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JEL Classification: F13, F31, F51, G15

Keywords: N/A

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Trading Blows: The Exchange-Rate Response to Tariffs and Retaliations*

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November 19, 2025

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1 Introduction

To many, the U.S. dollar (USD) depreciation in response to the U.S. government's 'Liberation Day' tariff announcements on April 2nd 2025 marked a sharp discontinuity with the past. The USD depreciated by over 6 percent against the euro (EUR) (see Figure 1a), as well as in effective terms against a basket of currencies. When viewed alongside the spike in U.S. Treasury yields, these currency moves appear reflective of a 'reserve-currency shock' whereby the safety premium associated with U.S. assets is eroded. However, numerous commentators went a step further, claiming that the USD response contradicted economic models and conventional wisdom, according to which tariffs should necessarily result in a currency appreciation driven by a shift in global demand.[1]

In this paper, we reconsider this claim, providing new empirical evidence on the response of exchange rates to tariffs threatened and/or implemented in the 2018-2020 period. Relative to the literature, our innovation consists of distinguishing tariff shocks depending on whether or not they give rise to retaliation.

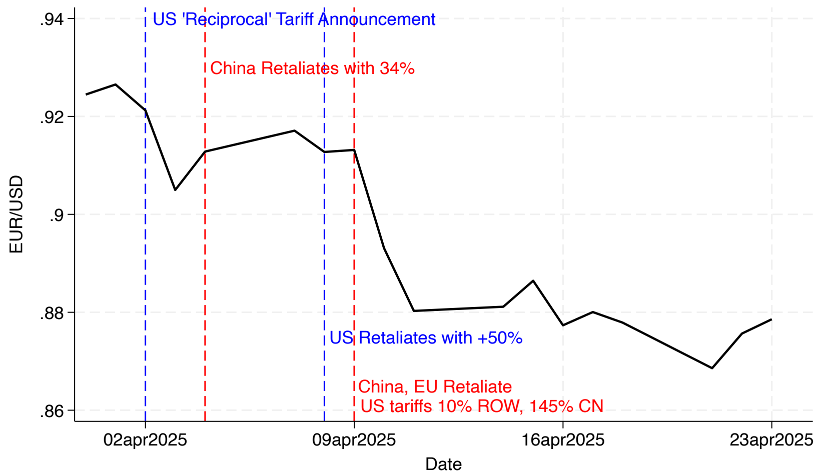
Our analysis is best introduced with the case study shown in Figure 1b: the announcement of U.S. tariffs on steel and aluminum imported from the European Union (EU), and other regions, on March 1st 2018. Like the Liberation Day event in 2025, many anticipated retaliatory tariff measures almost immediately, as this FT article with the headline "*EU considers imposing 'safeguard' import tariffs in response to US*" from March 2nd 2018 evidences. Indeed, the EU announced their retaliatory measures on March 7th 2018. In contrast to the conventional wisdom, the USD depreciated immediately after the U.S. announcement. It remained significantly weaker than its end-February level over the whole of March, after EU retaliation was announced, too.

Our primary contribution is to show, based on evidence from 2018-2020, that this pattern is systematic. We provide econometric evidence that, while the USD does appreciate in response to unilateral U.S. tariff actions, the appreciation is offset when retaliatory measures are threatened. This evidence resonates with the predictions of open-economy models with dominant currency pricing in which U.S. tariffs that are

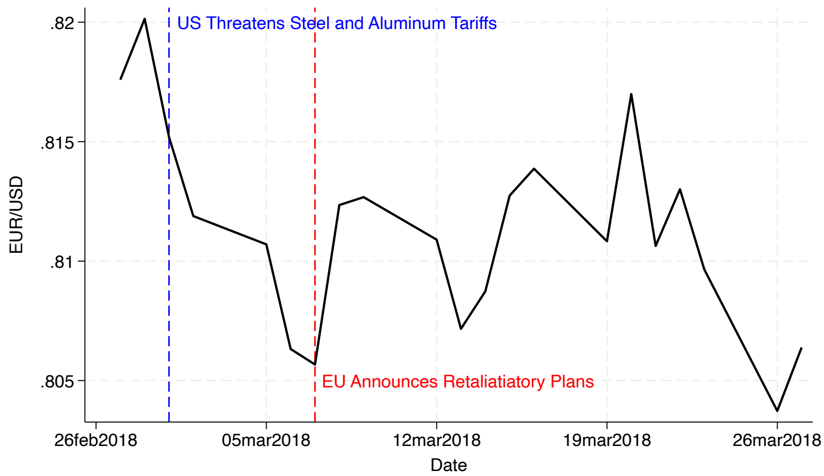
[1]See, e.g., the discussions in Hartley and Rebucci (2025) and Cardani et al. (2025).

Figure 1: Exchange-Rate Reactions to Tariff Announcements

(a) April 2nd 2025: US 'Liberation Day' Tariffs



(b) March 1st 2018: US Steel & Aluminum Tariffs



met with foreign retaliations induce USD depreciations.[2] A comparative analysis of the 2025 tariff events reveals notable differences in the responses of long-maturity U.S. Treasury yields and in the magnitude of the USD depreciations, which together suggest the presence of a 'reserve-currency' shock in 2025 operating over-and-above standard tariff transmission channels.

[2] Bergin and Corsetti (2023) study the transmission of symmetric retaliation under different assumptions around exchange-rate pass through and pass-through from the border to final prices due to distribution. Under perfect pass-through, optimal monetary stabilization by all countries involved in a symmetric retaliation prevents currency movements. In contrast, with a dominant currency in international trade, the optimal policy, as well as the prescription from a Taylor-type rule, in the country issuing the dominant currency is relatively more expansionary, which facilitates the depreciation of their currency.

We reach these conclusions in three steps. First, we construct a new dataset of tariff shocks. Our database captures U.S. tariff announcements, threats and implementations over the 2018-2020 period and in 2025, alongside information on the tariff responses by the rest of the world (RoW), namely, China, the EU and Canada. We ground the dataset in timelines of tariff-related events compiled by the *Peterson Institute for International Economics*, with additional supporting evidence from contemporary news sources. From the information in those timelines, we note the timing of each event (at daily frequency) and classify them into either (i) a tariff announcement or threat or (ii) a tariff implementation. Armed with 35 U.S. and 19 RoW tariff events from 2018-2020 and 13 U.S. and 11 RoW tariff events in 2025, we next quantify the size of each tariff action. To do so, we construct an 'effective tariff-rate shock', by combining the size of the tariff in *ad valorem* terms with the share of imports receiving that tariff. Our shocks thus capture heterogeneity in the economic relevance of different tariff actions. Importantly, given the unpredictable nature of the U.S. tariff actions in our sample, our U.S. shocks can be viewed as unanticipated. However, as the rest-of-the-world events are responses to U.S. actions, they can be anticipated. As such, we do not use these as shocks. Instead, and crucially, we record a U.S. tariff shock as retaliated against if the rest of the world threatens, announces or implements a tariff on the U.S. within the subsequent 7 days, although our results are robust to varying this definition.

Second, focusing on the 2018-2020 period, we use our U.S. effective tariff-rate shocks to investigate how U.S. tariff actions affected exchange rates and interest rates in the U.S., China and euro area over the days that follow. In particular, relying on local-projection methods, we show that the USD remains roughly stable in bilateral tariff exchanges between the U.S. and China, despite appreciating when U.S. tariffs were imposed unilaterally. Yet, beyond U.S.-China bilateral actions, the USD depreciates significantly in tariff exchanges between the U.S. and the world—i.e., when a broad set of countries are targeted and retaliate to U.S. tariffs. In both cases, we show that U.S. 2-year and 10-year bond yields fall relative to those in the euro area and China under retaliation, which helps explain the weakening of the USD.

In a final step, we estimate the response of exchange rates and interest rates to the

U.S. tariff shocks from January to May 2025. We find, as in the earlier period when US global tariffs were retaliated against, that the USD depreciated. While the overall depreciation was larger in magnitude around 'Liberation Day' than in comparable episodes from 2018-2020, the marginal effect per unit of effective tariff was smaller.[3] In contrast to the earlier period, long-maturity U.S. Treasury yields rose sharply in 2025 while short-maturity yields fell in line with those in the euro area. We conclude that, although the market response to U.S. tariff announcements with retaliation continued to feature a USD depreciation, the divergent behavior of bond yields suggests that the 2025 episodes reflected a broader reassessment of the extent and consequences of geopolitical and trade fragmentation.

Related Literature. Our paper most directly contributes to the empirical literature assessing exchange-rate responses to tariffs. Closest to our work is Jeanne and Son (2024) who show that U.S. tariffs during the 2018-2020 period appreciated the USD and depreciated the Chinese Yuan (CNH) using minute-by-minute data. Although our focus is on daily-frequency moves, our average results are consistent with the work by these authors: in line with the conventional wisdom and a number of other studies (e.g., Furceri et al., 2018; Barattieri et al., 2021), U.S. tariff shocks appreciate the USD. However, we show that this average effect masks heterogeneity, with the USD appreciating only if the U.S. tariff actions were not met with retaliation. Relative to Jeanne and Son (2024), our results suggest the importance of allowing for market anticipation of retaliatory measures, as these may be already priced in the exchange rate at the time of the U.S. announcements.

Within the empirical literature, a key contribution is to construct a new database tracking changes in tariffs. Our application, to exchange rates, has antecedents in the literature assessing the impact of news on exchange rates (e.g., Faust et al., 2006; Andersen et al., 2007; Rogers et al., 2014). Relatedly, Matveev and Ruge-Murcia (2024) use tweets by the U.S. President about potential tariffs on Canadian and Mexican goods, finding that they appreciate the USD. Similarly, Filippou et al. (2025) show that

[3] This points to non-linearities in the transmission of tariff shocks, since effective tariff rates were an order of magnitude larger in 2025 than in 2018-2020.

a broader set of tweets by the U.S. President, with macroeconomic and trade content, drive significant USD appreciation.

More recent work has focused on the Liberation Day tariff announcements, highlighting surprising features of asset-market moves in this period (e.g., Hartley and Rebucci, 2025; Jiang et al., 2025; Rey and Stavrakeva, 2025). In contrast to these contributions, our systematic empirical analysis reveals the challenges of comparing the financial-market moves following the single Liberation Day event to the average effect of tariffs over the 2018-2020 period. Once we focus on US tariff actions over 2018-2020 on a wider set of trading partners that elicited foreign retaliation, we find, like on April 2nd 2025, that the USD depreciated. Yet, comparing the response of other asset prices, especially long-maturity U.S. Treasury yields, across the samples suggests that the 2025 tariffs indeed featured an additional 'reserve-currency' shock, as these recent contributions argued.

Stepping back, our results contribute to the broad literature assessing the macroeconomic implications of tariffs, where the exchange-rate response plays a crucial role in determining the size and sign of aggregate variables. In the Mundell-Fleming framework, tariffs result in a currency appreciation, which can worsen the trade balance and reduce employment. In contrast, within dynamic open-economy models, the nominal exchange rate can depreciate following tariffs when import substitution is sufficiently low (Ostry, 1991; Lloyd and Marin, 2024; Auclert et al., 2025) or if domestic interest rates fall (Krugman, 1982; Kalemli-Özcan et al., 2025). Indeed, a nominal currency depreciation can arise when monetary policy is set optimally in response to tariffs (Bergin and Corsetti, 2023, 2025; Bianchi and Coulibaly, 2025). Our paper provides direct model-free evidence on exchange-rate responses to tariffs, highlighting the importance of retaliation for the sign and persistence of currency changes.

