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Sebnem Kalemli-Ozcan and Liliana Varela

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Centre for Economic Policy Research
33 Great Sutton Street, London EC1V 0DX, UK
Tel: +44 (0)20 7183 8801
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FIVE FACTS ABOUT THE UIP PREMIUM

Abstract

We uncovered 5 novel facts on Uncovered Interest Parity (UIP) deviations for 22 emerging markets (EM). The average UIP premium -or the excess currency return- is: 1) always positive with large time-varying volatility; 2) correlates negatively with capital flows; 3) co-moves with global risk sentiments. 4) Using realized exchange rate changes or expected changes from survey data delivers the same result. 5) Policy uncertainty is the underlying primitive, capturing the high-frequency-variation in the UIP deviations, since country and currency risk are both captured by the interest rate differentials. Only fact (3) holds for advanced countries' excess currency returns.

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Sebnem Kalemli-Ozcan - kalemli@umd.edu
University Of Maryland and CEPR

Liliana Varela - l.v.varela@lse.ac.uk
London School of Economics and Political Science and CEPR

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Interest rate volatility helps FX trading business
—James Gorman, Morgan Stanley, CEO

1. Introduction

A central concept in international macroeconomics and finance is the Uncovered Interest Parity (UIP) condition that equates returns to different currencies. Yet, from the pioneering works of Hansen and Hodrick (1980) and Fama (1984), a long literature, focusing on advanced economy (AE) currencies, has shown that this prediction fails in reality, and that high interest rate currencies tend to appreciate instead of depreciate –as implied by the UIP condition– and pay excess returns. The reasons behind excess currency returns in AEs, that can be both positive and negative over time, are still debated in the literature, and little is known about the failure of the UIP principle in EMs. Focusing on EM currencies and comparing them to AE currencies, we show that the origins of excess currency returns in EMs differ substantially from those in AEs.

We document five novel facts on the UIP deviations in EMs and compare them to those in AEs. First, the average UIP deviation across all the EMs is positive with large time-varying volatility. This fact implies that, although volatile, excess currency returns to EMs are always positive. This is different in AEs as excess currency returns change sign over time in G7 countries, as shown by Valchev (2020). Second the UIP deviations correlate negatively with capital flows, that is when capital flows out, the UIP premium increases in EMs, where there is no such relationship for AEs. Third, global risk sentiments correlate positively with the UIP deviations, such that risk-off episodes correlate with higher excess returns. This fact holds both for EMs and AEs. The fourth fact is that ex-ante expected excess returns and ex-post realized excess returns for EMs show similar patterns, unlike for AEs, where expected excess returns are zero, as shown by Froot and Frankel (1989). Fifth, the primitive factor underlying all the other EM facts we show is "policy uncertainty."

Let us explain the fifth fact in detail. The country-specific policy uncertainty affects global investors' currency returns from that country's currency. Uncertain government policies make the currency "risky" and, thus, global investors *expect ex-ante* to earn and *earn ex-post* positive excess returns from investing in such currencies, by requiring an excess return ex-ante, priced-in as the UIP risk premium. These returns are *systematic*, both on average and over time, and go beyond and above expected and realized exchange rate fluctuations as they are mainly driven by the interest rate differentials. The country-specific policy uncertainty is different than country risk (default risk) as it stems from volatility in a broad set of policies including monetary policy uncertainty, fiscal policy uncertainty, expropriation risk, and democratization risk. Even if a country has low external debt implying low sovereign default risk, it can observe a high UIP premium under policy uncertainty, paying positive excess currency returns. In this sense, the UIP premium is a currency risk premium for local currency external borrowing of EMs, paid ex-ante as a positive interest rate differential compensating for the possible future currency depreciations. The high frequency variation in the UIP premium is captured by the volatility in interest rate differentials, showing ex-ante pricing of currency risk by foreign investors.

An extensive literature argues that the UIP deviations relate to time-varying risk premia, that can be either global or country-specific or both. Our paper's contribution is to document robust unconditional and conditional evidence for the key determinant of time-varying country and currency risk and hence the UIP premium. We argue that policy risk is a better determinant of country/currency risk compared to default risk in terms of high frequency variation. EMs prefer to borrow in their local currency since when an adverse shock hits the domestic economy, the currency can depreciate but this will not affect government's debt burden when the debt is in local currency, lowering the default risk. However, risk-averse international investors charge a *UIP premium* for debt in local currency as such debt will be a depreciating asset for investors when the EMs got hit by adverse shocks. When foreign investors invest in EM assets in their own currency (FX), they only need to worry about the default premium, whereas when they invest in EM assets that is in EM currency, they also need to worry about the fluctuations in the value of that asset. As a result, pursuit of a credible monetary policy is often cited as a key factor behind foreign investors' increasing acceptance of local currency borrowing by EMs. We provide systematic evidence on this argument and show that it extends to credibility of other policies too. The implication is that countries can reduce their excess currency returns by reducing their policy uncertainty.

To fix ideas, let us first write the UIP premium (excess return to local currency asset) in logs as

$$\lambda_{t+h}^{e} = \underbrace{(i_t - i_t^{US})}_{\text{IR Differential}} - \underbrace{(s_{t+h}^{e} - s_t)}_{\text{ER Adjustment}}, \tag{1}$$

where i_t and i_t^{US} are the local and the U.S. short-term (12 month) deposit and/or money market interest rates,[1] and h is a 12-month horizon, E denotes expectations over the same

[1]One can also use short-term local currency government bond rates for each country. Using bond rates makes our results even stronger since the default risk in local currency short-term EM bonds is higher than the default risk in short-term U.S. government bonds in USD. We opt for using the closest rate possible to a "risk-free rate" on local currency borrowing/return to saving one can obtain in EM that is deposit/money market rates. This is consistent with the textbook UIP condition that is based on deposit rates to highlight the indifference between saving in local currency vs saving in foreign currency once expected changes in the

horizon and s is the exchange rate in units of local currency per USD. When $\lambda^e_{t+h} = 0$, the UIP condition holds. When $\lambda^e_{t+h} > 0$, the UIP condition does not hold and there are positive expected excess returns from investing in the EM currency for the U.S. investor. A positive UIP premium can be due to either interest rate differentials for the EM currency being higher than the expected depreciation in that currency or the currency is expected to appreciate and hence the 'ER Adjustment' term adds to the 'IR Differential' term instead of subtracting from it. We show below that for EM it is always the former, that is interest rate differentials (IR term) for EMs are always higher than the expected depreciations (ER term). It is also interesting to note that, investors expect further depreciation after an exogenous shock to interest rate differentials leading to depreciation of the EM currency, whereas, for AEs, they expect an appreciation in the future, when currency depreciates due to a similar shock to rate differentials.

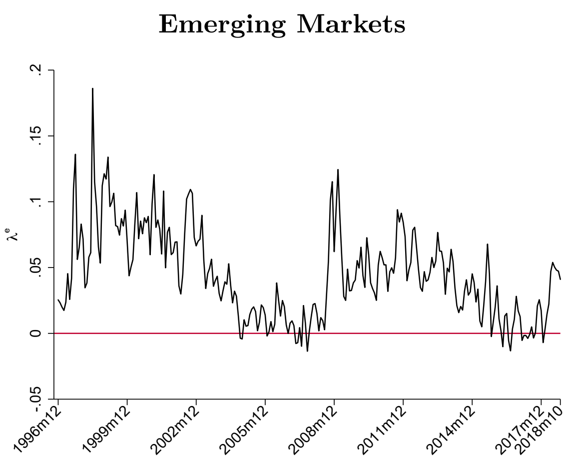
Calculating λ^e_{t+h} for a panel of EMs and AEs – over 1996m11-2018m12 and plotting in the top panel of Figure 1 shows that UIP is systematically positive –indicating persistent excess returns– in EMs. However, it is a mean-reverting process and holds on average in AEs, as λ^e_{t+h} fluctuates around zero (especially since early 2000s). We confirm these observations with Fama regressions at various horizons, and show that the UIP does not hold in EMs regardless of whether we measure the currency movement with *expected* or *realized* exchange rate changes. It is also noteworthy that these currencies never show the "wrong sign" Fama coefficient, i.e. these currencies do not appreciate (either in expectation ex-ante or in reality ex-post), but they depreciate as predicted by the UIP but never enough to offset the interest rate differentials.[2]

The bottom panel shows that the UIP premium comove with policy uncertainty in EMs only. We measure policy uncertainty by the Economic Policy Uncertainty (EPU) news-based index of Baker et al. (2016), which we extend to EMs. Given the volatile policies, foreign investors ask for "excess" compensation that goes over and above EM currency depreciations. A case in point is the nationalization of pension funds in Argentina in October 2008. We compare this to Brexit referendum in the United Kingdom in June 2016. The nationalization of pension funds in Argentina was taken as a surprise.[3] The results of the Brexit referendum

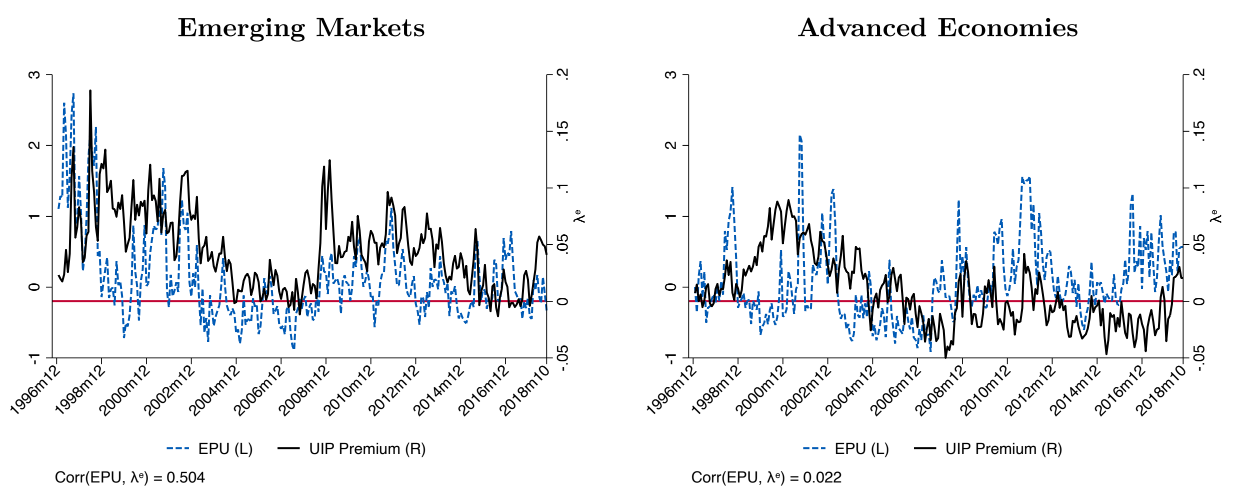
exchange rate is taken into account. It is important to use short-term rates as UIP holds in long-term bonds (e.g. Chinn 2006 and Lustig et al. 2019). Focusing on rates for less than 1 year maturity assets also helps us to separate UIP premia from term premia which can be high due to high inflation in EMs.

[2]It is instrumental to note that we work with floating currencies since under a fixed exchange rate regime, UIP premium cannot be measured given the equality between domestic and foreign interest rates by construction and minimal fluctuations in the exchange rate.

[3]As Webber (November 2008) in the *Financial Times* writes *"the sudden way in which the president announced the nationalisation plan, and its speedy course through Congress, have done nothing to calm fears among investors that the government will flout property rights (...).* In similar manner, senator Sanz said *"We have no doubt that here the right to private property is being violated. Not just for us but for society*



a) UIP Premium



b) UIP Premium and EPU Index

Figure 1. Policy Uncertainty and the UIP Premium

Note: This figure shows the EPU and the UIP premium at 12 month horizon for 33 currencies –21 EMs and 12 AEs– over 1996m11:2018m10. The UIP premium is measured using deposit and money market interest rates from Bloomberg and expectations of exchange rates from Consensus Forecast.

in June 2016 was also unexpected. Both events are characterized by a high degree of policy uncertainty and the UIP premium has increased in both countries, as shown in Figure 2. Interestingly, while the EPU rose much more in the U.K., the UIP premium increased "only" by 2 percentage points. The increase in the UIP premium in Argentina was much higher –6 percentage points–, suggesting a higher risk premium charged by foreign investors for the Argentina case versus the U.K. case, even if the Brexit entailed higher policy uncertainty.

Why is this the case? Figure 3 breaks down the UIP premium into its two components as shown in equation (1). In Argentina, the higher risk premium is solely captured by the higher

and the world, this is a clear confiscation".

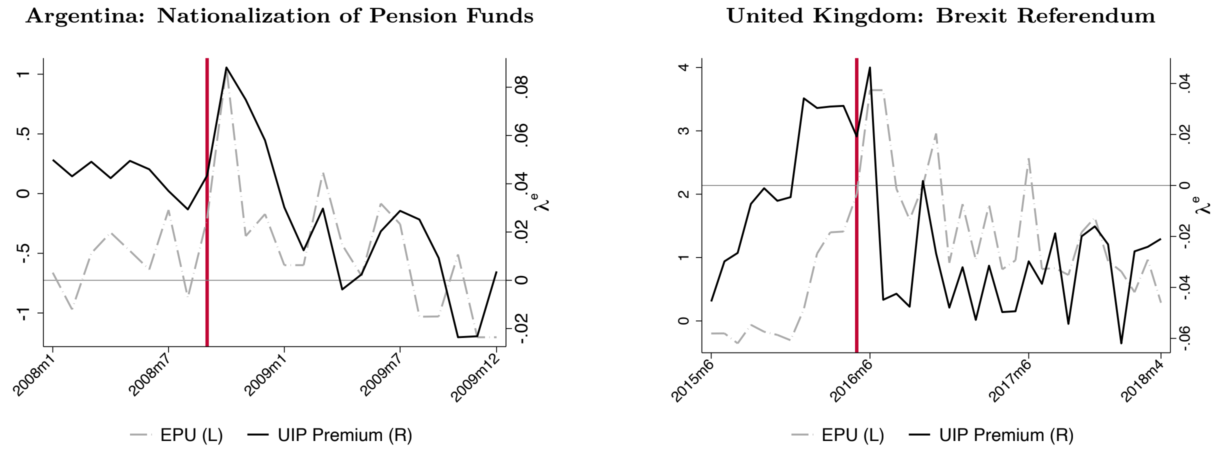


Figure 2. Economic Policy Uncertainty and UIP Premium

interest differentials, leading to higher IR term and the UIP premium. It is not surprising that there was a depreciation of peso at the time of announcement. What is interesting is that this led to further expected depreciation of peso, as opposed to expected appreciation, that increased the ER term, but less than the IR term, explaining the larger increase in the UIP premium. In the U.K., on the other hand, the interest rate differentials did not respond to heightened policy uncertainty. The higher UIP premium is instead driven by the exchange rate movement, where the original depreciation in pound led to an expected appreciation and hence a lower ER term and a higher UIP premium. In Argentina, higher policy uncertainty was priced in persistent interest rate differentials, while in the U.K. exchange rate fluctuations smoothed out the uncertainty.[4]

The paper is structured as follows. Section 2 summarizes the literature. Section 3 presents our data and measurement. Section 4 undertakes the benchmark analysis, robustness analysis and rules out alternative stories. Section 5 concludes.

2. Literature

Our paper contributes to three strands of the literature. First and foremost, we show the detrimental effect of policy uncertainty on real outcomes through foreign investors' pricing as they attach a higher risk premium to policy uncertainty in EMs. Since the pioneering work of Baker et al. (2016), who show that economic policy uncertainty reduces investment and

[4]The recent 2022 mini-budget episode in the U.K. bears a lot of resemblance to the Argentina case. Both policy uncertainty and UIP premium increased but this time U.K. government bond yield differentials exceed the immediate depreciation of the pound leading to expectations of further depreciations, an episode dubbed as the "moron premium" by investors due to uncertainty created by inconsistency among fiscal and monetary policies (The Economist, 2022; Ashworth, 2022; Giles and Parker, 2022).

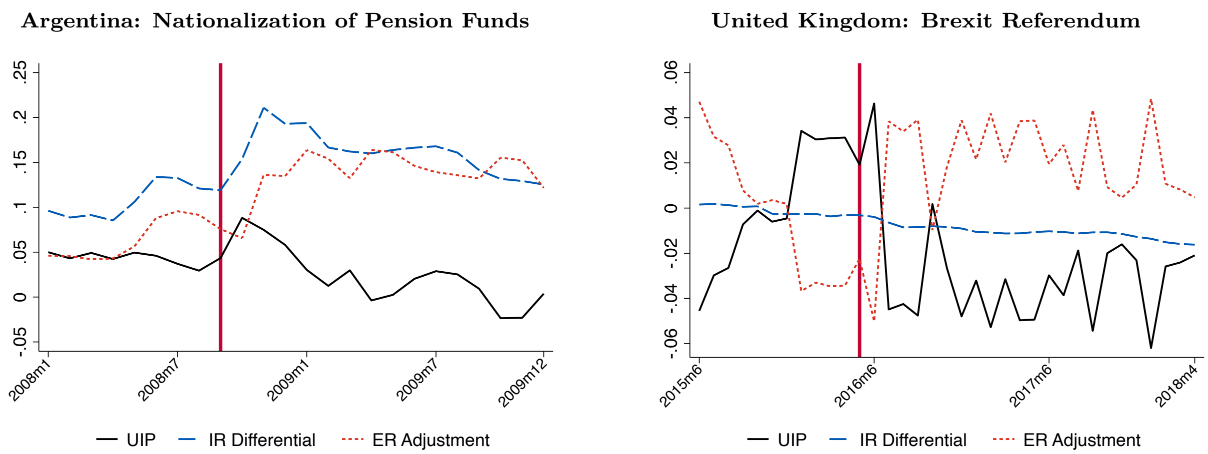


Figure 3. Economic Policy Uncertainty and UIP Premium Decomposition

output in the U.S., research has shown that policy uncertainty leads to inefficiencies through market pricing. For example, Cieslak et al. (2021) show that Fed-driven policy uncertainty reduces the impact of monetary policy on real outcomes due to market volatility. We are the first paper who studies how economic policy uncertainty affects global investors' risk sentiments, cross-border capital flows, and cost of borrowing for EMs.[5]

Our second contribution is to show that EM currencies always pay a UIP premium independently of whether we calculate a textbook UIP with survey data on expectations of exchange rates or we measure the UIP following the Fama literature with realized exchanges rates. The empirical Fama literature measures the UIP condition using realized exchange rates on the assumption of full information rational expectations (FIRE). In addition, this literature assumes that Covered Interest Parity (CIP) holds by equating the difference between forward rates and spot rates to interest rate differentials. This is why the Fama puzzle is also known as the forward premium/discount puzzle, as forward premium is associated with appreciations instead of depreciations. This literature, focusing mostly on advanced countries, shows that UIP does not hold with realized exchange rates under FIRE, but it holds when survey data for expectations is used. Some papers interpret these results as a result of deviations from FIRE (e.g Ito 1990, Chinn and Frankel 1994, Gourinchas and Tornell 2002, Bacchetta and Wincoop 2006, Burnside et al. 2007, Bacchetta et al. 2009, Stavrakeva and Tang 2018, Bussiere et al. 2018, and Candian and De Leo 2021), whereas others argue as excess returns are predictable, they must be associated with risk averse investors (e.g Backus

[5]Our findings might be confused with the classical "peso problem" but they are quite different. The peso problem is about the credibility of a fixed exchange regime. For example, during 1970s, investors expected a depreciation of Mexican peso that did not materialize and, hence, created a gap between the U.S. and the Mexican interest rates. Our results are on the contrary about floating exchange rate regimes and how uncertainty surrounding non-exchange rate monetary, fiscal and regulatory policies lead to a UIP premium.

et al. 2001, Lustig and Verdelhan 2007, Burnside et al. 2011, Sarno et al. 2012, Colacito and Croce 2013, Hassan and Mano 2019, Kremens and Martin 2019). Yet another group of papers argue that risk-neutral investors might be subject to financial frictions limiting the arbitrage as in Gabaix and Maggiori (2015), Gopinath and Stein (2018), Akinci and Queralto (2018), Basu et al. (2020), Itskhoki and Mukhin (2021), and Bianchi and Lorenzoni (2021). Since we get same results with realized exchange rates and expected exchange rates in EMs, contrary to the AE literature cited above, we investigate investors' exchange rate expectation responses to policy uncertainty shocks (both for consensus expectations and investor level expectations) and find that policy uncertainty affects the expectations of exchange rate and realized exchange rates in a similar way.

Our third contribution is to overshooting literature (e.g. Dornbusch 1976, Eichenbaum and Evans 1995). This literature shows that exchange rate overshoots its equilibrium level after the initial interest rate shock, a violation of the UIP condition. None of the puzzles associated with this literature that are shown for advanced countries, such as delayed overshooting and predictability reversal puzzles, are present for emerging countries as we show. On the contrary, exchange rates actually depreciate after interest rate shocks and expected to depreciate further with no delay, no overshooting and no reversal in EMs. They go back to original level very slowly, given the persistence of depreciation expectations. By instrumenting interest rate shocks with policy uncertainty, we also show all these results causally.

3. Data and Measurement

We employ monthly data from International Monetary Fund (IMF), Bloomberg and Consensus Economics to construct the UIP. We obtain the deposit interest rates, money market rates and government bond rates from Bloomberg, the spot exchange rate from International Financial Statistics (IFS) from the IMF, and the exchange rate forecasts data comes from Consensus Economics. This survey provides information on expected exchange rate at 12-month horizon that we use to construct the UIP at this maturity. We additionally conduct robustness tests for UIP at 3 months maturity. For the Euro Area, we employ individual series for countries before they join the Euro and, after they join, we use Euro level series. We measure actual inflation with CPI and for expected inflation we use survey data from Consensus Economics. We further use CDS data for default risk from Bloomberg and default episodes from Reinhart et al. (2021).

To proxy for domestic policy uncertainty for each country, we employ different methodologies. We first compute the EPU index for our sample following Baker et al. (2016). This index is constructed by counting the number of journal articles containing words reflecting economic policy uncertainty and, as such, is a good proxy for global investors' risk on government and central bank policies. To narrow down the factors more relevant creating policy uncertainty, we then complement our analysis with the indicators from International Country Risk Guide (ICRG), which –as detailed in the relevant sections– reports detailed information of the components of policy risk for each country over time. We investigate monetary policy uncertainty by studying inflation forecast errors using inflation expectations and realized inflation.

We employ the VIX index to proxy for global risk perception, which we obtain from the Federal Reserve Economic Data (FRED). We use standard capital flows data from IMF, IFS. Following Miranda-Agrippino and Rey (2020), we interpolate all capital flow series to monthly frequency (see Appendix A.1 for details).

Our panel is for 34 currencies, 12 AEs and 22 EMs, over the period 1996m11–2018m12, for which we have information for all variables to construct the UIP condition and information about our policy risk variables. Our sample excludes country-month observations when there is a fixed exchange rate regime based on the classification of Ilzetzki et al. (2017), as in these cases the exchange rate does not move or covary with the interest rate by construction. Appendix A discusses in detail the construction of the series and samples.

