Five Facts about the UIP Premium

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June 2024

Abstract

We document five novel facts about the UIP-wedge—the difference between expected USD return on local currency assets and the actual return on the USD assets. We show that the UIP-wedge behaves differently across emerging markets (EM) and advanced economies (AE) along several dimensions: 1) The EM-UIP wedge fluctuates but always stays positive, implying persistent currency excess returns. 2) Global and local risk factors together can explain 45% of the time-variation in the EM-UIP wedge. 3) The interest rate differentials explain 70% of the time-variation in the EM-UIP wedge. 4) Survey expectations and ex-post exchange rate changes deliver similar EM-UIP wedges in the data as foreign investors expect EM currencies to depreciate most of the time, pricing-in an ex-ante risk premium to hold these currencies. 5) The EM-UIP wedge comoves negatively with capital inflows. Although facts (1) to (3) are consistent with several class of models, facts (4) and (5) are harder to explain with existing models, as interest rate differentials reflect endogenous ex-ante pricing of country-specific risks and can explain a large part of the correlation between capital flows and the EM-UIP wedge.

JEL: F21, F32, F41.

Keywords: Excess currency returns, risk premia, expectations, policy credibility.

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

1. Introduction

A central concept in international macroeconomics and finance is the Uncovered Interest Parity (UIP) condition that equates expected returns to assets denominated in different currencies. Yet, starting with the seminal works of Hansen and Hodrick (1980) and Fama (1984), a long literature has shown that this prediction fails in the data, and that high interest rate currencies tend to appreciate –instead of depreciate as implied by the theory–, paying excess returns. We show that this does not happen in emerging markets (EM), in the sense that, high interest rate EM currencies do depreciate but there is still an EM-UIP-wedge that captures excess returns (expected and realized) in spite of the depreciated currency. This EM-UIP-wedge behaves quite differently than advanced economies' (AE) UIP-wedge.

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 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.[1] 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 in logs and can be defined as:

$$\lambda^e_{t+h} = i_t - (s^e_{t+h} - s_t) - i^{US}_t, \tag{1}$$

which can be re-written as:

$$\lambda^e_{t+h} = \underbrace{(i_t - i^{US}_t)}_{\text{IR Differential}} - \underbrace{(s^e_{t+h} - s_t)}_{\text{ER Adjustment}}, \tag{2}$$

[1]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"*.

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. 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 5 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.[2]

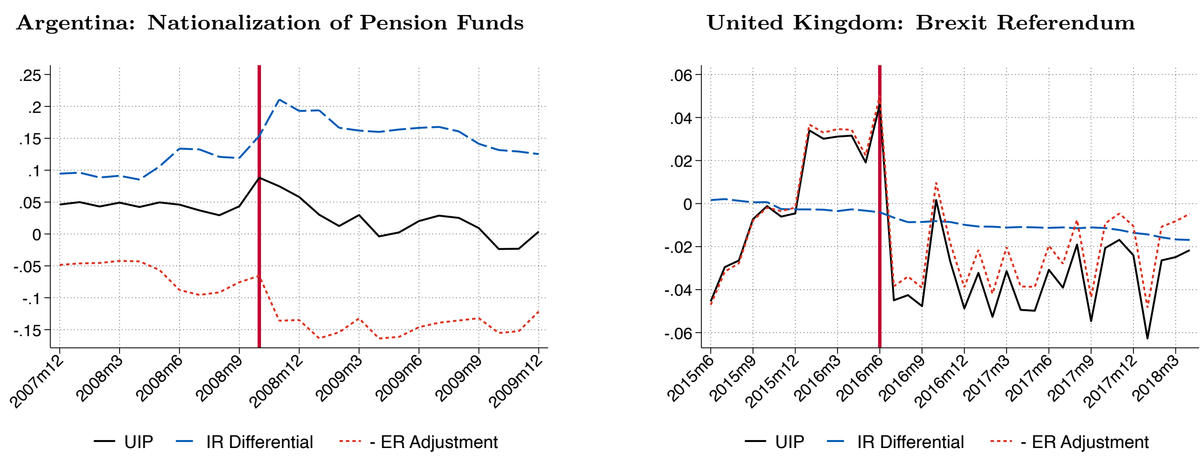


Figure 1. UIP Premium Decomposition

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, though at a rate 3 times that of the U.K. in Argentina that is also more persistent. This means that the UIP premium goes down slowly in Argentina, compared to the U.K., given the

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

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 is 3.3 percentage points higher in EMs than AEs, which is of similar magnitude with the risk premium observed using ex-post realizations of exchange rates in previous studies (e.g. Gilmore and Hayashi (2011) for EMs and Lustig and Verdelhan (2007) for AE). 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 also explain both ex-ante forecasts and ex-post realizations of the exchange rates, though with a much higher explanatory power for the forecasts. These properties differ for advanced economies, as documented by a large literature.[3]

Second, global and local risk factors explain more than 45% of the time-variation in the EM-UIP-wedge. 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 Verdelhan (2011)). 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% and that of Brazil is 18%. Interestingly, local risk factors have no role in driving the AE-UIP-wedge.

Third, 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), 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

[3]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). Both in AEs and EMs, there are systematic forecast errors, though these errors are much larger in AEs.

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 in equation (1) 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, 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 our fact four. 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 forecasts, 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. As a result, our fact four shows that the interest rate differential is endogenous to expected currency risk in EMs. In contrast, while local risk affects only marginally the dispersion in exchange rate forecasts in AEs' currencies, it does not show up in the interest rate differentials.

Fifth, the EM-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. Interestingly, capital outflows by domestic investors is correlated in a similar manner with realized excess returns.

Overall, the facts we showed in this paper imply that EM-UIP-wedge relates to a risk premium compensating foreign investors for additional country-specific time-varying risks stemming from investing in EMs on top of the common global risk factors that affect global financial intermediation. Such local risks priced-in the UIP-wedge also correlate with actual investment of foreigners as movements in capital flows. These 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.[4] Similarly, our results indicate that EM-UIP-wedge is due to a risk premium rather than being due to expectational errors, as this wedge is systematically related to those variables on which risk premiums are thought to depend on, such as volatility of the U.S. stock market (VIX) and country-specific policy

[4]See among others Isaard (1983, 1984), Friedman and Kuttner (1992), Bryant (1995), Chinn and Frankel (1994).

uncertainty. Our regressions show the importance of measuring the heterogeneity of expectations across EM and AE assets for UIP based theories of exchange rates, and highlight that expectations are endogenous to asset riskiness. As EM investors expect EM currencies to depreciate most of the time, they demand higher interest rates to hold them. As a result, 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 local risks can pin down the ex-ante interest rates and hence ex-ante excess returns.

Related Literature

Our paper is related to several large literatures. First and foremost, the theoretical UIP literature that starts from frictionless trade in currencies, shows that 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. A strand of this literature highlights the importance of global risk factors and shows that currencies that depreciate in bad states of the world pay a risk premium (e.g. Lustig and Verdelhan (2007), Backus, Foresi and Telmer (2001), Lustig, Roussanov and Verdelhan (2011), Hassan and Mano (2019)). Another strand of this theory literature shows that excess returns can be a compensation for bearing currency-idiosyncratic risk under imperfect/segmented capital markets, where such currency risk cannot be diversified away (e.g Alvarez, Atkeson and Kehoe (2009)). Similarly, Gabaix and Maggiori (2015), Itskhoki and Mukhin (2021), Itskhoki and Mukhin (2023) highlight the role of global financial intermediaries in segmented markets with limits to arbitrage, and in the case of the latter papers, show that a country's monetary regime is crucial to explain currency risk and the dynamics of the exchange rate. Relying on local and global financial frictions, both Akinci and Queralto (2024) and Jiang, Krishnamurthy and Lustig (2023) show that idiosyncratic risk factors can create excess returns in currency markets.

The key to this theoretical literature 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, even if aggregate consumption is constant.

Our paper's contribution to this literature is to provide evidence consistent with this key theoretical mechanism that links the nominal exchange rate fluctuations to risk premia. For such a link nominal factors, such as policy changes should affect pricing of the asset. We provide evidence for this by connecting future interest rate uncertainty to expected returns (UIP premia) through investors' pricing of currency risk based on global and local risk factors.

Although endogenous pricing of risk has been widely employed to model financial frictions in the international finance literature (Salomao and Varela (2022); Akinci, Kalemli-Özcan and Queralto (2022)) and sovereign debt literature (Arellano (2008); Aguiar and Amador (2023)), it has not been applied to short-term pricing of currency risk in theoretical models with few exceptions such as Alvarez, Atkeson and Kehoe (2009). Empirically, endogenous pricing of currency risk via the UIP-wedge has been related to international spillovers of the U.S. monetary policy in Kalemli-Özcan (2019).

Our second contribution is to the policy uncertainty literature as we show the detrimental effect of policy uncertainty on real outcomes through capital flows and foreign investors' pricing of currency risk. Since the pioneering work of Baker, Bloom and Davis (2016), who show that economic policy uncertainty reduces investment and output in the U.S., this literature mainly focused on closed economies, mostly the U.S., and research has shown that policy uncertainty leads to inefficiencies through market pricing. 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. Focusing on inflation policy uncertainty, Du, Pflueger and Schreger (2020) show that lack of government commitment and risk averse lenders can encourage foreign currency borrowing by sovereigns. 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.[5] We contribute methodologically to this literature by connecting the standard survey based measures of policy credibility based on institutional strength (e.g. transparency, expropriation risk), with a news-based measure. We hand-collect new data from each country's own newspapers together with global English newspapers following the seminal work of Baker, Bloom and Davis (2016). Our measure covers –but it is not limited to– uncertainty around monetary policy, taxation, fiscal deficit, central bank independence, labor regulations, competition law, capital controls, nationalization, corruption, etc.

Given our focus on the dynamics of the UIP-wedges instead of cross-section of currency returns, our third contribution is to overshooting literature (e.g. Dornbusch (1976), Eichenbaum and Evans (1995)), as we document the underlying determinants of time-varying country-specific risk premium. This literature shows that exchange rate overshoots its equi-

[5]Our findings might be confused with the classical "peso problem" but they are quite different. The peso problem is about the credibility of a fixed exchange regime. For example, during 1970s, investors expected a depreciation of Mexican peso that did not materialize and, hence, created a gap between the U.S. and the Mexican interest rates. Our results are 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.

librium 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. They go back to original level very slowly, given the persistence in exchange rate expectations underlined by persistent policy uncertainty.

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 forecasts data comes from 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 Forecast conducts a monthly survey about expectations on future exchange rates at 1, 3, 12 and 24 months horizons of major participants in the foreign exchange rate market. Appendix A.2 discusses thoroughly the details of this dataset. The coverage is extensive and includes 55 forecasters on average for AEs' currencies. Some currencies –as the Euro, Japanese Yen and UK Pound– include more than a hundred of forecasters in several periods. Albeit with a lower number of forecasters, the survey is also comprehensive in EMs and includes on average 17 forecasters per currency. The forecasters interviewed are typically global banks and investors that actively participate in the FX market. Notably, these global agents are present in both AEs and EMs and, hence, provide together their forecasts for both sets of economies.

Having the same set of agents surveyed for both set of economies is important because it implies that different results between AEs and EMs should not arise from heterogeneity in the type of forecasters among these economies. To provide an example of the forecasters surveyed, in September 2012, for the Japanese Yen (96 forecasters) these included: Goldman Sachs, HSBC, JP Morgan, Citigroup, Bank of Tokio Mitsubishi, IHS Global Insight, General Motors, ING Financial Markets, Barclays Capital, and Morgan Stanley. These ten forecasters were also surveyed for the Euro and the UK pound, which included a total of 103 and 81 forecasters that month. Forecasters of EM currencies also included these group of global banks. For example, the main forecasters of the Korean Won (22 forecasters) were: Goldman Sachs, HSBC, JP Morgan, Citigroup, Bank of Tokio Mitsubishi, IHS Global Insight, General Motors, ING Financial Markets. Similarly, the Turkish Lira (28 forecasters) included the same list of forecasters. Other EM currencies (as the Argentinean Peso, Brazilian Real, Chilean Peso, Colombian Peso, Hungarian Forint, Indian Rupee, Malaysian Ringgit, Mexican Peso, Polish Zloty and Russian Rouble) also included these forecasters, as well as other global investors like Barclays Capital, BNP, ABN Amro, Allianz, Royal Bank of Canada, UBS and Royal Bank of Scotland.

