Long-Run UIP and Sovereign Risk

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Preliminary and Incomplete. Comments Welcome.

Abstract

Long-run uncovered interest rate parity (UIP) tends to hold for G10 currencies (Chinn & Meredith, 2004; Lustig, Stathopoulos, & Verdelhan, 2019). Focusing on the ten most freely floating emerging market currencies (EM10), we show that UIP does not hold even in the long run for emerging markets (EMs). However, when UIP regressions are augmented with measures of credit risk, long-run UIP cannot be rejected statistically for these currencies. We also find that credit risk plays a role in explaining exchange rate dynamics in countries with less than stellar credit ratings, regardless of their level of market development.

JEL Codes: F31, G12, G15, F30

Keywords: Long-run UIP, Credit risk, Credit ratings, G10 currencies, Emerging markets.

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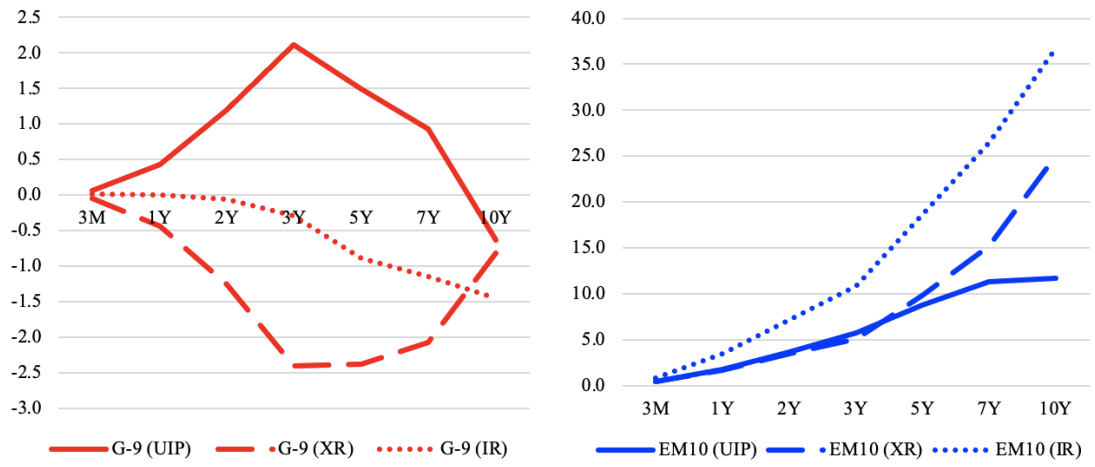
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1 Introduction

The Uncovered Interest Parity (UIP) is a fundamental no-arbitrage condition in international macroeconomics and finance, positing that the expected change in exchange rates between two currencies equals the difference in their nominal interest rates. Despite its theoretical importance, the empirical failure of UIP is well-documented. An exception to this pattern is the evidence that UIP tends to hold at longer horizons for currencies in advanced economies (AEs) (Chernov & Creal, 2021; Meredith & Chinn, 1998; Chinn, 2006; Lustig et al., 2019). The empirical validity of the parity for emerging market economies (EMs) remains an open question regardless of the horizon (Bansal & Dahlquist, 2000; Chernov & Dahlquist, 2023).

In this paper, we empirically explore long-run uncovered interest rate parity (LRUIP) in both AEs and EMs and show that it fails to hold for EMs unless credit risk is controlled for. We also show that credit risk plays a vital role in explaining exchange rate dynamics in countries with less than stellar credit ratings, regardless of their level of market development.

Figure 1: Decomposition of mean UIP premium across different maturities



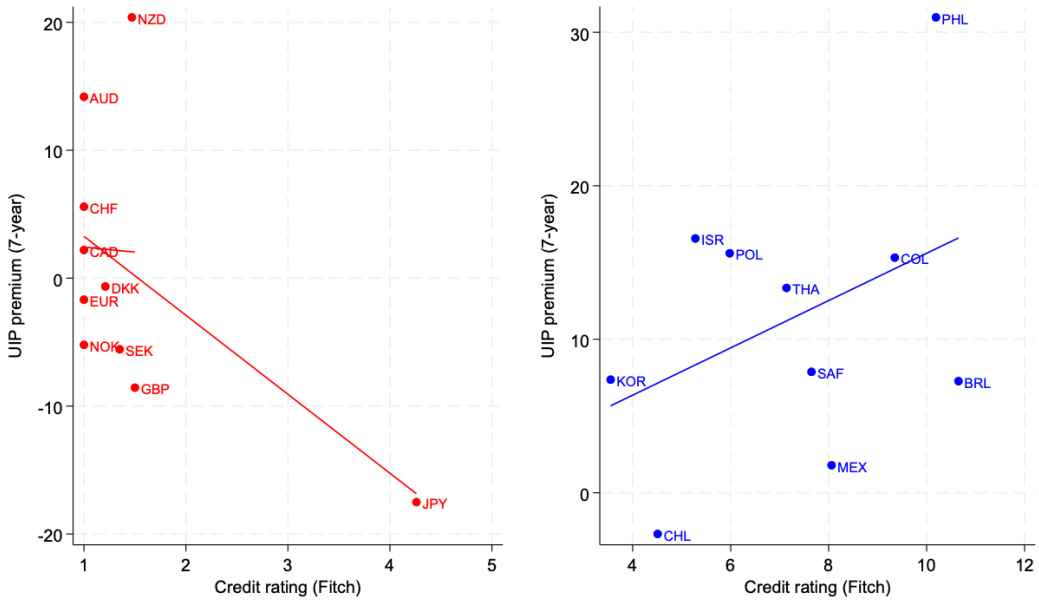
The figure shows the average unconditional uncovered interest parity (UIP) deviation (solid line) along with its components – ex-post exchange rate change (XR) and interest rate differential (IR) – for G9 (left panel) and EM10 (right-panel) currencies. Note: See Section 2 for details on data sources, sample period, and country sample.