3.1. Survey Data on Exchange Rate Expectations and the UIP Premium

Consensus Forecast conducts a monthly survey about expectations on future exchange rates at 1, 3, 12 and 24 months horizons of major participants in the foreign exchange rate market. Appendix A.2 discusses thoroughly the details of this dataset. The coverage is extensive and includes 55 forecasters on average for AEs' currencies. Some currencies –as the Euro, Japanese Yen and UK Pound– include more than a hundred of forecasters in several periods. Albeit with a lower number of forecasters, the survey is also comprehensive in EMs and includes on average 17 forecasters per currency. Using this data we measure the UIP premium as we stated in the introduction, equation (1).

The forecasters interviewed are typically global banks and investors that actively participate in the FX market. Notably, these global agents are present in both AEs and EMs and, hence, provide together their forecasts for both sets of economies. Having the same set of agents surveyed for both set of economies is important because it implies that different results between AEs and EMs should not arise from heterogeneity in the type of forecasters among these economies. To provide an example of the forecasters surveyed, in September 2012, for the Japanese Yen (96 forecasters) these included: Goldman Sachs, HSBC, JP Morgan, Citigroup, Bank of Tokio Mitsubishi, IHS Global Insight, General Motors, ING

Financial Markets, Barclays Capital, and Morgan Stanley. These ten forecasters were also surveyed for the Euro and the UK pound, which included a total of 103 and 81 forecasters that month. Forecasters of EM currencies also included these group of global banks. For example, the main forecasters of the Korean Won (22 forecasters) were: Goldman Sachs, HSBC, JP Morgan, Citigroup, Bank of Tokio Mitsubishi, IHS Global Insight, General Motors, ING Financial Markets. Similarly, the Turkish Lira (28 forecasters) included the same list of forecasters. Other EM currencies (as the Argentinean Peso, Brazilian Real, Chilean Peso, Colombian Peso, Hungarian Forint, Indian Rupee, Malaysian Ringgit, Mexican Peso, Polish Zloty and Russian Rouble) also included these forecasters, as well as other global investors like Barclays Capital, BNP, ABN Amro, Allianz, Royal Bank of Canada, UBS and Royal Bank of Scotland.

3.2. Economic Policy Uncertainty and Policy Risk Variables

We construct the EPU index following the methodology of Baker et al. (2016). In particular, we use the online platform Factiva, which reports journal articles of main international newspapers. Our list of words follows Baker et al. (2016) to which we add four new words to capture additional policy uncertainty characteristic of emerging markers (i.e. capital controls, expropriation, nationalization and corruption). Because we are interested in the perspective of the U.S. international investor, we focus on news reported in international newspapers (such as Financial Times, Reuters and the Wall Street Journal, among others).

We construct the EPU index for each currency and month as follows, $EPU_{it} = X_{it}/\frac{1}{12}\sum_{j=1}^{12} Y_{t-j}$, where X_{it} is the number of articles referring to EPU episodes in country i at month t, $Y_t = \sum_i Y_{it}$ is the total number of articles written at month t (i.e. the sum of articles across countries), and Y_{it} is total number of articles referring to country i at month t. We then normalize the index to 100 by estimating $EPU^N_{it} = \frac{EPU_{it}}{\overline{EPU}_i} \times 100$, where $\overline{EPU}_i = \frac{1}{T}\sum_{t=1}^{T} EPU_{it}$ is the average of EPU news for each country across time. Appendix A.3 reports a detailed description of the methodology to create this index.[6]

The other data set we employ, ICRG, breaks down a country's policy risk into several components. We use *composite country risk* using the composite risk index, which includes political, economic and financial risks. Political risk contributes 50% to the composite index,

[6]Our methodology to construct the index follows Barrett et al. (2020) and is an adaptation of Baker et al. (2016) for studies based on international newspapers, i.e. where there is less availability of local newspapers. In particular, the difference with Baker et al. (2016) is that their index includes a non-minor proportion of local newspapers, which allows them to first compute the share of news for each individual newspaper within a country and then add up the total sum for each country. Instead, Barrett et al. (2020) methodology adds the total number of articles in a country and pools all the newspapers together for each country.

and financial and economic risks contribute to the remaining 50%. To pin down the main elements entailing policy risk, we focus on two key elements of the political risk component that capture investors' sentiments: *government policy risk* and *confidence risk*. Government policy risk captures expropriation risk, risk of not being able to repatriate profits and government accountability, where this later evaluates different types of democratic systems and the degree of freedom that a government has to impose policies to its own advantage.[7] Confidence risk assesses consumer confidence and unemployment (see Appendix A.4 for more details).[8]

3.3. CIP Deviations, US Convenience Yield and the US Treasury Liquidity Premium

We construct variables that aim to capture the predominant role of the US dollar in financial markets. Since we calculate each country UIP deviation vis-à-vis the US dollar, it is important to separate our story from stories that center on the special role of the US as a country and currency. We describe each of these variables and how they are related to the UIP premium in detail in our empirical analysis in subsequent sections. We now briefly outline how we construct them from the data.

We start by defining the Covered Interest Parity (CIP). Omitting the country subscript for simplicity, the CIP deviation at time t for a given country relative the US at horizon h, λ_{t+h}^{CIP}, is

$$\lambda_{t+h}^{CIP} = (i_t - i_t^{US}) - (f_{t+h} - s_t), \tag{2}$$

where i_t is an interest rate in the home currency, i_t^{US} is the US interest rate, f_{t+h} is a (log) forward exchange rate h periods ahead, and s_t is the (log) spot exchange rate. Higher CIP deviations in our context means that investors can go short in the US dollar and long in the home currency, thus generating arbitrage profits. In a nutshell, borrowing in dollars is relatively cheap when compared to a synthetic US dollar transaction ($i_t + s_t - f_{t+h}$). The only difference between the CIP premium given in the above equation and the UIP premium given in equation (1) of introduction is using forward rates versus expected exchange rates.

Using different interest rates — such as LIBOR, government bonds, deposit rates or

[7]In recent work, Azzimonti and Mitra (2022) also relate government accountability with a country's default probability.

[8]These two indexes come directly from the ICRG data. Our measure of government policy risk is the average of the variables investment profile and democratic accountability, and our measure of confidence risk is the socioeconomic risk variable. We pool investment profile and democratic accountability together as, despite both variables capture different types of risk, they are highly correlated in data.

money market rates — we can capture different forms of equation (2). One particularly important concept to capture is the so-called US dollar convenience yield. To that end, let the *Convenience Yield* of the US dollar relative to a given country i at time t be $Convenience\ Yield_{it} = i^{L}_{i,t} - i^{US,L}_{t} - (f_{i,t+1} - s_{i,t})$, where $i^{L}_{i,t}$ is the LIBOR rate in country i, $i^{US,L}_{t}$ is the LIBOR rate in the US, $f_{i,t+h}$ is the (log) forward (one year ahead) exchange rate and $s_{i,t}$ is the spot exchange rate. Both exchange rates are in units of home currency per US dollar. This convenience yield is no more than a LIBOR-based CIP. Since US convenience yield is always regarded as a global factor, we follow the literature and average these convenience yields across G10 countries[9]. Hence, the convenience yield for the US dollar is $Convenience\ Yield_{t} = \sum_{i \in G10} Convenience\ Yield_{it}/9$. Defined this way, the convenience yield on the US dollar (relative to G10 countries) measures how much investors are willing to forego higher returns in G10 in exchange for higher safety provided by the US dollar. Additionally, we measure the *Liquidity Premium* on US government bonds as the spread between 12-month government bond and the LIBOR rates in the home economy and in the US. Formally, $Liquidity\ Premium_{it} = i^{L}_{i,t} - i^{G}_{i,t} - (i^{US,L}_{t} - i^{US,G}_{t})$, where $i^{G}_{i,t}$ and $i^{US,G}_{t}$ are interest rates on government bonds in the home country and the US, respectively. As with the convenience yield, we construct a single measure of liquidity premium by averaging across G10 countries, since this premium is only about the US treasuries: $Liquidity\ Premium_{t} = \sum_{i \in G10} Liquidity\ Premium_{it}/9$. Finally, we define

$$Convenience\ Yield/Liquidity\ Premium_{t} = Convenience\ Yield_{t} + Liquidity\ Premium_{t},$$

which consider the role of the US dollar in financial market both as a safe asset and also as a liquidity source.

3.4. Summary Statistics

We present summary statistics of the UIP premium and its components of equation (1). Confirming our observation of Figure 1, the column 1 of Panels A and B in Table 1 shows that there is a striking contrast between AEs and EMs. While in EMs there is a positive UIP premium that reaches – on average – 4 percentage points, the UIP premium in AEs is small and lower than 1 percentage point. The median values presented in column 2 confirm this finding.

The decomposition between the interest rate differential and the exchange rate adjust-

[9] The G10 countries we consider are Australia, Canada, Germany, Japan, New Zealand, Norway, Sweden, Switzerland, and United Kingdom.

Table 1. Summary Statistics

	Mean	Median	Std. Dev.	p25	p75	Observations
	(1)	(2)	(3)	(4)	(5)	(6)
	Panel (A): Emerging Markets					
UIP Premium						
UIP Premium	0.042	0.035	0.060	0.006	0.070	3,397
Interest Rate Differential	0.051	0.035	0.079	0.012	0.066	3,397
Expected Exchange Rate Adjustment	0.010	0.004	0.063	-0.026	0.034	3,397
Other variables						
Capital Inflows/GDP	0.071	0.017	0.558	-0.004	0.047	3,290
EPU	-0.001	-0.293	0.974	-0.639	0.335	3,397
Expected Inflation Differential	0.024	0.016	0.025	0.007	0.037	2,605
Sovereign Default Risk	0.018	0.013	0.018	0.008	0.020	2,297
Composite Risk	-0.394	-0.433	0.443	-0.712	-0.134	3,397
Government Policy Risk	-0.583	-0.617	0.615	-1.066	-0.267	3,397
Confidence Risk	-0.278	-0.346	0.713	-0.772	0.293	3,397
	Panel (B): Advanced Economies					
UIP Premium						
UIP Premium	0.009	0.007	0.046	-0.022	0.035	2,260
Interest Rate Differential	0.003	0.002	0.022	-0.009	0.016	2,260
Expected Exchange Rate Adjustment	-0.006	-0.003	0.050	-0.036	0.028	2,260
Other variables						
Capital Inflows/GDP	0.059	0.037	0.108	0.003	0.092	2,212
EPU	0.024	-0.174	0.859	-0.578	0.371	2,260
Expected Inflation Differential	-0.003	-0.002	0.008	-0.007	0.002	1,968
Composite Risk	-1.183	-1.179	0.400	-1.421	-0.936	2,260
Government Policy Risk	-1.283	-1.466	0.348	-1.566	-1.166	2,055
Confidence Risk	-1.448	-1.411	0.459	-1.836	-1.198	2,055
	Panel (C): Global US Specific Variables					
Convenience Yield/Liquidity Premium	0.001	0.001	0.002	-0.000	0.002	264
Convenience Yield	0.001	0.001	0.002	0.000	0.003	264
Liquidity Premium	-0.000	0.000	0.003	-0.000	0.003	264
VIX	2.945	2.953	0.352	2.655	3.175	264

Note: 34 currencies, 22 EMs, 12 AEs. Period 1996m11:2018m10. Source: Consensus Forecast, Bloomberg, FRED, IMF, ICRG. Capital Inflows/GDP is the ratio of capital flows to GDP. EPU measures economic policy uncertainty based on newspapers articles search. Expected inflation differential compute the difference between expected inflation in the home country relative to the US. Sovereign default risk refers to Credit Default Swap (CDS). The Convenience Yield is an average of LIBOR-based CIP deviations among G10 countries. The Liquidity Premium measures the difference between the spread in LIBOR rates and government bond rates among G10 countries relative to the US dollar. Composite, government policy and confidence are as defined in the text.

ment terms also confirms our previous finding of Figure 4. The second and third lines of Panel A show that, in EMs, the mean interest rate differential accounts for the bulk of the UIP premium, while the exchange rate adjustment term is negligible. Instead, in AEs (shown in Panel B), the mean interest rate differential and exchange rate adjustment terms are closed to each other, which is consistent with a UIP premium being on average close to zero in these economies. All other variables such as capital flows show quite a bit of variation. We report US specific global variables in the last panel.

4. The Empirical Analysis: The Role of Global and Local Uncertainty

In this section, we present a conceptual framework to illustrate how global and local factors can drive the dynamic UIP premium (Section 4.1). Based on this framework, we then conduct out empirical analysis estimating panel regressions (Section 4.2) and local projections (Section 4.3).

4.1. Modelling the UIP Premium

If the UIP condition does not hold, the UIP premium would be different from zero:

$$\lambda^e_{t+h} = (i_t - i^{US}_t) - (s^e_{t+h} - s_t) \neq 0$$

To assess the drivers of this UIP wedge, we follow Obstfeld and Zhou (2022) and break it down into two main components:

$$\lambda^e_{t+h} = \underbrace{\tilde{\gamma}^{US}_t}_{\text{convenience yield/liquidity premium}} + \underbrace{\tilde{\rho}_t,}_{\text{excess returns}} \tag{3}$$

where $\tilde{\gamma}^{US}_t$ is a convenience yield or liquidity premium of a dollar-denominated asset, which arises from the unique role of USD in the world economy. As we calculate each of our country's/currency's UIP premium vis-à-vis the USD, this is relevant for us if there is a common factor in each UIP premium due to specific role of USD. $\tilde{\rho}_t$ is a term that captures "excess returns" due to risk averse global investors and/or financial frictions. This term can be driven by both global and local factors. Obstfeld and Zhou (2022) call this $\tilde{\rho}_t$ term the "dark matter" and highlight the empirical challenge of finding counterparts in the data to measure each factor underlying excess returns, a task we undertake in our paper.

The literature models $\tilde{\gamma}^{US}_t$ as composed of two forces that relate to safety of USD assets and liquidity of USD assets: $\tilde{\gamma}^{US}_t = \gamma^{\text{US}}_t + \gamma^{\text{US,GOV}}_t$. The first force, γ^{US}_t, is the convenience yield of a USD asset arising from US dollar's unique position as the reserve currency in the world economy (Krishnamurthy and Lustig 2019, and Jiang et al. 2021*a*). The second force, $\gamma^{\text{US, GOV}}_t$, arises from the liquidity advantage of issuing safer government bonds, due to very low default risk of US government, compared to USD corporate bonds with default and credit risk and hence lower liquidity (Du et al. 2018*b*, and Engel and Wu 2022).

On the excess returns, $\tilde{\rho}_t$, the literature models this wedge as arising from either financial frictions limiting risk-neutral financial intermediaries' arbitrage (Gabaix and Maggiori 2015), or risk averse investors (Kouri et al. 1978, Farhi and Gabaix 2016, Verdelhan 2010), or a combination of both risk averse investors and financial frictions (Itskhoki and Mukhin 2021). It is worth remarking that excess returns stemming from financial frictions, risk aversion or both always refer to global financial intermediaries. Most of this literature treats both financial frictions and risk-aversion from the global investor side as a global factor.

Yet this approach leaves the question on the "primitives" behind the global investors' changing risk sentiments unexplained. Why do we see different effects of risk-on and risk-off episodes on different countries? For example, if global shocks were the only source of risk –for example, when US monetary policy tightens, the USD appreciates and global financial conditions tighten– why global financial intermediaries would tighten their investments heterogeneously across countries? If a global financial intermediary's balance sheet gets constrained, why would the same intermediary price Mexico vs Canada assets differently and change their portfolio holdings heterogeneously?

We argue that, using data on EMs, we can further decompose the excess returns term into global and local factors, and disentangle country-idiosyncratic financial risks from common global financial shocks. In this way, we can help explaining the link between financial frictions/uncertainty specific to each country and the associated risk aversion/financial frictions of global intermediaries. In particular, excess returns –$\tilde{\rho}_t$– can be decomposed into two terms:

$$\tilde{\rho}_t = \rho_t^{\text{US}} + \rho_t^{\text{COUNTRY}}. \tag{4}$$

The global factor, ρ_t^{US}, captures risk sentiment of global investors on the global economy (Miranda-Agrippino and Rey 2020). This can also relate to financial frictions on global intermediaries, where both can further be a function of US monetary policy. The local factor ρ_t^{COUNTRY} captures country-specific frictions that can arise from economic policy uncertainty affecting global investors' expected returns. By this means, the local factor shapes the risk sentiment of global investors towards a given country (Kalemli-Özcan 2019). More precisely,

$$\rho_t^{\text{COUNTRY}} = f(\rho_t^{\text{EPU}}). \tag{5}$$

We can then re-write the UIP premium in equation (3) as

$$\lambda^e_{t+h} = \underbrace{\gamma^{US}_t}_{\text{US convenience yield}} + \underbrace{\gamma^{US,GOV}_t}_{\text{US liquidity premium}} + \underbrace{\rho^{US}_t}_{\text{risk averse/limited absorption investor}} + \underbrace{\rho^{EPU}_t}_{\text{local frictions/country-risk sentiment}}. \quad (6)$$

The local factor ρ^{EPU}_t captures uncertainty about global investors' returns over unexpected government policies. These policies are broad and can cover a wide range of measures from capital controls to sovereign default and expropriation risk. To characterize ρ^{EPU}_t, we can break it down into two broad categories that cover different types of risks that global investors face when investing in EMs: credit risk ($\rho^{\text{credit risk}}_t$) and policy risk ($\rho^{\text{policy risk}}_t$).

$$\rho^{EPU}_t = \rho^{\text{credit/default risk}}_t + \rho^{\text{policy risk}}_t. \quad (7)$$

We think of credit risk as arising from sovereign, bank or firm default risk, expropriation of foreign assets, nationalization of deposits, etc., all sorts of events affecting the repayment probability of foreigners. Policy risk could be thought as arising from uncertain regulations and policies that leads to large fluctuations in the value of currency such as inconsistent fiscal and monetary policies, central bank credibility and so on.

After these considerations, equation (6) could be extended to

$$\lambda^e_{t+h} = \gamma^{US}_t + \gamma^{US,GOV}_t + \rho^{US}_t + \rho^{\text{credit/default risk}}_t + \rho^{\text{policy risk}}_t. \quad (8)$$

The first two terms of equation (8) could arise in efficient markets in which risk-neutral agents arbitrage between currencies and instruments with some preference for USD assets. The third term can be due to risk-averse global agents who prefer USD safety above all and/or some other regulatory friction on global risk-neutral USD investors. The last two terms of equation (8) arise from country-specific frictions and country-specific risk sentiments. In Section 4.2, we describe our empirical analysis and how we proxy each term.

4.2. UIP Premium Panel Regressions

To estimate equation (6), we follow the existing literature and proxy γ^{US}_t, convenience yield, with USD basis, which is nothing but log deviations from the covered interest rate parity (Du and Schreger 2021). $\gamma^{US,GOV}_t$ is a similar convinience/safety yield but only focusing on US government bonds (not all USD assets) and hence dubbed as the liquidity premium of US treasuries. As discussed by Obstfeld and Zhou (2022), γ^{US}_t and $\gamma^{US,GOV}_t$ can be highly correlated and, hence, be difficult to disentangle one from another. In fact, these authors show that when both variables are included together only γ_t^{US} is significant in the short and medium terms.[10] Given the insignificance of $\gamma_t^{US,GOV}$ in the short term and our short-term focus that is necessary to study the UIP premium, we focus on the sum of these variables as described above.

As discussed above, ρ_t^{US} can arise from either global risk sentiment or the financial constraints of global intermediaries, or both. We then use two variables to proxy for it. To capture global risk sentiment, we employ the VIX, as in Rey (2013), di Giovanni et al. (2021) and Miranda-Agrippino and Rey (2020), among others. To capture the financial constraints of global intermediaries, we use capital inflows over GDP because the literature has shown theoretically that capital inflows are related to financial constraints of global intermediaries (Gabaix and Maggiori 2015, and Basu et al. 2020). Since capital flows are at the country-month level, they will also capture country-specific financial frictions. We use our EPU index to proxy ρ_t^{EPU} for country-specific policy uncertainty that leads to differential risk sentiment of global investors for each country. We estimate panel regressions with currency/country-fixed effects, where we introduce the covariates sequentially to understand the effect of each factor.[11]

We start our analysis by taking equation (7) to the data, which can be estimated in a linear-regression as follows:

$$\begin{aligned} Y_{it} = {} & \gamma_1 \text{Convenience Yield/Liquidity Premium}_{t-1} + \gamma_2 \log(\text{Capital Inflows/GDP}_{it-1}) \\ & + \gamma_3 \log(VIX_{t-1}) + \gamma_4 \, \text{EPU}_{it-1} + \mu_i + \varepsilon_{it}, \end{aligned} \tag{9}$$

where i is currency/country, t is month, Y_{it} is the UIP premium, the interest rate differential term or the exchange rate adjustment term, i.e. $Y_{it} = \{\lambda_{it+h}^e, \text{IR Diff}_{it}, \text{ER Adj}_{it+h}\}$, and the independent variables are lagged one month. μ_i are currency fixed effects that allow assessing the UIP condition 'within' currencies/countries across time. We double cluster the standard errors across at month and country/currency level. To assess whether our results change when using *ex ante expectations* from survey data or *ex-post realizations* to compute exchange rate changes, we present the results for (expected) and realized UIP premium in parallel, where we called the former just UIP Premium and latter Realized UIP Premium.[12]

(i) Drivers of the UIP Premium in EMs. Column 1 shows that higher capital

[10] Obstfeld and Zhou (2022) find that $\gamma_t^{US,GOV}$ is only significant for 10 year treasury bonds.
[11] Note that currency and country is the same as we treat Euro area countries as a group.
[12] We have to drop Colombia, going down to 21 EM as EPU index is not available for Colombia.

inflows associate with a decrease in the UIP premium. The estimated coefficient implies that one percentage point increase in capital inflows over GDP leads to a 0.5 percentage points decrease in the UIP premium, for the average EM. By the same token, a decrease in capital inflows (or capital outflows by foreign investors) will lead to an increase in UIP premium. As the average UIP premium is 4 percent in EMs, a change of 0.5 percentage points is an economically significant effect.

Columns 2 adds one of the main global factors used in the literature, convenience yield/liquidity premium as a control. This comes in positive, as expected, since it indicates cheaper USD borrowing means more expensive borrowing in other currency and hence the positive coefficient. Note that this variable can be capturing both risk averse global financial intermediaries and/or liquid and safe dollar assets. To separate the risk story, we next include VIX, the common risk aversion and volatile measure for the global financial markets.

In column 3, when we include the VIX to assess the role of risk sentiment of global investors, the continence yield/liquidity premium term becomes non-significant. This means that safety of the US dollar and risk aversion of the global intermediaries are the two sides of the same coin. The coefficient on the VIX is positive and highly statistically significant, suggesting that higher global risk associates with higher UIP premia in EMs. In particular, an increase in the VIX from p25 to p75 leads to 3 percentage points higher UIP premium. Another way to look at this coefficient is considering the increase during the Global Financial Crisis. If the VIX increases as it did after the collapse of Lehman Brothers (2008m8-2008m12) by 150%, the UIP premium in EMs would increase by 9 percentage points. It is worth remarking that global uncertainty substantially increases the explanatory power of the regression, by raising the R^2 by 12 percentage points.