The remainder of this paper is structured as follows. Section 2 describes our tariff shock database. Section 3 presents our empirical analysis of the exchange-rate response to tariff shocks between 2018 and 2020. Section 4 compares the 2025 exchange-rate responses to those from 2018-2020 and discusses the response of bond yields. Section 5 concludes.

2 Tariff-Shock Database

One key contribution of this paper is to develop a new daily database of effective tariff-rate shocks, covering the periods 2018-2020 and January to May 2025. This section describes the construction of those shocks. The underlying timeline of tariff-related news comes from the *Peterson Institute*. We combine this with narrative evidence and macroeconomic data to construct shock series scaled for the size and economic relevance of tariff measures. Most importantly, we distinguish between whether our US tariff shocks are retaliated against.

2.1 Tariff News Timeline

Bown and Kolb (2025) provide a detailed timeline tracking tariff-related news during the 2018-2020 period. We restrict our sample to events which pertain directly to tariffs and involve at least one of the U.S.'s largest four trading partners: the EU, Mexico, China and Canada. This leaves 58 event days in total for the 2018-2020 period, including 45 with actions by the U.S., 16 by China, 2 by the EU and 3 by Canada. For the purposes of our analyses into the effects of tariff news on financial markets, we use only events occurring on business days, dropping tariff-related news occurring on non-business days. We further restrict attention to tariff events that are sufficiently specific to allow us to measure their economic relevance, as discussed in the next section.[4] In addition, we drop events from the timeline which do not constitute a tariff threat, announcement or implementation.[5] After dropping these events, our final timeline for the 2018-2020 period includes 46 distinct entries (days).

Panel A of Table A.1 details these 2018-2020 events. On these 46 days are 35 U.S. tariff announcements, threats or implementations,[6] and 19 tariff responses by China, the EU and Canada. A majority of the U.S. tariff events, 21 out of 35, pertain to U.S.-

[4]We verify that our results are robust to including all tariffs as categorical variables.

[5]For example, the timeline includes the U.S. filing a complaint to the WTO about Chinese retaliatory tariffs on July 16th 2018, as well as the U.S. announcing subsidies for farmers affected by tariffs on July 24th 2018. While not independent of the retaliation at the time, since neither of these are direct tariffs on traded goods, we drop them from our timeline.

[6]In some instances the dates on which tariffs are announced, threatened or implemented are not mutually exclusive, so we are not able to decompose events along these lines.

China-bilateral tariffs, with the remaining 14 events corresponding to 'global' tariffs beyond these U.S.-China bilateral actions. These are mostly on specific products such as steel and aluminum, autos, solar panels and washing machines. Of the 19 tariff-response events, 15 represent actions by China and 4 by the EU and Canada (including the March 1st 2018 example shown in Figure 1b).

The right-most columns of Table A.1 categorize all these events as tariff escalations or de-escalations, denoted by $+1$ or -1, respectively. The majority of events represent escalations, although there are still a number of de-escalation events. The narrative information in the table also helps to highlight the unanticipated nature of many of the U.S. tariff actions. And, even when a tariff-related event was expected, the details of tariff proposals were less clear *ex ante*.

As the rest-of-the-world events represent retaliations, the unanticipated nature of these events is less clear. So, a crucial step in our analysis is to determine which events represent retaliations to specific U.S. policies. Rather than use foreign retaliatory tariff events as 'shocks' themselves, we instead distinguish between U.S. tariff shocks that *were* and *were not* retaliated against. The idea here is that foreign retaliatory tariffs are likely to be anticipated or heavily signaled—as the March 1st 2018 example in the Introduction highlighted—so will not be exogenous events.

We classify a U.S. shock to have been retaliated against if we see a foreign response within the 7 days following the initial U.S. event. From the perspective of our empirical event-study analysis, this is akin to assuming that markets expected a retaliation at the time of the initial U.S. tariff action. We view the 7-day cut-off to be conservative, since in practice retaliations occur pretty swiftly, as the timelines in Table A.1 demonstrate. Importantly, our results are robust to alternative specifications of this retaliation rule, including modifying the threshold number of days and considering the size of the foreign response.

Panel B of Table A.1 details the tariff events from January to May 2025 from Bown (2025) that match our selection criteria outlined above. There are 16 event days in total,[7] which include 13 U.S. tariff actions and 11 rest of the world actions. As we shall discuss in Section 4, the "global" nature of the U.S. tariffs and the number of rest-of-

[7] In the 2025 sample, there are 3 events occurring on weekends, which are not included in the table.

the-world actions, as well as the size of the tariff shocks and the speed with which they have taken place, stand out as key differences with the tariffs in 2018-2020.

2.2 Shock Construction

Our news database isolates key tariff-related events. In Table A.1, we have distinguished between escalations or de-escalations, captured by an categorical variable taking the value $+1$ and -1, respectively, as in Jeanne and Son (2024). This indicator, however, does not capture differences in tariff rates or the economic relevance of announcements—e.g., a 10% tariff on a single type of good vs. a 10% tariff on all inputs. To account for heterogeneity in the economic importance of different tariff-related news events, we transform our news database into a (set of) continuous shock variable(s)—i.e., an effective tariff-rate shock—by combining narrative evidence and macroeconomic data.

Our baseline tariff-shock measure captures *both* the size of the announced, threatened or implemented tariff rate *and* the total value of imports impacted by those tariffs. Let $\tau_{i,t}$ denote the *ad valorem* tariff rate linked to a tariff event on a date t and for a country/region i. In addition, let $M^{\tau}_{i,(-1)}$ denote the USD value of annual imports affected by that tariff (in billions) in the last 12-month period for which it is measured relative to date t, and let $M_{i,(-1)}$ denote total annual imports by country i over the corresponding period. Our tariff shock, $\varepsilon^{\tau}_{i,t}$, is defined as:

$$\varepsilon^{\tau}_{i,t} := \tau_{i,t} \cdot \frac{M^{\tau}_{i,(-1)}}{M_{i,(-1)}} \qquad \text{for } i = US, CN, EA, CA \tag{1}$$

where US denotes U.S., CN is China, EA is euro area and CA is Canada.

The shock definition (1) ensures that the shock measure captures the economic relevance of the tariff actions. For example, if U.S. total imports are 2.5tn USD and the U.S. applies, announces or threatens a 25% tariff on 100bn USD of foreign imports, we record this as a 1 percentage point (pp) effective tariff-rate shock. In addition, the normalization of the shock with respect to total imports $M_{i,(-1)}$ helps to account for inflation over time, so shock values can be compared across the two (2018-2020 and 2025) sub-samples.

In practice, we obtain information on the tariff rate $\tau_{i,t}$ and size of the 'tariffed' goods $M^{\tau}_{i,(-1)}$ from narrative information related to the tariff event. In some instances, this can be read directly from Table A.1. For example, on April 3rd 2018, the U.S. announced an *ad valorem* tariff rate of $\tau_{i,t} = 0.25$ on a pre-determined (nominal) quantity of imports $M^{\tau}_{i,(-1)} = 50$bn USD. In other cases, when tariffs are applied on a subset of goods (e.g., steel and aluminum on March 1st 2018), we calculate the quantity of imports of those specific goods using a variety of sources.

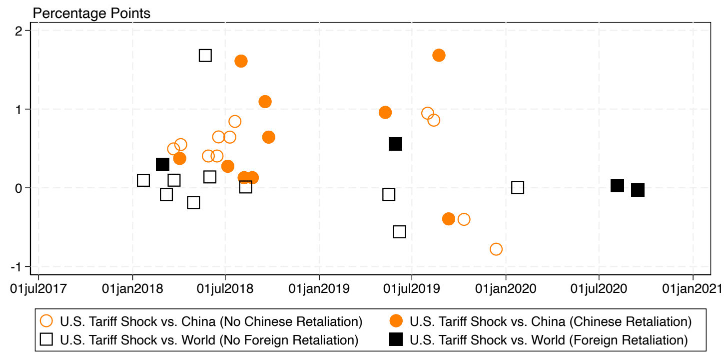
Figures 2a and 2b plot our tariff shocks and responses for the 2018-2020 period. (Orange) circles denote U.S. tariff actions applied on imports *only* from China, while (black) squares represent U.S. 'global' tariff actions that are not only applied to China (e.g., product-based tariffs). For events that were met with foreign relation within 7 days, the corresponding circle or square is filled in. For example, in the figure, the first black filled-in square from the left corresponds to the March 1st 2018 event described in the Introduction, when the U.S. announced tariffs on imported steel and aluminum from the EU. The effective tariff-rate shock on that date is around 0.3pp, reflecting the 25% and 10% *ad valorem* rates on steel and aluminum, respectively, and the scale of these imports overall (as a share of U.S. total imports).

The magnitude of the overall effective tariff-rate shocks over the 2018-2020 period lies between -1pp and +2pp. In our graphs, negative values denote instances where announced tariffs were paused, or canceled or implemented tariffs were removed. For example, there are three negative values in the second half of 2019 recorded in Figure 2a. These represent a de-escalation of the U.S.-China tariffs over that time. On September 11th 2019, the U.S. delayed an increase of tariffs on China and, in retaliation on the same day, China announced the removal of some tariffs on the U.S. Subsequently, the U.S. administration canceled announced increases in tariff rates on China, in anticipation of a trade deal on October 11th 2019 and upon successful agreement of a trade deal on December 13th 2019.

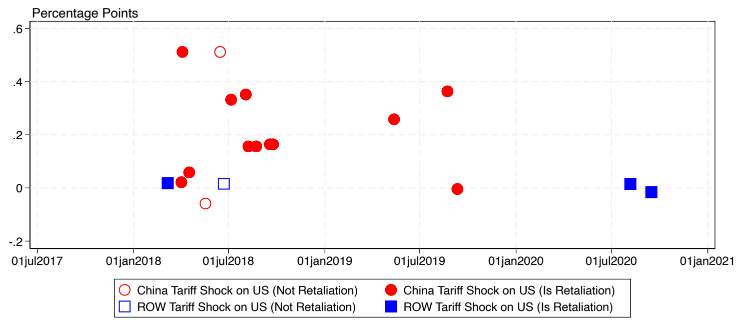
Figure 2b plots effective tariff-rate responses for rest-of-the-world actions. Here, the shaded entries denote events that took place in retaliation to U.S. tariffs, so correspond with shaded U.S. actions in Figure 2a. Although almost all Foreign actions occur swiftly (within a week) and so meet the retaliation condition, the retaliatory

Figure 2: Effective Tariff-Rate Shocks and Responses, 2018-2020 and 2025

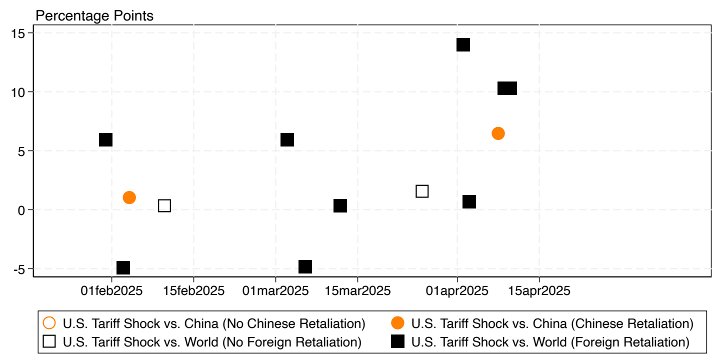
(a) U.S. Shocks 2018-2020



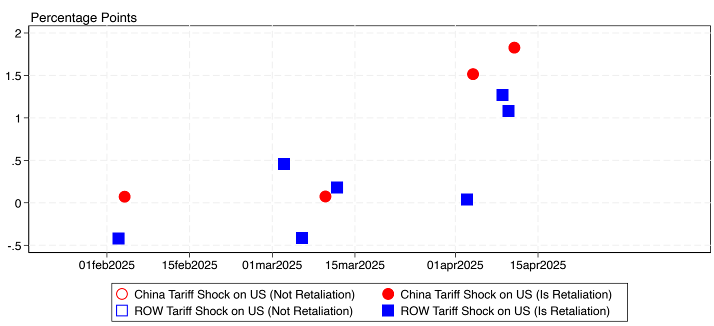
(b) Rest-of-the-World Responses 2018-2020



(c) U.S. Shocks 2025-Present



(d) Rest-of-the-World Responses 2025-Present



Notes. Shocks constructed by combining tariff news timeline (Bown and Kolb, 2025) (for 2018-2020) and Bown (2025) (for 2025-Present) with narrative evidence on the size and economic relevance of each event via equation (1).

measures are strikingly small in terms of effective tariff-rate magnitudes. While the U.S. tariff shocks in Figure 2b lie between -1pp and 2pp, the retaliatory actions range from -0.1pp to 0.5pp.

