NBER WORKING PAPER SERIES

FIVE FACTS ABOUT THE UIP PREMIUM

Șebnem Kalemli-Özcan
Liliana Varela

Working Paper 28923
http://www.nber.org/papers/w28923

NATIONAL BUREAU OF ECONOMIC RESEARCH
1050 Massachusetts Avenue
Cambridge, MA 02138
June 2021, Revised August 2024

First draft of this paper has been presented at NBER SI-IFM in 2019 with the following title: "The Exchange Rate and Interest Rate Disconnect: The Role of Capital Flows and Risk Premia." We thank Pat Kehoe for an extensive set of comments and detailed discussions. We also thank Oleg Itskhoki, Vania Stavrakeva, and Adrien Verdelhan for useful conversations and comments at the early stages of this project. We thank Manuel Amador, Mark Aguiar, Pablo Becker, Javier Bianchi, Menzi Chinn, Wenxin Du, Pierre de Leo, Charles Engel, Jeffrey Frankel, Tarek Hassan, Ian Martin, Dmitry Mukhin, Emi Nakamura, Jesse Schreger, Ken Rogoff, Alessandro Rebucci, Hélène Rey, Jenny Tang, and other participants at several seminars and conferences for helpful comments. We are grateful to Jun Hee Kwak, Alvaro Silva, Jose Cristi, Vahid Ahmadi for their excellent research assistance. Varela thanks funding from UK Research and Innovation (UKRI) under the UK government's Horizon Europe funding guarantee [grant number EP/X020916/1]. The views expressed herein are those of the authors and do not necessarily reflect the views of the National Bureau of Economic Research.

Five Facts about the UIP Premium
Ṣebnem Kalemli-Özcan and Liliana Varela
NBER Working Paper No. 28923
June 2021, Revised August 2024
JEL No. E0, F0

ABSTRACT

We present five novel facts on the UIP-wedge—the difference between expected USD returns on local currency assets and actual USD asset returns. We focus on emerging markets (EMs) and contrast our new findings with established ones for advanced economies (AEs). The five facts are: 1) Persistent EM-UIP Wedge: The EM-UIP wedge fluctuates but remains positive, indicating a continuous excess currency return both ex-ante and ex-post. 2) Expectation Accuracy: Survey data on agents' expectations of future exchange rate changes closely align with actual outcomes, demonstrating similar dynamics and Fama coefficients for the EMUIP wedge. 3) Heterogenous Perceptions and Risk Factors: Disagreement among agents about future exchange rate movements is positively correlated with local risk factors and can forecast interest rate differentials. 4) Local Risk and Time-Variability: Local risk factors account for 70% of the variability in the EM-UIP wedge over time, driven by interest rate differentials. 5) Foreign Capital: The EM-UIP wedge relates to foreign investment, exhibiting a negative relationship with capital inflows. These findings underscore the nuanced behavior of the UIP wedge in EMs vs AEs, where EM-UIP wedge more closely reflects compensation for systematic, country-specific, and time-varying risk premia in segmented asset markets.

Ṣebnem Kalemli-Özcan
Department of Economics
Brown University
Box B
Providence, RI 02912
and CEPR
and also NBER
sebnem_kalemli-ozcan@brown.edu

Liliana Varela
Houghton Street
Department of Finance
London School of Economics
London, WC2A 2AE
United Kingdom
L.V.Varela@lse.ac.uk

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

1. Introduction

A fundamental concept in international macroeconomics and finance is the Uncovered Interest Parity (UIP) condition, which posits that expected returns on assets denominated in different currencies should be equalized. However, research since the influential works of Tryon (1979), Hansen and Hodrick (1980), and Fama (1984) has consistently shown that this prediction does not hold in practice. Contrary to theory, currencies with higher interest rates often appreciate rather than depreciate, yielding excess returns. Our study focuses on emerging markets (EMs), where we find that high interest rate EM currencies do depreciate, yet an EM-UIP-wedge persists, capturing both expected and realized excess returns despite the currency depreciation. Notably, this EM-UIP-wedge behaves distinctly from the UIP-wedge observed in advanced economies (AEs).

The conventional result when regressing ex-post changes in exchange rates against interest rate differentials typically reveals a Fama-coefficient significantly less than 1. The interpretation of this finding has long been debated. The prevailing view attributes it to a risk premium (e.g. Lustig and Verdelhan (2007), Lustig, Roussanov and Verdelhan (2011), Hassan and Mano (2019)). An alternative perspective suggests it may reflect a bias in the expectations of market participants within the studied period. Some papers suggest a departure from rational expectations, where others argue for behavior consistent with rational expectations referred to as "the peso problem," in spite of the fact that all these papers attempt to gauge market expectations through survey data. Notably, studies such as those by Frankel and Froot (1987) , Froot and Frankel (1989), and Stavrakeva and Tang (2020) have tended to refute the risk premium interpretation, as the coefficient in question is not just less than 1 but often less than 0 and there are large forecast errors.[1] This extensive "Fama" literature mostly focuses on advanced country currencies, whereas early work by Bansal and Dahlquist (2000), utilizing data spanning from 1976 to 1998 across 28 countries, argue that including emerging markets in the sample is crucial for achieving a theory-implied Fama-coefficient of 1. This underscores the importance of accounting for country-specific characteristics in explaining the variability of UIP-wedge across different countries.[2]

[1] This result can be explained with carry trade, making money via interest rate differentials and appreciation, until an unwinding of the carry trade where currency depreciates and the risk premium rises.

[2] Bansal and Dahlquist (2000) writes: "The forward premium puzzle, contrary to popular belief, not a pervasive phenomenon. It is confined to developed economies." Unlike our panel study, they work with a cross-section of currencies as there is no time variation in their sample by construction for their 12 EMs,

Building on this large body of work and using a monthly panel for 34 currencies since 1996, we show that, the large and persistent EM-UIP-wedge captures compensation for *systematic country-time varying risk premia*. Foreign investors' perceptions of currency risk and how the formation of their expectations depends on country-specific factors is central to our results. This echoes results from the macro-finance literature, where U.S. investors' risk-perceptions are endogenous to local news and shown to be important for asset pricing (e.g. Pflueger, Siriwardane and Sunderam (2020), Bauer, Pflueger and Sunderam (2024)). We show that the currency risk premium manifests as both *expected* and *realized* excess returns, hence *systematic*, reflecting the compensation for bearing currency risks that are both in the cross-section of currencies and also *time-varying* and cannot be diversified away. Models with imperfect or segmented capital markets envision such time-varying risk premia due to idiosyncratic risk that cannot be diversified away (e.g Alvarez, Atkeson and Kehoe (2009), Gabaix and Maggiori (2015), Itskhoki and Mukhin (2021), Itskhoki and Mukhin (2023)).[3]

In relation to the empirical UIP literature, our findings support both the risk premium and some form of "expectations failure" explanations for UIP deviations. Specifically, we estimate that approximately half of the variation in interest rate differentials is attributable to variations in the risk premium, while the other half is linked to expectations not predicting the full extent of the exchange rate depreciations—though the prediction is in the right direction picking up half of the depreciation. We can explain why this is the case by linking "expectations failure" to variability in local and global risk factors affecting investors' currency risk perceptions in a heterogenous way. This variability is captured by interest rate differentials. Thus, we get the same exact Fama coefficient of 0.5 regardless of whether we regress expected change in the exchange rate measured with survey data on interest rate differentials, or we run the standard Fama regressions of ex-post exchange rate changes on interest rate differentials.

We present two famous events that illustrate the key finding of our paper: the nationalization of pension funds in Argentina in October 2008, and Brexit referendum in the United Kingdom in June 2016. These are very different events in very different countries but both countries experienced a sharp increase in the UIP-wedge during these events, implying their

most of which were under a fixed exchange rate before 2000. Frankel and Poonawala (2010) also shows a positive but small Fama coefficient in EMs.

[3]In most finance and macro models, the UIP-wedge arises from the covariance of currency returns with a stochastic discount factor whose variation reflects changes in investors' marginal utilities across states. The key is monetary non-neutrality, so that investors' consumption moves with countries' policies. Since in segmented markets, the marginal investor is not the representative consumer, the marginal utility of the relevant investor can change with the money growth. Our evidence is consistent with this key theoretical mechanism that links the nominal exchange rate fluctuations to risk premia, since for such a link, policy changes should affect pricing of the risky asset as we document. A similar link has been documented by Bauer, Pflueger and Sunderam (2024) in the context of U.S. risky assets and U.S. policies.

currencies expected (at the time of the event) to deliver higher USD returns to investors over USD assets in the future. The common notion among these events is the fact that both are unexpected. The nationalization of pension funds in Argentina was taken as a surprise.[4] As well known, the results of the Brexit referendum was also a surprise. Both events constitute an unexpected policy change affecting the relative value of the local currency assets.

Figure 1 plots the UIP-wedge in both countries together with its decomposition. UIP-wedge is expected excess return to local currency asset over US dollar asset in logs and can be defined as:

$$\lambda_{t+h}^{e} = i_t - (s_{t+h}^{e} - s_t) - i_t^{US}, \tag{1}$$

which can be re-written as:

$$\lambda_{t+h}^{e} = \underbrace{(i_t - i_t^{US})}_{\text{IR Differential}} - \underbrace{(s_{t+h}^{e} - s_t)}_{\text{ER Adjustment}}, \tag{2}$$

where i_t and i_t^{US} are the local and the U.S. short-term deposit and/or money market interest rates, and h is a 12-month horizon, s is the exchange rate in units of local currency per USD, and s^e is the expected exchange rate over the same horizon, measured with survey data.

The vertical red line denotes the month of the policy change announcement. Interestingly, the UIP premium increased "only" by 4 percentage points in the U.K., whereas the increase in the UIP premium in Argentina was much higher, 8 percentage points. Why is this the case? As can be seen in the figure, the UIP-wedge is the sum of IR and ER terms.[5] In Argentina, the higher UIP-wedge, in the month of the announcement, is solely captured by the higher interest differentials. Even though there was a slight expected appreciation of the peso, it is so small to drive an 8 percentage point spike in the UIP premium. The higher UIP premium in the U.K., on the other hand, was solely driven by the large 4.2 percentage point expected appreciation of the pound as there is no significant movement in the interest rate differentials at the time of the policy surprise.[6]

[4] 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 and the world, this is a clear confiscation".*

[5] We revert the sign on the ER term for the figure for better visualization so now an increase in ER is expected appreciation.

[6] 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

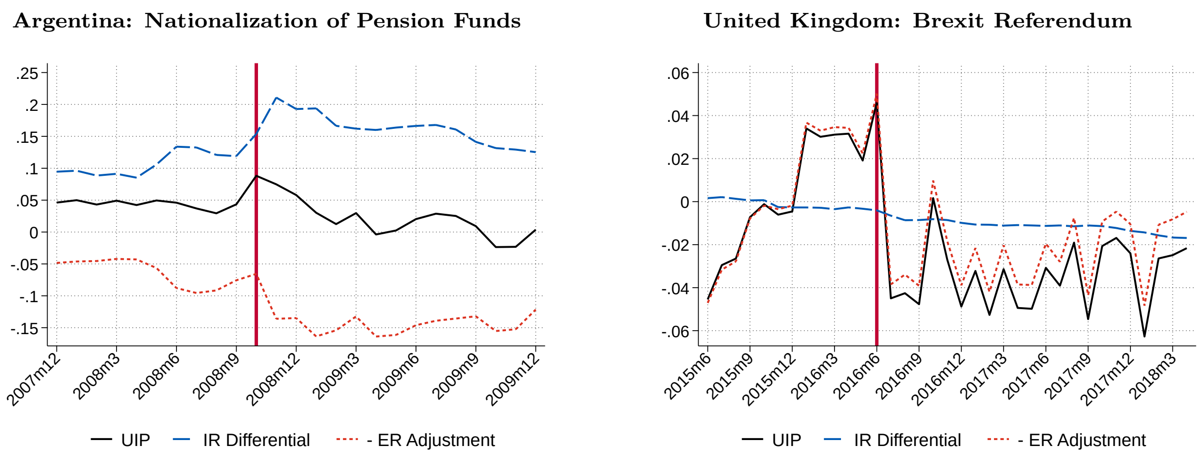


Figure 1. UIP Premium Decomposition

As well-known both peso and the pound depreciated against the dollar at the time of these announcements. Interestingly, in both countries, as of next month, currencies expected to depreciate over the next 12-months, 4 percentage points in the U.K., and 12 percentage points in Argentina. Hence, a total surprise shock leads to expected depreciation in future months for the next 12-months in both countries, in spite of the actual depreciation and expected appreciation in the immediate month of the shock. The future expected depreciation is at a rate 3 times that of the U.K. in Argentina and more persistent. This means that the UIP premium goes down slowly in Argentina, compared to the U.K., given the higher interest rate differentials over the expected depreciation, leading to a more persistent premium in Argentina than the U.K.

We show that this pattern captures many of the features that differentiate EMs from AEs. We document five novel facts for a panel of 22 EMs and compare them to a panel of 12 AEs at monthly frequency over 1996m11-2018m12.

First, in EMs, the UIP-wedge fluctuates over time but stays always positive, reflecting an *expected* and persistent positive risk premium for investing in these currencies exceeding the expected returns in advanced economies' currencies. The unconditional mean UIP-wedge, measured with survey expectations, is 3.3 percentage points higher in EMs than AEs, which is of similar magnitude with the risk premium measured using ex-post realizations of exchange rates in previous EM studies (e.g. Gilmore and Hayashi (2011)). The conditional mean of the UIP-wedge also shows that expected and ex-post excess returns are predictable by a variety of risk factors and interest rate differentials. The interest rate differentials can explain both ex-ante expectations and ex-post realizations of the exchange rates, though with a much

monetary policies The Economist (2022); Ashworth (2022); Giles and Parker (2022).

higher explanatory power for ex-ante survey-based expectations. These properties differ for advanced economies, as documented by a large literature.[7]

Second, foreign investors respond to higher potential currency risk in EMs related to local risk factors in a way that their expectations are reflected in the interest rate differentials. We document three pieces of evidence that supports this fact. First, we show that foreign investors expect depreciation for EM currencies most of the time and their expectations predict actual depreciations in the future. Second, we show that they price-in an ex-ante risk premium in the interest rate differentials to hold the EM currencies since they expect the value of these currencies to fall in the future. And third, higher global and local risks increase the dispersion in exchange rate expectations, reflecting an increase in disagreement among investors on the future exchange rate and such disagreement correlates with increases in the interest rate differentials in EMs. Thus when perceived currency risk is high, the return to invest in that asset is high (e.g. Pflueger, Siriwardane and Sunderam (2020)). As a result, the interest rate differential is endogenous to expected currency risk in EMs. In contrast, dispersion in exchange rate expectations for AEs' currencies is smaller and does not show up in the interest rate differentials.

Third, consistent with the previous facts, most of the time-variation in the EM-UIP-wedge can be accounted by the fluctuations in the interest rate differential component. Going back to equation (2) decomposition, the average correlation between UIP premium and the interest rate differential in EMs is 70%, while the correlation with the exchange rate adjustment term is -21%. Both of these correlations are significant. The negative sign shows that when the UIP premium is higher due to an expected appreciation (ER terms go down) the strength of this relation is only 21 percent. In contrast, in AEs, the correlation between the UIP-wedge and the ER term is 93 percent, whereas the correlation between interest rate differentials and the UIP-wedge is low and insignificant. Our third fact suggests that the key to understanding endogenous UIP violations in EMs is the fluctuations in interest rate differentials, whereas for AEs this requires an understanding of the exchange rate fluctuations.

Fourth, global risk factors, proxying for undiversifiable aggregate risk, are important for both EM and AE UIP-wedges but cannot account for the role of local risk factors shown in previous facts in the case of EMs. We show that local risk factors have a distinct role in addition to country-specific loadings on global risk factors (e.g. Lustig, Roussanov and

[7]Note that predictability of realized excess returns (carry trade profits) and expected excess returns (UIP-wedge) are different from the predictability of forecast errors in exchange rate changes (actual minus expected change in the exchange rate, or difference between realized and expected profits). Both in AEs and EMs, there are forecast errors, though these errors are small and weakly predictable in EMs and much larger and highly predictable in AEs. See Appendix C for details.

Verdelhan (2011)) for EMs. Specifically, country-specific loadings on a commonly used global risk factor (VIX) increases the adjusted R^2 by 126%, while allowing country-specific risk factors raise the adjusted R^2 marginally more, by 130%. When both different loadings to global risk and also local-risk factors are included, the adjusted R^2 increases even more– by 148%. It is interesting that global and local risk factors do not overpower each other, as their correlation is low, only 22%. There is large variation in this correlation across countries. For example, Turkey has a correlation between global risk and local risk factor of 2%, whereas Chile's correlation is 47% (a commodity exporter) and that of Brazil is 18%. AEs are different. The local risk factors have no role in driving the AE-UIP-wedge, conditional on global risk factors.

Fifth, the EM-UIP-wedge and foreigners' capital allocation to EMs are related as the UIP-wedge comoves negatively with capital inflows by foreigners but not with capital outflows by domestic residents. Such a comovement is absent for AE currencies. When foreigners leave EMs, the UIP-wedge goes up; when they invest, it goes down, or vice versa. Interestingly, capital outflows by domestic investors is correlated in a similar manner with realized excess returns; that is when domestic investors leave home currency assets and save in foreign currency assets instead, realized excess returns to local currency assets go down, and when domestics come back to home currency assets, realized returns go up. Or they invest to those local currency assets when returns go up; since these are reduced form correlations, the signs can be interpreted both ways. As a result, our fifth fact is also consistent with the country-time varying risk premium interpretation of the EM-UIP-wedge. That is UIP-wedge captures cost of international borrowing that includes a risk premium where typical investors in local currency assets are foreigners and not domestics in EMs. The realized excess returns, on the other hand, might capture relative demand for local currency vs foreign currency assets of domestic residents.

