One War, Two Dollars: The International Transmission of U.S. Trade Policy Uncertainty*

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October 27, 2026

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Abstract

We construct a new series of U.S. trade policy uncertainty (TPU) shocks from the events of the two episodes of the U.S. trade war, in 2018–2019 and 2025–2026, measured as the change in a daily newspaper-based TPU index around each event. Using these shocks, we study the transmission of U.S. TPU shocks to 29 advanced and emerging economies. Estimated over the whole trade war, the effect of TPU shocks on other currencies against the U.S. dollar is close to zero, but this estimate hides responses of opposite sign in its two episodes. TPU shocks depreciated other currencies in 2018–2019 and appreciated them in 2025–2026, and the responses of trade, prices and policy rates changed sign with them. Only in the second episode did they act as a negative demand shock for the rest of the world. In both episodes, the response of the exchange rate reflects the premium that investors require to hold other currencies instead of the dollar, which rose in 2018–2019 and fell in 2025–2026.

JEL Classification: F13, F31, F41

Keywords: Trade policy uncertainty; International spillovers; Event-based identification

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"…you cannot go into the same water twice."

—Heraclitus, as quoted by Socrates in Plato's *Cratylus*.

1 Introduction

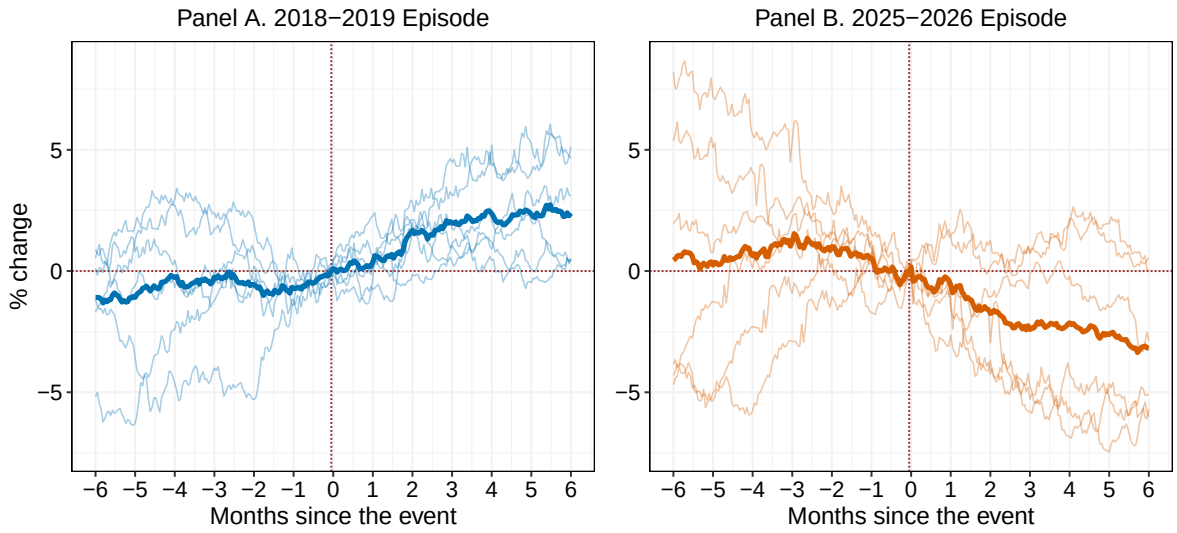
Trade policy has become one of the main sources of geoeconomic risk during the last decade. In 2018, uncertainty about U.S. trade policy reached levels not seen since the 1970s (Caldara, Iacoviello, Molligo, Prestipino, & Raffo, 2020), and in 2025 it rose well above them. The decisions behind this increase in uncertainty were made in Washington, but their consequences reached the rest of the world through exchange rates, trade, and portfolio adjustments. Consider the exchange rate. Uncertainty shocks are usually associated with flows toward the safety of the dollar, so other currencies should weaken when uncertainty about U.S. trade policy rises. Large shifts in U.S. tariffs are a clear source of such uncertainty since each of them leaves open how long the new tariffs will last and how trading partners will respond. Figure 1 shows that the dollar strengthened against a broad basket of currencies in the months after the main trade war events of 2018–2019, as expected, but weakened after those of 2025–2026. This contrast raises a set of questions. How do U.S. trade policy uncertainty (TPU) shocks transmit to other economies? Do they have the same effects in every episode? If not, what explains the differences?

To answer these questions, we construct a new series of TPU shocks from the events of the trade war and study their effects on 29 advanced and emerging economies with flexible exchange rates. We show that, estimated over the whole trade war, the effect of these shocks on other currencies against the dollar is close to zero, but that this estimate hides responses of opposite sign in its two episodes. TPU shocks depreciated other currencies against the dollar in 2018–2019 and appreciated them in 2025–2026, and the responses of trade, prices and policy rates changed sign with them.[1] In 2018–2019, the trade of other economies expanded and their prices and policy rates rose, whereas in 2025–2026 the shock acted as a negative demand shock for the rest of the world, lowering trade and prices, raising unemployment and leading central banks to ease. In both episodes, the premium that investors require to hold other currencies instead of the dollar accounts for the response of the exchange rate. This premium rose in the first episode and fell in the second.

We begin by identifying exogenous variation in TPU. The main measures of TPU are

[1] Throughout the paper, we define the nominal exchange rate as the number of units of domestic currency required to purchase one U.S. dollar. Thus, a depreciation of the domestic currency means that more domestic currency units are needed to buy one dollar.

FIGURE 1. THE U.S. DOLLAR AROUND MAJOR TARIFF SHIFTS OF THE TRADE WAR



Notes: This figure shows the broad U.S. dollar index of the Federal Reserve six months (126 trading days) before and after six major shifts in U.S. tariffs in each episode of the trade war, in percent change relative to the trading day before each shift. A higher index is a stronger dollar. Thin lines are the individual tariff shifts and the thick line is their average. Panel A: tariffs on steel and aluminum (1 March 2018), Section 301 findings on China (22 March 2018), tariffs on $50 billion of Chinese imports (15 June 2018), tariffs on $200 billion of Chinese imports (17 September 2018), increase of those tariffs to 25 percent (5 May 2019), and tariffs on almost all remaining Chinese imports (1 August 2019). Panel B: tariffs on Canada, Mexico and China announced (1 February 2025) and in effect (4 March 2025), reciprocal tariffs (2 April 2025), new tariff rates set by letter (7 July 2025), reciprocal rates adjusted on nearly all countries (31 July 2025), and the Section 122 tariff that followed the Supreme Court ruling against the IEEPA tariffs (20 February 2026).

indices built from newspaper coverage (Baker, Bloom, & Davis, 2016; Caldara et al., 2020), which are not fully exogenous because they often respond to the economic conditions that motivate trade policy in the first place. We identify exogenous shifts in TPU following an approach that resembles the identification of monetary policy shocks from FOMC announcements (Kuttner, 2001; Nakamura & Steinsson, 2018). Using the trade war timelines of the Peterson Institute for International Economics (Bown, 2025; Bown & Kolb, 2018), we select the 207 events between 2017 and 2026 that changed the expected distribution of future tariffs —e.g., threats and announcements of tariffs, retaliations, pauses and deals. We then define the surprise of each event day as the change in the daily TPU index of Caldara et al. (2020) over a two-day window around it, so that the index, rather than our reading of each event, determines the size and the sign of the surprise. Since trade war events move the expected level and the dispersion of future tariffs together, we interpret these surprises as news about trade policy risk.

Financial markets treat these surprises as genuine news. Using daily local projections, we show that the VIX rises 2% and the S&P 500 falls 0.2% on the day of a one standard deviation surprise. The surprises therefore carry news that markets had not anticipated, and that raises uncertainty and lowers the expected value of U.S. firms. Based on these responses, we interpret a one standard deviation TPU shock as equivalent to a 2% increase in uncertainty, as measured by the VIX.

Next, we aggregate the surprises to the monthly frequency and estimate their effects on other economies with panel local projections à la Jordà (2005). Our sample covers eleven advanced and eighteen emerging economies with flexible exchange rates between January 2015 and August 2026. When we estimate a single response over the whole trade war, a one standard deviation TPU shock leaves the exchange rate of these economies against the dollar unchanged. However, this result comes from combining two episodes in which the shock had opposite effects. When we let the response differ across the two episodes of the trade war, the same shock depreciates other currencies close to 1% three months after the shock in 2018–2019 and appreciates them 0.4% in 2025–2026.

Other outcomes also respond in opposite directions in the two episodes. In 2018–2019, exports and imports rose, consumer prices rose and central banks raised policy rates, while unemployment did not move. In 2025–2026, exports and imports fell, consumer prices fell, unemployment rose and central banks cut policy rates. Using the volumes and prices of merchandise trade from the CPB *World Trade Monitor* (CPB Netherlands Bureau for Economic Policy Analysis, 2026), we show that these responses are not driven by changes in dollar prices. In 2018–2019, U.S. import volumes did not fall despite the new tariffs, and the trade volumes of the rest of the world rose, consistent with the diversion of U.S. imports away from China documented by Fajgelbaum, Goldberg, Kennedy, Khandelwal, and Taglioni (2024) and Freund, Mattoo, Mulabdic, and Ruta (2024). In 2025–2026, U.S. import volumes fell 3%, and the export volumes and dollar prices of the rest of the world fell with them, so the shock reached other economies as a fall in the demand for their goods.

Finally, we study why the exchange rate moved in opposite directions in the two episodes. Following Engel (2016), we compute the yield-adjusted exchange rate, which removes from the exchange rate the part explained by the ten-year interest rate differential with the United States, so that its response reflects the premium that investors require to hold other currencies instead of the dollar. In 2018–2019, this premium rose and accounts for the whole depreciation of other currencies, as in a flight to the safety of the dollar. In 2025–2026, it fell, so the appreciation of other currencies reflects a lower premium relative to the dollar rather than changes in interest rate differentials. The same holds when we use yields with

maturities between one and ten years. Taken together, these results show that the international effects of U.S. TPU shocks are not a fixed feature of the shock, and that the same news about trade policy risk can reach the rest of the world as very different shocks.

Related Literature. This paper contributes to three main strands of the literature. First, we contribute to the literature on the measurement and macroeconomic effects of uncertainty (Baker et al., 2016; Bhattarai, Chatterjee, & Park, 2020; Bloom, 2009; Fernández-Villaverde, Guerrón-Quintana, Kuester, & Rubio-Ramírez, 2015; Leduc & Liu, 2016), and of TPU in particular (Caldara et al., 2020; Handley & Limão, 2017; Novy & Taylor, 2020; Steinberg, 2019). A growing number of studies examine the effects of U.S. TPU on other economies (Avril, Horan, & Pancaro, 2026; Bilenkisi, 2025; Bobasu & Pierluigi, 2026; Caldara, Iacoviello, Molligo, Prestipino, & Raffo, 2019; Hlatshwayo & Trivedi, 2026; Jakubik & Wei, 2026), most of them by ordering a newspaper-based index first in a vector autoregression or by using it directly as the shock in local projections. Relative to these studies, we construct a series of TPU shocks from the events of the Trump-era trade war and show that financial markets react to them on the day they occur. Our approach is in the spirit of the high-frequency identification of monetary policy surprises (Kuttner, 2001; Nakamura & Steinsson, 2018) and is closest to Ostry, Lloyd, and Corsetti (2025), who also exploit announcements of tariffs and retaliations to study the response of exchange rates. The shock series, together with the coding of every event, can be used to study the effects of TPU on other outcomes.

Second, we contribute to the literature on the effects of tariffs and TPU on the exchange rate. Open economy models predict that a tariff appreciates the currency of the country that imposes it (Lindé & Pescatori, 2019), yet the dollar weakened in 2025 as trade tensions escalated, which has opened a debate on the role of trade policy in the special status of the dollar (Itskhoki & Mukhin, 2025; Jiang, Krishnamurthy, Lustig, Richmond, & Xu, 2025; Kalemli-Özcan, Soylu, & Yildirim, 2026). Kalemli-Özcan et al. (2026) study the tariff announcements of 2025–2026 and show that, in daily and intraday windows around them, higher tariff uncertainty depreciated the dollar while leaving its interest rate differential with Germany unchanged, which points to a higher premium on dollar assets. Merendino and Monacelli (2026) study U.S. tariff shocks over three decades and show that the response of the dollar to TPU shocks is essentially zero for the first two quarters. We study the two episodes of the trade war with the same shock, and estimate its effects on the currencies of 29 advanced and emerging economies over the six months that follow it. We show that the same TPU shock moved other currencies against the dollar in opposite directions in the two episodes, and that the premium on other currencies relative to the dollar rose

in 2018–2019 and fell in 2025–2026. The premium channel that Kalemli-Özcan et al. (2026) identify for the second episode of the trade war therefore extends well beyond the euro and the days around the announcements, but it is specific to the second episode, since in the first the premium moved in favor of the dollar.

Finally, we contribute to the literature on the effects of the Trump administration trade war (Amiti, Kong, & Weinstein, 2020; Amiti, Redding, & Weinstein, 2019; Fajgelbaum, Goldberg, Kennedy, & Khandelwal, 2020), and in particular on its consequences for countries outside the conflict. Fajgelbaum et al. (2024) show that these countries increased their exports of the products that the United States taxed on China, and Freund et al. (2024) that the countries that replaced China in U.S. imports tend to be integrated in Chinese supply chains. We show that, at the macroeconomic level, the TPU shocks of 2018–2019 raised the trade of the rest of the world, consistent with this reallocation, whereas those of 2025–2026 reduced it and acted as a negative demand shock for the rest of the world.

Layout. The paper is organized as follows. Section 2 describes the construction of the TPU shocks and shows that financial markets react to them on the day they occur. Section 3 presents the data and the evidence on the international transmission of TPU shocks in the two episodes of the trade war. Section 4 concludes.

2 Identification of Trade Policy Uncertainty Shocks

This section describes how we identify exogenous variation in TPU by taking advantage of the trade war events documented by the Peterson Institute for International Economics, and shows that financial markets react to the resulting surprises on the day they occur.

2.1 Event-Based Identification

TPU is not directly observable, and the literature has measured it mainly through text analysis, with indices that count the share of newspaper articles that discuss trade policy together with terms related to uncertainty. Throughout the paper, we use the index of Caldara et al. (2020), which searches directly for articles that discuss trade policy and uncertainty jointly and is available at a daily frequency.

This index, however, is an endogenous object. Trade policy is itself a response to economic conditions, such as a widening trade deficit, a surge of imports from a particular partner or a slowdown in manufacturing, and newspapers write more about it when those conditions deteriorate. A regression of macroeconomic outcomes on the TPU index would

therefore confound the effects of uncertainty with those of the conditions that gave rise to it. Researchers have addressed this problem mostly with recursive identification, in which the TPU index is ordered first in a vector autoregression (e.g., Bobasu & Pierluigi, 2026; Caldara et al., 2019, 2020), or enters local projections directly as the shock (e.g., Avril et al., 2026; Bilenkisi, 2025; Jakubik & Wei, 2026). Recursive identification is easiest to defend in small systems of slow-moving variables, such as investment and output. It becomes harder to defend for exchange rates, interest rates and asset prices, which react to news within days and to which trade policy may itself respond within the month. These variables are at the center of this paper, which motivates the identification approach that we propose next.

Definition of TPU shocks. We identify exogenous variation in TPU by exploiting the trade war events recorded by the Peterson Institute for International Economics (PIIE). PIIE's two trade war timelines document, day by day, the trade policy actions of the first Trump administration and the Biden years (Bown & Kolb, 2018) and of the second Trump administration (Bown, 2025), and together they list 301 entries between March 2016 and August 2026. We define the surprise of event day d as the change in the daily TPU index over a two-day window around it,

$$s_d = \text{TPU}_{d+1} - \text{TPU}_{d-1}, \tag{1}$$

which takes into account that newspaper-based indices register news with roughly a one-day lag.[2] Measuring the surprise with the index, rather than coding the content of each event, lets the index rather than our reading of the event determine the size and the sign of each surprise, and nets the events when several fall on the same day.

For these surprises to identify the effects of TPU on other economies, the change in the index around each event day must reflect the trade policy news of that day rather than the economic conditions of the economies we study. This is plausible because the timing of the announcements was driven largely by U.S. domestic politics and the course of negotiations, and because the two-day window is short enough that other news is unlikely to dominate the change in the index. It also requires that event days carry genuine news about trade policy, which is why we select the entries of the timelines carefully.

