentioned);`
$+1.0$`: Strongly positive (major opportunity/advantage).`

`Return 0 if content refers to non-trade tariffs (utility rates, electricity tariffs, non-trade related tariffs, etc.).`

## B Compustat Data: Construction and Coverage

**Accounting data and panel construction.** The accounting backbone is quarterly Compustat fundamentals (industrial, standardized, consolidated). We retain firm identifiers, quarter-end dates, total assets, capital expenditures (`capxy`), gross PP&E, industry classifications, tickers, and location codes. Calendar-quarter and fiscal-quarter timing variables are constructed from Compustat quarter labels; the raw quarter-end date is also used to align fiscal reporting with earnings-call timing when fiscal years do not end in December.

De-duplication proceeds in two steps. When the same firm-quarter appears multiple times, we first prefer observations with non-missing capital expenditures; if duplicates remain, we drop all such observations rather than selecting one arbitrarily. We restrict to U.S. firms using the location code, drop observations missing firm identifiers or quarter assignments, and attach Fama–French 49-industry classifications using SIC codes.

**Reporting-date imputation and residual duplicate handling.** Linking transcripts to firm-quarters requires a valid reporting window. Missing period-end dates are replaced with the Compustat quarter-end date; missing filing dates are imputed as the next quarter-end minus one week (or quarter-end plus 60 days for the last observation in a firm's spell). Imputed dates are flagged. After earnings-call matching, residual duplicates are identified and handled through two additional screens: we remove firms whose financial profiles (capital expenditures and total assets across all quarters) are identical, likely reflecting data errors; and we manually inspect and drop observations with identical financial data but different ticker suffixes, retaining the primary ticker listing.

**Matching earnings calls to firm-quarters.** Transcript data are linked to Compustat via a Capital IQ firm crosswalk. Calls whose headline explicitly references a fiscal quarter are matched directly to that firm-quarter; when multiple calls reference the same firm-quarter the later call is retained. Remaining calls are matched by date: a call is assigned to the firm-quarter whose adjusted period-end date precedes the call date and whose filing date follows it; when multiple firm-quarters satisfy this date window, the call is assigned to the most recent such quarter. Where both an explicit-quarter match and a date-window match exist, the explicit-quarter match takes precedence.[1]

**Investment variable and sample restrictions.** Capital expenditures are constructed as quarterly flows from `capxy`, using within-year first differences. The final panel is restricted to observations from 2021 onward and excludes financial firms, banks, and the Fama–French "other" category.

[1]Investment is measured at the calendar-quarter level. For firms with non-December fiscal years, we align fiscal-quarter financial data to the calendar quarter containing the fiscal quarter-end date, ensuring that each earnings call is matched to the capital expenditures reported for the corresponding calendar period.

## C Permutation Inference for the Synthetic Control

We assess the statistical significance of the synthetic control estimate using a placebo-based permutation approach. We draw $N = 100$ random reassignments of firms to treatment and control groups, preserving the number of treated and control firms in each draw. For each placebo, we re-run the synthetic control optimization and compute the post-treatment gap between the placebo-treated aggregate and its synthetic control.

To ensure comparability, we retain only placebos whose pre-treatment root mean squared prediction error (RMSPE) is no more than twice that of the actual estimate. Placebos with a poor pre-treatment fit are uninformative about the distribution of post-treatment gaps under the null, so dropping them tightens the reference distribution without introducing bias.

The 90% confidence band shown in Figure 5 is formed by adding the 5th and 95th percentiles of the distribution of placebo post-treatment gaps to the synthetic control path:

$$\mathrm{CI}_{\mathrm{lower},t} = \hat{Y}_t^{\mathrm{synth}} + \mathrm{Percentile}_5\Big(\{\hat{\delta}_t^{(j)}\}_{j=1}^{N}\Big) \tag{A.1}$$

$$\mathrm{CI}_{\mathrm{upper},t} = \hat{Y}_t^{\mathrm{synth}} + \mathrm{Percentile}_{95}\Big(\{\hat{\delta}_t^{(j)}\}_{j=1}^{N}\Big) \tag{A.2}$$

where $\hat{\delta}_t^{(j)}$ is the gap between the placebo-treated and placebo-synthetic series in draw $j$ at time $t$.