Overall, our results are consistent with EM and AE assets being imperfect substitutes and different factors driving investors' pricing of risk across economies, as argued by an older literature.[8] Our regressions show the importance of measuring the heterogeneity of exchange rate expectations across EM and AE assets for UIP-based theories of exchange rate determination, and highlight the fact that investors' expectations are endogenous to assets' differential riskiness. As EM investors expect EM currencies to depreciate most of the time, they demand higher interest rates to hold them. As a result, policy and/or monetary-based causality that underlines the UIP theory might be working in reverse. Instead of higher interest rate currencies today are expected to depreciate in the future, we have shown that expectations of future depreciations linked to persistent local risks can pin down the ex-ante

[8] See among others Isard (1983), Friedman and Kuttner (1992), Bryant (1995), Chinn and Frankel (1994).

market interest rates and hence ex-ante excess returns.[9]

The paper is structured as follows. Section 2 presents our data and measurement. Section 3 undertakes the benchmark analysis. Section 4 presents an extensive robustness analysis. Section 5 concludes.

2. Data and Measurement

We briefly describe our variables here, where Appendix A discusses in detail the construction of all the series and samples.

2.1. UIP, Exchange Rates and Survey Expectations

We employ monthly data from IMF, Bloomberg and Consensus Economics. Our sample includes 34 currencies and excludes country-month observations when there is a fixed exchange rate regime based on the classification of Ilzetzki, Reinhart and Rogoff (2017), as in these cases the exchange rate does not move or covary with the interest rate by construction. Our sample consists of 22 emerging markets and 12 advanced economies over 1996m11-2018m12.

We obtain the deposit interest rates, money market rates and government bond rates from Bloomberg, the spot exchange rate from IFS, and the exchange rate expectations come from Surveys of Consensus Economics. 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 inflation with CPI. We further use CDS data for default risk from Bloomberg and default episodes from Reinhart, Rogoff, Trebesch and Reinhart (2021).

Consensus 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 investors on average for AEs' currencies. Some currencies –as the Euro, Japanese Yen and UK Pound– include more than hundreds. Albeit with a lower number of investors, the survey is also comprehensive in EMs and includes on average 17 investors per currency. These investors surveyed are typically global banks and investors that actively participate in the FX market. Notably, the same set of investors are present in both AEs and EMs.

[9]Thus, we also relate to overshooting literature (e.g. Dornbusch (1976), Eichenbaum and Evans (1995)) that takes the interest rate differentials stemming from monetary and/or fiscal policy shocks or differences between countries. This literature shows that exchange rate overshoots its equilibrium level after the initial interest rate shock. None of the puzzles associated with this literature that are shown for AEs, such as delayed overshooting and predictability reversal puzzles, are present for EMs. 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.

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 such heterogeneity. To provide an example, in September 2012, for the Japanese Yen 96 agents 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 were also surveyed for the Euro and the UK pound, which included a total of 103 and 81 that month. The main agents surveyed for the Korean Won (22) were: Goldman Sachs, HSBC, JP Morgan, Citigroup, Bank of Tokio Mitsubishi, IHS Global Insight, General Motors, ING Financial Markets. Similarly, for the Turkish Lira (28). 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, as well as other global investors like Barclays Capital, BNP, ABN Amro, Allianz, Royal Bank of Canada, UBS and Royal Bank of Scotland.

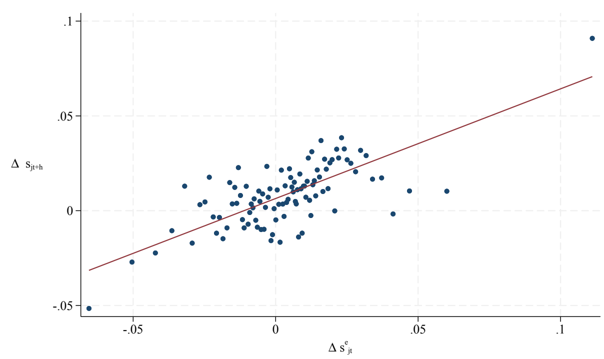


Figure 2. Emerging Markets

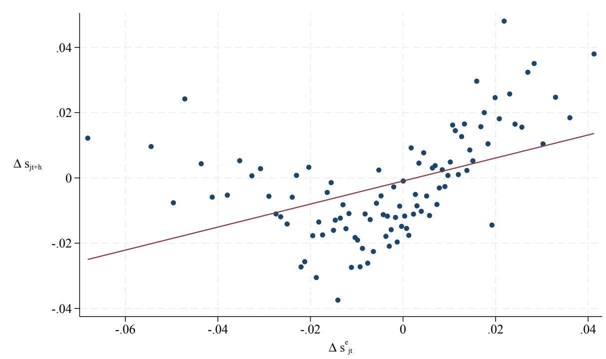


Figure 3. Advanced Economies

Note: The slope (EM is 0.57***, AE: 0.35***) of the fitted line corresponds to the equation $s_{c,t+h} - s_{c,t} = \gamma_c + \beta(E_t[s_{c,t+h}] - s_{c,t}) + \mu_{c,t+h}$, with h=12 months. The vertical axis plots LHS.

As shown in Figures 2 and 3, these expectations (expected exchange rate change as denoted by $(s^e_{t+h} - s_t)$ plotted on x-axis track the actual changes in the exchange rate $(s_{t+h} - s_t)$, plotted on y-axis, pretty well, better in EMs than AEs.

Combining all the data, we measure the UIP premium as stated in the introduction $(\lambda^e_{t+h} = \underbrace{(i_t - i_t^{US})}_{\text{IR Differential}} - \underbrace{(s^e_{t+h} - s_t),}_{\text{ER Adjustment}})$. The base currency is always the USD. Instead of deposit and money market rates, one can also use short-term local currency government bond rates for each country. 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 given the default risk on short-term EM bonds. Our definition is identical to textbook. It is important to use short-term rates as the UIP tends holds at longer maturities (e.g.

Chinn (2006) and Lustig, Stathopoulos and Verdelhan (2019)). Focusing on rates for less than 1 year maturity also helps us to separate UIP premia from term premia.

2.2. Global/U.S. Variables

Since we calculate the UIP always vis-à-vis the U.S. dollar, we also construct variables that aim to capture the predominant role of the U.S. dollar in financial markets, such as the convenience yield and USD liquidity premium. We also separate the USD specific factors from global risk factors by employing measures for the latter. We use data from the Federal Reserve Economic Data (FRED) and employ VIX, convenience and liquidity yields as in papers Rey (2013), Jiang, Krishnamurthy and Lustig (2021), Engel and Wu (2023), Bianchi, Bigio and Engel (2021), Du and Schreger (2021), Obstfeld and Zhou (2022). Following Miranda-Agrippino and Rey (2020), we interpolate all capital flow series from IMF, IFS, to monthly frequency. We briefly outline how we construct the global variables. All interest rate will be at 12-month maturity.

To construct global variables, we first need to define the CIP deviation at time t for a given country relative the U.S. at horizon h, λ_{t+h}^{CIP}, is

$$\lambda_{t+h}^{CIP} = (i_t - i_t^{US}) - (f_{t+h} - s_t), \tag{3}$$

where f_{t+h} is a (log) forward exchange rate h periods ahead. Using different interest rates — such as LIBOR, government bonds, deposit rates or money market rates — we can capture different forms of equation (3). One particularly important concept to capture is the so-called the U.S. dollar convenience yield. To that end, let the *Convenience Yield* of the U.S. dollar relative to a given country c at time t be $Convenience\,Yield_{ct} = i_{c,t}^{L} - i_t^{US,L} - (f_{c,t+1} - s_{c,t})$, where $i_{c,t}^{L}$ is the LIBOR rate in country c, $i_t^{US,L}$ is the LIBOR rate in the U.S., $f_{c,t+h}$ is the (log) forward exchange rate and $s_{c,t}$ is the spot exchange rate. Both exchange rates are in units of home currency per U.S. dollar.

Since U.S. convenience yield is always regarded as a global factor, we follow the literature and average these convenience yields across G10 countries.[10] Hence, the convenience yield for the U.S. dollar is $Convenience\,Yield_t = \sum_{c \in G10} Convenience\,Yield_{ct}/9$. Defined this way, the convenience yield on the U.S. dollar (relative to G10 countries) measures how much investors are willing to forego higher returns in G10 in exchange for the convenient low returns from the U.S. dollar.

Additionally, we measure the *Liquidity Premium* on U.S. government bonds as the

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

spread between 12-month government bond and the LIBOR rates in the home economy and in the U.S. We follow the literature on this that argues short-term bonds are liquid everywhere but even more so in the U.S. since the short end of the term structure is too low. Formally, $Liquidity\ Premium_{ct} = i^{L}_{c,t} - i^{G}_{c,t} - (i^{US,L}_{t} - i^{US,G}_{t})$, where $i^{G}_{c,t}$ and $i^{US,G}_{t}$ are interest rates on government bonds in the home country and the U.S., 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 U.S. treasuries: $Liquidity\ Premium_{t} = \sum_{c \in G10} Liquidity\ Premium_{ct}/9$.

Finally, we define:

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

which takes into account the special role of the U.S. dollar assets without taking a stance on where this role comes from. Above cited papers build models arguing that it is either from safe U.S. assets or from liquid U.S. assets or from low default risk U.S. assets or all of the above. Our analysis does not depend on where the "special-ness" of the USD assets come from, as long as, we account for this unique role of the dollar.

2.3. Variables for Local Risks based on Uncertainty

We have two sets of variables that we use as proxies for local risks. A news-based variable, and several survey based variables. Overall these variables try to capture local risks related to policy volatility so that we can separate high frequency local risks from fundamental default risk of government. We describe each in turn.

We first compute the news-based policy risk premium (PRP) index for our sample following Baker, Bloom and Davis (2016). This index is constructed by counting the number of journal articles containing words reflecting policy uncertainty and, as such, is a good proxy for foreign investors' risk sentiment on government and central bank policies. In particular, we use the online platform Factiva, which reports journal articles. Our list of words follows Baker, Bloom and Davis (2016) to which we add new words to capture additional policy uncertainty characteristic of emerging markers (e.g expropriation, nationalization and corruption). Because we are interested in the perspective of all investors, we focus both domestic news and the news reported in international newspapers (such as Financial Times, Reuters and the Wall Street Journal, among others).

We construct the high frequency policy risk premium (PRP) index for each currency and month as follows, $PRP_{ct} = X_{ct}/Y_{t}$, where X_{ct} is the number of articles referring to episodes in country c at month t, $Y_{t} = \sum_{c} Y_{ct}$ is the total number of articles written at month t (i.e.

the sum of articles across countries), and Y_{ct} is total number of articles referring to country c at month t. We then normalize the index to 100 by estimating $PRP_{ct} = \frac{PRP_{ct}}{\overline{PRP_c}} \times 100$, where $\overline{PRP_c}$ is the average of news for each country across time. Appendix A.3 reports a detailed description of the methodology to create this index.[11]

As shown in Figure 4, our constructed measure for policy risk premium moves very closely with the UIP risk premium. We plot the averages for EMs. The tight connection between the two series is remarkable. All the important EM events and crises are picked up by spikes in both premia, as expected, but more importantly, when we exclude those types of bad events, shown with dashed lines, we still record a high and significant correlation between the UIP premium and PRP. Notice that we do not need this measure to be a "pure" policy uncertainty measure: it can be both connected to bad events, and also connected to worse and uncertain future outcomes. Both can shape foreign investors' perceptions and hence show up in the stochastic discount factor of the investor.

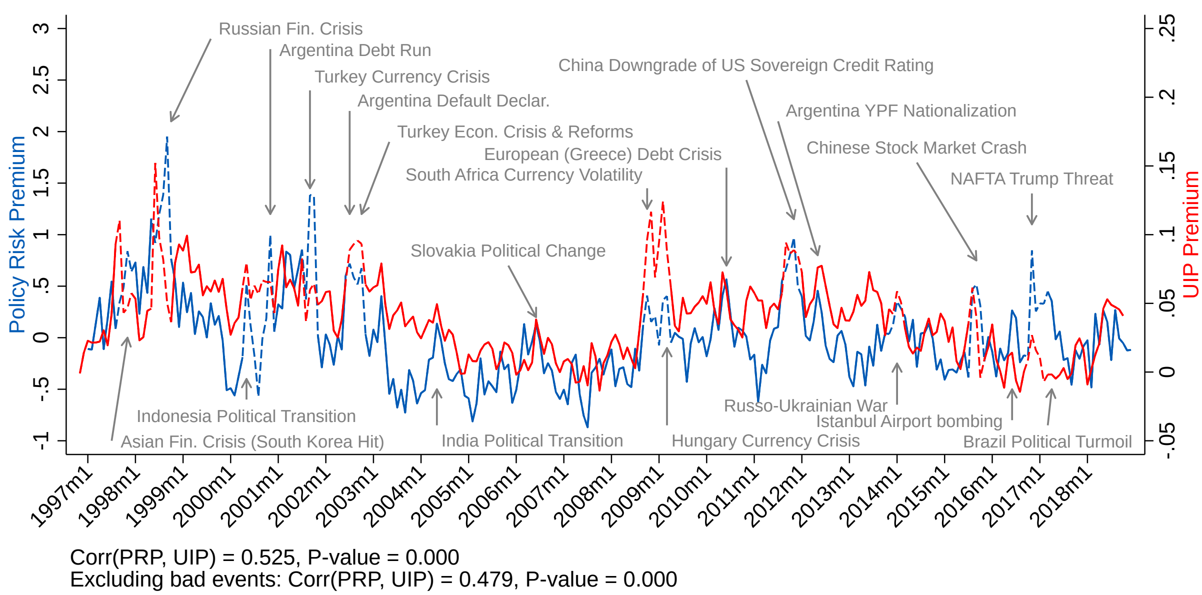


Figure 4. Policy Risk Premium and UIP Premium For Emerging Markets, 1997–2018

Since the pioneering work of Baker, Bloom and Davis (2016), who show that news-based economic policy uncertainty reduces investment and output in the U.S., this literature mainly

[11]Our methodology to construct the index follows Barrett, Appendino, Nguyen and de Leon Miranda (2022) and is an adaptation of Baker, Bloom and Davis (2016) to include international news. In particular, the difference with Baker, Bloom and Davis (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, Appendino, Nguyen and de Leon Miranda (2022) methodology adds the total number of articles in a country and pools all the newspapers together for each country.

focused on closed economies, mostly the U.S., and research has shown that policy uncertainty leads to inefficiencies through market pricing. We contribute to this literature in terms of measurement as we hand-collect or news data from each country's own newspapers together with global English newspapers. Our measure covers –but it is not limited to –news-mentions of uncertainty around: monetary policy, taxation, fiscal deficit, central bank independence, labor regulations, competition law, capital controls, nationalization, corruption, etc.

For the survey based variables, we use the standard indicators from International Country Risk Guide (ICRG), which reports detailed information of the components of policy risk for each country over time. According to these ICRG measures, that are used by foreign investors according to ICRG documentation, political risk contributes 50% to the composite policy risk index, 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: *government policy risk* and *confidence risk*. Both capture expropriation risk, risk of not being able to repatriate profits and government accountability, the degree of freedom that a government has to impose policies to its own advantage, together with confidence in economic policies. For example, Azzimonti and Mitra (2023) relate government accountability with a country's default probability.[12]

The literature has put particular emphasis on the uncertainty of "monetary policy", using measures of inflation expectations or forecasts errors or text-based measures trying to detect uncertainty in central banks' statement. For example, Cieslak, Hansen, McMahon and Xiao (2023) show that Fed-driven policy uncertainty reduces the impact of monetary policy on real outcomes due to market volatility. We are the first paper showing that economic policy uncertainty goes beyond monetary policy uncertainty and affects global investors' risk sentiments, cross-border capital flows, and cost of borrowing for EMs leading to international risky arbitrage deviations. 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 not based on comparing different regimes, on the contrary, we use only floating exchange rate regimes and how uncertainty surrounding non-exchange rate monetary, fiscal and regulatory policies lead to a UIP premium.

[12]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.

2.4. Summary Statistics

We present summary statistics of the UIP premium and its components of equation (2) in Table 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 adjustment terms, 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 close 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 U.S. specific and global variables in the last panel.

3. The Five Facts

3.1. The UIP Premium in Emerging Markets

Fact 1*: In emerging markets, UIP-wedge fluctuates over time but stays always positive, implying persistent expected excess currency returns.*

Figure 5 shows that UIP-wedge, measured with survey-based expectations of exchange rate, is systematically positive –indicating persistent expected excess returns– in EMs. However, it is mean-reverting and holds on average in AEs as it fluctuates around zero (especially since early 2000s), as shown on the right panel. In Figure 6, we plot realized excess returns (in blue) based on ex-post exchange rates together with the UIP premium (in black). The dynamic patterns are similar for EMs (with a higher mean), but for AEs, there is now also positive realized excess returns, a well-known fact in the literature. The correlation between the UIP-wedge and realized excess returns (or realized-UIP) is 20 percent in both set of countries and significant.