We code each event based on whether it changes the expected distribution of future tariffs. We include U.S. government actions, partner retaliation and court rulings that do,

[2]Since part of the news of the second episode was already reported on the day of the event, in Section 3.4 we consider alternative definitions of the surprise s_d that also count the coverage of the event day itself, and show that our results are essentially the same.

namely threats and formal announcements of tariffs, the initiation and findings of investigations under Sections 232, 301, and 201, deadlines set or extended, pauses and exemptions, deals that set or cut tariff rates, and retaliation announced or withdrawn.[3] We exclude the implementation of measures already announced, routine administrative steps, non-tariff measures such as export controls or investment screening, legal steps that do not change tariffs, and entries that are not policy actions.

We interpret the surprises as news about trade policy risk, that is, a change in the distribution of future U.S. tariffs that raises their dispersion, rather than as a change in volatility holding expectations fixed. This is because the surprises we identify come from trade war events, which move the first and second moments of future tariffs together. Suppose that an event opens the possibility that a tariff of size τ is imposed with probability p, and that tariffs are otherwise unchanged. Expected tariffs are then $p \cdot \tau$ and their standard deviation is $\sqrt{p(1-p)} \cdot \tau$, so news that raises p while the outcome is still open ($p < 1/2$), such as a threat or the initiation of an investigation, raises both at once.[4] Once a tariff is close to certain ($p > 1/2$), news in the opposite direction, such as a pause on tariffs about to take effect, lowers expected tariffs but raises their dispersion. This is why de-escalations do not systematically lower the index, and 34 of the 58 de-escalation days in our sample have positive surprises.

Aggregation. The outcomes we study are monthly, so we aggregate the daily surprises to the monthly frequency. The monthly shock is the sum of the surprises of the event days in each month, $\text{Shock}_t = \sum_{d \in t} s_d$, which is zero in months without events. Summing dates each event in its own month. An event late in the month has little time to affect that month's outcomes, which attenuates the response on impact but does not move it to the months

[3] Sections 232, 301, and 201 are the three main statutes under which the U.S. executive can raise tariffs without new legislation, each after an investigation by a federal agency. Section 232 of the Trade Expansion Act of 1962 allows the President to restrict imports that the Department of Commerce finds to threaten national security; it was the basis of the 2018 tariffs on steel and aluminum and of later tariffs on automobiles and other sectors. Section 301 of the Trade Act of 1974 allows the United States Trade Representative to respond to foreign practices that are unfair or that burden U.S. commerce; it was the basis of the 2018–2019 tariffs on Chinese imports. Section 201 of the same act allows temporary "safeguard" tariffs when the U.S. International Trade Commission finds that a surge of imports seriously injures a domestic industry; it was the basis of the 2018 tariffs on solar panels and washing machines. An investigation under any of them signals that tariffs may follow, which is why its initiation, and not only its outcome, is included as an event.

[4] Caldara et al. (2020) model a rise in trade tensions in the same way. In their baseline experiment, agents learn that tariffs will rise by 6 percentage points with probability 0.5, which raises both the expected level and the standard deviation of future tariffs by 3 percentage points. They also note that their news-based index in practice incorporates both first and second moment information about trade policy.

before the event. The daily index starts in January 2015, and since there are no included events before April 2017, we set the shock to zero in 2014 so that its lags are observed from the start of the sample.

In our empirical analysis we use the standardized shock $z_t = \text{Shock}_t/\sigma_{\text{Shock}}$, where σ_{Shock} is the standard deviation of Shock_t over the sample, so that all responses are to a one standard deviation surprise. As we show below in Section 2.2, a shock of this size is economically sizable. When the daily surprises are scaled by the same σ_{Shock}, a unit surprise raises the VIX by 2% on the day it occurs.

The resulting shocks. Table 1 summarizes the selection of events, and Appendix A lists every entry of the timelines with its coding. Of the 301 entries in the two PIIE timelines, 207 change the expected distribution of future tariffs and are included as events (Panel A). Most exclusions fall into two categories that reflect the nature of each episode (Panel B). In the first timeline, they are mainly non-tariff measures, such as the export controls and entity listings of the technology dispute with China, whereas in the second they are mainly the implementation of tariffs that had already been announced, often weeks earlier. Escalations account for 124 of the included events, but de-escalations are also frequent (75 events), mostly pauses, exemptions and deals, so the surprises take both signs (Panel C).

Figure 2 shows the monthly shocks z_t. The identifying variation is concentrated in the two episodes of the trade war. The months of 2017–2019 account for about a third of the variance of the shock, those of 2025–2026 for nearly two thirds, and the years in between for 1%. The largest surprises are positive, led by July and April 2025, April 2018 and February 2026. Since each episode contributes a large share of the variation, the shock has enough variation to estimate its effects in each of them separately, which we do in Section 3.

The surprises also stand apart from the ordinary day-to-day movements of the index. As Appendix Figure A1 shows, on the 169 event days the index rises on average by 55 points, against roughly zero on the 4,039 days without any listed event, and its two-day change is almost twice as volatile, with a standard deviation of 183 points against 97.

2.2 TPU Surprises in Real Time

If the event days carry genuine news about trade policy, financial markets should react to the surprises on the day they occur. Stock prices and the VIX are a natural test, since they are forward looking, observed every trading day, and not used to build the surprises. To

TABLE 1. TRADE WAR EVENTS

	Timeline 1.0 (2016–2024)	Timeline 2.0 (2025–2026)	Total
Panel A. Selection			
Entries in the PIIE timelines	128	173	301
Included	78	129	207
Excluded	50	44	94
Panel B. Reasons for exclusion			
Non-tariff measures	27	10	37
Implementation of announced measures	8	27	35
Analysis or data releases	8	0	8
Administrative steps	0	6	6
Legal steps without tariff changes	4	0	4
Not a policy action	3	1	4
Panel C. Included events by direction			
Escalation	49	75	124
De-escalation	27	48	75
Mixed	2	6	8

Notes: This table shows the entries of the two PIIE trade war timelines (Bown, 2025; Bown & Kolb, 2018), coded under the selection rule described in the text. Timeline 1.0 covers March 2016–December 2024 and Timeline 2.0 January 2025–August 2026. An event day is a day with at least one included event. The full list of events is in Appendix A.

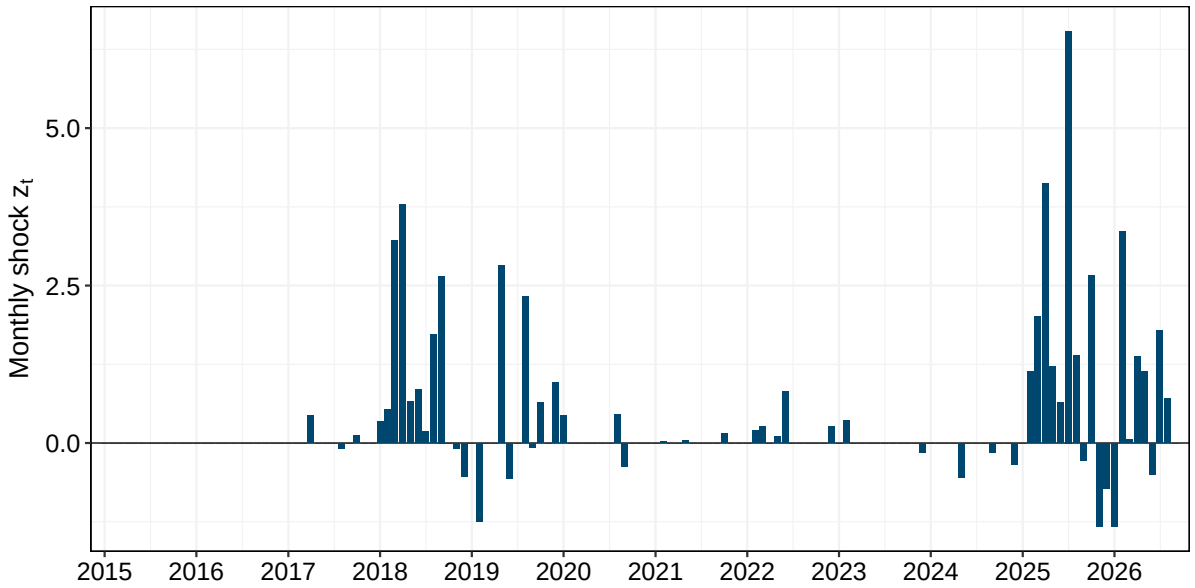
check this, we estimate daily local projections of the form

$$x_{d+h} = a^h + b^h \tilde{s}_d + \sum_{j=1}^{30} \rho_j^h x_{d-j} + \sum_{k=1}^{30} \kappa_k^h \tilde{s}_{d-k} + e_{d+h}, \tag{2}$$

where x_d is 100 times the log of the S&P 500 or of the VIX, and $\tilde{s}_d = s_d/\sigma_{\text{Shock}}$ is the surprise of equation (1) scaled by the standard deviation of the monthly shock, so that b^h is the response to a one standard deviation surprise that arrives on a single day. The surprise is zero on days without events, an event on a non-trading day enters on the next trading day, and surprises that fall on the same trading day are added up. We normalize the response on the trading day before the surprise to zero, drop the windows that overlap March 2020–December 2021, and report Newey and West (1987) standard errors.

Figure 3 shows that markets treat TPU surprises as bad news for the U.S. economy, and

FIGURE 2. TRADE POLICY UNCERTAINTY SHOCKS



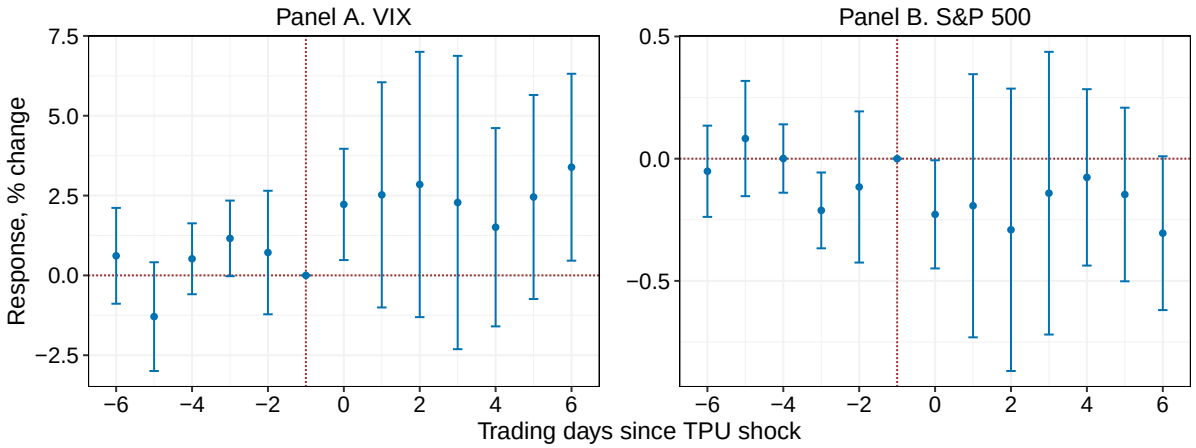
Notes: This figure shows the monthly TPU shock z_t, the sum of the event-day surprises s_d of each month, in units of its standard deviation over the sample. Months without events are zero. Appendix Figure A1 compares the event-day surprises with the changes in the index on days without events.

that they do so on the day of the surprise. The VIX rises 2% on the day of the surprise and stays close to 2% higher during the following week. The S&P 500 falls 0.2% on the day of the surprise. The surprises therefore carry news that markets had not anticipated, and that raises uncertainty and lowers the expected value of U.S. firms, which is what one would expect from news about trade policy risk.

3 The International Transmission of TPU Shocks

How do U.S. TPU shocks affect other economies? Did these shocks have the same effects in the two episodes of the trade war? In this section, we show that they did not. Estimated over the whole trade war, TPU shocks do not move the exchange rate of other economies against the dollar, but this estimate hides responses of opposite sign. TPU shocks depreciated other currencies against the dollar in 2018–2019 and appreciated them in 2025–2026, and the responses of trade, prices and policy rates changed sign with them. In both episodes, the exchange rate moved by more than the long-term interest rate differential with the United States implies, so the premium that investors require to hold other currencies instead of the dollar rose in 2018–2019 and fell in 2025–2026.

FIGURE 3. RESPONSE OF THE S&P 500 AND THE VIX TO TPU SURPRISES



Notes: This figure shows the responses to a one standard deviation TPU surprise that arrives on a single day, from the daily local projections of equation (2). The VIX (Panel A) and S&P 500 (Panel B) are in 100 times logs, so the responses are percent changes. The response on the trading day before the surprise is normalized to zero. Windows that overlap March 2020–December 2021 are dropped. Whiskers are 90% confidence intervals based on Newey and West (1987) standard errors.

3.1 Data and Sample

To study the effects of TPU shocks comprehensively, we build a monthly dataset that covers January 2015 to August 2026, the period for which the daily TPU index is available, which spans the two episodes of the trade war behind the TPU shocks of Section 2. The panel is unbalanced, since each outcome is used for every economy and month in which it is available, although most outcomes are available for most economies and months, as documented in Appendix Table B2.

Country sample. We keep the economies whose exchange rate has some degree of flexibility. Using the fine classification of Ilzetzki, Reinhart, and Rogoff (2019), we exclude economies without a separate legal tender or in a currency union, with a pre-announced peg or currency board, or with a de facto peg, as well as those classified as freely falling or with dual markets, and keep those classified as having a horizontal or crawling band, a crawling peg, a managed float, or a free float.[5] The sample comprises eleven advanced economies (Australia, Canada, Iceland, Israel, Japan, Korea, New Zealand, Norway, Swe-

[5]The classification of Ilzetzki et al. (2019) ends in December 2019. We select economies on their classification over January 2015–December 2019 and assume that their regimes did not change afterwards. Switzerland is coded as having a peg only in January 2015, when the Swiss National Bank abandoned the EUR/CHF floor, and is kept in the sample.

den, Switzerland, and the United Kingdom) and eighteen emerging market economies (Brazil, Chile, China, Colombia, the Dominican Republic, Egypt, Hungary, India, Indonesia, Malaysia, Mexico, Peru, the Philippines, Poland, Romania, South Africa, Thailand, and Uruguay).

We restrict the sample in this way for two reasons. First, the exchange rate and monetary policy, two of the main margins through which TPU shocks reach other economies, are shut down or tied to a foreign central bank under a hard peg. Second, members of a currency union share a single exchange rate and a single policy rate, and countries pegged to the U.S. dollar have, by construction, no exchange rate response, so including them would enter the same outcome series several times and overstate the precision of the estimates. The United States is excluded as the source of the shock.

Macroeconomic and financial data. Our outcome variables come from several sources. From the *International Financial Statistics* (IFS) of the International Monetary Fund, we obtain the consumer price index, the nominal exchange rate against the U.S. dollar (domestic currency per U.S. dollar, so a decrease is an appreciation), the unemployment rate and the monetary policy rate. From the IMF's *Direction of Trade Statistics* (DOTS), we obtain merchandise exports and imports in U.S. dollars, with which we compute the log ratio of exports to imports. From Global Financial Data, we obtain the ten-year government bond yields of the economies in our sample and of the United States, with which we compute the yield-adjusted exchange rate described in Section 3.3. For the world economy, we use the volumes and prices of merchandise trade from the CPB *World Trade Monitor* (CPB Netherlands Bureau for Economic Policy Analysis, 2026) and the IMF index of commodity prices.

We use global controls that capture the state of the world economy and U.S. financial conditions. From the *Federal Reserve Economic Data* (FRED) database, we obtain the federal funds rate, the VIX, the broad U.S. dollar index, and the price of Brent oil. We complement them with the Global Supply Chain Pressure Index of the Federal Reserve Bank of New York (Benigno, di Giovanni, Groen, & Noble, 2022) and the index of world industrial production of Baumeister and Hamilton (2019). The definitions, sources, and coverage of every variable are in Appendix B.

3.2 One War, Two Episodes

We first estimate the average response of other economies' exchange rate to TPU shocks using a local projections approach à la Jordà (2005). Specifically, for outcome variable

$y_{i,t+h} = \log S_{i,t+h}$ in economy i, month t, and horizon h, we estimate

$$y_{i,t+h} = \alpha_i^h + \mu_{m(t)}^h + \beta^h \cdot z_t + \sum_{j=1}^{12} \rho_j^h \cdot y_{i,t-j} + \sum_{k=1}^{12} \kappa_k^h \cdot z_{t-k} + \sum_{l=1}^{3} \boldsymbol{\gamma}_l^{h\prime} \boldsymbol{m}_{t-l} + \varepsilon_{i,t+h}, \tag{3}$$

where z_t is the TPU shock of Section 2 and β^h is the response of the outcome variable (i.e., the exchange rate) h months after a one standard deviation TPU shock.