Is there anything else to explain? Column 4 assesses local risk factors by adding the EPU index as a covariate. The coefficient is positive and highly statistically significant indicating that increases in a country's policy uncertainty associate with higher a UIP premium. The effect is also economically important. The coefficient implies that if EPU risk increases from the p25 to p75 (for example, from China to South Korea in 2016m10), the UIP premium raises by one percentage point. Importantly, once we include the EPU index into the regression, the coefficient for capital inflows drops substantially in size, indicating that policy uncertainty captures part of the effect of capital inflows. Idiosyncratic policy uncertainty affects the UIP premium *directly* and is the reason for low absorption capacity of the global intermediaries of EM capital. Put it differently, what the literature models as the financial constraint of the global intermediary in terms of low absorption of EM capital, can be explained by risk averse international investors charging a higher UIP premium ex-ante. Thus, we interpret

Table 2. UIP Premium in Emerging Markets

Panel A: Emerging Markets

	(i) Expected UIP Premium				(ii) Realized UIP Premium			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflows/GDP$_{it-1}$	-0.005***	-0.005***	-0.002***	-0.001*	-0.023***	-0.023***	-0.021***	-0.020***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.004)	(0.003)	(0.003)	(0.003)
Convenience Yield/Liquidity Premium$_{t-1}$		3.917***	0.168	0.163		7.269**	4.154	4.147
		(1.238)	(1.065)	(1.014)		(3.126)	(3.894)	(3.845)
$\log(VIX_{t-1})$			0.058***	0.053***			0.049*	0.041
			(0.008)	(0.008)			(0.026)	(0.026)
EPU_{it-1}				0.010***				0.012**
				(0.003)				(0.006)
Obs.	3288	3288	3288	3288	3288	3288	3288	3288
Number of Countries	21	21	21	21	21	21	21	21
R^2	0.0016	0.0280	0.1497	0.1764	0.0057	0.0202	0.0336	0.0405
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Panel B: Advanced Economies

	(i) Expected UIP Premium				(ii) Realized UIP Premium			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflows/GDP$_{it-1}$	0.019	0.024	0.035	0.034	-0.045	-0.044	-0.017	-0.017
	(0.032)	(0.028)	(0.025)	(0.025)	(0.049)	(0.048)	(0.046)	(0.046)
Convenience Yield/Liquidity Premium$_{t-1}$		3.704***	1.810	1.687		0.569	-4.009	-3.998
		(1.356)	(1.270)	(1.266)		(3.065)	(3.196)	(3.214)
$\log(VIX_{t-1})$			0.030**	0.032**			0.073***	0.073***
			(0.013)	(0.013)			(0.022)	(0.024)
EPU_{it-1}				-0.002				0.000
				(0.002)				(0.005)
Obs.	2209	2209	2209	2209	2209	2209	2209	2209
Number of Countries	12	12	12	12	12	12	12	12
R^2	0.0020	0.0418	0.0916	0.0938	0.0016	0.0017	0.0458	0.0458
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: * p < 0.10 ** p < 0.05 *** p < 0.01. Currency-time two-way clustered standard errors in parentheses. 21 EMs currencies. Period 1996m11:2018m10. Capital inflows are measured as changes in gross debt liabilities. The UIP premium and the exchange rate adjustment term are measured using expected exchange rate changes from Consensus Forecast. Inflows/GDP$_{it-1}$ are capital inflows into the country as a fraction of GDP. VIX is a proxy for global risk perception. Convenience yield/Liquidity Premium is the sum of USD convenience yield and its liquidity premium averaged across G10 countries. EPU_{it} is the economic policy uncertainty index. Both Inflows/GDP$_{it-1}$ and EPU vary at the country-time level. VIX and Convenience yield/Liquidity premium vary at the time level.

this evidence as country-specific policy uncertainty being the "primitive" for global financial intermediary frictions.

To check that our results are not an artefact of the survey data on exchange rate expectations, we re-estimate our regressions using realized exchange rates to compute the UIP premium. Columns 5-8 report the estimated coefficients and show that all our results hold. In particular, local risk factors captured by country-level policy uncertainty associates with higher realized UIP premium, or ex-post excess currency returns, even after controlling for all the other variables.

(ii) Comparison with AEs. For comparison, we also present the results for advanced countries in Panel B of Table 2 using both expected and ex-post changes in the exchange rate to compute the UIP premium. Differently from EMs, capital inflows do not affect the UIP premium in AEs, as the coefficients are not statistically significant (column 1-4). We then include the convenience yield, VIX and EPU. While the VIX is statistically significant, the results on EPU show a sharp contrast with those of EMs. Economic policy uncertainty does not affect the UIP premium in AEs. The coefficient on the VIX shows that increases in global risk perception correlate with higher UIP premium in these economies. In particular, going from p25 to p75 associates with a 2.4 percentage points increase in the premium in AEs. Columns 5-8 presents the results using realized exchange rates. Once all variables are included in the analysis, column 8 shows that only VIX remains statistically significant to explain the realized UIP premium in AEs. So only global risk factor matters for AE UIP premium, but this is not the case for EM.

(iii) Mechanism and Robustness with Different Interest Rates. To illustrate the mechanism for these high frequency drivers of the UIP premium, we present the general version of the decomposition of the UIP premium into its components that we show for the specific cases of Argentina and the U.K. in the introduction. Figure 4 plots the UIP premium decomposition as defined in equation 1 for the average advanced economy and the EM. In AEs, the UIP premium and the exchange rate adjustment term overlap most of the time, with a correlation over 90%, while movements in the interest rate differential term are negligible. In contrast, in EMs, interest rate differentials almost perfectly co-move with the UIP premium, a 70% correlation, whereas the exchange rate adjustment term barely correlates with the UIP premium. These interest rate differentials are systematic and highly correlated with the expected excess returns, specially during periods of high uncertainty, related to EMs' crises as in 1990s or to global shocks, as in late 2000s. We will show below that high inflation in EMs cannot explain these patterns.

To assess the channels driving each of the components of the UIP premium econometrically, we reestimate equation (9) using the two components of the UIP premium –interest rate differential and exchange rate adjustment– as dependent variables. Table 3 presents the results. For expositional simplicity, column 1 reproduces our result on the UIP premium of column 4 in Table 2. As shown in columns 2 and 3, none of our variables affect the UIP premium via ER term but rather the IR term. The VIX is an exception to this, as higher VIX implies and expected appreciation due to immediate depreciation. All other variables' effects, especially the policy uncertainty, work via the interest rate differential channel. Un-

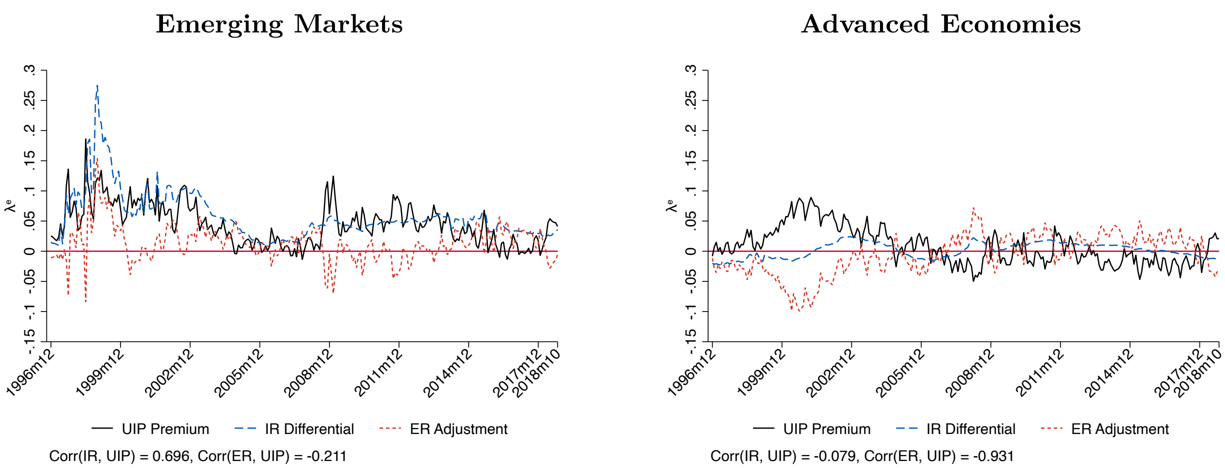


Figure 4. Interest Rate Differential and Exchange Rate Adjustment Terms in AEs and EMs

Note: This figure shows the UIP premium decomposition into the interest rate differential and exchange rate adjustment terms at 12 month horizon for 33 currencies –21 EMs and 12 AEs– over 1996m11:2018m10. The UIP premium is measured using deposit and money market interest rates from Bloomberg and expectations of exchange rates from Consensus Forecast.

certainty about local economic policies makes global investors' returns risky and, hence, a higher ex-ante compensation is required to invest in these currencies. This risk is priced in the interest rate differential and leads to a higher UIP premium.

A natural question to ask is whether this is specific of deposit rates or a general characteristic of EMs. To assess this, we re-estimate our equations using government bond rates and money market rates. Results presented in columns 4-9 of Table 3 confirm our previous findings. EPU is priced in the interest rate differential and, through it, is the main channel increasing the UIP premium, independently of the interest rate used to measure it. The reason why there is a positive relation between capital inflows and the exchange rate adjustment term when we use government bond rates is because of the expected depreciation of the local currency government bonds. Since inflows are still negatively correlated with the interest rate differential, they are also negatively correlated with the UIP premium, that is interest rate part dominates the exchange rate part, making UIP premium higher than the expected depreciation and also making the UIP premium negatively correlated with the capital inflows. Put it differently, even there are capital inflows into local currency government bonds, because such flows is positively correlated with future risk of deprecation of these assets, this risk is priced in the interest rate differentials, making these differentials the main channel for the drivers of the UIP premium.

Why is the interest rate differential channel the dominant channel? For advanced countries when there are excess returns to currency, such returns comes from appreciations (or expected appreciations). For EMs, excess currency returns are associated with currency depreciations and expected deprecations. The only way for this to be possible is if interest

Table 3. UIP Premium in EMs: Decomposition and Robustness with Interest Rates

	(A) Deposit Rates			(B) Government Bonds			(C) Money Market Rates		
	(1) UIP Premium	(2) IR Diff.	(3) ER Adj.	(4) UIP Premium	(5) IR Diff.	(6) ER Adj.	(7) UIP Premium	(8) IR Diff.	(9) ER Adj.
Inflows/GDP$_{it-1}$	-0.001*	-0.002**	-0.001	-0.009***	-0.005***	0.005	-0.001	-0.002***	-0.001
	(0.001)	(0.001)	(0.001)	(0.003)	(0.001)	(0.003)	(0.001)	(0.000)	(0.001)
$\log(VIX_{t-1})$	0.053***	0.034***	-0.018**	0.049***	0.018***	-0.031***	0.045***	0.024***	-0.021***
	(0.008)	(0.011)	(0.008)	(0.009)	(0.005)	(0.009)	(0.007)	(0.005)	(0.007)
Convenience Yield/Liquidity Premium$_{t-1}$	0.163	-0.117	-0.279	-1.034	-0.627	0.407	-0.166	-0.900*	-0.734
	(1.014)	(1.156)	(1.119)	(1.102)	(0.451)	(0.872)	(1.030)	(0.525)	(0.988)
EPU_{it-1}	0.010***	0.006***	-0.004	0.007**	0.003**	-0.003	0.010**	0.006***	-0.004
	(0.003)	(0.002)	(0.002)	(0.003)	(0.001)	(0.004)	(0.004)	(0.002)	(0.003)
Obs.	3288	3288	3288	1761	1761	1761	2665	2665	2665
Number of Countries	21	21	21	19	19	19	18	18	18
R^2	0.1764	0.0615	0.0239	0.1807	0.1388	0.0825	0.1668	0.1313	0.0533
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note: Two-way currency-time clustered standard errors in parenthesis. $^{*}, ^{**}, ^{***}$ denotes statistical significance at the 10, 5, and 1 percent respectively. Capital inflows are measured as changes in gross debt liabilities. The UIP premium and the exchange rate adjustment term are measured using expected exchange rate changes from Consensus Forecast. Inflows/GDP$_{it-1}$ are capital inflows into the country as a fraction of GDP. VIX is a proxy for global risk perception. Convenience yield/Liquidity Premium is the sum of USD convenience yield and its liquidity premium averaged across G10 countries. EPU_{it} is the economic policy uncertainty index. Both Inflows/GDP$_{it-1}$ and EPU vary at the country-time level. VIX and Convenience yield/Liquidity premium vary at the time level.

rate differential term is higher than these depreciations. The figure below shows that this is exactly how the data is. Panel (a) plots the distribution of interest rate differentials for EMs and AEs and panel (b) plots the distribution of exchange rate changes, where panel (c) plots the distribution of the UIP premium. Panel (a) shows a long right tail for interest rate differentials for EMs, so they are positive for most, where they are basically zero for most AEs. Panel (b) shows that there are more expected depreciations in EMs, whereas there is almost none for AEs. Panel (c) shows the distribution of the UIP premium is tilted to right in EMs compared to AEs due to the long tail in panel (a) in spite of the expected depreciations in panel (b).

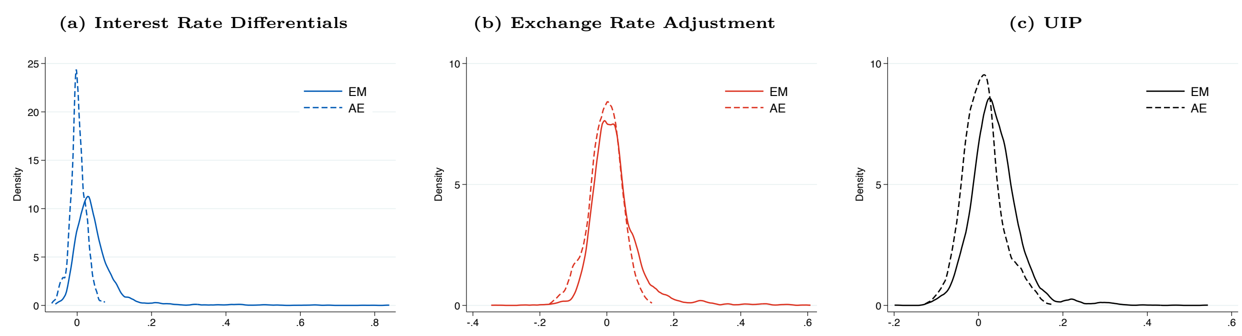


Figure 5. IR Differential, ER Adjustment, and UIP Distribution

Note: This figure shows the distribution of interest rate differentials (panel (a)), exchange rate adjustment ($s^e_{t+1} - s_t$, panel (b)), and UIP (panel (c)). Each point in these plots represents a country-date observation. Dashed lines correspond to Advanced Economies (AE) and solid lines correspond to Emerging Markets (EM).

This also explains why our results cannot be explained by the CIP deviations. Before to construct the US based convince yield we averaged all the CIP deviations of AEs vis-à-vis the US. An influential recent literature, focusing on advanced countries, documented a link between country-specific CIP deviations, global risk perception, financial or regulatory frictions and USD exchange rates (e.g Du et al. 2018*a*, Jiang et al. 2021*b* and Avdjiev et al. 2019). However, these deviations are very different for EMs and much smaller than the UIP deviations.

We plot CIP and UIP deviations in our sample in Figure D.2 in Appendix D, using interbank rates, and here in Figure 6, using deposit rates. These figures show that, regardless of the interest rates used, UIP and CIP deviations have a very low correlation with each other over time. And they have the IR part exactly the same! They are opposite sign to each other when interbank rates used and same sign when deposit rates are used. This is because they have the common component, credit/default risk, captured better by the deposit rates in the latter. The larger size of the UIP is due to fact that, UIP mainly captures currency risk stemmed from policy uncertainty, priced-in as currency risk premia, and CIP does not capture any currency risk given the forward contract. If there are financial frictions, these will also be captured by both and the fact that UIP is much larger than CIP, tells us that financial frictions alone cannot explain UIP deviations.

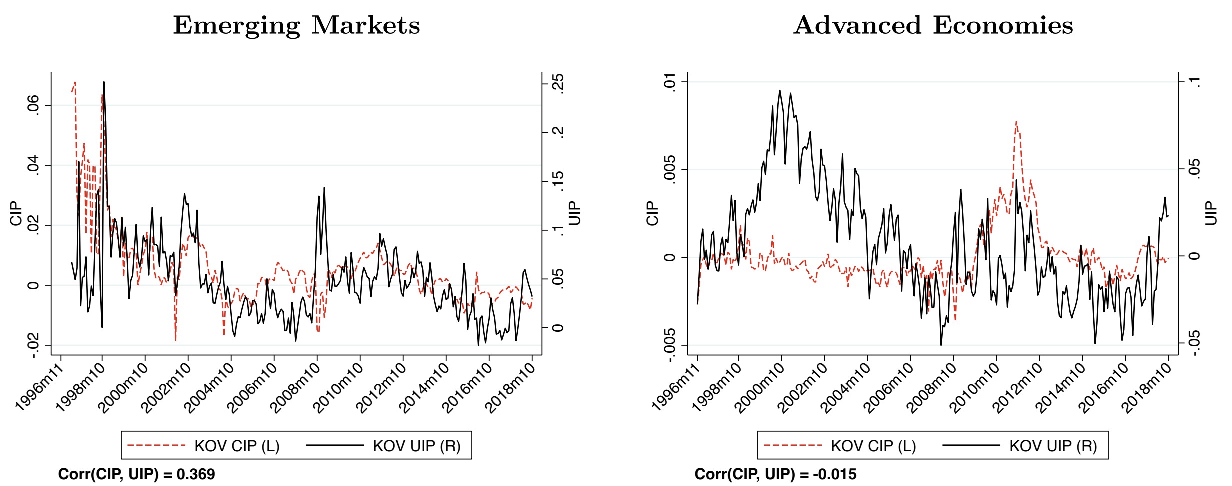


Figure 6. UIP and CIP (12 Months)

Note: This figure shows UIP and CIP deviations using our sample. Both series use deposit rates. UIP deviations is measured using Consensus Forecast.

These patterns are not about the average country but also hold in the cross-section of countries. Regardless of how we measure the CIP deviations, with forward rates or currency basis,[13] there is not a one-to-one mapping between UIP and CIP deviations both in EMs and in AEs as shown in Figure 7. None of the observations from each set of countries lie along the 45 degree line.

[13]See Appendix D for a comparison with DS currency-basis.

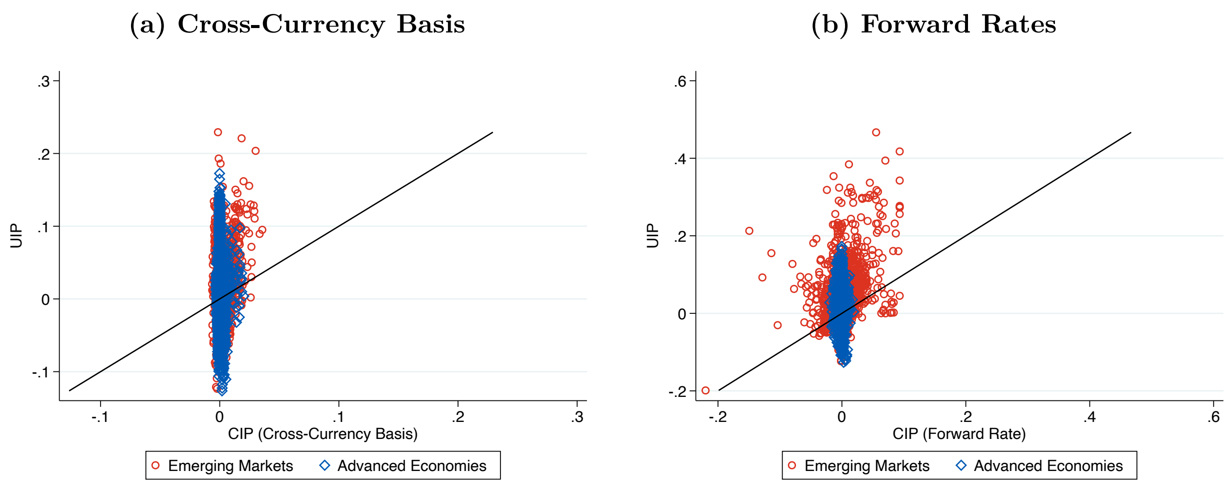


Figure 7. Cross-Sectional UIP and CIP (12 Months)

Note: This figure shows UIP and CIP deviations where each point represent a different date. At each date, we take the average across countries in each classification (Emerging and Advanced). Panel (a) constructs CIP using Du and Schreger (2021) cross-currency basis. Panel (b) constructs CIP using forward rates. Both panels compute UIP using expectations from Consensus Forecast. Both UIP and CIP deviations use 12 months deposit rates.

(iv) Monetary Policy Uncertainty and Sovereign Default. To zoom-in on the most important policy uncertainty in EMs, we adopt a basic measure of monetary policy uncertainty, that is inflation expectations. We created an expected inflation differential variable using survey data and a high value of this variable means EM inflation expectations are less anchored vis-à-vis the US and hence monetary policy is more uncertain and less credible than the U.S. dollar. We also want to control default/credit risk, as high inflation and inflation expectations is sometimes associated with government debt monetization and default in EMs. It is worth noting that both EMBI and CDS only capture default risk on foreign currency bonds of government and, hence, both are limited measures of broad credit risk as they do not capture corporate borrowing and any local currency borrowing. Hence, we omit serial defaulters from the sample to control for default risk. In Section 4.6, we use subjective measures for credit risks coming from the ICRG to try to overcome this issue since UIP is about local currency vs foreign currency returns. Table 4 presents the results. In column 1, we present a highly stringent test by only keeping countries that never defaulted since World War II and, thus, removing countries that investors could perceive as risky. In column 2, we employ data from Reinhart et al. (2021) on monthly episodes of sovereign debt crises and control for them. Table 4 shows that none of these controls overpower the EPU. Our results then are robust to controlling default episodes, default risk and expected inflation.

Another way to look at the relationship between sovereign default and the EPU is to plot their unconditional correlation, which we do in Figure 8. This figure shows that the CDS and the EPU are correlated, but their correlation only reaches 22.1%.

Table 4. UIP Premium: Panel Regressions: Controlling for Sovereign Default Risk

	UIP Premium	
	(1)	(2)
Inflows/GDP$_{it-1}$	0.001	-0.005
	(0.029)	(0.044)
$\log(VIX_{t-1})$	0.024**	0.036***
	(0.011)	(0.009)
Convenience Yield/Liquidity Premium$_{t-1}$	-0.433	-0.555
	(1.321)	(0.920)
EPU_{it-1}	0.009***	0.012***
	(0.002)	(0.003)
Expected Inflation Differential$_{it-1}$	1.737***	1.423***
	(0.310)	(0.177)
No Sovereign Default		0.003
		(0.015)
Observations	797	2224
Number of Countries	6	16
R^2	0.2730	0.2845
Currency FE	Yes	Yes

Note: Two-way currency-time clustered standard errors in parenthesis. *,** ,*** denotes statistical significance at the 10, 5, and 1 percent respectively. Column 1 removes countries in which the sovereign defaulted since WWII. Capital inflows are measured as changes in gross debt liabilities. The UIP premium and the exchange rate adjustment term are measured using expected exchange rate changes from Consensus Forecast. Inflows/GDP$_{it-1}$ are capital inflows into the country as a fraction of GDP. VIX is a proxy for global risk perception. Convenience yield/Liquidity Premium is the sum of USD convenience yield and its liquidity premium averaged across G10 countries. EPU_{it} is the economic policy uncertainty index. Expected inflation differential are the difference between expected inflation 1 year ahead in the home economy relative to the US. Both Inflows/GDP$_{it-1}$ and EPU vary at the country-time level, while VIX and Convenience yield/Liquidity premium vary at the time level.