3.1.1. Fama Regressions in EM

Although our fact (1) is about dynamics of the EM-UIP-wedge, we also assess whether the UIP condition holds *on average* by estimating the conventional Fama and excess returns regressions using both ex-post realized and ex-ante expectational data on exchange rates. In

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%	4.2	3.5	6.0	0.6	7.0	3,397
Interest Rate Differential%	5.1	3.5	7.9	1.2	6.6	3,397
Expected Exchange Rate Adjustment%	1.0	0.4	6.3	-2.6	3.4	3,397
Other variables						
Capital Inflows/GDP%	7.1	1.7	55.8	-0.4	4.7	3,290
PRP%	-0.1	-29.3	97.4	-63.9	33.5	3,397
Expected Inflation Differential%	2.4	1.6	2.5	0.7	3.7	2,605
Sovereign Default Risk	0.02	0.01	0.02	0.01	0.02	2,297
Composite Risk	-0.39	-0.43	0.44	-0.71	-0.13	3,397
Government Policy Risk	-0.58	-0.62	0.62	-1.07	-0.27	3,397
Confidence Risk	-0.28	-0.35	0.71	-0.77	0.29	3,397
	Panel (B): Advanced Economies					
UIP Premium						
UIP Premium%	0.9	0.7	4.6	-2.2	3.5	2,260
Interest Rate Differential%	0.3	0.2	2.2	-0.9	1.6	2,260
Expected Exchange Rate Adjustment%	-0.6	-0.3	5.0	-3.6	2.8	2,260
Other variables						
Capital Inflows/GDP%	5.9	3.7	10.8	0.3	9.2	2,212
PRP%	2.4	-17.4	85.9	-57.8	37.1	2,260
Expected Inflation Differential%	-0.3	-0.2	0.8	-0.7	0.2	1,968
Composite Risk	-1.18	-1.18	0.40	-1.42	-0.94	2,260
Government Policy Risk	-1.28	-1.47	0.35	-1.57	-1.17	2,055
Confidence Risk	-1.45	-1.41	0.46	-1.84	-1.20	2,055
	Panel (C): Global/US Specific Variables					
Convenience Yield/Liquidity Premium%	0.1	0.1	0.2	-0.0	0.2	264
Convenience Yield%	0.1	0.1	0.2	0.0	0.3	264
Liquidity Premium%	-0.0	0.0	0.3	-0.0	0.3	264
VIX	2.95	2.95	0.35	2.66	3.18	264

Notes: 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. PRP measures economic policy uncertainty related policy risk premium based on local and international newspaper articles. Expected inflation differential compute the difference between expected inflation in the home country relative to the U.S. 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 U.S. dollar. Composite, government policy and confidence are as defined in the text. Sovereign Default Risk, Government Policy Risk, Confidence Risk, and VIX are indexes without units.

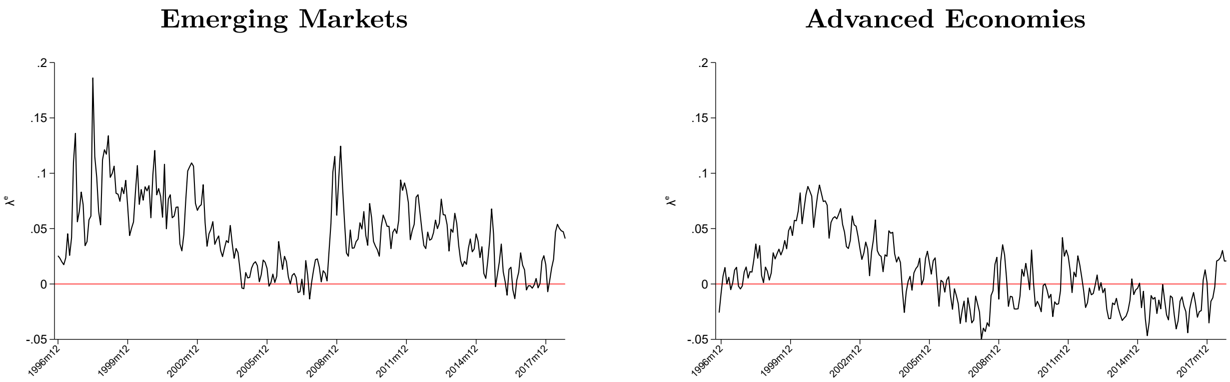


Figure 5. UIP Premium
UIP premium at 12 month horizon for 21 EMs and 12 AEs, over 1996m11:2018m10, measured using deposit and money market interest rates from Bloomberg and expectations of exchange rates.

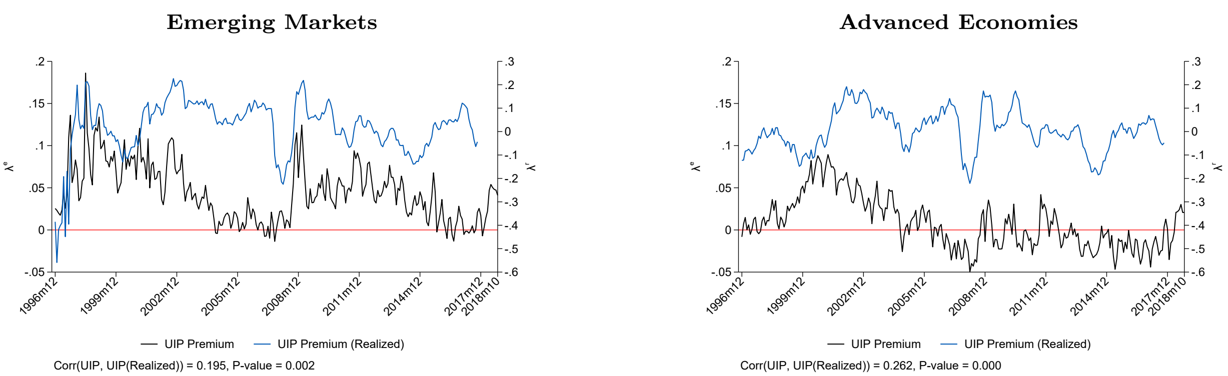


Figure 6. UIP Premium: Expected vs Realized Exchange Rates
UIP premium at 12 month horizon for 21 EMs and 12 AEs, over 1996m11:2018m10, measured as above. The blue line plots realized UIP premium, that is realized excess returns (carry trade profits).

particular, we estimate (in the panel of country-month for EMs and AEs separately):

$$s^e_{ct+h} - s_{ct} = \beta(i_{ct} - i^{US}_t) + \mu_c + \varepsilon_{ct+h}, \tag{4}$$

where s^e_{ct+h} is the expected exchange rate for country c in period $t+h$. If $\beta = 1$, interest rate differentials and expected exchange rate changes offset each other and the UIP condition holds on average. If $\beta < 1$, the expected depreciation is lower than implied by the interest rate differential and there are expected excess returns. When we run this regression with realized exchange rates, this is a Fama regression:

$$s_{ct+h} - s_{ct} = \beta^F(i_{ct} - i^{US}_t) + \mu_c + \varepsilon_{ct+h}, \tag{5}$$

$\beta^F < 1$ implies that there are ex-post excess returns since actual depreciation does not offset the interest rate differentials. The results are shown in columns (1) and (3) of Table 2.

There are several surprising findings here. First, the estimated β and β^F coefficients are very similar (approx. 0.4) regardless of using ex-ante expected or ex-post exchange rates. Second, the Fama coefficient (β^F) is positive, not negative. This stands in contrast to a large literature based on advanced country data that shows a negative Fama coefficient and a theoretically correct coefficient of 1 when ex-ante expectational survey data on exchange rates are used.[13] R^2s are also much larger when expectations are used indicating existence of valuable information in expectations that are correlated with interest rate differentials.

Table 2. 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***
	(0.075)	(0.075)	(0.118)	(0.118)
p-value ($H_0 : \beta^F = 1$)	0.0000		0.0000	
Observations	3577	3577	3577	3577
Number of Countries	22	22	22	22
Adjusted R^2	0.4935	0.4484	0.1291	0.1057
Country (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.

Since we run these regressions as panel, we used country (currency) fixed effects in order to be able to capture the time-varying (within country) risk premia. However, the influential work by Hassan and Mano (2019) argue that using country/currency fixed effects will absorb a large part of country risk premia. Hence, we have run same regressions without country fixed effects and we plot these results in Figure 7: the fitted line for the expected (left) and realized (right) rate of depreciation on the interest rate differentials in EMs. These results are not only very similar to the ones before using country fixed effects, proving the higher explanatory power of time variation instead of cross-section in the case of EMs, they also show identical coefficients in both panels, which is in stark contrast to the well-known textbook version of this figure, where figure on the right with realized exchange rates will be a cloud (e.g. see Feenstra-Taylor textbook).

The third surprising finding, which follows from the first two, is that the amount of realized excess returns are similar to expected excess returns and predictable. To show this, we run:

[13] Part of this literature explains the Fama/UIP puzzle with distorted beliefs or information frictions (e.g Ito (1990), Chinn and Frankel (1994), Bacchetta and Wincoop (2006), Burnside, Eichenbaum and Rebelo (2007), Stavrakeva and Tang (2020), and Candian and De Leo (2023)).

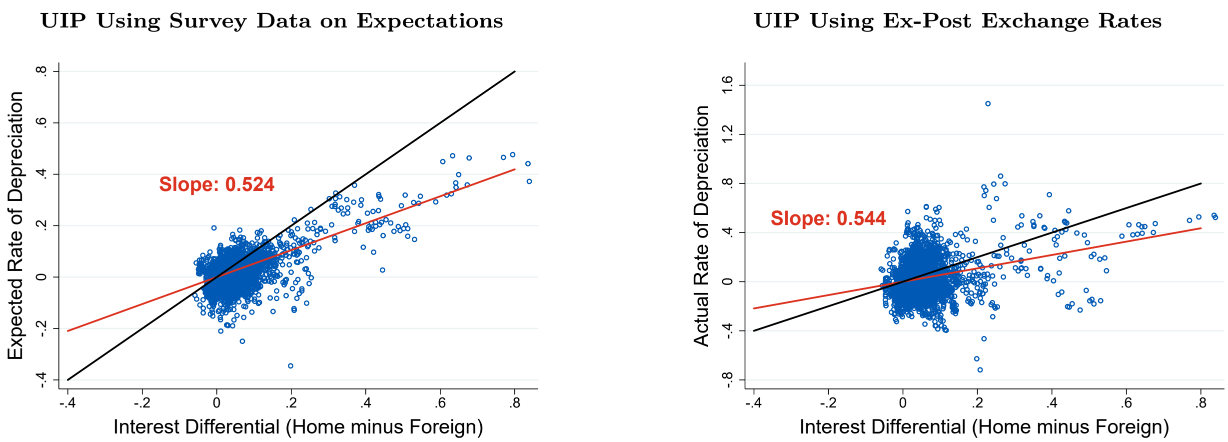


Figure 7. UIP with Realized and Expected Exchange Rates in Emerging Markets
The expected and ex-post rate of depreciation at 12 month horizon and the interest rate differentials.

$$\lambda^e_{ct+h} = \beta_1(i_{ct} - i_t^{US}) + \mu_c + \varepsilon_{1ct+h}, \tag{6}$$

$$\lambda_{ct+h} = \beta_2(i_{ct} - i_t^{US}) + \mu_c + \varepsilon_{1ct+h}, \tag{7}$$

where λ^e_{ct+h} denotes "expected" excess returns (UIP premium), whereas λ_{ct+h} denotes ex-post realized excess returns. $\beta_2 = 0$ implies the absence of predictable excess returns. Note that $\beta_1 = 1 - \beta$ and $\beta_2 = 1 - \beta^F$. Table 2 reports β_1 in column (2) and β_2 in column (4). Interestingly, in EMs, there are ex-ante and ex-post excess returns from investing in these currencies, and both are predictable and similar magnitude. Investors seem rational as they ended up earning what they expect to earn by investing in EM currencies, at the same time they knowingly leave money on the table, a notion we will investigate next.[14]

3.2. The UIP Premium, Expectations, Global and Local Risk Factors

***Fact 2**: Foreign investors, most of the time, expect depreciation on EM currencies and endogenously price this currency risk ex-ante in the interest rate differentials.*

To illustrate this fact we create two measures for exchange rate uncertainty that are both highly correlated with the volatility of the exchange rate. The first one is the standard deviation of the exchange rate expectations among different agents. The second measure is the difference between lowest and highest value for the expected exchange rate by different agents. We kept the horizon constant at 12-months for both of these measures. Both

[14]Note that these results also imply, as we argued in introduction, half of the country-time varying UIP deviations come from risk premium and the other half from some form of expectations failure. As additional supporting evidence, we have run one of the standard decompositions used in the literature in B, showing similar qualitative results.

measures capture the disagreement among foreign investors' in terms of their expectations and good proxies for the currency risk perceptions of investors.[15] The correlation of these measures with the volatility of the nominal exchange rate is over 96 percent.

Using these measures, we run a two-stage IV regression as shown below in Table 3. In the first stage, we regress the newly constructed measures of volatility in exchange rate expectations on a typically used global risk factor (VIX) and our news based measure for the local risk factor (PRP). As clear, when we use both VIX and PRP, we have a very strong first stage, satisfying the tests for strong instruments and overidentifying restrictions, that is both relevance and exclusion criteria for IV are satisfied. The VIX alone is not enough to pass the weak instrument test (columns (1) and (4)). This confirms the strong idiosyncratic component for the country-time varying currency risk. In the second stage, we regress interest rate differentials on the global and local risk predicted part of these disagreement measures and show a robust causal relation between the currency risk expectations and higher interest rate differentials (and hence higher UIP premia). When uncertainty about the future value of the currency vis-à-vis the USD is high, the interest rate differential vis-à-vis the USD is also high. We employ the VIX and PRP as the exogenous shifters for such uncertainty, that is our global and local risk factors. Interestingly, when we undertake the same exercise for AEs, PRP (local risk) has no power in predicting the interest rate differential, where VIX is much less powerful (Table B.1 in the Appendix B).

Table 3. Expectations Channel in Emerging Markets

	Second Stage: Interest Rate Differential					
	(1)	(2)	(3)	(4)	(5)	(6)
$s^e_{a^{high}t+1}$-$s^e_{a^{low}t+1}$	0.141*	0.075***	0.101***			
	(0.077)	(0.015)	(0.029)			
Std Dev s^e_{at+1}				0.073	0.050***	0.057***
				(0.045)	(0.015)	(0.015)
RHS variable in First Stage	VIX	PRP	VIX & PRP	VIX	PRP	VIX & PRP
Observations	3279	3279	3279	2155	2155	2155
	First Stage: Dispersion in ER Expectations					
	$s^e_{a^{high}t+1} - s^e_{a^{low}t+1}$			Std Dev s^e_{at+1}		
$\log(VIX_{t-1})$	0.267***		0.205**	0.215**		0.170*
	(0.080)		(0.084)	(0.096)		(0.094)
PRP_{ct-1}		0.119***	0.101***		0.136***	0.124***
		(0.024)	(0.028)		(0.028)	(0.030)
Cragg-Donal Wald F statistic	137.75	197.70	141.16	58.72	120.99	80.29
Kleibergen-Paap Wald F statistic	11.06	24.46	20.89	5.01	23.57	10.71

[15]Our measures for currency risk perceptions are similar to risk perception measures for high and low volatility assets of Pflueger, Siriwardane and Sunderam (2020).

3.3. Endogenous Pricing of Risk in Interest Rate Differentials

Fact 3: *Fluctuations in the interest rate differential component can account most of the time-variation in emerging markets' UIP wedge.*

To connect the previous fact to the UIP dynamics, we present the generalized version of the UIP decomposition that we did for the specific cases of Argentina and the UK before. Figure 8 plots the UIP premium decomposition for the average AE and 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.

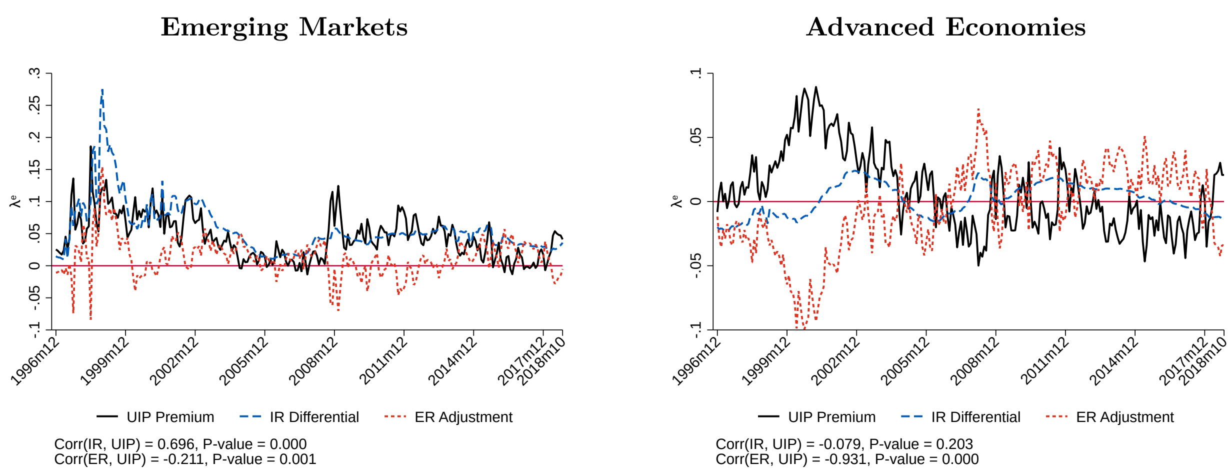


Figure 8. Interest Rate Differential and Exchange Rate Adjustment in AEs and EMs
UIP premium decomposition into interest rate differential and exchange rate adjustment at 12-month.

