Exchange Rate Responses to Geopolitical Risk and Trade Policy Uncertainty: Cross-Country Evidence *

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Abstract

This paper examines how exchange rates respond to *geopolitical risk* (GPR) and *trade policy uncertainty* (TPU) shocks using a panel local projection framework. We analyze monthly bilateral exchange rates of advanced economy and most freely floating emerging market currencies against the U.S. dollar from 1985 to 2025. We document two main findings. First, large global GPR shocks, defined as those above the 90th percentile, exhibit threshold effects, causing advanced economy currencies to depreciate against the U.S. dollar more strongly and more significantly than those of emerging markets. In contrast, country-specific GPR shocks trigger pronounced depreciation in emerging market currencies, while responses in advanced economies are delayed and less statistically significant. Second, TPU shocks above the same threshold lead to significant depreciation against the U.S. dollar across both country groups, with larger effects on emerging markets. Our results highlight the non-linearity of GPR and TPU shocks and their differential impacts across country groups.

JEL Classification: D80, F13, F31, F51

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1 Introduction

In the past decade, geopolitical conflicts and trade tensions have risen rapidly, raising concerns about their effects on economic stability and growth (Gopinath, 2024; Carney, 2016). Events such as the U.S.–China trade war and Russia's invasion of Ukraine have significantly affected global markets, sparking interest in understanding how geopolitical risk and trade uncertainty transmit to macroeconomic and financial variables.

Exchange rates serve as a key transmission channel in macroeconomics. They link monetary policy and external shocks from global markets to domestic economy, influencing inflation, output, and financial and fiscal stability. While extensive research has investigated how policy shocks and macroeconomic fundamentals drive exchange rates, their response to *geopolitical risk* (GPR) or *trade policy uncertainty* (TPU) shocks remains relatively under-explored.

This paper examines the effects of those two shocks on nominal exchange rates, measured as the value of local currency relative to the U.S. dollar, in advanced (G10) and emerging (EM10) economies. [1] Using a panel local projection framework, we estimate monthly exchange rate responses to these shocks for the period 1985 to 2025.

We use the GPR index, developed by Caldara and Iacoviello (2022), and the TPU index, computed by Caldara et al. (2020), in our analysis. These indices measure uncertainty, with the former related to geopolitical events and the latter to trade policy. Both are constructed by counting newspaper articles that contain specific keywords, reflecting perceived uncertainty as conveyed in media coverage.

The first part of the paper analyzes how global and country-specific geopolitical risk shocks affect bilateral exchange rates. We use a panel local projection framework. To study global shocks, we also explore threshold effects by distinguishing acute events (e.g., 9/11, Iraq War, and Ukraine invasion) using the 90th percentile of the index as a cutoff. Our results reveal distinct responses between G10 and EM10 currencies.

We find that during periods of elevated GPR, currencies of G10 countries depreciate more against the U.S. dollar than those of EM10 countries. We speculate that the aforementioned result arises because global geopolitical risk shocks trigger rapid *flight-to-safety* flows. These flows likely begin earlier in advanced economies, which are more deeply integrated into the global financial system than emerging markets. The non-linearity can occur as global risk aversion rises disproportionately during major geopolitical events that exceed the threshold.

For country-specific GPR shocks, controlling for both country and time fixed effects, a

[1] We adopt the country classification of Rebucci, Toraman and Valente (2025) and use the exchange rate regime classification from Ilzetzki, Reinhart and Rogoff (2022) to identify emerging markets with the most freely floating exchange rates. Section 3 describes the G10 and EM10 samples in detail.

country-level GPR shock depreciates EM10 currencies substantially and persistently since the initial impact. In contrast, G10 currencies exhibit a weaker response that emerges only at longer horizons and is marginally significant at the 32% level.

This response suggests that country-specific geopolitical risk shocks induce *flight-from-risk* behavior in emerging markets, where heightened country-specific risks leads to sharper portfolio rebalancing and significant currency depreciation. [2]

In the second part of the paper, we investigate how exchange rates respond to shocks of trade policy uncertainty. We allow for threshold effects by explicitly accounting for months of intense trade tension (above the 90th percentile), notably the U.S.–China negotiations and tariff escalations under the Trump administration.

Unlike geopolitical risk shocks that yield different responses across country groups, we find that TPU shocks during these episodes cause both G10 and EM10 currencies to depreciate against the U.S. dollar. This finding is also consistent with the first moment effect found in Jeanne and Son (2024), who documents that news about U.S. tariffs appreciated the dollar and depreciated the renminbi in 2018-2019. [3]

Our findings have two main policy implications. First, exchange rates serve as a critical transmission channel for both global and country-specific uncertainty shocks. Second, exchange rate responses are non-linear conditional on whether the shock exceeds a threshold, and differ across country groups and shock types. These results underscore the need for policy frameworks that can address each country's specific external vulnerabilities, macroeconomic structure, and exchange rate regime.

Layout. The remainder of the paper is structured as follows. Section 2 reviews the index definitions, as originally developed and introduced by Caldara and Iacoviello (2022) and Caldara et al. (2020). Section 3 presents our empirical strategy based on a panel local projection framework. Section 4 examines exchange rate responses to global and country-specific geopolitical risk shocks. Section 5 analyzes the effects of trade policy uncertainty shocks on exchange rates. Section 6 concludes. Additional results and supplementary materials are presented in the appendix.

[2]This distinction aligns with empirical findings by Zhang and Chen (2025). They show that while increases in global economic uncertainty (GEU) tend to attract capital inflows, rises in country-specific economic uncertainty (CSEU) lead to capital outflows.

[3]While our analysis does not include data beyond early 2025 and therefore does not capture the 2025 "Liberation Day" episode, we recognize that this event has sparked renewed debate about the safe-haven role of the U.S. dollar, where the expected appreciation of the U.S. dollar failed to materialize during a period of heightened uncertainty (Hartley and Rebucci, 2025).

1.1 Related Literature

This paper contributes to three main strands of literature: (i) the role of uncertainty in exchange rate dynamics, (ii) the impact of geopolitical and trade policy uncertainty on the exchange rate, and (iii) the heterogeneous transmission of geopolitical risk and trade policy uncertainty to exchange rate in advanced and emerging market economies.

First, we build on the extensive literature examining how various forms of uncertainty influence exchange rate behavior. Early studies documented that traditional models based on macroeconomic fundamentals or interest rate differentials struggle to explain short-run exchange rate movements (Meese and Rogoff, 1983; Engel and West, 2005), leading to a shift in focus on time-varying risk premia and uncertainty-driven channels (Backus, Foresi and Telmer, 2001; Lustig, Roussanov and Verdelhan, 2011).

More recent contributions highlight that monetary policy uncertainty (Mueller, Tahbaz-Salehi and Vedolin, 2017; Beckmann and Czudaj, 2017), economic policy uncertainty (Baker, Bloom and Davis, 2016), fiscal policy uncertainty (Fernández-Villaverde et al., 2015), U.S. economic policy uncertainty (Kido, 2016) and firm-level political risk (Hassan et al., 2019) all have an effect on the macroeconomic aggregates. Our analysis complements and extends this literature by focusing specifically on the role of geopolitical risk (GPR) and trade policy uncertainty (TPU) and shifting the focus specifically to exchange rates.

Second, we contribute to the growing literature on the macro-financial effects of geopolitical and trade policy uncertainty. Caldara and Iacoviello (2022) introduce a widely used GPR index based on newspaper coverage, showing that spikes in geopolitical tensions are associated with lower investment, increased financial volatility, and capital outflows. Similarly, trade policy uncertainty has been shown to have adverse macroeconomic effects, particularly following the escalation of U.S.–China trade tensions after 2016 (Caldara et al., 2020; Huynh, Nasir and Nguyen, 2023).

While previous studies have emphasized the impact of GPR and TPU on investment, output, and financial market volatility, systematic analysis of their effects on exchange rates remains limited. Existing studies often focus on specific historical events or case studies (e.g., Brexit, U.S.–China trade war) rather than providing a broader empirical assessment. Our contribution is to bridge this gap by jointly analyzing the effects of GPR and TPU shocks on exchange rates for a panel of advanced and emerging economies.