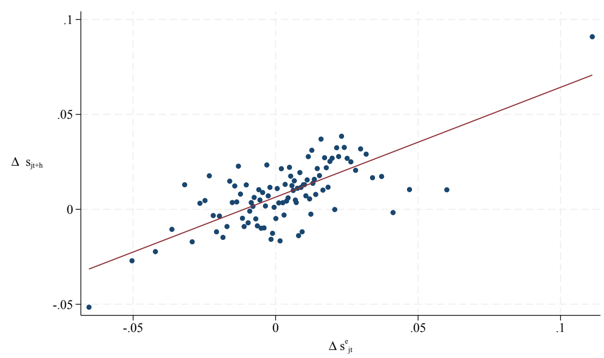


Figure 2. Emerging Markets

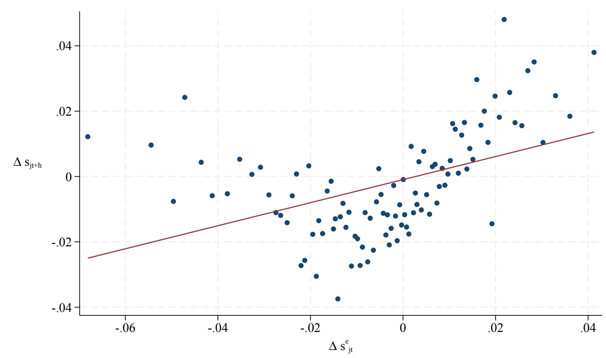


Figure 3. Advanced Economies

Note: Slope 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 horizontal axis denotes the ER term, while the vertical axis denotes the 12 month change in spot exchange rate. The slope for EM is 0.57*** and for is AE: 0.35***.

As shown in Figures 2 and 3, these forecasts (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), Obstfeld and Zhou (2023). 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 with the exception of LIBOR, which is 1-month by construction.

We start by defining the Covered Interest Parity (CIP) (hedged currency return). The CIP deviation at time t for a given country relative the U.S. at horizon h, λ_{t+h}^{CIP}, is

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

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 i at time t be $Convenience\ Yield_{it} = i_{i,t}^{L} - i_t^{US,L} - (f_{i,t+1} - s_{i,t})$, where $i_{i,t}^{L}$ is the LIBOR rate in country i, $i_t^{US,L}$ is the LIBOR rate in the U.S., $f_{i,t+h}$ is the (log) forward exchange rate and $s_{i,t}$ is the spot exchange rate (1-month maturity). Both exchange rates are in units of home currency per U.S. dollar. Hence, the convenience yield is LIBOR-based CIP, also known as cross-currency basis (e.g Du, Im and Schreger (2018), Du, Tepper and Verdelhan (2018)).

Since U.S. convenience yield is always regarded as a global factor, we follow the literature and average these convenience yields across G10 countries.[6] Hence, the convenience yield for

[6]The G10 countries we consider are Australia, Canada, Germany, Japan, New Zealand, Norway, Sweden,

the U.S. dollar is $Convenience\,Yield_t = \sum_{i\in G10} Convenience\,Yield_{it}/9$. 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 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, $Liquidity\ Premium_{it} = i^L_{i,t} - i^G_{i,t} - (i^{US,L}_t - i^{US,G}_t)$, where $i^G_{i,t}$ and $i^{US,G}_t$ are interest rates on government bonds in the home country and the 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: $Liquidity\ Premium_t = \sum_{i\in G10} Liquidity\ Premium_{it}/9$.

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 Policy Uncertainty

We have two sets of variables to measure policy uncertainty. A news-based variable, and several survey based variables. 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 four new words to capture additional policy uncertainty characteristic of emerging markers (i.e. capital controls, expropriation, nationalization and corruption). Because we are interested in the perspective of all investors,

Switzerland, and United Kingdom.

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 policy risk premium (PRP) index for each currency and month as follows, $PRP_{it} = X_{it}/\frac{1}{12}\sum_{j=1}^{12} Y_{t-j}$, where X_{it} is the number of articles referring to episodes in country i at month t, $Y_t = \sum_i Y_{it}$ is the total number of articles written at month t (i.e. the sum of articles across countries), and Y_{it} is total number of articles referring to country i at month t. We then normalize the index to 100 by estimating $PRP_{it}^N = \frac{PRP_{it}}{\overline{PRP}_i} \times 100$, where $\overline{PRP}_i = \frac{1}{T}\sum_{t=1}^{T} PRP_{it}$ is the average of news for each country across time. Appendix A.3 reports a detailed description of the methodology to create this index.[7]

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. In fact, we need both as to shape the foreign investors perceptions and to affect their stochastic discount factor.

For the survey based variables, we use the indicators from International Country Risk Guide (ICRG), which reports detailed information of the components of policy risk for each country over time. Political risk contributes 50% to the composite policy risk index, and financial and economic risks contribute to the remaining 50%. It is important to use different measures for financial risks, that will be more related to global risk factors such as the VIX and other local economic and policy risks, that will be more related to EMs own business cycles, which are important for foreign investors.

To pin down the main elements entailing policy risk, we focus on two key elements of the political risk component that capture investors' sentiments: *government policy risk* and *confidence risk*. 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

[7]Our methodology to construct the index follows Barrett, Appendino, Nguyen and de Leon Miranda (2020) 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 (2020) methodology adds the total number of articles in a country and pools all the newspapers together for each country.

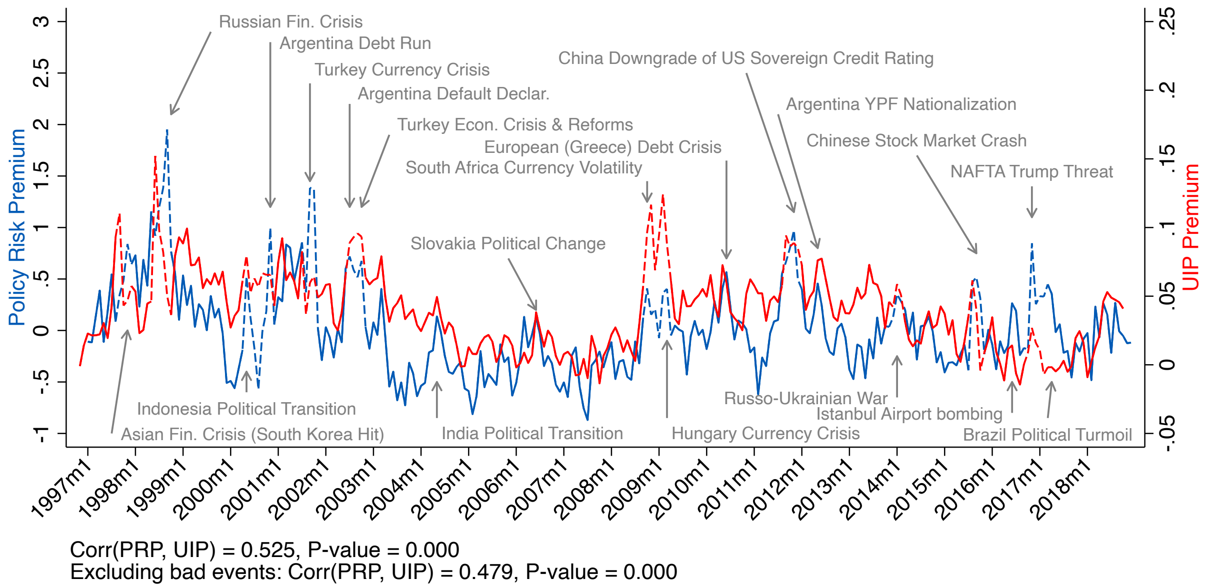


Figure 4. Policy Risk Premium and UIP Premium For Emerging Markets, 1997–2018

example, Azzimonti and Mitra (2023) relate government accountability with a country's default probability.[8] In addition, we have separately investigated the role of monetary policy uncertainty by studying inflation forecast errors.

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 global variables in the last

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

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.

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 patterns are similar for EMs, but for AEs, even though UIP holds on average, this is not true for realized excess returns, a well-known fact in the literature. The correlation between the UIP-wedge and realized UIP (or excess returns) is 20 percent in both set of countries and significant.

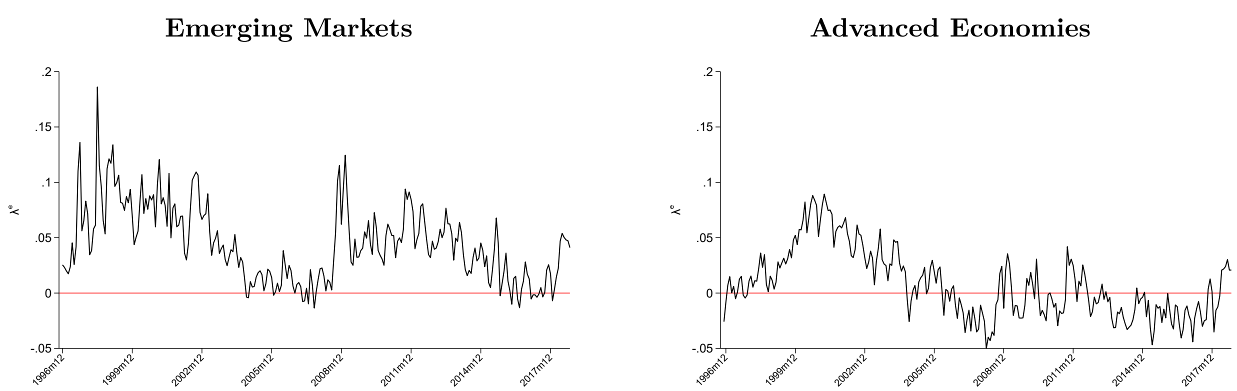


Figure 5. UIP Premium

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

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 particular, we estimate:

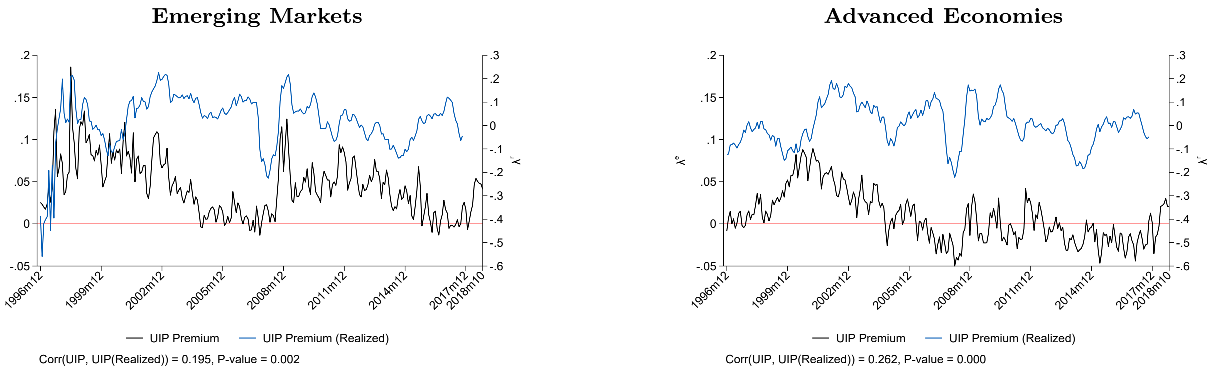


Figure 6. UIP Premium: Expected vs Realized Exchange Rates

Note: This figure shows the UIP premium at 12 month horizon for 33 currencies –21 EMs and 12 AEs– over 1996m11:2018m10, together with realized excess returns (carry trade profits). The UIP premium is measured using deposit and money market interest rates from Bloomberg and expectations of exchange rates from Consensus Forecast, whereas realized excess returns use ex-post exchange rate with the same interest rates.

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

where s^e_{it+h} is the expected exchange rate for country i 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, that is a Fama regression as in:

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

$\beta^F < 1$ implies that there are ex-post excess returns since actual depreciation does not offset the interest rate differentials. These 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.[9]

To visualize our results, we plot in Figure 7, the fitted line for the expected (left) and realized (right) rate of depreciation on the interest rate differentials in EMs. The figure

[9]In Appendix C.1, we present the results for advanced economies which mimics the findings in the literature. 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), Bacchetta, Mertens and van Wincoop (2009), Stavrakeva and Tang (2018), Bussiere, Chinn, Ferrara and Heipertz (2022), and Candian and De Leo (2023)).

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***
	(0.073)	(0.073)	(0.115)	(0.115)
p-value ($H_0 : \beta^F = 1$)	0.0000		0.0000	
Observations	3577	3577	3577	3577
Number of Countries	22	22	22	22
R^2	0.2749	0.3076	0.0255	0.0682
Currency FE	Yes	Yes	Yes	Yes

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.

shows no difference in slopes, 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).