The figure 9 below shows that the distributions of UIP, IR and ER are consistent with these time series patterns. 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. In each figure the dotted line denote the AEs. Panel (a) shows a long right tail for interest rate differentials (vis-a-vis the U.S.) for EMs, so they are positive for most, where they are basically zero for most AEs. This is interesting since the mean interest rate differentials is similar on both countries and most countries are clustered around the mean. Panel (b) shows that there are more expected depreciations in EMs, whereas this is not a characteristic of the data for AEs at all. Panel (c) shows the distribution of the UIP premium is tilted to right in EMs compared to AEs due to higher interest rate differentials from panel (a) in spite of the expected depreciations shown in panel (b).

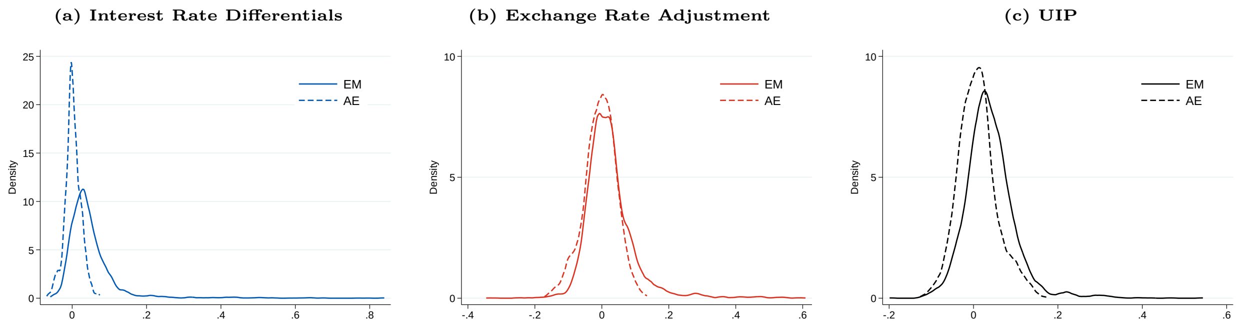


Figure 9. IR Differential, ER Adjustment, and UIP Distribution
Distributions: interest rate differentials (a), exchange rate adjustment ($s^e_{t+1} - s_t$, (b)), UIP (c).

3.4. General Determinants of the UIP Premium in EMs

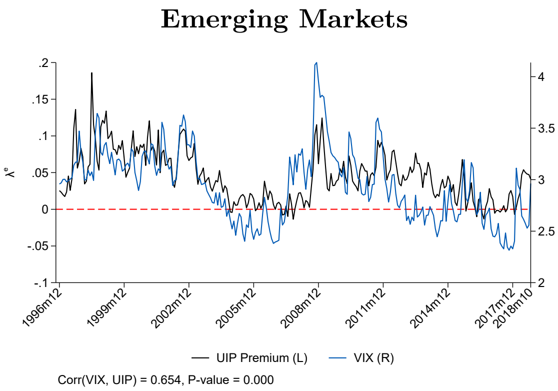
***Fact 4**: Global and local time-varying risk premia explain more than 45% of the time-variation in the UIP premium of emerging markets.*

To connect the facts 2 and 3 to each other dynamically, we show in Figure 10 that, the UIP-wedge in EMs is highly correlated with VIX (global risk factor) and PRP (local risk factor) and these are statistically significant correlations. VIX is correlated over 60% with the EM-UIP wedge and 40% with the AE-UIP wedge. For the local policy risk premium, there is also an equally strong correlation of 50% for the EM-UIP wedge, however, the correlation of the AE-UIP wedge and their policy risk premium is practically zero. To dig deeper, we turn to econometric modeling of the UIP-wedge next that will deliver our generalized fact 4.

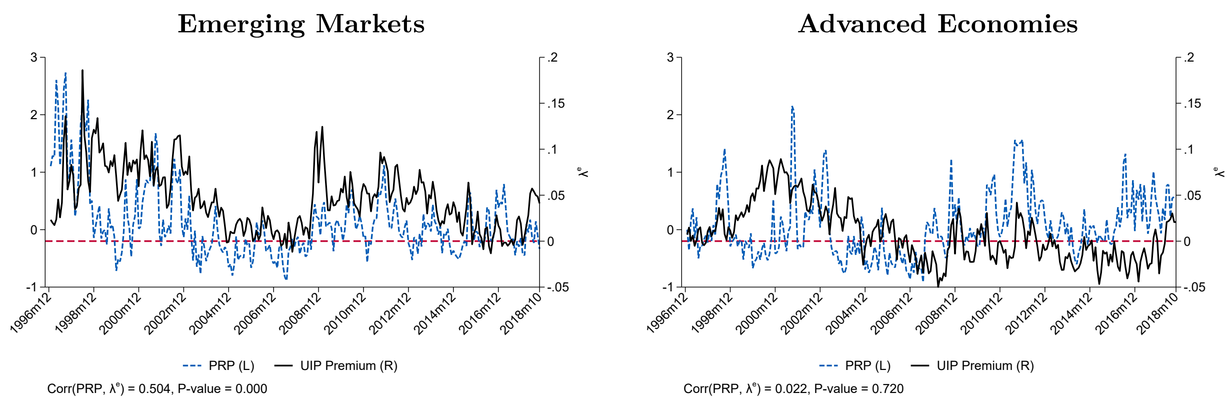
To assess several drivers of the UIP-wedge, we follow Obstfeld and Zhou (2022) and break it down into two main components:

$$\lambda^e_{t+h} = \underbrace{\tilde{\gamma}^{US}_t}_{\text{convenience yield/liquidity premium}} + \underbrace{\tilde{\rho}_t,}_{\text{excess returns}} \tag{8}$$

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. As discussed in the data section, the literature models $\tilde{\gamma}^{US}_t$ as composed of two forces that relate to safety 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



a) UIP Premium and VIX



b) UIP Premium and Policy Risk Premium

Figure 10. Global and Local Risk Premia and the UIP Premium
VIX, PRP and the UIP premium at 12 month horizon for 21 EMs and 12 AEs.

asset arising from the U.S. dollar's unique position as the reserve currency in the world economy. The second force, $\gamma_t^{\text{US, GOV}}$, arises from the liquidity advantage of issuing safer government bonds (treasuries), due to very low default risk of U.S. government, compared to USD corporate bonds with default risk and hence lower liquidity.

$\tilde{\rho}_t$ is a term that captures "excess returns", where this term can be driven by both global and local factors in principle as it will have a country-specific idiosyncratic component, unlike only U.S. based convenience yield/liquidity premium. Obstfeld and Zhou (2022) call this $\tilde{\rho}_t$ term the "dark matter" and highlight the empirical challenge of finding counterparts in the data. Note that there are two distinct empirical difficulties here. First and foremost as this is the decomposition of the UIP-wedge, we use survey data to measure exchange rate expectations and hence part of the excess returns term is really "expected excess returns". Second, if a large part of this term is driven by local risk factors then we need to understand why idiosyncratic country risks are not priced in the risk-neutral way. Put differently, how can risk premium arise from local risk factors and cannot be diversified away by well-diversified global investors?

We argue that, focusing on the EM-UIP-wedge, we can learn new information on how the world works and answer such questions. The overarching theme here is imperfect substitutability of different currency assets. Using data on EMs, we can disentangle different ways that global investors are pricing AE and EM assets. In particular:

$$\tilde{\rho}_t = \rho_t^{\text{US}} + \rho_t^{\text{COUNTRY}}. \tag{9}$$

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. The local factor ρ_t^{COUNTRY} captures country-specific frictions that can arise from economic policy uncertainty, leading to a policy risk premium, affecting global investors' expected returns. The local factor shapes the risk sentiment of global investors towards a given country (Kalemli-Özcan (2019)). More precisely,

$$\rho_t^{\text{COUNTRY}} = f(\rho_t^{\text{PRP}}). \tag{10}$$

We can then re-write the UIP premium in equation (8) as

$$\begin{aligned}\lambda_{t+h}^{e} = & \underbrace{\gamma_t^{US}}_{\text{US convenience yield}} + \underbrace{\gamma_t^{US,GOV}}_{\text{US liquidity premium}} + \underbrace{\rho_t^{Global}}_{\text{risk averse/limited absorption investor}} \\ & + \underbrace{\rho_t^{PRP}.}_{\text{local frictions/country-risk sentiment}}\end{aligned} \tag{11}$$

The local factor ρ_t^{PRP} captures uncertainty about global investors' returns over unexpected government policies. To characterize ρ_t^{PRP}, 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 ($\rho_t^{\text{credit risk}}$) and policy risk ($\rho_t^{\text{policy risk}}$).

$$\rho_t^{PRP} = \rho_t^{\text{credit/default risk}} + \rho_t^{\text{policy risk}}. \tag{12}$$

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. Thus, policy risk premium is a premium demanded by foreigners for the possible *return fluctuations*.

After these considerations, equation (11) could be extended to

$$\lambda^e_{t+h} = \gamma^{US}_t + \gamma^{US,GOV}_t + \rho^{Global}_t + \rho^{\text{credit/default risk}}_t + \rho^{\text{policy risk}}_t. \tag{13}$$

To estimate equation (13), we follow the existing literature and proxy γ^{US}_t, convenience yield, with USD basis, as explained in the data section. $\gamma^{US,GOV}_t$ is a similar convinience/safety yield but only focusing on US government bonds and hence it also captures low default risk and high liquidity premium of the 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^{US}_t is significant in the short and medium terms, which is our focus.[16] Given this insignificance of $\gamma^{US,GOV}_t$ in the short term, we combine the two and focus on the sum of these variables as described above.

To capture, ρ^{Global}_t as the global risk sentiment, we employ the VIX, as in Rey (2013), di Giovanni, Kalemli-Özcan, Ulu and Baskaya (2021) and Miranda-Agrippino and Rey (2020), among others. Since global risk sentiment can be related to financial constraints of global intermediaries that limits full capital mobility, we also use capital inflows over GDP, which will also capture country-specific financial frictions. We use our PRP index to proxy ρ^{PRP}_t for country-specific policy risk premium that picks up the differential risk sentiment of global investors for each country, or local risk factors. We estimate panel regressions with currency/country-fixed effects, where we introduce the covariates sequentially to understand the effect of each factor.[17]

We estimate:

$$\begin{aligned} Y_{ct} &= \gamma_1 \log(\text{Capital Inflows/GDP}_{ct-1}) + \gamma_2 \text{Convenience Yield/Liquidity Premium}_{t-1} \\ &\quad + \gamma_3 \log(VIX_{t-1}) + \gamma_4 \,\text{PRP}_{ct-1} + \mu_c + \varepsilon_{ct}, \end{aligned} \tag{14}$$

where c is currency/country, t is month, Y_{ct} is the UIP premium, the interest rate differential term or the exchange rate adjustment term, i.e. $Y_{ct} = \{\lambda^e_{ct+h}, \text{IR Diff}_{ct}, \text{ER Adj}_{ct+h}\}$, and the independent variables are lagged one month. μ_c 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. We present the results for the EM-UIP-wedge but also for carry trade profits (actual excess returns). We also call the latter realized UIP premium.[18]

[16] Obstfeld and Zhou (2022) find that $\gamma^{US,GOV}_t$ is only significant for 10 year treasury bonds.

[17] Note that currency and country is the same as we treat Euro area countries as a group.

[18] We have to drop Colombia, going down to 21 EM as PRP index is not available for Colombia.

Column 1 shows that higher capital inflows associate with a decrease in the UIP premium. In fact this negative relation constitutes our fact (5), and as we will explain later it will be unique to foreigners, that is when capital is flowing out of EMs (foreigners leave), the EM-UIP-wedge tends to be high. 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 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.

Table 4. Determinants of the UIP Premium: 1996m11–2018m10

	Panel A: Emerging Markets							
	(i) Expected UIP Premium				(ii) Realized UIP Premium			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Inflows/GDP$_{ct-1}$	-0.005***	-0.005***	-0.002**	-0.001	-0.023***	-0.023***	-0.021***	-0.020***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.004)	(0.004)	(0.003)	(0.003)
Convenience Yield/Liquidity Premium$_{t-1}$		3.917***	0.168	0.163		7.269**	4.154	4.147
		(1.269)	(1.092)	(1.040)		(3.204)	(3.992)	(3.943)
$\log(VIX_{t-1})$			0.058***	0.053***			0.049*	0.041
			(0.009)	(0.008)			(0.027)	(0.027)
PRP_{ct-1}				0.010***				0.012*
				(0.003)				(0.006)
Observations	3288	3288	3288	3288	3288	3288	3288	3288
Adjusted R^2	0.2089	0.2296	0.3259	0.3468	0.0459	0.0595	0.0721	0.0785
Number of Countries	21	21	21	21	21	21	21	21
Country (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$_{ct-1}$	0.019	0.024	0.035	0.034	-0.045	-0.044	-0.017	-0.017
	(0.034)	(0.029)	(0.027)	(0.027)	(0.051)	(0.051)	(0.048)	(0.049)
Convenience Yield/Liquidity Premium$_{t-1}$		3.704**	1.810	1.687		0.569	-4.009	-3.998
		(1.417)	(1.327)	(1.324)		(3.203)	(3.341)	(3.360)
$\log(VIX_{t-1})$			0.030*	0.032**			0.073***	0.073**
			(0.014)	(0.014)			(0.023)	(0.025)
PRP_{ct-1}				-0.002				0.000
				(0.002)				(0.006)
Observations	2209	2209	2209	2209	2209	2209	2209	2209
Adjusted R^2	0.1582	0.1914	0.2331	0.2346	0.0305	0.0302	0.0726	0.0722
Number of Countries	12	12	12	12	12	12	12	12
Country (currency) FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$. Currency-time two-way clustered standard errors in parentheses. Inflows/GDP$_{ct-1}$ are capital inflows into the country as a fraction of GDP. Convenience yield/Liquidity Premium is the sum of USD convenience yield and its liquidity premium averaged across G10 countries.

Columns 2 adds the convenience yield/liquidity premium as a control. This comes in positive, as expected, since cheaper USD borrowing means more expensive borrowing in other currency and, hence, a positive coefficient. In column 3, when we include the VIX, the convenience yield/liquidity premium term becomes insignificant. 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.

Column 4 assesses local risk factors by adding the PRP. 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 PRP 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 PRP into the regression, the coefficient for capital inflows drops substantially in size, indicating that policy uncertainty captures part of the effect of capital inflows.

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. It is interesting to notice that, VIX is no longer significant and capital inflow effect is stronger on realized excess returns, even after controlling local risk factors.

Overall, these results are consistent with facts 2 and 3, where investors expectations are shaped by local and global risk factors and priced-in as an ex-ante risk premium (UIP-wedge) in EMs, whereas actual portfolio adjustment of foreign investors through capital flows is related to ex-post realized returns in EMS.

3.4.1. Comparison with AEs

For comparison, we also present the results for advanced countries in Panel B of Table 4 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 1-8). We then include the convenience yield, VIX and PRP. While the VIX is statistically significant, the results on PRP show a sharp contrast with those of EMs. Economic policy uncertainty does not lead to a policy risk premium and, hence, does not affect the UIP premium in AEs. Columns 5-8 presents the results using realized exchange rates. Once all variables are included in the analysis, only VIX remains statistically significant to explain the realized UIP premium in AEs.

The AEs result is straightforward to explain with standard theory. If investors who hold AEs' assets are well diversified, then only aggregate risk will affect them and such risk will be captured by global risk factors. In the case of EMs result, local risk factors affect investors' returns as well. Going back to our Argentina nationalization of pension funds example, if such erratic policies are truly idiosyncratic, then investors would be able to diversified them away. For the EM-UIP-wedge to be a risk premium, the marginal investor should either be a domestic Argentinean bank, or EMs, as an asset class, is big enough in the segmented market that U.S. bank is investing in that policy risk in EMs pushes down the networth of the U.S. banks. Theoretically both are possible and hence it is an empirical question which story is valid. Empirically there is evidence for both stories (e.g. For Turkey, see di Giovanni, Kalemli-Özcan, Ulu and Baskaya (2021) for marginal investor being Turkish banks, and Morelli, Ottonello and Perez (2022) for U.S. banks networth linked to EMs default risk).

3.4.2. Joint Explanatory Power of Local and Global Risk Factors in EMs

Going back to EM results, we ask, is 34 percent the maximum R^2 that can be obtained? We report below an additional specification where we allow for heterogeneous slopes in both global and local risk factors, and show that these together can explain more than 40 percent of the UIP premium in emerging markets. In particular, we interact VIX with country-specific dummies and also allow for country-specific effects of PRP (instead of estimating the average effect across countries) and re-estimate regression (14). We proceed in steps and report the heterogeneous slopes in the VIX in column 2 of Table 5, in the policy risk premium in column 3, and in both the VIX and PRP in column 4. For ease of the comparison, column 1 reproduces column 4 of Table 4. As shown in columns 2 and 3 (and compared to column 1), the R^2 increases by 126% when allowing for individual loading on the VIX, and by 130% when allowing for heterogeneous effects of country-specific risk. When included together, heterogeneous effects of the global and local factors increase the R^2 even higher, by 148%. Importantly, Table B.2 in the Appendix B presents the full table and shows the country-specific coefficients of VIX and PRP survive in the same regression.