Finally, we contribute to the literature on the heterogeneous transmission of global shocks across country groups. A large body of research emphasizes that EMs are more vulnerable to global financial shocks due to higher sovereign risk, weaker policy credibility, and more limited access to international capital markets (Ahmed, Coulibaly and Zlate, 2017). In contrast, AEs often benefit from safe-haven inflows during periods of heightened global risk, leading to appreciation pressures on their currencies (Habib and Stracca, 2012).

While these asymmetries are well established in the context of monetary policy transmission and capital flow volatility, there is relatively little systematic evidence on whether and how geopolitical and trade policy uncertainty shocks affect exchange rates differently across advanced and emerging economies. Most existing studies either focus on advanced economies or analyze individual episodes in emerging markets without providing broader comparative evidence (Handley and Limão, 2017; Crowley, Meng and Song, 2018; Steinberg, 2019).

We fill this gap by providing a comparative, cross-country analysis of exchange rate responses to uncertainty shocks across G10 and EM10 economies. We show that the magnitude and persistence of exchange rate reactions differ between advanced and emerging markets. Specifically, we show that global geopolitical risk shocks, particularly around major geopolitical events, trigger significant depreciations in G10 currencies relative to the U.S. dollar, consistent with *flight-to-safety* behavior. In contrast, country-specific GPR shocks lead to significant depreciations in EM currencies - what we interpret as *flight-from-risk* dynamics. Furthermore, we find that TPU shocks lead to a significant and persistent depreciation of both G10 and EM10 currencies, consistent with the predictions in Jeanne and Son (2024), Khalil and Strobel (2024) and Cavallo et al. (2021).

2 Indices of Geopolitical Risk and Trade Uncertainty

For our empirical analysis, we use the *Geopolitical Risk* (GPR) index developed by Caldara and Iacoviello (2022) and the *Trade Policy Uncertainty* (TPU) index from Caldara et al. (2020). We use both indices at a monthly frequency.

Before presenting our empirical framework in Section 3, we firstly provide a brief overview of how each index is constructed and highlight key features of the resulting series to clarify what these variables capture.

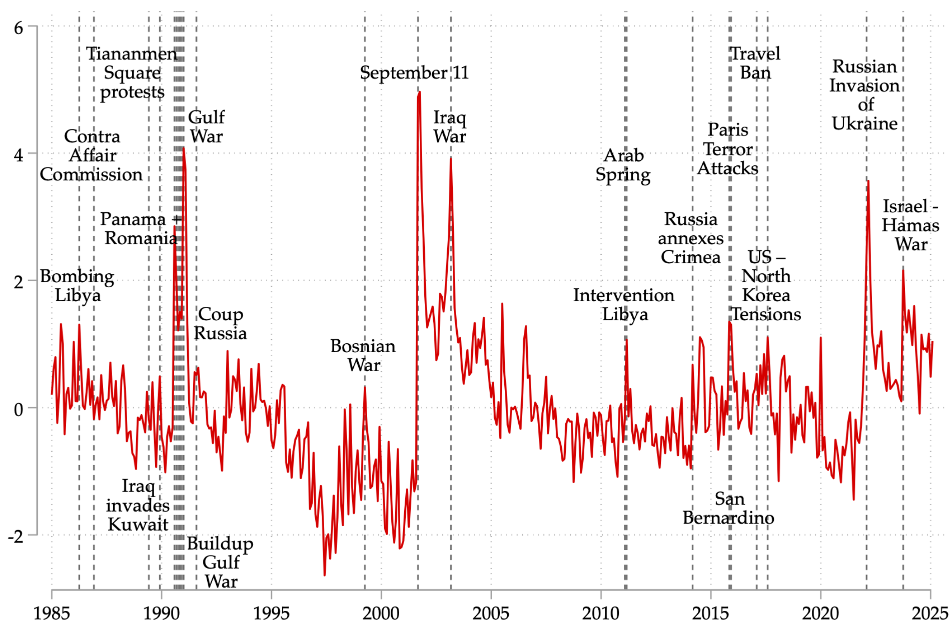
2.1 Geopolitical Risk (GPR) Indices

2.1.1 Aggregate GPR Index

The recent GPR Index, developed by Caldara and Iacoviello (2022), measures the intensity of adverse geopolitical events. It is the proportion of articles containing terms such as "war," "military," and "terrorism," in ten major U.S. and U.K. newspapers relative to total published articles in those ten newspapers. [4] The newspapers are the *Chicago Tribune*, *Daily Telegraph*, *Financial Times*, *Globe and Mail*, *Guardian*, *Los Angeles Times*, *New York Times*, *USA Today*, *Wall Street Journal*, and *Washington Post*. As such, the global GPR index reflects an Anglo-American perspective, emphasizing geopolitical events covered by U.S., U.K., and Canada newspapers.

Figure 1 shows our standardized global GPR index, defined as the standardized natural logarithm of the original index, using data from January 1985 to February 2025. The figure labels key geopolitical episodes from the original dataset, such as the 9/11 attacks, Iraq War, and 2014 Crimea crisis. [5] We also labeled the February 2022 Russian invasion of Ukraine and the October 2023 Israel–Hamas war, both of which correspond to pronounced spikes in the GPR index.

Figure 1: Standardized GPR & Major Events following Caldara and Iacoviello (2022)



The scale shows the natural log of the GPR index developed by Caldara and Iacoviello (2022) and standardizes it over the period 1985M1 - 2025M2. The exact dates of the events are listed in Appendix B.

Based on Figure 1, we make two observations. First, the global GPR index shows several major bursts since 1985, but also exhibit considerable variations over time, capturing geopolitical events across different continents. Notably, the average index seems

[4] For the complete list of sets of words and construction details, see Caldara and Iacoviello (2022), Table 1, Section 1.B.

[5] See Caldara and Iacoviello (2022) figure 1 for the original list of major geopolitical events. Many large GPR surges historically align with wars and terrorist attacks.

to be higher for sample period after 2000, with two recent sharp increases associated with geopolitical events in Eastern Europe and the Middle East. Second, the GPR index does not leap during major economic disruptions such as the 2008 financial crisis, the 1997 Asian financial crisis, or the COVID-19 pandemic onset. [6] As Caldara and Iacoviello (2022) demonstrate, the GPR index, by construction, primarily captures events that are less likely to be driven by economic factors.

Motivated by the above observations, we hypothesize that large GPR shocks may exert disproportionately stronger effects, suggesting potential threshold effects, which we further discuss in Section 3.

2.1.2 Country-Specific GPR Index

To complement this global measure, we use the country-specific GPR indices developed by Caldara and Iacoviello (2022), constructed using three U.S.-based newspapers, i.e., the *Chicago Tribune*, the *New York Times*, and the *Washington Post*. These indices apply a similar methodology but restrict the sample to articles that mention both geopolitical keywords and country-specific identifiers, such as the country's name, capital, or major cities. This allows the index to track geopolitical events that originate in or directly affect a given country. While global events may appear in multiple country-specific indices, the measured impact varies depending on the degree to which a country is directly referenced in connection with the event.

This distinction between global and country-specific measures is particularly important for emerging markets (EMs), which may be more exposed to localized geopolitical tensions not fully captured by the global index. Indeed, the correlation between global and country-specific GPR indices is significantly lower for EMs—ranging from 0.05 to 0.57, with an average of 0.28—than for advanced economies (AEs), where correlations range from 0.16 to 0.74, averaging 0.43. For the United States, the correlation is nearly one, reflecting both its central role in many geopolitical developments and the fact that six of the ten newspapers used in the index construction are U.S.-based.

In our analysis, we refer to the global and country-specific measures simply as the global and country-specific GPR indices, respectively. We use both to distinguish the differential effects of global versus country-level geopolitical shocks on exchange rates.

[6] Other indices are more suited to capture economic and financial uncertainty. For instance, Fratzscher (2012) utilizes the VIX index to measure financial market volatility, while Ahir, Bloom and Furceri (2022) develop the World Pandemic Uncertainty Index (WPUI) to assess uncertainty related to the COVID-19 pandemic.