The one-sided p-value tests the directional hypothesis that concerned firms invest *less* than the synthetic counterfactual. It is the share of placebo draws whose average post-treatment gap is at least as negative as the observed gap:

$$p = \frac{1}{N}\sum_{j=1}^{N} \mathbb{I}\Big(\bar{\delta}_{\mathrm{post}}^{(j)} \leq \bar{\delta}_{\mathrm{post}}\Big) \tag{A.3}$$

where $\bar{\delta}_{\mathrm{post}}$ denotes the average post-treatment gap in the actual estimate.

# D Additional Model Details

We report below the optimization problems and optimality conditions for all the agents in our baseline multi-country multi-sector model.

## D.1 Households

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

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

$$\begin{aligned} &P^c_{i,t} C_{i,t} + e_{ii,t}\tilde{B}_{ii,t} + e_{i1,t}\tilde{B}_{i1,t} + P^c_{i,t}\frac{\varphi_i \xi^{UIP}_{it}}{2}\left(\frac{e_{i1,t}\tilde{B}_{i1,t}}{P^c_{1,t}} - \bar{b}_i\right)^2 + \tilde{Q}^k_{i,t}K_{i,t} \\ &\leq \ \tilde{W}_{i,t}L_{i,t} + \tilde{B}_{ii,t-1}R^n_{i,t} + B_{i1,t-1}e_{i1,t}R^n_{1,t} + \tilde{\Pi}_{i,t} + \tilde{T}_{it} + \left[\tilde{r}^k_{i,t} + (1-\delta)\tilde{Q}^k_{i,t}\right]K_{i,t-1} \end{aligned}$$

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.

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

$$1 = \beta E_t \frac{U^c_{i,t+1}}{U^c_{i,t}}\frac{R^n_{i,t+1}}{\pi_{i,t+1}} \tag{A.4}$$

$$1 + \varphi_i \xi^{UIP}_{it}\left(B_{i1,t} - \bar{b}_i\right) = \beta E_t \frac{U^c_{i,t+1}}{U^c_{i,t}}\frac{R^n_{1,t}}{\pi_{1,t+1}}\frac{Q_{i1,t+1}}{Q_{i1,t}} \quad \text{if } i \neq 1 \tag{A.5}$$

$$1 = \beta E_t \frac{U^c_{i,t+1}}{U^c_{i,t}} R^k_{i,t+1} = \beta E_t \frac{U^c_{i,t+1}}{U^c_{i,t}}\frac{\left(r^k_{i,t+1} + (1-\delta)\,Q^k_{i,t+1}\right)}{Q^k_{i,t}} \tag{A.6}$$

where

$$U^c_{i,t} = (C_{i,t} - hC_{i,t-1})^{-\sigma} - \beta h \left(C_{i,t+1} - hC_{i,t}\right)^{-\sigma} \tag{A.7}$$

Consumption $C_{i,t}$ is a two-level CES aggregate. At the upper level, households combine goods from the two sectors with elasticity $\varepsilon_c$, using sector weights $\gamma^c_{ik}$:

$$C_{i,t} = \left(\sum_{k=1}^{S} \left(\gamma^c_{ik}\right)^{\frac{1}{\varepsilon_c}} C_{i,k,t}^{\frac{\varepsilon_c-1}{\varepsilon_c}}\right)^{\frac{\varepsilon_c}{\varepsilon_c-1}}, \quad \sum_{k=1}^{S} \gamma^c_{ik} = 1 \tag{A.8}$$

This specification results in the standard relative demand function

$$C_{i,k,t} = \gamma^c_{ik} \left(p_{i,k,t}\right)^{-\varepsilon_c} C_{i,t} \tag{A.9}$$

where $p_{i,k,t} = P_{i,k,t}/P^c_{i,t}$ is the real price of the good produced in country $i$ and sector $k$.