These results indicate that country-specific loadings of global variable VIX and the country-specific impact of PRP capture different risk premia. Hence global risk factors and local risk factors have their own role in driving the EM-UIP-wedge. Importantly, although

Table 5. R^2 for Heterogeneity in Global Risk Loadings and Country-Specific Risk in EMs

	UIP Premium			
	(1)	(2)	(3)	(4)
Adjusted R^2	0.3468	0.3836	0.3912	0.4214
Inflows/GDP$_{ct-1}$	Yes	Yes	Yes	Yes
Convenience Yield/Liquidity Premium$_{t-1}$	Yes	Yes	Yes	Yes
$\log(VIX_{t-1})$	Yes	Yes	Yes	Yes
PRP_{ct-1}	Yes	Yes	Yes	Yes
$\log(VIX_{t-1})$ × country dummy		Yes		Yes
PRP_{ct-1} × country dummy			Yes	Yes

global risk factors are correlated with other global variables such as the convenience yield, local risk factors are also distinct from these other global variables capturing specialty of the U.S. dollar as clearly shown in the figures below. These factors have a high correlation with VIX but basically a zero correlation with the local risk factors. Thus, neither convenience yield nor U.S. liquidity premium can capture the fluctuations in EMs business cycles, which are important for foreign investors short-term capital flows.

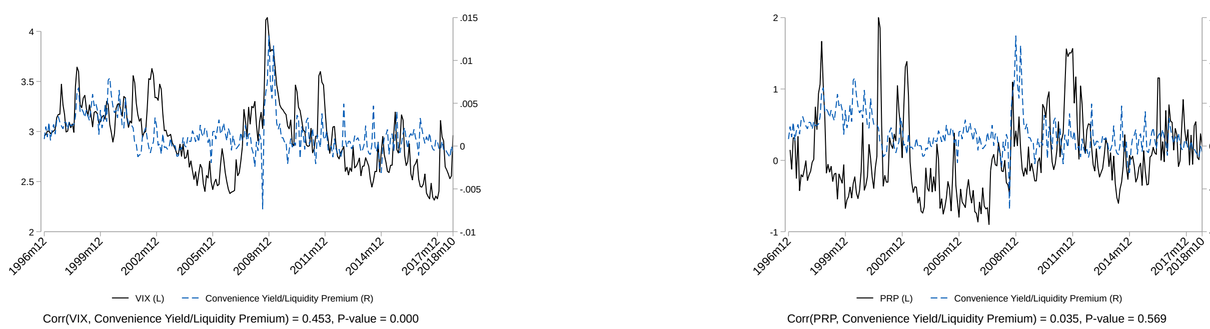


Figure 11. Global-Local Risk Factors and "Convenience/liquidity premium of the USD"

3.5. Implications of Facts 1-4 for Exchange Rate Predictability in EM

UIP condition is generally viewed in the context of a large literature on exchange rate predictability and disconnect (e.g. Lewis (1995), Obstfeld and Rogoff (2001)). Thus, we revisit this issue using our facts so far. We construct the fitted values from the Fama regressions we have run above using β^F. Then we plot below these fitted values (black line) and two ER terms that is: $s^e_{ct+h} - s_{ct}$ (red line), $s_{ct+h} - s_{ct}$ (grey line). The correlation between the fitted values and $s^e_{ct+h} - s_{ct}$ is 0.55 and with $s_{ct+h} - s_{ct}$ is 0.16. The correlation between the two ER terms is also 0.16. We also do this exercise for AEs for comparison and report results on the right panel.

Figure 12. Emerging Markets

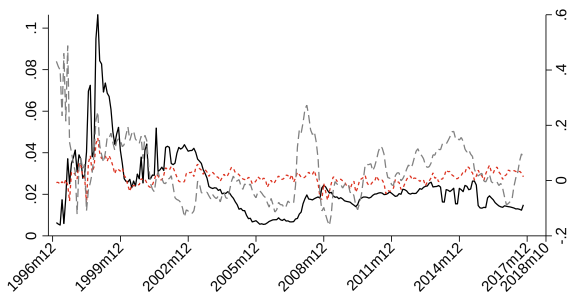
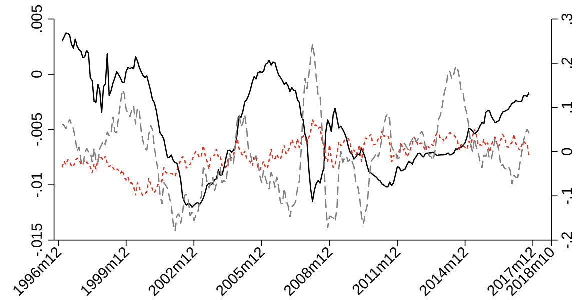


Figure 13. Advanced Economics



There are few interesting facts to notice here that are consistent with our results above and also tell us new information on exchange rate predictability and disconnect. In AEs, surveys do much better (22% vs 9%) in predicting exchange rates than the IR differentials, whereas in EMs surveys give more or less the same correlation (16 vs 15.5%), that is surveys are as successful as the interest rate differentials in predicting the exchange rates. Put differently, in EMs, exchange rates behave more random walk-like and all the relevant info in predicting the exchange rates are in the IR differentials.

To do this dynamically, we run local projections for the response of expected exchange rate changes to interest rate differential shocks at time t:

$$s^e_{c,t+h} - s_{c,t} = \beta_k(i_{c,t} - i^{US}_t) + \mu_c + \epsilon_{c,t+h}, \tag{15}$$

where the coefficient of interest is β_k and reports the response of expected exchange rate change for the next 12-month to interest rate differential shocks for each month h, conditional on currency fixed effects (μ_c).

Figure 14 plots the response of expected change in the exchange rate (for the next 12 month from the given month) to one percentage point interest rate differential shock on the left panel, and the response of expectations 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)). We rather observe an inverted U-shaped, where the exchange rate is expected to initially depreciate. This pattern will lead to persistent UIP-wedge even the initial shock is transitory. This is because, when there is an IR shock, investors expect depreciation to last in EMs. This implies that the expectations increases on impact relative to current spot rate, as shown in the second panel of the figure.

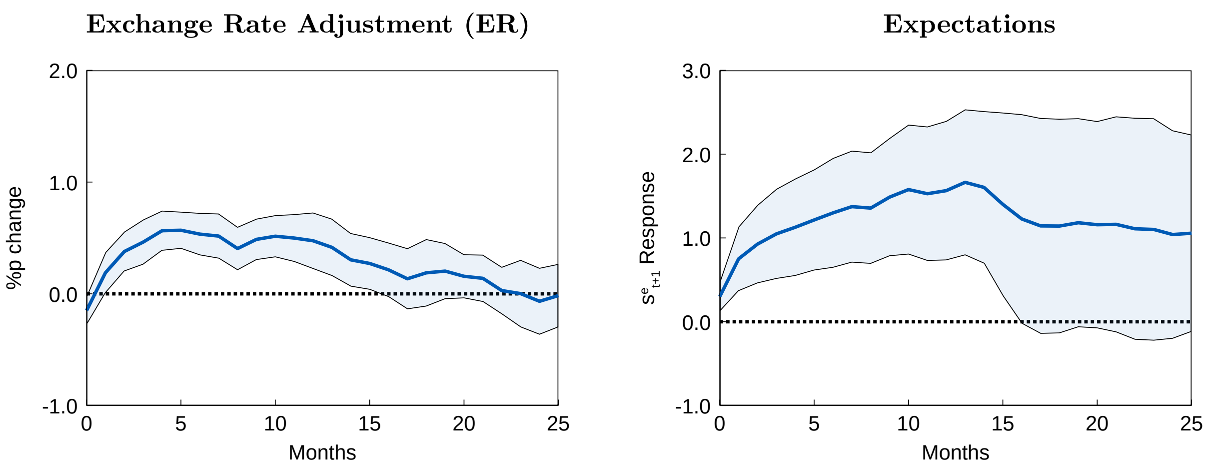


Figure 14. Emerging Markets: Response of ER and Expectations to an IR Shock
95% confidence intervals, using Driskoll-Kraay standard errors with a bandwidth lag $h+1$ for horizon h.

To test the average role of interest rate differentials and exchange rate expectations in predicting exchange rates, we run simple regressions shown in Table 6, where we regress realized exchange rate changes ($s_{ct+h} - s_{ct}$) on survey exchange rate changes ($s^e_{ct+h} - s_{ct}$) and the IR term.

It is interesting to note on the different role of the interest rate differential and exchange rate expectations between AEs and EMs currencies. In EMs currencies, the coefficient on the interest rate differential for EM becomes close to zero and non-statistically different from it when expected exchange rate is included in the regression (columns 1 and 2). This suggests that the IR differential does not contain more information than investors' expectations or, alternatively, it could be interpreted as investors' expectations of future exchange rate already incorporated in the interest rate differential (as discussed above). Importantly, the null role of the interest rate differential could lead to the interpretation that EM currencies are close to a random walk; but, at the same time, survey forecasts work better at predicting future exchange rate with a point estimate of 50%. In contrast in AE currencies, interest rate differentials have some role on top of expectations, yet their joint within R^2 is only 4%.[19] In addition, both expectations and interest rate differentials become non-significant when time fixed-effects are in included in AE currencies, but this does not occur in EMs currencies. This suggests that only global risk factors matter to predict exchange rates in AEs, as also argued by a large literature, but in EM both local and global risk factors play a role in predicting exchange rate through exchange rate expectations.

[19] The result on expectations predicting exchange rates in AE is in line with Kremens, Martin and Varela (2023), who find that expectations can predict currency appreciation at the two-year horizon, both in and out of sample.

Table 6. Exchange Rate Predictability

	Realized Exchange Rate Changes					
	Emerging Markets			Advanced Economies		
	(1)	(2)	(3)	(4)	(5)	(6)
Expected Exchange Rate changes		0.500***	0.528***		0.493***	0.113
		(0.155)	(0.109)		(0.158)	(0.086)
Log Interest Differential	0.374***	0.134	-0.039	-0.399	-1.001*	0.188
	(0.118)	(0.141)	(0.118)	(0.377)	(0.486)	(0.254)
Observations	3577	3577	3571	2285	2285	2285
Adjusted R^2	0.1291	0.1537	0.5271	0.0098	0.0468	0.6080
Number of Countries	22	22	22	12	12	12
Country (currency) FE	Yes	Yes	Yes	Yes	Yes	Yes
Time FE	No	No	Yes	No	No	Yes

Notes: * p<0.10 **p<0.05 *** p<0.01. Currency-time two-way clustered standard errors in parentheses. 21 EMs currencies and 12 AEs currencies. Period 1996m11:2018m10.

3.6. UIP, Capital Flows, and Foreign and Domestic Investors

Fact 5*: The UIP wedge comoves negatively with capital inflows (foreign investors) in emerging markets but not in advanced economies, and it does not move with capital outflows by domestic residents.*

We have already shown the strong correlation between the EM-UIP-wedge and capital inflows, regardless of the fact that we use survey expectations for exchange rate changes or employ realized exchange rate changes. The table below shows that, the UIP-wedge and capital flows correlation is about capital inflows and there is no correlation between the UIP-wedge and domestic residents taking the capital out. Interestingly, there is a significant negative relation between realized excess returns and capital outflows. This mimics the significant negative correlation between capital inflows and realized excess returns we showed before. This means that, both foreign and domestic investors' switching between local and foreign currency assets (portfolio adjustment via relative demand), is related to realized returns. However the ex-ante expected returns (UIP-wedge) are only related to expectations of foreign inventors and hence constitute risk premia.

Table 7. Determinants of the UIP Premium in EM: 1996m11–2018m10—The Role of Domestic vs Foreign Investors

	Emerging Markets							
	(i) Expected UIP Premium				(ii) Realized UIP Premium			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Outflows/GDP$_{ct-1}$	-0.002*	-0.002*	0.001	0.000	-0.014***	-0.014***	-0.011***	-0.012***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)	(0.002)
Convenience Yield/Liquidity Premium$_{t-1}$		4.077***	0.283	0.280		7.111**	3.911	3.906
		(1.300)	(1.108)	(1.053)		(3.313)	(4.108)	(4.056)
$\log(VIX_{t-1})$			0.060***	0.054***			0.050*	0.042
			(0.009)	(0.008)			(0.027)	(0.027)
PRP_{ct-1}				0.010***				0.013*
				(0.003)				(0.006)
Observations	3184	3184	3184	3184	3184	3184	3184	3184
Adjusted R^2	0.1932	0.2153	0.3153	0.3367	0.0419	0.0543	0.0675	0.0746
Number of Countries	20	20	20	20	20	20	20	20
Country (currency) FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

* $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$. Currency-time two-way clustered standard errors in parentheses. Inflows/GDP$_{ct-1}$ are capital inflows into the country as a fraction of GDP. Convenience yield/Liquidity Premium is the sum of USD convenience yield and its liquidity premium averaged across G10 countries.

4. Robustness Analysis

4.1. Bond vs Savings Rates

A natural question to ask is whether our results are specific to 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 8 confirm our previous findings. We also re-estimate our key equation using the two components of the UIP premium –interest rate differential and exchange rate adjustment– as dependent variables. For expositional simplicity, column 1 reproduces our result on the UIP premium of column 4 in Table 4. As shown in columns 2 and 3, all the local variables affect the UIP premium via IR term, whereas the VIX, the global risk factor, affects UIP via both terms. With higher VIX, there is an expected appreciation of the given country's currency in the future, since higher VIX is associated with USD appreciations contemporaneously. Conditional on this global risk factor, uncertainty about local economic policies still 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.

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 that are *lower* than the interest rate differentials. The only way for this to be possible is if interest rate differential term includes a risk premium, as we have argued before.

Table 8. 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$_{ct-1}$	-0.00123	-0.00232*	-0.00109	-0.00927**	-0.00471***	0.00455	-0.000888	-0.00168***	-0.000796
	(-1.61)	(-2.03)	(-0.87)	(-2.78)	(-3.57)	(1.58)	(-0.91)	(-3.59)	(-0.84)
$\log(VIX_{t-1})$	0.0526***	0.0343***	-0.0183**	0.0494***	0.0185***	-0.0310***	0.0449***	0.0236***	-0.0213***
	(6.32)	(3.00)	(-2.10)	(5.45)	(3.57)	(-3.41)	(6.14)	(4.48)	(-2.96)
Convenience Yield/Liquidity Premium$_{t-1}$	0.163	-0.117	-0.279	-1.034	-0.627	0.407	-0.166	-0.900	-0.734
	(0.16)	(-0.10)	(-0.24)	(-0.91)	(-1.35)	(0.45)	(-0.16)	(-1.66)	(-0.72)
PRP_{ct-1}	0.00961***	0.00607***	-0.00354	0.00666**	0.00322*	-0.00345	0.00972**	0.00606**	-0.00366
	(2.94)	(3.42)	(-1.39)	(2.13)	(2.10)	(-0.93)	(2.44)	(2.71)	(-1.19)
Observations	3288	3288	3288	1761	1761	1761	2665	2665	2665
Adjusted R^2	0.3468	0.4860	0.3255	0.3655	0.7045	0.2332	0.3534	0.5521	0.2075
Number of Countries	21	21	21	21	21	21	21	21	21
Country (currency) FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Two-way currency-time clustered standard errors in parenthesis. *,**,*** denotes statistical significance at the 10, 5, and 1 percent respectively. Inflows/GDP$_{ct-1}$ are capital inflows into the country as a fraction of GDP. Convenience yield/Liquidity Premium is the sum of USD convenience yield and its liquidity premium averaged across G10 countries.

4.2. Can Investor Heterogeneity Explain the Results?

To check that our results are not driven by different set of investors between AEs and EMs, we employ data of individual investors/forecasters that are common across countries. In particular, we select the five major financial intermediary in our sample – HSBC, JP Morgan, Morgan Stanley, UBS and Citigroup– reporting their own exchange rate forecasts for 20 EMs and 10 AEs between 2001m2 and 2018m10. We check how these individual investors expect the exchange rate to evolve reflected in the investor-specific UIPs and how these UIPs correlate with the average UIP-wedges for all investors for a given country that we have calculated so far.[20]

Figure 15 shows the correlation of the UIP premium computed for all investors vs five major investors. Importantly, the correlation is very high, reaching 76% for AEs and 62% for EMs. We have also decomposed investor-specific UIPs into IR and ER terms as before and confirm our earlier aggregate findings that for the investor-specific-UIP wedges most of the dynamic correlations come from IR term in EMs and from ER term in AEs.

4.3. Sovereign Default and Limited Commitment

There has been a large literature showing the link between limited commitment to inflation and high default risk in EMs (e.g Azzimonti and Mitra (2023)). Du, Pflueger and

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

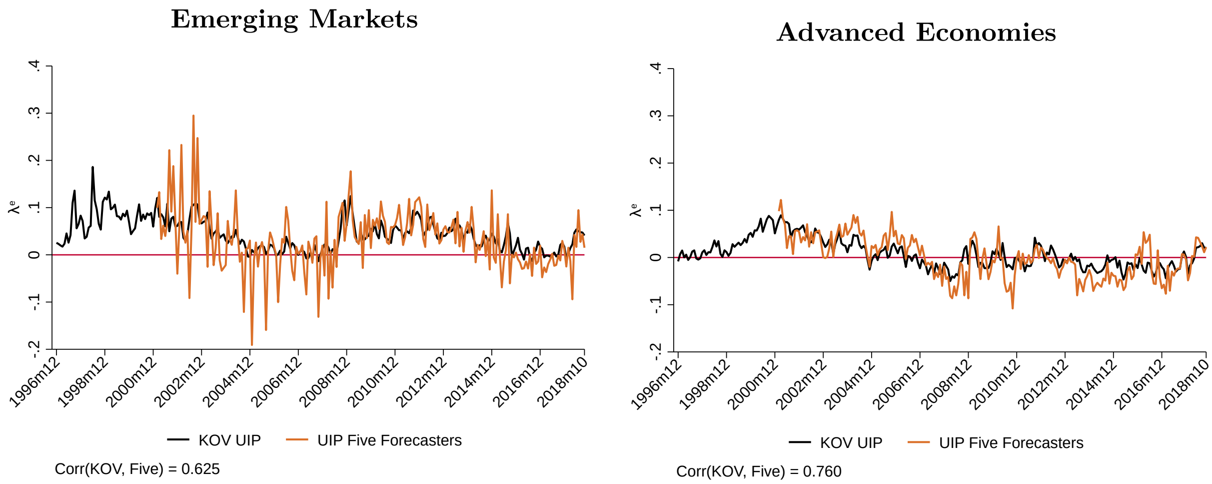


Figure 15. Five Key Forecasters vs Average Forecast: UIP
The average UIP premium of all investors (KOV) and the average UIP premium of five major investors.