Figures 2c and 2d plot our U.S. and rest-of-the-world tariff shocks for the more recent period, 2025-present. Compared to Figures 2a and 2b, there are 4 key differences. First, shocks are much larger in magnitude. The Liberation Day tariffs represented a U.S. effective tariff-rate shock shock of around 14pp, while the largest shock between 2018 and 2020 was less than 2pp. Second, the shocks happened in quicker succession, over a matter of days. Third, within the week after Liberation Day, all of the tariff shocks were retaliated against. In contrast, during the 2018-2020 period, about 40% of U.S. tariff events in our sample were retaliated against. Finally, while the majority of 2018-2020 tariffs were focused on China, the 2025 events span a broader set of countries and involve global retaliation.

3 Tariff Shocks and Exchange Rates, 2018-2020

Armed with our shock series, we now assess their impact on exchange rates over the days and weeks following tariff actions.

3.1 Average Effects Across All Shocks

We begin by estimating the average impact of all U.S. tariff events over the 2018-2020 period. To do this, we estimate the following local-projection (Jordà, 2005) specification:

$$e_{t+h} - e_{t-1} = \alpha^h + \beta^h \varepsilon^{\tau}_{US,t} + \boldsymbol{\gamma}^{h\prime} \mathbf{x}_{t-1} + u_{t+h} \tag{2}$$

where e_{t+h} denotes the (log) bilateral or effective USD exchange rate h business days after a date-t tariff event. Our coefficient of interest is β, which denotes the marginal impact of a 1 effective tariff shock on the dependent variable.

Regression (2) includes a set of (lagged) control variables $\mathbf{x}_{t-1}$ intended to capture factors that could impact the dependent variable, while being correlated (in sample) with the shock series itself. Primary among these controls is the daily exchange-rate macroeconomic-news index of Stavrakeva and Tang (2024), which has been shown to explain over 50% of exchange-rate variation at monthly and quarterly frequencies. This series is included to ensure that our β coefficient does not inadvertently capture the effects of other macroeconomic news—as opposed to the tariff event itself. We also control for lagged 10-year relative interest differentials (for the U.S. vs. the EU and China), the lagged VIX, and lagged 3-month covered interest parity deviations from Du et al. (2018), to account for other potential documented drivers of exchange rates.

Figure 3A plots estimated impulse responses from equation (2) for all U.S. tariff events in the 2018-2020 period, both those that were and were not retaliated against. The left-hand figure presents the response of the effective USD and CNY exchange rate, where an increase corresponds to an effective currency appreciation, and vice versa for a decrease. The right-hand figure documents results for the CNH/USD bilateral exchange rate, defined such that an increase corresponds to a USD appreciation (i.e., the bilateral exchange rate represents the yuan price of 1 USD).[8] For inference, we augment the local-projection regression with lags of the dependent variable (Montiel Olea and Plagborg-Møller, 2021) and use Newey and West (1987) standard errors.

The results in Figure 3A align with the conventional wisdom, as well as the existing literature for the 2018-2020 period (most notably Jeanne and Son, 2024). On average, U.S. tariff shocks during the 2018-2020 period are associated with an appreciation of the USD, in both effective terms and bilaterally against the CNH. Our point estimates indicate that a 1pp effective tariff-rate shock is, on average, associated with around 1% appreciation over the four weeks following the event. Consistent with our results for the CNH/USD bilateral exchange rate, we also find that the effective CNY exchange rate significantly depreciates in the weeks after a surprise U.S. tariff action.

3.2 Retaliation

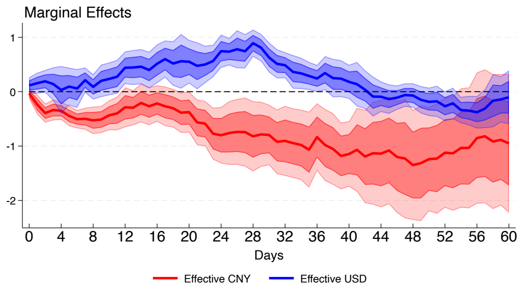
Although consistent with conventional wisdom, the results of regression (2) do not account for differences when U.S. tariffs face retaliation. To reach our key empirical

[8] We use the CNY and CNH (vis-a-vis the dollar) when estimating the effects of all our tariff shocks since Chinese imports are hit directly by almost all U.S. tariff shocks in our sample, and since China is the main country responding to U.S. tariff actions.

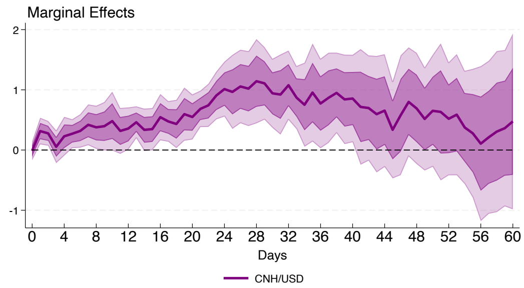
Figure 3: Estimated Impacts of 2018-2020 Tariff Events on Exchange Rates

A. Average Impacts

$\hat{\beta}$: Effective FX

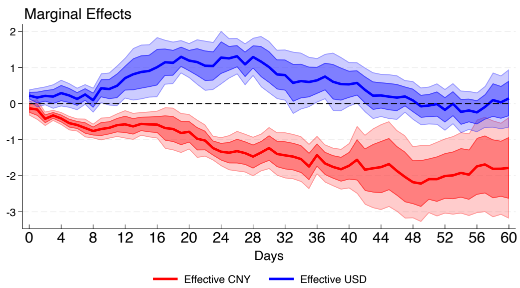


$\hat{\beta}$: Bilateral FX

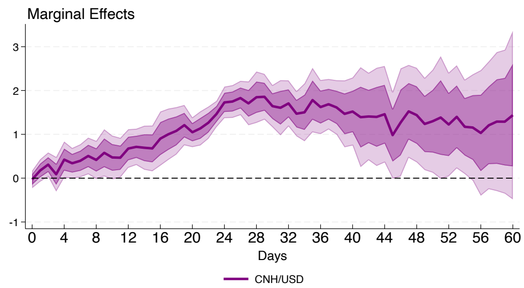


B. Impacts Conditional on Retaliation

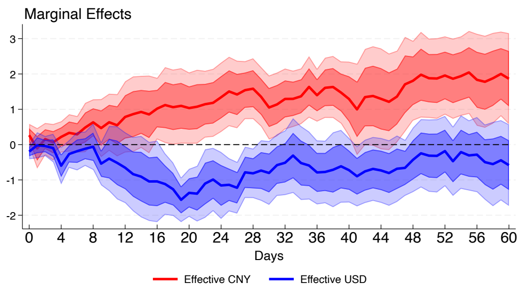
$\hat{\beta}_1$: No Retaliation



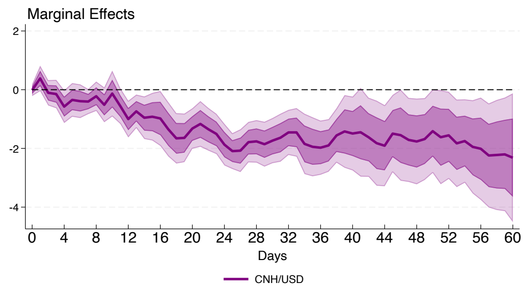
$\hat{\beta}_1$: No Retaliation



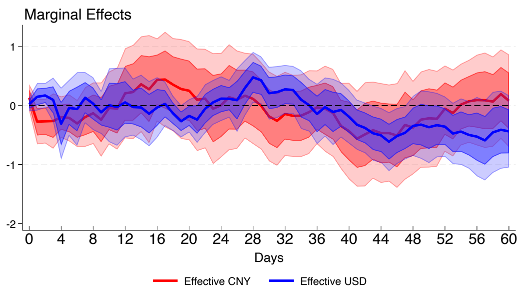
$\hat{\beta}_2$: Marginal from Retaliation



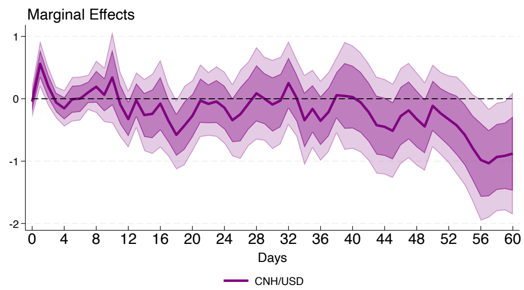
$\hat{\beta}_2$: Marginal from Retaliation



$\hat{\beta}_1 + \hat{\beta}_2$: Retaliation



$\hat{\beta}_1 + \hat{\beta}_2$: Retaliation



Notes. Shaded areas correspond to the 68% and 90% confidence intervals constructed from Newey and West (1987) standard errors with four lags, from the local-projection regression (2) (Panel A) and (3) (Panel B) with lags of the dependent variable (Montiel Olea and Plagborg-Møller, 2021).

result, we extend our regression setup to separately estimate the impact of U.S. tariff actions on exchange rates when there is and is not retaliation within the subsequent 7 days. To do so, we use the information collated in Section 2 to define a retaliation indicator variable $\mathbb{1}_t^{Ret}$, which equals 1 if a U.S. tariff shock on date t was retaliated against within 7 days, and 0 otherwise, by any region (i.e., China, EU or Canada). We then estimate the following extended local-projection model:

$$e_{t+h} - e_{t-1} = \alpha^h + \beta_1^h \varepsilon_{US,t}^{\tau} + \beta_2^h \left(\varepsilon_{US,t}^{\tau} \times \mathbb{1}_t^{Ret}\right) + \delta^h \mathbb{1}_t^{Ret} + \boldsymbol{\gamma}^{h\prime} \mathbf{x}_{t-1} + u_{t+h} \tag{3}$$

Here, β_1 represents the estimated effect of U.S. tariff shocks on exchange rates conditional on no retaliation, while $\beta_1 + \beta_2$ is the corresponding estimate conditional on relation—such that β_2 captures the marginal effect of retaliation. We estimate equation (3) using the same controls and inference procedures as for equation (2).

Figure 3B presents the results for effective currency baskets in the left-hand column and the CNH/USD bilateral exchange rate in the right-hand column. The estimated responses conditional on no retaliation corroborate with the average across the sample: the USD significantly appreciates, in effective terms and *vis-à-vis* the CNH, following a U.S. tariff shock. Point estimates are somewhat larger than in Figure 3A.