At the lower level, sectoral consumption $C_{i,k,t}$ is a CES bundle of domestic and imported varieties with trade elasticity $\eta_c$:

$$C_{i,k,t} = \left(\sum_{j=1}^{N} \left(\omega^c_{ij,k}\right)^{\frac{1}{\eta_c}} C_{ij,k,t}^{\frac{\eta_c-1}{\eta_c}}\right)^{\frac{\eta_c}{\eta_c-1}}, \quad \sum_{j=1}^{N} \omega^c_{ij,k} = 1 \tag{A.10}$$

where $\omega^c_{ij,k}$ is the home-bias parameter for sector-$k$ consumption goods in country $i$, and $C_{ij,k,t}$ is consumption in country $i$ of sector-$k$ goods produced in country $j$. Cost minimization yields the standard demand functions

$$C_{ij,k,t} = \omega^c_{ij,k} \left(\frac{p_{ij,k,t}}{p_{i,k,t}} \tau^c_{ij,k,t}\right)^{-\eta_c} C_{i,k,t} \tag{A.11}$$

where $p_{ij,k,t} = P_{ij,k,t}/P^c_{i,t}$ is the ex-tariff real price of imports from country $j$ to country $i$ in sector $k$, and $\tau^c_{ij,k,t} \geq 1$ is the gross tariff rate on consumer goods.

### D.2 Intermediate Goods Production

Sector $k$ in country $i$ produces gross output $Y_{i,k,t}$ with a CES technology combining value added $V_{i,k,t}$ and a composite of intermediate inputs $M_{i,k,t}$:

$$Y_{i,k,t} = A_{i,k,t} \left[(1-\nu_{ik})^{1/\varepsilon_Y} V_{i,k,t}^{\frac{\varepsilon_Y-1}{\varepsilon_Y}} + \nu_{ik}^{1/\varepsilon_Y} M_{i,k,t}^{\frac{\varepsilon_Y-1}{\varepsilon_Y}}\right]^{\frac{\varepsilon_Y}{\varepsilon_Y-1}} \tag{A.12}$$

where $\nu_{ik}$ is the intermediate input share of sector $k$ in country $i$ and $A_{i,k,t}$ is sector-level TFP.

Letting $mc_{i,k,t}$ be real marginal cost, $p^v_{i,k,t} = P^v_{i,k,t}/P^c_{i,t}$ and $p^m_{i,k,t} = P^m_{i,k,t}/P^c_{i,t}$ be the real prices of value added and the intermediate bundle in sector $k$, producers choose $Y_{i,k,t}$, $V_{i,k,t}$, and $M_{i,k,t}$ to solve

$$\max \; mc_{i,k,t} Y_{i,k,t} - p^v_{i,k,t} V_{i,k,t} - p^m_{i,k,t} M_{i,k,t}$$

subject to (A.12). The first order conditions imply

$$M_{i,k,t} = \nu_{ik} \left( \frac{p^m_{i,k,t}}{mc_{i,k,t}} \right)^{-\varepsilon_Y} Y_{i,k,t} \left( A_{i,k,t} \right)^{\varepsilon_Y - 1} \tag{A.13}$$

$$V_{i,k,t} = (1 - \nu_{ik}) \left( \frac{p^v_{i,k,t}}{mc_{i,k,t}} \right)^{-\varepsilon_Y} Y_{i,k,t} \left( A_{i,k,t} \right)^{\varepsilon_Y - 1} \tag{A.14}$$

which imply the following formula for the marginal cost in sector $k$ is

$$mc_{i,k,t} = \left[ (1 - \nu_{ik}) \left( \frac{p^v_{i,k,t}}{A_{i,k,t}} \right)^{1-\varepsilon_Y} + \nu_{ik} \left( \frac{p^m_{i,k,t}}{A_{i,k,t}} \right)^{1-\varepsilon_Y} \right]^{\frac{1}{1-\varepsilon_Y}} \tag{A.15}$$