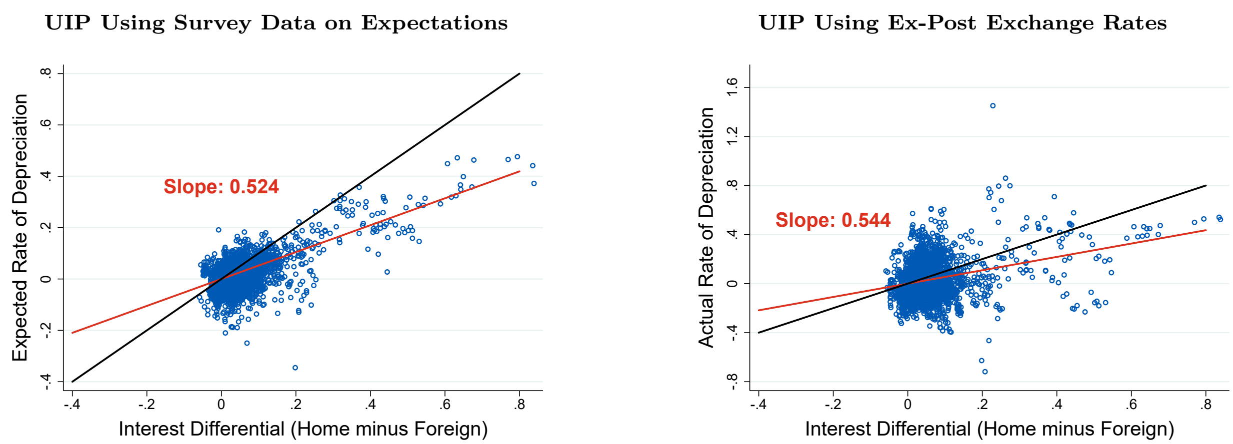


Figure 7. UIP with Realized and Expected Exchange Rates in Emerging Markets

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

The third surprising finding, which follows from the first two, is that the amount of excess returns are similar to expected excess returns and predictable:

$$\lambda^e_{it+h} = \beta_1(i_{it} - i^{US}_t) + \mu_i + \varepsilon_{1it+h}, \tag{6}$$

$$\lambda_{it+h} = \beta_2(i_{it} - i^{US}_t) + \mu_i + \varepsilon_{1it+h}, \tag{7}$$

where λ^e_{it+h} denotes "expected" excess returns (UIP premium), whereas λ_{it+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. As in columns (1) and (3) for the coefficients of the Fama regression estimated with realized and survey data being close to each other (depicted in Figure 7), columns (2) and (4) show that interest rate differentials can predict actual realized excess returns and also expected excess returns.

3.2. The UIP Premium, Global and Local Risk Factors

Fact 2: *Global and local time-varying risk premia explain more than 45% of the time-variation in the UIP premium of emerging markets.*

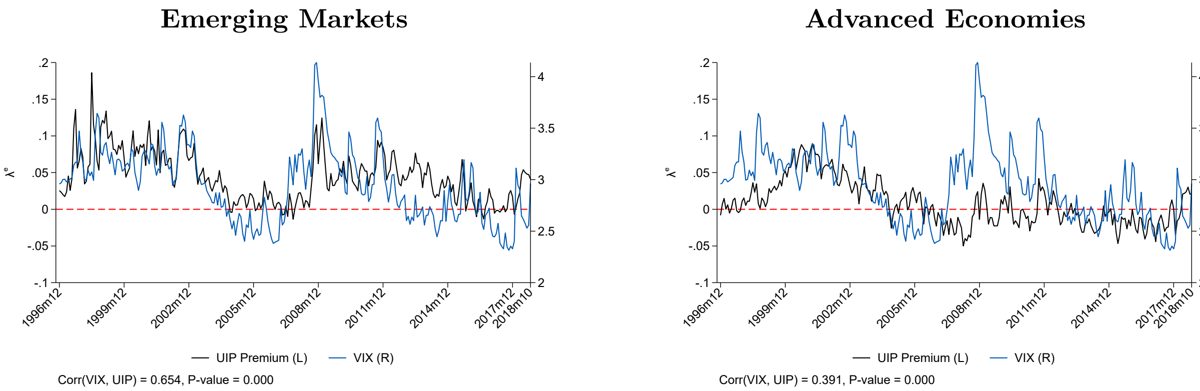
As shown in Figure 8, the UIP-wedge in EMs is highly correlated with VIX (global risk factor) and PRP (local risk factor) and these are statistically significant correlations. VIX is correlated over 60% with the EM-UIP wedge and 40% with the AE-UIP wedge. For the local policy risk premium, there is also 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.

3.2.1. Determinants of the UIP Premium in EMs

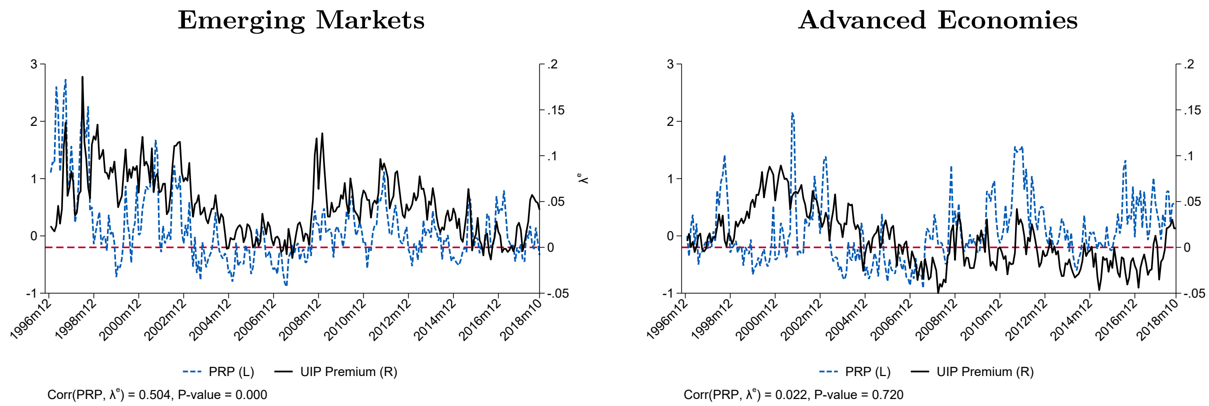
To assess the drivers of the UIP-wedge, we follow Obstfeld and Zhou (2023) and break it down into two main components:

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

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. 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 asset arising from the U.S. dollar's unique position as the reserve currency in the world economy (Krishnamurthy and Lustig (2019), and Jiang, Krishnamurthy and Lustig (2021)). The second force, $\gamma^{\text{US, GOV}}_t$, 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 (Du, Im and Schreger (2018), Engel and Wu (2023), and Bianchi, Bigio and Engel (2021)).



a) UIP Premium and VIX



b) UIP Premium and Policy Risk Premium

Figure 8. Global and Local Risk Premia and the UIP Premium

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

$\tilde{\rho}_t$ 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 (2023) 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 will be the fact that international investors price EM assets differently. Using data on EMs, we can disentangle country-idiosyncratic risks and global risks and begin to understand why the entire expected excess return may not be driven by global risks even though global investors are pricing both 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. Country risk is endogenous to PRP. The policies under PRP are broad and can cover a wide range of measures from capital controls to sovereign default and expropriation risk. Note that ρ_t^{Global} can also be endogenous to PRP if investors are risk averse towards only certain countries assets, not wanting to absorb particular assets.

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

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

To estimate equation (13), we follow the existing literature and proxy γ_t^{US}, convenience yield, with USD basis, as explained in the data section. $\gamma_t^{US,GOV}$ 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 (2023), γ_t^{US} and $\gamma_t^{US,GOV}$ can be highly correlated and, hence, be difficult to disentangle one from another. In fact, these authors show that when both variables are included together only γ_t^{US} is significant in the short and medium terms, which is our focus.[10] Given this insignificance of $\gamma_t^{US,GOV}$ in the short term, we combine the two and focus on the sum of these variables as described above.

To capture, ρ_t^{Global} 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_t^{PRP} 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.[11]

We start by taking our key equation and estimate it in a linear-regression as follows:

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

where i is currency/country, t is month, Y_{it} is the UIP premium, the interest rate differential term or the exchange rate adjustment term, i.e. $Y_{it} = \{\lambda^e_{it+h}, \text{IR Diff}_{it}, \text{ER Adj}_{it+h}\}$, and the independent variables are lagged one month. μ_i are currency fixed effects that allow assessing the UIP condition 'within' currencies/countries across time. We double cluster the standard errors across at month and country/currency level. We present the results for

[10] Obstfeld and Zhou (2023) find that $\gamma_t^{US,GOV}$ is only significant for 10 year treasury bonds.

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

the EM-UIP-wedge but also for carry trade profits (actual excess returns). We also call the latter realized UIP premium.[12]

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.

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

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

Table 3. UIP Premium in Emerging Markets

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

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

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

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.

3.2.2. Comparison with AEs

For comparison, we also present the results for advanced countries in Panel B of Table 3 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.

These results represent a generalized version of the difference between Argentina and the U.K. cases that we have presented before. Global risk factors are the only ones that matter for the AE-UIP-wedge, picked up by the ER term for the UIP-wedge, whereas for the EM-UIP-wedge both global and local risk factors matter, giving a key role for the IR term in the UIP-wedge decomposition. What can explain these diverging results?

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).

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

Going back to EM results, we ask, is 17 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 4, 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 3. 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.

Table 4. R^2 for Heterogeneity in Global Risk Loadings and Country-Specific Risk in EMs

	UIP Premium			
	(1)	(2)	(3)	(4)
Adjusted R^2	0.1701	0.3836	0.3912	0.4214
Inflows/GDP$_{it-1}$	Yes	Yes	Yes	Yes
Convenience Yield/Liquidity Premium$_{t-1}$	Yes	Yes	Yes	Yes
$\log(VIX_{t-1})$	Yes	Yes	Yes	Yes
PRP_{it-1}	Yes	Yes	Yes	Yes
$\log(VIX_{t-1}) \times$ country dummy		Yes		Yes
$PRP_{it-1} \times$ country dummy			Yes	Yes

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

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 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.

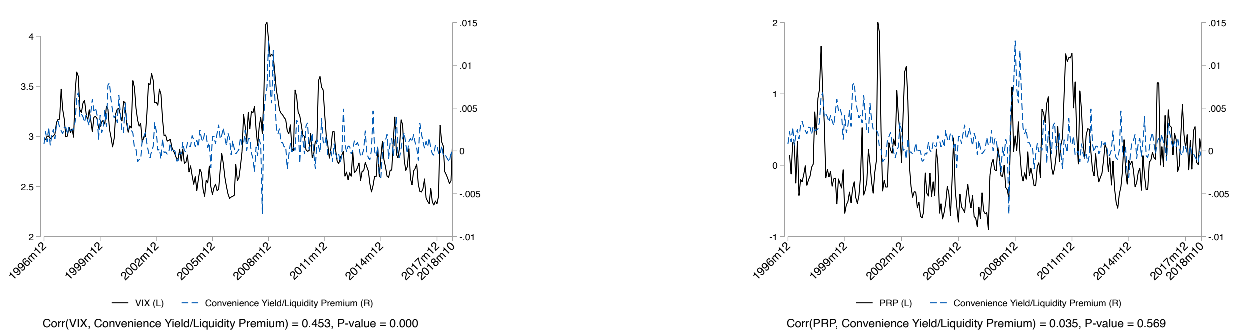


Figure 9. Global and Local Risk Factors and "Convenience/liquidity premium of the USD"

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 illustrate this fact, we present the generalized version of the UIP decomposition that we did for the specific cases of Argentina and the UK before. Figure 10 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. As we show in the robustness section, high inflation in EMs (and hence the inflation differentials) cannot explain the high correlation between the UIP and interest rate differentials.

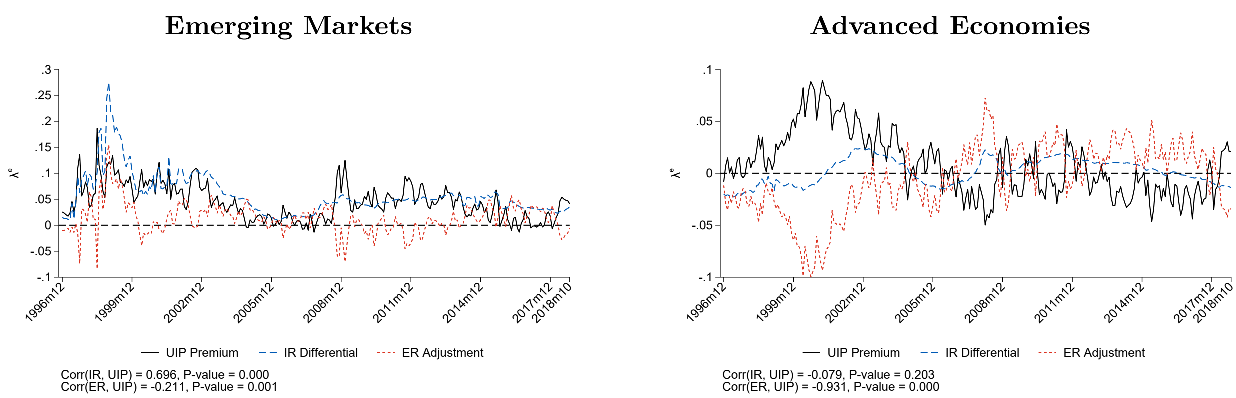


Figure 10. Interest Rate Differential and Exchange Rate Adjustment in AEs and EMs

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

We re-estimate our key equation using the two components of the UIP premium –interest rate differential and exchange rate adjustment– as dependent variables. Table 5 presents the results. For expositional simplicity, column 1 reproduces our result on the UIP premium of column 4 in Table 3. 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.

Table 5. UIP Premium in EMs: Decomposition and Robustness with Interest Rates

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

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

A natural question to ask is whether this is specific of deposit rates or a general characteristic of EMs. To assess this, we re-estimate our equations using government bond rates and money market rates. Results presented in columns 4-9 of Table 5 confirm our previous findings. 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.

The figure below shows that the distributions of UIP, IR and ER are consistent with this narrative. 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).