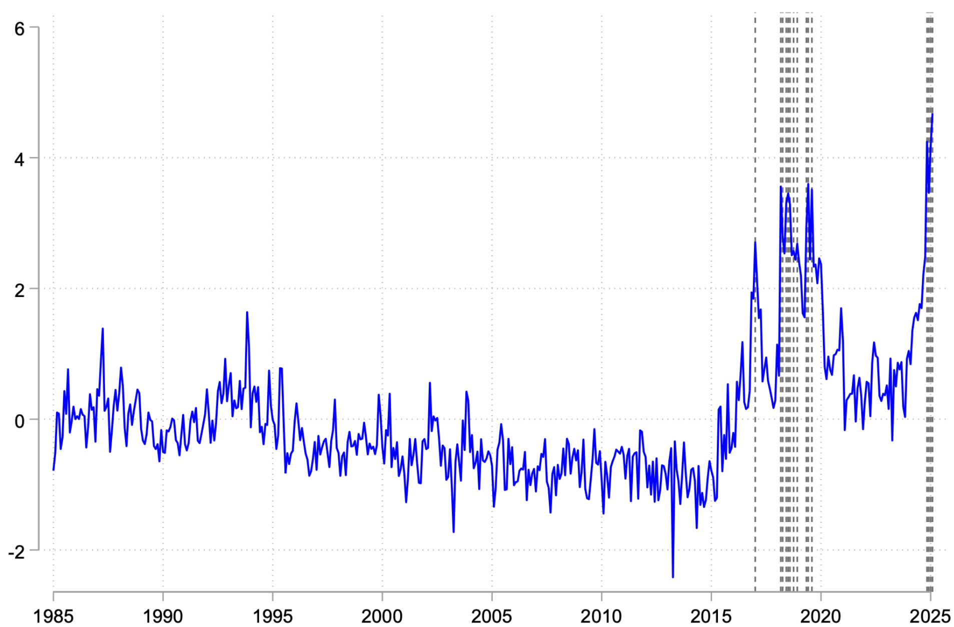
2.2 Trade Policy Uncertainty Index

For measures of trade-related uncertainty, we use the *trade policy uncertainty* (TPU) index developed by Caldara et al. (2020). Like the GPR index, the TPU index measures the frequency of trade-related terms appearing in newspaper articles alongside uncertainty-related words from seven newspapers. The newspapers are the *Boston Globe*, *Chicago Tribune*, *Guardian*, *Los Angeles Times*, *New York Times*, *Wall Street Journal*, and *Washington Post*.

The index identifies articles that contain both trade policy terms (e.g., "tariffs," "import barriers") and uncertainty-related terms (e.g., "risk," "uncertainty," "danger") appearing in close proximity within the same article. [7]

The index reflects perceived uncertainty in media coverage. Therefore, it likely captures both uncertainty about future trade policy (second-moment effects) and shifts in expected trade actions (first-moment effects). While this means the index might not be purely about uncertainty, our use is consistent with the standard application of news-based uncertainty measures in the literature.

Figure 2: Standardized TPU & Major Events following Caldara et al. (2020)



The scale shows the natural log of the TPU index developed by Caldara et al. (2020) and standardizes it over the period 1985M1 - 2025M2. Vertical dashed lines indicate major trade policy uncertainty events. The related policy actions are listed in Appendix B.

[7]For the complete methodology and newspaper sources, see Caldara et al. (2020). Section 2.3, footnote 6, 7, and 11 of their paper provide the proximity requirements as well as the complete list of trade-related and uncertainty-related terms.

Figure 2 shows the evolution of the standardized TPU index, constructed as the standardized natural logarithm of the raw Caldara et al. (2020) TPU index, using monthly data from 1985M1 to 2025M2.

Two key observations emerge from the data. First, before the establishment of the World Trade Organization (WTO) on January 1, 1995, the TPU index exhibited two notable spikes exceeding one standard deviation above zero. One occurred in the late 1980s and corresponded to the U.S. tariff war with Japan, while the other appeared in the mid-1990s and reflected uncertainty surrounding the North American Free Trade Agreement (NAFTA) negotiations (Caldara et al., 2020).

Second, after the establishment of the WTO, aggregate TPU remained relatively low until 2015. From 2015 onward, TPU started to rise again, with average levels approaching pre-WTO highs and new peaks surpassing historical records, reflecting more frequent and sizable shocks in the later period. [8] The dashed lines indicate periods of elevated trade policy uncertainty in recent years. Many of these episodes align with tariff policy shifts during the first Trump administration. Examples include trade disputes involving the European Union, Mexico, and the 2018 to 2019 U.S.–China trade conflict, et cetera. Additional increases are observed after the U.S. presidential election in late 2024.

Those especially high TPU periods motivate our empirical strategy to test whether they generate stronger effects on exchange rates. However, we acknowledge that much of the variation in the index, both pre-WTO and in recent years, reflects uncertainty surrounding U.S. trade policy, particularly during the two Trump administrations.

Challenges in Separating First and Second Moment Effects. The news-based GPR and TPU indices capture disturbances that both influence expected outcomes and increase uncertainty. As a result, it is difficult to disentangle pure uncertainty shocks (i.e., second-moment effects) from changes in the expected path of policy or events (i.e., first-moment effects). [9] Therefore, we do not attempt to separate the two effects in our analysis, but interpret the results as reflecting both first- and second-moment effects. Future research may explore ways to distinguish between them.

[8] A similar pattern is observed in the World Trade Uncertainty Index developed by Ahir, Bloom and Furceri (2022), which is based on text analysis of Economist Intelligence Unit country reports and captures references to trade-related uncertainty. However, since that index begins in 1996 and we consider a longer time coverage for our analysis starting from 1985, we rely on the TPU index constructed by Caldara et al. (2020).

[9] Given the conceptual and empirical challenges associated with measuring uncertainty, a variety of approaches have emerged. Some studies rely on the volatility of macro-financial variables (Ludvigson, Ma and Ng, 2021; Jurado, Ludvigson and Ng, 2015; Bloom, 2009; Leahy and Whited, 1996). In addition to the indices used in this paper, other closely related, text-based measures from news archives have also been developed, including the Economic Policy Uncertainty (EPU) index by Baker, Bloom and Davis (2016) and the World Uncertainty Index (WUI) by Ahir, Bloom and Furceri (2022).

3 Empirical Methodology

In this section, we discuss the empirical approach used to estimate the effects of geopolitical risk and trade policy uncertainty shocks on exchange rates.

3.1 Panel Local Projection Framework

Our empirical strategy examines how exchange rates respond to increases in global geopolitical risk (GPR) and trade policy uncertainty (TPU) using monthly panel local projections à la Jordá (2005), spanning the maximum available period from January 1985 to February 2025.

Country Groups. Throughout the paper, we focus on ten emerging market economies (EM10) and ten advanced economies (G10), following Rebucci, Toraman and Valente (2025). The G10 countries include Australia, Canada, Switzerland, Denmark, Germany, the United Kingdom, Japan, Norway, New Zealand, and Sweden.

The EM10 group consists of emerging markets with the most freely floating exchange rates, as classified by Ilzetzki, Reinhart and Rogoff (2022). We restrict our analysis to countries with relatively flexible regimes, selected based on a combination of regime classification and data availability. Our selection aims to balance coverage over time with consistency in regime flexibility. This group includes Brazil, Chile, Colombia, Israel, Korea, Mexico, the Philippines, Poland, South Africa, and Thailand. [10]

Shocks. Within the local projection framework, shocks are defined as the residuals from regressing the impulse variable on control variables. When a shock is unpredictable by construction, the residualized shock is equivalent to the original shock itself. Following the literature, we assume these news variables represent exogenous shocks.