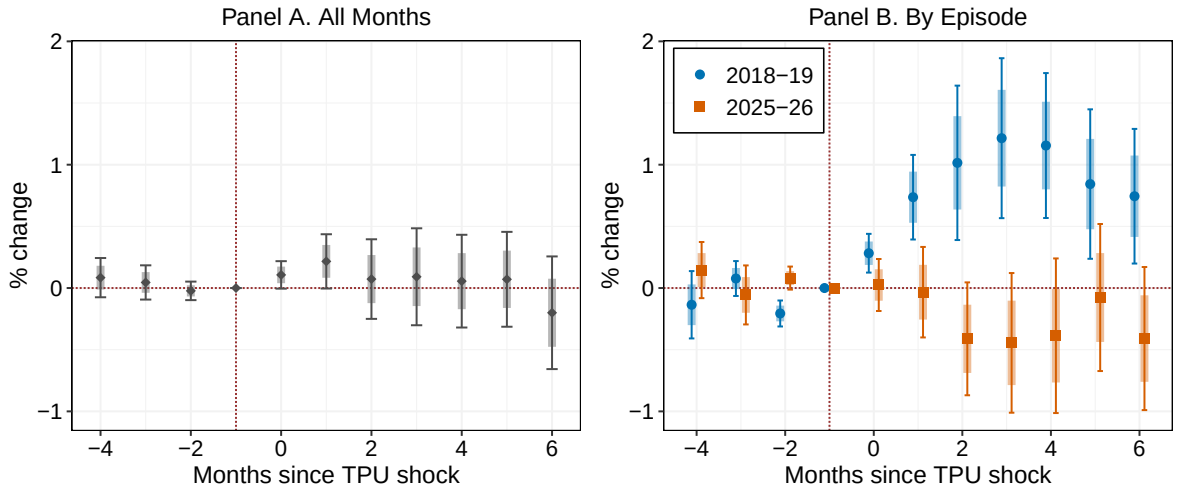
The remaining elements of equation (3) are fixed effects and controls. The terms α_i^h are country fixed effects and $\mu_{m(t)}^h$ are calendar-month fixed effects that absorb the seasonality of the outcomes. The lags of the outcome and of the shock account for the dynamics of each economy and for earlier trade policy news. For the log ratio of exports to imports, the lags are those of log exports and log imports. The vector of global controls $\boldsymbol{m}_t$ collects the change in the federal funds rate, the log of the VIX, the change in the broad U.S. dollar index, the change in the price of Brent oil, the Global Supply Chain Pressure Index, and the change in world industrial production.

We estimate equation (3) using ordinary least squares for $h = -4, \ldots, 6$, normalizing the response at $h = -1$ to zero. The responses at $h < -1$ serve to detect pre-trends. If the shocks were anticipated, or if they responded to the economic conditions of the economies in the sample, the outcomes would move before the shock. For these horizons, we follow the convention of dating the lags of the outcome before $t + h$. We drop the observations whose window between t and $t + h$ overlaps March 2020–December 2021, which reduces the influence of the pandemic and the inflation surge that followed it. We multiply outcomes measured in logs by 100, so these responses are percent changes, and we report Driscoll and Kraay (1998) standard errors, which account for the correlation across economies and time.

Panel A of Figure 4 shows the estimates of β^h for the exchange rate. Over the whole trade war, TPU shocks do not move the exchange rate of other economies against the dollar, since the response is small at every horizon and never far from zero. However, the evidence around the key events of the trade war in Figure 1 suggests that this estimate hides responses of opposite sign in its two episodes, as other currencies depreciated against the dollar after the main announcements of 2018–2019 and appreciated after those of 2025–2026.

To show this difference, we let the response to the shock differ across periods January 2018–December 2019, October 2024–August 2026, and the remaining months, and esti-

FIGURE 4. THE RESPONSE OF THE EXCHANGE RATE: AVERAGE AND BY EPISODE



Notes: This figure shows the response of the log exchange rate over the whole trade war, the estimates of β^h from equation (3) (Panel A), and by episode, the estimates of β_e^h from equation (4) in 2018–2019 (blue circles) and 2025–2026 (orange squares) (Panel B), with 68% (bars) and 90% (whiskers) confidence intervals based on Driscoll and Kraay (1998) standard errors. The response at $h = -1$ is set to zero. Exchange rates are domestic currency per U.S. dollar, so a negative response is an appreciation.

mate the local projection

$$y_{i,t+h} = \alpha_i^h + \mu_{m(t)}^h + \nu_{e(t)}^h + \sum_e 1\{e(t) = e\} \cdot \beta_e^h \cdot z_t + \sum_{j=1}^{12} \rho_j^h \cdot y_{i,t-j} + \sum_{k=1}^{12} \kappa_k^h \cdot z_{t-k} + \sum_{l=1}^{3} \boldsymbol{\gamma}_l^{h\prime} \boldsymbol{m}_{t-l} + \varepsilon_{i,t+h}, \tag{4}$$

where β_e^h is the response of the outcome variable h months after a one standard deviation TPU shock in episode e, and $\nu_{e(t)}^h$ are episode fixed effects, so that the two episodes are not compared through differences in the average level of the outcomes. The second episode starts in October 2024, when markets began to price the tariff agenda of the Trump campaign. The controls have common coefficients, so they are estimated on all months, and only the months of each episode identify its response.

Panel B of Figure 4 shows that TPU shocks depreciated other currencies against the dollar in 2018–2019 close to 1% three months after the shock, and appreciated them in 2025–2026, by 0.4%. The average response of Panel A combines these two responses with that of the remaining months, with weights given by the share of each period in the variance of the shock, a third for 2018–2019 and two-thirds for 2025–2026. Responses of opposite sign therefore cancel out. The exchange rate is not an exception. As Section 3.3 shows, consumer prices, exports, imports and policy rates also responded in opposite directions

in the two episodes, so their average responses mix opposite effects as well.

The average response in Panel A is consistent with Merendino and Monacelli (2026), who relate tariff shocks to TPU over three decades and find no strong evidence that the exchange rate moves in the first two quarters after the shock. The responses by episode in Panel B show that this average combines two episodes in which the exchange rate moved in opposite directions, and that understanding the effects of TPU shocks requires looking at each episode separately.

3.3 Macroeconomic Effects Across the Two Episodes

Figure 5 shows that the change in the response of the exchange rate came with very different spillovers on other economies. In 2018–2019, other currencies weakened against the dollar, prices rose and central banks tightened, while unemployment did not move. In 2025–2026, the shock instead looked like a negative demand shock for the rest of the world: exports and imports fell, unemployment rose, prices fell and central banks eased, while currencies appreciated against the dollar. None of the responses moves systematically before the shock in either episode, which indicates that our estimates are not driven by pre-trends.

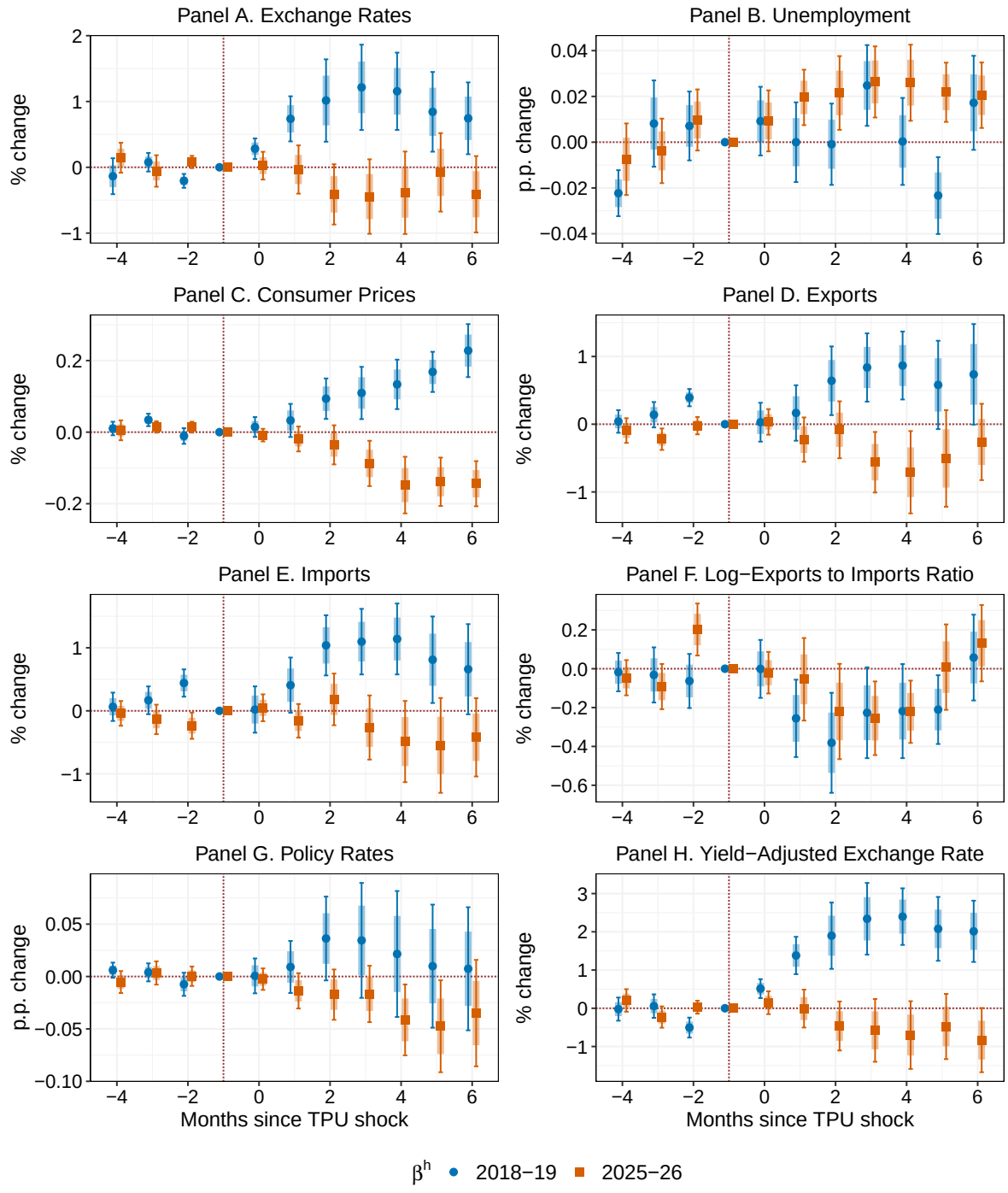
The exchange rate. To separate the role of interest rates from that of the risk premium in the response of the exchange rate, we follow Engel (2016) and compute the yield-adjusted exchange rate

$$x_{i,t} \equiv s_{i,t} + 10\,(y^{10}_{i,t} - y^{10}_{US,t}) = E_t s_{i,t+10} + 10\,\lambda^{10}_{i,t}, \tag{5}$$

where $s_{i,t}$ is 100 times the log exchange rate, $y^{10}_{i,t} - y^{10}_{US,t}$ is the ten-year yield differential with the United States, time is measured in years, and $\lambda^{10}_{i,t}$ is the premium that investors require to hold the domestic currency instead of the dollar. The second equality follows from uncovered interest parity at the ten-year horizon.[6] The yield-adjusted exchange rate, shown in Panel H of Figure 5, removes the part of the response of the exchange rate that comes from the interest rate differential. With the exchange rate that markets expect ten years ahead anchored, its response is that of the premium.

[6] Uncovered interest parity holds for the return of holding an n-year bond to maturity, $Y^n_{i,t} = Y^n_{US,t} + (E_t s_{i,t+n} - s_{i,t}) + n\,\lambda^n_{i,t}$, where $Y^n_{j,t}$ is the log return, in percent, of the n-year bond of country j, and $\lambda^n_{i,t}$ is the average annual premium over the n years. For a zero-coupon bond with continuously compounded yield $y^n_{j,t}$, $Y^n_{j,t} = n\,y^n_{j,t}$, and rearranging gives equation (5) for $n = 10$. For the yields to maturity of the coupon bonds we use, this holds as an approximation.

FIGURE 5. THE MACROECONOMIC EFFECTS OF TPU SHOCKS IN THE TWO EPISODES



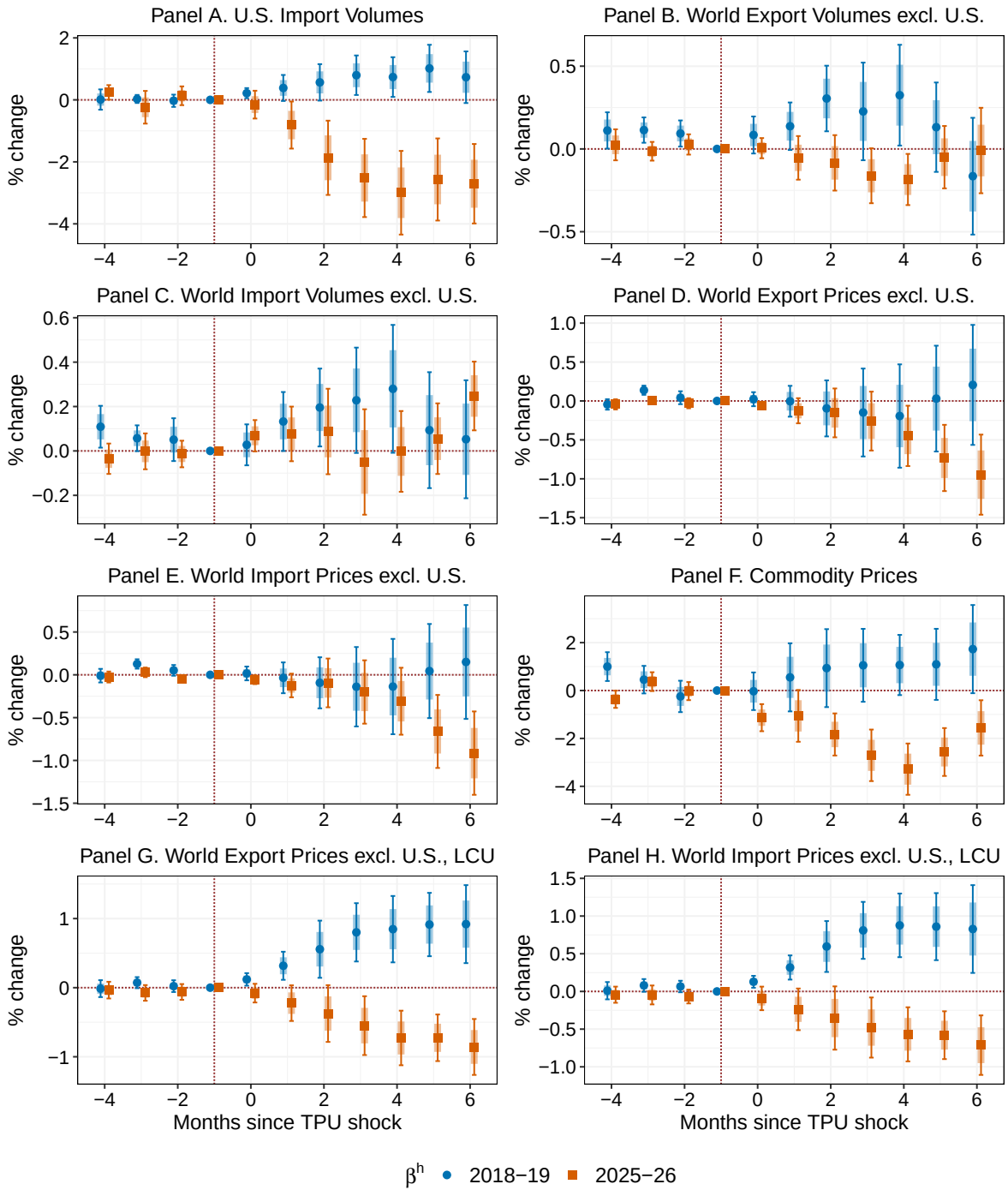
Notes: This figure shows the estimates of β_e^h from equation (4) in 2018–2019 (blue circles) and 2025–2026 (orange squares), with 68% (bars) and 90% (whiskers) confidence intervals based on Driscoll and Kraay (1998) standard errors. The response at $h = -1$ is set to zero. Exchange rates are domestic currency per U.S. dollar, so a negative response is an appreciation. Panel H is the yield-adjusted exchange rate, the log exchange rate plus ten times the ten-year yield differential with the United States, for the 25 economies with ten-year yields.