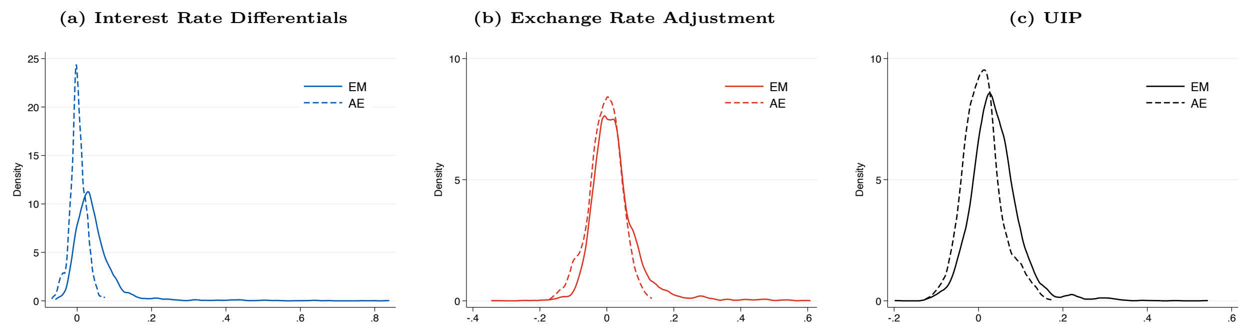


Figure 11. IR Differential, ER Adjustment, and UIP Distribution

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

3.4. Expectations Channel

***Fact 4**: 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 links to exchange rate volatility. The first one is the standard deviation of the exchange rate forecasts. The second measure is the difference between lowest and highest value for expected exchange rate. We kept the horizon constant at 12-months for both of these measures. Both measures capture the disagreement among foreign investors' in terms of their expectations. As shown before in terms of high predictive power of expectations for realized exchange rates for EMs, these measures also link well with the volatility of the nominal exchange rate, as they are correlated over 96 percent with the volatility of the nominal exchange rate.

Once we have these measures, we run a two-stage IV regressions as shown below. In the first stage, we regress the newly constructed measures of volatility in exchange rate expectations on the main global risk factor (VIX) local and 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-specific currency risk. In the second stage, we regress interest rate differentials on both of these measures of exchange rate expectations volatility 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 6. Expectations Channel in Emerging Markets

	Second Stage: Interest Rate Differential					
	(1)	(2)	(3)	(4)	(5)	(6)
$s^e_{ihigh,t+1} - s^e_{ilow,t+1}$	0.141*	0.075***	0.101***			
	(0.077)	(0.015)	(0.029)			
Std Dev s^e_{it+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
N	3279	3279	3279	2155	2155	2155
	First stage: Dispersion in ER Expectations					
	$s^e_{ihigh,t+1} - s^e_{ilow,t+1}$			Std Dev s^e_{it+1}		
$\log(VIX_{t-1})$	0.267***		0.205**	0.215**		0.170*
	(0.080)		(0.084)	(0.096)		(0.094)
PRP_{it-1}		0.119***	0.101***		0.136***	0.124***
		(0.024)	(0.028)		(0.028)	(0.031)
Cragg-Donald Wald F statistic	137.75	197.70	141.16	58.72	120.99	80.29
Kleibergen-Paap Wald rk F statistic	11.06	24.46	20.89	5.01	23.57	10.71

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

Before moving to our last fact that will connect the UIP-wedge to capital flows, we want to discuss briefly the implications of our facts 3 and 4 that is the power of interest rate differentials in explaining the EM-UIP-wedge and investors' expectations being captured by those interest rate differentials, from the lens of the vast literature on exchange rate predictability.

3.4.1. Exchange Rate Predictability in EM: The Role of Expectations

Recall that we have already shown results on excess return predictability. To connect these results to a large literature on exchange rate predictability and disconnect (e.g. Lewis (1995), Obstfeld and Rogoff (2001)) 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: $s^e_{it+h} - s_{it}$ (red line), $s_{it+h} - s_{it}$ (grey line). The correlation between the fitted values and $s^e_{it+h} - s_{it}$ is 0.55 and with $s_{it+h} - s_{it}$ 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

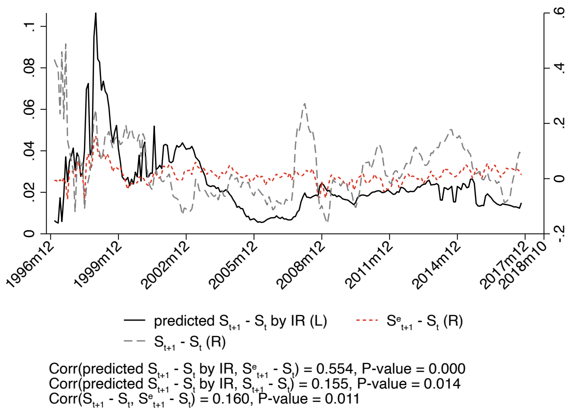
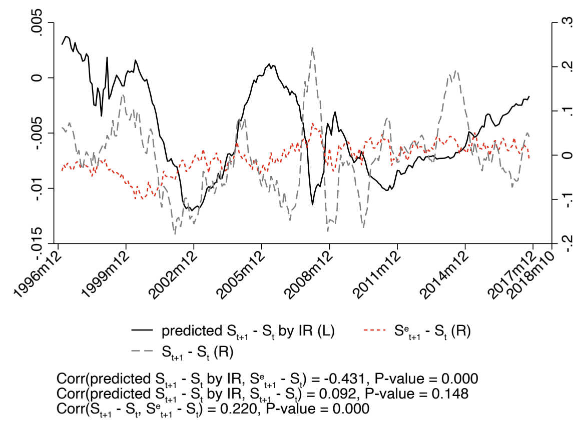


Figure 13. Advanced Economics



There are few interesting facts to notice here that are consistent with our results above. 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 in currency i, conditional on lagged values, that is we estimate:

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

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_i).

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), and Bacchetta and van Wincoop (2010) among others). 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.

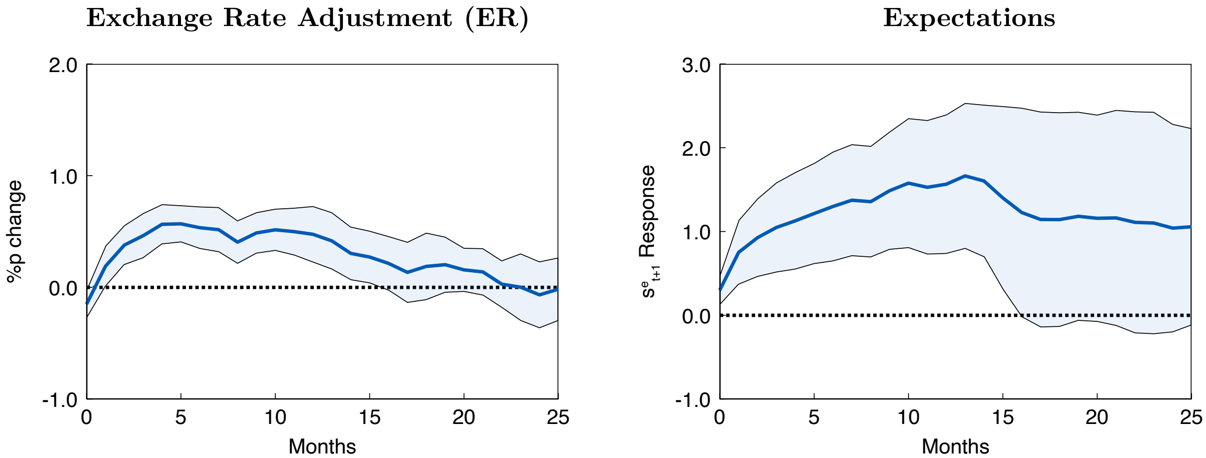


Figure 14. Emerging Markets: Response of ER and Expectations to an IR Shock

Note: The shaded area shows 95 percent confidence intervals, calculated 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 7, where we regress realized exchange rate changes $(s_{it+h} - s_{it})$ on survey exchange rate changes $(s^e_{it+h} - s_{it})$ 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 are marginally significant even after including survey forecasts, which indicates that some information in the interest rate differentials helps predicting AEs exchange rates in addition to what is explained by the expectations. Yet their joint within R^2 is only 4%.[13]

[13]The result on expectations predicting exchange rates in AE is in line with Kremens, Martin and Varela (2023), who study exchange rate expectations in surveys of financial professionals and find that they successfully forecast currency appreciation at the two-year horizon, both in and out of sample.

Lastly, note that the exchange rate expectations become non-significant to explain realized changes 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 in exchange rate expectations in AE currencies, but in EM both local and global risk factors play a role in exchange rate expectations.

Table 7. 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
		(0.151)	(0.109)		(0.151)	(0.086)
Log Interest Differential	0.374***	0.134	-0.039	-0.399	-1.001**	0.188
	(0.115)	(0.138)	(0.118)	(0.361)	(0.465)	(0.254)
Obs.	3577	3577	3571	2285	2285	2285
R^2 within	0.0255	0.0532	0.0578	0.0034	0.0411	0.0058
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.

3.5. UIP and Capital Flows

***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. That is when foreigners take their money out, they demand higher interest rates passing through as a higher UIP-wedge in EMs.*

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.

Table 8. UIP Premium in Emerging Markets

	Emerging Markets							
	(i) UIP Premium				(ii) Realized UIP Premium			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Outflows/GDP$_{it-1}$	-0.002	-0.002*	0.000	-0.000	-0.011***	-0.011***	-0.010***	-0.010***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Convenience Yield/Liquidity Premium$_{t-1}$		3.599***	-0.092	-0.015		7.331**	5.140	5.283
		(1.308)	(1.087)	(1.053)		(3.300)	(3.957)	(3.862)
$\log(VIX_{t-1})$			0.058***	0.054***			0.034	0.027
			(0.009)	(0.009)			(0.025)	(0.025)
EPU_{it-1}				0.007**				0.013*
				(0.003)				(0.007)
Obs.	3004	3004	3004	3004	3004	3004	3004	3004
Number of Countries	19	19	19	19	19	19	19	19
R^2	0.0003	0.0235	0.1507	0.1665	0.0011	0.0170	0.0245	0.0334
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

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

4. Robustness Analysis

4.1. 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.[14]

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.

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

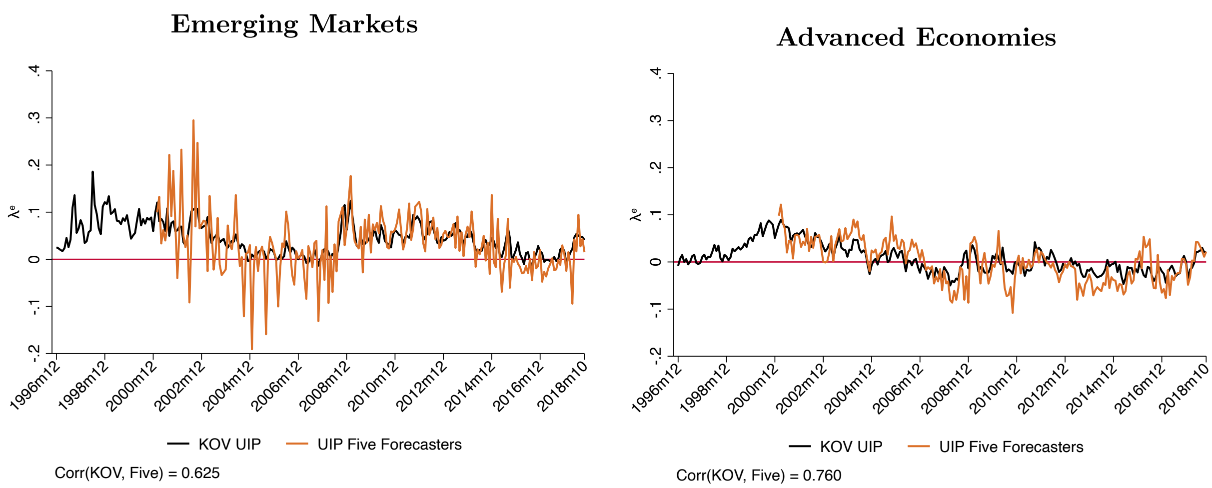


Figure 15. Five Key Forecasters vs Average Forecast: UIP

Note: This figure shows the average UIP premium of all investors (KOV) and the average UIP premium of five major ones. UIP-wedges are measured using Consensus Forecast.

4.2. Monetary Policy Uncertainty and Sovereign Default

In addition to news-based general policy uncertainty we also add a measure of monetary policy uncertainty in EMs. We use the deviations of inflation expectations in a given country from the inflation expectations in the U.S., a country where expectations are in general well anchored. Since limited commitment to inflation and high default risk is tightly linked in EMs, we also control for default risk. It is worth noting that both EMBI and CDS only capture default risk on foreign currency bonds of government and, hence, both are limited measures of broad credit risk as they do not capture the credit risks related to local currency borrowing of both corporate and governments, which are essential for the UIP-wedge.

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

These results are not surprising given the low dynamic correlation between CDS spreads and policy risk premium (PRP) as shown in Figure 16.