Baseline Specification with Country Fixed Effects. We estimate a baseline specification that examines the response of bilateral exchange rates to uncertainty shocks, controlling for key macroeconomic and financial variables. We adopt a parsimonious approach by including two lags of each control variable and the uncertainty shock, with a forecast horizon of 12 months. We report Driscoll-Kraay standard errors with a lag order of 12 to account for serial correlation and cross-sectional dependence. Detailed data sources and variable definitions are provided in Appendix A.

[10] While our data span the period from 1985 onward, we acknowledge that exchange rate regimes - particularly in emerging markets - were more mixed and potentially less flexible prior to the early 2000s.

In particular, we estimate the following linear regression for each forecast horizon $h = 0, 1, 2, \dots, 12$:

$$e_{i,t+h} - e_{i,t-1} = \alpha_i^{(h)} + \beta_1^{(h)} shock_t + \beta_2^{(h)} (shock_t \times \mathbb{1}(shock_t > q_{0.9})) + \beta_3^{(h)} \mathbb{1}(shock_t > q_{0.9}) + \sum_{s=1}^{p} \gamma_s^{(h)} (e_{i,t-s} - e_{i,t-s-1}) + \sum_{s=1}^{p} \delta_s^{(h)} (Z_{i,t} - Z_{i,t-1}) + \epsilon_{i,t+h}, \quad (1)$$

where the dependent variable is the bilateral exchange rate vis-à-vis the US dollar. The variable $shock_t \in \{GPR_t, TPU_t\}$ represents a standardized monthly value of global geopolitical or trade policy uncertainty, with zero mean and unit variance.

To assess how responses vary during periods of heightened geopolitical or trade tensions, we allow for non-linearity by interacting shocks with "high-GPR month" indicators. $\mathbb{1}(shock_t > q_{0.9})$ is an indicator variable that equals 1 if the value of the shock at time t exceeds its 90th percentile, i.e., $q_{0.9}$, and 0 otherwise. This construction captures the months of unusually high geopolitical risk (in the case of GPR) or peak trade policy uncertainty (in the case of TPU), corresponding to the upper tail of the distribution and typically associated with major crisis episodes.

The GPR crisis periods include some of the labeled events in the original dataset from Caldara and Iacoviello (2022), along with additional months that meet our 90th-percentile threshold. [11] Similarly, peak TPU months are defined as those in which the TPU index exceeds its 90th percentile value. [12]

The impulse response functions of interest are then constructed from the sequence of regression coefficients $\{\beta_1^{(h)}\}_{h=0}^{H}$, which capture the responses during normal periods. The additional effect during crisis periods is captured by $\{\beta_2^{(h)}\}_{h=0}^{H}$. This adjustment allows us to test whether exchange rate responses to GPR or TPU shocks differ not only in magnitude but also in direction during major geopolitical events or trade tensions.

Other variables in the baseline specification include country fixed effects $\alpha_i^{(h)}$ to account for time-invariant heterogeneity, and Z denotes a set of control variables. In the baseline, Z includes the policy interest rate differential between country i and the United States, the CPI inflation rate, industrial production (as a measure of economic activity), and the VIX (as a measure of global financial market uncertainty).

[11] It also includes two recent events: the Russian invasion of Ukraine and the Israel–Hamas war.

[12] In the case of TPU, the original dataset does not provide event labels. Our proposed labeling is shown in the appendix.

Adding Time-Fixed Effects. To isolate the domestic transmission channel of geopolitical tensions, we estimate a parallel set of regressions using country-specific GPR indices. These regressions focus exclusively on GPR, as no comparable country-level TPU index exists:

$$e_{i,t+h} - e_{i,t-1} = \alpha_i^{(h)} + \lambda_t^{(h)} + \beta_1^{(h)} shock_{i,t} + \sum_{s=1}^{p} \gamma_s^{(h)} (e_{i,t-s} - e_{i,t-s-1}) + \sum_{s=1}^{p} \delta_s^{(h)} (Z_{i,t} - Z_{i,t-1}) + \epsilon_{i,t+h} \tag{2}$$

Here, $shock_{i,t}$ denotes the country-specific GPR shock, and λ_t represents time fixed effects that absorb global shocks and capture contemporaneous common factors constant across countries.

Panel Local Projections and Panel Vector Autoregressions (VAR). Plagborg-Møller and Wolf (2021) show that local projection estimators can recover the same impulse responses as a Cholesky-identified panel VAR in large samples, provided the local projection specification includes the appropriate set of controls. Specifically, in addition to including lagged values of all variables in the system, the correct specification also includes the contemporaneous values of the variables that are ordered before the shock variable in the Cholesky causal ordering.

In our baseline specification, when estimating the response of the exchange rate to a GPR or TPU shock, we order GPR/TPU first in the Cholesky decomposition. As a result, no contemporaneous controls are included, consistent with the assumption that GPR and TPU are exogenous with respect to the remaining variables in the system. In particular, we assume that monthly movements in GPR and TPU do not contemporaneously respond to domestic macroeconomic and financial conditions, including the VIX, interest rate differentials, CPI inflation, industrial production, or the exchange rate.

This identification strategy is supported by the external, geopolitical, or policy-driven nature of these shocks. Caldara and Iacoviello (2022) show that the GPR index Granger-causes various macro-financial variables, but not the other way around. This supports treating GPR as an exogenous shock in our empirical specification.

4 Geopolitical Risk Shocks: Empirical Evidence

In this section, we use monthly panel data and the local projection methods outlined in Section 3 to examine the dynamic effects of geopolitical uncertainty across ten advanced economies (G10) and ten emerging markets (EM10). We test whether exchange-rate responses to geopolitical risk (GPR) shocks vary by country group and by the aggregation level of geopolitical risk.

Specifically, we distinguish between two types of GPR shocks. First, we examine *global* GPR shocks, measured as an aggregate index that captures fluctuations in geopolitical events worldwide and reflects broad increases in geopolitical tensions. We further test for threshold effects by identifying large shocks as months when the global GPR index exceeds its 90th percentile. [13] Second, we analyze *country-specific* GPR shocks, which capture geopolitical risks originating from or involving an individual country.

4.1 Global Geopolitical Risk Shock

We begin by examining the bilateral exchange rate responses to global GPR shocks at the monthly frequency across G10 and EM10 country groups.

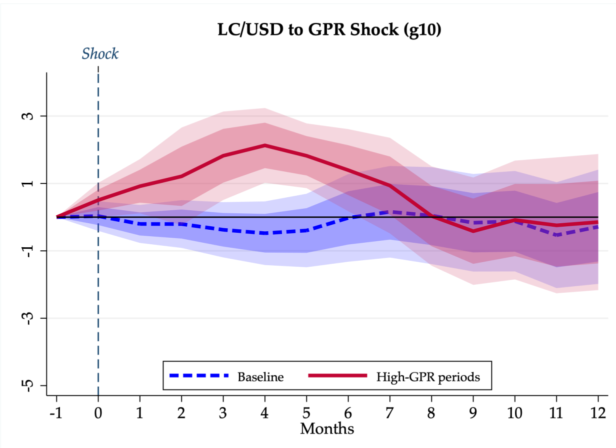
Capturing Threshold Effects During High-GPR Periods. Motivated by the patterns in the GPR index series discussed in Section 2, we hypothesize that large geopolitical risk shocks may generate disproportionately stronger effects, indicating potential nonlinearity. To identify periods of elevated geopolitical tensions, we define *high-GPR months* as those in which the standardized logarithm of the global GPR index exceeds its 90th percentile.

Our classification identifies 48 high-GPR months in the sample as periods of extreme geopolitical stress. Many of these high-GPR months align with several significant geopolitical events, such as the "Bombing Libya," "Iraq invades Kuwait," "Buildup Gulf War," "Gulf War," "September 11," "Iraq War," "Paris Terror Attacks," "San Bernardino," "Russian Invasion of Ukraine," and "Israel-Hamas War" as labeled in Figure 3. This result confirms that our method captures both well-known crises and less recognized periods of elevated geopolitical risk.