Panel H of Figure 5 shows that the premium moved in opposite directions in the two episodes. In 2018–2019, the yield-adjusted exchange rate rises 2.3% three months after the shock, more than the exchange rate itself, so a higher premium on other currencies relative to the dollar accounts for the whole depreciation, as in a flight to the safety of the dollar. In 2025–2026, it falls 0.6%, slightly more than the exchange rate, so the appreciation of other currencies reflects a lower premium relative to the dollar rather than a change in interest rate differentials. Appendix Figure B1 shows that the same holds when we build the yield-adjusted exchange rate with yields of one, two, three, five and seven years, so the result does not depend on the horizon of the bonds. Kalemli-Özcan et al. (2026) focus on 2025–2026 and attribute the weakness of the dollar to a higher risk premium on the dollar. Our estimates point in the same direction for this episode, and show that in 2018–2019 the premium moved the other way, in favor of the dollar.

Economic activity. The responses of unemployment and trade in Figure 5 point to opposite shocks to the demand for the goods of the rest of the world. In 2018–2019, activity held up and trade expanded. Unemployment did not move, consumer prices rose slowly, by 0.2% after six months, and central banks raised policy rates by 4 basis points after two months. Exports rose 0.8% three to four months after the shock and imports rose more, 1.1%, so the ratio of exports to imports fell, by up to 0.4%. In 2025–2026, activity weakened and trade contracted. Exports fell 0.7% and imports 0.5% four to five months after the shock, and the ratio of exports to imports fell 0.2%. Unemployment rose by 0.03 percentage points, consumer prices fell 0.15% after four months, and central banks cut policy rates by 5 basis points.

Exports and imports in Figure 5 are measured in U.S. dollars. Their responses could therefore reflect changes in dollar prices rather than in the quantities traded. To account for this possibility, we estimate the same local projections on the volumes and the dollar prices of merchandise trade from the CPB *World Trade Monitor*, for U.S. imports and for the trade of the world excluding the United States. To remove the mechanical effect of the dollar on dollar prices, we also express the prices of the rest of the world in local currency, converting them into a basket of its currencies with the broad dollar index. Since these are single time series rather than a panel, we estimate the coefficients of the lags and of the global controls on the months since 2006, in which the shock is zero outside the trade war events, so that only the months with shocks identify the responses, and we smooth the trade series with three-month averages, as in Figure 5. Figure 6 shows that our main findings are not driven by valuation effects: trade volumes move in the same direction as the dollar values of Figure 5 in both episodes.

FIGURE 6. TRADE VOLUMES AND PRICES IN THE TWO EPISODES



Notes: This figure shows the responses to a one standard deviation TPU shock in 2018–2019 (blue circles) and 2025–2026 (orange squares), from local projections on each monthly series with the specification of equation (4), with 68% (bars) and 90% (whiskers) confidence intervals based on Newey and West (1987) standard errors. The response at $h = -1$ is set to zero.

In 2018–2019, U.S. import volumes did not fall despite the new tariffs, and rose by up to 1% five months after the shock. Export and import volumes of the rest of the world rose too, by 0.3%, and commodity prices rose 1%. The dollar prices of world trade fell slightly, but only because the dollar strengthened, since the same prices measured in the currencies of the rest of the world rose 0.8% (Panels G and H). These responses are consistent with trade diversion. Fajgelbaum et al. (2024) show that countries outside the conflict increased their exports of the products that the United States taxed on China, and Freund et al. (2024) that the countries that replaced China in U.S. imports tend to be integrated in Chinese supply chains, with faster growth of their own imports from China.

In 2025–2026, the shock reduced U.S. demand for imports. U.S. import volumes fell 2.5% three months after the shock and 3% after four months. Since the United States buys 13% of world imports, this fall reached the rest of the world, whose export volumes fell 0.2% three to four months after the shock. Prices fell at the same time. The dollar prices of exports and imports of the rest of the world fell steadily, reaching 0.9% after six months, and commodity prices fell by up to 3% four months after the shock, even though the dollar did not strengthen. Measured in local currency, the prices of the rest of the world fell by a similar amount, between 0.6% and 0.9% four to six months after the shock (Panels G and H). Volumes and prices together account for the fall in the dollar value of trade in Figure 5, and both point to a negative demand shock for the rest of the world.

3.4 Robustness

Appendix B.3 demonstrates that the opposite responses of the two episodes are robust to alternative choices in the construction of the shocks and in the estimation. There are three key inputs into our results, the definition of the surprises, the specification of the local projections, and the frequency at which we measure the shocks and the outcomes. We vary each in turn.

Definition of TPU surprises. One concern about our baseline results is that the surprise of equation (1) does not use the index on the event day d itself, so it may be ignoring news that newspapers report on that same day and that fade by the next one. To address this concern, we consider two alternative definitions for surprises: *(i)* the average of the index on the event day and the day after minus the index on the day before; and *(ii)* the sum of the index on the event day and the day after minus its sum on the two days before. Appendix Figures B2 and B3 show that, with either definition, the exchange rate, the yield-adjusted exchange rate, exports, imports and policy rates still respond in opposite directions in the

two episodes, and the responses of 2018–2019 are, if anything, larger.

Alternative specifications. We test the robustness of our baseline results by varying the specification of equation (4) along three dimensions. First, we vary the number of lags of the outcome and of the shock over every combination between 1 and 18. Appendix Figure B4 shows that the estimates are insensitive to the lag structure, with the baseline estimates of the exchange rate, if anything, closer to zero than most of the alternatives. Second, the baseline estimates are not driven by any single economy. Appendix Figure B5 shows that the estimates change little when we drop one economy at a time. Third, baseline results do not reflect other shocks that occurred in the same months. Appendix Figure B6 shows that the responses are essentially the same when we control for the oil supply news shocks of Känzig (2021) and the U.S. monetary policy shocks of Nakamura and Steinsson (2018), in the month of the surprise and the three previous months.

Frequency. Aggregating the surprises to the monthly frequency raises a concern. Within a month, macroeconomic and financial variables respond to trade policy news, and trade policy may in turn respond to them, so a monthly regression may mix the effect of the surprises with the response of trade policy to the economy. The surprises are daily, and so are exchange rates, which allows us to estimate the response of the exchange rate at the daily frequency, where there is little room for this feedback. Using daily exchange rates, we estimate daily local projections analogous to equation (2), with the response allowed to differ across the two episodes as in equation (4). Appendix Figure B7 shows that the daily responses reproduce the monthly ones. Other currencies depreciate against the dollar after the surprises of 2018–2019, close to 1% three to four months later, and appreciate after those of 2025–2026, 0.3% two to three months later.

4 Conclusion

We construct a new series of TPU shocks from the events of the U.S. trade war and show that financial markets treat them as news that raises uncertainty and lowers the value of U.S. firms. Using these shocks, we show that U.S. TPU affected other economies in opposite ways in the two episodes of the trade war. In 2018–2019, TPU shocks depreciated other currencies against the dollar and raised trade, prices and policy rates abroad. In 2025–2026, they appreciated other currencies and acted as a negative demand shock for the rest of the world, lowering trade and prices, raising unemployment and leading central banks to ease. In both episodes, the premium that investors require to hold other currencies instead of

the dollar accounts for the response of the exchange rate, rising in the first episode and falling in the second.

These results imply that the international consequences of U.S. trade policy uncertainty are not a fixed feature of the shock. Pooling episodes, as is common when estimating the effects of TPU, can hide effects of opposite sign behind an average close to zero. For policymakers abroad, the same news about U.S. trade policy can call for tightening or for easing, depending on how it moves the dollar. Understanding why the premium on the dollar moved in opposite directions in the two episodes is therefore key to anticipating the consequences of future trade tensions, and the shock series we construct offers a tool to study them.

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Appendices

A Appendix to Section 2

A.1 Trade War Events

This appendix documents the trade war events behind the TPU surprises of Section 2. Table A1 counts the event days by the economies they target, Table A2 lists the 207 included events with the surprise of each event day, and Table A3 lists the 94 excluded entries with the reason for their exclusion. Headlines are reproduced as they appear in the PIIE timelines (Bown, 2025; Bown & Kolb, 2018).

Each entry was coded under the rule of Section 2.1 before examining any outcome. A few conventions settle the cases that the rule does not resolve on its own. Entries reporting that measures go into effect as announced are excluded as implementation, unless the outcome was still open at that point, as when the pause on the tariffs on Canada and Mexico expired on 4 March 2025. Deals are included when they first set or cut tariff rates, and the later signing of their formal texts is excluded. Investigations are dated by the day the news became public. When PIIE gives two dates for a single entry, as for the investigations on steel and aluminum in April 2017, the first date is used. Several entries on the same day are coded separately, but they share the surprise of that day, since the index moves only once per day. Retaliation is assigned to the retaliating partner, and events aimed at any member of the European Union are assigned to the EU.

Table A1 shows that China is by far the most frequent target, with 49 of the 106 targeted days, followed by Canada, the EU and Mexico; no other economy is targeted on more than six days. A day that targets several economies counts once for each of them, so the rows for individual economies add up to more than the number of targeted days. One event day, 3 February 2026, when the United States reauthorized the African Growth and Opportunity Act, cannot be assigned to any single economy.

Table A1. Event Days by Target

	Timeline 1.0 (2016–2024)	Timeline 2.0 (2025–2026)	Total
Global days	13	49	62
Targeted days	62	44	106
China	36	13	49
Canada	8	11	19
European Union	9	6	15

Continued on next page

Table A1 (continued)

	Timeline 1.0 (2016–2024)	Timeline 2.0 (2025–2026)	Total
Mexico	7	4	11
United Kingdom	1	5	6
Brazil	1	3	4
Vietnam	1	3	4
India	1	2	3
Korea	2	1	3
Turkey	2	1	3
20 other economies (1–2 days each)	9	14	23
Unassigned days	0	1	1
Event days	75	94	169

Notes: This table shows the number of event days (days with at least one included event) of each type. A day is global if at least one of its included events is global, and targeted otherwise; a targeted day counts once for each economy it targets. Events aimed at any member of the European Union are assigned to the EU. The unassigned day is the reauthorization of the African Growth and Opportunity Act (3 February 2026).

Table A2. Included Events

Date	Event	Target	Direction	s_d
Timeline 1.0 (first Trump administration and Biden years)				
20 Apr 2017	National Security Investigations Commence	Global	Esc.	91.6
18 Aug 2017	USTR Self-Initiates Investigation of China	China	Esc.	−18.7
31 Oct 2017	USITC Recommends Remedies	Global	Esc.	26.3
22 Jan 2018	Trump Imposes Safeguard Tariffs	Global	Esc.	73.7
5 Feb 2018	China Investigates US Exports of Sorghum	China	Esc.	12.9
16 Feb 2018	National Security Investigation Results	Global	Esc.	100.3
1 Mar 2018	Tariff Announcement	Global	Esc.	140.3
7 Mar 2018	EU Threatens to Rebalance in Response	EU	Esc.	266.4
8 Mar 2018	Steel and Aluminum NAFTA Tariff Exemptions	Canada, Mexico	De-esc.	196.2
22 Mar 2018	More Tariff Exemptions	EU, Korea, Brazil, Argentina, Australia	De-esc.	101.4
	Unfair Trade Practices Investigation Results	China	Esc.	
28 Mar 2018	Korea Receives Permanent Exemption for Steel, But Faces Quota	Korea	De-esc.	−27.5
2 Apr 2018	China Retaliates	China	Esc.	218.8
3 Apr 2018	US Threatens Tariffs	China	Esc.	−112.9
4 Apr 2018	China Threatens Retaliation on Autos, Aircraft, and Agriculture	China	Esc.	265.8
5 Apr 2018	US Considers Additional Tariffs on $100 Billion	China	Esc.	147.4
17 Apr 2018	China Imposes Preliminary Tariffs on US Sorghum	China	Esc.	84.5
30 Apr 2018	US Extends Tariff Exemptions	EU, Canada, Mexico	De-esc.	194.9
18 May 2018	China Ends Tariffs on US Sorghum During Negotiations	China	De-esc.	100.7
23 May 2018	Another National Security Investigation	Global	Esc.	−44.1
29 May 2018	White House Plans Tariffs After Brief 'Hold'	China	Esc.	82.9

Continued on next page

Table A2 (continued)

Date	Event	Target	Direction	s_d
1 Jun 2018	US Ends Tariff Exemptions for EU, Canada, and Mexico	EU, Canada, Mexico	Esc.	144.3
15 Jun 2018	US Revises $50 Billion Tariff List	China	Esc.	42.6
	China's Revised Retaliation List	China	Esc.	
18 Jun 2018	Trump Asks for More Tariffs	China	Esc.	49.8
22 Jun 2018	EU Retaliates on Iconic American Goods	EU	Esc.	−58.6
1 Jul 2018	Canada Strikes Back	Canada	Esc.	−93.5
10 Jul 2018	USTR Announces $200 Billion Tariffs on China	China	Esc.	0.9
20 Jul 2018	Trump Threatens Tariffs on All Imports from China	China	Esc.	132.2
1 Aug 2018	Trump Wants 25 Percent Tariffs, Not 10 Percent	China	Esc.	59.6
3 Aug 2018	China Threatens $60 Billion Tariffs	China	Esc.	33.3
7 Aug 2018	USTR Finalizes Second Tranche of Tariffs	China	Esc.	−32.5
8 Aug 2018	China Revises Its $50 Billion Tariff List, Removing Crude Oil	China	Esc.	−89.4
10 Aug 2018	Higher Rates for Turkey	Turkey	Esc.	160.3
14 Aug 2018	Turkey Retaliates	Turkey	Esc.	−62.4
27 Aug 2018	'Side Letter' on Autos Reportedly in New US-Mexico Trade Deal to Replace NAFTA	Mexico, Canada	Mixed	295.1
17 Sep 2018	Trump Finalizes $200 Billion Tariff List	China	Esc.	267.2
18 Sep 2018	China Finalizes Tariffs on $60 Billion of US Goods	China	Esc.	292.3
30 Nov 2018	USMCA Is Signed with Side Letters	Canada, Mexico	De-esc.	−17.9
1 Dec 2018	US-China Tariff Truce	China	De-esc.	−111.6
17 Feb 2019	Commerce Department Submits National Security Report to White House	Global	Esc.	−185.1
24 Feb 2019	Tariff Increase Delayed	China	De-esc.	−78.2
5 May 2019	Trump Renews Tariff Threats	China	Esc.	187.6
13 May 2019	China Plans to Hike Tariff Rate	China	Esc.	310.9
17 May 2019	US Lifts Tariffs on Canada and Mexico	Canada, Mexico	De-esc.	64.3
	Trump Delays Auto Tariff Decision	Global	De-esc.	
30 May 2019	Tariffs on Mexico to Deter Migrants	Mexico	Esc.	31.9
7 Jun 2019	Tariffs on Mexico Called Off	Mexico	De-esc.	−53.3
15 Jun 2019	India Retaliates after Losing Special Trade Status	India	Esc.	−65.6
1 Aug 2019	US Announces Tariffs on Almost All Remaining Imports from China	China	Esc.	62.9
13 Aug 2019	Trump Plans Two Major Rollouts of Fall 2019 Tariffs	China	De-esc.	250.5
23 Aug 2019	China Retaliates and Trump Announces More Tariffs	China	Esc.	178.2
11 Sep 2019	China Removes a Few Tariffs, Trump Moves Date	China	De-esc.	−15.5
11 Oct 2019	Trump Cancels October Tariffs, Points to 'Phase One' of Deal with China	China	De-esc.	136.4
13 Dec 2019	Trump Calls Off December Tariffs in Anticipation of Deal	China	De-esc.	202.5
15 Jan 2020	Leaders Sign Phase One Deal	China	De-esc.	155.4
24 Jan 2020	Trump Broadens Tariffs	Global	Esc.	−62.9

Continued on next page

Table A2 (continued)