Value added combines labor and capital in a CES technology:

$$V_{i,k,t} = \left[ (1 - \alpha_{ik})^{1/\varepsilon_k} L_{i,k,t}^{\frac{\varepsilon_k - 1}{\varepsilon_k}} + \alpha_{ik}^{1/\varepsilon_k} K_{i,k,t-1}^{\frac{\varepsilon_k - 1}{\varepsilon_k}} \right]^{\frac{\varepsilon_k}{\varepsilon_k - 1}} \tag{A.16}$$

where $\alpha_{ik}$ is the capital share and $\varepsilon_k$ is the elasticity of substitution between capital and labor.

The intermediate input bundle $M_{i,k,t}$ used in sector $k$ is a two-level CES aggregate. At the upper level, sector $k$ sources inputs from all sectors $l$ with weights $\gamma^m_{kl}$:

$$M_{i,k,t} = \left( \sum_{l=1}^{S} (\gamma^m_{kl})^{\frac{1}{\varepsilon_m}} M_{i,kl,t}^{\frac{\varepsilon_m - 1}{\varepsilon_m}} \right)^{\frac{\varepsilon_m}{\varepsilon_m - 1}}, \quad \sum_{l=1}^{S} \gamma^m_{kl} = 1 \tag{A.17}$$

where $M_{i,kl,t}$ denotes the quantity of sector-$l$ intermediates used in sector $k$ of country $i$. This specification implies the relative demands

$$M_{i,kl,t} = \gamma^m_{ik} \left( \frac{p_{i,k,t}}{p^m_{i,k,t}} \right)^{-\varepsilon_c} M_{i,k,t} \tag{A.18}$$

where $p^m_{i,k,t} = P^m_{i,k,t}/P^c_{i,t}$ is the real price of bundle $M_{i,k,t}$.

At the lower level, each intermediate input bundle $M_{i,kl,t}$ is a CES aggregate over countries with trade elasticity $\eta_m$:

$$M_{i,kl,t} = \left( \sum_{j=1}^{N} \left( \omega^m_{ij,kl} \right)^{\frac{1}{\eta_m}} M_{ij,kl,t}^{\frac{\eta_m - 1}{\eta_m}} \right)^{\frac{\eta_m}{\eta_m - 1}}, \quad \sum_{j=1}^{N} \omega^m_{ij,kl} = 1 \tag{A.19}$$

where $M_{ij,kl,t}$ is the flow of sector-$l$ intermediate goods produced in country $j$ and used in sector $k$ of country $i$, and $\omega^m_{ij,kl}$ is the corresponding home-bias parameter. Optimal demand implies:

$$M_{ij,kl,t} = \omega^m_{ij,kl} \left( p_{ij,l,t} \tau^m_{ij,l,t} \right)^{-\eta_m} M_{i,kl,t} \tag{A.20}$$

where $\tau^m_{ij,l,t}$ is the gross tariff rate on imports of materials from country $i$ to country $j$.