However, the responses conditional on retaliation are significantly different. The impulse responses in the middle row show that retaliation pushes the USD to *depreciate* in effective and bilateral terms. The magnitude of the marginal $\hat{\beta}_2$ coefficient broadly offsets that of the no-retaliation coefficient, $\hat{\beta}_1$, such that the overall effect of tariffs with retaliation on exchange rates are approximately awash, as shown in the bottom panels. Recall from Section 2 that the size of rest-of-the-world effective tariff-rate shocks are smaller than those of the U.S. Our empirical evidence may reasonably reflect asymmetries in the transmission of tariff shocks and the impact of tariffs on financial markets. We expand on this issue below.

3.3 Global Events

In the set of 35 U.S. tariff events between 2018 and 2020, 21 capture actions specifically on China, while 14 reflect events that involve tariffs on other U.S. trade partners—

predominantly the EU, Canada and Mexico—often *in addition* to China. In this subsection, we focus our attention on these events, asking the question of whether the exchange-rate responses differ when these US tariff actions on the world are met with retaliation.

To address this, we re-estimate regression (3), restricting our sample to these 14 global events. Figure 4 plots the estimated impulse responses, focusing on the USD *and EUR* effective tariff rates, as well as the EUR/USD bilateral exchange rate (where, again, this is defined such that a decline corresponds to a USD depreciation).[9]

Qualitatively, the USD patterns are similar to Figure 3B, which relies on the entire set of shocks with retaliation. Conditional on no retaliation, the USD appreciates significantly—both in effective terms and bilaterally *vis-à-vis* the euro.[10] The marginal impact of retaliation, captured by $\hat{\beta}_2$, again has the opposite sign and is statistically significant indicating that retaliation places pressure on the USD to depreciate.

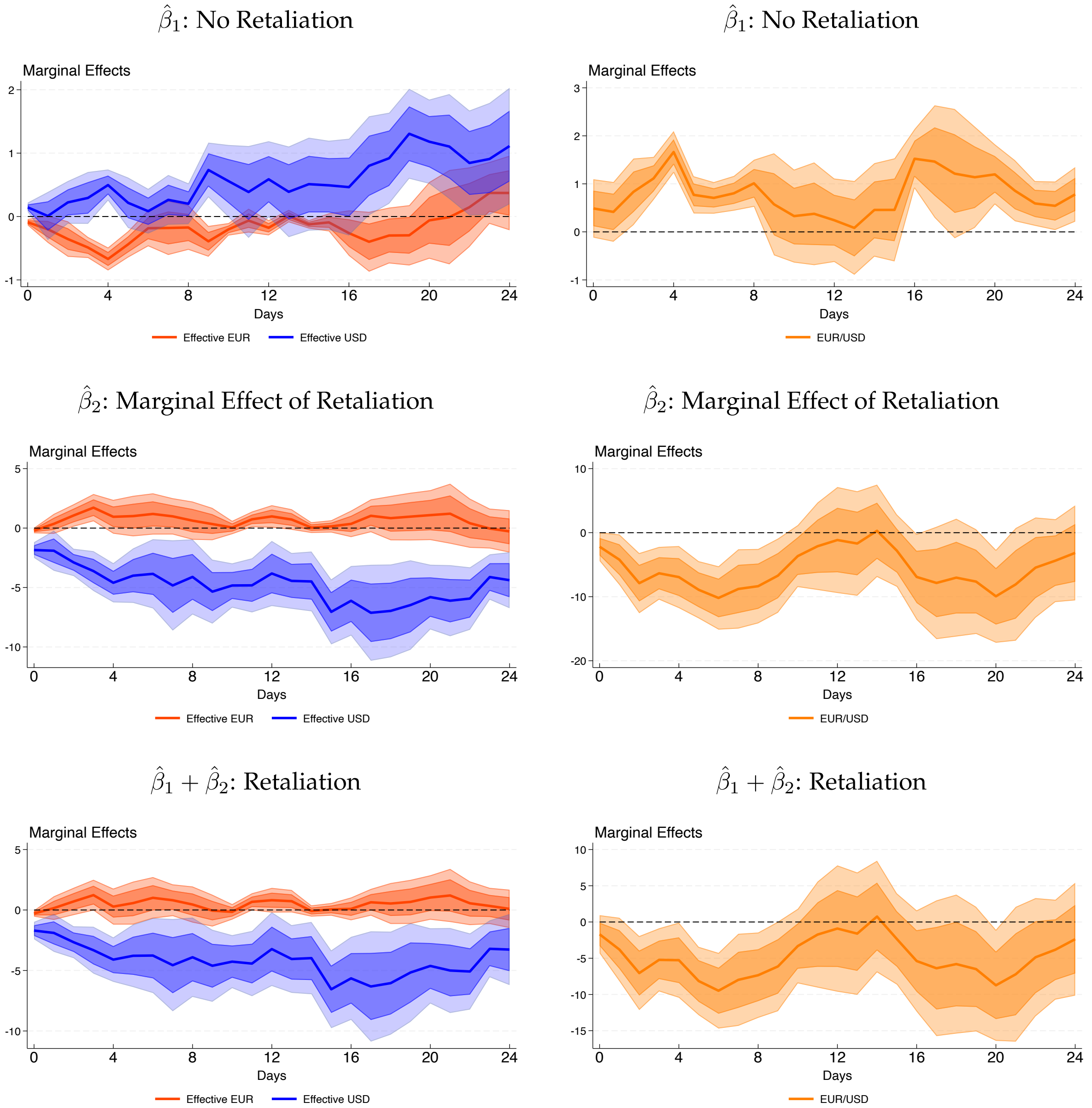
But there is a key difference in this case: the magnitude of estimated responses. In Figure 3B, the $\hat{\beta}_1$ and $\hat{\beta}_2$ were similar in magnitude such that a retaliation would leave the implied USD exchange rate broadly unchanged. In Figure 4, the $\hat{\beta}_2$ coefficients are much larger. The peak marginal effect of a 1pp effective U.S. tariff rate shock, conditional on no-retaliation, is around 1.5% on the USD effective exchange rate. The marginal impact of retaliation peaks at nearly -6pp. So, if the rest of the world retaliates against a U.S. tariff action, our results indicate that the USD will actually *depreciate*—both in effective terms and *vis-à-vis* the euro.

It is worth noting that our finding that the USD depreciates when US tariffs are met with retaliation is *not* a departure from theory. This is because, in standard models in which the USD is the dominant currency in international trade, the asymmetry in exchange-rate pass through translates into an asymmetry in the policy trade offs faced by monetary authorities. Specifically, since import prices in USD at the border move very little with the exchange rate, at least in the short run, a USD depreciation does not impact imported U.S. inflation in goods and inputs. This means that, when responding to tariff shocks with retaliation, the costs of pursuing a relatively expansionary policy

[9] We focus on the EUR for these 'global' tariff events to provide a comparison with the 2025 period, and because the euro-area imports are hit directly by many of these U.S. tariff events.

[10] The USD also appreciates on average across all observations, as shown in Figure B.1.

Figure 4: Exchange-Rate Impacts of 2018-2020 Global Tariff Events Conditional On Retaliation



Notes. Shaded areas correspond to the 68% and 90% confidence intervals constructed from Newey and West (1987) standard errors with four lags, from the local-projection regression (3) augmented with lags of the dependent variable (Montiel Olea and Plagborg-Møller, 2021).

in which the USD depreciates are lower in the U.S., compared with the rest of the world. In a symmetric trade war, the optimal response in the U.S. is naturally more expansionary, implying a USD depreciation (see, e.g., Bergin and Corsetti, 2023).[11]

[11]Observe that, since a USD depreciation weighs on the foreign-currency prices of imports from the U.S., it reduces the rest-of-the-world imported inflation. Therefore, in the rest of the world, even if

3.4 Robustness

In Appendix C, we show that our empirical results are robust to many variations of our empirical approach. First, in C.1, we replace our continuous U.S. tariff shock $\varepsilon^{\tau}_{US,t}$ with a categorical variable $\mathcal{S}_{US,t}$ that denotes the sign of the U.S. action: $+1$ for tariff increases and -1 for decreases. This allows us to increase our sample from 35 to 41 shocks, since some US announcements were insufficiently precise to measure their magnitudes. In C.2, we replace our retaliation dummy $\mathbb{1}^{Ret}_{t}$ with a continuous retaliation variable $\varepsilon^{\tau,Ret}_{F,t}/\varepsilon^{\tau}_{US,t}$ that measures the relative size of the foreign retaliation compared to the initial US tariff, i.e., it equals 0 if there is no retaliation and 1 when the foreign retaliation is as large as the US tariff. In C.3, we consider only tariff increases, i.e., when $\varepsilon^{\tau}_{US,t} > 0$. And finally, in C.4, we extend our retaliation window from 7 to 10 days. Across each of these alternative specifications, we continue to find that U.S. tariffs appreciate the dollar when imposed unilaterally, while foreign retaliations weaken the dollar.

4 What is Different in 2025?

In this section, we study the transmission of the 2025 U.S. tariff shocks, highlighting similarities and differences relative to those from the earlier 2018-2020 sample. We compare the responses of both the exchange rate and bond yields, in turn. As discussed above, compared to the earlier sample, the 2025 tariff shocks are much larger in magnitude, occur in a much tighter sequence, and target a much broader of countries. These differences have implications for the way markets interpreted and responded to the 2025 shocks.

retaliation matches U.S. tariff rates one-for-one, matching the U.S. monetary stance is not desirable. Additional relevant asymmetries in the transmission of tariff shocks and the policy response could arise from differences in exchange-rate regimes, differences in openness, as well as from differences in targeted sectors and industries—e.g., with countries setting diverse tariffs rates on intermediate inputs, commodities, and final consumer goods.

4.1 Tariff Shocks and Exchange Rates in 2025

Results from re-estimating our average effect regression (2) using the 2025 tariff shocks are presented in Figure 5A. As shown in the figure, the U.S. tariff actions in 2025 *depreciate* the USD, both in effective terms and bilaterally against the EUR. Importantly, since all post-April 2nd 2025 U.S. tariffs are retaliated against, and almost all correspond to US tariff announcements on a wide set of trading partners, the correct counterpart for these results in the 2018-2020 period comes from $\beta_1 + \beta_2$ in regression (3), where we see a U.S. dollar depreciation as well (see Figure 4).

Although the sign of the exchange-rate response is the same, there are notable differences in magnitude. While the observed USD depreciation is larger after April 2nd 2025 than at any point between 2018 and 2020, the estimated marginal effects are smaller—arguably reflecting nonlinearities in the transmission mechanism[12], but also consistent with the view that the nature and propagation of the tariff shocks differed across the two periods.

4.2 Tariff Shocks and Bond Yields: 2018-2020 vs. 2025

The most striking difference in the nature of the tariff shocks between 2018–2020 and 2025 emerges when we bring the model to bear on the response of bond yields. As shown in Figure 6, during the 2018-2020 period, U.S. bond yields decline in response to U.S. 'global' tariffs, especially when met with foreign retaliations.[13] This is consistent with a scenario of price stability in which economic activity may be negatively affected by the impact of tariffs on productivity. The response follows the same pattern at both the 2-year and the 10-year horizon. Importantly, yields in the euro area (Germany) respond more positively than in the U.S., especially conditional on retaliation.