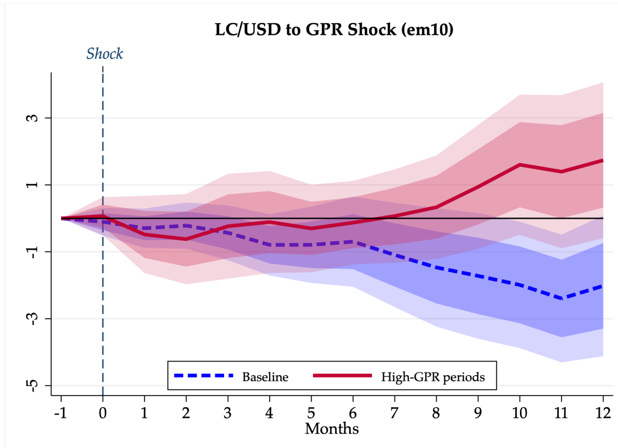
[13] We also explore alternative percentile thresholds to define high GPR episodes. Using the 95th percentile yields results that are consistent with our baseline. When using the 75th percentile, the distinction between high-risk and below-threshold responses becomes less pronounced and statistically insignificant, likely due to the inclusion of more moderate GPR episodes that are closer to average levels of uncertainty.

Exchange Rate Responses During High-GPR Periods. Next, we present our empirical findings. As detailed in Section 3, we construct a dummy variable identifying high-GPR months and interact it with the standardized log GPR index. [14] In particular, the high-GPR dummy captures level shifts in bilateral exchange rates during high-profile geopolitical tensions, while the interaction term measures the additional effects of GPR shocks above a specified threshold.

Figure 3: Response of Exchange Rate to a Global GPR Shock



(a) G10



(b) EM10

Note: The standard errors are Driscoll–Kraay standard errors with a lag order of 12, accounting for serial correlation and cross-sectional dependence. The lighter shaded areas represent 90% confidence intervals, while the darker, more saturated regions indicate 68% intervals. For the red line, which shows the total effect during high-GPR episodes, standard errors are computed as: $\text{SE} = \sqrt{\text{Var}(\hat{\beta}_{\text{GPR}}) + \text{Var}(\hat{\beta}_{\text{GPR}\times\text{High}-\text{GPR}}) + 2\,\text{Cov}(\hat{\beta}_{\text{GPR}}, \hat{\beta}_{\text{GPR}\times\text{High}-\text{GPR}})}$.

Figure 3 plots the impulse responses of local currencies against the U.S. dollar for G10 and EM10 countries over the 12 months following a one-standard-deviation increase in global geopolitical risk. The red solid line illustrates the response during months associated with major geopolitical events, which is the sum of the main effect and the interaction term. The blue dashed line shows the response without the interaction term. Shaded areas represent 68% and 90% confidence intervals. [15]

We first discuss the results indicated by the red solid line. For G10 countries (Panel 3a), the response is both economically and statistically significant. The red line shows that, during major geopolitical events, a GPR shock triggers an immediate depreciation, with the effect rising and peaking at month 4. Thus, G10 currencies weaken against the US

[14]The interactions are generated for all months in which the global GPR index exceeds its 90th percentile, ten of which correspond to events displayed in Figure 1.

[15]We formally test the joint significance of the interaction coefficients across all horizons and report these results in Appendix C.

dollar both on impact and cumulatively over roughly six months, with no significant effects beyond month 7.

In contrast, for EM10 countries (Panel 3b), the red solid line shows a marginally significant depreciation at the 32-percent level during months 10 to 12. Over the first 9 months, the exchange rate response remains near zero and largely statistically insignificant. This finding indicates that, on average, emerging market currencies do not react to global GPR shocks on impact, even after accounting for the conditional effects during major events when the GPR index exceeds the 90th percentile.

To illustrate the economic significance of our estimates, Table 1 maps observed GPR spikes during major geopolitical crises into implied average exchange rate movements in G10 exchange rates, using the peak estimated effect of a one-standard-deviation shock. Historical surges, for instance, the six-standard-deviation jump after the September-11 attacks, imply depreciations of roughly 13% on average. This magnitude is economically meaningful, underscoring the large exchange rate impacts driven by major geopolitical shocks.

Table 1: Realized GPR Spikes and Implied FX Depreciation for G10 Currencies

Event	Date	GPR Spike (s.d.)	Peak FX Impact per s.d.	Implied LC Depreciation
September 11 Attacks	2001M9	6.06	–2.12%	–12.85%
Iraq invades Kuwait	1990M8	3.16	–2.12%	–6.70%
Russian Invasion of Ukraine	2022M2	1.31	–2.12%	–2.88%

Note: The column "Peak FX Impact per s.d." shows the estimated maximum depreciation of G10 currencies relative to the US dollar at the 4-month horizon following a one standard deviation increase in global GPR during major geopolitical event months. The "GPR Spike" values represent the change in the standardized natural log of the global geopolitical risk index from the month prior to each listed event.

Exchange Rate Responses During Below-Threshold Periods. We now examine how GPR shocks affect exchange rates during non-high-GPR months. With our empirical specification, the main effect captures the impact of a GPR shock during milder periods, when the GPR index is below the threshold. Figure 3 presents the results, where the blue dashed line shows the exchange rate responses of G10 and EM10 currencies during below-threshold months.

For G10 currencies, the main effect is not statistically significant. In contrast, EM10 currencies begin to appreciate after month 7, with significance at the 32% level. This sign reversal suggests that the effects of global GPR shocks on exchange rates are state-dependent and vary across country groups. It may also reflect other economic forces caused by GPR shocks that influence exchange rates in the same direction concurrently with the observed geopolitical events, such as terms of trade shocks.

Potential Channels Behind the Differential GPR Response. Our empirical analysis yields two main results. Geopolitical risk shocks have non-linear effects on exchange rate movements. Additionally, during periods of high geopolitical risk, the impact of global shocks is stronger on advanced economies than on emerging markets. We briefly discuss potential mechanisms that may explain these findings below.

Firstly, the threshold behavior can be linked to the severity and geographic scope of geopolitical risk events. High-profile conflicts or tensions tend to generate larger risk-premium wedges in the uncovered interest parity (UIP) condition. Once a threshold level is reached (e.g., the 90th percentile in our empirical analysis), panic-driven capital flight and liquidity shortages can further amplify risk premia. As a result, a GPR shock of the same magnitude produces a significantly larger impact on exchange rates during high-GPR periods than during milder times.

Second, we find that G10 currencies respond more strongly to GPR shocks than EM10 currencies when shocks exceed the threshold. This result is likely driven by *flight-to-safety* flows into U.S. assets, which tend to originate first from other advanced economies rather than from emerging markets.

Because AEs are typically highly integrated into global financial markets, investors from G10 countries can quickly adjust portfolios during periods of heightened uncertainty. Habib and Stracca (2012) show that even traditional safe-haven currencies within the G10 can depreciate against the U.S. dollar during episodes of global risk aversion. This finding aligns with our conjecture that GPR shocks lead to capital shifts into U.S. assets.

Compared to AEs, portfolio adjustments in EMs can potentially be slower on average, reflecting differences in financial integration, market liquidity, and economic fundamentals. Although the studies by Eichengreen and Gupta (2015) and Ahmed, Coulibaly and Zlate (2017) primarily focus on variation within EMs, their findings also help highlight general differences between EMs and AEs. [16] Typically, AEs have deeper and more integrated financial markets. As a result, they can adjust portfolios quickly, leading to greater exchange rate depreciation during global shocks. In contrast, EMs tend to face more constraints in rapidly reallocating portfolios, which limits their exchange rate responses.