Schreger (2020) show that lack of government commitment can also encourage foreign currency borrowing by sovereigns. Thus, we control for default risk and use a measure of limited commitment, that is the deviations of inflation expectations in a given country from the inflation expectations in the U.S., where U.S. serves as the country where expectations are in general well anchored.

Table 9 presents the results. In column 1, we present a highly stringent test by only keeping 6 countries that never defaulted since World War II and, thus, removing countries that investors could perceive as risky from a default perspective . In column 2, we employ data from Reinhart, Rogoff, Trebesch and Reinhart (2021) on monthly episodes of sovereign debt crises and control these episodes with a dummy. Table 9 shows that none of these controls overpower the local and global risk factors measured with PRP and VIX.

One can also control default risk spreads such as EMBI and CDS. But these spreads only capture default risk on foreign currency bonds of government and, hence, will not capture default risk on local currency bonds, smt our PRP measure should also pick up. In fact, the correlation between CDS spreads and policy risk premium is low as shown in Figure 16.

4.4. 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 terms might vanish in real terms. To assess this, we re-estimate our panel regressions and add inflation differentials as a control. As Table 10 below shows that all our results hold when including inflation differential as a control. Importantly, the size of the estimated coefficients is very similar to our main estimation.

Table 9. The Role of Sovereign Default and Limited Commitment

	UIP premium	
	(1)	(2)
Inflows/GDP$_{ct-1}$	0.001	-0.005
	(0.032)	(0.046)
$\log(VIX_{t-1})$	0.024*	0.036***
	(0.012)	(0.009)
Convenience Yield/Liquidity premium$_{t-1}$	-0.433	-0.555
	(1.452)	(0.951)
PRP$_{ct-1}$	0.009***	0.012***
	(0.002)	(0.003)
Expected Inflation Differential$_{ct-1}$	1.737***	1.423***
	(0.340)	(0.184)
Sovereign Default Control		0.003
		(0.016)
Observations	797	2224
Adjusted R^2	0.4851	0.4421
Number of Countries	6	16
Country (currency) FE	Yes	Yes

Notes: Two-way currency-time clustered standard errors in parenthesis. *,**,*** denotes statistical significance at the 10, 5, and 1 percent respectively.

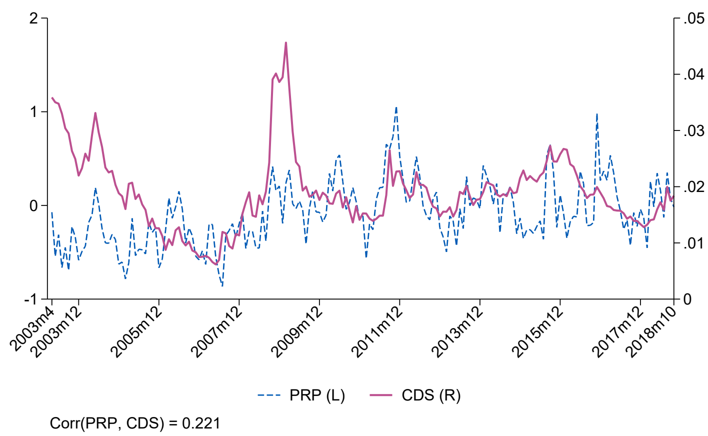


Figure 16. Policy Risk Premium and Default Risk in Emerging Markets
Credit Default Swaps (CDS) and PRP for 18 EMs over 2003m4:2018m10.

4.5. Can CIP Deviations Explain the Results?

Although CIP represents riskless arbitrage or hedged currency returns, they can be highly correlated with UIP deviations. Thus, we plot CIP deviations together with our UIP-wedges in Figure 17. These figures show that UIP and CIP deviations have low and insignificant correlation with each other, both in EMs and AEs.

Regardless of how we measure the CIP deviations, with forward rates or as currency basis

Table 10. Inflation Differential

	Emerging Markets		
	(1)	(2)	(3)
	UIP Premium	IR Diff.	ER Adj.
Inflows/GDP$_{ct-1}$	-0.001	-0.002*	-0.001
	(0.001)	(0.001)	(0.001)
$\log(VIX_{t-1})$	0.048***	0.028***	-0.020**
	(0.008)	(0.008)	(0.007)
Convenience Yield/Liquidity premium$_{t-1}$	-0.126	-0.352	-0.226
	(0.987)	(1.025)	(1.102)
PRP$_{ct-1}$	0.009***	0.005**	-0.004
	(0.003)	(0.002)	(0.003)
Inflation Differential$_{ct-1}$	1.840***	2.517	0.677
	(0.457)	(1.592)	(1.215)
Observations	3203	3203	3203
Adjusted R^2	0.4015	0.5239	0.2620
Number of Countries	20	20	20
Country (currency) FE	Yes	Yes	Yes

Notes: * p < 0.10 ** p < 0.05 *** p < 0.01. Currency-time two-way clustered standard errors in parentheses. Inflation differential are the difference between CPI in the home economy relative to the U.S.

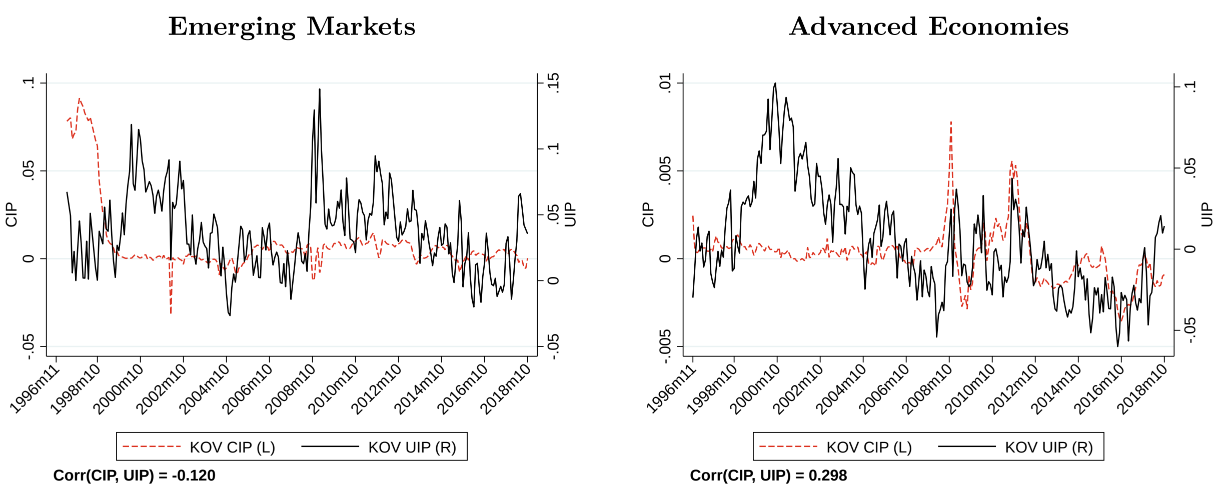


Figure 17. UIP and CIP (12 Months Horizon)
CIP uses interbank rates and forward rates and UIP uses deposit rates and expected exchange rates.

as in the literature,[21] CIP and UIP deviations capture different things and not correlated both in EMs and in AEs as shown in Figure 18. Again, these results should not be surprising as CIP-wedges represent low hedged returns whereas UIP-wedges represent high unhedged returns.

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

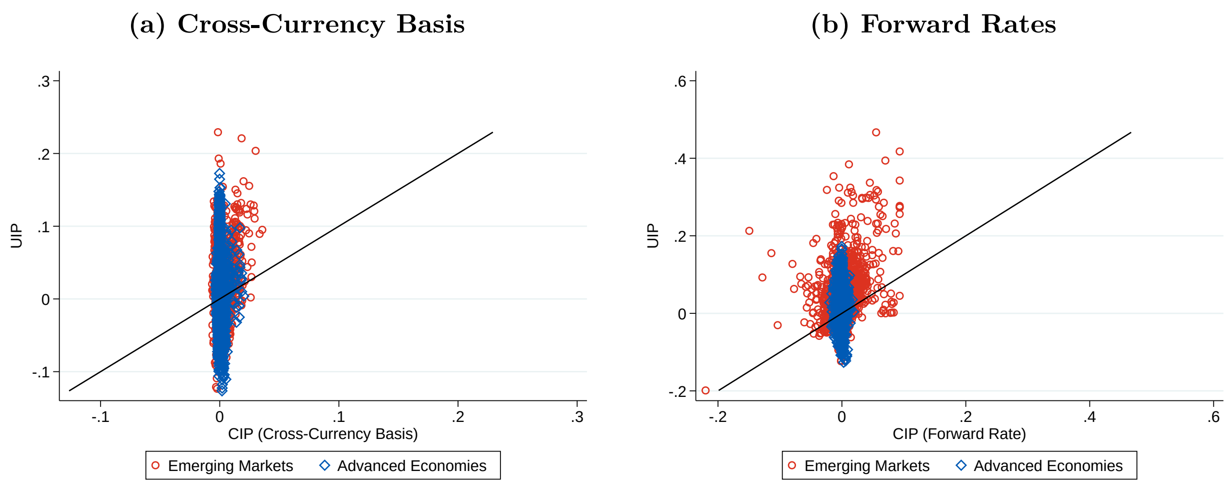


Figure 18. Cross-Sectional UIP and CIP (12 Months)
Panel (a) CIP uses Du and Schreger (2021) cross-currency basis. Panel (b) CIP uses forward rates.

4.6. Other Measures of Policy Uncertainty: A Granular Look

We employ three additional variables reflecting policy uncertainty: *composite country risk*, *government policy risk* and *confidence risk*.[22]

The left graph of Figure 19 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, 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.

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 11, the coefficient 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

[22]See Section 2 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).

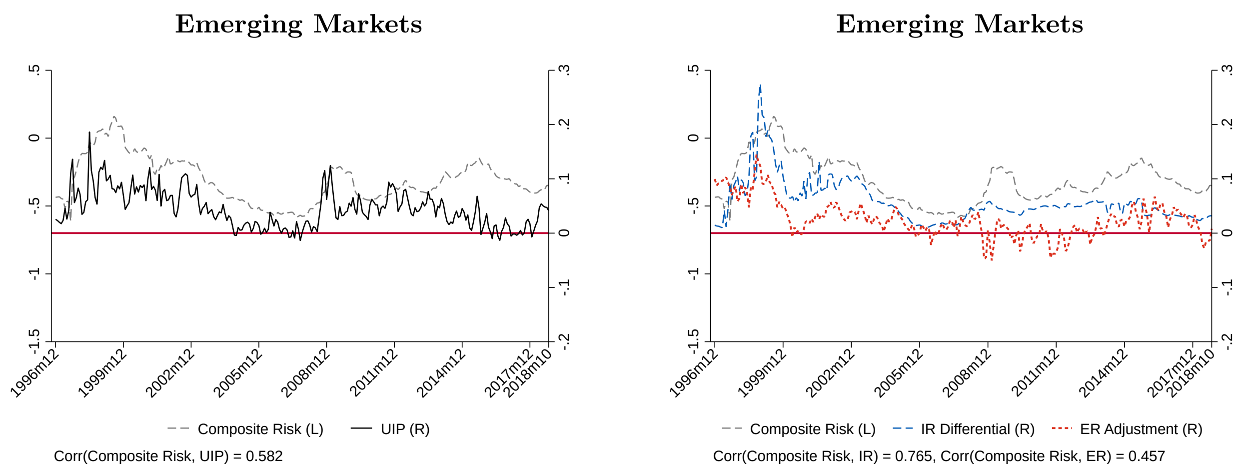


Figure 19. Composite Risk and UIP Premium in EM

magnitude and highly statistically significant –, but it overpowers capital inflows.

Table 11. UIP Deviations in EMs: A Granular View

	Panel (A): Composite Risk			**Panel (B): Unpacking Composite Risk**		
	(1) UIP Premium	(2) IR Diff.	(3) ER Adj.	(4) UIP Premium	(5) UIP Premium	(6) UIP Premium
Inflows/GDP$_{ct-1}$	-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$_{ct-1}$	0.052***	0.089***	0.037***			
	(0.006)	(0.006)	(0.006)			
Government Policy Risk$_{ct-1}$				0.020***		0.014***
				(0.005)		(0.005)
Confidence Risk$_{ct-1}$					0.023***	0.020***
					(0.004)	(0.004)
Observations	3427	3427	3427	3427	3427	3427
Adjusted R^2	0.3639	0.3639	0.3639	0.3316	0.3396	0.3435
Number of Countries	245	245	245	245	245	245
Country (currency) FE	Yes	Yes	Yes	Yes	Yes	Yes

* 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.

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.

5. Conclusion

We document five novel facts on the Uncovered Interest Parity (UIP) wedge, using an extensive cross-country panel data set since late 1990s. The key takeaway from our paper is that when "perceived" currency risk by foreign investors is high, the ex-ante return to invest in that local currency asset is high. This result suggests that the interest rate differential is endogenous to expected currency risk. Thus, if one wants to answer the question of why are there UIP deviations in emerging markets (EM), then he/she needs to focus on the determinants of interest rate differentials. These determinants will encompass a wide range of shocks, including monetary and financial shocks, but also uncertainty surrounding economic policies. On the other hand, understanding advanced country (AE) UIP deviations require an understanding of exchange rate determination.

While AE-UIP-wedges can be solely driven by global shocks and global risk factors, EM-UIP-wedges are also going to have an important local idiosyncratic risk component. Our interpretation of this result is that marginal investor in EMs cares about the country-specific risk. If, in this sense, EM and AE assets are imperfect substitutes, then it is not surprising that investors price these assets heterogenously. There might be heterogenous institutions and individuals using probably different methods of forming expectations in financial markets and this may lead to noise and to erratic behavior of the spot rate, the forward rate, and the expected future spot rate. However, the difference between the expected rate and interest rate differentials (UIP-wedge) and also the realized excess returns/forward premium should behave less erratically, if tied down with stable policies. This is the case in AEs but not in EMs. Thus, a general implication of our results is that in order to better understand the short-run behavior of the UIP-wedge and exchange rates, future research will have to dig more deeply into the heterogeneity of asset riskiness and differential investor expectations of currency risk for EMs and AEs together with the manner in which agents process new information.

References

Alvarez, Fernando, Andrew Atkeson, and Patrick J. Kehoe. 2009. "Time-Varying Risk, Interest Rates, and Exchange Rates in General Equilibrium." *The Review of Economic Studies*, 76(3): 851–878.

Ashworth, Louis. 2022. "Quantifying Britain's moron risk premium." *Financial Times*.

Avdjiev, Stefan, Bryan Hardy, Şebnem Kalemli-Özcan, and Luis Servén. 2022. "Gross Capital Flows by Banks, Corporates and Sovereigns." *Journal of European Economic Association*, 20(5): 2098–2135.

Azzimonti, Marina, and Nirvana Mitra. 2023. "Political Constraints and Sovereign Default." *Journal of International Money and Finance*, 137: 102–895.

Bacchetta, Philippe, and Eric Van Wincoop. 2006. "Can Information Heterogeneity Explain the Exchange Rate Determination Puzzle?" *American Economic Review*, 96(3): 552–576.

Baker, Scott R, Nicholas Bloom, and Steven J Davis. 2016. "Measuring Economic Policy Uncertainty." *The Quarterly Journal of Economics*, 131(4): 1593–1636.

Bansal, Ravi, and Magnus Dahlquist. 2000. "The forward premium puzzle: different tales from developed and emerging economies." *Journal of International Economics*, 51(1): 115 – 144.

Barrett, Philip, Maximiliano Appendino, Kate Nguyen, and Jorge de Leon Miranda. 2022. "Measuring social unrest using media reports." *Journal of Development Economics*, 158: 102–924.

Bauer, Michael D, Carolin E Pflueger, and Adi Sunderam. 2024. "Perceptions About Monetary Policy." *The Quarterly Journal of Economics*, qjae021.

Bianchi, Javier, Saki Bigio, and Charles Engel. 2021. "Scrambling for dollars: International liquidity, banks and exchange rates." National Bureau of Economic Research.

Bryant, Ralph C. 1995. *The "exchange Risk Premium," Uncovered Unterest Parity, and the Treatment of Exchange Rates in Multicountry Macroeconomic Models.* Brookings Institution.

Burnside, Craig, Martin Eichenbaum, and Sergio Rebelo. 2007. "The Returns to Currency Speculation in Emerging Markets." *American Economic Review*, 97(2): 333–338.

Candian, Giacomo, and Pierre De Leo. 2023. "Imperfect exchange rate expectations." *Review of Economics and Statistics*, 1–46.