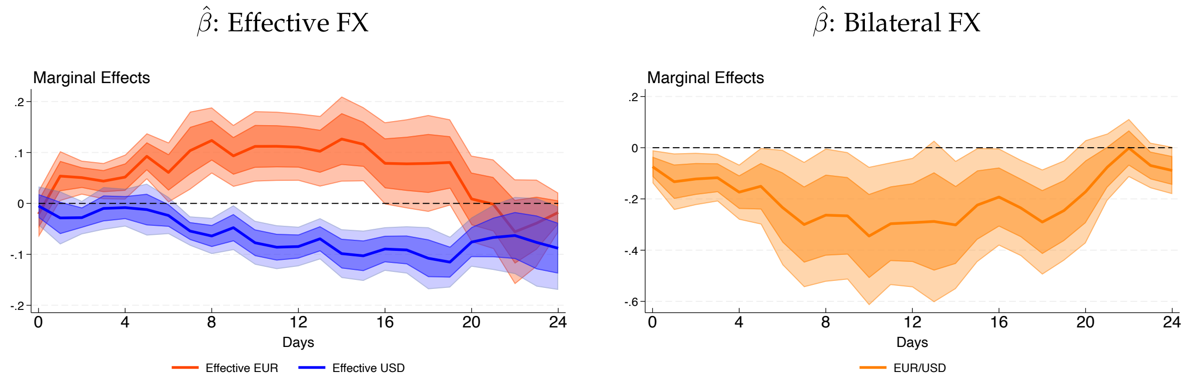
The pattern does not repeat in 2025, as Figure 5B shows. While US 2-year yields do fall, the response is muted and not significantly different compared to euro area yields. US 10-year yields, however, significantly increase over time. At longer horizons, the short-run stabilization policy of the central bank, which may optimally ac-

[12] A currency cannot depreciate by more than 100%, for example.

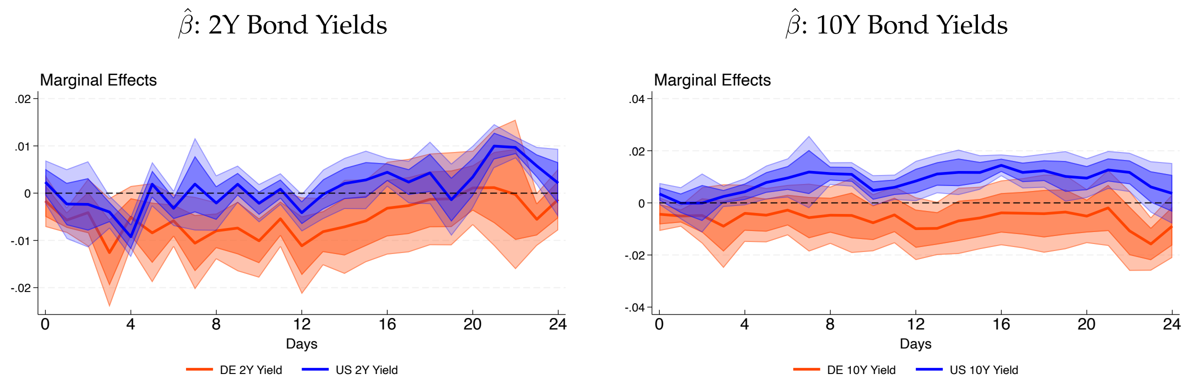
[13] The pattern is similar across all U.S. tariff events, as shown in Figure B.2.

Figure 5: Impact of 2025 Tariff Events on Asset Prices

A. Exchange Rates



B. Bond Yields



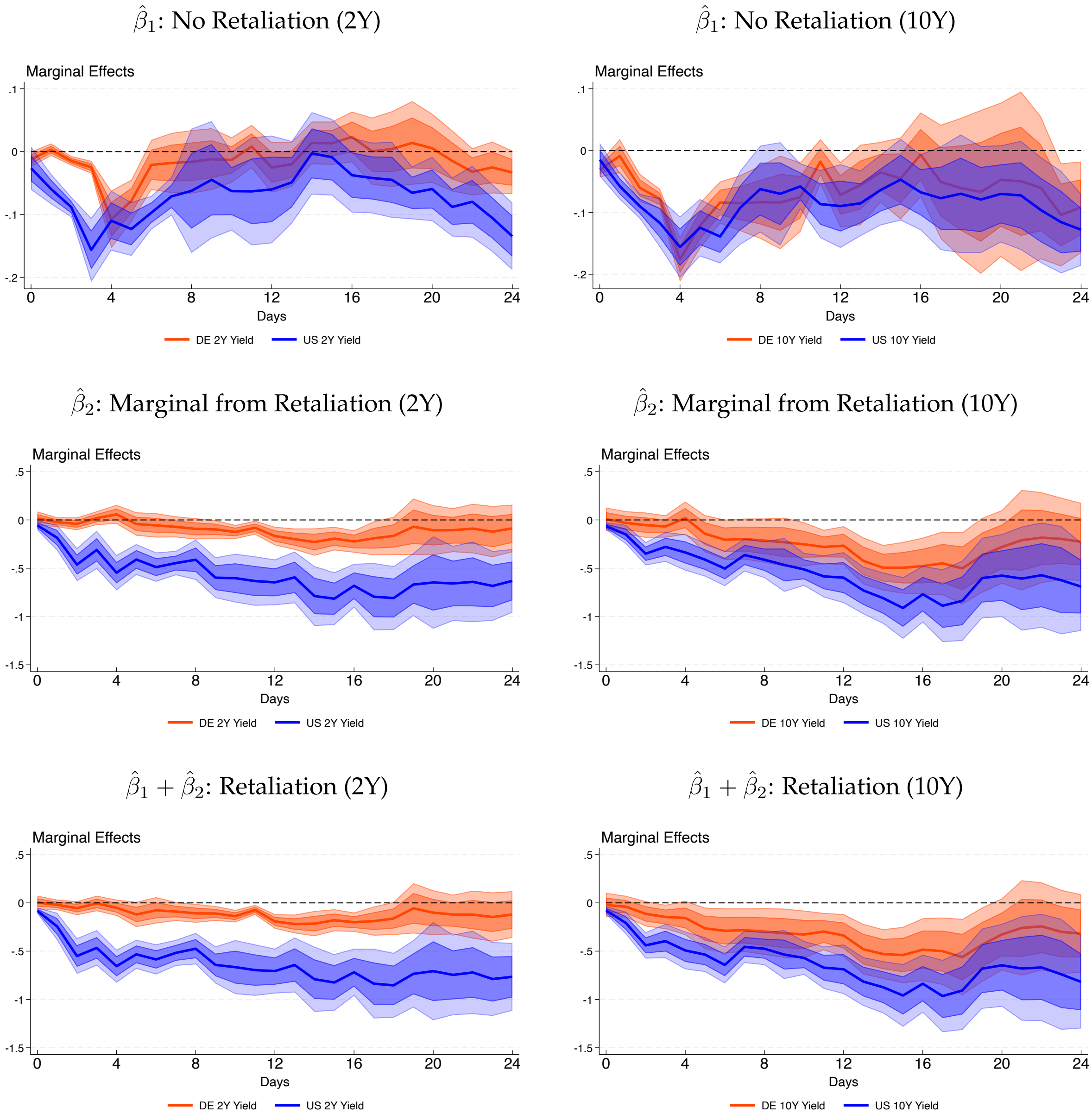
Notes. Shaded areas correspond to the 68% and 90% confidence intervals constructed from Newey and West (1987) standard errors with four lags, from the local-projection regression (2) augmented with lags of the dependent variable (Montiel Olea and Plagborg-Møller, 2021).

commodate some inflation to sustain economic activity, should no longer be reflected in investors' expectations. These yield moves may instead reflect a re-appraisal of longer-term growth and inflation prospects. Overall, this comparison of results across the two periods points to a different, more complex, transmission mechanism of the 2025 tariff shocks.

5 Conclusion

In this paper, we provide new empirical evidence on the response of exchange rates to tariff actions based on the recent experiences in 2018-2020 and 2025. Our innovation comes from a careful classification between tariff shocks, depending on whether they

Figure 6: 2- & 10-Year Bond Yields and 2018-2020 Global Tariff Events Conditional on Retaliation



Notes. Shaded areas correspond to the 68% and 90% confidence intervals constructed from Newey and West (1987) standard errors with four lags, from the local-projection regression (3) augmented with lags of the dependent variable (Montiel Olea and Plagborg-Møller, 2021).

give rise to retaliatory measures in the rest of the world.

We construct a new dataset documenting effective tariff-rate shocks, going beyond a classification of escalations/de-escalations used in the literature to date. Our shocks measure has the advantage of capturing the size and economic relevance of different tariff announcements.

Our econometric evidence for the period 2018-2020 suggests that, when the rest of the world is expected to retaliate against a U.S. tariff announcement, the USD may not appreciate, and can even depreciate significantly. In light of our evidence, the USD depreciation following the April 2nd 2025 is not in and of itself surprising. However, the size of announced tariffs, the frequency of events, and the broad set of countries involved suggest differences in the nature and transmission mechanism of the 'Liberation Day' shock. In particular, the response of 10-year Treasury yields to US tariffs in 2025 diverges dramatically from the earlier sample, and is consistent with a broader reassessment of risks and pricing of U.S. assets by investors.

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Appendix

A Timeline of Tariff Events

Table A.1: Timeline of Tariff Events (+1 denotes effective tariff increase, −1 decrease)

Date	Description	US Event	RoW Event
A: 2018-2020			
22-Jan-18	U.S. imposes safeguard tariffs on solar panels and washing machines.	1	0
01-Mar-18	U.S. announces future tariffs of 25% on steel and 10% on aluminum across board (affecting mostly Canada, EU, Mexico, Korea).	1	0
07-Mar-18	EU announces its retaliatory response if hit with U.S. steel and aluminum tariffs, hitting consumer goods.	0	1
08-Mar-18	U.S. temporarily exempts Canada and Mexico from steel and aluminum tariffs.	-1	0
22-Mar-18	Investigation finds China uses unfair trade practices; U.S. indicates forthcoming tariffs on Chinese goods and WTO dispute. At same time, U.S. temporarily exempts EU, Korea, Brazil, Argentina, Australia from steel and aluminum tariffs.	1	0
23-Mar-18	U.S. steel and aluminum tariffs come into effect.	1	0
02-Apr-18	China imposes retaliatory tariffs on U.S. on aluminum waste and various foods.	0	1
03-Apr-18	U.S. threatens tariffs on China, at 25% on 50bn USD, largely on intermediate inputs and capital goods.	1	0
04-Apr-18	China retaliates with threat of tariffs on 50bn USD imports, mostly on U.S. transportation and vegetable products.	0	1
05-Apr-18	U.S. escalates by asking officials to consider whether addition 100 billion USD of US imports from China should be tariffed.	1	0
17-Apr-18	China imposes preliminary tariffs on U.S. Sorghum.	0	1
30-Apr-18	U.S. extends tariff exemptions for EU, Canada and Mexico; Argentina, Australia and Brazil receive indefinite exemptions.	-1	0
18-May-18	China ends Sorghum tariffs during negotiations.	0	-1
23-May-18	U.S. considers 25% tariffs on autos and parts.	1	0
29-May-18	U.S. says it will impose tariffs on 50bn USD of Chinese goods starting June 15.	1	0
01-Jun-18	U.S. ends tariff exemptions for EU, Canada, Mexico.	1	0
15-Jun-18	U.S. amends list of tariffed 50bn goods from China; China also updates its list. Both effective from July 6.	1	1
18-Jun-18	U.S. looks into another 200bn USD of Chinese imports to tariff at rate of 10%.	1	0
22-Jun-18	EU retaliates against U.S., affecting steel, aluminum, agriculture and food.	0	1
06-Jul-18	First stage of U.S. and Chinese 50bn USD tariffs, totalling 34bn USD, go into effect.	1	1
10-Jul-18	U.S. publishes list of additional 200bn USD worth of Chinese imports to tariff.	1	0
20-Jul-18	U.S. threatens to tariff all Chinese imports.	1	0
01-Aug-18	U.S. considers 25% tariff on 200bn USD of Chinese imports, up from 10%.	1	0
03-Aug-18	China threatens further tariffs on 60bn USD of goods (5–25%).	0	1
07-Aug-18	U.S. finalizes second tranche of 50bn USD tariff plan.	1	0