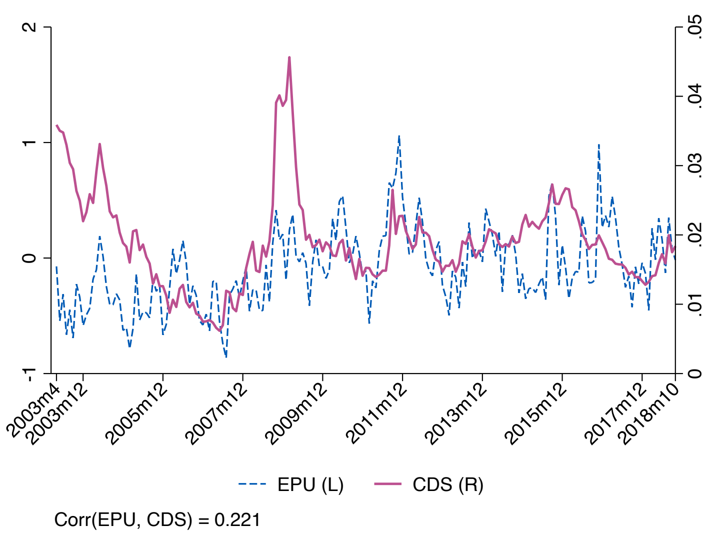


Figure 8. Economic Policy Uncertainty and Default in Emerging Markets

Note: This figure shows the Credit Default Swaps (CDS) and Economic Policy Uncertainty (EPU) for 18 EMs over 2003m4:2018m10.

4.3. Identification

We now turn to identification. Since we show that policy uncertainty (EPU) affects the UIP premium only through the interest rate differentials, EPU is a valid instrument for the interest rate differential shocks satisfying the exclusion restriction. Given the high correlation between the EPU and the interest ate differentials, it also passes the relevance criteria for a valid instrument.

To instrument interest rate differentials with EPU, we follow the overshooting/delayed overshooting literatures that treat interest rate differentials as shocks though lacks a valid instrument for these endogenous shocks. We estimate impulse responses obtained through Jorda-style local projections with dynamic panel regressions. We regress expected exchange rate changes and UIP premium, separately, on interest rate differential shocks instrumented by the EPU.[14]

To compare to the overshooting literature, we first estimate the response of expected exchange rate changes to interest rate differential shocks at time t in currency i, conditional on lagged values, we estimate

$$s^e_{it+h+k} - s_{it+k} = \beta_k(i_{it} - i^{US}_t) + \gamma_k(s^e_{it+h+k-1} - s_{it+k-1}) + \delta_k(i_{it-1} - i^{US}_{t-1}) + \mu_i + \epsilon_{it+h+k}, \quad (10)$$

where the coefficient of interest is β_k and reports the response of expected exchange rate change to interest rate differential shocks at k month ahead over a horizon of h. Similarly for the UIP premium/expected excess returns, we run the following with a similar interpretation for β_k:

$$\lambda^e_{it+h+k} = \beta_k(i_{it} - i^{US}_t) + \gamma_k\lambda^e_{it+h+k-1} + \delta_k(i_{it-1} - i^{US}_{t-1}) + \mu_i + \epsilon_{it+h+k}. \quad (11)$$

Figure 9 plots the response of expected change in the exchange rate to one percentage point interest rate differential shock on the left panel, and the response of the UIP premium to the same shock on the right panel. Interestingly, we do not observe a U-shaped dynamic as the overshooting literature documented for AEs, where an interest rate differentials shock leads to an initial appreciation and then a delayed depreciation (see Dornbusch 1976, Eichenbaum and Evans 1995, and Bacchetta and van Wincoop 2010 among others). In contrast, Figure 9 shows an inverted U-shaped, where the exchange rate is expected to initially depreciate. Since the extent of expected depreciation is less than the one percentage point shock to IR, UIP fails, leading to expected excess returns as shown in top right panel. Interestingly, expected excess returns is persistently positive during the entire time, being still significant at month 20. Hence, even if the shock is transitory, UIP deviations are persistent in EMs, not overshooting and reverting.

Why is there an inverted-U shaped response of expected change in the exchange rate

[14] The literature undertakes a VAR analysis assuming a global structure for the endogenous variables. The advantage of local projections is to identify the responses without assuming such a structure. See recent work by Plagborg-Møller and Wolf (2021) that shows that both methods produce equivalent results.

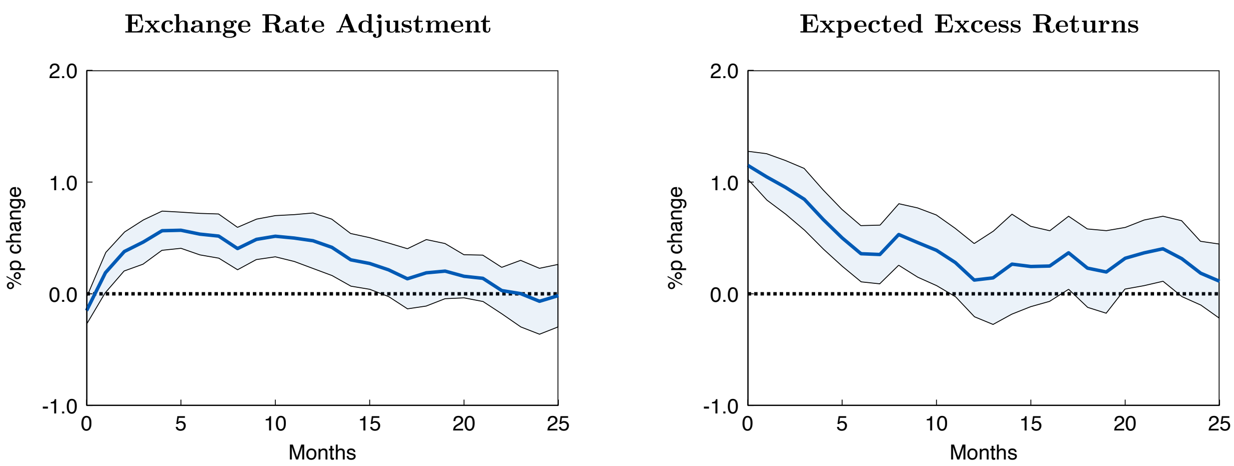


Figure 9. Emerging Markets: Response of ER and UIP Premium to an IR Shock (OLS)

Note: This figure shows the response of exchange rate adjustment and the UIP premium to an interest rate differential shock at 12 month horizon for 22 EMs over 1996m11:2018m12. Exchange rate adjustment and expected returns are measured using expected exchange rate changes from Consensus Forecast. The shaded area shows 95 percent confidence intervals, calculated using Driskoll-Kraay standard errors with a bandwidth lag $h+1$ for horizon h.

and persistent UIP deviations in EMs? Figure 10 answers this question. With an IR shock, investors always expect a depreciation in EMs. This implies that the expectations in the ER term above $(s^e_{it+h+k} - s_{it+k})$ increases on impact relative to current spot rate. As actual spot exchange rate starts depreciating later, we have the ER term increasing first and then decreasing, delivering the inverted-U shape dynamics. Similarly, UIP deviations/expected excess returns starts positive and high and then goes down, as expected change in the exchange rate goes down with actual depreciation. Since neither expected or actual depreciation can offset the IR shock, UIP deviations stay positive and persistent over the entire horizon.

Next, for identification, we estimate the local projections from the instrumental variable regression. In particular, we regress interest rate differentials on policy uncertainty shocks (EPU) first and then use residuals from this first stage in the second stage for impulse responses of expected exchange rate changes and the UIP premium.

Figure 11 shows a strong first stage where shocks to policy uncertainty captured by increases in the EPU index are positively correlated with the interest rate differentials. This shows again the validity of the instrument as before but now in a dynamic setting. This result indicates that domestic interest rates respond to risk appetite of foreign investors that increases with higher policy uncertainty.[15] In Figure 12, we plot the the second stage and show that, as a result of a shock to policy uncertainty (that will lead to one percentage point

[15]This effect can also come from the fact that monetary authority raises the policy rate as a result of lower risk appetite of foreign investors with higher policy uncertainty. Kalemli-Özcan (2019) shows that higher domestic interest rates as a result of uncertainty shocks/lower risk appetite of foreign investors are due to higher risk premium on EMs and not due to higher policy rates.

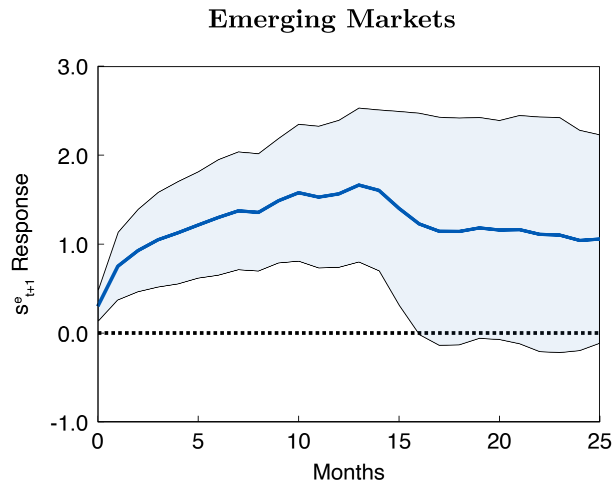


Figure 10. Response of Emerging Market Investors' Exchange Rate Expectations to an IR Shock

Note: This figure shows the response of expected exchange rate to an interest rate differential shock at 12 month horizon for 22 EMs' currencies over 1996m11:2018m12. Expected exchange rate is measured using Consensus Forecast. The shaded area shows 95 percent confidence intervals, calculated using Driskoll-Kraay standard errors with a bandwidth lag $h+1$ for horizon h.

IR shock), there is still an inverted-U shape response of expected changes in the exchange rate and positive UIP premium.[16]

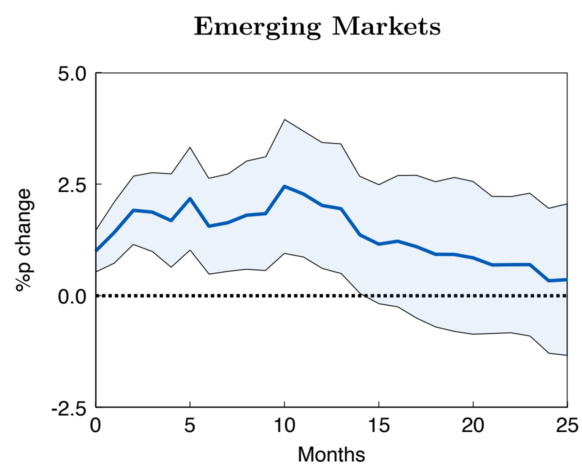


Figure 11. First Stage: IR Response to EPU Shocks

Note: This figure shows the response of interest rate differentials at 12 month horizon to an EPU shock at 12 month horizon for 21 EMs over 1996m11:2018m12. The shaded area shows 95 percent confidence intervals, calculated using Driskoll-Kraay standard errors with a bandwidth lag $h+1$ for horizon h.

For comparison, Figure E.1 in Appendix E plots the impulse responses of expected exchange rate changes and the UIP premium to interest rate differential shocks in AEs. As the figures show, interest rate differential shocks do not lead to increases in the UIP premium in these economies, as the expected depreciation increases by the same amount of the interest rate

[16]See Appendix E for the same exercises using realized exchange rates.

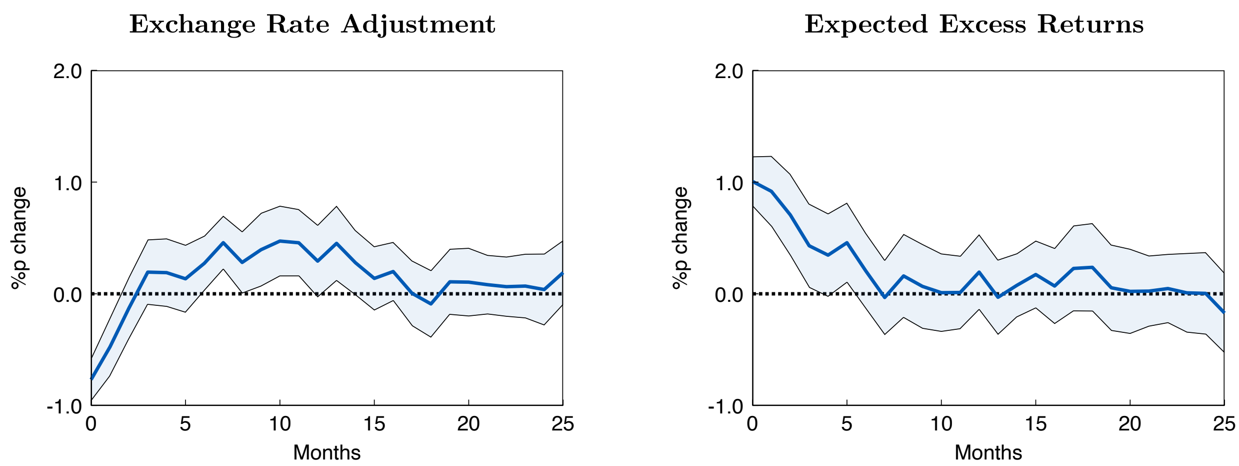


Figure 12. Emerging Markets: Response of ER and UIP Premium to an IR Shock (IV)

Note: This figure shows the exchange rate adjustment and excess returns responses to an interest rate differential shock instrumented by EPU at 12 month horizon for 21 EMs currencies' over 1996m11:2018m12. Expected exchange rate changes and expected returns are measured using expected exchange rate changes from Consensus Forecast. The shaded area shows 95 percent confidence intervals, calculated using Driskoll-Kraay standard errors with a bandwidth lag $h + 1$ for horizon h.

differential shock.

4.4. Can Different Investor Base Explain the Results?

To check that our results are not driven by different set of forecasters between AEs and EMs, we employ data of individual forecasters . In particular, we select the five major forecasters in our sample – HSBC, JP Morgan, Morgan Stanley, UBS and Citigroup– reporting exchange rate forecasts for 20 EMs and 10 AEs between 2001m2 and 2018m10, and check how they correlate with the UIP premium.[17]

Figure C.2 in Appendix C shows the correlation of the UIP premium computed for these five forecasters and for the average forecaster reported by Consensus Forecast. Importantly, the correlation with our UIP premium variable is high, reaching 76% for AEs and 62% for EMs. In Figure C.3, in Appendix C, we break down the components of the UIP premium between the interest rate differential and the exchange rate adjustment terms, and confirm our earlier finding that in AEs the UIP premium mainly associates with exchange rate adjustments, whilst in EMs it associates with interest rate differential. Overall, individual forecaster data shows that our results cannot be attributed to differences in the sample of forecasters between AEs and EMs.

[17]Unfortunately, the data about individual forecasters is only reported since February 2001.

4.5. Can High Inflation Explain the Results?

A potential concern of the analysis is that high interest rate currencies might correlate with high inflation rates and, thus, the UIP premium observed in nominal term might vanished in real terms. To assess this, we re-estimate our panel regressions in equation (9) and add inflation differentials as a control. As Table C.1 shows, all our results hold true when including inflation differential as a control. Importantly, the size of the estimated coefficients is very similar to our main estimation in Table 2 in Appendix C, indicating that inflation differentials do not significantly affect the importance of the EPU driving the UIP premium.

4.6. Other Measures of Policy Uncertainty: A Granular Look

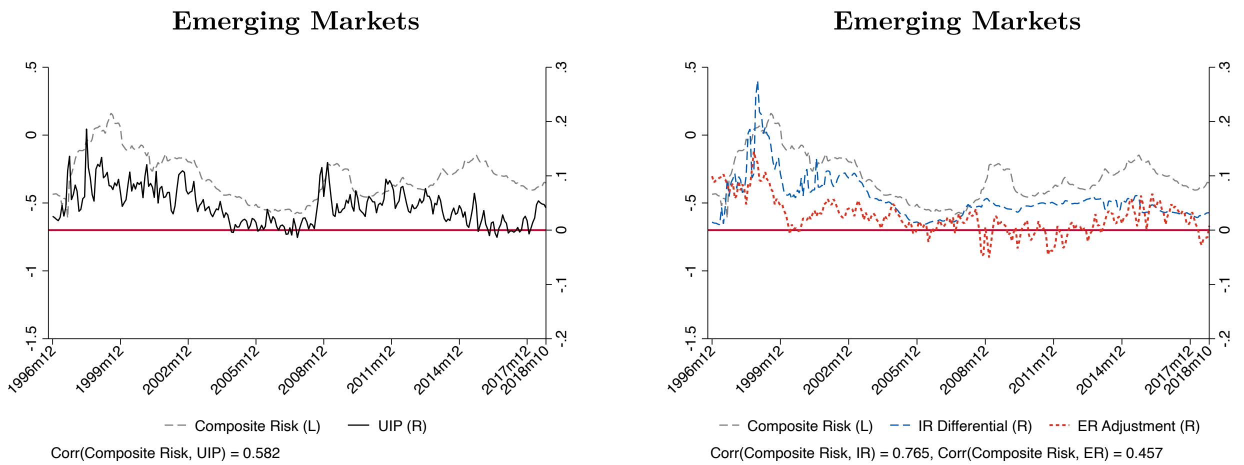
Results in the previous sections indicate that the failure of the UIP condition for EM currencies relates to the presence of a time-varying risk premium that associates with global risk perception and country-specific policy uncertainty. In this section, we go deeper in our analysis of local policy uncertainty and ask about its main determinants. With this end, we employ three additional variables reflecting policy uncertainty: *composite country risk*, *government policy risk* and *confidence risk*.[18]

The left graph of Panel A in Figure 13 plots the average composite risk index (gray-dashed line) and UIP premium (black line) for EMs. Notably, these two lines track each other very closely and their comovement reaches 58%. In the right graph of Panel A, we plot the correlation of the composite risk index with the two components of the UIP premium. Confirming our previous findings, in EMs, the composite risk highly correlates with the interest rate differential (76%, blue line) and this correlation is much higher than the negative correlation with the exchange rate adjustment (-45%, red dashed line).

For comparison, in Figure C.1 in Appendix C, we plot the correlations for AEs in Panel B. Interestingly, the correlation of the composite risk index with the UIP premium is much smaller and has the opposite sign for AEs (-24%) (left graph). The UIP premium decomposition is also revealing (right graph), as it shows that the comovement of the composite risk and the two components of the UIP premium offset each other.

To unpack the elements implied in the composite risk and affecting foreign investors' sentiments on EM currencies, we revisit our previous panel regressions in Table 5. The coef-

[18] See Section 3 and Appendix A.4 for further details. The ICRG further decompose political risk into other sub-components, such as corruption, law and order, bureaucracy quality, internal and external conflicts, among others. These sub-components capture elements of political risk that are not significantly related to foreign investors' risk sentiments about unexpected changes in government policies that can affect their investment returns. In Appendix A.4, we detail thoroughly all these sub-components and show that the correlation with the UIP premium in EMs has usually the wrong (negative) sign and is low (likely due to their low time-series variation).



a) Composite Risk and UIP Premium in Emerging Markets

Figure 13. Composite Risk and the UIP Decomposition in EMs

Note: This figure shows the correlation of composite risk with the UIP premium and UIP decomposition at 12 month horizon for 34 currencies –22 EMs and 12 AEs– over 1996m11:2018m10. The UIP premium and expected exchange rate changes are measured using Consensus Forecast.

ficient for the composite risk index is positive and highly statistically significant indicating that increases in a country-specific risk associates with a higher UIP premium on its currency (column 1). The size of the coefficient is economically important: if composite risk increases from the p25 to p75 (from Chile to Russia in the 2016m6), the UIP premium increases by 4 percentage points. As above, the channel of transmission of a composite risk shock is the increase in the interest rate differential (columns 2 and 3). It is worth noting that the composite risk does not overpower the VIX coefficient – which remains similar in magnitude and highly statistically significant –, but it overpowers capital inflows.

Columns 4-6 presents the results for the two components. Column 4 shows that increases in government policy risk associates higher UIP premium and column 5 confirms a similar correlation for confidence risk. Importantly, column 6 includes both variables together and shows that both variables remain positive and highly statistically significant. Furthermore, both coefficients remain similar in size as those estimated in columns 4 and 5, which indicates that both variables are capturing different policy risks. Finally, it is worth remarking on the R^2 of these regressions, which reaches more than 17% and is close in size to the 20% observed for the composite index (column 1) and 19% captured in the EPU index (column 4, Panel A in Table 2). This similar value of the R^2 indicates that the policy uncertainty captured by the EPU and the composite indexes is highly related to these two narrowly-defined measures of policy risk that capture the confidence on in EMs' government policies.

Table 5. UIP Deviations in EMs: A Granular View

	Panel (A): Composite Risk			Panel (B): Unpacking Composite Risk		
	(1)	(2)	(3)	(4)	(5)	(6)
	UIP Premium	IR Diff.	ER Adj.	UIP Premium	UIP Premium	UIP Premium
Inflows/GDP$_{it-1}$	-0.001	-0.001**	-0.000	-0.001	-0.002*	-0.001
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
$\log(VIX_{t-1})$	0.052***	0.029***	-0.023***	0.058***	0.054***	0.055***
	(0.005)	(0.003)	(0.005)	(0.005)	(0.005)	(0.005)
Convenience Yield/Liquidity Premium$_{t-1}$	-0.328	-0.750	-0.422	-0.203	-0.273	-0.388
	(0.749)	(0.587)	(0.719)	(0.757)	(0.727)	(0.712)
Composite Risk$_{it-1}$	0.052***	0.089***	0.037***			
	(0.006)	(0.006)	(0.006)			
Government Policy Risk$_{it-1}$				0.020***		0.014***
				(0.005)		(0.005)
Confidence Risk$_{it-1}$					0.023***	0.020***
					(0.004)	(0.004)
Obs.	3427	3427	3427	3427	3427	3427
Number of Currencies	245	245	245	22	22	22
R^2	0.1949	0.1879	0.0471	0.1541	0.1642	0.1693
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: * p < 0.10 ** p < 0.05 *** p < 0.01. Time clustered standard errors in parentheses. Note that given low clusters due to data availability, we cannot double cluster in this regression. 22 EMs currencies. Period 1996m11:2018m10. Capital inflows are measured as changes in gross debt liabilities. The UIP premium and the exchange rate adjustment term are measured using expected exchange rate changes from Consensus Forecast. Inflows/GDP$_{it-1}$ are capital inflows into the country as a fraction of GDP. VIX is a proxy for global risk perception. Convenience yield/Liquidity Premium is the sum of USD convenience yield and its liquidity premium averaged across G10 countries. EPU_{it} is the economic policy uncertainty index. Composite risk measures political, economic and financial risks. Government policy risk captures expropiation risk. Confidence risk measures consumer confidence, and unemployment.Inflows/GDP$_{it-1}$, EPU_{it}, composite risk, government policy risk, and confidence risk vary at the country-time level, while VIX and Convenience yield/Liquidity premium vary at the time level.

4.7. Connection to the Fama Regressions

In Appendix B, we extend our analysis to test whether the UIP holds *on average* by estimating the so called Fama regressions. As Table B.1 shows, the UIP conditions does not hold on EMs either using expected or realized exchange rate changes, which leads to ex-ante and ex-post excess returns. In Table B.2, we estimate time-varying Fama coefficients and show that the higher the policy uncertainty, the lower is the coefficient of the Fama regression (i.e. larger downward bias) and, thus, higher are excess returns in EM currencies. Finally, in Table B.6, we conduct a decomposition analysis and show that policy risk downward biases the Fama coefficient through high volatile interest rates that translate into a high volatile risk premium.