Chinn, Menzie. 2006. "The (partial) rehabilitation of interest rate parity in the floating rate era: Longer horizons, alternative expectations, and emerging markets." *Journal of International Money and Finance*, 25(1): 7–21.

Chinn, Menzie, and Jeffrey Frankel. 1994. "Patterns in Exchange Rate Forecasts for Twenty-Five Currencies." *Journal of Money, Credit and Banking*, 26(4): 759–770.

Cieslak, Anna, Stephen Hansen, Michael McMahon, and Song Xiao. 2023. "Policymakers' Uncertainty." National Bureau of Economic Research.

di Giovanni, Julian, Şebnem Kalemli-Özcan, Mehmet Fatih Ulu, and Yusuf Soner Baskaya. 2021. "International Spillovers and Local Credit Cycles." *The Review of Economic Studies*, 89(2): 733–773.

Dornbusch, Rudiger. 1976. "Expectations and Exchange Rate Dynamics." *Journal of Political Economy*, 84(6): 1161–76.

Du, Wenxin, and Jesse Schreger. 2021. "CIP Deviations, the Dollar, and Frictions in International Capital Markets." *Handbook of International Economics*, 5.

Du, Wenxin, Carolin E. Pflueger, and Jesse Schreger. 2020. "Sovereign Debt Portfolios, Bond Risks, and the Credibility of Monetary Policy." *The Journal of Finance*, 75(6): 3097–3138.

Eichenbaum, Martin, and Charles Evans. 1995. "Some Empirical Evidence on the Effects of Shocks to Monetary Policy on Exchange Rates." *The Quarterly Journal of Economics*, 110(4): 975–1009.

Engel, Charles, and Steve Pak Yeung Wu. 2023. "Liquidity and exchange rates: An empirical investigation." *The Review of Economic Studies*, 90(5): 2395–2438.

Fama, Eugene F. 1984. "Forward and spot exchange rates." *Journal of Monetary Economics*, 14(3): 319 – 338.

Frankel, Jeffrey A, and Kenneth A Froot. 1987. "Understanding the U.S. Dollar in the Eighties: The Expectations of Chartists and Fundamentalists." National Bureau of Economic Research Working Paper 957.

Frankel, Jeffrey, and Jumana Poonawala. 2010. "The forward market in emerging currencies: Less biased than in major currencies." *Journal of International Money and Finance*, 29(3): 585–598.

Friedman, Benjamin M, and Kenneth N Kuttner. 1992. "Time-varying risk perceptions and the pricing of risky assets." *Oxford Economic Papers*, 44(4): 566–598.

Froot, Kenneth A., and Jeffrey Frankel. 1989. "Forward Discount Bias: Is it an Exchange Risk Premium?" *The Quarterly Journal of Economics*, 104(1): 139–161.

Gabaix, Xavier, and Matteo Maggiori. 2015. "International Liquidity and Exchange Rate Dynamics." *The Quarterly Journal of Economics*, 130(3): 1369–1420.

Giles, Chris, and George Parker. 2022. "UK Public Finances Shift from 'Moron Premium' to 'Dullness Dividend'." *Financial Times*.

Gilmore, Stephen, and Fumio Hayashi. 2011. "Emerging Market Currency Excess Returns." *American Economic Journal: Macroeconomics*, 3(4): 85–111.

Hansen, Lars Peter, and Robert J. Hodrick. 1980. "Forward Exchange Rates as Optimal Predictors of Future Spot Rates: An Econometric Analysis." *Journal of Political Economy*, 88(5): 829–853.

Hassan, Tarek, and Rui C Mano. 2019. "Forward and Spot Exchange Rates in a Multi-currency World." *The Quarterly Journal of Economics*, 134(1): 397–450.

Ilzetzki, Ethan, Carmen M. Reinhart, and Kenneth S. Rogoff. 2017. "The Country Chronologies to Exchange Rate Arrangements into the 21st Century: Will the Anchor Currency Hold?" National Bureau of Economic Research, Inc NBER Working Papers 23135.

Isard, Peter. 1983. "An Accounting Framework and Some Issues for Modeling How Exchange Rates Respond to the News." *Exchange Rates and International Macroeconomics*, 19–66. University of Chicago Press.

Ito, Takatoshi. 1990. "Foreign Exchange Rate Expectations: Micro Survey Data." *American Economic Review*, 80(3): 434–49.

Itskhoki, Oleg, and Dmitry Mukhin. 2021. "Exchange Rate Disconnect in General Equilibrium." *Journal of Political Economy*, 129(8): 2183–2232.

Itskhoki, Oleg, and Dmitry Mukhin. 2023. "Mussa Puzzle Redux." National Bureau of Economic Research Working Paper 28950.

Jiang, Zhengyang, Arvind Krishnamurthy, and Hanno Lustig. 2021. "Foreign Safe Asset Demand and the Dollar Exchange Rate." *The Journal of Finance*.

Kalemli-Özcan, Şebnem. 2019. "U.S. Monetary Policy and International Risk Spillovers." Proceedings of the Jackson Hole Symposium, 2019.

Kremens, Lukas, Ian Martin, and Liliana Varela. 2023. "Long-Horizon Exchange Rate Expectations." CEPR Discussion Paper 18412.

Lewis, Karen K. 1995. "Puzzles in international financial markets." *Handbook of international economics*, 3: 1913–1971.

Lustig, Hanno, and Adrien Verdelhan. 2007. "The Cross Section of Foreign Currency Risk Premia and Consumption Growth Risk." *American Economic Review*, 97(1): 89–117.

Lustig, Hanno, Andreas Stathopoulos, and Adrien Verdelhan. 2019. "The Term Structure of Currency Carry Trade Risk Premia." *American Economic Review*, 109(12): 4142–77.

Lustig, Hanno, Nikolai Roussanov, and Adrien Verdelhan. 2011. "Common Risk Factors in Currency Markets." *The Review of Financial Studies*, 24(11): 3731–3777.

Miranda-Agrippino, Silvia, and Hélène Rey. 2020. "U.S. Monetary Policy and the Global Financial Cycle." *The Review of Economic Studies*.

Morelli, Juan M., Pablo Ottonello, and Diego J. Perez. 2022. "Global Banks and Systemic Debt Crises." *Econometrica*, 90(2): 749–798.

Obstfeld, Maurice, and Haonan Zhou. 2022. "The global dollar cycle." *Brookings Papers on Economic Activity*, 2022(2): 361–447.

Obstfeld, Maurice, and Kenneth Rogoff. 2001. "The Six Major Puzzles in International Macroeconomics: Is There a Common Cause?" University Library of Munich, Germany International Trade 0012003.

Pflueger, Carolin, Emil Siriwardane, and Adi Sunderam. 2020. "Financial market risk perceptions and the macroeconomy." *The Quarterly Journal of Economics*, 135(3): 1443–1491.

Reinhart, Carmen, Ken Rogoff, Christoph Trebesch, and Vincent Reinhart. 2021. "Global Crises Data by Country." *https://www.hbs.edu/behavioral-finance-and-financial-stability/data/Pages/global.aspx*.

Rey, Hélène. 2013. "Dilemma not trilemma: the global cycle and monetary policy independence." Proceedings of the Jackson Hole Symposium.

Stavrakeva, Vania, and Jenny Tang. 2020. "A fundamental connection: Exchange rates and macroeconomic expectations." *Review of Economic and Statistics, forthcoming.*

The Economist. 2022. "For bond investors, every country is an emerging market now." *The Economist*.

Tryon, Ralph. 1979. "Testing for rational expectations in foreign exchange markets."

Webber, Jude. November 2008. "Argentina moves to nationalise pension funds." *Financial Times*.

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 (bond, 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, Reinhart and Rogoff (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.

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.

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).

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, Hardy, Kalemli-Özcan and Servén (2022)
Aggregate variables:			
GDP	local currency (million), real and nominal, non-seasonally-adjusted and seasonally-adjusted series	quarter / year	
Industrial production	index 2010=100, non- and seasonally-adjusted series	month / quarter / year	IMF IFS
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, Reinhart and Rogoff (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

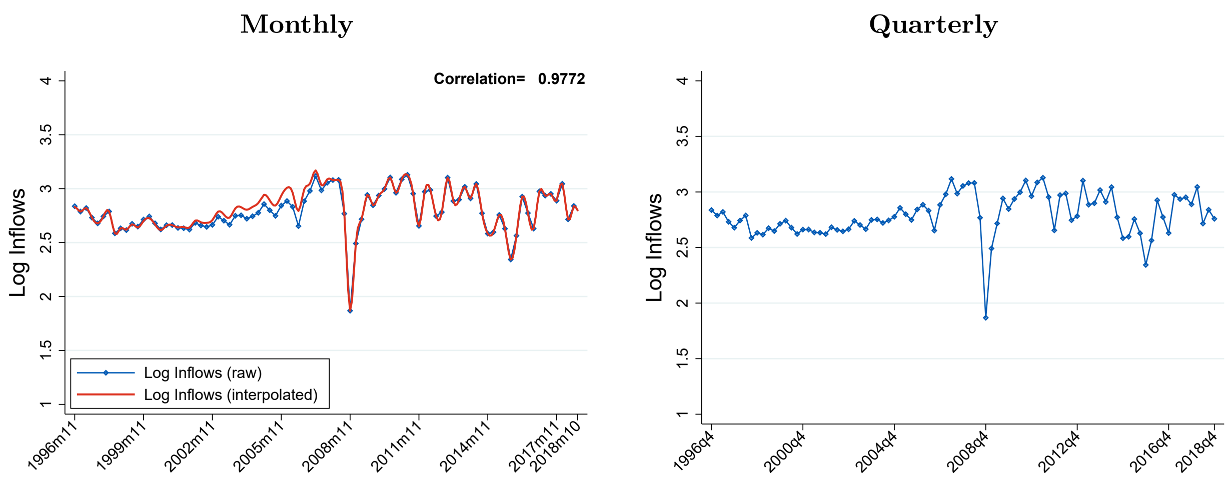
A.2. Exchange Rate Expectations from Survey Data: Consensus Forecasts

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.

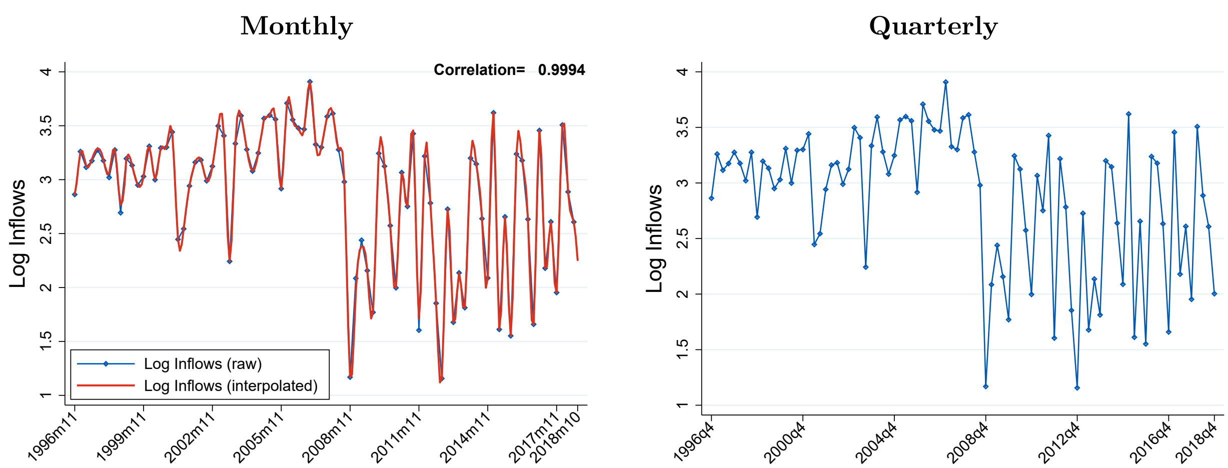
Table A6 presents examples of the main forecasters for the Euro, Yen, UK Pound, Korean Won, Turkish Lira and other emerging markets in September 2012. The first thing to notice is that these forecasters are also the main global investors and the investor-forecasters surveyed for EMs' currencies were also top investor-forecasters in AEs. We also collect individual forecasts from printed monthly reports created by Consensus Forecasts. These reports do not provide a complete list of forecasters for each currency. For this reason, the empty cells

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		



(a) Emerging Markets



(b) Advanced Economies

Figure A1. Average Capital Inflows: Raw vs. Interpolated Data
The interpolation of capital inflows at monthly frequency for AEs and EMs.

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

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.

A.3. Policy Risk Premium Measure

We construct the PRP measure following the methodology of Baker, Bloom and Davis (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, Bloom and Davis (2016). Our list of words contains 218 words and follows closely theirs. Since Baker, Bloom and Davis (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

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

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, Appendino, Nguyen and de Leon Miranda (2022) to construct our PRP measure. This methodology adds total number of articles in a country and pools all the newspapers together for each country.[23] More precisely, define X_{ct} the number of articles referring to policy risk episodes in country c at time t, Y_{ct} total number of articles referring to country c at time t, and $Y_t = \sum_c Y_{ct}$ the total number of articles written at each time t (i.e. the sum of articles across countries). We replicate Barrett, Appendino, Nguyen and de Leon Miranda (2022) index as follows

[23]The difference with Baker, Bloom and Davis (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.

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

*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.

$$PRP_{ct} = \frac{X_{ct}}{\frac{1}{12}\sum_{j=1}^{12} Y_{t-j}}$$

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

$$PRP_{ct}^{N} = \frac{PRP_{ct}}{\overline{PRP}_c} \times 100,$$

where $\overline{PRP}_c = \frac{1}{T}\sum_{t=1}^{T} PRP_{ct}$ is the average of policy risk news for each country across time. We construct the monthly PRP 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 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 PRP measure as $PRP_t = \sum_{c=1}^{N} \omega_{ct} PRP_{ct}$, where $\omega_{ct} = RGDP_{ct} / \sum_{c=1}^{N} RGDP_{ct}$ is the share of the eurozone GDP accounted for by country c, PRP_{ct} is the PRP measure for country c at time t, and N is the number of countries in the eurozone for which we observe a value for PRP_{ct} and their GDP.

List of Words

Our list of words from comes from Baker, Bloom and Davis (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, Bloom and Davis (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:

-Political risk: 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

$$ECR_t = \sum_{c=1}^{N_t} \omega_{ct} CR_{ct},$$

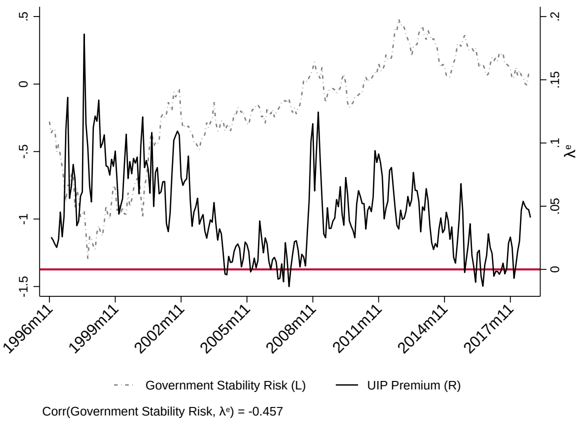
where $\omega_{ct} = RGDP_{ct} / \sum_{c=1}^{N_t} RGDP_{ct}$ is the share of the Eurozone GDP accounted for by country c, CR_{ct} is the ICRG risk index for country c at time t, and N_t is the number of countries in the eurozone for which we observe a value for CR_{ct} and their GDP. This latter number 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

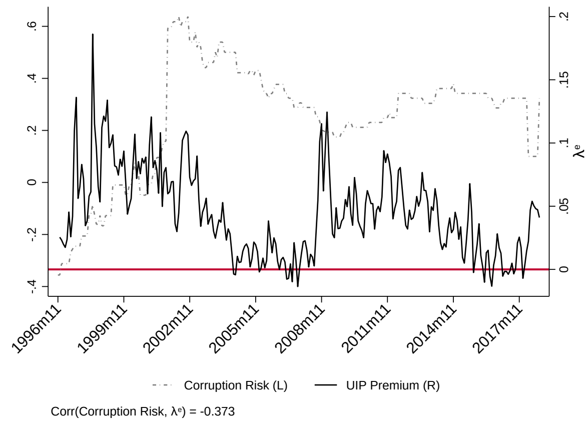
Section 4.6 focused on two main determinants of political risk correlated with the UIP premium in EMs, namely government policy risk (composed by anti-democratic and expropriation risks) and confidence risk. In this section, we present the correlation of other sub-components of political risk with the 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.

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 subcomponent 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.

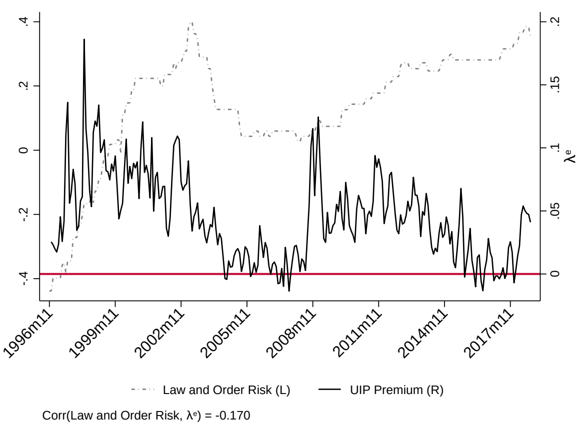
Therefore, these figures indicate that these sub-components capture elements of political risk that are not significantly related to foreign investors' risk sentiments, and thus do not significantly correlate with the UIP premium in EMs.