Date	Event	Target	Direction	s_d
6 Aug 2020	Trump Reimposes Tariffs on Some Canadian Aluminum; Canada Retaliates	Canada	Esc.	94.0
15 Sep 2020	Trump Ends Duties on Canadian Aluminum but Wants Export Quotas	Canada	De-esc.	−79.9
14 Jan 2021	Trump Extends Tariffs on Washing Machines	Global	Esc.	−0.6
1 Feb 2021	Biden Reinstates Duties on Aluminum from the UAE	United Arab Emirates	Esc.	4.9
17 May 2021	US and EU Will Discuss Excess Steel and Aluminum Capacity	EU	De-esc.	9.8
4 Oct 2021	USTR Tai Describes Initial Trade Policy Toward China	China	Mixed	77.3
31 Oct 2021	US Lifts Tariffs on Some Steel and Aluminum Imports from the EU	EU	De-esc.	−44.9
4 Feb 2022	Biden Extends Trump-Era Solar Tariffs	Global	Esc.	75.7
7 Feb 2022	US Rolls Back Some Tariffs on Japanese Steel	Japan	De-esc.	−32.2
22 Mar 2022	US Eases Tariffs on UK Steel	United Kingdom	De-esc.	88.6
28 Mar 2022	USTR reinstates some tariff exclusions	China	De-esc.	−31.6
9 May 2022	US Suspends Tariffs on Ukrainian steel	Ukraine	De-esc.	20.4
6 Jun 2022	Biden Temporarily Suspends Tariffs on Southeast Asian Solar Panels	Cambodia, Malaysia, Thailand, Vietnam	De-esc.	173.1
9 Dec 2022	WTO Rules on Trump's Tariffs	Global	De-esc.	54.4
24 Feb 2023	US Raises Russian Steel and Aluminum Tariffs	Russia	Esc.	75.4
19 Dec 2023	EU prolongs tariff suspension for US products	EU	De-esc.	42.8
28 Dec 2023	US Extends Steel and Aluminum Tariff Rate Quota for EU	EU	De-esc.	−73.7
14 May 2024	Biden's USTR Releases Four-Year Review and Proposes New Tariffs	China	Esc.	68.3
16 May 2024	Biden Further Modifies Trump-era Solar Tariffs	Global	Esc.	−183.8
13 Sep 2024	USTR Imposes New Tariffs on China Following Four-Year Review	China	Esc.	−33.4
11 Dec 2024	USTR Imposes More New Tariffs on China Following Four-Year Review	China	Esc.	−72.0
Timeline 2.0 (second Trump administration)				
1 Feb 2025	Tariffs on Canada, Mexico, and China	Canada, China, Mexico	Esc.	−139.4
	Canada announces retaliation	Canada	Esc.	
3 Feb 2025	Tariffs on Mexico on hold	Mexico	De-esc.	695.7
	Tariffs on Canada on hold	Canada	De-esc.	
4 Feb 2025	China retaliates	China	Esc.	−27.8
5 Feb 2025	Duty-free packages from China restored	China	De-esc.	−442.9
10 Feb 2025	Tariffs on steel and aluminum	Global	Esc.	−31.0
13 Feb 2025	Reciprocal Trade and Tariffs Memorandum	Global	Esc.	97.2
21 Feb 2025	Defending American Companies and Innovators From Overseas Extortion... Memorandum	Canada, EU, United Kingdom, Turkey	Esc.	36.3
25 Feb 2025	Copper imports as a national security threat	Global	Esc.	50.2
1 Mar 2025	Timber and lumber imports as a national security threat	Global	Esc.	−104.8

Continued on next page

Table A2 (continued)

Date	Event	Target	Direction	s_d
4 Mar 2025	US tariffs go into effect on Canada	Canada	Esc.	430.7
	US tariffs go into effect on Mexico	Mexico	Esc.	
	Higher tariffs go into effect on China	China	Esc.	
	Canada retaliates on US farm exports and more	Canada	Esc.	
	China retaliates: tariffs on US farm exports, export controls, sanctions, antidumping investigation, and more	China	Esc.	
6 Mar 2025	US exempts imports from Canada satisfying USMCA rules of origin	Canada	De-esc.	22.3
	US exempts imports from Mexico satisfying USMCA rules of origin	Mexico	De-esc.	
12 Mar 2025	EU retaliates against US steel and aluminum tariffs	EU	Esc.	108.0
	Canada retaliates against US steel and aluminum tariffs	Canada	Esc.	
25 Mar 2025	Secondary tariffs on third countries importing Venezuelan oil	Global	Esc.	−151.3
26 Mar 2025	Tariffs on automobiles and automobile parts	Global	Esc.	118.5
2 Apr 2025	Tariffs on nearly all countries for their trade surpluses	Global	Esc.	236.8
	Duty-free packages from China to end May 2	China	Esc.	
3 Apr 2025	Canada announces new countermeasures in response to US tariffs on autos	Canada	Esc.	693.6
4 Apr 2025	China retaliates	China	Esc.	124.5
8 Apr 2025	Additional 50 percent tariffs on China for retaliating	China	Esc.	680.6
9 Apr 2025	China retaliates	China	Esc.	90.6
	EU confirms retaliation	EU	Esc.	
	Differential tariffs to be paused for 90 days; additional tariff increase for China	Global	Mixed	
	Restoring Maritime Dominance	China	Esc.	
10 Apr 2025	EU pauses retaliation	EU	De-esc.	−177.5
11 Apr 2025	China retaliates	China	Esc.	−329.3
	Smartphones and other consumer electronics containing semiconductors exempted from some tariffs	Global	De-esc.	
14 Apr 2025	Pharmaceutical imports as a national security threat	Global	Esc.	−150.5
	Semiconductor and SME imports as a national security threat	Global	Esc.	
15 Apr 2025	Critical mineral and rare earth imports as a national security threat	Global	Esc.	−77.7
17 Apr 2025	Measures to address China's targeting of the maritime, logistics, and shipbuilding sectors	China	Esc.	17.9
	Restoring American seafood competitiveness	Global	Esc.	
23 Apr 2025	Truck imports as a national security threat	Global	Esc.	−97.4
29 Apr 2025	Addressing certain tariffs on imported articles affecting the auto sector	Global	De-esc.	−140.8
8 May 2025	Expected US-UK Economic Prosperity Deal	United Kingdom	De-esc.	−26.3

Continued on next page

Table A2 (continued)

Date	Event	Target	Direction	s_d
12 May 2025	US lowers certain additional tariffs on China from 125 to 10 percent	China	De-esc.	322.2
	China removes certain retaliatory measures against the US	China	De-esc.	
13 May 2025	Commercial aircraft, engines, and parts imports as a national security threat	Global	Esc.	109.6
28 May 2025	US Court of International Trade ruling	Global	De-esc.	−150.4
3 Jun 2025	Higher steel and aluminum tariffs announced	Global	Esc.	15.1
11 Jun 2025	Trump announces deal with China on Truth Social; no legal details provided	China	De-esc.	30.3
16 Jun 2025	Steel tariffs expanded to appliances and more	Global	Esc.	91.8
2 Jul 2025	Trump announces tariff agreement with Vietnam on Truth Social	Vietnam	De-esc.	119.3
7 Jul 2025	Trump delays 90-day deadline, sets new tariff rates for certain countries	Global	Mixed	342.1
10 Jul 2025	Trump announces new tariff rates for additional countries on Truth Social	Global	Esc.	87.8
15 Jul 2025	Trump announces tariff agreement with Indonesia on Truth Social	Indonesia	De-esc.	398.1
	Trump administration launches unfair trade investigation of Brazil	Brazil	Esc.	
16 Jul 2025	Drone imports as a national security threat	Global	Esc.	−37.2
	Polysilicon imports as a national security threat	Global	Esc.	
22 Jul 2025	Trump announces tariff agreements with Japan and Philippines on Truth Social	Japan, Philippines	De-esc.	−61.8
27 Jul 2025	Trump, von der Leyen announce US-EU agreement	EU	De-esc.	356.3
30 Jul 2025	Brazil tariffs and a new national emergency	Brazil	Esc.	−57.4
	Duty free treatment for de minimis ends for all countries	Global	Esc.	
	Copper tariffs will begin on August 1	Global	Esc.	
	Trump announces tariff agreement with South Korea on Truth Social	Korea	De-esc.	
31 Jul 2025	Tariffs on Canada increased to 35 percent for USMCA noncompliant goods	Canada	Esc.	233.2
	Tariffs adjusted on nearly all countries	Global	Mixed	
6 Aug 2025	Tariffs on India for buying Russian oil	India	Esc.	71.6
11 Aug 2025	Trump extends China tariff pause for another 90 days	China	De-esc.	353.5
15 Aug 2025	Steel and aluminum tariffs expanded to aerosol cans and more	Global	Esc.	−268.2
29 Aug 2025	Canada drops some of its retaliatory tariffs, retains others	Canada	De-esc.	137.4
5 Sep 2025	More details on tariff coverage and implementation of Trump's deals	Global	De-esc.	−14.9
9 Sep 2025	Wind turbines and parts as a national security threat	Global	Esc.	−337.9
26 Sep 2025	PPE and medical supply imports as a national security threat	Global	Esc.	116.3

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Table A2 (continued)

Date	Event	Target	Direction	s_d
	Robotics and industrial machinery imports as a national security threat	Global	Esc.	
29 Sep 2025	Tariffs on lumber and lumber products	Global	Esc.	176.8
16 Oct 2025	Fees on Chinese ships and tariffs on Chinese cranes	China	Mixed	−160.5
17 Oct 2025	Tariffs on big trucks, buses, and parts	Global	Esc.	−52.7
20 Oct 2025	Ruling on Nicaragua's treatment of labor rights, human rights, and the rule of law	Nicaragua	Esc.	383.0
26 Oct 2025	US-Thailand trade deal and critical minerals cooperation	Thailand	De-esc.	392.8
	US-Cambodia trade deal	Cambodia	De-esc.	
	US-Malaysia trade deal and critical minerals cooperation	Malaysia	De-esc.	
	US-Vietnam trade deal	Vietnam	De-esc.	
1 Nov 2025	US-China deal reduces fentanyl tariffs	China	De-esc.	−161.6
13 Nov 2025	US deals with Argentina, Ecuador, El Salvador, and Guatemala	Argentina, Ecuador, Guatemala, El Salvador	De-esc.	178.5
	More details on the US-Korea trade deal	Korea	De-esc.	
14 Nov 2025	US deal with Switzerland and Liechtenstein	Switzerland	De-esc.	−92.8
	US reduces tariffs on some agriculture products	Global	De-esc.	
17 Nov 2025	USITC initiates investigation into quartz surface products	Global	Esc.	−291.2
20 Nov 2025	US eliminates tariffs on some agricultural products from Brazil	Brazil	De-esc.	88.6
1 Dec 2025	US and UK pharmaceuticals deal	United Kingdom	De-esc.	345.8
23 Dec 2025	US finds China targeted semiconductor industry for dominance but delays tariffs	China	Esc.	−141.3
31 Dec 2025	Tariff increase for lumber and lumber products delayed for one year	Global	De-esc.	−357.1
14 Jan 2026	New negotiations for critical minerals agreements	Global	Mixed	−151.1
	Tariffs and exemptions for semiconductors as well as tax on AI chip exports to China	Global	Esc.	
15 Jan 2026	US-Taiwan trade deal	Taiwan	De-esc.	62.6
21 Jan 2026	Trump posts he has a 'framework' for a future deal on Greenland	EU, United Kingdom, Norway	De-esc.	−198.0
29 Jan 2026	Tariffs on countries selling oil to Cuba	Global	Esc.	6.2
3 Feb 2026	Trump reauthorizes AGOA through end of 2026	Unassigned	De-esc.	−160.2
6 Feb 2026	US-India deal	India	De-esc.	133.4
9 Feb 2026	US-Bangladesh trade deal	Bangladesh	De-esc.	48.5
12 Feb 2026	US-North Macedonia trade deal	North Macedonia	De-esc.	−10.6
20 Feb 2026	The Supreme Court rules against Trump's IEEPA tariffs	Global	De-esc.	696.2
	White House continues suspension of de minimis treatment	Global	Esc.	
	White House announces new 10 percent tariff under Section 122	Global	Esc.	
11 Mar 2026	USTR launches investigations into structural excess capacity	Global	Esc.	61.3

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Table A2 (continued)

Date	Event	Target	Direction	s_d
12 Mar 2026	USTR launches investigations into forced labor practices	Global	Esc.	−50.6
1 Apr 2026	USITC finds injury from quartz surface product imports	Global	Esc.	300.4
2 Apr 2026	Adjustments to tariffs on steel, aluminum, and copper	Global	Mixed	−117.5
	Tariffs on pharmaceuticals, more information on deal with UK	Global	Esc.	
30 Apr 2026	US lowers tariff on UK whiskey	United Kingdom	De-esc.	107.5
17 May 2026	US describes recent deal with China	China	De-esc.	37.8
29 May 2026	USTR launches investigation into Vietnam intellectual property practices	Vietnam	Esc.	203.2
1 Jun 2026	USTR finds Brazil's practices actionable under Section 301	Brazil	Esc.	128.7
	Section 232 metals tariffs adjusted	Global	De-esc.	
2 Jun 2026	USTR releases results of forced labor investigations	Global	Esc.	8.6
18 Jun 2026	USTR launches investigation into Germany's pharmaceutical pricing	EU	Esc.	−128.9
29 Jun 2026	Section 232 investigation into anthracite coal imports	Global	Esc.	−112.5
	US temporarily suspends duties on Moroccan phosphate fertilizer	Morocco	De-esc.	
9 Jul 2026	Section 232 investigation into commercial aircraft concludes without immediate tariffs	Global	De-esc.	77.8
13 Jul 2026	USITC initiates investigation into lamb meat imports	Global	Esc.	269.6
15 Jul 2026	USTR imposes 25 percent Section 301 tariffs on Brazil	Brazil	Esc.	−234.0
20 Jul 2026	Section 232 aluminum tariffs modified for those investing in new smelting capacity	Global	De-esc.	69.7
	White House announces additional tariffs on Canada over autos, dairy, and alcohol	Canada	Esc.	
21 Jul 2026	US-Jordan trade deal	Jordan	De-esc.	89.3
23 Jul 2026	USTR imposes Section 301 tariffs over forced labor	Global	Esc.	75.4
31 Jul 2026	White House imposes tariff-rate quota on quartz surface products	Global	Esc.	28.2
6 Aug 2026	White House prepares polysilicon tariffs and price floor	Global	Esc.	24.7
13 Aug 2026	White House imposes Section 232 tariffs on drones	Global	Esc.	−11.8
18 Aug 2026	White House delays Section 338 tariffs on Canada for three days	Canada	De-esc.	32.0
22 Aug 2026	Section 338 tariffs take effect after US-Canada negotiations break down	Canada	Esc.	−13.4

25 Aug 2026	Canada announces retaliation against US tariffs	Canada	Esc.	118.2

Notes: This table lists the included entries of the PIIE trade war timelines (Bown, 2025; Bown & Kolb, 2018), with their headlines as published. Target: Global for events that concern the rest of the world or many partners at once; otherwise, the economies targeted by the event, with partner retaliation assigned to the retaliating economy and events aimed at EU members assigned to the EU. Direction: escalation (Esc.), de-escalation (De-esc.), or both (Mixed). s_d: surprise of the event day, the two-day change in the daily TPU index of Caldara et al. (2020) in equation (1), in index points; it is reported once per event day, on the row of its first event. A day is global if at least one of its events is global (Table A1).