### D.3 Capital Accumulation and Investment

Each sector $k$ in country $i$ accumulates its own capital stock $K_{i,k,t}$ according to

$$K_{i,k,t} = I_{i,k,t} + (1 - \delta_k) K_{i,k,t-1} \tag{A.21}$$

where $\delta_k$ is the depreciation rate. The investment good $I_{i,k,t}$ for sector $k$ is produced by competitive capital goods producers using a two-level CES technology that mirrors the intermediate goods structure. At the upper level, sector $k$'s investment sources goods from sectors $l$ with IO weights $\gamma_{kl}^I$:

$$I_{i,k,t} = \left( \sum_{l=1}^{S} \left(\gamma_{kl}^I\right)^{\frac{1}{\varepsilon_i}} I_{i,kl,t}^{\frac{\varepsilon_i - 1}{\varepsilon_i}} \right)^{\frac{\varepsilon_i}{\varepsilon_i - 1}}, \quad \sum_{l=1}^{S} \gamma_{kl}^I = 1 \tag{A.22}$$

At the lower level, $I_{i,kl,t}$ aggregates domestic and imported sector-$l$ investment goods:

$$I_{i,kl,t} = \left( \sum_{j=1}^{N} \left(\omega_{ij,kl}^I\right)^{\frac{1}{\eta_I}} I_{ij,kl,t}^{\frac{\eta_I - 1}{\eta_I}} \right)^{\frac{\eta_I}{\eta_I - 1}}, \quad \sum_{j=1}^{N} \omega_{ij,kl}^I = 1 \tag{A.23}$$

This structure implies the following relative demand schedules for investment goods

$$I_{i,kl,t} = \gamma_{ik}^I \left( \frac{p_{i,k,t}}{p_{i,k,t}^I} \right)^{-\varepsilon_c} I_{i,k,t} \tag{A.24}$$

$$I_{ij,kl,t} = \omega_{ij,kl}^I \left( p_{ij,l,t} \tau_{ij,l,t}^I \right)^{-\eta_m} I_{i,kl,t} \tag{A.25}$$

where $\tau_{ij,l,t}^I$ is the gross tariff rate on capital goods imported from country $j$ to country $i$.

Capital goods producers create sector-specific capital while facing convex adjustment costs $\frac{\psi}{2} \left(I_{i,k,t}/I_{i,k,t-1} - 1\right)^2$, yielding a sector-specific Tobin's q equation for the price of capital:

$$\begin{aligned} q_{i,k,t}^k = & \left[ 1 + \frac{\psi}{2} \left( \frac{I_{i,k,t}}{I_{i,k,t-1}} - 1 \right)^2 + \psi \frac{I_{i,k,t}}{I_{i,k,t-1}} \left( \frac{I_{i,k,t}}{I_{i,k,t-1}} - 1 \right) \right] p_{i,k,t}^I \\ & - \beta E_t \Lambda_{i,t+1} \, \psi \left( \frac{I_{i,k,t+1}}{I_{i,k,t}} \right)^2 \left( \frac{I_{i,k,t+1}}{I_{i,k,t}} - 1 \right) p_{i,k,t+1}^I \end{aligned} \tag{A.26}$$

### D.4 Price and Wage Setting

Wholesale retailers in sector $k$ of country $i$ sell differentiated varieties subject to Rotemberg adjustment costs. Their domestic pricing satisfies the sector-level Phillips curve:

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

where $mc_{i,k,t}$ is the real marginal cost in sector $k$ and $\pi_{ii,k,t} = p_{ii,k,t}/p_{ii,k,t-1}$ is the inflation rate for domestically sold goods from sector $k$. Exporters from sector $k$ in country $i$ set their price in the destination currency (dominant currency pricing), so $\kappa_1^* = 0$ for US exporters. For importers, Rotemberg costs $\kappa^*$ govern how quickly import prices adjust.

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

$$\pi_{i,t}^w\left(\pi_{i,t}^w - 1\right) = \frac{\varepsilon^w - 1}{\kappa^w}\left[\frac{\varepsilon^w}{\varepsilon^w - 1}\frac{\bar{\varphi}L_{i,t}^{\varphi}}{U_{i,t}^c} - w_{i,t}\right] + \beta E_t \Lambda_{i,t+1}\pi_{i,t+1}^w\left(\pi_{i,t+1}^w - 1\right)\frac{L_{i,t+1}}{L_{i,t}} \tag{A.28}$$

where $\pi_{i,t}^w = \frac{w_{i,t}}{w_{i,t-1}}\pi_{i,t}$ and $U_{i,t}^c$ is the marginal utility of consumption.