4.3. Can High Inflation Explain the Results?

A potential concern of the analysis is that high interest rate currencies might correlate with high inflation rates and, thus, the UIP premium observed in nominal term might vanished in real terms. To assess this, we re-estimate our panel regressions and add inflation differentials

Table 9. UIP Premium: Panel Regressions: Controlling for Sovereign Default Risk

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

Notes: Two-way currency-time clustered standard errors in parenthesis. *,** ,*** denotes statistical significance at the 10, 5, and 1 percent respectively. Column 1 removes countries in which the sovereign defaulted since WWII. The UIP premium and the exchange rate adjustment term are measured using expected exchange rate changes from Consensus Forecast. Inflows/GDP$_{it-1}$ are capital inflows into the country as a fraction of GDP. VIX is a proxy for global risk perception. Convenience yield/Liquidity Premium is the sum of USD convenience yield and its liquidity premium averaged across G10 countries. PRP_{it} is the policy risk premium related to economic policy uncertainty. Expected inflation differential is the difference between expected inflation 1 year ahead in the home economy relative to the US. No Sovereign Default counts the months that a given country is in full or partial default.

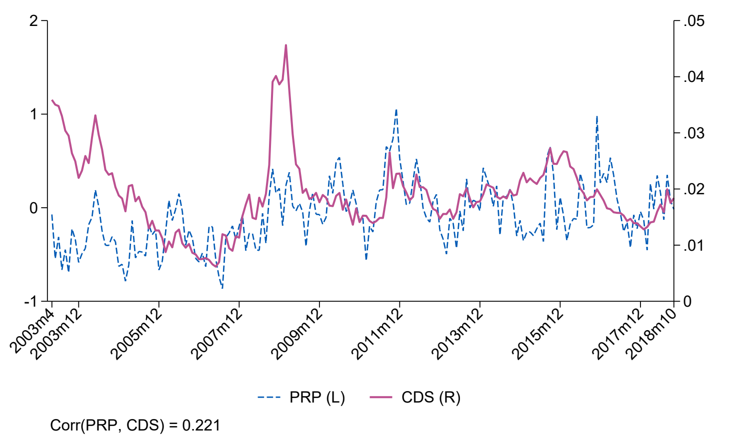


Figure 16. Policy Risk Premium and Default Risk in Emerging Markets

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

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 10. Inflation Differential

	Emerging Markets		
	(1) UIP Premium	(2) IR Diff.	(3) ER Adj.
Inflows/GDP$_{it-1}$	-0.001	-0.002**	-0.001
	(0.001)	(0.001)	(0.001)
$\log(VIX_{t-1})$	0.048***	0.028***	-0.020***
	(0.007)	(0.007)	(0.007)
Convenience Yield/Liquidity Premium$_{t-1}$	-0.126	-0.352	-0.226
	(0.962)	(0.998)	(1.073)
PRP_{it-1}	0.009***	0.005***	-0.004
	(0.003)	(0.002)	(0.003)
Inflation Differential$_{it-1}$	1.840***	2.517	0.677
	(0.445)	(1.550)	(1.183)
Obs.	3203	3203	3203
Number of Countries	20	20	20
R^2	0.2363	0.1503	0.0328
Currency FE	Yes	Yes	Yes

Notes: * p < 0.10 ** p < 0.05 *** p < 0.01. Currency-time two-way clustered standard errors in parentheses. The UIP premium is measured using Consensus Forecast. Inflows/GDP$_{it-1}$ are capital inflows into the country as a fraction of GDP. VIX is a proxy for global risk perception. Convenience yield/Liquidity Premium is the sum of USD convenience yield and its liquidity premium averaged across G10 countries. PRP_{it} is the economic policy uncertainty index. Inflation differential are the difference between inflation in the home economy relative to the U.S.

4.4. Can CIP Deviations Explain the Results?

An influential recent literature, mostly focusing on advanced countries, documented a link between country-specific CIP deviations, financial or regulatory frictions and USD exchange rates (e.g Du, Tepper and Verdelhan (2018), Jiang, Krishnamurthy and Lustig (2021) and Avdjiev, Du, Koch and Shin (2019)). Thus, we check if our results can be driven by such CIP deviations. Following this literature, we plot CIP deviations together with our UIP-wedges in Figure 17.[15] These figures show that UIP and CIP deviations have low and insignificant correlation with each other, both in EMs and AEs. It is also interesting to note that CIP deviations in EMs are 10 times larger than the ones in advanced countries.

Regardless of how we measure the CIP deviations, with forward rates or as currency basis as in the literature, CIP and UIP are far from each other both in EMs and in AEs as shown in Figure 18. These results should not be surprising as CIP-wedges represent low hedged returns whereas UIP-wedges represent high unhedged returns.

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

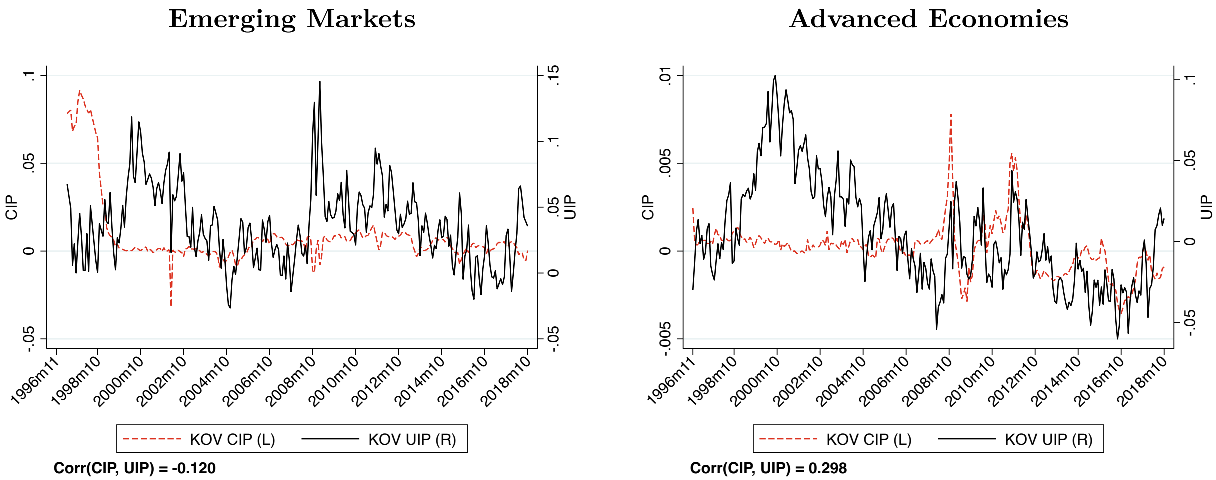


Figure 17. UIP and CIP (12 Months Horizon)

Note: This figure shows CIP and UIP deviations using our data. CIP uses interbank rates and UIP uses deposit rates.

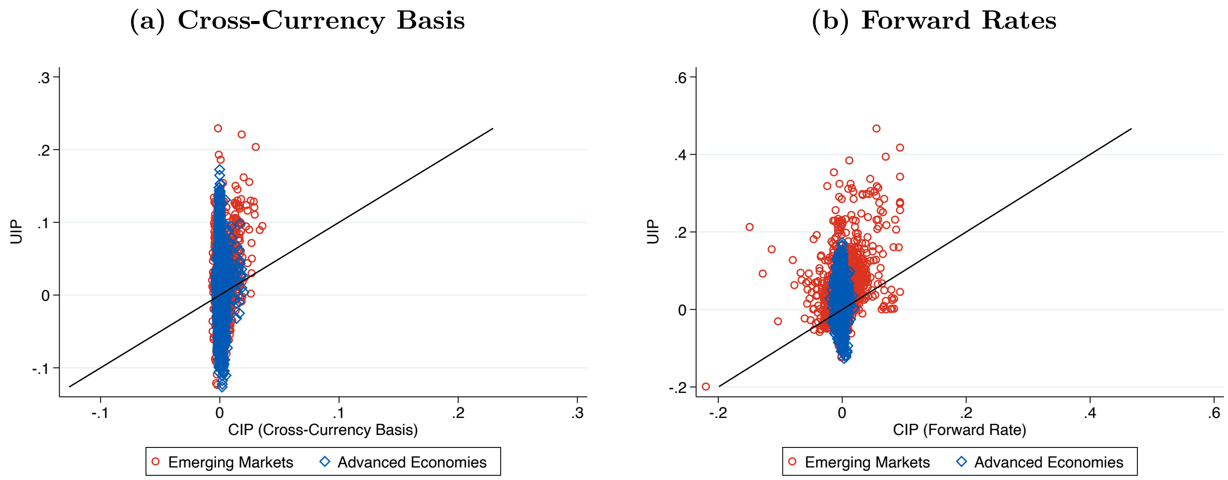


Figure 18. Cross-Sectional UIP and CIP (12 Months)

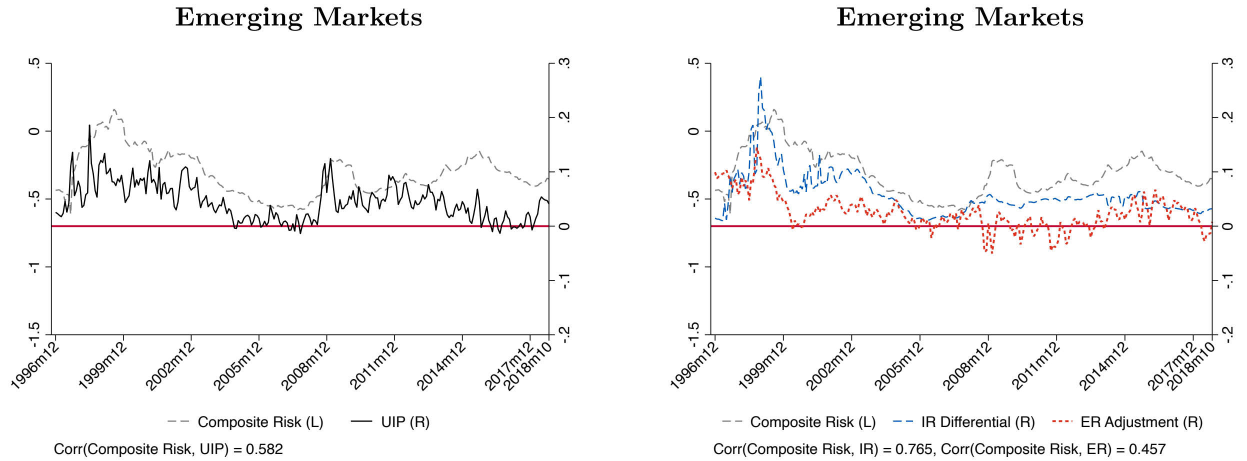
Note: This figure shows UIP and CIP deviations where each point represent a different date. At each date, we take the average across countries in each classification (Emerging and Advanced). Panel (a) constructs CIP using Du and Schreger (2021) cross-currency basis. Panel (b) constructs CIP using forward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

4.5. 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*.[16]

[16]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).

The left graph of Panel A in 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 of Panel A, we plot the correlation of the composite risk index with the two components of the UIP premium. Confirming our previous findings, in EMs, the composite risk highly correlates with the interest rate differential (76%, blue line) and this correlation is much higher than the negative correlation with the exchange rate adjustment (-45%, red dashed line).



a) Composite Risk and UIP Premium in Emerging Markets

Figure 19. Composite Risk and the UIP Decomposition

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

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

To unpack the elements implied in the composite risk and affecting foreign investors' sentiments on EM currencies, we revisit our previous panel regressions in Table 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 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$_{it-1}$	-0.001	-0.001**	-0.000	-0.001	-0.002*	-0.001
	(0.001)	(0.000)	(0.001)	(0.001)	(0.001)	(0.001)
$\log(VIX_{t-1})$	0.052***	0.029***	-0.023***	0.058***	0.054***	0.055***
	(0.005)	(0.003)	(0.005)	(0.005)	(0.005)	(0.005)
Convenience Yield/Liquidity Premium$_{t-1}$	-0.328	-0.750	-0.422	-0.203	-0.273	-0.388
	(0.749)	(0.587)	(0.719)	(0.757)	(0.727)	(0.712)
Composite Risk$_{it-1}$	0.052***	0.089***	0.037***			
	(0.006)	(0.006)	(0.006)			
Government Policy Risk$_{it-1}$				0.020***		0.014***
				(0.005)		(0.005)
Confidence Risk$_{it-1}$					0.023***	0.020***
					(0.004)	(0.004)
Obs.	3427	3427	3427	3427	3427	3427
Number of Currencies	245	245	245	22	22	22
R^2	0.1949	0.1879	0.0471	0.1541	0.1642	0.1693
Currency FE	Yes	Yes	Yes	Yes	Yes	Yes

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

Columns 4-6 presents the results for the two components. Column 4 shows that increases in government policy risk associates higher UIP premium and column 5 confirms a similar correlation for confidence risk. Importantly, column 6 includes both variables together and shows that both variables remain positive and highly statistically significant. Furthermore, both coefficients remain similar in size as those estimated in columns 4 and 5, which indicates that both variables are capturing different policy risks. Finally, it is worth remarking on the R^2 of these regressions, which reaches more than 17% and is close in size to the 20% observed for the composite index (column 1) and 19% captured in the PRP measure (column 4, Panel A in Table 3). This similar value of the R^2 indicates that the policy uncertainty captured by the PRP and the composite indexes is highly related to these two narrowly-defined measures of policy risk that capture the confidence on in EMs' government policies.