5. Conclusion

We uncovered 5 novel facts on Uncovered Interest Parity (UIP) deviations for 22 EMs. These facts are as follows. The average UIP premium across EM currencies is positive with large time-varying volatility, implying volatile excess currency returns. The average UIP premium also correlates negatively with capital flows but positively with global risk sentiments. This may not be surprising at a first glance since higher the global risk-off sentiment, lower the capital flows. However, as we show, these variables have distinct direct roles on the UIP premium, suggesting the importance of both local and global risk factors. We uncover that all these high-frequency facts can be explained by volatile polices for EMs, measured by several different indices of policy uncertainty. In fact, higher policy uncertainty is the sole factor that can explain the negative correlation between capital inflows and the UIP premium, conditional on the distinct role of global risk sentiments. We measure the UIP premium based on the textbook definition, that is we use the expected changes in the exchange rate from survey data. When we use the realized changes in the exchange rate to measure the UIP premium, our results still hold. This means that foreign investors both expect to earn excess returns from EM currencies, ex-ante, and they do earn excess returns, ex-post.

Our results have important policy implications. UIP premia constitute the cost of local currency financing relative to foreign currency financing for EMs. The fact that such financing costs are high on average and they increase even more during crisis times represents an important new avenue for EM monetary and financial policies. There is a recent theory literature suggesting the importance of closing the UIP deviations during crisis to maximize the welfare using certain policies such as preemptive macroprudential measures and capital flow management policies and FX interventions (e.g. Basu et al. 2020, Itskhoki and Mukhin 2022). As a result, understanding the drivers of the endogenous UIP premium in EMs is absolutely essential both for academics and policy makers alike.

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FOR ONLINE PUBLICATION: APPENDIX

A. Data

In this section, we first present in detail the source of the data used in this paper and the construction of the individual series. We then provide further details about the Consensus Forecast data on exchange rate expectations.

A.1. Source of Data and Construction of Individual Series

Table A1 lists variables that we employ in this paper. We obtain spot exchange rate from IMF International Financial Statistics (IFS). IFS provides both period end and period average of daily exchange rates for monthly, quarterly, and yearly frequency.

We collect market interest rates (treasury bill, money market, and deposit rate) from the Bloomberg terminal. We choose interbank offered rate as a money market rate. For a given country and an interest rate, there are various tickers in Bloomberg. We choose the most reliable and long-spanning ticker after checking whether interest rates are in annual percentage rate with the same maturity and denominated in local currency. Interest rates are with maturities of 1, 3, and 12 months in the dataset. As Bloomberg provides daily values for most series, we can get both period end and period average for monthly, quarterly, and yearly frequency. When interest rates are missing from Bloomberg, we obtain data from IMF IFS. Though IFS usually gives interest rates with mixed maturities, some series are with fixed maturity. We refer to country notes of IFS database to check whether the interest rate is of the same maturity, denominated in local currency and calculated as period end or average of daily values. If the series has the same characteristics in all these criteria, we add that series to our database. For some interest rate series, only period end of period average data is available. Aggregate variables including GDP are downloaded from IMF IFS.

Exchange rate forecasts are available only at the end of period. Consensus forecast (mean average) at 1 month, 3 months, 12 months, and 24 months from the survey date. More precisely, the survey form which is usually received on the Survey Date (often the second Monday of the survey month), requests forecasts at the end of the month at 1 month, 3 months, 12 months and 24 months. Thus the forecast periods may be slightly longer than these monthly horizons.

Forward rates come from Bloomberg. After downloading forward rates, we convert data into unit of local currency per US dollar. Daily forward rates are available. We download monthly, quarterly, and yearly data for both period end and average of daily values . We get exchange rate forecasts from Consensus Economics. We convert forecasts into local currency per US dollar forecasts using appropriate currency forecasts. We get Emerging Markets Bond Index (EMBI global) from J.P. Morgan. We employ the exchange rate regime classification by Ilzetzki et al. (2017) to exclude countries with fixed exchange rate regimes.

We proxy global risk with the VIX, which is obtained from Federal Reserve Economic Data (FRED). We obtain detailed information about policy risk from the International Country Risk Guide (ICRG). The International Country Risk Guide (ICRG) rating comprises 22 variables in three subcategories of risk: political, financial, and economic. We normalize these risk indices x using the following formula: $-(x - \mu_x)/\sigma_x$ where μ_x is the mean and σ_x is the standard deviation of a variable x in a full sample. We add the minus sign so that higher normalized indices mean higher risk.

Our sample consists of 12 currencies of AEs and 22 of EMs over the period 1996m11 and 2018m12. Table A2 presents the sample of countries.

Table A1. List of Variables

Variable	Description	Frequency	Source
Spot exchange rate	local currency/US dollar, period end and average	month / quarter / year	IMF IFS
Interest rates:			
Treasury bill rate	annual percentage rate, denominated in local currency,	month / quarter / year	Bloomberg, IMF IFS
Money market rate	maturity: 1, 3, 12 month, period end and average		
Deposit rate			
Capital inflows	capital inflows by sector	quarter / year	Avdjiev et al. (forthcoming)
Aggregate variables:			
GDP	local currency (million), real and nominal, non-seasonally-adjusted and seasonally-adjusted series	quarter / year	IMF IFS
Industrial production	index 2010=100, non- and seasonally-adjusted series	month / quarter / year	
Consumer price index	2010=100	month / quarter / year	
Producer price index	2010=100	month / quarter / year	
GDP deflator	2010=100, non- and seasonally-adjusted series	quarter / year	
Current account	million US dollars	quarter / year	
Capital account	million US dollars	quarter / year	
Forward Rates	local currency/US dollar, maturity: 1, 3, 12 month, period end and average	month / quarter / year	Bloomberg
Exchange rate forecasts	local currency/US dollar, period end, forecast horizon: 1, 3, 12, 24 month	month / quarter / year	Consensus Economics
VIX	Chicago Board Options Exchange volatility index	month / quarter / year	FRED
EMBI	Emerging Markets Bond Index (EMBI global)	month	J.P. Morgan
Country Risk	22 variables in three subcategories of risk: political, financial, and economic.	month / year	ICRG
Exchange Rate Regime	Exchange Rate Regime Coarse Classification (1–6)	month / year	Ilzetzki et al. (2017)

Table A2. List of Currencies

Advanced Economies (1)	Emerging Markets (2)
Australia	Argentina
Canada	Brazil
Denmark	Chile
Euro	China, P.R.: Mainland
Germany	Colombia
Israel	Czech Republic
Japan	Hungary
New Zealand	India
Norway	Indonesia
Sweden	Republic of Korea
Switzerland	Malaysia
United Kingdom	Mexico
	Peru
	Philippines
	Poland
	Romania
	Russian Federation
	Slovak Republic
	South Africa
	Thailand
	Turkey
	Ukraine

Note: 34 currencies, 12 AEs and 22 EMs. Period 1996m11-2018m10.

Interest Rates for UIP Calculation

We obtain interest rates to calculate the UIP deviations as follows. First, we replace deposit rates with money market rates of the same maturity if the data coverage for deposit rates is shorter than 5 years in a given country. If the data coverage for market rates is shorter than 5 years in a given country, we replace deposit rates with government bond rates of the same maturity in a given country. Table A3 shows country-year observations of deposit rates that are replaced with money market rates or government bond rates.

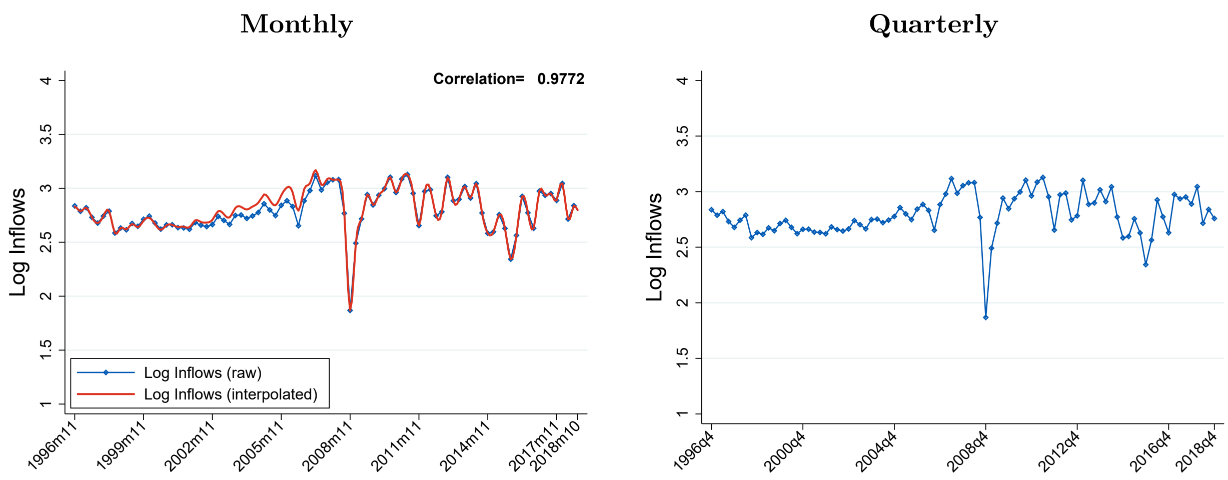
Table A3. Replaced Deposit Rates: Country-year Observations (1996-2018)

Country	Year	Country	Year
Austria	2008-14	Ireland	1999-2016
Canada	1996-2005, 2007-18	Italy	1996, 2014-16
Chile	2001-18	South Korea	2004-18
Colombia	2001-18	Netherlands	2001-14
Finland	1999, 2005-14	Portugal	2002-16
France	1996, 2000-16	Spain	1996-2015
Germany	1996, 2000-14		

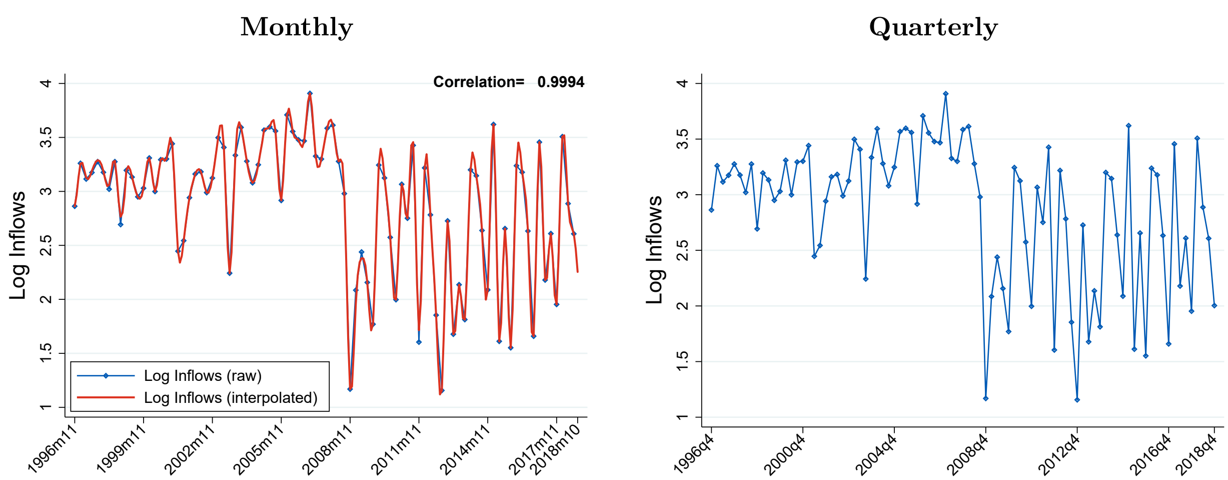
Interpolation of Quarterly Capital Flows

We interpolate quarterly capital flows to get monthly flows using a cubic spline built in Stata. More precisely, we use the following Stata command: `by id: mipolate 'var' date , gen('var'i) spline`, where `id` is country group, `'var'` is flows data, and `date` is a variable denoting months. The interpolated flows are generated with a variable name `'var'i`. This Stata module can be installed by using the command `ssc install mipolate`. Before running this command, quarterly flows are imported into the median month of each quarter. For example, the first quarter flows are imported into February, which is the median month of the first quarter. Then, the command fills remaining empty months with a cubic spline interpolation.

We plot averages of raw data and interpolated data across AEs and EMs in Figure A1. We plot both raw quarterly flows (blue solid line with diamond labels) and monthly flows interpolated using raw quarterly flows (red solid line). We find that interpolated monthly flows closely track raw quarterly flows with small deviations (the correlation between these two series is 0.99).



(a) Emerging Markets



(b) Advanced Economies

Figure A1. Average Capital Inflows: Raw vs. Interpolated Data

Note: This figure present the interpolation of capital inflows at monthly frequency for AEs and EMs.

A.2. Consensus Forecasts

This section provides additional descriptive statistics about the Consensus Forecasts database. Table A4 presents the average number of forecasters per year for currencies of AEs and EMs, separately. As shown in this table, the number of forecasters surveyed is vast in both set of economies, albeit it is smaller in EMs. Table A5 reports the average number of forecasters for each country across time.

Table A6 presents examples of the main forecasters for the Euro, Yen, UK Pound, Korean Won, Turkish Lira and other emerging markets in September 2012. This table shows that the forecasters surveyed for EMs' currencies were also top forecasters in AEs. It is worth

Table A4. Number of Forecasters in Consensus Forecasts (all years)

	Advanced Economies (1)	**Emerging Markets** (2)
1996	62	26
1997	63	21
1998	54	14
1999	58	13
2000	57	15
2001	53	14
2002	55	13
2003	58	15
2004	59	16
2005	62	16
2006	61	16
2007	58	15
2008	57	16
2009	50	15
2010	50	17
2011	52	17
2012	56	17
2013	54	16
2014	53	16
2015	54	17
2016	43	19
2017	43	18
Mean	55	17

Note: 34 currencies, 22 EMs, 12 AEs. Source: Consensus Forecast.

mentioning that our database does not provide information on individual forecast series and does not indicate which forecasters were surveyed. We collect this information from printed monthly reports created by Consensus Forecasts. These reports provide some examples of forecasters for main currencies, but they do not provide a complete list of forecasters for each currency. As such, the information about individual foresters in Table A6 is only illustrative. For this reason, the empty cells in Table A6 indicate the absence of information about whether the forecaster was surveyed for that currency and, hence, they do *not* indicate that the forecaster was *not* surveyed for that currency. It could easily be the case that the forecaster was also surveyed, but we do not know it.

Table A5. Number of Forecasters By Currency

Average Number of Forecasters			
Advanced Economies		**Emerging Markets**	
Australia	37	Argentina	11
Canada	77	Brazil	13
Denmark	25	Chile	12
Euro Area	101	China, P.R.: Mainland	26
Germany	107	Colombia	10
Israel	11	Czech Republic	12
Japan	98	Hungary	11
New Zealand	31	India	20
Norway	24	Indonesia	23
Sweden	30	Republic of Korea	23
Switzerland	27	Malaysia	24
United Kingdom	84	Mexico	12
		Peru	9
		Philippines	17
		Poland	11
		Romania	8
		Russian Federation	11
		Slovak Republic	9
		South Africa	22
		Thailand	24
		Turkey	23
		Ukraine	4
Average 1996-2018	55		17

Note: 34 currencies, 22 EMs, 12 AEs. Source: Consensus Forecast.

Table A6. Example: Main Forecasters in Advanced Economies and Emerging Markets, September 2012

Advanced Economies			Emerging Markets		
Euro (1)	**Yen** (2)	**UK Pound** (3)	**Korean Won** (4)	**Turkish Lira** (5)	**Other EMs*** (6)
Goldman Sachs	Goldman Sachs	Goldman Sachs	Goldman Sachs	Goldman Sachs	Goldman Sachs
HSBC	HSBC	HSBC	HSBC	HSBC	HSBC
General Motors	General Motors	General Motors	General Motors	General Motors	General Motors
ING Financial Markets	ING Financial Markets	ING Financial Markets	ING Financial Markets		ING Financial Markets
BNP Paribas	BNP Paribas	BNP Paribas		BNP Paribas	BNP Paribas
JP Morgan	JP Morgan	JP Morgan	JP Morgan	JP Morgan	JP Morgan
Allianz	Allianz	Allianz			Allianz
Oxford Economics	Oxford Economics	Oxford Economics		Oxford Economics	Oxford Economics
Morgan Stanley	Morgan Stanley	Morgan Stanley		Morgan Stanley	Morgan Stanley
Bank of Tokio Mitsubishi	Bank of Tokio Mitsubishi	Bank of Tokio Mitsubishi	Bank of Tokio Mitsubishi	Bank of Tokio Mitsubishi	Bank of Tokio Mitsubishi
Credit Suisse	Credit Suisse	Credit Suisse		Credit Suisse	
Citigroup	Citigroup	Citigroup	Citigroup	Citigroup	Citigroup
Societe Generale	Societe Generale	Societe Generale		Societe Generale	Societe Generale
Royal Bank of Canada	Royal Bank of Canada	Royal Bank of Canada			Royal Bank of Canada
Royal Bank of Scotland	Royal Bank of Scotland	Royal Bank of Scotland			Royal Bank of Scotland
ABN Amro	ABN Amro	ABN Amro			ABN Amro
Barclays Capital	Barclays Capital	Barclays Capital		Barclays Capital	Barclays Capital
Commerzbank	Commerzbank	Commerzbank			Commerzbank
UBS	UBS	UBS	UBS	UBS	UBS
IHS Global Insight	IHS Global Insight	IHS Global Insight	IHS Global Insight	IHS Global Insight	IHS Global Insight
Nomura Securities	Nomura Securities	Nomura Securities	Nomura Economics	Nomura Securities	Nomura Securities
			Macquarie Capital		Macquarie Capital
			ANZ Bank		ANZ Bank

Note: *Other EM currencies' include: Argentinean Peso, Brazilian Real, Chilean Peso, Chinese Renminbi, Colombian Peso, Czech Koruna, Hungarian Forint, Indian Rupee, Indonesian Rupiah, Malaysian Ringgit, Mexican Peso, Peruvian Sol, Polish Zloty, Romanian Leu, Russian Rouble, South African Rand, Ukrainian HRYVNIA. Note that non-filled cells indicate the absence of information about whether the forecaster was surveyed for that currency (i.e. they do *not* indicate that the forecaster was not surveyed for that currency). Source: Consensus Forecast.

A.3. Economic Policy Uncertainty Index

We construct the EPU index following the methodology of Baker et al. (2016). In particular, we use the online platform Factiva, which reports journal articles of main international newspapers. We employ the same search procedure as Baker et al. (2016). Our list of words contains 218 words and follows closely theirs. Since Baker et al. (2016) list of words is mostly conceived for AEs, we include four additional words to better capture policy uncertainty characteristics in emerging markers (i.e. capital controls, expropriation, nationalization and corruption). We report below the list of words used in this paper.

Because we are interested in the perspective of the U.S. international investor, we focus on news reported in international newspapers (see below the complete list of newspapers). Given the lower availability of international newspapers, we follow the methodology of Barrett et al. (2020) to construct our EPU index. This methodology adds total number of articles in a country and pools all the newspapers together for each country.[19] More precisely, define X_{it} the number of articles referring to EPU episodes in country i at time t, Y_{it} total number of articles referring to country i at time t, and $Y_t = \sum_i Y_{it}$ the total number of articles written at each time t (i.e. the sum of articles across countries). We replicate Barrett et al. (2020) index as follows

$$EPU_{it} = \frac{X_{it}}{\frac{1}{12}\sum_{j=1}^{12} Y_{t-j}}$$

where $X_i = \frac{1}{T}\sum_{t=1}^{T} X_{it}$ and $Y = \frac{1}{T}\sum_{t=1}^{T} Y_t$. We normalize the index to 100 by estimating

$$EPU_{it}^{N} = \frac{EPU_{it}}{\overline{EPU}_i} \times 100,$$

where $\overline{EPU}_i = \frac{1}{T}\sum_{t=1}^{T} EPU_{it}$ is the average of EPU news for each country across time. We construct the monthly EPU for the Euro area as follows. We use real GDP data for France, Germany, Greece, Italy and Spain. This real GDP is expressed in local currency and it is reported at a quarterly frequency. Prior to 2000, we transform this real GDP measures to US dollars using the observed average exchange rate in the quarter. From 2000 onward, we

[19] The difference with Baker et al. (2016) is that their index includes a non minor proportion of local newspapers. Higher heterogeneity across newspapers allows them to first compute the share of news for each individual newspaper within a country and then add up the total sum for each country. In other words, they do not pool all articles within a country together.

assume that all countries use the euro as the relevant currency, so that there is no need for us to convert them to a common currency. We linearly interpolate the real GDP of each country to get GDP at a monthly frequency. As a result, we can aggregate GDP across countries in the eurozone to construct a GDP measure for the entire eurozone. We then construct the Euro Area EPU Index as $EPU_t = \sum_{i=1}^{N} \omega_{it} EPU_{it}$, where $\omega_{it} = RGDP_{it} / \sum_{i=1}^{N} RGDP_{it}$ is the share of the eurozone GDP accounted for by country i, EPU_{it} is the EPU index for country i at time t, and N is the number of countries in the eurozone for which we observe a value for EPU_{it} and their GDP.

List of Words

Our list of words from comes from Baker et al. (2016). In particular, we use the following list of words from their list: tax, taxation, taxes, policy, government spending, federal budget, budget battle, balanced budget, defense spending, defence spending, military spending, entitlement spending, fiscal stimulus, budget deficit, federal debt, national debt, debt ceiling, fiscal footing, government deficit, fiscal policy, federal reserve, the fed, money supply, open market operations, quantitative easing, monetary policy, fed funds rate, overnight lending rate, the fed, Bernanke, Volker, Greenspan, central bank, interest rates, fed chairman, fed chair, lender of last resort, discount window, central bank, monetary policy, health care, health insurance, prescription drugs, drug policy, medical insurance reform, medical liability, , national security, war, military conflict, terrorism, terror, 9/11, armed forces, base closure, military procurement, military embargo, no-fly zone, military invasion, terrorist attack, banking (or bank) supervision, thrift supervision, financial reform, basel, capital requirement, bank stress test, deposit insurance, union rights, card check, collective bargaining law, minimum wage, closed shop, workers compensation, advance notice requirement, affirmative action, overtime requirements, antitrust, competition policy, merger policy, monopoly, patent, copyright, unfair business practice, cartel, competition law, price fixing, healthcare lawsuit, tort reform, tort policy, punitive damages, medical malpractice, energy policy, energy tax, carbon tax, drilling restrictions, offshore drilling, pollution controls, environmental restrictions, immigration policy, illegal immigration, sovereign debt, currency crisis, currency crises, currency crash, crisis, crises, reserves, tariff, trade, devaluation, capital controls, expropriation, nationalization, corruption.

The list of words used in Baker et al. (2016) is mostly conceived for AEs. To better capture that policy uncertainty characteristics of emerging markers, we include five additional words: capital controls, expropriation, nationalization and corruption.

List of Newspapers

We include the following newspapers: ABC Network, Agence France Presse, BBC, The Boston Globe, CBS Network, Chicago Tribune, Financial Times, The Globe and Mail, Houston Chronicle, Los Angeles Times, NBC Network, The New York Times, The San Francisco Chronicle, The Telegraph (U.K), The Wall Street Journal, The Times (U.K), USA Today, Washington Post, Reuters, The Dallas Morning News, The Miami Herald, The Guardian (U.K), and The Economist.