### D.5 Monetary Policy and Market Clearing

The central bank follows an inertial Taylor rule:

$$\log R_{i,t}^n = (1-\rho_{r,i})\log R_{SS} + \rho_{r,i}\log R_{i,t-1}^n + (1-\rho_{r,i})\left[\kappa_{\pi,i}\log\left(\pi_{i,t}^{4q}\right) + \kappa_{y,i}\log\left(\frac{GDP_{i,t}}{GDP_{i,SS}}\right)\right] + \xi_{i,t}^m \tag{A.29}$$

where $\pi_{i,t}^{4q}$ is four-quarter CPI inflation and $GDP_{i,t}$ is real GDP. Market clearing in sector $k$ of country $i$ requires

$$Y_{i,k,t} = \sum_{j=1}^{N}\frac{n_j}{n_i}\left(C_{ji,k,t} + I_{ji,k,t}\right) + \sum_{j=1}^{N}\sum_{l=1}^{S}\frac{n_j}{n_i}M_{ij,lk,t} \quad \text{for } i = 1,\ldots,N;\ k = 1,\ldots,S \tag{A.30}$$

where $n_i$ is country $i$'s population share. Aggregate GDP in country $i$ is defined as:

$$GDP_{i,t} = (C_{i,t} + I_{i,t}) + NX_{i,t} \tag{A.31}$$

where $I_{i,t} = \sum_{k=1}^{S} I_{i,k,t}$ is aggregate investment and $NX_{i,t}$ are net exports.