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 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.

We have also shown that survey data on exchange rate expectations provides additional information than interest rate differentials in predicting exchange rates in AEs, whereas in EMs, such expectational data do not add any new information over the interest rate differentials. Put differently, exchange rate expectations track actual exchange rates better in EMs than AEs and foreign investment is correlated with ex-ante excess returns. As a result, foreign investors expectations of currency risk are priced-in the interest rate differentials in EMs and related to capital inflows, but this is not the case in AEs.

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 investor expectations together with the manner in which agents process new information.

Once a country transforms from being an EM into an AE, that is a country is integrated into international capital markets, they might pursue better policies that lead to disappearance of country-specific policy risk. The policy implication of this finding is that EMs should be careful with their policies relating to capital flows and exchange rates during their transition since such policies might lead to volatility and hence to higher UIP-wedges through foreign investors pricing of the currency risk in the market rates.

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FOR ONLINE PUBLICATION: APPENDIX

A. Data

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

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

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

We collect market interest rates (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.

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

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

Interest Rates for UIP Calculation

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

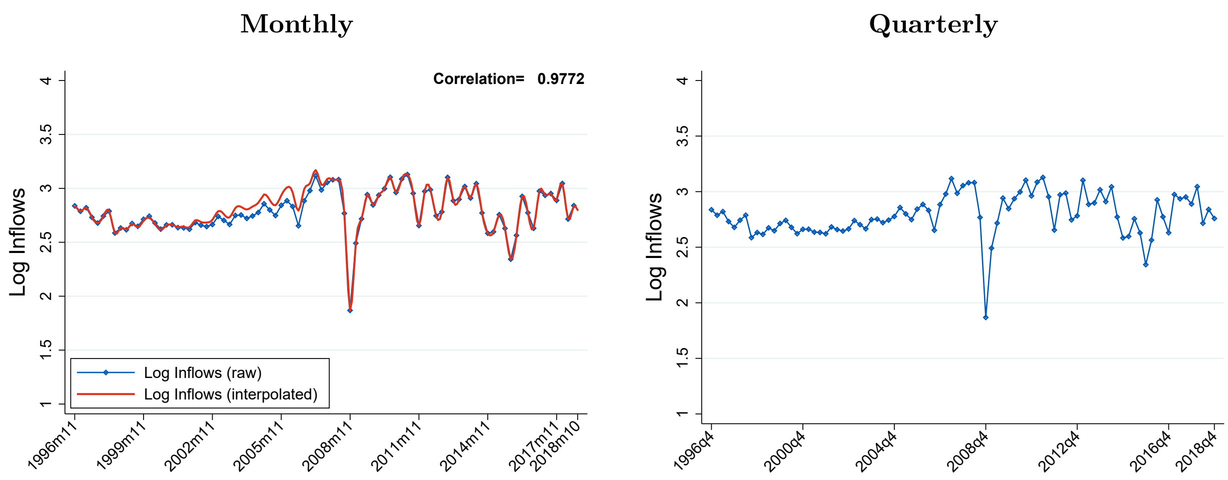
Table A3. Replaced Deposit Rates: Country-year Observations (1996-2018)

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

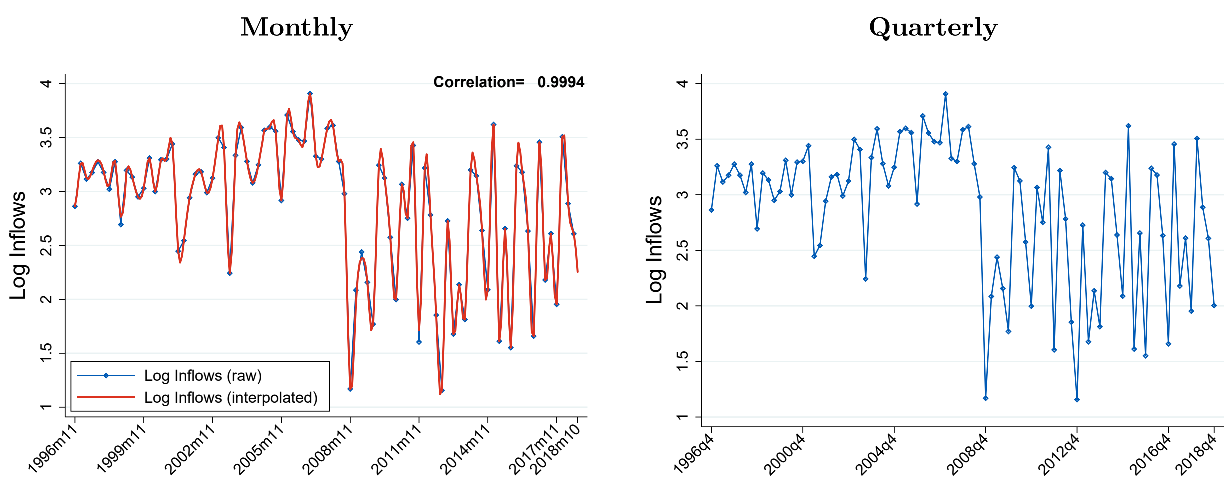
Interpolation of Quarterly Capital Flows

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

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



(a) Emerging Markets



(b) Advanced Economies

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

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

A.2. Consensus Forecasts

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

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

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

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

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

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

Table A5. Number of Forecasters By Currency

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

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

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

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

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

A.3. 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 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 (2020) to construct our PRP measure. This methodology adds total number of articles in a country and pools all the newspapers together for each country.[17] More precisely, define X_{it} the number of articles referring to policy risk episodes in country i at time t, Y_{it} total number of articles referring to country i at time t, and $Y_t = \sum_i Y_{it}$ the total number of articles written at each time t (i.e. the sum of articles across countries). We replicate Barrett, Appendino, Nguyen and de Leon Miranda (2020) index as follows

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

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

$$PRP_{it}^{N} = \frac{PRP_{it}}{\overline{PRP}_i} \times 100,$$

where $\overline{PRP}_i = \frac{1}{T}\sum_{t=1}^{T} PRP_{it}$ 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 cur-

[17] 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.

rency 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 $PRP_t = \sum_{i=1}^{N} \omega_{it} PRP_{it}$, where $\omega_{it} = RGDP_{it} / \sum_{i=1}^{N} RGDP_{it}$ is the share of the eurozone GDP accounted for by country i, PRP_{it} is the PRP measure for country i at time t, and N is the number of countries in the eurozone for which we observe a value for PRP_{it} 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:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

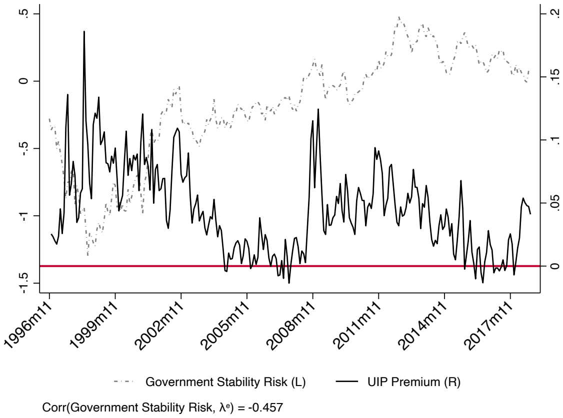
A.4.2 Correlation of Sub-Components of Political Risk and UIP Premium in EMs

Section 4.5 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.[18]

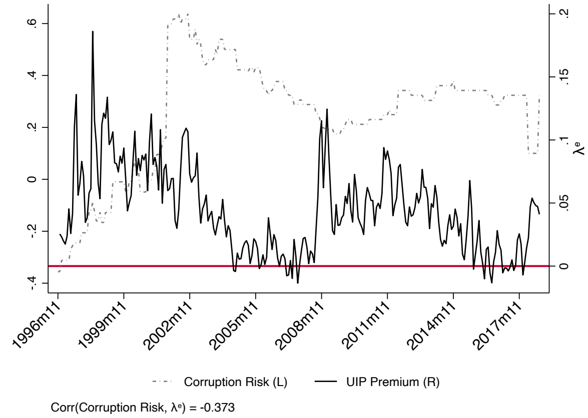
As detailed above, the other sub-components of political risk reported in the ICRG data and not directly used in the paper are: government stability, corruption, external conflict, internal conflict, military in politics, religious tensions, law and order, ethnic tensions and bureaucracy quality. Figure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

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

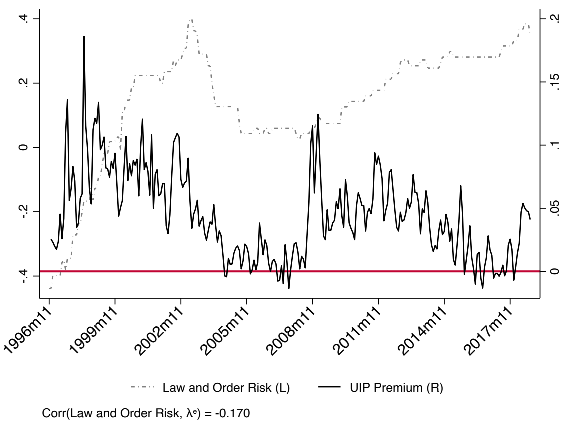
[18] The correlation of the UIP premium with government policy and confidence risk is presented in Figure B.2, and the its correlation with anti-democratic and expropriation risks is reported in Figure B.3.