A.4. ICRG: Composite and Political Risks

Our measures of composite and policy risks come from the International Country Risk Guide (ICRG) dataset which provides data on country's political, economic and financial risks for more than than 140 countries at monthly frequency. We describe below the definition of each variable used in the paper and then present the correlation of the sub-components of political risk with the UIP premium.

A.4.1 Definition of Variables

In our analysis, we employ the composite risk variable to proxy for overall country risk – political, economic and financial risks–, and socioeconomic conditions to capture confidence risk. We pool investment profile and democratic accountability together to measure government policy risk (i.e. the average of both variables). Additionally, we use separately investment profile to proxy for expropriation risk and democratic accountability to capture anti-democratic risk. We describe below all the variables in detail.

-*Composite risk*. It is a composite of political, financial and economic risk. Political risk contributes 50% of the composite rating, while financial and economic risk ratings each contribute 25%. Political risk has 12 components and the assessment is made on the basis of subjective analysis of the available information. Financial and economic risk each have five components and their assessments are made solely on the basis of objective data. The components of political, economic and financial risks are:

-<u>Political risk</u>: government stability*, socioeconomic conditions*, investment profile*, internal conflict*, external conflict*, democratic accountability$^+$, corruption$^+$, military in politics$^+$, religious tensions$^+$, law and order$^+$, ethnic tensions$^+$, and bureaucracy quality. The components with $*$ are given up to 12 points and, hence, have a higher weight, the components with $^+$ are given up to 6 points, and the last component (bureaucracy quality) is given only 4 points.

- Government stability: this index assesses both of the government's ability to carry out its declared programs, and its ability to stay in office. It has three subcomponents that describe government unity, legislative strength and popular support.
- Socioeconomic conditions: this index assesses the socioeconomic pressures at work in society that could constrain government action or fuel social dissatisfaction. It has three subcomponents: unemployment, consumer confidence and poverty.

- Investment profile: this index assesses factors affecting the risk to investment that are not covered by other political, economic and financial risk components. It has three components: contract viability/expropriation, profits repatriation and payment delays.

- Internal conflict: assesses political violence in the country and its actual or potential impact on governance. The subcomponents are: civil war/coup threat, terrorism/political violence and civil disorder.

- External conflict: this index is an assessment both of the risk to the incumbent government from foreign action, ranging from non-violent external pressure (diplomatic pressures, withholding of aid, trade restrictions, territorial disputes, sanctions, etc) to violent external pressure (cross-border conflicts to all-out war). External conflicts can adversely affect foreign business in many ways, ranging from restrictions on operations to trade and investment sanctions, to distortions in the allocation of economic resources, to violent change in the structure of society. The subcomponents are: war, cross-border conflict and foreign pressures.

- Democratic accountability: it is a measure of how responsive and accountable government is to its people. As such, it captures the degree of freedom that a government has to impose policies to its own advantage. It evaluates several types of government from more to less democratic, considering whether it is alternating democracy, dominated democracy, de facto one-party state, de jure one-party state, and autarchy.

- Corruption: assessment of corruption within the political system. Such corruption is a threat to foreign investment for several reasons: it distorts the economic and financial environment; it reduces the efficiency of government and business by enabling people to assume positions of power through patronage rather than ability; and, last but not least, introduces an inherent instability into the political process. The measure considers financial corruption in the form of demands for special payments and bribes connected with import and export licenses, exchange controls, tax assessments, police protection, or loans. It also considers potential corruption in the form of excessive patronage, nepotism, job reservations, 'favor-for-favors', secret party funding, and suspiciously close ties between politics and business.

- Military in politics: considers involvement of militaries in politics,

- Religious tensions: measures the relevance of a single religious group that seeks to replace civil law by religious law and to exclude other religions from the political and/or social process; the desire of a single religious group to dominate governance;

the suppression of religious freedom; the desire of a religious group to express its own identity, separate from the country as a whole.

- Law and order: this refers to the strength and impartiality of the legal system and the popular observance of the law.
- Ethnic tensions: refers to the degree of tension within a country attributable to racial, nationality, or language divisions.
- Bureaucracy quality: measures the strength and quality of the bureaucracy. High points are given to countries where the bureaucracy has the strength and expertise to govern without drastic changes in policy or interruptions in government services.

-Economic risk: it includes GDP per capita, real GDP growth, inflation rate, budget balance over GDP, current account over GDP.

-Financial risk: it includes foreign debt over GDP, foreign debt service over exports of goods and services, current account over exports of goods and services, net international liquidity as months of import cover, exchange rate stability.

Eurozone ICRG Risk Variable Construction. We construct a monthly eurozone ICRG risk indexes as follows. We use real GDP data for the 19 countries that compose the eurozone. This real GDP is expressed in local currency and it is reported at a quarterly frequency. Prior to 2000, we transform this real GDP measures to US dollars using the observed average exchange rate in the quarter. From 2000 onward, we assume that all countries in the Eurozone use the Euro as the relevant currency, so that there is no need for us to convert them to a common currency. We linearly interpolate the real GDP of each country to get GDP at a monthly frequency. As a result, we can aggregate GDP across countries in the eurozone to construct a GDP measure for the entire Eurozone. We then construct the Eurozone Composite Risk Index as

$$ECR_t = \sum_{i=1}^{N_t} \omega_{it} CR_{it},$$

where $\omega_{it} = RGDP_{it} / \sum_{i=1}^{N_t} RGDP_{it}$ is the share of the Eurozone GDP accounted for by country i, CR_{it} is the ICRG risk index for country i at time t, and N_t is the number of countries in the eurozone for which we observe a value for CR_{it} and their GDP. This latter number can change over time due to reporting issues. However, starting in 1999 all 19 countries in the eurozone have information on both their GDP and the composite risk index.

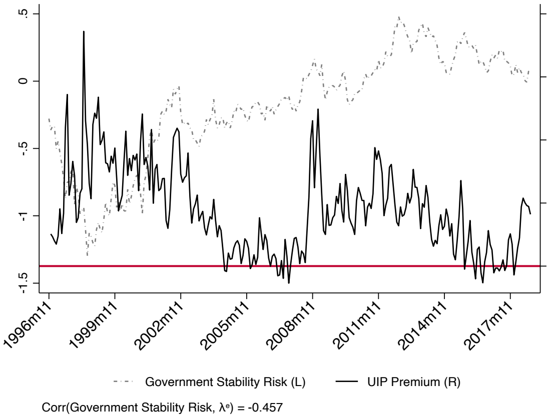
A.4.2 Correlation of Sub-Components of Political Risk and UIP Premium in EMs

Section 4.6 focused on two main determinants of political risk correlated with the UIP premium in EMs, namely government policy risk (composed by anti-democratic and expropriation risks) and confidence risk. In this section, we present the correlation of other sub-components of political risk with the UIP premium (for EMs) not directly employed in this paper, and show that these correlations have usually the wrong (negative) sign and are typically small.[20]

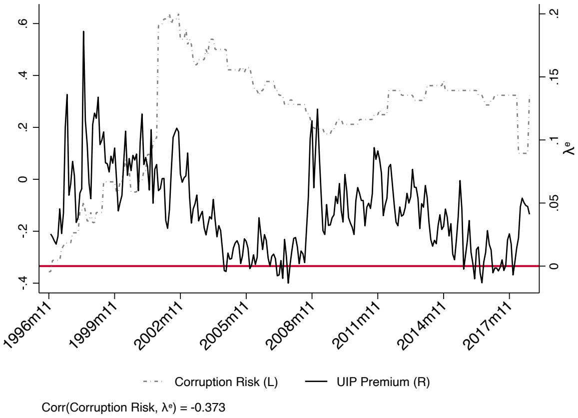
As detailed above, the other sub-components of political risk reported in the ICRG data and not directly used in the paper are: government stability, corruption, external conflict, internal conflict, military in politics, religious tensions, law and order, ethnic tensions and bureaucracy quality. Figure A2 presents the correlation of the UIP premium with each of this components. The correlation with these other subcomponents is usually small and sometimes has the opposite sign. For example, it is interesting to note on the correlation with government stability risk (panel a), which has the wrong sign (negative). This sub-component captures government unity and legislative strength and, hence, is quite different from from our government policy risk variable (which captures expropriation risk). Other examples are sub-components of political risk are: corruption, law and order, religious tensions, bureaucracy quality and ethnic tensions (panels b, c, d, e and f), which have less time-series variation and are negatively correlated with the UIP premium.

Therefore, these figures indicate that these sub-components capture elements of political risk that are not significantly related to foreign investors' risk sentiments, and thus do not significantly correlate with the UIP premium in EMs.

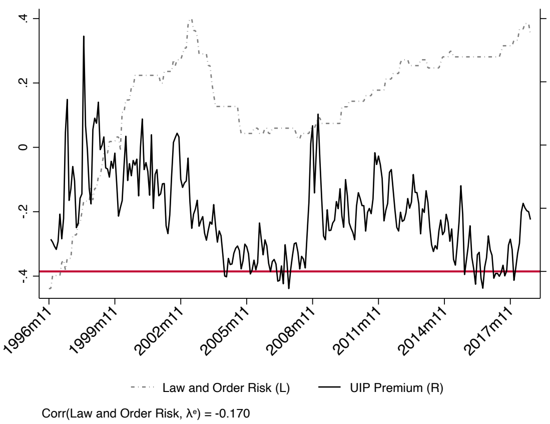
[20]The correlation of the UIP premium with government policy and confidence risk is presented in Figure C.4, and the its correlation with anti-democratic and expropriation risks is reported in Figure C.5.



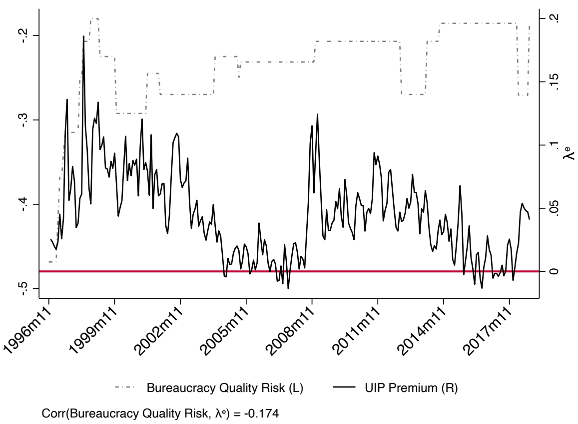
a) Government Stability Risk



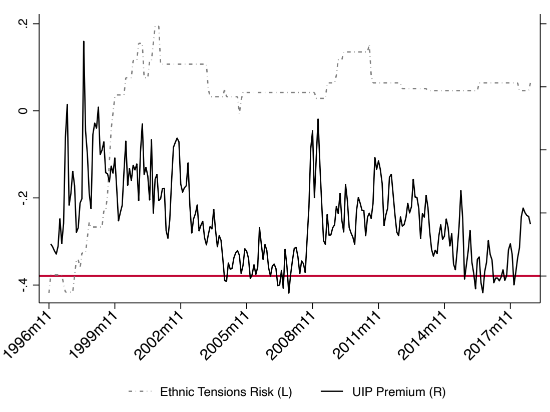
b) Corruption Risk



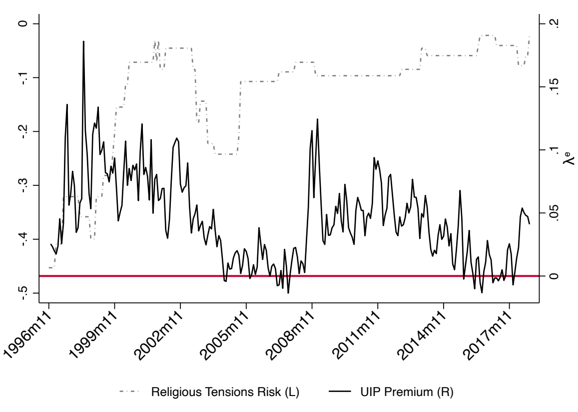
c) Law and Order Risk



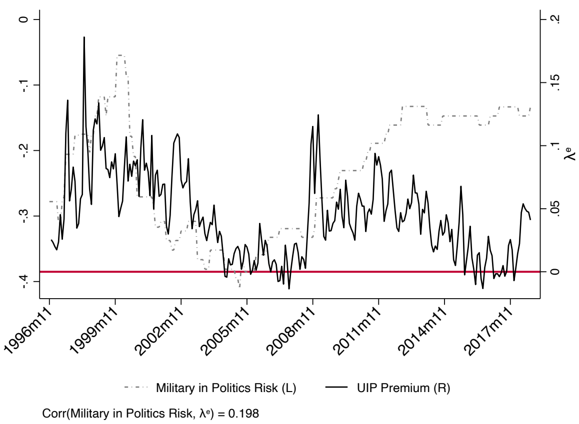
d) Bureaucracy Quality Risk



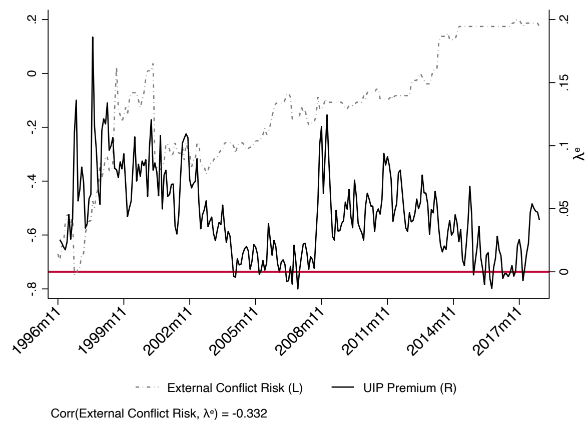
e) Ethnic Tensions Risk



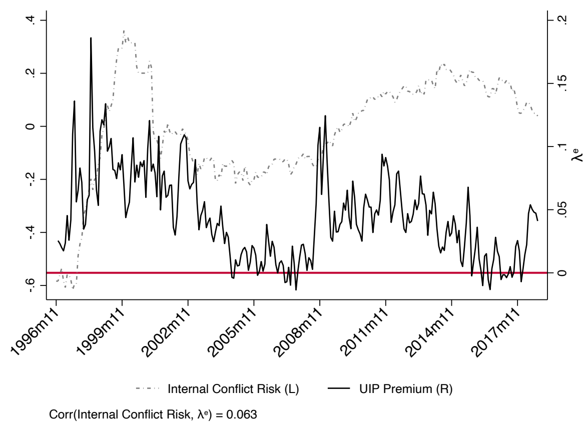
f) Religious Tensions Risk



g) Military in Politics Risk



h) External Conflict Risk



i) Internal Conflict Risk

Figure A2. Correlation of Sub-Components of Political Risk and UIP Premium in Emerging Markets

Note: This figure shows the correlation of other sub-components of political risk (not used in the paper) with the UIP Premium in EMs. The UIP premium is measured using Consensus Forecast.

B. Connection to Fama Puzzle

We have studied the dynamics of the UIP premium across time in emerging markets. We now assess whether the UIP condition holds *on average* by estimating the so-called Fama and excess returns regressions using both ex-post realized and ex-ante expectational data on exchange rates.

From the pioneering works of Fama (1984) and Hansen and Hodrick (1980), the empirical international macro and finance literature usually assumes that agents have FIRE and tests the UIP condition using ex-post exchange rate.[21] In particular, it estimates

$$s_{it+h} - s_{it} = \beta^F (i_{it} - i_t^{US}) + \mu_i + \varepsilon_{it+h}^F, \tag{12}$$

where the superscript F denotes that equation (12) is computed using ex-post exchange rate (s_{it+h}). If $\beta^F = 1$, interest rate differentials and exchange rate changes offset each other and the UIP condition holds on average under FIRE. If $\beta^F < 1$, the depreciation is lower than implied by the interest rate differential and there are ex-post excess returns. To test whether excess returns are predictable, we estimate

$$\lambda_{it+h}^F = \beta_1^F (i_{it} - i_t^{US}) + \mu_i + \varepsilon_{1it+h}^F, \tag{13}$$

where λ_{it+h}^F denotes excess returns estimated using the realized exchange rate. $\beta_1^F = 0$ implies the absence of predictable excess returns. If β_1^F is statistically different from zero, there are predictable excess returns.[22] In both equations, we cluster the standard errors by currency and time.

Table B.1 reports the results and show that in EMs, there are ex-post excess returns from investing in these currencies. Although the coefficient of the Fama regression has the right sign (0.374) –indicating that EM currencies tend to depreciate as implied by the UIP condition–, it is statistically different from and lower than one (column 3). This indicates that the depreciation is not enough, and there are predictable excess returns (column 4). Importantly, when we use expectational data to compute exchange rate changes and the UIP premium, we still obtain that the UIP condition does not hold for EM currencies. The Fama coefficient has the right-positive sign, but it is still statistically different from one (column 1). Consistently, expected excess returns are predictable in these economies. It is interesting

[21] Under the FIRE assumption, the expected exchange rate can be approximated with the ex-post exchange rate. There can still be an error such that expected exchange rate is equal to the realized rate plus an error term $s_{t+1}^e = s_{t+1} + \epsilon_{t+1}$. Importantly, the assumption is that, under FIRE, this error ϵ is i.i.d. and uncorrelated with the interest rate differential.

[22] Note that equations (12) and (13) are equivalent and that $\beta_1^F = 1 - \beta^F$.

to note that the coefficient of the Fama regression estimated with realized and survey data are close to each other, which suggests that UIP violations cannot be entirely associated with failures to FIRE in EMs.

Table B.1. Fama and Excess Returns Regressions

	Emerging Markets			
	(i) Expected Values		(ii) Realized Values	
	(1) Fama	(2) Excess Returns	(3) Fama	(4) Excess Returns
β^F	0.480***	0.520***	0.374***	0.626***
	(0.073)	(0.073)	(0.115)	(0.115)
p-value ($H_0 : \beta^F = 1$)	0.0000		0.0000	
Observations	3577	3577	3577	3577
Number of Countries	22	22	22	22
R^2	0.2749	0.3076	0.0255	0.0682
Currency FE	Yes	Yes	Yes	Yes

	Panel B: Advanced Economies			
	(i) Expected Values		(ii) Realized Values	
	(1) Fama	(2) Excess Returns	(3) Fama	(4) Excess Returns
β^F	1.220***	-0.220	-0.399	1.399***
	(0.269)	(0.269)	(0.361)	(0.361)
p-value ($H_0 : \beta^F = 1$)	0.4290		0.0022	
Observations	2285	2285	2285	2285
Number of Countries	12	12	12	12
R^2	0.1724	0.0068	0.0034	0.0408
Currency FE	Yes	Yes	Yes	Yes

Notes: * p < 0.10 ** p < 0.05 *** p < 0.01. Currency-time two-way clustered standard errors in parentheses. 22 EMs currencies. Period 1996m11:2018m10.

Note: * p < 0.10 ** p < 0.05 *** p < 0.01. Currency-time two-way clustered standard errors in parentheses. 22 EMs. Period 1996m11:2018m12.

To visualize this results, we plot in Figure B.1, the expected (left) and realized (right) rate of depreciation on the interest rate differentials EMs, which slope is equivalent to UIP regressions without currency fixed effects. As the figure shows, there is no much difference in the slope of the course. Either using ex-post realization or ex-ante expected exchange rates, EM currencies offer excess returns. That is, investors expect and earn ex-post excess returns for investing in EM currencies.

Comparison with AEs.

For comparison, Panel B in Table B.1 presents the results for AEs, and shows that the results changed substantially for these economies. Using realized exchange rates to measure the UIP premium, we find that he Fama coefficient is negative –albeit non-statistically significant– in-

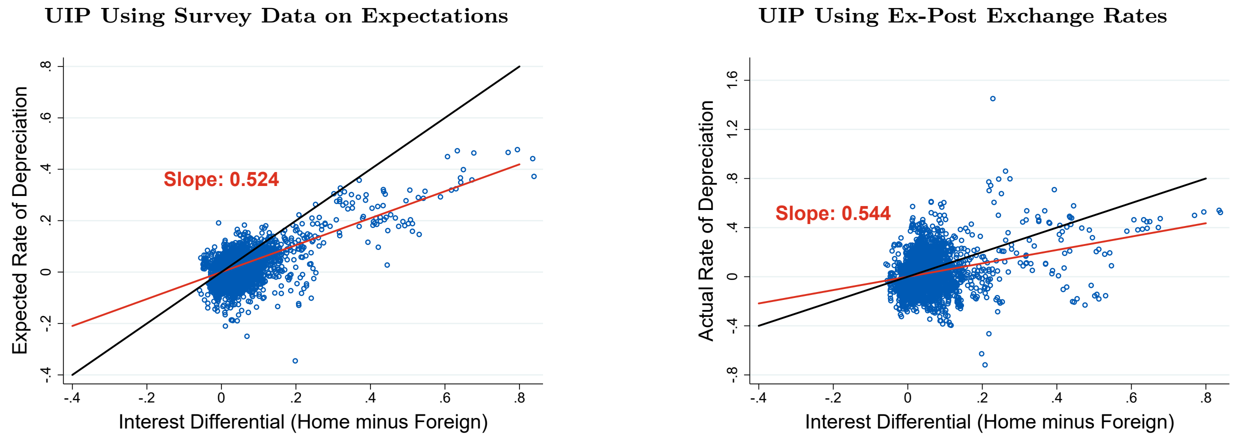


Figure B.1. UIP with Realized and Expected Exchange Rates in Emerging Markets

Note: This figure shows the expected and ex-post rate of depreciation at 12 month horizon and the interest rate differential for 34 currencies –22 EMs and 12 AEs– over 1996m11:2018m10. The expected rate of depreciation is measured using Consensus Forecast.

dicating that high interest rate currencies tend to appreciate, instead of depreciate as implied by the UIP condition (column 3). In line with this result, realized excess returns positively and significantly associate with interest rate differentials in these economies (column 4). These results change substantially when using expectational data. The Fama coefficient is positive and not statistically different from one, which implies that expected exchange rate changes tend to offset changes in the interest rate differential, as the UIP condition implies (column 1). Along these lines, the coefficient of the expected excess return regression is not statistically differently from zero (column 2). The failure of the UIP condition using realized exchange rates and its validity using expectational data in AEs have also been documented by Frankel and Froot (1987), Bacchetta et al. (2009), Chinn and Frankel (1994), Stavrakeva and Tang (2018), Bussiere et al. (2018).

B.1. Does the Bias on the Fama Coefficient Correlate with Policy Uncertainty?

In this section, we evaluate whether the downward bias of the Fama coefficient in EMs associates with a time-varying risk premium arising from country-specific policy uncertainty. As discussed in Froot and Frankel (1989) and shown in detailed in Appendix B.3, the Fama coefficient estimated using expectational data can be written as: $plim\hat{\beta} = 1 - b_{RP}$, where b_{RP} is a time-varying risk premium.