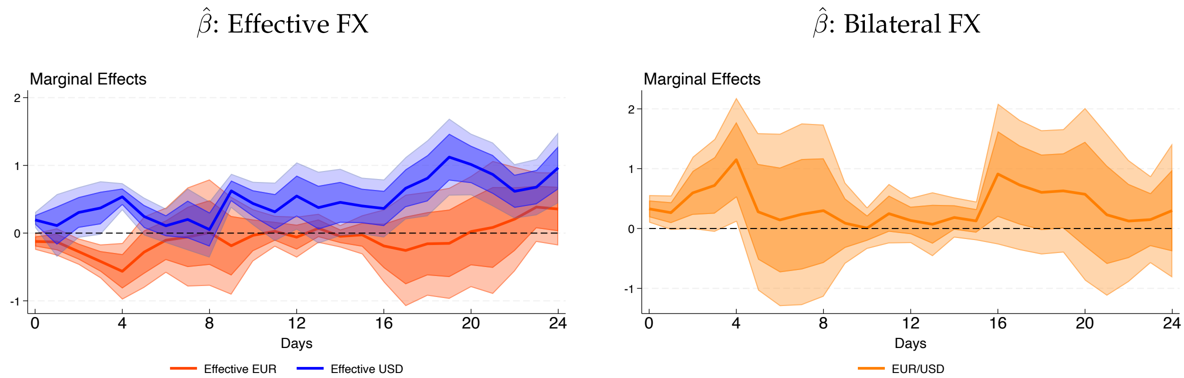
Continued on next page

Table A.1 – continued from previous page

Date	Description	US Event	RoW Event
08-Aug-18	China removes crude oil from 50bn USD tariff list, but maintains 25% on 16bn USD.	0	1
10-Aug-18	U.S. doubles steel tariffs on Turkey to 50%, aluminum to 20%.	1	0
23-Aug-18	Second tranches of U.S. and China 50bn USD tariffs come into effect.	1	1
17-Sep-18	U.S. finalizes 200bn USD tariff list, with 10% tariff rising to 25% in Jan.	1	0
18-Sep-18	China finalizes tariffs on 60bn USD of US goods; lowers rate to 5–10%.	0	1
24-Sep-18	US (200B at 10%) and China (60B at 7%) tariffs come into effect.	1	1
10-May-19	U.S. tariffs of 25% on 200bn USD of Chinese goods come into effect.	1	0
13-May-19	China intends to retaliate by raising tariff rate on 60bn USD.	0	1
17-May-19	U.S. lifts steel and aluminum tariffs on Canada and Mexico.	-1	0
30-May-19	U.S. announces 5% tariffs on all imports from Mexico due to border.	1	0
01-Jun-19	China tariffs on 36bn USD of goods go into effect.	0	1
07-Jun-19	U.S calls off Mexico tariffs.	-1	0
01-Aug-19	U.S. announces 10% tariffs on all remaining Chinese exports, starting Sep 1.	1	0
13-Aug-19	U.S. plans two new tariff rollouts, 112bn USD and 160bn USD.	1	0
23-Aug-19	China retaliates with 75bn USD tariffs. U.S. raises tariffs to 30%.	1	1
11-Sep-19	China removes some tariffs; U.S. delays increase.	-1	-1
11-Oct-19	U.S. cancels October tariffs in anticipation of trade deal.	-1	0
13-Dec-19	U.S. cancels December tariffs after trade deal.	-1	0
24-Jan-20	U.S. increases steel and aluminum tariffs on EU, Taiwan, Japan and China.	1	0
06-Aug-20	U.S. reinstates Canadian steel tariffs. Canada retaliates.	1	1
15-Sep-20	U.S. ends tariffs on Canadian steel.	-1	-1
B: 2025-Present			
31-Jan-25	U.S. announces tariffs on all imports from Canada, Mexico (25%), China (+10%).	1	0
03-Feb-25	U.S., Canada and Mexico postpone tariffs for 1 month.	-1	-1
04-Feb-25	U.S. 10% tariffs on China. China retaliates with 15%/10% on U.S. goods.	1	1
10-Feb-25	U.S. announces 25% tariffs on steel and aluminum.	1	0
03-Mar-25	U.S. confirms tariffs; Canada and China retaliate.	1	1
06-Mar-25	USMCA exemptions on Canada/Mexico tariffs. Canada follows.	-1	-1
10-Mar-25	China's March 4 retaliatory tariffs come into effect.	0	1
12-Mar-25	U.S. steel/aluminum tariffs come into effect. Canada, EU retaliate.	1	1
26-Mar-25	U.S. announces 25% auto tariffs (USMCA exempted).	1	0
02-Apr-25	U.S. 'Liberation Day': tariff rate rises by 14pp.	1	0
03-Apr-25	March 26 auto tariffs take effect. Canada retaliates.	1	1
04-Apr-25	China announces 34% tariffs on all U.S. goods.	0	1
08-Apr-25	U.S. amends 34% tariff on China to 84%.	1	0
09-Apr-25	Liberation Day tariffs paused; U.S. announces 125% tariffs on China. China, EU, Canada retaliate.	1	1
10-Apr-25	China's retaliatory tariffs take effect. EU retaliation paused.	1	1
11-Apr-25	China announces further retaliation: 125% on U.S. imports.	0	1

B Additional Results

Figure B.1: Average Impact of 2018-2020 Global Tariff Events on Exchange Rates

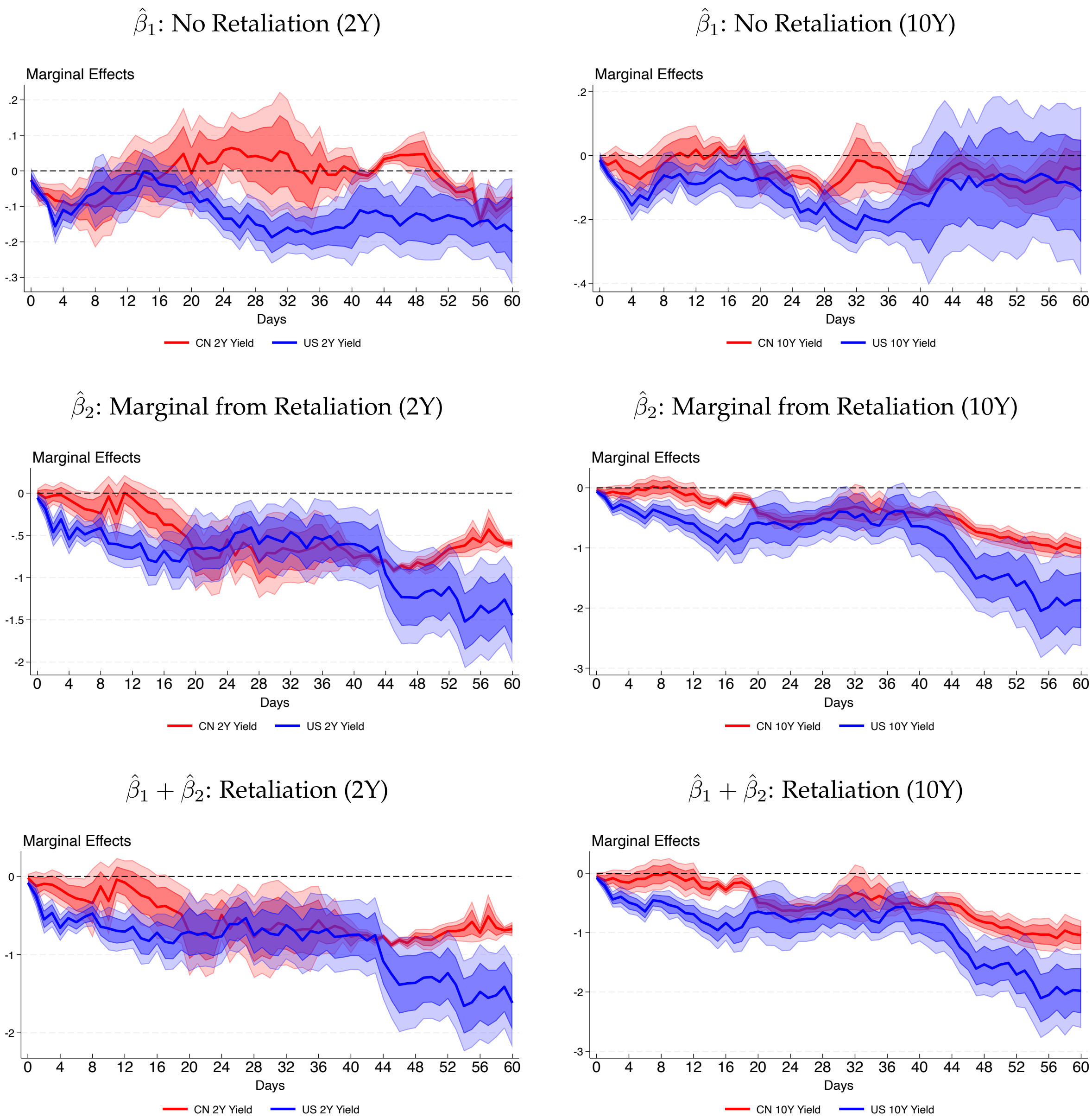


Notes. Shaded areas correspond to the 68% and 90% confidence intervals constructed from Newey and West (1987) standard errors with four lags, from the local-projection regression (2) augmented with lags of the dependent variable (Montiel Olea and Plagborg-Møller, 2021).

Complementing the analysis in Section 3.3, Figure B.1 shows that, in response to U.S. global tariff events during the 2018-2020 period, the USD appreciates on average across all observations. Complementing the analysis in Section 4.2, Figure B.2 shows the response of bond yields across all U.S. tariff events, revealing a pattern consistent with the reaction to U.S. global tariff shocks.

Figure B.3 plots, for a sample of 11 advanced (G11) and 12 emerging market currencies vis-à-vis the USD, the 2-day ($t-1$ to $t+1$) exchange rate movements around the March 1st 2018 steel and aluminum tariff announcement against the 2-day exchange rate movements around, respectively, the April 2nd 2025 (top panel) and April 9 2025 (bottom panel) announcements. The upper panel displays a striking correlation in the immediate aftermath of Liberation Day. The correlation completely breaks down around April 9—when US tariffs on China escalated to 145%, China responded with 125% tariffs on US goods, and the EU and Canada officially announced their retaliatory plans. Through the lenses of a factor model of exchange rate determination, the currency responses around April 2nd 2025 appear to reflect an underlying factors structure that was similar to March 1st 2018, despite the striking differences in the size of the announced tariff and their geographical scope. This is not the case for April 9th 2025.