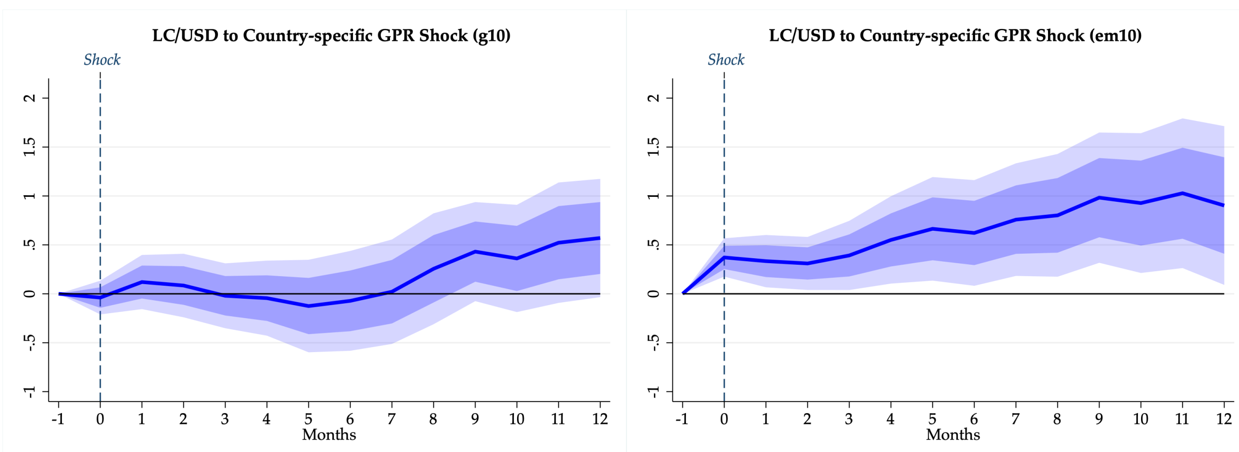
[16] Eichengreen and Gupta (2015) show that EMs with larger and more liquid financial markets experienced sharper pressures during stress episodes, as investors were better able to rebalance their portfolios. Ahmed, Coulibaly and Zlate (2017) emphasize that differences in economic fundamentals account for much of the variation in financial market responses across EMs.

4.2 Country-Specific Geopolitical Risk Shock

We next turn to country-specific GPR shocks in lieu of the global index to examine the response of bilateral exchange rates. We apply the same local projection framework, but now include both country fixed effects and time fixed effects. However, because time fixed effects absorb common aggregate time variations across countries, we do not specifically analyze non-linear responses to country-specific shocks in this setting.

Empirical Evidence. Similarly, we separate our sample into advanced (G10) and emerging market (EM10) economies. By including time fixed effects, we eliminate aggregate time variation in identifying the dynamic causal effects; thus, identification is from idiosyncratic variations. That is, we examine how a country's exchange rate against the U.S. dollar responds relative to others when its geopolitical risk index increases, holding constant the global backdrop affecting all countries and its own time-invariant country characteristics.

Figure 4: Response of Exchange Rate to a Country-Specific GPR Shock



(a) G10 (b) EM10

Note: The standard errors are Driscoll–Kraay standard errors with a lag order of 12, accounting for serial correlation and cross-sectional dependence. The lighter shaded areas represent 90% confidence intervals, while the darker, more saturated regions indicate 68% intervals.

Figure 4 presents the estimated impulse responses. We find that country groups respond to country-specific GPR shocks in ways that differ from their responses to global GPR shocks.

First, G10 currencies show no statistically significant response to country-specific GPR shocks at the 10% level, in contrast to their reaction to global shocks. When a G10 country's geopolitical risk increases relative to others and its own baseline, on average, its exchange rate against the U.S. dollar remains stable. The impulse response indicates statistically weaker effect, with depreciation significant only at the 32% level in later periods.

Second, for EM10 countries, a country-specific geopolitical risk shock induces a significant immediate local currency depreciation against the U.S. dollar. This depreciation persists and increases over time, reaching a peak of approximately 1% above country baseline and global conditions around 11 months following a one-standard-deviation shock.

G10 Resilience vs. EM Vulnerability. As the global GPR measure triggers flight-to-safety flows into the United States, a disaggregated, country-specific GPR shock may instead lead to capital outflows from the involved country reflecting *flight-from-risk* dynamics.

This flight-from-risk is likely more pronounced in EM10 countries. EM10 currencies (Figure 4b) show significant depreciation in response to country-specific GPR shocks, above and beyond the global movements and baseline trends as captured by two-way fixed effects. The persistent depreciation suggests greater vulnerability, reflecting stronger *flight-from-risk* behavior and capital outflow pressures. Such outflow is especially concerning for emerging markets, where substantial exposure to foreign currency-denominated debt (Cavallino et al., 2022) amplifies balance sheet risks and poses significant challenges for maintaining monetary and financial stability. [17]

In contrast, G10 currencies on average do not exhibit a significant response to country-level GPR shocks, suggesting greater resilience among advanced economies. This muted response likely reflects the ability of investors in G10 countries to re-allocate portfolio towards other advanced economy assets, including safe-haven currencies, when facing country-specific shocks. Since one currency may weaken against the dollar while another remains stable, the average exchange rate response for the G10 sample lacks statistical significance at the 10% level.

[17] Empirical studies indicate that countries with robust institutional frameworks, sound financial systems, and effective policy measures are better equipped to manage capital flow volatility and mitigate the adverse effects of economic uncertainty (Cerdeiro and Komaromi, 2021; Cavallaro and Cutrini, 2019).

5 Trade Policy Uncertainty Shocks: Empirical Evidence

This section examines how exchange rates respond to aggregate trade policy uncertainty (TPU) shocks, controlling for country fixed effects. Specifically, we assess whether responses differ by country group and during periods of elevated trade policy uncertainty.

5.1 Empirical Results

Capturing Non-linear TPU Effects. Similar to our approach for geopolitical risk shocks, we allow for state-dependence in the exchange rate response to TPU shocks by interacting the shock with a dummy variable for *high-TPU* periods. [18] We define *high-TPU* periods as months when the standardized logarithm of the TPU index exceeds its 90th percentile.

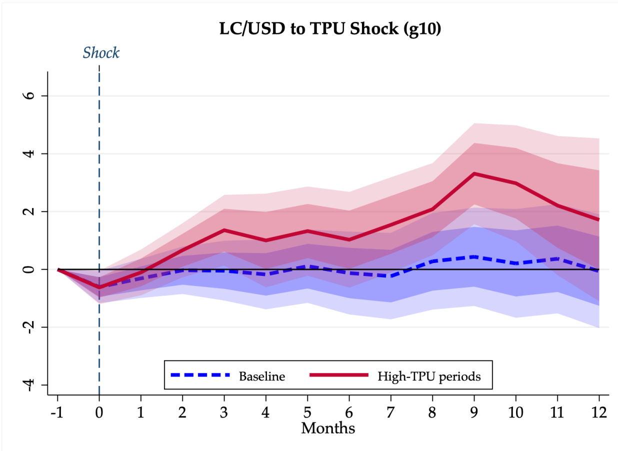
This criterion identifies 48 high-TPU episodes, with the vast majority of which occur after 2016 and coincide with U.S. trade policy shifts during the two Trump administrations. The only exceptions are April 1987 and November 1993, which align with U.S. tariff war with Japan and the North American Free Trade Agreement (NAFTA) negotiations, respectively (Caldara et al., 2020).

We are mindful that, due to the limited number of pre-WTO spikes, estimates of TPU shock effects may be less precise. Most identifying variation stems from the post-2015 period, and the aggregate index primarily reflects uncertainty around U.S. trade policy.

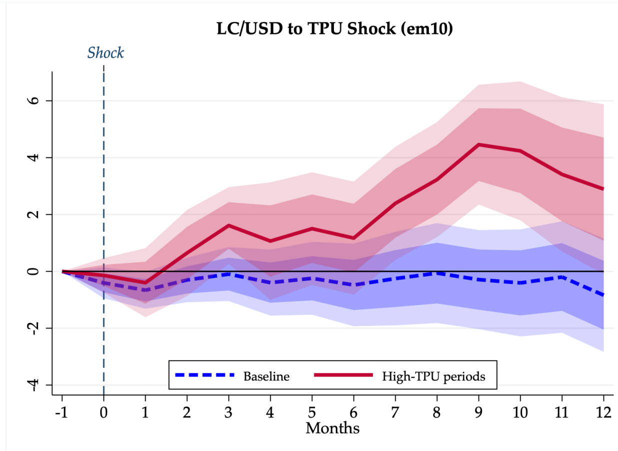
Exchange Rate Responses to TPU Shocks. Figure 5 shows impulse responses of local currency versus the U.S. dollar exchange rates following a one-standard-deviation TPU shock, based on panel local projections. Results are shown separately for G10 countries (panel 5a) and EM10 economies (panel 5b). Red solid lines show total effects during high-TPU periods, while blue dashed lines represent the main effect in non-high-TPU periods. Upward movements indicate local currency depreciation against the dollar. Overall, exchange rate responses to TPU shocks are qualitatively similar across country groups.