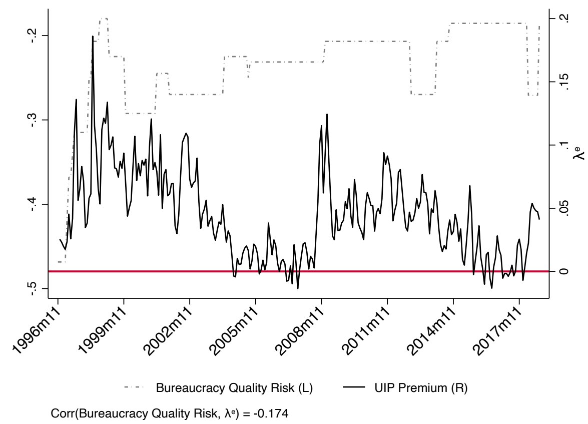
a) Government Stability Risk



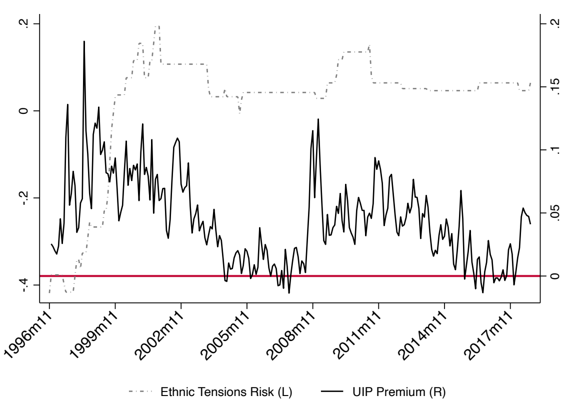
b) Corruption Risk



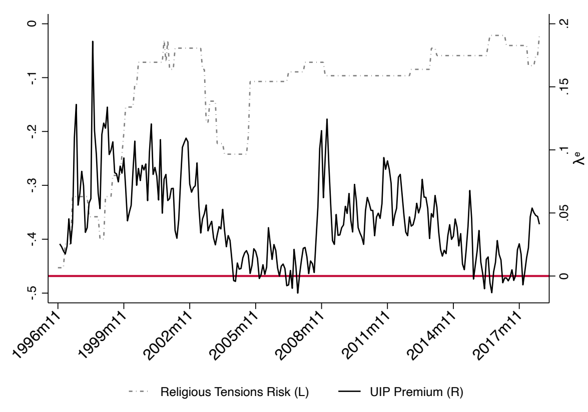
c) Law and Order Risk



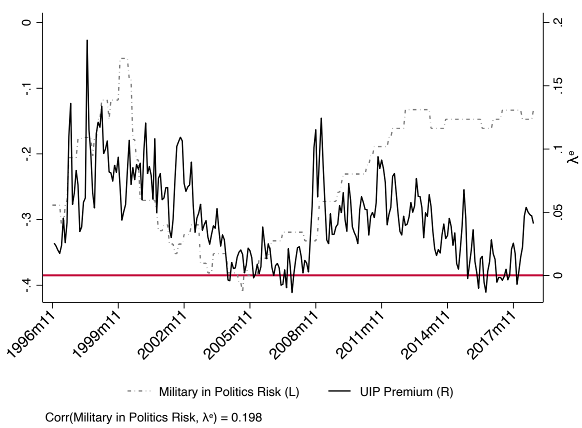
d) Bureaucracy Quality Risk



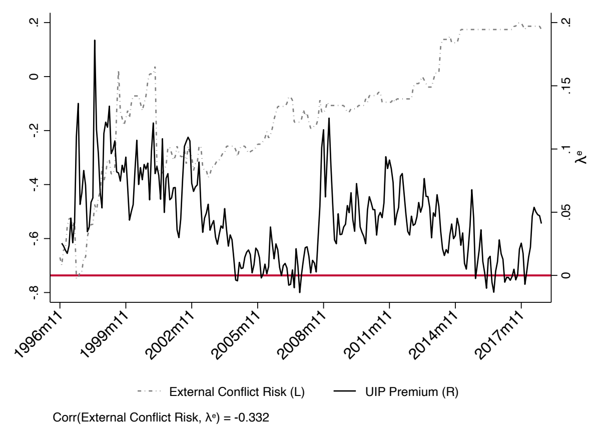
e) Ethnic Tensions Risk



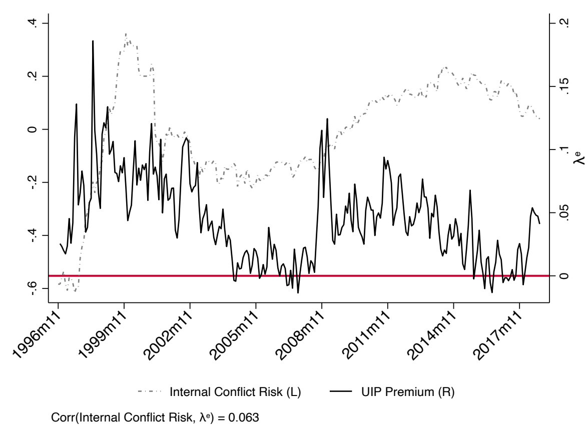
f) Religious Tensions Risk



g) Military in Politics Risk



h) External Conflict Risk



i) Internal Conflict Risk

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

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

B. Additional Figures and Tables

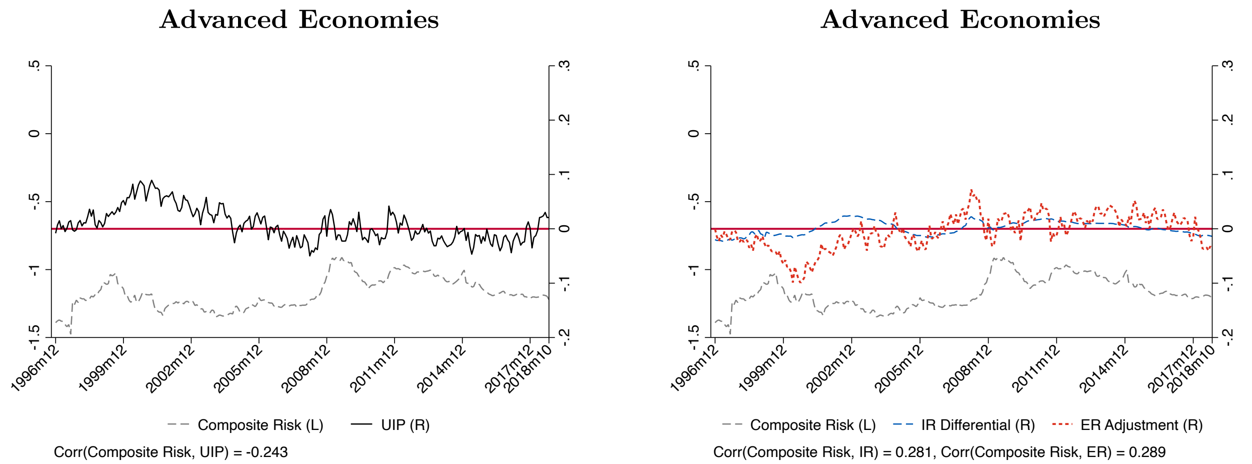


Figure B.1. Composite Risk and the UIP Decomposition in Advanced Economies

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

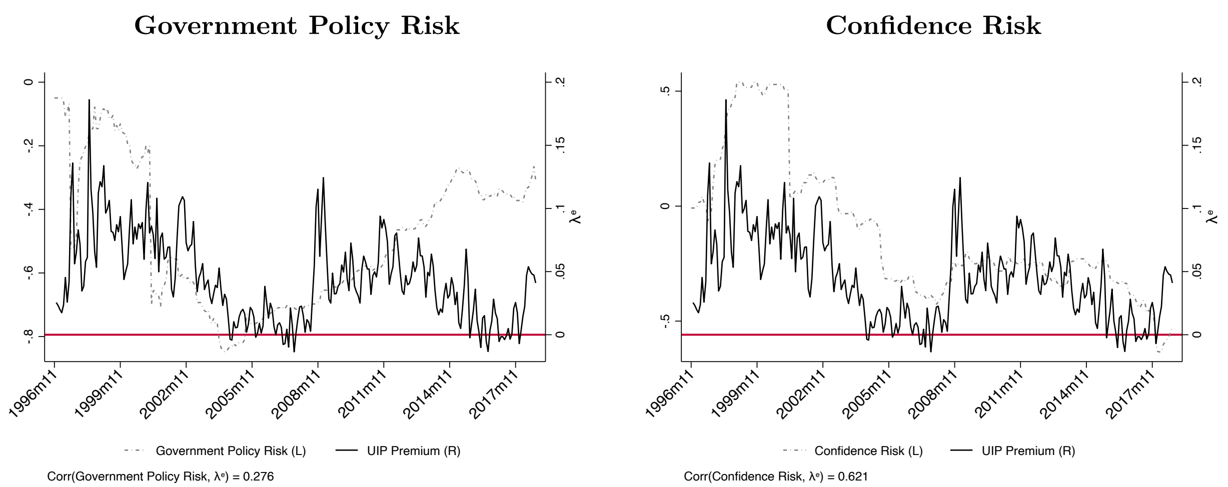


Figure B.2. Government Policy and Confidence Risks in Emerging Markets

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

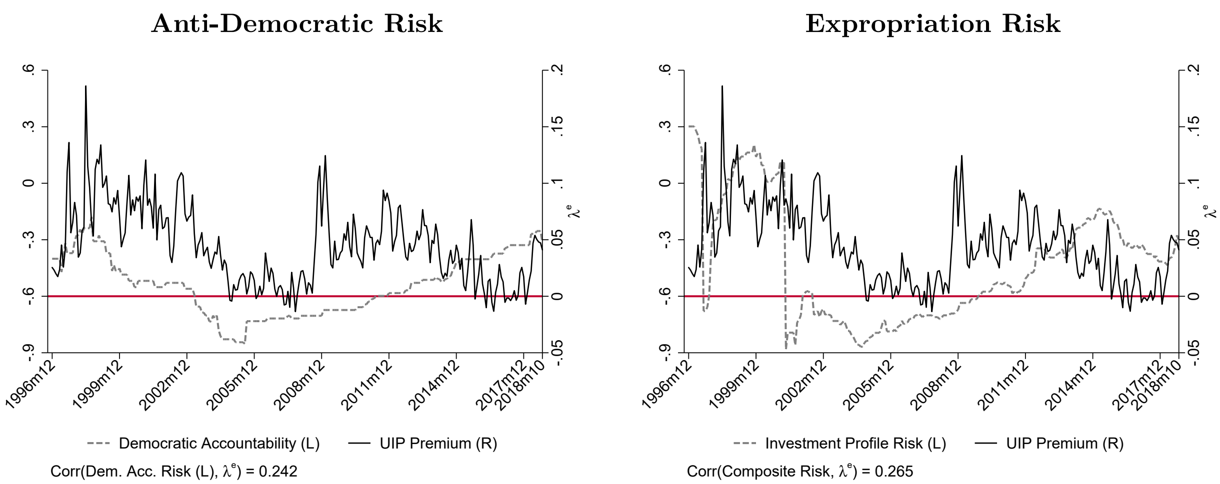


Figure B.3. Decomposing Government Policy Risk in Emerging Markets

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

Table B.1. Mechanism: Advanced Economies

	Second Stage: Interest Rate Differential					
	(1)	(2)	(3)	(4)	(5)	(6)
$s^e_{i^{high},t+1} - s^e_{i^{low},t+1}$	0.030**	0.062	0.030**			
	(0.013)	(0.045)	(0.013)			
Std Dev s^e_{it+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
N	2116	2116	2116	1259	1259	1259
	First stage: Dispersion in ER Expectations					
	$s^e_{i^{high},t+1} - s^e_{i^{low},t+1}$			Std Dev s^e_{it+1}		
$\log(VIX_{t-1})$	0.288***		0.285***	0.258***		0.262***
	(0.042)		(0.048)	(0.041)		(0.047)
PRP_{it-1}		0.039**	0.005		0.031	-0.005
		(0.019)	(0.023)		(0.020)	(0.024)
Cragg-Donald Wald F statistic	277.96	28.36	139.16	195.75	13.38	98.03
Kleibergen-Paap Wald rk F statistic	48.04	4.11	25.78	38.69	2.41	98.03

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

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)
Obs.	3288	3288	3288	3288
Number of Countries	21	21	21	21
R^2	0.3516	0.3918	0.3994	0.4327
$Adjusted R^2$	0.3468	0.3836	0.3912	0.4214
Currency FE	Yes	Yes	Yes	Yes

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

C. Fama Puzzle and Exchange Rate Predictability

C.1. Fama and Predictability in Advanced Economies

For comparison, we present in this section the Fama regression for advanced economies using both ex-post realized and ex-ante expectational data on exchange rates. Columns 3 and 4 of Table C.1 shows that the results for realized exchange rates to measure the UIP premium. The Fama coefficient in column 3 is negative –albeit non-statistically significant– indicating that high interest rate currencies tend to appreciate, instead of depreciate as implied by the UIP condition. In line with this result, realized excess returns positively and significantly associate with interest rate differentials in these economies (column 4).

These results change substantially when using expectational data. The Fama coefficient is positive and not statistically different from one, which implies that expected exchange rate changes tend to offset changes in the interest rate differential, as the UIP condition implies (column 1). Along these lines, the coefficient of the expected excess return regression is not statistically differently from zero (column 2). The failure of the UIP condition using realized exchange rates and its validity using expectational data in AEs have also been documented by Frankel and Froot (1987), Bacchetta, Mertens and van Wincoop (2009), Chinn and Frankel (1994), Stavrakeva and Tang (2018), Bussiere, Chinn, Ferrara and Heipertz (2022).

Table C.1. Fama and Excess Returns Regressions

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

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

C.2. Fama and Predictability: Robustness with Unbalanced Panel

To make sure that results are not driven by sample selection, we re-estimate the Fama and excess return regressions for an unbalanced panel of 34 advanced and emerging economies.[19] Results reported – in Table C.2– confirm the failure of the UIP condition for both advanced and emerging economies when using realized exchange rates, and its failure for EMs when using survey data.

Table C.2. Fama and Excess Return Regressions: Unbalanced Sample

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

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

C.3. Forecast errors

We run the conventional predictability regressions in the literature, that is, regressing forecast errors for the exchange rate on interest rate differentials. Based on the recent developments as in the work of Coibion and Gorodnichenko (2015) and Bordalo, Gennaioli, Ma and Shleifer (2020), we run the forecast error predictability regressions using data on individual forecasts. As Table C.3 shows, we obtain similar results to the literature both for advanced economies

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

and emerging markets, where forecast errors are systematically and negatively correlated with interest rate differentials.

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.

Table C.3. Forecast Error Regression: Individual Forecast Data

	Advanced Economies		Emerging Markets	
	(1)	(2)	(3)	(4)
$(i_t - i_t^{US})$	-0.796*	-0.780*	-0.434**	-0.394**
	(0.438)	(0.438)	(0.177)	(0.165)
R^2	0.007	0.007	0.027	0.022
Observations	11,985	11,985	5,185	5,185
Number of Forecasters	48	48	67	67
Number of Currencies	9	9	20	20
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.

C.4. Bias on the Fama Coefficient and Policy Risk

In this section, we conduct two exercises. First, we assess whether the lower depreciation found in EMs following interest rate changes (Fama regression) correlates with policy uncertainty. Second, we conduct a decomposition exercise to assess the channels through which policy risk can create a downward bias the Fama coefficient.

C.4.1. Does the Bias on the Fama Coefficient Correlate with Policy Risk in EMs?

We start by evaluating whether the downward bias of the Fama coefficient in EMs associates with a time-varying risk premium arising from country-specific policy uncertainty. As discussed in Froot and Frankel (1989), the Fama coefficient estimated using expectational data can be written as: $plim\hat{\beta} = 1 - b_{RP}$, where b_{RP} is a time-varying risk premium.

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

$$\Delta s^e_{ijt+h} = \alpha_{ij} + \beta_{ij}(i_{ijt} - i^{US}_{jt}) + \varepsilon_{ijt+h} \qquad \forall i, j, \tag{16}$$

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

$$plim\hat{\beta}_{ij} = 1 - b_{ij,RP} \qquad \text{and} \qquad b_{ij,RP} = \frac{var(\lambda^e_{ij}) + cov(\Delta s^e_{ij}, \lambda^e_{ij})}{var(IR_{ij})}, \tag{17}$$

where $var(\lambda^e_{ij})$, $cov(\Delta s^e_{ij}, \lambda^e_{ij})$ and $var(IR_{ij})$ are calculated across months within window j for each currency i.[20,21] To assess the relationship between policy risk and the Fama coefficient, we estimate the following pooled OLS regression:

$$\hat{\beta}_{ij} = \gamma_2 + \gamma_3 \text{ policy risk}_{ij} + \varepsilon_{ij}, \tag{18}$$

where $\hat{\beta}_{ij}$ is the Fama coefficient estimated in regression (16) and policy risk_{ij} is the mean of policy risk in currency i and window j for each of our policy risk variables. The coefficient γ_3 captures the change in the Fama coefficient associated with a change in the policy risk. In both regressions (16) and (18), we cluster the standard errors by country.[22]

Table C.4 presents the results for the Fama coefficient. The coefficient for composite risk is negative and indicates that an increase in a country's composite risk associates with a contemporaneous decrease in the Fama coefficient (column 1). The estimated coefficient implies that if the composite risk increases from the p25 to p75 (from Poland to India in the window 2001m5 to 2002m10) the Fama coefficient would decrease 0.31 percentage points. In columns 2 and 3, we unpack the composite risk in its two components: government policy risk and confidence risk. Both risks are negatively correlated with the Fama coefficient, but only government policy risk is significant.