Table A3. Excluded Entries

Date	Entry	Reason for exclusion
Timeline 1.0 (first Trump administration and Biden years)		
7 Mar 2016	ZTE Added to Entity List	Non-tariff measure
7 Mar 2017	ZTE Agrees to Settlement	Non-tariff measure
23 Mar 2018	Tariffs Go Into Effect	Implementation
16 Apr 2018	US Enacts Denial Order Against ZTE	Non-tariff measure
13 May 2018	Trump Overrules ZTE Denial Order	Non-tariff measure
14 May 2018	Korea Files WTO Disputes	Legal step
7 Jun 2018	ZTE Settlement Announced	Non-tariff measure
6 Jul 2018	US and China Impose First Phase of June 15 Tariff Lists	Implementation
13 Jul 2018	ZTE Denial Order Lifted	Non-tariff measure
16 Jul 2018	Trump Administration Files WTO Challenges	Legal step
24 Jul 2018	Subsidies for American Farmers After Export Fallout	Non-tariff measure
24 Jul 2018	Subsidies for American Farmers After Export Fallout	Non-tariff measure
13 Aug 2018	US Passes Law on Trade and National Security	Non-tariff measure
13 Aug 2018	Export Control Reform Act Becomes Law	Non-tariff measure
14 Aug 2018	China Files WTO Dispute Against US Solar Panel Tariffs	Legal step
23 Aug 2018	US and China Impose Second Phase of $50 Billion Tariffs	Implementation
24 Sep 2018	Next Phase of Tariffs Goes into Effect	Implementation
15 Nov 2018	Steel Tariffs Have Hit Poor Countries the Hardest	Analysis or data
19 Nov 2018	US Proposes Criteria for Essential Technologies	Non-tariff measure
20 Dec 2018	Steel Jobs Come at a High Cost	Analysis or data
28 Jan 2019	Department of Justice Indicts Huawei	Non-tariff measure
15 Feb 2019	Almost 15 Percent of US Imports Are Now Protected	Analysis or data
1 Apr 2019	Concerns Emerge over Possible Deal	Not a policy action
10 May 2019	US Raises Tariff Rate on Previous List	Implementation
15 May 2019	Huawei Added to Entity List	Non-tariff measure
1 Jun 2019	China Raises Retaliatory Tariffs	Implementation
19 Aug 2019	Huawei Affiliates Added to Entity List	Non-tariff measure
14 Feb 2020	Phase One Deal Goes into Effect	Implementation
13 Mar 2020	Tariffs Leave US Underprepared for COVID-19	Analysis or data
27 Apr 2020	US Tightens Technology Export Restrictions	Non-tariff measure
15 May 2020	US Extends Huawei Export Ban to Foreign Users of US Technology	Non-tariff measure
15 May 2020	Taiwan Semiconductor Manufacturing Company Announces US Facility	Not a policy action
15 Jun 2020	US Announces Exemptions for Developing International Standards	Non-tariff measure
17 Aug 2020	US Adjusts the Foreign-Produced Direct Product Rule	Non-tariff measure
28 Sep 2020	Export Restrictions Will Hurt US Tech Firms	Analysis or data
4 Dec 2020	China's Phase One Purchases are Falling Short	Analysis or data

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Table A3 (continued)

Date	Entry	Reason for exclusion
18 Dec 2020	SMIC Added to Entity List	Non-tariff measure
8 Feb 2021	China Misses Its Phase One Purchase Targets	Analysis or data
31 Dec 2021	China Fails to Fulfill Phase One Deal Purchases	Analysis or data
26 Jul 2022	SMIC Achieves a Chipmaking Breakthrough	Not a policy action
2 Aug 2022	Pelosi Visits Taiwan	Non-tariff measure
9 Aug 2022	US Passes the CHIPS Act	Non-tariff measure
31 Aug 2022	US Imposes New Controls on Advanced Chip Exports	Non-tariff measure
16 Sep 2022	US Redefines National Security	Non-tariff measure
7 Oct 2022	Biden Administration Adopts New Export Controls	Non-tariff measure
27 Jan 2023	US Appeals WTO Ruling	Legal step
7 Feb 2023	Safeguard Tariffs on Washing Machines End	Implementation
8 Mar 2023	Netherlands Joins US Export Controls	Non-tariff measure
31 Mar 2023	Japan Restricts Chipmaking Equipment Exports	Non-tariff measure
21 May 2023	China Bans Some Chips from US-Based Micron	Non-tariff measure
Timeline 2.0 (second Trump administration)		
20 Jan 2025	America First Trade Policy Memorandum	Administrative
4 Feb 2025	Tariffs on China go into effect, end of duty-free packages from China	Implementation
10 Feb 2025	China's tariff retaliation goes into effect	Implementation
21 Feb 2025	America First Investment Policy Memorandum	Non-tariff measure
10 Mar 2025	China's tariff retaliation goes into effect	Implementation
12 Mar 2025	Tariffs on steel and aluminum go into effect	Implementation
20 Mar 2025	Increasing critical minerals production in the United States	Non-tariff measure
3 Apr 2025	Tariffs on automobiles but not parts go into effect	Implementation
3 Apr 2025	Report to President on America First Trade Policy	Administrative
5 Apr 2025	Tariffs of 10 percent on nearly all countries go into effect	Implementation
9 Apr 2025	Differential tariffs on nearly all countries go into effect	Implementation
9 Apr 2025	Canada tariff retaliation for US auto tariffs goes into effect	Implementation
10 Apr 2025	China's tariff retaliation goes into effect	Implementation
10 Apr 2025	Tariff changes go into effect	Implementation
12 Apr 2025	China's tariff changes go into effect	Implementation
24 Apr 2025	Unleashing America's offshore critical minerals and resources	Non-tariff measure
4 Jun 2025	Higher steel and aluminum tariffs go into effect	Implementation
16 Jun 2025	More details on US-UK Economic Prosperity Deal	Implementation
22 Jul 2025	More details on Indonesian trade agreement	Implementation
21 Aug 2025	More details of US-EU trade deal released	Implementation
4 Sep 2025	More details of the US-Japan trade deal released	Implementation
25 Sep 2025	More details on implementation of the US-EU trade deal	Administrative
20 Oct 2025	US-Australia framework for critical minerals and rare earths	Non-tariff measure
4 Nov 2025	US releases more details on deal with China	Implementation
5 Nov 2025	China releases more details on deal with US	Implementation
10 Nov 2025	Suspending fees on Chinese ships, tariffs on Chinese cranes	Implementation
29 Dec 2025	US makes technical adjustments to tariff schedule	Administrative
1 Jan 2026	China makes annual tariff rate adjustments	Not a policy action
8 Jan 2026	China to reduce subsidies for exports of solar panels, batteries, and other products	Non-tariff measure
12 Jan 2026	The national emergencies continue	Administrative
29 Jan 2026	More details on the US-El Salvador trade deal	Implementation
31 Jan 2026	More details on the US-Guatemala trade deal	Implementation

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Table A3 (continued)

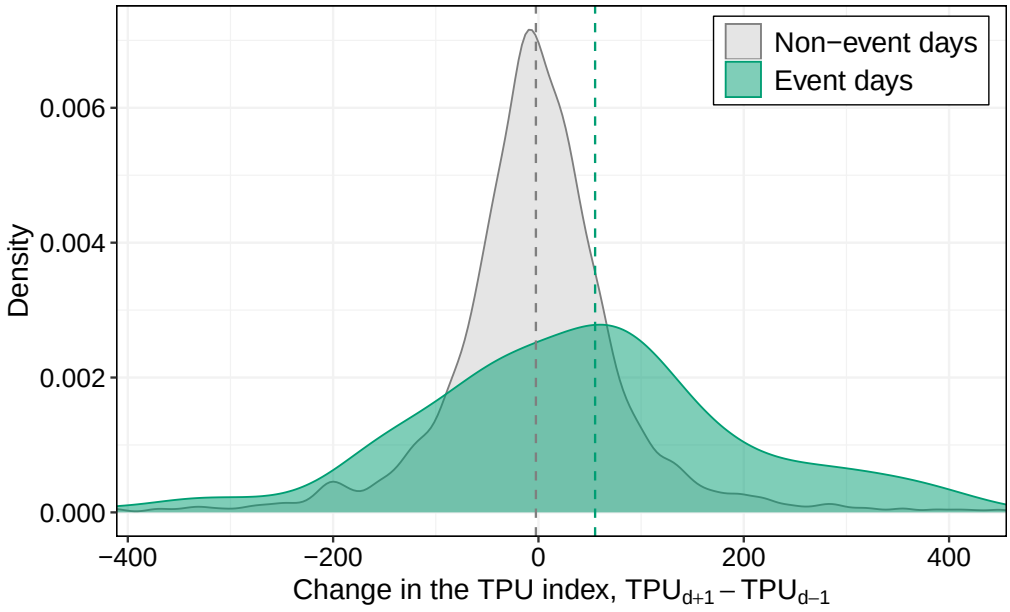
Date	Entry	Reason for exclusion
4 Feb 2026	US announces critical mineral efforts with Mexico, EU, and Japan	Non-tariff measure
5 Feb 2026	More details on the US-Argentina trade deal	Implementation
12 Feb 2026	More details on the US-Taiwan trade deal	Implementation
19 Feb 2026	More details on the US-Indonesia trade deal	Implementation
20 Feb 2026	White House ends certain tariff actions	Implementation
13 Mar 2026	More details on the US-Ecuador trade deal	Implementation
19 Mar 2026	US announces critical minerals effort with Japan	Non-tariff measure
24 Apr 2026	US-EU critical minerals action plan announced	Non-tariff measure
28 May 2026	US implements elements of earlier deal with Taiwan	Implementation
2 Jun 2026	USTR seeks comment on US-China Board of Trade	Administrative
20 Jul 2026	White House orders stricter sourcing requirements for defense critical materials	Non-tariff measure
30 Jul 2026	White House authorizes export restrictions on certain critical minerals and materials	Non-tariff measure

Notes: This table lists the excluded entries of the PIIE trade war timelines (Bown, 2025; Bown & Kolb, 2018), with their headlines as published. Non-tariff measure: export controls, entity listings, investment screening, subsidies, or cooperation on critical minerals. Implementation: measures taking effect as announced, or formal texts of deals whose tariff rates were already known. Analysis or data: PIIE analyses or data releases. Administrative: routine notices, renewals, or requests for comments. Legal step: filings or appeals, such as those at the World Trade Organization, that do not change tariffs. Not a policy action: corporate, media, or routine foreign items. The entry of 24 July 2018 appears twice because PIIE lists it under two of its trade war battles.

A.2 Distribution of the Surprises

Figure A1 compares the surprises s_d on the 169 event days with the equivalent two-day changes in the daily TPU index on the 4,039 days without any listed event. On event days the index rises on average by 55 points, against roughly zero on other days, and the standard deviation of the change is almost twice as large (183 against 97). One in five event days has a change larger in absolute value than the 95th percentile of the changes on other days, and a Kolmogorov–Smirnov test rejects that the two distributions are equal ($p < 0.001$).

FIGURE A1. DISTRIBUTION OF THE TPU SURPRISES



Notes: This figure shows the density of the two-day change in the daily TPU index of Caldara et al. (2020), $\text{TPU}_{d+1} - \text{TPU}_{d-1}$, on event days (green) and on days without any listed event (gray). The dashed lines mark the mean of each distribution. The horizontal axis is cut at the 0.5th and 99.5th percentiles of all days; the densities and means use all days.

B Appendix to Section 3

This appendix documents the data used in the paper and reports the robustness checks of Section 3. Appendix B.1 defines each variable and gives its source, Appendix B.2 reports how many months of each outcome are observed for each economy of the baseline sample, and Appendix B.3 reports the yield-adjusted exchange rates at other maturities and the robustness checks of Section 3.4.

B.1 Variable Definitions

Table B1 lists every variable used in the paper, grouped into the outcome variables of the panel regressions, the series used to build the TPU shocks, the global controls, the world trade series of Figure 6, the daily series, and the shocks used as additional controls in Section 3.4. For each variable, it gives its definition, its source, and the transformation used in the regressions. Monthly series from daily data are monthly averages, except government bond yields, and every monthly series is dated on the first day of its month.

TABLE B1. VARIABLE DEFINITIONS AND SOURCES

Variable	Definition and source	Transformation
Outcome variables (monthly)		
Consumer prices	Consumer price index, all items. IMF *International Financial Statistics* (IFS).	$100 \times \log$
Exchange rate	Nominal exchange rate, domestic currency per U.S. dollar, period average; an increase is a depreciation. IFS.	$100 \times \log$
Unemployment	Unemployment rate, percent of the labor force. IFS.	Percent
Exports	Merchandise exports to the world, free on board (FOB), U.S. dollars. IMF *Direction of Trade Statistics* (DOTS).	$100 \times \log$, 3-month average
Imports	Merchandise imports from the world, cost, insurance and freight (CIF), or FOB when CIF is not reported, U.S. dollars. DOTS.	$100 \times \log$, 3-month average
Export-import ratio	Exports over imports. DOTS.	$100 \times \log$, 3-month averages
Policy rate	Monetary policy-related interest rate, percent per annum. IFS.	Percent
Government bond yields	Yields to maturity of the 1-, 2-, 3-, 5-, 7- and 10-year government bonds of each economy and of the United States, percent per annum, end of month. Global Financial Data (GFD). The 10-year yields build the yield-adjusted exchange rate of equation (5), and the other maturities those of Appendix Figure B1.	Percent, average of the end-of-month yields of months $t-1$ and t
Trade policy uncertainty		
TPU index	Daily trade policy uncertainty index of Caldara et al. (2020), from January 2015.	Two-day change on event days, equation (1)

Continued on next page

Table B1 (continued)

Variable	Definition and source	Transformation
Trade war events	Entries of the PIIE trade war timelines (Bown, 2025; Bown & Kolb, 2018), coded as described in Section 2.1.	Event days; Appendix A
Global controls (monthly)		
Federal funds rate	Effective federal funds rate, percent. FRED (FEDFUNDS).	First difference
VIX	CBOE volatility index, monthly average of daily values. FRED (VIXCLS).	log
U.S. dollar index	Nominal broad U.S. dollar index (January 2006 = 100), monthly average of daily values; an increase is a stronger dollar. FRED (DTWEXBGS).	$100 \times \Delta \log$
Brent oil price	Price of Brent crude oil, U.S. dollars per barrel, monthly average of daily values. FRED (DCOILBRENTEU).	$100 \times \Delta \log$
Supply chain pressure	Global Supply Chain Pressure Index of the Federal Reserve Bank of New York, standard deviations from its mean (Benigno et al., 2022).	Level
World industrial production	World industrial production index (OECD and six major non-member economies) of Baumeister and Hamilton (2019). In the regressions on the CPB series of Figure 6, the world industrial production index of the CPB *World Trade Monitor*.	$100 \times \Delta \log$
World trade and commodity prices (monthly), Figure 6		
U.S. import volumes	Volume of merchandise imports of the United States, seasonally adjusted (2021 = 100). CPB Netherlands Bureau for Economic Policy Analysis, *World Trade Monitor*.	$100 \times \log$, 3-month average
World export and import volumes excl. U.S.	Volumes of world merchandise exports and imports, seasonally adjusted, net of those of the United States, aggregated with the 2021 value weights of the CPB. CPB *World Trade Monitor*.	$100 \times \log$, 3-month average
World export and import prices excl. U.S.	Unit values in U.S. dollars of the export and import aggregates above, the ratio of their values to their volumes. CPB *World Trade Monitor*.	$100 \times \log$, 3-month average
World export and import prices excl. U.S., local currency	Unit values above in a basket of the currencies of the rest of the world, $\log P_t^{LC} = \log P_t^{USD} + \log \text{USD}_t$, with USD_t the broad U.S. dollar index.	$100 \times \log$, 3-month average
Commodity prices	Global price index of all commodities (2016 = 100), International Monetary Fund. FRED (PALLFNFINDEXM).	$100 \times \log$
Daily series		
S&P 500	S&P 500 stock price index, daily close. FRED (SP500).	$100 \times \log$
VIX	CBOE volatility index, daily close. FRED (VIXCLS).	$100 \times \log$
Exchange rates	Domestic currency per U.S. dollar. IMF representative rates for 21 economies, and the websites of the central banks for Colombia, the Dominican Republic, Egypt, Hungary, Iceland, Indonesia, Romania and South Africa. Rates are carried forward over the weekdays without a quote.	$100 \times \log$
Additional controls (monthly), Section 3.4		

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Table B1 (continued)

Variable	Definition and source	Transformation
U.S. monetary policy shocks	Policy news shocks of Nakamura and Steinsson (2018): first principal component of the surprises in the federal funds and eurodollar futures (MP1, MP2, ED2, ED3, ED4) in 30-minute windows around FOMC statements, scaled so that a unit shock raises the one-year OIS rate by one percentage point. Built from the U.S. Monetary Policy Event-Study Database of Acosta, Ajello, Bauer, Loria, and Miranda-Agrippino (2025).	Sum over the statements of the month
Oil supply news shocks	Oil supply news shocks of Känzig (2021).	Level

Notes: This table defines each variable and gives its source and the transformation used in the regressions. Δ denotes the first difference over one month. Trade flows and the CPB series of volumes and prices enter as 3-month averages of their logs.

B.2 Outcome Variable Coverage

Table B2 reports, for each economy of the baseline sample, the number of months between January 2015 and August 2026 (140 months) in which each outcome is observed. The exchange rate and the trade flows are available for every economy; trade flows end in May 2026, the last month in DOTS. Consumer prices are available for every economy except New Zealand, and for only 28 months in Australia, since both countries publish consumer prices quarterly. Coverage is thinner for unemployment, which is missing for Egypt, India, Indonesia and South Africa, and for policy rates, which are missing for China, India, the United Kingdom and Uruguay. Since every regression uses all the country-months in which its outcome and controls are observed, the set of economies behind each response differs across outcomes, as shown in the last row of the table.