To evaluate the impact of policy risk on the downward bias of the Fama coefficient, we need to evaluate how a country's policy risk affects Fama coefficient and the risk premium across time. This implies obtaining a currency-specific and time-varying risk premium and Fama coefficient, and assessing their correlation with a country's policy risk. With this end, we estimate the Fama regression for each currency in non-overlapping 18-months rolling windows, and obtain a currency i- and window j-specific Fama coefficient, β_{ij}. More precisely, we estimate

$$\Delta s^e_{ijt+h} = \alpha_{ij} + \beta_{ij}(i_{ijt} - i^{US}_{jt}) + \varepsilon_{ijt+h} \qquad \forall i, j, \tag{14}$$

where j denotes a non-ovelapping rolling window and t is the monthly variation within this window with a 12-month horizon expectation denoted with h. Under subjective expectations, the risk premium has a one-to-one mapping with the Fama coefficient. More precisely,

$$plim\hat{\beta}_{ij} = 1 - b_{ij,RP} \qquad \text{and} \qquad b_{ij,RP} = \frac{var(\lambda^e_{ij}) + cov(\Delta s^e_{ij}, \lambda^e_{ij})}{var(IR_{ij})}, \tag{15}$$

where $var(\lambda^e_{ij})$, $cov(\Delta s^e_{ij}, \lambda^e_{ij})$ and $var(IR_{ij})$ are calculated across months within window j for each currency i.[23,24] To assess the relationship between policy risk and the Fama coefficient, we estimate the following pooled OLS regression:

$$\hat{\beta}_{ij} = \gamma_2 + \gamma_3 \text{ policy risk}_{ij} + \varepsilon_{ij}, \tag{16}$$

where $\hat{\beta}_{ij}$ is the Fama coefficient estimated in regression (14) and policy risk$_{ij}$ is the mean of policy risk in currency i and window j for each of our policy risk variables. The coefficient γ_3 captures the change in the Fama coefficient associated with a change in the policy risk. In both regressions (14) and (16), we cluster the standard errors by country.[25]

Table B.2 presents the results for the Fama coefficient. The coefficient for composite risk is negative and indicates that an increase in a country's composite risk associates with a contemporaneous decrease in the Fama coefficient (column 1). The estimated coefficient implies that if the composite risk increases from the p25 to p75 (from Poland to India in the window 2001m5 to 2002m10) the Fama coefficient would decrease 0.31 percentage points. In columns 2 and 3, we unpack the composite risk in its two components: government policy risk and confidence risk. Both risks are negatively correlated with the Fama coefficient, but only government policy risk is significant.

In columns 4 and 5, we go one step further and break down government policy risk in its two sub-components: anti-democratic risk and expropriation risk. Anti-democratic risk captures the level of autocracy of the government and, thus, the degree of freedom that a

[23] For expositional simplicity, we removed the time horizon subscript h and note that all our estimates are considered at 12-month horizon.

[24] Using survey data to estimate equation (14) eliminates the term b_{RE}, as the regression already considers subjective expectations. See Appendix B.3 for a derivation of this relationship.

[25] We only cluster the standard errors by country, because there is not enough observations across windows to cluster by time. Note that there are only 13 windows in the sample.

government has to impose policies to its own advantage. Expropriation risk captures the risk of expropriation, the risk of limiting or banning foreign investors' profits repatriation and payment delays.[26] Interestingly, both anti-democratic risk and expropriation risk are negative and statistically significant, pointing to a downward bias in the Fama coefficient.[27]

Table B.2. The Fama Coefficient in Emerging Markets: Composite and Government Policy Risks

	Bias of Fama Coefficien: Risk Premium				
	Composite Risk	Unpacking Composite Risk		Decomposing Government Policy Risk	
		Government Policy Risk	Confidence Risk	Anti-Democratic Risk	Expropriation Risk
	(1)	(2)	(3)	(4)	(5)
	Panel A. Fama Coefficient $\hat{\beta}_{ij}$				
Policy $\text{risk}_{i,j}$	-0.592*	-0.764***	-0.139	-0.624***	-0.489*
	(0.328)	(0.253)	(0.186)	(0.180)	(0.256)
R^2	0.0134	0.0414	0.0020	0.0415	0.0205
	Panel B. Risk Premium: $b_{ij,RP}$				
Policy $\text{risk}_{i,j}$	0.592*	0.764***	0.139	0.624***	0.489*
	(0.328)	(0.253)	(0.186)	(0.180)	(0.256)
R^2	0.0134	0.0414	0.0020	0.0415	0.0205
Observations	180	180	180	180	180

Note: * p < 0.10 ** p < 0.05 *** p < 0.01. Currency-clustered standard errors in parentheses. Expected exchange rate changes are measured using Consensus Forecast. All regressions include a constant term.

For completeness, we replace the right hand side of equation (16) with $b_{ij,RP}$ and evaluate the correlation between risk premium term and policy risk. As we show in Panel B, the coefficients for composite, government policy, anti-democratic and expropriation risks are all positive and statistically significant, indicating that higher uncertainty on EMs' government policies associate with increases in the risk premium which –in turn– downward bias the Fama coefficient. Lastly, in Appendix B.2, we conduct a decomposition exercise to assess the channels through which policy risk creates a downward bias the Fama coefficient. In line with the analysis of the previous sections, we find that increases in country-specific policy risk are channelled through higher interest rate differential and, hence, policy risk is priced-in

[26]More precisely, the anti-democratic risk corresponds to the "democratic accountability" variable and expropriation risk corresponds to the "investment profile" in the ICRG dataset.

[27]In Figure C.5 in Appendix C, we show that anti-democratic risk and expropriation risk are substantially correlated with the UIP in EMs.

the interest rate term.

-Additional Robustness. To make sure that results are not driven by sample selection, we re-estimate the Fama and excess return regressions for an unbalanced panel of 34 advanced and emerging economies.[28] Results reported – in Table B.3– confirm the failure of the UIP condition for both advanced and emerging economies when using realized exchange rates, and its failure for EMs when using survey data. Additionally, to assess whether our analysis on the channel creating a downward bias in the Fama coefficient is not driven by the length of the window with which we estimate the β coefficient and b_{RP} term, we re-compute these variables for 12-months and 24-months rolling windows and show in Tables B.4 and B.5 that our results hold true for these different windows.

Table B.3. Fama and Excess Return Regressions: Unbalanced Sample

	Fama Regression		Excess Return Regression	
	Advanced Economies	Emerging Markets	Advanced Economies	Emerging Markets
	(1)	(2)	(3)	(4)
	Panel A: Realized Exchange Rate			
β^F	-0.399	0.374***	1.399***	0.626***
	(0.361)	(0.115)	(0.361)	(0.115)
P-value ($H_0 : \beta^F = 1$)	0.0022	0.0000		
R^2	0.0034	0.0255	0.0408	0.0682
	Panel B: Expected Exchange Rate			
β	1.196***	0.482***	-0.196	0.518***
	(0.258)	(0.073)	(0.258)	(0.073)
P-value ($H_0 : \beta = 1$)	0.4620	0.0000		
R^2	0.1750	0.2705	0.0057	0.3007
Currency FE	yes	yes	yes	yes
Observations	2,375	3,755	2,375	3,755
Number of Currencies	12	22	12	22

Note: * p < 0.10 ** p < 0.05 *** p < 0.01. Currency-time two-way standard errors in parentheses. The UIP premium and expected exchange rate changes are measured using Consensus Forecast.

[28]Recall that our balanced sample consists on countries for which we have observations for all variables to compute the Fama and excess return regressions and the composite risk. In the unbalanced panel, we still exclude fixed pegs.

Table B.4. The Fama Coefficient in EMs: Composite and Government Policy Risks (12-Months)

	Panel A. Fama Coefficient: $\hat{\beta}_{ij}$				
	Composite Risk	Unpacking Composite Risk		Decomposing Government Policy Risk	
		Government Policy Risk	Confidence Risk	Anti-Democratic Risk	Expropriation Risk
	(1)	(2)	(3)	(4)	(5)
Policy risk$_{i,j}$	-0.555^d	-0.952***	-0.111	-0.686***	-0.729**
	(0.356)	(0.329)	(0.197)	(0.258)	(0.290)
R^2	0.0086	0.0481	0.0009	0.0377	0.0335
	Panel B. Risk Premium: $b_{ij,RP}$				
Policy risk$_{i,j}$	0.555^d	0.952***	0.111	0.686***	0.729**
	(0.356)	(0.329)	(0.197)	(0.258)	(0.290)
R^2	0.0086	0.0481	0.0009	0.0377	0.0335
Observations	275	275	275	275	275

Note: ^{d}p<0.15 * p < 0.10 ** p < 0.05 *** p < 0.01. Currency-clustered standard errors in parentheses. All regressions include a constant term. Expected exchange rate changes are measured using Consensus Forecast.

Table B.5. The Fama Coefficient in EMs: Composite and Government Policy Risks (24-Months)

	Panel A. Fama Coefficient: $\hat{\beta}_{ij}$				
	Composite Risk	Unpacking Composite Risk		Decomposing Government Policy Risk	
		Government Policy Risk	Confidence Risk	Anti-Democratic Risk	Expropriation Risk
	(1)	(2)	(3)	(4)	(5)
Policy risk$_{i,j}$	-0.527**	-0.864***	-0.182	-0.669***	-0.612***
	(0.260)	(0.131)	(0.168)	(0.121)	(0.188)
R^2	0.0202	0.1009	0.0066	0.0902	0.0604
	Panel B. Risk Premium: $b_{ij,RP}$				
Policy risk$_{i,j}$	0.527**	0.864***	0.182	0.669***	0.612***
	(0.260)	(0.131)	(0.168)	(0.121)	(0.188)
R^2	0.0202	0.1009	0.0066	0.0902	0.0604
Observations	132	132	132	132	132

Note: * p < 0.10 ** p < 0.05 *** p < 0.01. Currency-clustered standard errors in parentheses. All regressions include a constant term. Expected exchange rate changes are measured using Consensus Forecast.

B.2. The Role of Interest Rate and Exchange Rates

We now conduct a decomposition analysis to unpack the channels through which policy risk affects the risk premium and downwards bias the Fama coefficient. Recall that the Fama coefficient for country i in window j can be expressed as $plim\hat{\beta}_{ij} = 1 - b_{ij,RP} = 1 - \frac{var(\lambda^e_{ij})+cov(\Delta s^e_{ij},\lambda^e_{ij})}{var(IR_{ij})}$ (equation (15)).

Mathematically, one could evaluate how an increase in policy risk in window j in country i affects its Fama coefficient by taking derivatives of this expression with respect to risk. After some algebra, the change in the Fama coefficient would be

$$\frac{\partial\hat{\beta}_{ij}}{\partial \text{policy risk}_{ij}} = \underbrace{-\frac{1}{var(IR_{ij})}\frac{\partial var(\lambda^e_{ij})}{\partial \text{policy risk}_{ij}}}_{\text{UIP Premium Volatility}} - \underbrace{\frac{1}{var(IR_{ij})}\frac{\partial cov(\Delta s^e_{ij},\lambda^e_{ij})}{\partial \text{policy risk}_{ij}}}_{\text{Comovement ER \& UIP Premium}} + \underbrace{\frac{b_{ij,RP}}{var(IR_{ij})}\frac{\partial var(IR_{ij})}{\partial \text{policy risk}_{ij}}}_{\text{Interest Rate Volatility}}. \tag{17}$$

Equation (17) shows that the change in the Fama coefficient stems from three forces: (i) changes in the volatility of the UIP premium (first term), (ii) changes in the comovement between the expected exchange rate change and the UIP premium (second term), and (iii) changes in the volatility of the interest rate differential (third term). Equation (17) is a mathematical derivation for a particular country i at window j but, under the assumption that each component of the risk premium responds homogeneously across time and countries, we can estimate each of these three forces econometrically.[29] That is, we can regress $var(\lambda^e_{ij})$, $cov(\Delta s^e_{ij},\lambda^e_{ij})$ and $var(IR_{ij})$ on policy risk and obtain the *average* responses to policy risk across countries and time (i.e. $\frac{\Delta var(\lambda^e_{ij})}{\Delta \text{policy risk}_{ij}}$, $\frac{\Delta var(IR_{ij})}{\Delta \text{policy risk}_{ij}}$ and $\frac{\Delta cov(\Delta s^e_{ij},\lambda^e_{ij})}{\Delta \text{policy risk}_{ij}}$). Because these derivatives are weighted by the variance of the interest rate differential in each country i and window j and the last derivate is additionally weighted by the risk premium term $b_{ij,RP}$, we estimate them econometrically employing Weighted Least Squares.[30] More precisely, we estimate

[29]To understand this assumption, note that equation (17) captures the change in the β coefficient in a country i at time j upon an increase in policy risk in that period. Yet the econometrician is not interested in each individual response of each country at each moment of time, but on the *average* response across time and countries. To compute average responses, we can assume that each component of the risk premium in equation (17) responds homogeneously across time and countries, and employ these homogeneous responses to obtain the average response of the Fama coefficient to changes in policy risk. Hence, under this homogeneity assumption, the derivative – $\frac{\partial\beta_{ij}}{\partial \text{policy risk}_{ij}}$ – can be interpreted as the *average* response of the Fama coefficient.

[30]The WLS is a good econometric approximation of the derivatives in equation (17). More precisely, the derivatives in equation (17) refer to the response of each country i at time j and are weighted by variables at country i and time j level. So, these are individual responses for each country and time pair. Instead, the WLS weights each observation for each country and time to compute average responses. Put it differently, the WLS weights each observation to estimate individual responses, while the derivatives in equation (17) are the average responses weighted by country and time.

$$Y_{ij} = \gamma_4 + \gamma_5 \, \text{policy risk}_{ij} + \varepsilon_{1ij}, \tag{18}$$

where $Y_{ij} = \{var(\lambda^e_{ij}), cov(\Delta s^e_{ij}, \lambda^e_{ij}), var(IR_{ij})\}$. The regressions for $var(\lambda^e_{ij})$ and $cov(\Delta s^e_{ij}, \lambda^e_{ij})$ are weighted by the variance of the interest rate differential in each country i window j, and that for $var(IR_{ij})$ is weighted by the ratio of the risk premium term and the variance of the interest rate differential in each country i window j.[31]

We assess the impact of the policy risk on the Fama coefficient using our composite risk variable. Panel A in Table B.6 presents the results and shows that the driver of the downward bias of the Fama coefficient is the increase in the volatility of the UIP premium. In particular, column 1 shows that the coefficient of the variance of the UIP premium is positive and highly statistically significant, while the other two coefficients – the covariance between exchange rate change and the UIP premium and the interest rate volatility– are close to zero. This result indicates that a one standard deviation in that increases in composite risk associates with a 0.49 percentage points decrease in the volatility of the UIP premium. We can then use the estimated coefficients to check how each of these three forces contribute to the bias of the Fama coefficient. As expected, the increase in the volatility of the UIP premium explains 87% of the bias of the Fama coefficient arising from changes in composite risk.[32]

We then evaluate how composite risk affects each of the component of the variance of the UIP premium. Recall that the UIP premium in country i in period j is given by $\lambda^e_{ij} = IR_{ij} - \Delta s^e_{ij}$ and, thus, its variance is equal to

$$var(\lambda^e_{ij}) = var(IR_{ij}) + var(\Delta s^e_{ij}) - 2cov(IR_{ij}, \Delta s^e_{ij}). \tag{19}$$

To assess the impact of composite risk on each term of equation (19), we regress each of these components on composite risk. Panel B in Table B.6 shows that composite risk associates with increases in both the volatility of the interest rate differential and the volatility of the exchange rate change, but the increase in the volatility of the interest rate differential is larger. As discussed above, the higher increase in the volatility of the interest rate differential suggests that a country's composite risk is priced in the interest rate differential.

[31] Alternatively, with time series long enough, one could estimate these regressions separately for each country, i.e. without imposing homogeneity across countries. That is, one could estimate regression (18) for each country and obtain individual γ_{4i}. Unfortunately, because our data spans only between 1996m11 and 2018m12, we do not have enough time series variation to estimate these coefficients consistently. As West (2012) shows, in models where the discount factor approaches one, the coefficient in the Fama regression could be inconsistent in small samples.

[32] Note that the sum of the estimated coefficients of equation (17) (0.878) and the coefficient reported in Table B.6 (0.584) are not exactly identical, due to the presence of non-linearities in this decomposition.

Table B.6. Decomposition of The Bias of Fama Coefficient in Emerging Markets

	Panel A: Decomposition of Bias of Fama Coefficient		
	UIP premium Volatility (1)	Comovement ER & UIP premium (2)	Interest Rate Volatility (3)
Composite risk$_{i,j}$	0.765***	0.115	0.002***
	(0.066)	(0.176)	(0.001)
Contribution to $\frac{\partial \beta_{ij}}{\partial \text{composite risk}_{ij}}$ ($\frac{\partial \beta_{ij}}{\partial \text{composite risk}_{ij}}$ normalized to 100)	87	13	0
R^2	0.8213	0.0433	0.0072
	Panel B: Components of the Volatility of the UIP Premium		
	$var(IR_{ij})$ (1)	$var(\Delta s^e_{ij})$ (2)	$cov(IR_{ij}, \Delta s^e_{ij})$ (3)
Composite risk$_{i,j}$	0.241*	0.153***	-0.062
	(0.138)	(0.032)	(0.053)
R^2	0.1494	0.1953	0.0626
Observations	180	180	180

Note: * p < 0.10 ** p < 0.05 *** p < 0.01. Currency-clustered standard errors in parentheses. All regressions include a constant term. The UIP premium and expected exchange rate changes are measured using Consensus Forecast.

B.3. Decomposing the Bias in the Fama Regression

We follow Froot and Frankel (1989) to decompose the bias on the Fama regression arising from systematic errors in expectations and from a risk premium.

- *Decomposition of Fama Regression under FIRE.*

Consider that the probability limit of the coefficient β^F in equation (12) is given by

$$plim\hat{\beta}^F = \frac{cov(\Delta s_{it+h} - \Delta\overline{s}_i, IR_{it} - \overline{IR}_i)}{var(IR_{it} - \overline{IR}_i)} \tag{20}$$

where IR_{it} denotes de interest rate differential, $IR_{it} = i_{it} - i_t^{US}$, and the over-line denotes the average of the variable for each country across quarters corresponding to the country fixed effects included in regression (12), i.e. $\overline{X}_i = \frac{1}{T}\sum_{t=1}^{T} X_{it}$. Note that, when we average out across time, we remove the horizon subscript h, but we still consider our specifications at the same forecast horizon (12 month in our case). We can define the forecast errors as $\eta^e_{it+h} = \Delta s_{it+h} - \Delta s^e_{it+h}$ and use them to replace in equation (20) to obtain

$$plim\hat{\beta}^F = \frac{cov(\Delta s^e_{it+h} - \Delta\overline{s}^e_i, IR_{it} - \overline{IR}_i) + cov(\eta^e_{it+h} - \overline{\eta}^e_i, IR_{it} - \overline{IR}_i)}{var(IR_{it} - \bar{IR}_i)} \tag{21}$$

Using the definition of expected excess returns, we can re-write equation (21) as

$$\begin{aligned}
plim\hat{\beta}^F &= \frac{cov((IR_{it} - \overline{IR}_i) - (\lambda^e_{it+h} - \overline{\lambda}^e_i), IR_{it} - \overline{IR}_i) + cov(\eta^e_{it+h} - \overline{\eta}^e_i, IR_{it} - \bar{IR}_i)}{var(IR_{it} - \overline{IR}_i)} \\
&= \frac{var(IR_{it} - \overline{IR}_i) - cov(\lambda^e_{it+h} - \overline{\lambda}^e_i, IR_{it} - \overline{IR}_i) + cov(\eta^e_{it+h} - \overline{\eta}^e_i, IR_{it} - \bar{IR}_i)}{var(IR_{it} - \overline{IR}_i)} \\
&= 1 + \frac{cov(\eta^e_{it+h} - \overline{\eta}^e_i, IR_{it} - \overline{IR}_i)}{var(IR_{it} - \overline{IR}_i)} - \frac{cov(\lambda^e_{it+h} - \overline{\lambda}^e_i, IR_{it} - \bar{IR}_i)}{var(IR_{it} - \overline{IR}_i)}
\end{aligned} \tag{22}$$

$$\begin{aligned}
plim\hat{\beta}^F &= 1 + \frac{cov(\eta^e_{it+h} - \overline{\eta}^e_i, IR_{it} - \overline{IR}_i)}{var(IR_{it} - \bar{IR}_i)} - \frac{cov(\lambda^e_{it+h} - \overline{\lambda}^e_i, \lambda^e_{it+h} - \overline{\lambda}^e_i + \Delta s^e_{it+h} - \Delta\overline{s}^e_i)}{var(IR_{it} - \overline{IR}_i)} \\
&= 1 + \frac{cov(\eta^e_{it+h} - \overline{\eta}^e_i, IR_{it} - \overline{IR}_i)}{var(IR_{it} - \overline{IR}_i)} - \left(\frac{var(\lambda^e_{it+h} - \overline{\lambda}^e_i) + cov(\lambda^e_{it+h} - \overline{\lambda}^e_i, \Delta s^e_{it+h} - \Delta\overline{s}^e_i)}{var(IR_{it} - \overline{IR}_i)}\right)
\end{aligned} \tag{23}$$

Thus, we have

$$plim\hat{\beta}^F = 1 - b_{RE} - b_{RP}, \tag{24}$$

where

$$b_{RE} = -\frac{cov(\eta^e_{it+h} - \overline{\eta}^e_i, IR_{it} - \overline{IR}_i)}{var(IR_{it} - \overline{IR}_i)}$$

$$b_{RP} = \frac{var(\lambda^e_{it+h} - \overline{\lambda}^e_i) + cov(\Delta s^e_{it+h} - \Delta\overline{s}^e_i, \lambda^e_{it+h} - \bar{\lambda}^e_i)}{var(IR_{it} - \overline{IR}_i)}.$$

- Decomposition of Fama Regression using Expectational Data.