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

[21] Using survey data to estimate equation (16) eliminates the term b_{RE}, as the regression already considers subjective expectations.

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

In columns 4 and 5, we go one step further and break down government policy risk in its two sub-components: anti-democratic risk and expropriation risk. Anti-democratic risk captures the level of autocracy of the government and, thus, the degree of freedom that a government has to impose policies to its own advantage. Expropriation risk captures the risk of expropriation, the risk of limiting or banning foreign investors' profits repatriation and payment delays.[23] Interestingly, both anti-democratic risk and expropriation risk are negative and statistically significant, pointing to a downward bias in the Fama coefficient.[24]

Table C.4. The Fama Coefficient in Emerging Markets: Composite and Government Policy Risks

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

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

For completeness, we replace the right hand side of equation (18) with $b_{ij,RP}$ and evaluate the correlation between risk premium term and policy risk. As we show in Panel B, the coefficients for composite, government policy, anti-democratic and expropriation risks are all positive and statistically significant, indicating that higher uncertainty on EMs' government policies associate with increases in the risk premium which –in turn– downward bias the Fama coefficient.

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

[24]In Figure B.3 in Appendix B, we show that anti-democratic risk and expropriation risk are substantially correlated with the UIP in EMs.

Finally, to assess whether our analysis on the channel creating a downward bias in the Fama coefficient is not driven by the length of the window with which we estimate the β coefficient and b_{RP} term, we re-compute these variables for 12-months and 24-months rolling windows and show in Tables C.5 and C.6 that our results hold true for these different windows.

Table C.5. The Fama Coefficient in EMs: Composite and Government Policy Risks (12-Months)

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

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

Table C.6. The Fama Coefficient in EMs: Composite and Government Policy Risks (24-Months)

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

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

C.4.2. Bias on the Fama Coefficient and Policy Risk: A Decomposition Analysis

We now conduct a decomposition analysis to unpack the channels through which policy risk affects the risk premium and downwards bias the Fama coefficient. Recall that the Fama coefficient for country i in window j can be expressed as $plim\hat{\beta}_{ij} = 1 - b_{ij,RP} = 1 - \frac{var(\lambda^e_{ij})+cov(\Delta s^e_{ij},\lambda^e_{ij})}{var(IR_{ij})}$ (equation (17)).

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

$$\frac{\partial\hat{\beta}_{ij}}{\partial\text{policy risk}_{ij}} = \underbrace{-\frac{1}{var(IR_{ij})}\frac{\partial var(\lambda^e_{ij})}{\partial\text{policy risk}_{ij}}}_{\text{UIP Premium Volatility}} \underbrace{-\frac{1}{var(IR_{ij})}\frac{\partial cov(\Delta s^e_{ij},\lambda^e_{ij})}{\partial\text{policy risk}_{ij}}}_{\text{Comovement ER \& UIP Premium}} + \underbrace{\frac{b_{ij,RP}}{var(IR_{ij})}\frac{\partial var(IR_{ij})}{\partial\text{policy risk}_{ij}}}_{\text{Interest Rate Volatility}}. \tag{19}$$

Equation (19) shows that the change in the Fama coefficient stems from three forces: (i) changes in the volatility of the UIP premium (first term), (ii) changes in the comovement between the expected exchange rate change and the UIP premium (second term), and (iii) changes in the volatility of the interest rate differential (third term). Equation (19) is a mathematical derivation for a particular country i at window j but, under the assumption that each component of the risk premium responds homogeneously across time and countries, we can estimate each of these three forces econometrically.[25] That is, we can regress $var(\lambda^e_{ij})$, $cov(\Delta s^e_{ij},\lambda^e_{ij})$ and $var(IR_{ij})$ on policy risk and obtain the *average* responses to policy risk across countries and time (i.e. $\frac{\Delta var(\lambda^e_{ij})}{\Delta\text{policy risk}_{ij}}$, $\frac{\Delta var(IR_{ij})}{\Delta\text{policy risk}_{ij}}$ and $\frac{\Delta cov(\Delta s^e_{ij},\lambda^e_{ij})}{\Delta\text{policy risk}_{ij}}$). Because these derivatives are weighted by the variance of the interest rate differential in each country i and window j and the last derivate is additionally weighted by the risk premium term $b_{ij,RP}$, we estimate them econometrically employing Weighted Least Squares.[26] More precisely, we estimate

[25]To understand this assumption, note that equation (19) captures the change in the β coefficient in a country i at time j upon an increase in policy risk in that period. Yet the econometrician is not interested in each individual response of each country at each moment of time, but on the *average* response across time and countries. To compute average responses, we can assume that each component of the risk premium in equation (19) responds homogeneously across time and countries, and employ these homogeneous responses to obtain the average response of the Fama coefficient to changes in policy risk. Hence, under this homogeneity assumption, the derivative – $\frac{\partial\beta_{ij}}{\partial\text{policy risk}_{ij}}$ – can be interpreted as the *average* response of the Fama coefficient.

[26]The WLS is a good econometric approximation of the derivatives in equation (19). More precisely, the derivatives in equation (19) refer to the response of each country i at time j and are weighted by variables at country i and time j level. So, these are individual responses for each country and time pair. Instead, the WLS weights each observation for each country and time to compute average responses. Put it differently, the WLS weights each observation to estimate individual responses, while the derivatives in equation (19) are the average responses weighted by country and time.

$$Y_{ij} = \gamma_4 + \gamma_5 \text{ policy risk}_{ij} + \varepsilon_{1ij}, \tag{20}$$

where $Y_{ij} = \{var(\lambda^e_{ij}), cov(\Delta s^e_{ij}, \lambda^e_{ij}), var(IR_{ij})\}$. The regressions for $var(\lambda^e_{ij})$ and $cov(\Delta s^e_{ij}, \lambda^e_{ij})$ are weighted by the variance of the interest rate differential in each country i window j, and that for $var(IR_{ij})$ is weighted by the ratio of the risk premium term and the variance of the interest rate differential in each country i window j.[27]

We assess the impact of the policy risk on the Fama coefficient using our composite risk variable. Panel A in Table C.7 presents the results and shows that the driver of the downward bias of the Fama coefficient is the increase in the volatility of the UIP premium. In particular, column 1 shows that the coefficient of the variance of the UIP premium is positive and highly statistically significant, while the other two coefficients – the covariance between exchange rate change and the UIP premium and the interest rate volatility– are close to zero. This result indicates that a one standard deviation in that increases in composite risk associates with a 0.49 percentage points decrease in the volatility of the UIP premium. We can then use the estimated coefficients to check how each of these three forces contribute to the bias of the Fama coefficient. As expected, the increase in the volatility of the UIP premium explains 87% of the bias of the Fama coefficient arising from changes in composite risk.[28]

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

$$var(\lambda^e_{ij}) = var(IR_{ij}) + var(\Delta s^e_{ij}) - 2cov(IR_{ij}, \Delta s^e_{ij}). \tag{21}$$

To assess the impact of composite risk on each term of equation (21), we regress each of these components on composite risk. Panel B in Table C.7 shows that composite risk associates with increases in both the volatility of the interest rate differential and the volatility of the exchange rate change, but the increase in the volatility of the interest rate differential is larger. As discussed above, the higher increase in the volatility of the interest rate differential suggests that a country's composite risk is priced in the interest rate differential.

[27] Alternatively, with time series long enough, one could estimate these regressions separately for each country, i.e. without imposing homogeneity across countries. That is, one could estimate regression (20) for each country and obtain individual γ_{4i}. Unfortunately, because our data spans only between 1996m11 and 2018m12, we do not have enough time series variation to estimate these coefficients consistently. As West (2012) shows, in models where the discount factor approaches one, the coefficient in the Fama regression could be inconsistent in small samples.

[28] Note that the sum of the estimated coefficients of equation (19) (0.878) and the coefficient reported in Table C.7 (0.584) are not exactly identical, due to the presence of non-linearities in this decomposition.

Table C.7. Decomposition of The Bias of Fama Coefficient in Emerging Markets

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

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

D. Local Projections

D.1. Comparison with Advanced Economies and VIX control

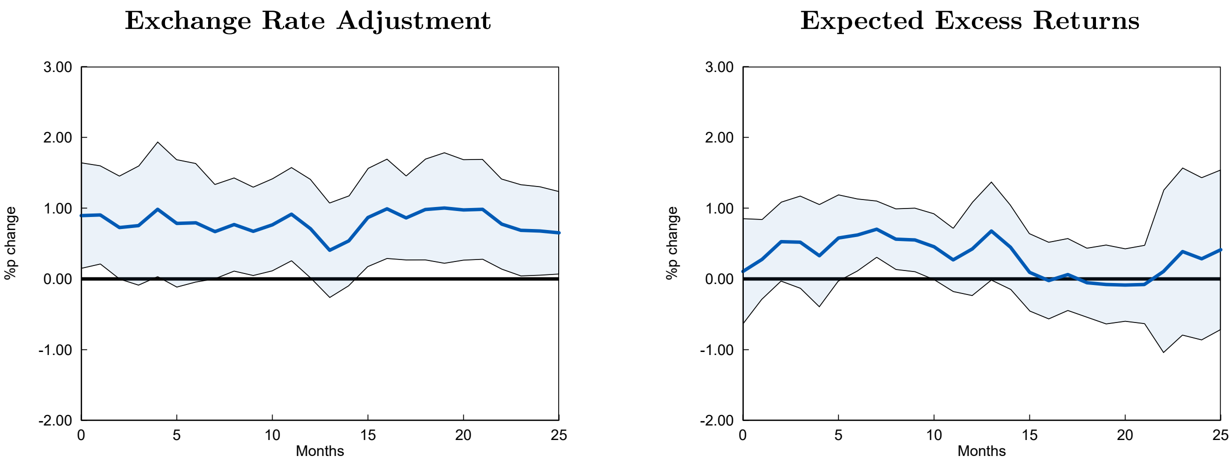
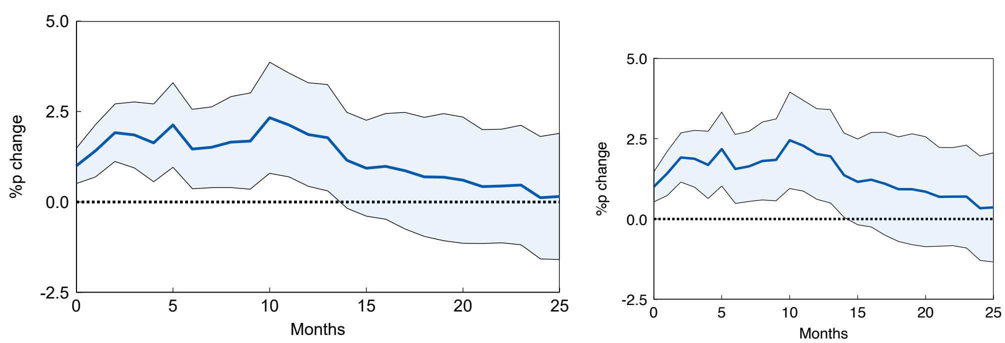


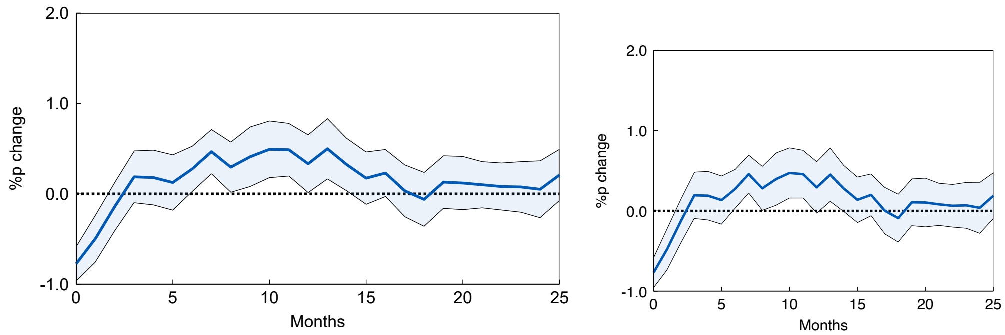
Figure E.1. Advanced Countries: Response of ER and UIP Premium to an IR Shock (OLS)

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

First Stage: IR Response to PRP Shocks (VIX control on the left)



Exchange Rate Adjustment: Response of ER and UIP Premium to an IR Shock (VIX control on the left)



Expected Excess Returns: Response of ER and UIP Premium to an IR Shock (VIX control on the left)