TABLE B2. COVERAGE OF THE OUTCOME VARIABLES

Economy	CPI	Exch. rate	Unemp. rate	Exports	Imports	Policy rate
Advanced economies						
Australia	28	140	140	137	137	130
Canada	140	140	140	137	137	130
Iceland	140	140	140	137	137	137
Israel	139	140	139	137	137	120
Japan	138	140	139	137	137	110
Korea	140	140	140	137	137	137
New Zealand	–	140	1	137	137	137
Norway	140	140	140	137	137	136
Sweden	140	140	140	137	137	30
Switzerland	139	140	140	137	137	139
United Kingdom	139	140	139	137	137	–
Emerging market economies						
Brazil	139	140	139	137	137	137

Continued on next page

Table B2 (continued)

Economy	CPI	Exch. rate	Unemp. rate	Exports	Imports	Policy rate
Chile	140	140	139	137	137	137
China	140	140	104	137	137	–
Colombia	139	139	139	137	137	137
Dominican Rep.	140	139	132	137	137	130
Egypt	140	139	–	137	137	119
Hungary	140	140	140	137	137	132
India	139	140	–	137	137	–
Indonesia	139	140	–	137	137	138
Malaysia	139	140	120	137	137	137
Mexico	140	140	140	137	137	137
Peru	140	140	140	137	137	100
Philippines	138	140	67	137	137	137
Poland	138	140	140	137	137	133
Romania	138	140	139	137	137	136
South Africa	139	140	–	137	137	137
Thailand	138	140	117	137	137	137
Uruguay	138	140	140	137	137	–
No. of economies	28	29	25	29	29	25

Notes: This table shows the number of months between January 2015 and August 2026 (140 months) in which each outcome is observed; – denotes an outcome that is not observed in any month. The last row reports the number of economies with at least one observation. Sources and definitions are in Table B1.

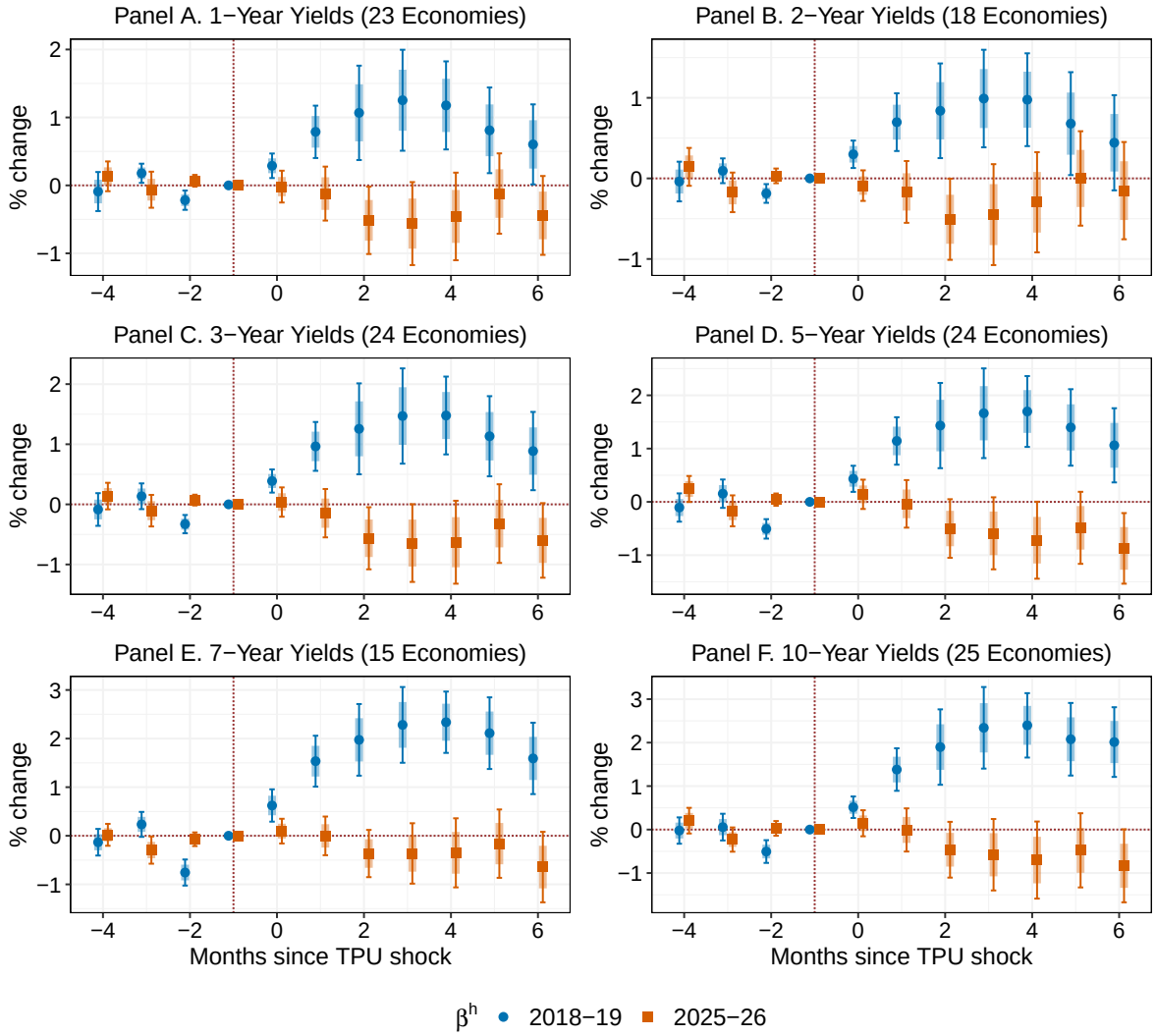
B.3 Robustness

This subsection reports the yield-adjusted exchange rates at other maturities discussed in Section 3.3 and the robustness checks of Section 3.4, in the order of the discussion there.

Yields at other maturities. Figure B1 shows the response of the yield-adjusted exchange rate $s_{i,t}+n\,(y^n_{i,t}-y^n_{US,t})$ built with government bond yields with maturities of $n = 1, 2, 3, 5, 7$ and 10 years. In every panel, the yield-adjusted exchange rate rises in 2018–2019 and falls in 2025–2026, as with the ten-year yields of Figure 5.

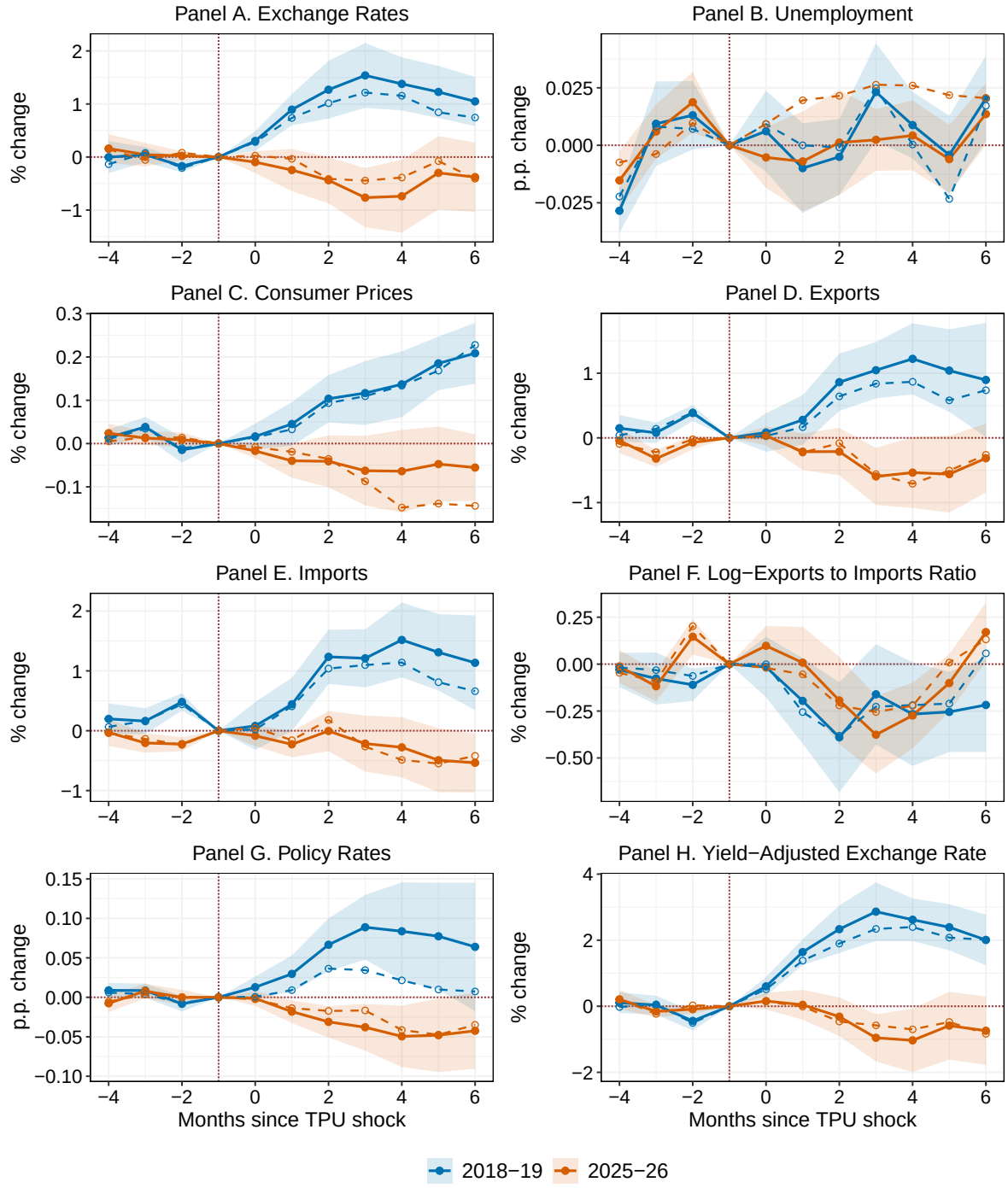
Definition of the surprises. Figures B2 and B3 show the responses to two alternative definitions of the event-day surprise of equation (1), which also count the coverage of the event day itself. In Figure B2, the surprise is the average of the index on the event day and the day after minus the index on the day before, $s_d = (\text{TPU}_d + \text{TPU}_{d+1})/2 - \text{TPU}_{d-1}$. In Figure B3, it is the sum of the index on the event day and the day after minus its sum on the two days before, $s_d = (\text{TPU}_d + \text{TPU}_{d+1}) - (\text{TPU}_{d-1} + \text{TPU}_{d-2})$. Both are aggregated and standardized as the baseline shock.

FIGURE B1. ROBUSTNESS: YIELD-ADJUSTED EXCHANGE RATES AT DIFFERENT MATURITIES



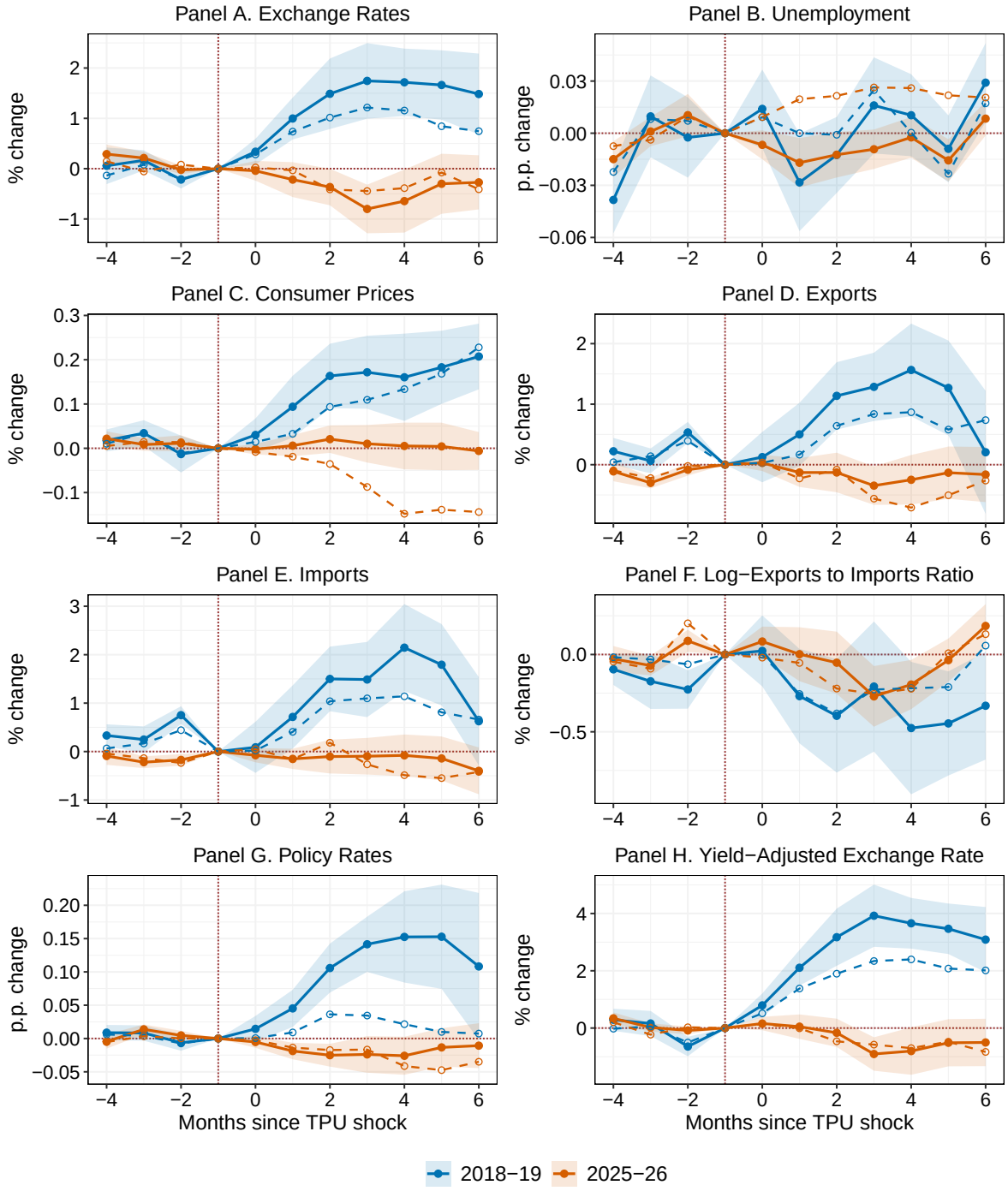
Notes: This figure shows the estimates of β_e^h from equation (4) for the yield-adjusted exchange rate $s_{i,t} + n\,(y_{i,t}^n - y_{US,t}^n)$, with n-year government bond yields from Global Financial Data, in 2018–2019 (blue circles) and 2025–2026 (orange squares), with 68% (bars) and 90% (whiskers) confidence intervals based on Driscoll and Kraay (1998) standard errors. The response at $h = -1$ is set to zero. Each panel title gives the number of economies with yields at that maturity. Panel F is Panel H of Figure 5.

FIGURE B2. ROBUSTNESS: AVERAGE OF THE EVENT DAY AND THE DAY AFTER



Notes: This figure shows the estimates of β_e^h from equation (4) with the surprise $s_d = (\text{TPU}_d + \text{TPU}_{d+1})/2 - \text{TPU}_{d-1}$, in 2018–2019 (blue) and 2025–2026 (orange). Solid lines are the estimates of this specification, with 90% confidence bands with Driscoll and Kraay (1998) standard errors, and dashed lines are the baseline estimates of Figure 5.

FIGURE B3. ROBUSTNESS: TWO DAYS BEFORE AND AFTER THE EVENT



Notes: This figure shows the estimates of β_e^h from equation (4) with the surprise $s_d = (\text{TPU}_d + \text{TPU}_{d+1}) - (\text{TPU}_{d-1} + \text{TPU}_{d-2})$, in 2018–2019 (blue) and 2025–2026 (orange). Solid lines are the estimates of this specification, with 90% confidence bands with Driscoll and Kraay (1998) standard errors, and dashed lines are the baseline estimates of Figure 5.