Calibrated parameters are reported in Table A.1

Table A.1: Two-Sector Model: Calibration

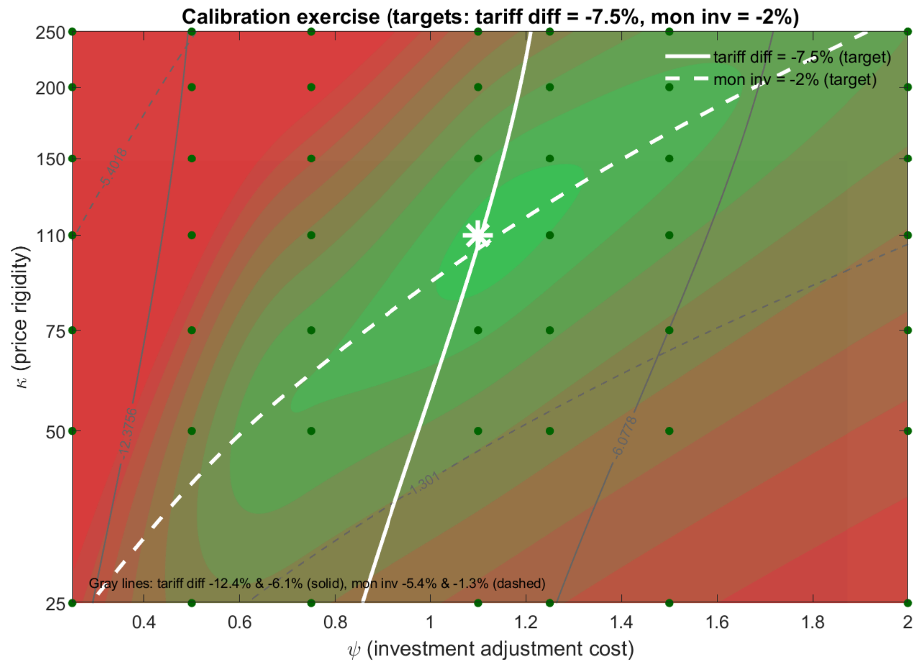
| Parameter | Description | Goods ($k = 1$) | | Services ($k = 2$) |
|---|---|---|---|---|
| *A. Preferences and technology (common across sectors)* | | | | |
| $\beta$ | Discount factor | | 0.995 | |
| $\sigma$ | Inverse IES | | 1.00 | |
| $\varphi$ | Inverse Frisch elasticity | | 1.00 | |
| $h$ | Habit formation | | 0.75 | |
| $\delta_k$ | Capital depreciation rate | | 0.025 | |
| $\varepsilon_Y$ | Elast. value added / materials | | 1 | |
| $\varepsilon_k$ | Elast. capital / labor | | 1.25 | |
| $\psi$ | Investment adjustment cost | | 1.10 | |
| $\alpha_{ik}$ | Capital share in value added | | 0.40 | |
| $\nu_{ik}$ | Intermediate share in gross output | | 0.40 | |
| *C. Price setting and monetary policy* | | | | |
| $\varepsilon$ | Elast. across varieties | | 6.00 | |
| $\kappa$ | Rotemberg cost, domestic sales | | 110 | |
| $\kappa^*$ | Rotemberg cost, imports | | 110 | |
| $\kappa^w$ | Rotemberg cost, wages | | 110 | |
| | | US ($i = 1$) | | RoW ($i = 2$) |
| $\rho_{r,i}$ | Interest rate smoothing | 0.80 | | 0.80 |
| $\kappa_{\pi,i}$ | Taylor rule, inflation | 1.50 | | 1.50 |
| $\kappa_{y,i}$ | Taylor rule, output gap | 0.25 | | 0.00 |
| *D. Consumption shares and home bias* | | | | |
| $\gamma^c_{ik}$ | Sector weight in consumption | 0.30 | | 0.70 |
| $\omega^c_{ii,k}$ | Home bias, consumption | 0.80 | | 0.995 |
| $\varepsilon_c$ | Sector elast. in consumption | | 1 | |
| $\eta_c$ | Country elast. in consumption | | 1.50 | |
| *E. Intermediate input IO shares and home bias* | | | | |
| $\gamma^m_{11}$, $\gamma^m_{21}$ | Goods / services inputs in goods sector | 0.70 | | 0.30 |
| $\gamma^m_{12}$, $\gamma^m_{22}$ | Goods / services inputs in services sector | 0.30 | | 0.70 |
| $\omega^m_{ii,kl}$ | Home bias, intermediates | 0.75 | | 0.99 |
| $\varepsilon_m$ | Sector elast. in intermediates | | 0.30 | |
| $\eta_m$ | Country elast. in intermediates | | 1.50 | |
| *F. Investment IO shares and home bias* | | | | |
| $\gamma^I_{11}$, $\gamma^I_{22}$ | Diagonal IO shares (goods, services) | 1.00 | | 1.00 |
| $\omega^I_{ii,kl}$ | Home bias, investment goods | 0.75 | | 0.99 |
| $\varepsilon_i$ | Sector elast. in investment | | 0.30 | |
| $\eta_I$ | Country elast. in investment | | 1.50 | |
| *G. Country sizes* | | | | |
| $n_1$ | Population share (US) | | 0.20 | |
| $n_2$ | Population share (RoW) | | 0.80 | |

# E Calibration

Table A.1 reports the full parameter values for the two-sector model. Aggregate preference and technology parameters are standard in the macro open-economy literature. Trade elasticities are set to 1.5 throughout, consistent with mid-range estimates from the international trade literature. The IO shares and home-bias parameters are calibrated to match BEA input-output accounts and import penetration ratios, with the goods sector significantly more open than services in both intermediate inputs and investment goods. Nominal rigidities $\kappa$ and investment adjustment costs $\psi$ are jointly calibrated as described in Section 5.

Figure A.1 illustrates the joint calibration of $\kappa$ and $\psi$. The heat map shows the value of the loss function—a weighted sum of squared deviations from the two target moments—over a grid

Figure A.1: Calibration loss over the $(\psi, \kappa)$ grid.