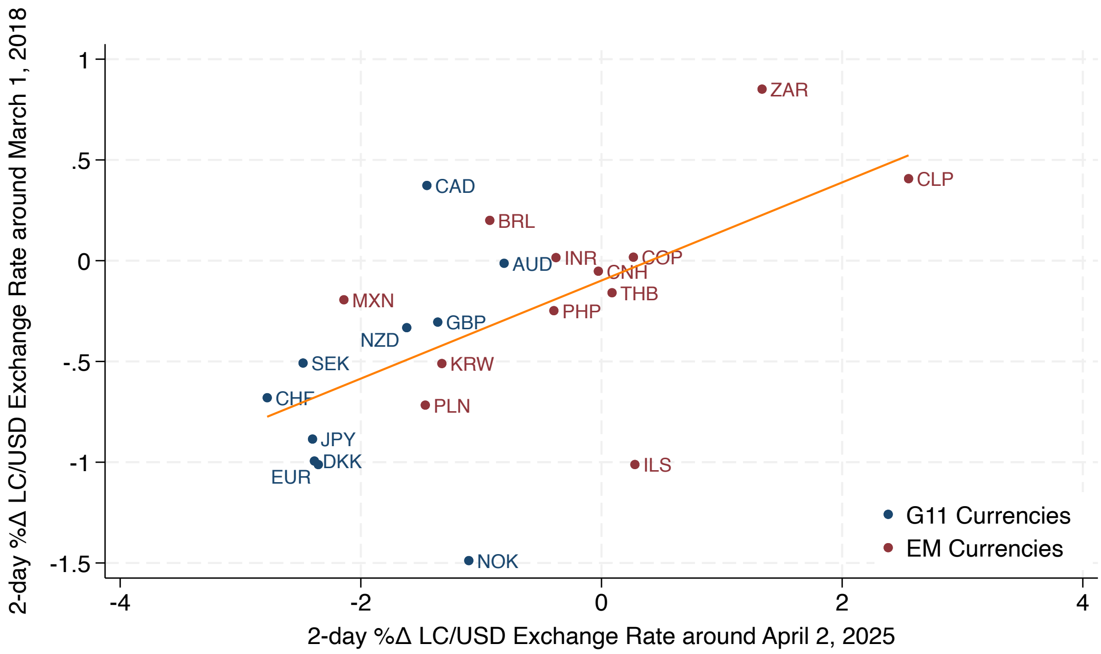
Figure B.2: 2- & 10-Year Bond Yields and 2018-2020 Tariff Events Conditional on Retaliation



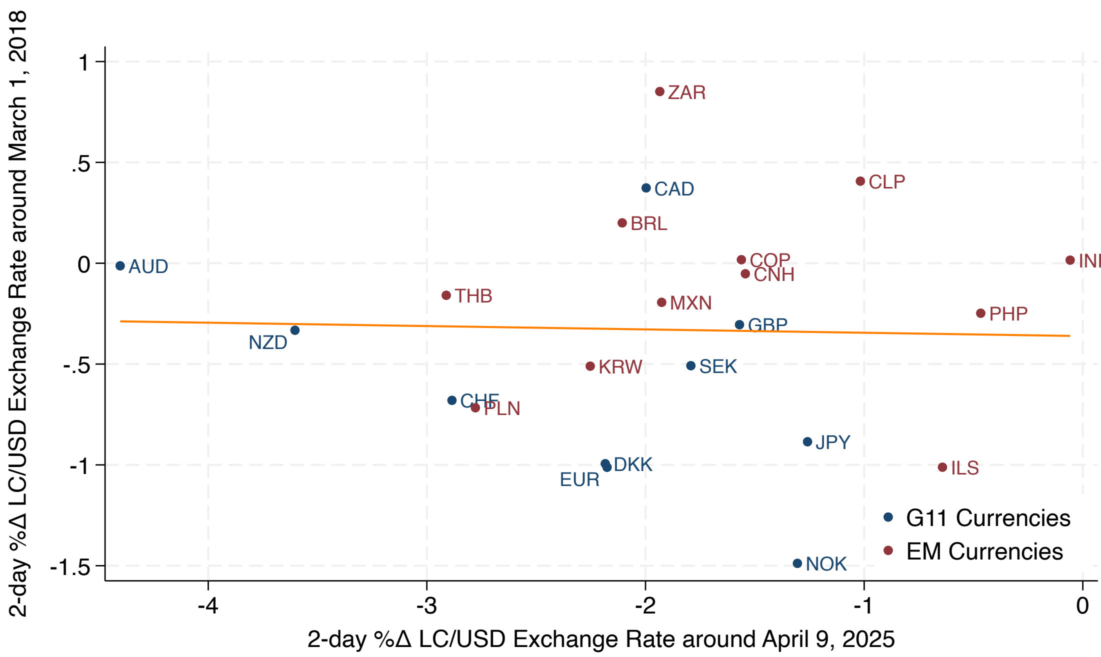
Notes. Shaded areas correspond to the 68% and 90% confidence intervals constructed from Newey and West (1987) standard errors with four lags, from the local-projection regression (3) augmented with lags of the dependent variable (Montiel Olea and Plagborg-Møller, 2021).

Figure B.3: Exchange-Rate Reactions to Tariff Announcements

(a)



(b)



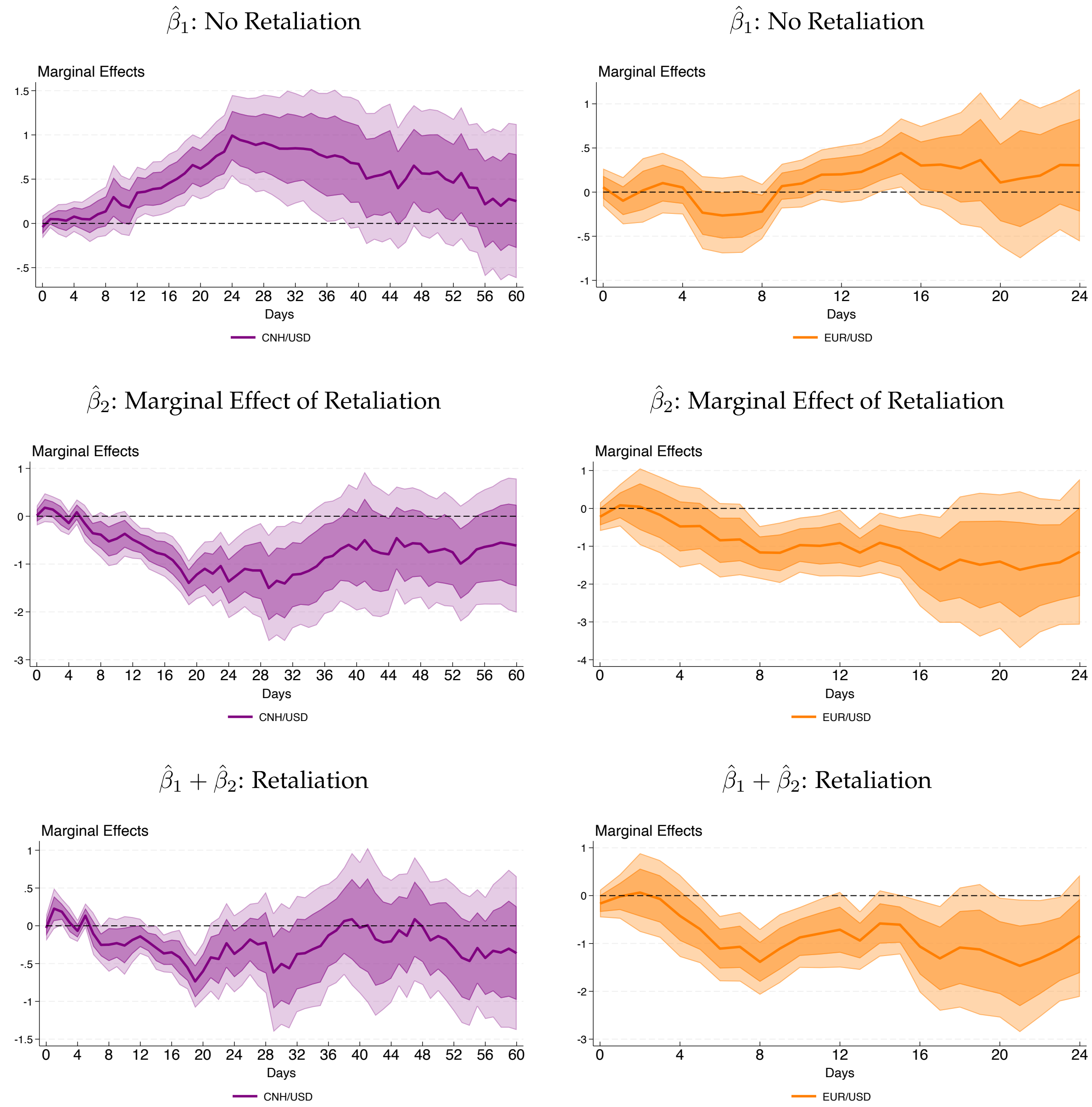
Notes. Scatter plots of percentage changes in G11 and 12 EM currencies vis-à-vis the USD in 2-day windows ($t-1$, $t+1$) around three tariff events (t): (1) steel and aluminum tariff announcement on March 1st 2018; (2) April 2nd 2025 Liberation Day tariff announcement (top panel); (3) US announces 145% tariff on China, China, EU and Canada officially retaliate on April 9th 2025 (bottom panel).

C Robustness

C.1 US Tariffs as Categorical Variables

$$e_{t+h} - e_{t-1} = \alpha^h + \beta_1^h \mathcal{S}_{US,t} + \beta_2^h \left(\mathcal{S}_{US,t} \times \mathbb{1}_t^{Ret}\right) + \delta^h \mathbb{1}_t^{Ret} + \boldsymbol{\gamma}^{h\prime} \mathbf{x}_{t-1} + u_{t+h} \tag{C.1}$$

Figure C.1: Exchange-Rate Impacts of 2018-2020 Tariff Events with Discrete US Tariff Shock