[18] Appendix C reports the significance of these interaction effects across all horizons using a Wald test.

Figure 5: Response of Exchange Rate to a TPU Shock



(a) G10



(b) EM10

Note: The standard errors are Driscoll–Kraay standard errors with a lag order of 12, accounting for serial correlation and cross-sectional dependence. The lighter shaded areas represent 90% confidence intervals, while the darker, more saturated regions indicate 68% intervals. For the red line, which shows the total effect during high-TPU episodes, standard errors are computed as: $\text{SE} = \sqrt{\text{Var}(\hat{\beta}_{\text{TPU}}) + \text{Var}(\hat{\beta}_{\text{TPU}\times\text{High}-\text{TPU}}) + 2\,\text{Cov}(\hat{\beta}_{\text{TPU}}, \hat{\beta}_{\text{TPU}\times\text{High}-\text{TPU}})}$.

Exchange Rate Responses During High-TPU Periods. For G10 countries (panel 5a), the estimated impulse response during high-TPU months (the red solid line) shows that currencies gradually depreciate starting around month 3. At its peak, a one-standard-deviation TPU shock leads to roughly a 3.3% depreciation.

For EM10 countries (panel 5b), the impulse response is qualitatively similar as large shocks cause depreciation against the dollar. At the peak, EM currencies experienced a slightly larger depreciation, which may reflect their greater exposure to external vulnerabilities.

To illustrate the economic significance of our estimates, Table 2 translates observed TPU spikes during major trade-related turbulent events into implied average exchange rate movements. Calculations are based on the peak responses to a one-standard-deviation TPU shock. For instance, the approximately three-standard-deviation surge in TPU following the Trump administration's trade restrictions implies a depreciation of roughly 9.5% for G10 currencies and 13.3% for EM10 currencies. These magnitudes highlight the substantial exchange rate impacts of trade policy uncertainty shocks.

Table 2: Realized TPU Spikes and Implied FX Depreciation for G10 (EM10) Currencies

Event	Date	TPU Spike (s.d.)	Peak FX Impact per s.d.	Implied LC Dep.
Obama Trade Strategy	2013M5	2.1	3.3% (4.6%)	6.9% (9.7%)
Trump Adm. Trade Restrictions	2018M3	2.9	3.3% (4.6%)	9.5% (13.3%)
U.S. Elections	2024M11	1.8	3.3% (4.6%)	5.9% (8.3%)

Note. The column "Peak FX Impact per s.d." shows the estimated maximum depreciation of G10 (EM10) currencies relative to the U.S. dollar at the 9-month horizon following a one standard deviation increase in global GPR during major geopolitical event months. The "TPU Spike" values represent the change in the standardized natural log of the trade policy uncertainty index from the month prior to each listed event.

Channels Driving Exchange Rate Movements. The primary channel likely operates through reduced U.S. import demand, consistent with standard open-economy macroeconomic models. When U.S. imposes tariffs or signals protectionist measures, domestic import demand typically falls. This reduction in demand lowers exports from trading partners, either due to the level effect or uncertainty about whether the tariffs will be reversed or increased further. Then, the demand for foreign currencies falls, leading to their depreciation relative to the U.S. dollar. [19]

A complementary channel involves safe-haven flows into U.S. assets. Khalil and Strobel (2024) show that TPU shocks, rather than changes in tariff rates, accounted for most of the U.S. dollar appreciation during the 2018–2019 trade war. They document increased foreign holdings of U.S. long-term assets, pointing to a strong global demand for dollar-denominated safe assets amid heightened trade-related uncertainty. [20] Together, these trade and financial market responses provide potential explanations on the observed depreciation of foreign currencies during periods of elevated trade uncertainty.

[19] Another relevant mechanism is the interest rate channel. However, our empirical specification controls for interest rate differentials, which may partly capture monetary policy reactions.

[20] These findings are in line with recent work showing that U.S. trade policy shocks generate an appreciation of the U.S. dollar (Cavallo et al., 2021). Moreover, Jeanne and Son (2024) examine how exchange rates respond to expected tariff changes. In addition to the theoretical model, using high-frequency tariff news from the 2018–2019 trade war, they find that the trade war led to a significant depreciation of the renminbi but had little effect on the U.S. dollar. This response reflects a first-moment effect.

6 Conclusion

This paper studies the effects of *geopolitical risk* (GPR) and *trade policy uncertainty* (TPU) shocks on exchange rates. We analyze both emerging markets (EM10) and advanced economies (G10) using panel local projections with data from 1985 to 2025.

We report two main findings. First, large global GPR shocks, defined as periods when the index exceeds the 90th percentile, lead to significant depreciation of G10 currencies relative to the U.S. dollar, reflecting a *flight-to-safety* dynamic. In contrast, EM10 currencies show weaker and delayed responses to global shocks but respond strongly and persistently to country-specific GPR shocks, consistent with *flight-from-risk* behavior. Second, conditional on the aggregate trade policy uncertainty index exceeding the 90th percentile, currencies across both G10 and EM10 countries depreciate against the U.S. dollar.

Our results highlight that not all uncertainty is created equal. While global shocks prompt capital to flight toward safety, country-specific shocks lead capital to flee from the country. This distinction is critical for understanding asymmetric spillovers and tailoring policy responses accordingly.

Advanced economy currencies are more vulnerable to global geopolitical risk shocks. Policymakers should closely monitor geopolitical tensions and coordinate responses that account for the safe-haven role of the U.S. dollar. Conversely, EM policymakers should focus on managing country-specific geopolitical tensions. These considerations should be incorporated into monetary policy, fiscal planning, and macro-financial surveillance frameworks.

Trade policy uncertainty shocks during major episodes significantly affect exchange rates in both advanced economy and emerging market countries. Although TPU remained relatively low after the establishment of the World Trade Organization (WTO), it has risen sharply over the past decade. As trade tensions and retaliatory actions may become more frequent, more variations may offer improved empirical identification of TPU shocks' effects on exchange rate dynamics.

In summary, uncertainty shocks can affect the macroeconomy through the exchange rate channel, posing additional risks to growth, fiscal sustainability, and financial stability. Future research should examine how these shocks interact with other macroeconomic factors such as inflation, additional financial market variables, and real economic activity. It is also worth revisiting the safe-haven role of the U.S. dollar in light of the recent 2025 "Liberation Day" announcement, where trade uncertainty did not trigger dollar appreciation (Hartley and Rebucci, 2025). Building theoretical models extending Jeanne and Son (2024) and Itskhoki and Mukhin (2021) could also help clarify the mechanisms behind the differential impact of GPR and TPU shocks on exchange rates.

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Appendix

A Appendix: Data

A.1 Data Sources

Risk and Uncertainty Measures

- **Global and Country-specific Geopolitical Risk:** Monthly indices from Caldara and Iacoviello (2022). We use the *Recent* GPR index, based on ten newspapers and available from January 1985.
- **Trade Policy Uncertainty:** Monthly index from Caldara et al. (2020), available from January 1960.

Our dataset thus covers the maximum available period from January 1985 to February 2025. However, due to variation in the availability of country-specific financial and macroeconomic variables, sample period may differ across specifications.

Financial Variables

- **Bilateral Exchange Rate:** Monthly end-of-period nominal series from Bank for International Settlements (BIS). Defined as the price of one country's domestic currency (LC) in terms of US dollar (USD), i.e., LC/USD. Thus, an increase indicates depreciation of the local currency.
- **Effective Exchange Rate (EER):** Monthly nominal/real EER from BIS. Calculated as a geometric trade-weighted average of bilateral rates. Thus, an increase indicates an appreciation of the local currency.
- **Central Bank Policy Rate (% per annum):** Monthly series from the International Financial Statistics (IFS) of the International Monetary Fund (IMF). Code: `FPOLM_PA`. For missing values, we use data from Refinitiv or Bloomberg.
- **CBOE Volatility Index (VIX):** Monthly series, not seasonally adjusted, from FRED.