Consider the regression estimated using expected exchange rate changes

$$\Delta s^e_{it+h} = \alpha + \beta(i_{it} - i^*_{it}) + \mu_i + \varepsilon_{1it+h} \tag{25}$$

The probability limit of β is given by

$$plim\hat{\beta} = \frac{cov(\Delta s^e_{it+h} - \Delta\overline{s}^e_i, IR_{it} - \overline{IR}_i)}{var(IR_{it} - \overline{IR}_i)} \tag{26}$$

Combining the definition of expected excess returns in equation (1) and (26) we obtain

$$\begin{aligned} plim\hat{\beta} &= \frac{cov((IR_{it} - \overline{IR}_i) - (\lambda^e_{it+h} - \overline{\lambda}^e_i), IR_{it} - \overline{IR}_i)}{var(IR_{it} - \bar{IR}_i)} \\ &= 1 - \frac{cov(\lambda^e_{it+h} - \overline{\lambda}^e_i, IR_{it} - \overline{IR}_i)}{var(IR_{it} - \overline{IR}_i)} \end{aligned} \tag{27}$$

The probability limit of the Fama coefficient – β – of the regression estimated using expectational data is given by

$$plim\hat{\beta} = 1 - b_{RP} \qquad \text{where} \qquad b_{RP} = \frac{var(\lambda^e_{it+h} - \overline{\lambda}^e_i) + cov(\Delta s^e_{it+h} - \Delta\overline{s}^e_i, \lambda^e_{it} - \bar{\lambda}^e_i)}{var(IR_{it} - \overline{IR}_i)}.$$

C. Additional Figures and Tables

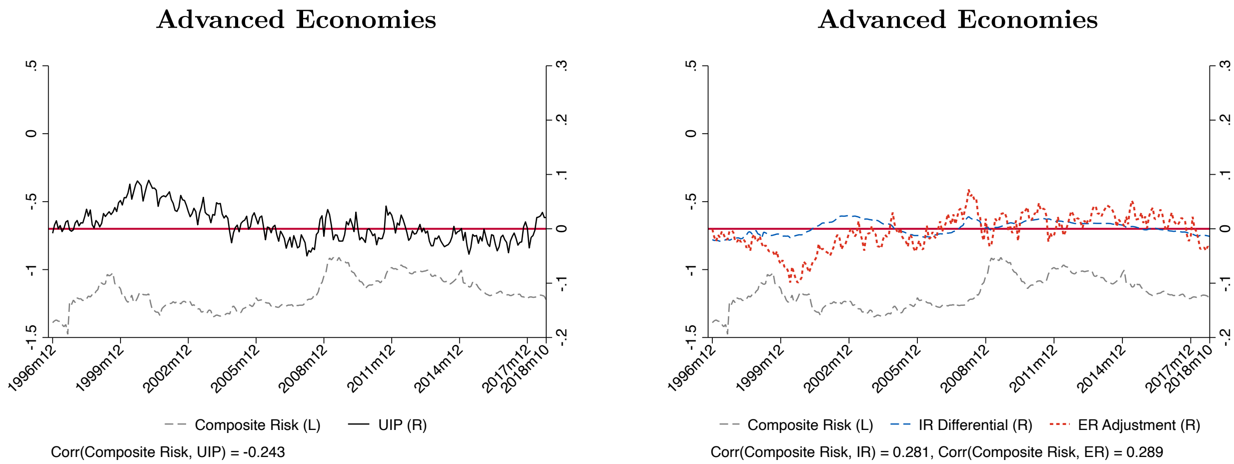


Figure C.1. Composite Risk and the UIP Decomposition n Advanced Economies

Note: This figure shows the correlation of composite risk with the UIP premium and UIP decomposition at 12 month horizon for 34 currencies –22 EMs and 12 AEs– over 1996m11:2018m10. The UIP premium and expected exchange rate changes are measured using Consensus Forecast.

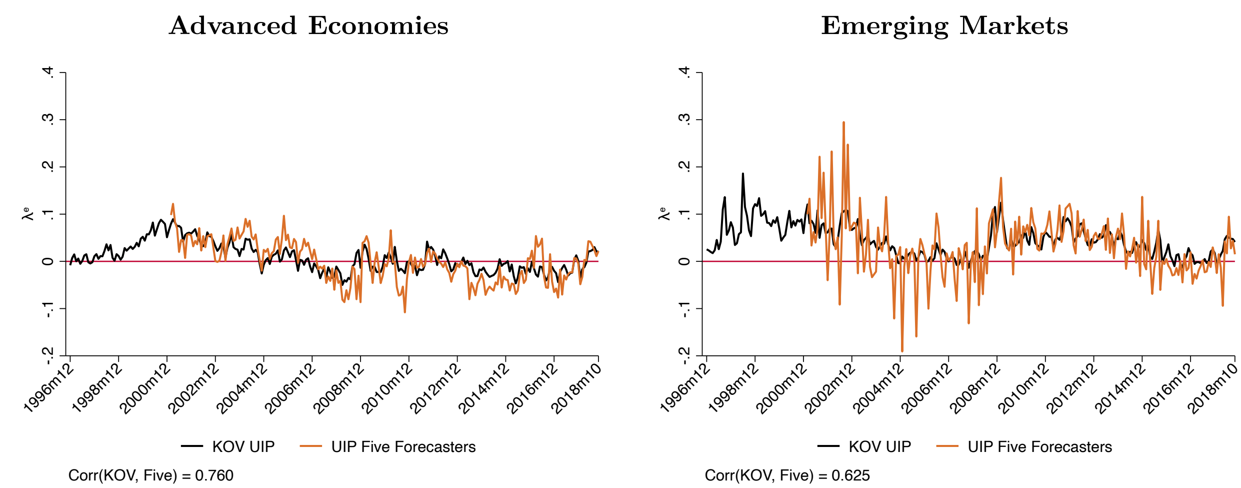


Figure C.2. Five Forecasters UIP versus Average Forecast UIP

Note: This figure shows the average UIP premium of all sample and the average UIP premium of five mayor forcasters. UIP deviations is measured using Consensus Forecast.

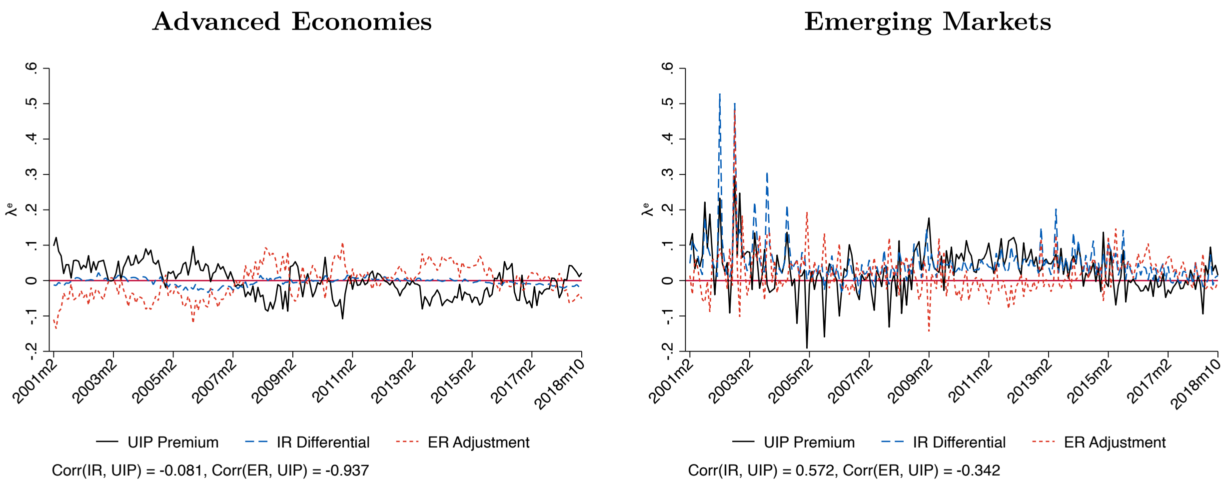


Figure C.3. Five Forecasters UIP versus Average Forecast UIP: UIP Decomposition

Note: This figure shows the average UIP premium and its decomposition of all sample and the average UIP premium of five mayor forecasters. UIP deviations is measured using Consensus Forecast.

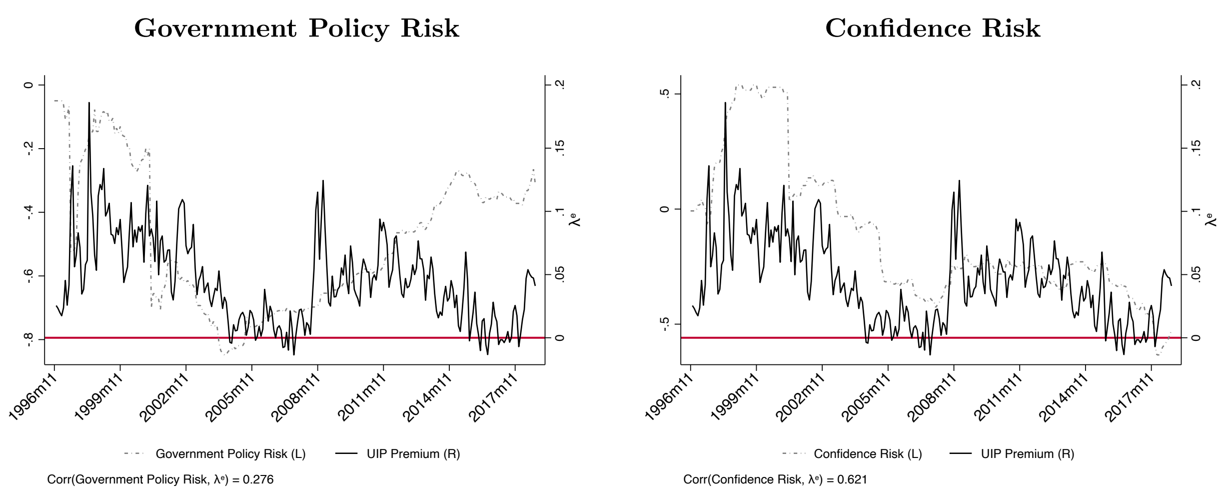


Figure C.4. Government Policy and Confidence Risks in Emerging Markets

Note: This figure shows the correlation of between the Government Policy and Confidence Risks with the UIP premium at 12 month horizon for 22 emerging markets' currencies over the period 1996m11:2018m12. The UIP premium is measured using Consensus Forecast surveys.

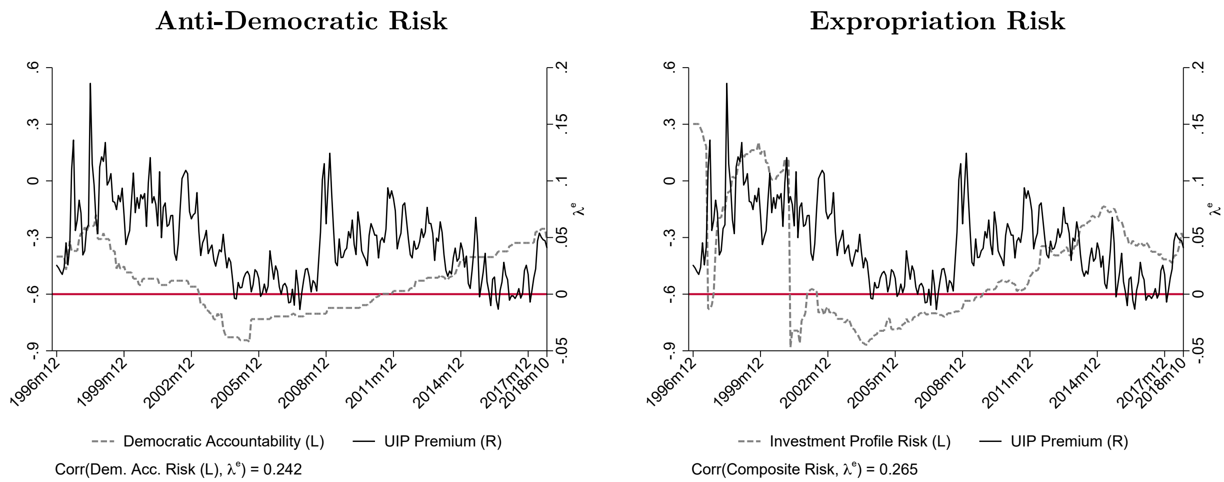


Figure C.5. Decomposing Government Policy Risk in Emerging Markets

Note: This figure shows the correlation of anti-democratic and expropriation risks and the UIP premium 12 month horizon. The UIP premium is measured using Consensus Forecast.

Table C.1. Inflation Differential

	Panel (A): Emerging Markets			Panel (B): Advanced Economies		
	(1) UIP Premium	(2) IR Diff.	(3) ER Adj.	(4) UIP Premium	(5) IR Diff.	(6) ER Adj.
Inflows/GDP$_{it-1}$	-0.001	-0.002**	-0.001	0.038	-0.007	-0.045
	(0.001)	(0.001)	(0.001)	(0.026)	(0.006)	(0.030)
$\log(VIX_{t-1})$	0.048***	0.028***	-0.020***	0.017	0.020***	0.002
	(0.007)	(0.007)	(0.007)	(0.012)	(0.004)	(0.011)
Convenience Yield/Liquidity Premium$_{t-1}$	-0.126	-0.352	-0.226	2.125*	-2.663***	-4.788***
	(0.962)	(0.998)	(1.073)	(1.264)	(0.407)	(1.426)
EPU_{it-1}	0.009***	0.005***	-0.004	-0.001	0.001	0.002
	(0.003)	(0.002)	(0.003)	(0.002)	(0.001)	(0.002)
Inflation Differential$_{it-1}$	1.840***	2.517	0.677	0.015	0.030	0.014
	(0.445)	(1.550)	(1.183)	(0.357)	(0.130)	(0.404)
Obs.	3203	3203	3203	1751	1751	1751
Number of Countries	20	20	20	10	10	10
R^2	0.2363	0.1503	0.0328	0.0644	0.2299	0.0823
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes

Note: * p < 0.10 ** p < 0.05 *** p < 0.01. Currency-time two-way clustered standard errors in parentheses. Capital inflows are measured as changes in gross debt liabilities. 30 countries, 20 EMs, 10 AEs. Period 1996m11:2018m10. The UIP premium is measured using Consensus Forecast. Inflows/GDP$_{it-1}$ are capital inflows into the country as a fraction of GDP. VIX is a proxy for global risk perception. Convenience yield/Liquidity Premium is the sum of USD convenience yield and its liquidity premium averaged across G10 countries. EPU_{it} is the economic policy uncertainty index. Inflation differential are the difference between inflation in the home economy relative to the US. Both Inflows/GDP$_{it-1}$, EPU , and inflation differentials vary at the country-time level, while VIX and Convenience yield/Liquidity premium vary at the time level.

D. CIP and Currency Basis

Du and Schreger (2021) use swaps and interbank rates instead of deposit rates and forward rates. So we first plot their CIP deviations against ours (that use forward rates as in equation (2))) in their sample of 15 EMs and 11 advanced countries.[33] Figure D.1 shows that both series are very highly correlated. It is interesting to note that CIP deviations in EMs are 10 times larger than the ones in advanced countries.

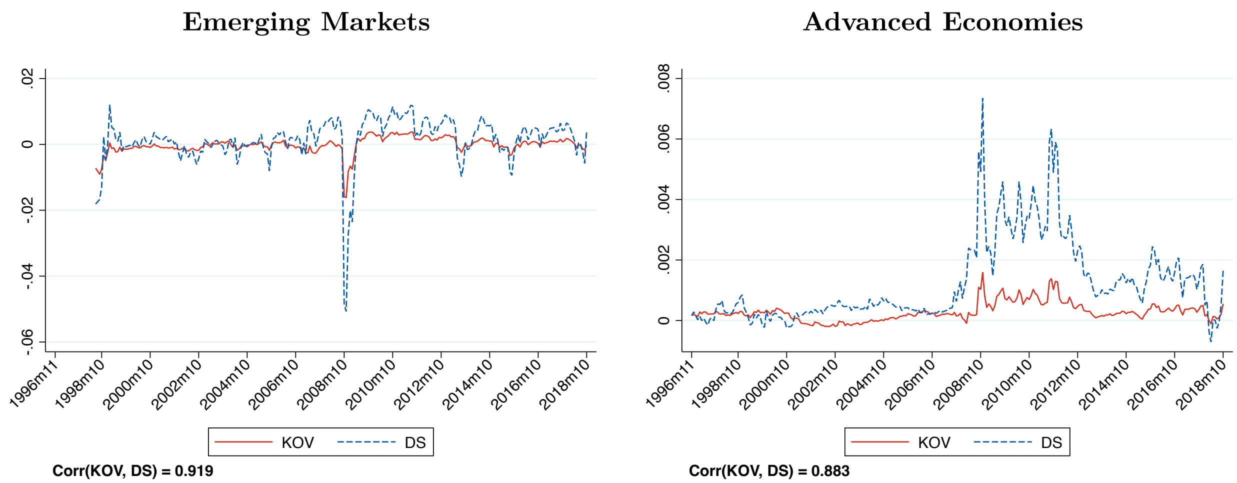


Figure D.1. CIP Comparison: Kalemli-Ozcan and Varela (KOV) vs. Du and Schreger (DS)

Note: This figure shows CIP comparison in a sample that restrict observations to be the same at date-country pairs in DS and our data. Both series use money market interbank rates.

In our sample:

[33] We would like to thank Wenxin Du and Jesse Schreger for sharing their CIP deviations data.

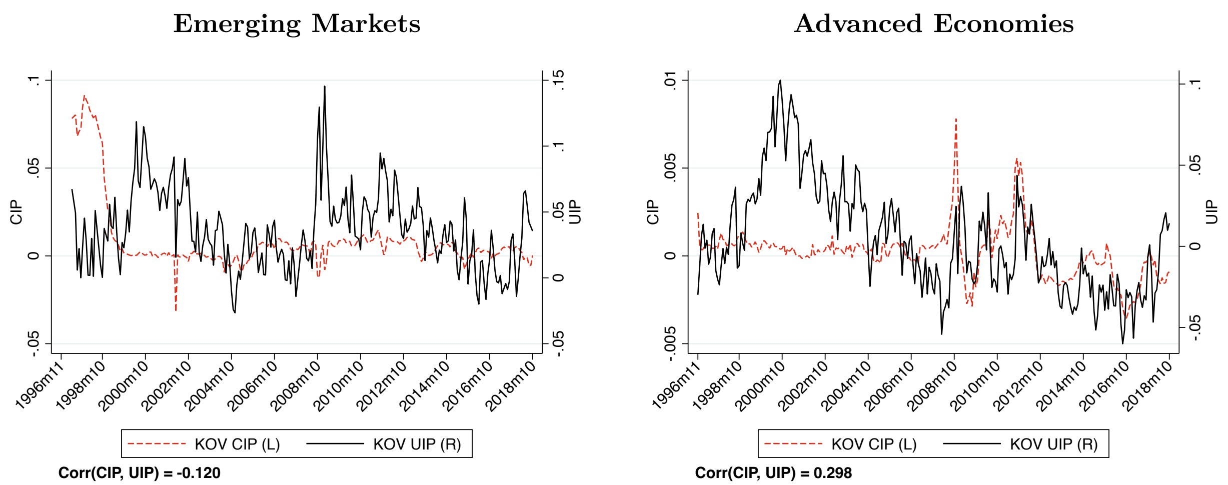


Figure D.2. UIP and CIP (12 Months Horizon)

Note: This figure shows CIP and UIP deviations using our data. We use interbank rates to construct CIP, while we use deposit rates to construct UIP.

E. Local Projections

E.1. Comparison with Advanced Economies

We now compare the responses of expected exchange rate changes and UIP Premium to interest rate differential shocks for AEs. As Figure E.1 shows, interest rate differential shocks do not lead to increases in the UIP premium in these economies, as the expected depreciation increases by the same amount of the interest rate differential shock.

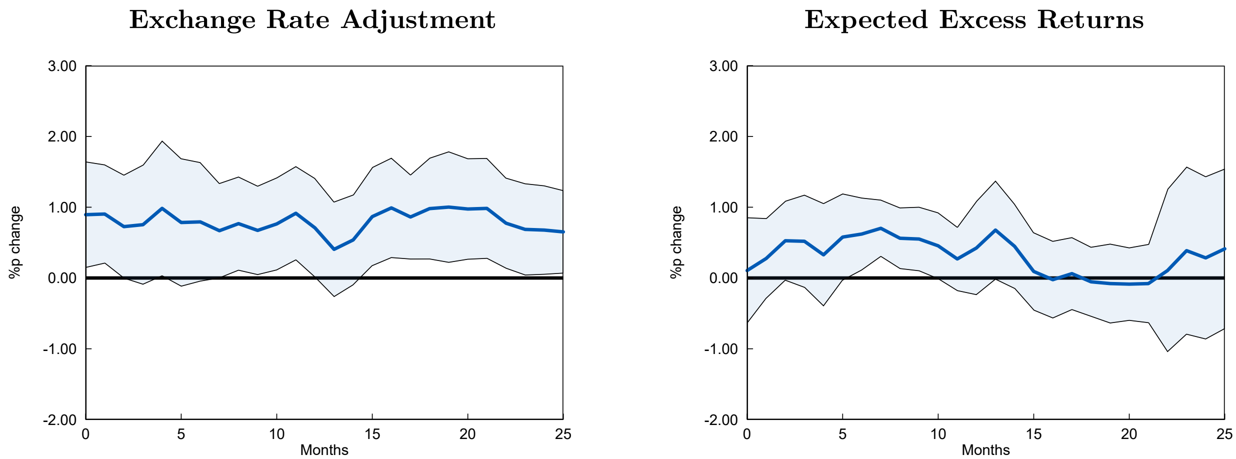


Figure E.1. Advanced Countries: Response of ER and UIP Premium to an IR Shock (OLS)

Note: This figure shows the response of expected exchange rate changes and the UIP premium to an interest rate differential shock at 12 month horizon for 12 AEs over 1996m11:2018m12. Exchange rate adjustment and expected returns are measured using expected exchange rate changes from Consensus Forecast. The shaded area shows 95 percent confidence intervals, calculated using Driskoll-Kraay standard errors with a bandwidth lag $h + 1$ for horizon h.

E.2. Instrumenting Interest Rate Differential shocks with EPU Using Realized Excess Returns

The overshooting literature works with realized excess returns and shows that they turn from positive to negative for advanced countries (predictability reversal puzzle) and sum of them is negative (Engel puzzle). As we show below in Figure E.2, these puzzles are not present in EMs with realized exchange rates, similar to their non-existence with expected exchange rates as we show in the main text. Realized excess returns are always positive in EMs regardless of the econometric specification with or without lags as shown in Panels (i) and (ii).[34] Again this is due to actual depreciation that is never enough to offset the IR shock.

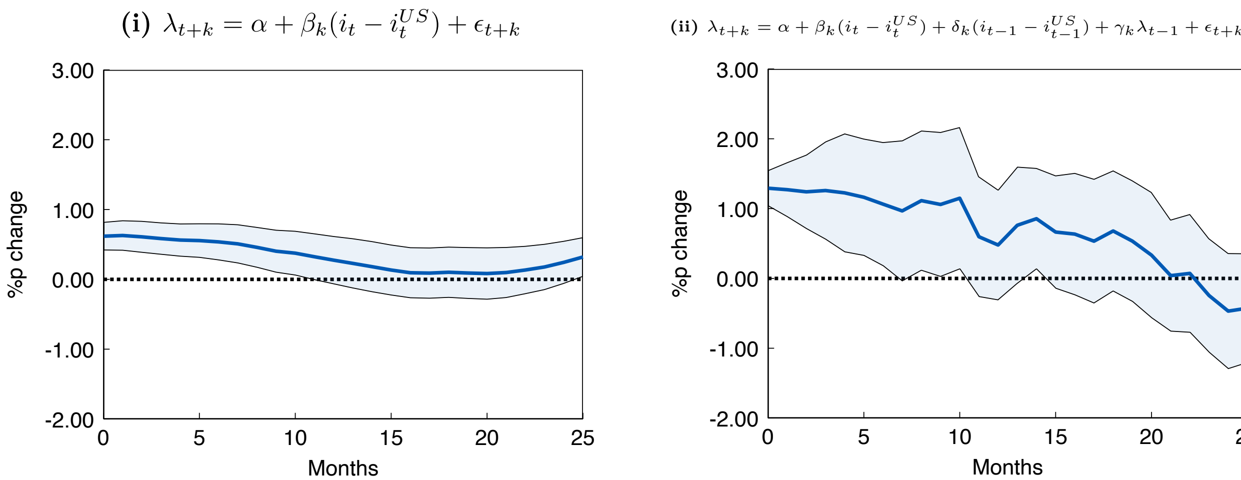


Figure E.2. Emerging Markets: Ex-Post Excess Return Responses to an IR Shock

Note: This figure shows the response of ex-post excess returns to interest rate differential shocks at 12 month horizon for 21 EMs over 1996m11:2018m12. The shaded area shows 95 percent confidence intervals, calculated using Driskoll-Kraay standard errors with a bandwidth lag $h+1$ for horizon h.

[34] There are papers both using lags and not in the literature.