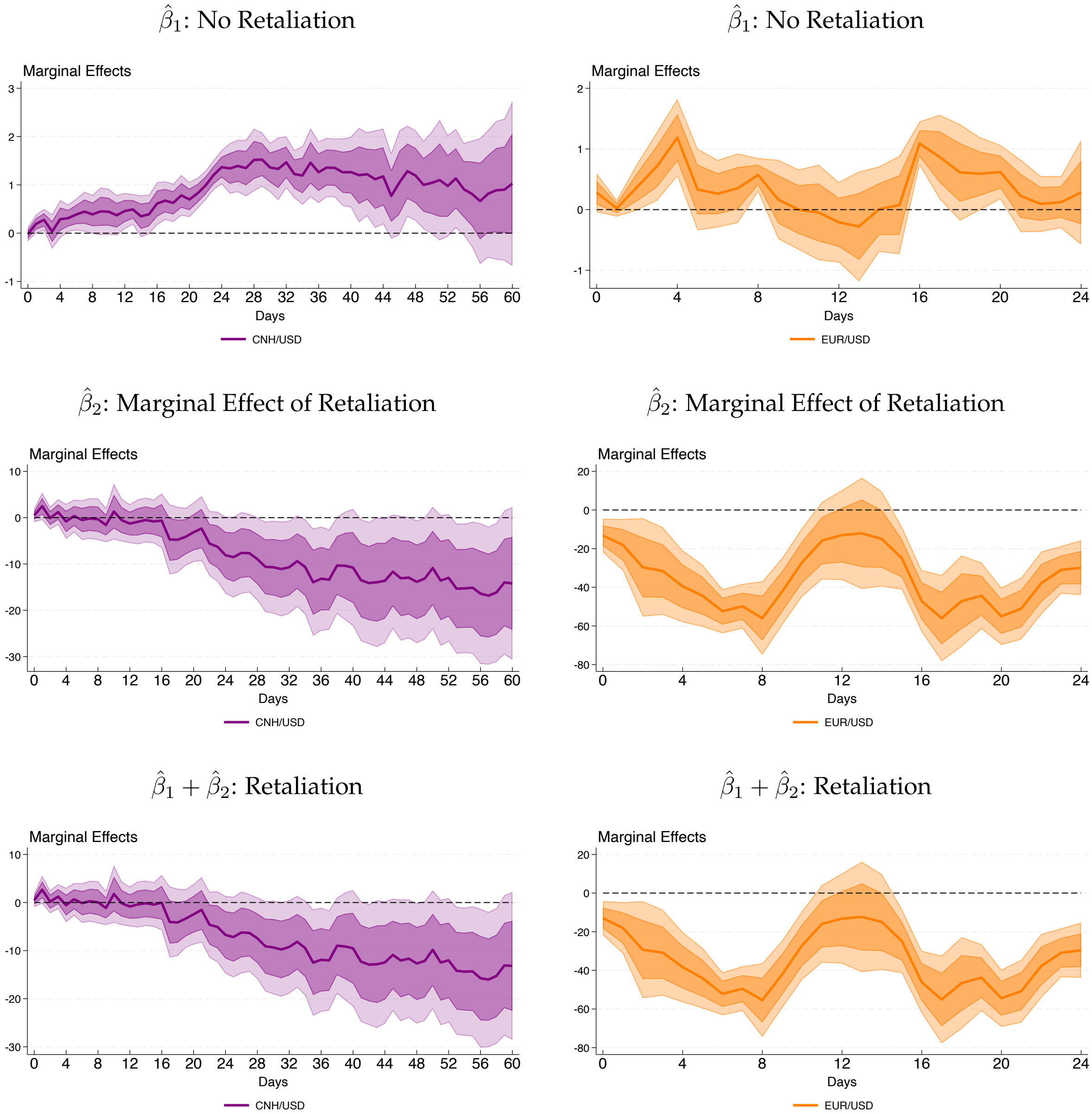


Notes. Shaded areas correspond to the 68% and 90% confidence intervals constructed from Newey and West (1987) standard errors with four lags, from the local-projection regression (3) augmented with lags of the dependent variable (Montiel Olea and Plagborg-Møller, 2021).

C.2 Foreign Tariff Retaliations as Continuous Variable

$$e_{t+h} - e_{t-1} = \alpha^h + \beta_1^h \varepsilon_{US,t}^{\tau} + \beta_2^h \left(\varepsilon_{US,t}^{\tau} \times \varepsilon_{F,t}^{\tau,Ret} / \varepsilon_{US,t}^{\tau} \right) + \delta^h \varepsilon_{F,t}^{\tau,Ret} / \varepsilon_{US,t}^{\tau} + \boldsymbol{\gamma}^{h\prime} \mathbf{x}_{t-1} + u_{t+h} \quad \text{(C.2)}$$

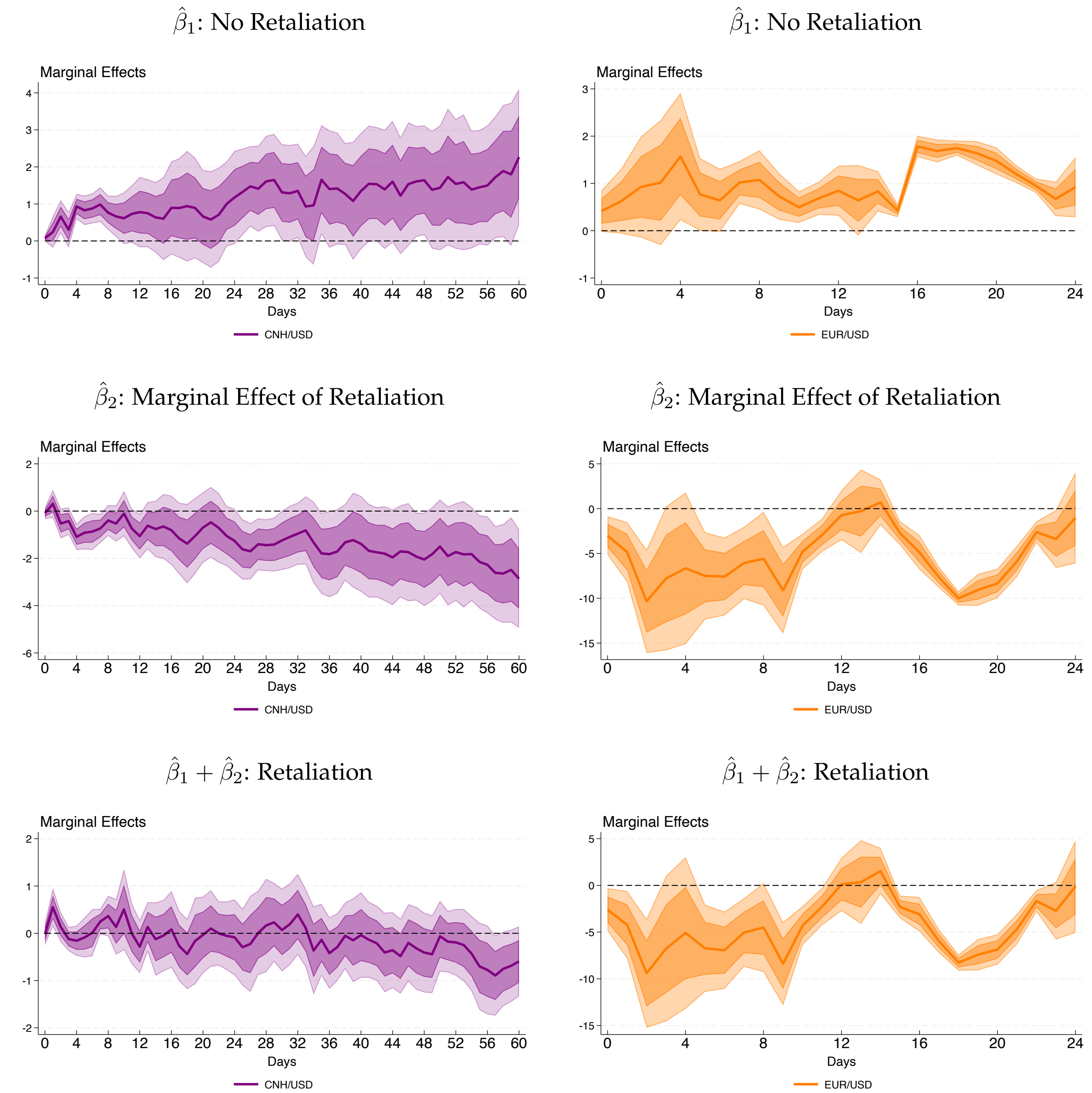
Figure C.2: Exchange-Rate Impacts of 2018-2020 Tariff Events with Continuous Retaliation Variable



Notes. Shaded areas correspond to the 68% and 90% confidence intervals constructed from Newey and West (1987) standard errors with four lags, from the local-projection regression (3) augmented with lags of the dependent variable (Montiel Olea and Plagborg-Møller, 2021).

C.3 US Tariff Increases Only

Figure C.3: Exchange-Rate Impacts of 2018-2020 Tariff Events with only Tariff Increases

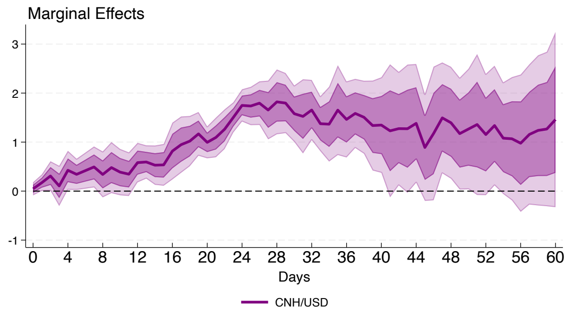


Notes. Shaded areas correspond to the 68% and 90% confidence intervals constructed from Newey and West (1987) standard errors with four lags, from the local-projection regression (3) augmented with lags of the dependent variable (Montiel Olea and Plagborg-Møller, 2021).

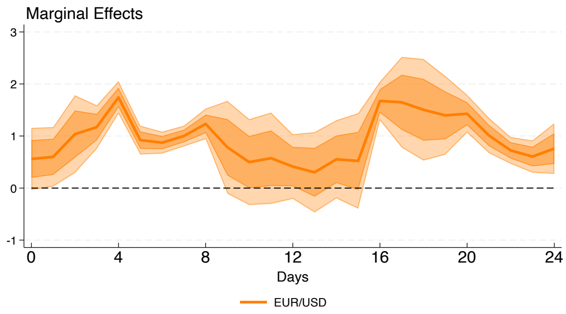
C.4 10-Day Retaliation Window

Figure C.4: Exchange-Rate Impacts of 2018-2020 Tariff Events with 10-Day Retaliation Window

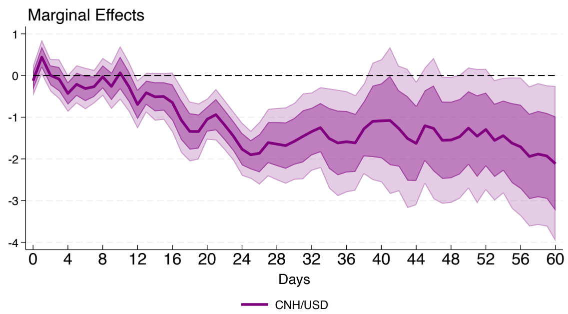
$\hat{\beta}_1$: No Retaliation



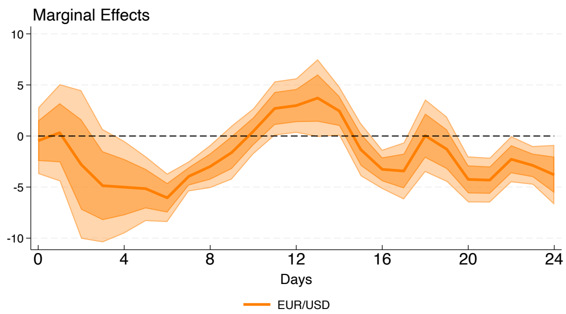
$\hat{\beta}_1$: No Retaliation



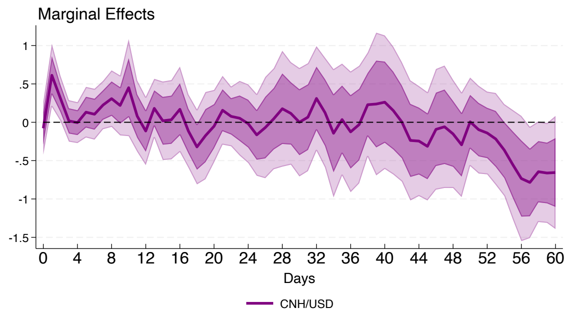
$\hat{\beta}_2$: Marginal Effect of Retaliation



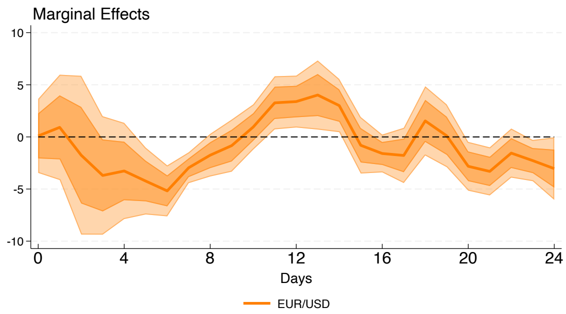
$\hat{\beta}_2$: Marginal Effect of Retaliation



$\hat{\beta}_1 + \hat{\beta}_2$: Retaliation



$\hat{\beta}_1 + \hat{\beta}_2$: Retaliation



Notes. Shaded areas correspond to the 68% and 90% confidence intervals constructed from Newey and West (1987) standard errors with four lags, from the local-projection regression (3) augmented with lags of the dependent variable (Montiel Olea and Plagborg-Møller, 2021).