Macro Variables

- **Industrial Production (SA):** Monthly seasonally adjusted index from IFS, code `AIP_SA_IX`.
- **Consumer Price Index (CPI):** Monthly index, all items, from IFS. Code: `PCPI_IX`.

B Appendix: List of Major Events

Table 1: Major Geopolitical Risk Events

Date	Event
April 1986	Bombing Libya
August 1990	Iraq Invades Kuwait
January 1991	Gulf War
January 1993	Airstrikes on Iraq
April 1999	Bosnian War
September 2001	September 11
March 2003	Iraq War
July 2005	London Bombings
March 2011	Intervention in Libya
March 2014	Russia Annexes Crimea
November 2015	Paris Terror Attacks
August 2017	US–North Korea Tensions
January 2020	US–Iran Tensions
February 2022	Russian Invasion of Ukraine
October 2023	Israel–Hamas War

Source: Based on information from Caldara and Iacoviello (2022), with additions by the authors.

Table 2: Major Trade Policy Uncertainty Events

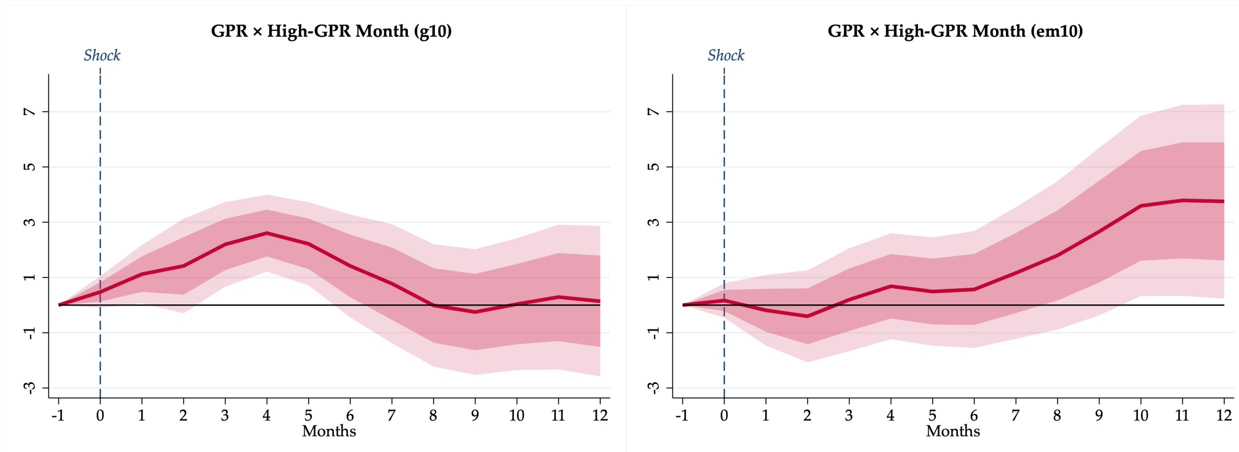
Date	Event
January 2017	Trans-Pacific Partnership (TPP) Withdrawal
March 2018	Trump: 10 percent tariff on Aluminum imports
April 2018	Return to TPP
June 2018	Extension of Tariffs
July 2018	US-China: retaliation
August 2018	US imposes 25 percent tariffs on 16 billion USD worth of Chinese goods
October 2018	EU-US trade dispute
December 2018	90-day trade truce with China
May 2019	Trump increased tariffs from 10 percent to 25 percent
June 2019	Trump on Mexico
August 2019	Trump on China
November 2024	Trump Tariff Threat
December 2024	Trump Tariff Threat
January 2025	Trump Tariff Threat
February 2025	Trump Tariff Threat

Source: Compiled by the authors from news outlets.

C Appendix: Statistical Significance of Threshold Effects

Figures 1 and 2 display the impulse responses associated with the interaction between the standardized GPR (TPU) shock and a high-GPR (high-TPU) dummy, defined as being above the 90th percentile of the historical distribution. These estimates capture the additional exchange rate response that occurs when geopolitical risk or trade policy uncertainty is unusually elevated.

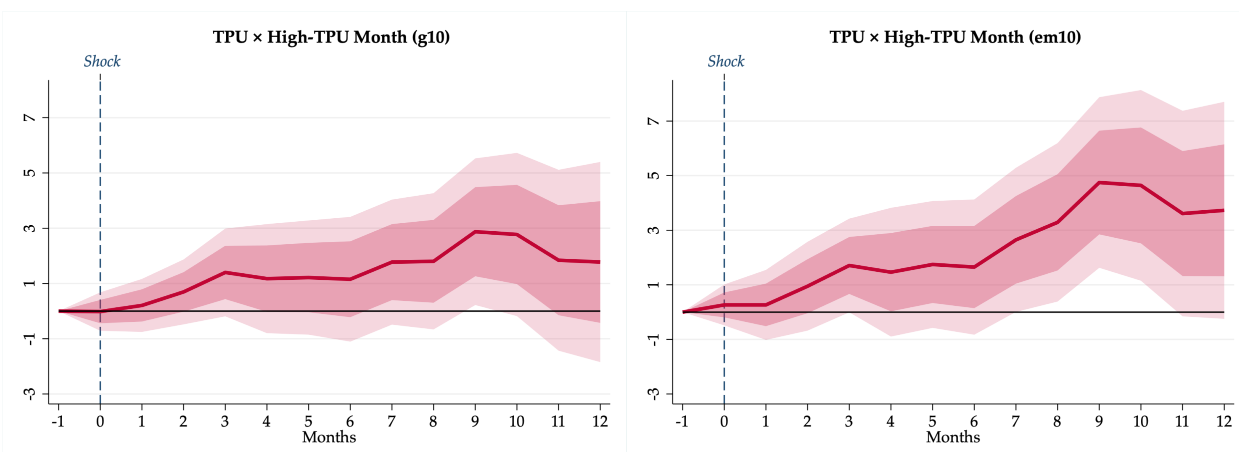
Figure 1: Coefficients for GPR $\times$ High GPR Interaction



(a) G10 currencies

(b) EM10 currencies

Figure 2: Coefficients for TPU $\times$ High TPU Interaction



(a) G10 currencies

(b) EM10 currencies

To formally assess the presence of a threshold effect, we conduct a Wald test for the joint significance of the interaction terms across all horizons from 0 to 12 months. The results are displayed in table 3.

For GPR shocks, we find that the interaction terms are jointly significant for G10 currencies, indicating that the exchange rate response to geopolitical risk shocks is state-dependent in advanced economies. In contrast, the same test for EM10 currencies yields a p-value of 0.325, suggesting that the response to GPR shocks in emerging markets is not statistically different across high- and non-high-GPR periods.

In the case of TPU shocks, the pattern reverses. The joint test for EM10 currencies produces a significant result, indicating that emerging markets experience a significantly different exchange rate response to trade policy uncertainty during high-TPU periods. For G10 countries, however, the joint test is not significant, suggesting limited evidence of threshold effects in the TPU-exchange rate relationship for advanced economies.

Table 3: Joint Significance Tests for Interaction Terms Across Horizons

Specification	**Country Group**	**Wald χ^2 (df = 13)**	**p-value**
GPR $\times$ High GPR (Top 10%)	G10	29.691	0.005
	EM10	14.723	0.325
TPU $\times$ High TPU (Top 10%)	G10	15.952	0.252
	EM10	29.929	0.005

Note: This table reports the results of Wald tests evaluating the joint significance of interaction terms across horizons 0 to 12 months in local projection regressions. A significant test indicates that the exchange rate response to shocks depends on whether the shock occurs during a high-risk period. All regressions include country fixed effects and Driscoll-Kraay standard errors with a 12-month lag.