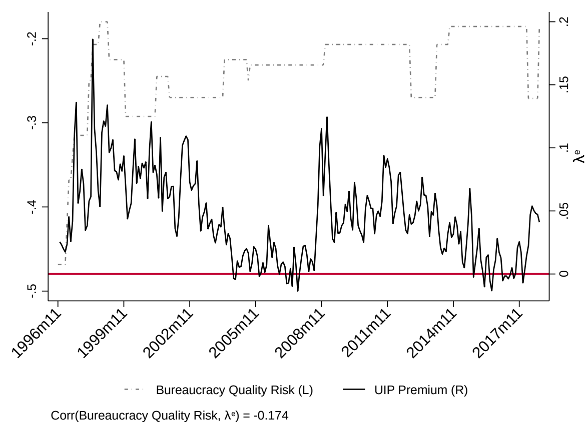
a) Government Stability Risk



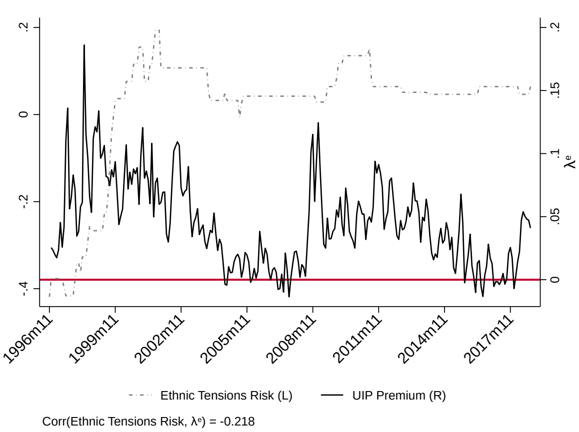
b) Corruption Risk



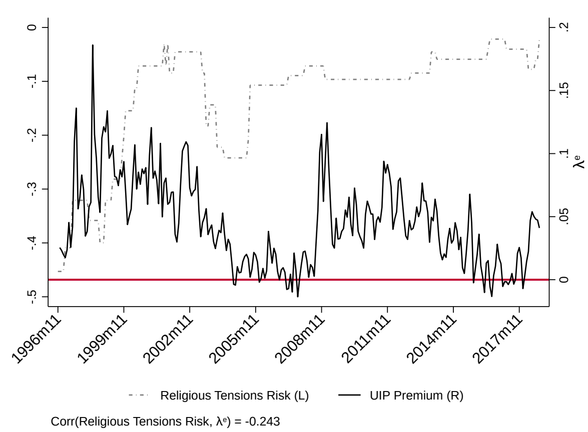
c) Law and Order Risk



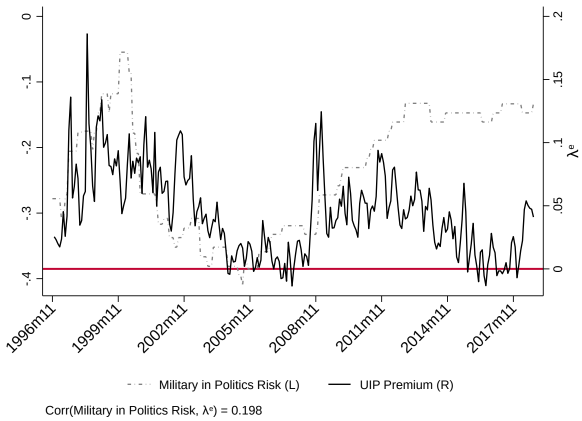
d) Bureaucracy Quality Risk



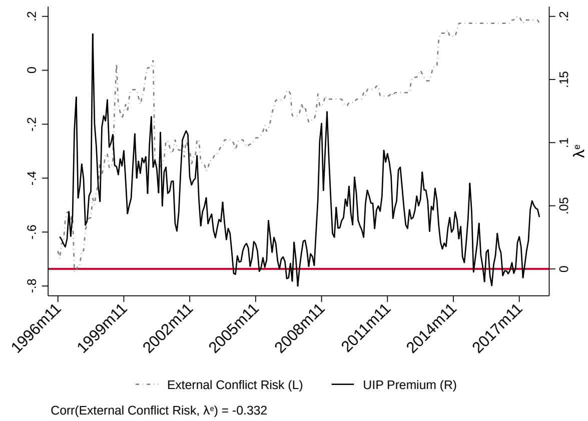
e) Ethnic Tensions Risk



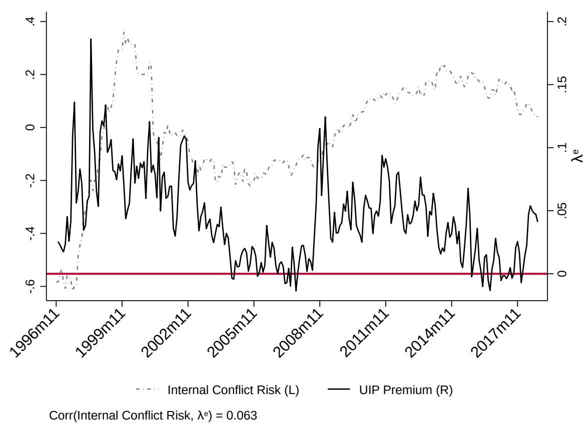
f) Religious Tensions Risk



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 EM

B. Additional Analysis

Below Table B.1 is the AE version of our expectations channel shown in Table 3 for EM. We also report the full version of Table 5 that we show in the text on different loadings on VIX and local risk factors, as Table B.2 below.

Table B.1. Mechanism: Advanced Economies

	Second Stage: Interest Rate Differential					
	(1)	(2)	(3)	(4)	(5)	(6)
$s^e_{a^{high}t+1}$-$s^e_{a^{low}t+1}$	0.026*	0.059	0.027*			
	(0.013)	(0.043)	(0.013)			
Std Dev s^e_{at+1}				0.031**	0.051	0.031*
				(0.013)	(0.058)	(0.013)
RHS variable in First Stage	VIX	PRP	VIX & PRP	VIX	PRP	VIX & PRP
Observations	2167	2167	2167	1260	1260	1260
	First Stage: Dispersion in ER Expectations					
	$s^e_{a^{high}t+1} - s^e_{a^{low}t+1}$			Std Dev s^e_{at+1}		
$\log(VIX_{t-1})$	0.288***		0.284***	0.257***		0.261***
	(0.041)		(0.048)	(0.042)		(0.047)
PRP_{t-1}		0.040**	0.005		0.031	-0.005
		(0.019)	(0.023)		(0.020)	(0.024)
Cragg-Donal Wald F statistic	285.68	29.66	143.09	194.84	13.40	97.56
Kleibergen-Paap Wald F statistic	49.40	4.42	26.77	38.20	2.41	19.21

Table B.2. R^2 for Heterogeneity in Global Risk Loadings and Country-Specific Risk in EMs

	UIP Premium			
	(1)	(2)	(3)	(4)
Inflows/GDP$_{it-1}$	-0.001*	-0.001	-0.001**	-0.002*
	(0.001)	(0.001)	(0.001)	(0.001)
Convenience Yield/Liquidity Premium$_{t-1}$	0.163	0.135	0.071	0.057
	(1.014)	(1.092)	(0.995)	(1.035)
$\log(VIX_{t-1})$	0.053***	0.027***	0.053***	0.040***
	(0.008)	(0.007)	(0.008)	(0.006)
PRP_{it-1}	0.010***	0.011***	-0.021***	-0.020***
	(0.003)	(0.004)	(0.001)	(0.002)
Argentina × $\log(VIX_{t-1})$		-0.041***		-0.040***
		(0.012)		(0.010)
Brazil × $\log(VIX_{t-1})$		0.065***		0.016*
		(0.006)		(0.008)
Chile × $\log(VIX_{t-1})$		-0.022**		-0.040***
		(0.008)		(0.007)
Czech Republic × $\log(VIX_{t-1})$		0.011**		0.011*
		(0.005)		(0.006)
Hungary × $\log(VIX_{t-1})$		0.052***		0.042***
		(0.005)		(0.007)
India × $\log(VIX_{t-1})$		-0.012***		-0.030***
		(0.003)		(0.003)
Indonesia × $\log(VIX_{t-1})$		0.035***		0.007
		(0.003)		(0.006)
Korea, Republic of × $\log(VIX_{t-1})$		0.072***		0.062***
		(0.004)		(0.006)
Malaysia × $\log(VIX_{t-1})$		-0.021***		-0.026***
		(0.003)		(0.003)
Mexico × $\log(VIX_{t-1})$		0.025***		0.015
		(0.009)		(0.009)
Peru × $\log(VIX_{t-1})$		-0.016***		-0.018***
		(0.005)		(0.005)
Philippines × $\log(VIX_{t-1})$		0.028***		0.006
		(0.006)		(0.007)
Poland × $\log(VIX_{t-1})$		0.034***		0.020***
		(0.006)		(0.007)
Romania × $\log(VIX_{t-1})$		0.029**		0.021
		(0.011)		(0.013)
Russian Federation × $\log(VIX_{t-1})$		0.029**		0.019
		(0.013)		(0.015)
Slovak Republic × $\log(VIX_{t-1})$		0.020**		0.006
		(0.007)		(0.006)
South Africa × $\log(VIX_{t-1})$		0.012		-0.005
		(0.007)		(0.006)
Thailand × $\log(VIX_{t-1})$		0.012***		-0.007
		(0.003)		(0.005)
Turkey × $\log(VIX_{t-1})$		0.102***		0.089***
		(0.005)		(0.005)
Ukraine × $\log(VIX_{t-1})$		0.153***		0.142***
		(0.021)		(0.021)

	PRP			
	(1)	(2)	(3)	(4)
Argentina × PRP_{it-1}			0.005	0.008
			(0.004)	(0.007)
Brazil × PRP_{it-1}			0.068***	0.067***
			(0.003)	(0.005)
Chile × PRP_{it-1}			0.027***	0.035***
			(0.003)	(0.004)
Czech Republic × PRP_{it-1}			0.017***	0.016***
			(0.002)	(0.003)
Hungary × PRP_{it-1}			0.031***	0.027***
			(0.002)	(0.004)
India × PRP_{it-1}			0.028***	0.035***
			(0.002)	(0.004)
Indonesia × PRP_{it-1}			0.053***	0.053***
			(0.003)	(0.004)
Korea, Republic of × PRP_{it-1}			0.031***	0.023***
			(0.003)	(0.005)
Malaysia × PRP_{it-1}			0.009***	0.016***
			(0.003)	(0.004)
Mexico × PRP_{it-1}			0.026***	0.025***
			(0.001)	(0.003)
Peru × PRP_{it-1}			0.019***	0.021***
			(0.002)	(0.003)
Philippines × PRP_{it-1}			0.036***	0.036***
			(0.002)	(0.003)
Poland × PRP_{it-1}			0.038***	0.037***
			(0.002)	(0.005)
Romania × PRP_{it-1}			0.025***	0.023***
			(0.001)	(0.003)
Russian Federation × PRP_{it-1}			0.035***	0.034***
			(0.002)	(0.003)
Slovak Republic × PRP_{it-1}			0.027***	0.026***
			(0.002)	(0.003)
South Africa × PRP_{it-1}			0.044***	0.044***
			(0.002)	(0.005)
Thailand × PRP_{it-1}			0.034***	0.036***
			(0.003)	(0.004)
Turkey × PRP_{it-1}			0.034***	0.033***
			(0.003)	(0.004)
Ukraine × PRP_{it-1}			0.034***	0.027**
			(0.008)	(0.011)
Constant	-0.112***	-0.110***	-0.112***	-0.107***
	(0.024)	(0.014)	(0.024)	(0.012)
Observations	3288	3288	3288	3288
Number of Countries	21	21	21	21
Adjusted R^2	0.3468	0.3836	0.3912	0.4214
Country (currency) FE	Yes	Yes	Yes	Yes

Notes: * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$.

Finally we present the standard Froot and Frankel (1989) decomposition that is used in the literature on UIP deviations.

First, note that the probability limit of the coefficient β^F in equation (5) is

$$plim\hat{\beta}^F = \frac{cov(\Delta s_{it+h} - \Delta\overline{s}_i, IR_{it} - \overline{IR}_i)}{var(IR_{it} - \overline{IR}_i)}, \tag{16}$$

where $IR_{it} = i_{it} - i_t^{US}$ denotes the interest rate differential, and the over-line denotes the average of the variable for each currency across months – $\overline{X}_i = \frac{1}{T}\sum_{t=1}^{T} X_{it}$ – and corresponds to the currency fixed effects. We can define the forecast errors as

$$\eta_{it+h}^e = \Delta s_{it+h} - \Delta s_{it+h}^e, \tag{17}$$

and rewrite $plim\beta^F$ as:

$$plim\hat{\beta}^F = 1 - b_{RE} - b_{RP} \tag{18}$$

where $\quad b_{RE} = -\frac{cov(\eta_{it+h}^e - \overline{\eta}_i^e, IR_{it} - \overline{IR}_i)}{var(IR_{it} - \overline{IR}_i)} \quad$ and $\quad b_{RP} = \frac{var(\lambda_{it+h}^e - \overline{\lambda}_i^e) + cov(\Delta s_{it+h}^e - \Delta\overline{s}_i^e, \lambda_{it+h}^e - \bar{\lambda}_i^e)}{var(IR_{it} - \overline{IR}_i)}$

The first term b_{RE} represents the covariance between the forecast errors and the interest rate differential. The Fama coefficient would be biased downward if higher interest rate differentials lead agents to expect a larger exchange rate change than the change observed ex-post in data. That is, whenever $b_{RE} > 0$. The second term b_{RP} represents a risk premium as is determined by the volatility of the expected excess return and its covariance with the expected exchange rate change. The Fama coefficient would be downward biased – $b_{RP} > 0$ – if there is a time-varying expected excess return and the volatility of the excess return is higher than the comovement between the expected excess return and the expected exchange rate change.

Table B.3 below shows the results. Column 1 reports the results for AEs and 2 for EMs. For AEs, b_{RE} term is more than an order of magnitude higher than the b_{RP}. For EMs, in contrast, the b_{RP} term is substantially larger than the b_{RE} term.

Table B.3. Decomposition of Fama Coefficient into Risk Premium and Expectational Error Components

	Advanced Economies	Emerging Markets
	(1)	(2)
	Panel A:Decomposition of Bias Fama Coefficient	
(i) β_{RE}	1.62	.106
(ii) β_{RP}	-.2202	.5198
implied β^F from (i) and (ii)	-.3998	.3742
	Panel B: Components of β_{RE} and β_{RP}	
$\text{cov}(\eta^e_{ct+h} - \bar{\eta}_c, IR_{ct} - \bar{IR}_c)$	-.04046	-.03421
$\text{var}(IR_{ct} - \bar{IR}_c)$	.02498	.3228
$\text{var}(\lambda^e_{ct+h} - \bar{\lambda}^e_c)$	.1798	.2836
$\text{cov}(\Delta s^e_{ct+h} - \Delta\bar{s}^e_c, \lambda^e_{ct+h} - \bar{\lambda}^e_c))$	-.1853	-.1158

C. Predictability of Forecast Errors

Based our narrative, for EMs, the expectations of currency risk is an ex-ante risk premium that shows up in the interest rate differential. This narrative implies that if instead of using forecast errors on the left hand side, which is the difference between realized exchange rates and expected exchange rates, we regress realized exchange rate on expected exchange rates and interest rate differentials, interest rate differentials will have no predictability power, as we have shown before.

In this appendix we do a standard forecast error regression, that is regress the difference between expected and realized exchange rates on interest rate differentials, using data on individual agents expectations, instead of average (or std deviation and high-low measures we used before). Using more than 11K observations for AE and almost 5000 for EM, we show below that forecast errors are larger in AEs and EM, though both are predictable with interest rate differentials as shown in the top Table that clusters the standard errors by forecaster and time. Interestingly when we cluster at currency-time level, as before, we find that forecast errors are not predictable with interest rate differentials both in EMs and in AEs.

Table C.1. Forecast Error Regression: Individual Forecast Data

	Advanced Economies		Emerging Markets	
	(1)	(2)	(3)	(4)
$(i_t - i_t^{US})$	-0.796*	-0.780*	-0.431**	-0.389**
	(0.438)	(0.438)	(0.178)	(0.166)
Observations	11985	11985	4908	4903
Adjusted R^2	.022	.0488	.113	.145
Number of Countries	9	9	19	19
Number of Forecasters	48	48	72	67
Country (currency) FE	Yes	Yes	Yes	Yes
Forecaster FE		Yes		Yes

Notes: * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$. Forecaster-time two-way clustered standard errors in parentheses. 29 currencies, 20 emerging markets, 9 advanced economies. Forecast errors are measured using Consensus Forecast survey.

Table C.2. Forecast Error Regression: Individual Forecast Data

	Advanced Economies		Emerging Markets	
	(1)	(2)	(3)	(4)
$(i_t - i_t^{US})$	-0.796	-0.780	-0.431	-0.389
	(0.697)	(0.732)	(0.360)	(0.327)
Observations	11985	11985	4908	4903
Adjusted R^2	.022	.0488	.113	.145
Number of Countries	9	9	19	19
Number of Forecasters	48	48	72	67
Country (currency) FE	Yes	Yes	Yes	Yes
Forecaster FE		Yes		Yes

Notes: * $p < 0.10$ ** $p < 0.05$ *** $p < 0.01$. Currency-time two-way clustered standard errors in parentheses. 29 currencies, 20 emerging markets, 9 advanced economies. Forecast errors are measured using Consensus Forecast survey.