*Note:* Green area indicates parameter combinations closest to targets. White solid line: iso-curve for the differential investment target (tariff shock). White dashed line: iso-curve for the aggregate investment target (monetary shock). White star: best-fitting parameter combination ($\kappa = 110$, $\psi = 1.1$).

of $\kappa$ and $\psi$ values. Greener regions are closer to both targets simultaneously. The two white iso-curves trace the combinations of $(\kappa, \psi)$ that exactly match each individual target: the solid line corresponds to the 7.5 percent differential investment target from the tariff shock, and the dashed line to the 2 percent aggregate investment target from the monetary shock. The two iso-curves cross near the white star, which marks the combination $\kappa = 110$, $\psi = 1.1$ that minimizes the joint loss. The figure also illustrates the identification argument in the text: the monetary iso-curve runs diagonally, reflecting the joint dependence of aggregate investment on both $\kappa$ and $\psi$, while the tariff iso-curve is nearly vertical, confirming that the cross-sectional differential is driven primarily by $\psi$ and is largely independent of $\kappa$.

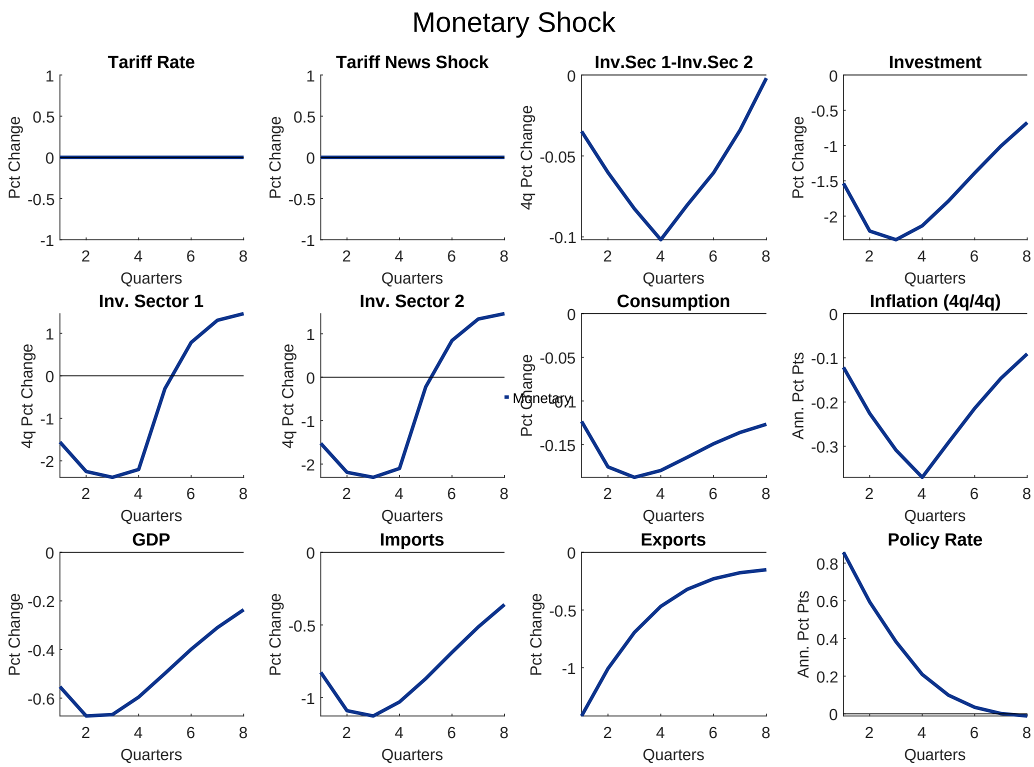



Figure A.2: Model Responses to a 100 basis-point monetary policy shock.

*Note:* Calibrated two-sector model with $\kappa = 110$, $\psi = 1.1$.