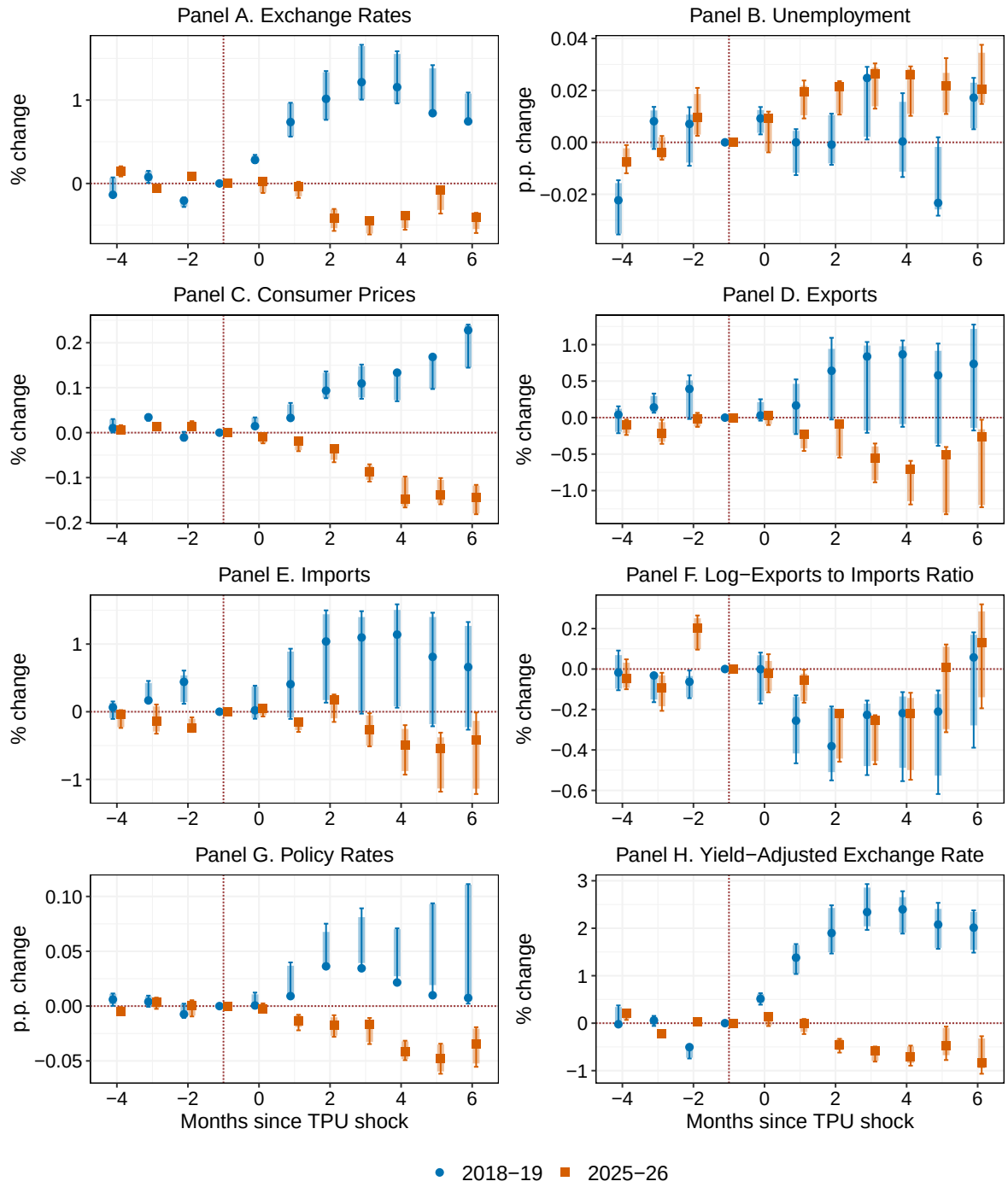
Number of lags. Figure B4 shows the distribution of the estimates of equation (4) over the 324 combinations of the number of lags of the outcome and of the shock, each between 1 and 18, keeping three lags of the global controls.

Leave one economy out. Figure B5 shows the range of the estimates of equation (4) when we drop one of the 29 economies of the sample at a time.

Monetary policy and oil shocks. Figure B6 shows the estimates of equation (4) when we add as controls the oil supply news shocks of Känzig (2021) and the U.S. monetary policy shocks of Nakamura and Steinsson (2018), the first principal component of the high-frequency surprises around FOMC statements of the database of Acosta et al. (2025), in the month of the surprise and the three previous months. The oil supply news shocks end in December 2025, so in this exercise the shock dates end in December 2025, and we compare the responses with the baseline estimated on the same sample.

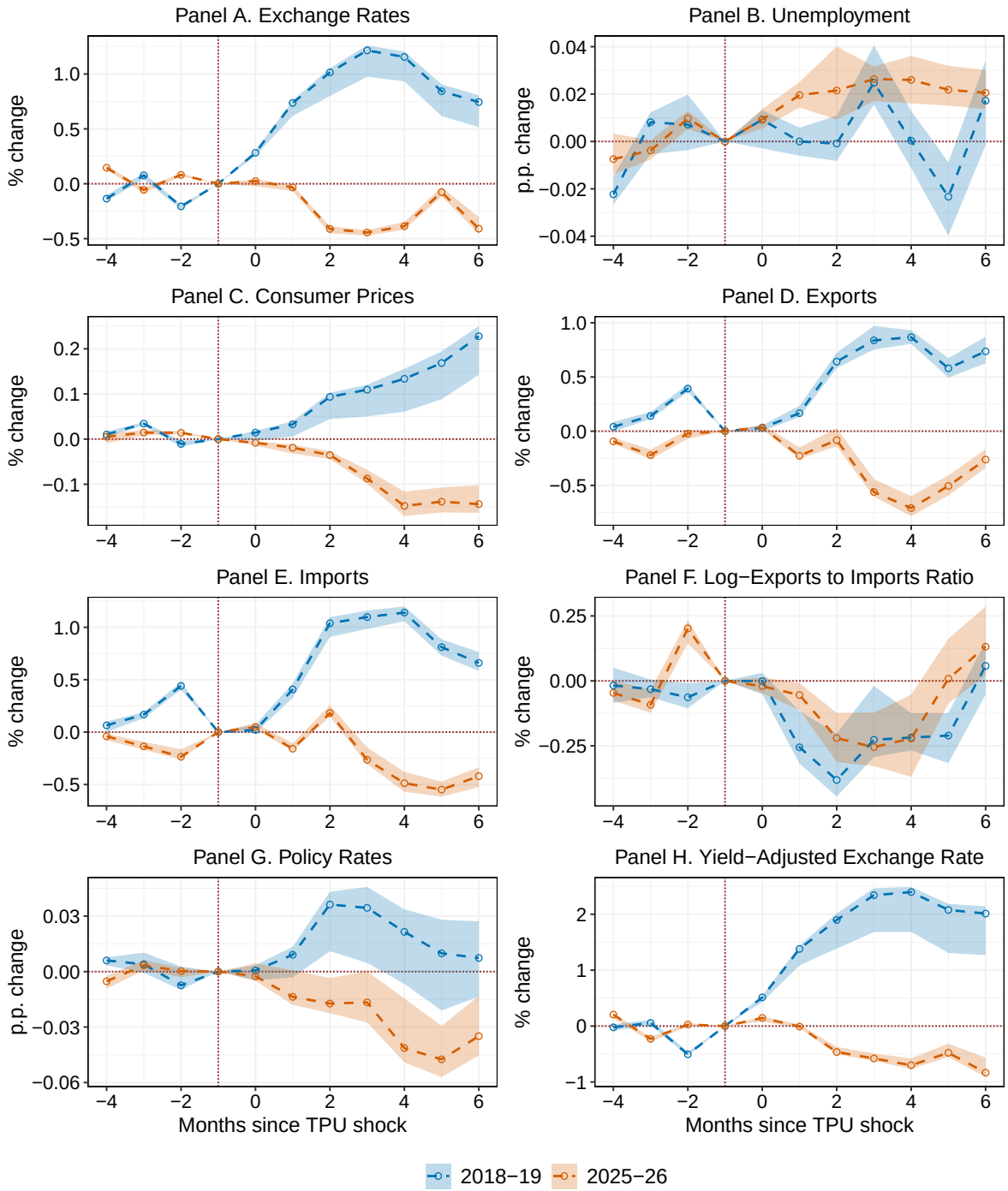
Daily exchange rates. Figure B7 shows the response of the exchange rate from daily local projections analogous to equation (2), estimated on the panel of the 29 economies of the sample with country and episode fixed effects, 30 lags of the exchange rate and of the surprise, and the surprise split by episode as in equation (4). As in Section 2.2, the daily surprises are scaled by the standard deviation of the monthly shock, so the responses are to a one standard deviation monthly shock that arrives on a single day.

FIGURE B4. ROBUSTNESS: NUMBER OF LAGS OF THE OUTCOME AND OF THE SHOCK



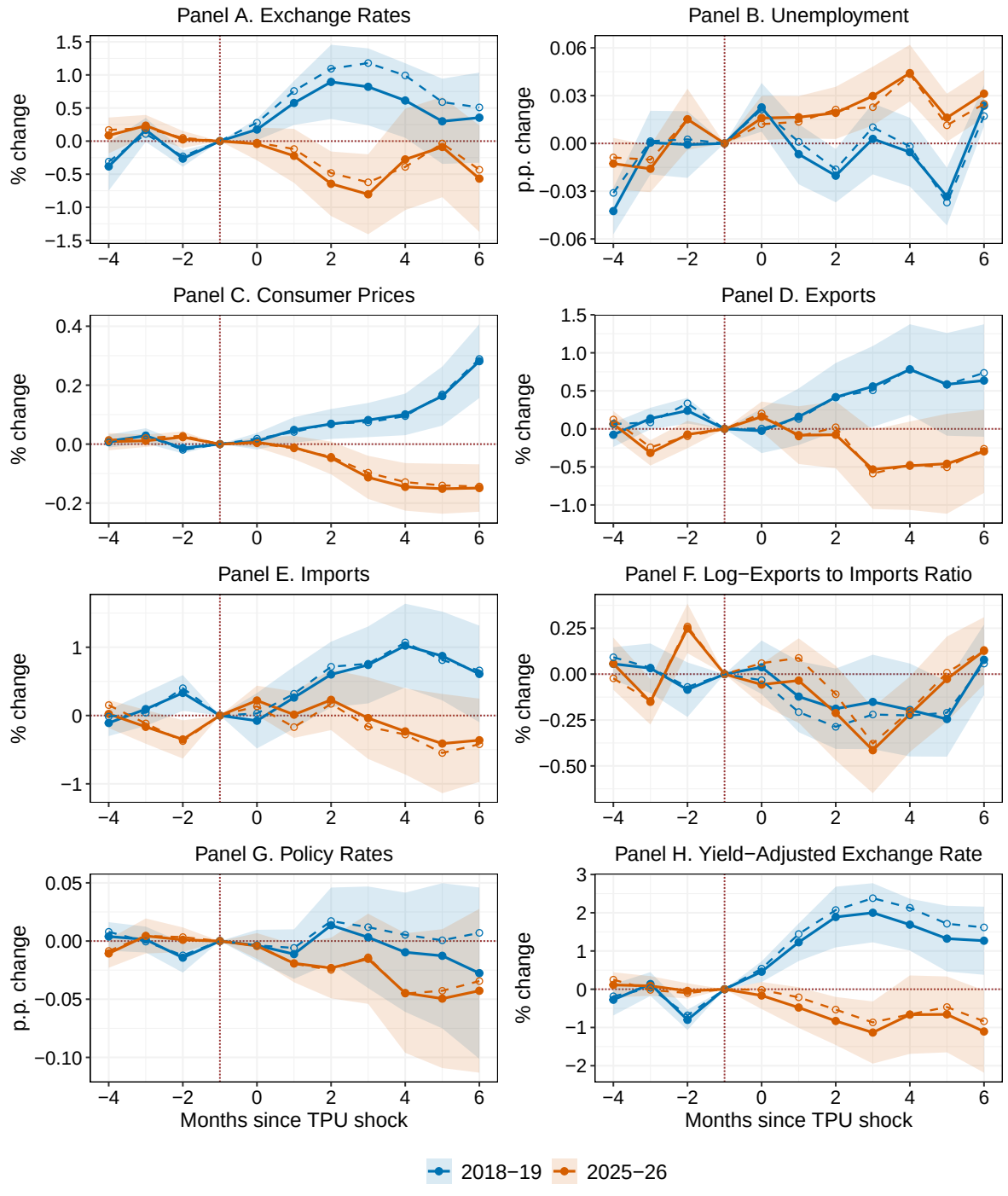
Notes: This figure shows the distribution of the estimates of β_e^h from equation (4) over the 324 combinations of the number of lags of the outcome and of the shock, each between 1 and 18, in 2018–2019 (blue) and 2025–2026 (orange). Bars span the 5th to the 95th percentile of the estimates and whiskers the 2.5th to the 97.5th percentile. Points are the baseline estimates of Figure 5, with twelve lags of each. The response at $h = -1$ is set to zero.

FIGURE B5. ROBUSTNESS: LEAVE ONE ECONOMY OUT



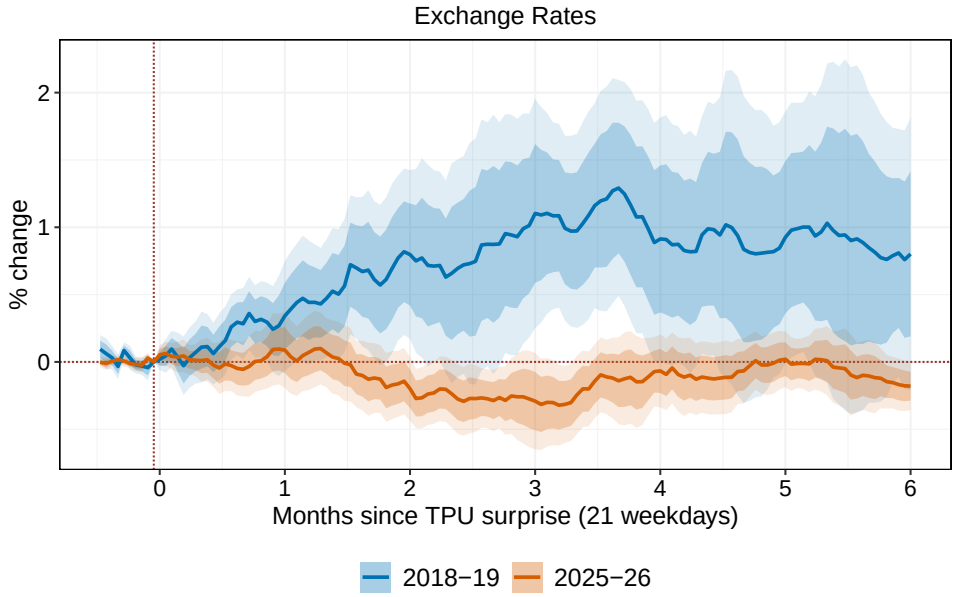
Notes: This figure shows the range of the estimates of β_e^h from equation (4) when one economy is dropped at a time, in 2018–2019 (blue) and 2025–2026 (orange). Shaded areas span the smallest and the largest estimate. Dashed lines are the baseline estimates of Figure 5, estimated on all economies.

FIGURE B6. ROBUSTNESS: CONTROLLING FOR MONETARY POLICY AND OIL SUPPLY NEWS SHOCKS



Notes: This figure shows the estimates of β_e^h from equation (4) controlling for the oil supply news shocks of Känzig (2021) and the U.S. monetary policy shocks of Nakamura and Steinsson (2018), in 2018–2019 (blue) and 2025–2026 (orange). Solid lines are the estimates of this specification, with 90% confidence bands with Driscoll and Kraay (1998) standard errors, and dashed lines are the baseline estimates on the same sample. Shock dates end in December 2025.

FIGURE B7. ROBUSTNESS: DAILY EXCHANGE RATES



Notes: This figure shows the response of the log exchange rate (domestic currency per U.S. dollar, so a positive response is a depreciation) to a one standard deviation TPU surprise that arrives on a single day, in 2018–2019 (blue) and 2025–2026 (orange), from daily panel local projections with 30 lags of the exchange rate and of the surprise. Horizons are in weekdays, labeled in months of 21 weekdays. The response on the weekday before the surprise is normalized to zero, and windows that overlap March 2020–December 2021 are dropped. Shaded areas are 68% and 90% confidence bands based on Driscoll and Kraay (1998) standard errors.