Figure 1 plots the average interest rate differential, the ex-post exchange rate change, and unconditional UIP deviation between the US dollar and each currency over horizons ranging from 3-month (3M) to 10-year (10Y) maturities for the G10 and a sample of ten floating emerging market currencies. The figure shows that while the average UIP deviation declines for AEs at maturities longer than 3 years, it monotonically increases with maturity for EMs. Additionally,

the size of the deviations is one order of magnitude larger in the context of EMs.[1]

Figure 2 plots Fitch sovereign credit ratings on long-term debt against LRUIP deviations for both AEs and EMs. The plot suggests a positive and statistically significant relationship for EMs, with wider UIP premia being associated with lower (numerically higher in the figure) credit ratings. This finding suggests that, in EMs, foreign investors demand additional compensation for bearing higher credit risk. In contrast, no such pattern is observed for AEs where the correlation between credit ratings and LRUIP premia is insignificant—or negative when Japan is included in the sample of AEs.

Figure 2: Long-term credit ratings (Fitch) and UIP premium



The figure shows the average UIP premium at 7-year maturity and the Fitch average long-term sovereign debt credit ratings for G10 (left panel) and EM10 (right-panel) currencies.

By tying these two stylized facts together, in this paper, we conjecture that when we account for credit risk, UIP may also hold for EMs in the long run. We evaluate this hypothesis both theoretically and empirically. Using a sample of the ten most freely floating emerging market currencies (EM10), we show that the coefficient on the interest rate differential in the standard UIP regression gets closer to unity when we account for the credit risk with credit default swaps (CDS) or interacting the interest rate differential with the country credit rating. Following Du and Schreger (2016), we also incorporate sovereign credit risk into a no-arbitrage asset pricing

[1]The evidence aligns with the findings of Kalemli-Özcan and Varela (2021), which suggest that the UIP premium is generally higher in EMs than in AEs.

framework with incomplete markets as in Jiang, Krishnamurthy, and Lustig (2021). We also show that credit risk plays an important role in explaining exchange rate dynamics in countries with less than stellar credit ratings, regardless of their level of market development.

The empirical literature on UIP has documented persistent deviations from its theoretical predictions, a phenomenon also referred to as the "forward premium puzzle" (Fama, 1984). These deviations, where high-interest-rate currencies appreciate instead of depreciating, suggest potential excess returns through carry trade strategies and challenge traditional rational expectations exchange rate models. Contributing explanations include time-varying risk premia, market frictions, and behavioral biases, yet no consensus exists on the dominant mechanism.

Chernov and Dahlquist (2023) provide a recent and extensive review of the UIP literature from a multi-horizon perspective and point out the differences in the behavior of AEs and EMs. They also conjecture that credit risk might be the critical driver of these differences but cast their argument in terms of omitted variable bias. In our study, we directly test such conjecture and show that once we condition CDS spreads, the null hypothesis of long-run UIP cannot be rejected.

Della Corte, Sarno, Schmeling, and Wagner (2022) and Della Corte, Jeanneret, and Patelli (2023) identify a link between sovereign risk and currency excess returns. Specifically, Della Corte et al. (2022) demonstrate that default expectations embedded in CDS spreads are a key determinant of exchange rate movements, with these expectations playing a more significant role than distress risk premia. Della Corte et al. (2023) develop a credit-based theory of the currency risk premium, emphasizing the importance of credit-implied risk premia (obtained from CDS spreads denominated in different currencies), especially for high-risk economies. Our findings align with these studies in pointing out the sovereign credit risk as a critical driver of the exchange rate dynamics.

UIP deviations have also been studied with a specific focus on emerging markets. Early studies on EMs primarily examine short-term interest rates (Bansal & Dahlquist, 2000; Frankel & Poonawala, 2010; Gilmore & Hayashi, 2011), exploring the sign of the relationship between interest rate differentials and expected exchange rate changes. They reveal that EMs exhibit opposite-sign relationship between interest rate differentials and exchange rates compared to AEs.

Gilmore and Hayashi (2011) examine the foreign exchange excess return from long-position in 20 EM currencies for the US dollar investors. The average excess return is found to be significantly

positive for many EM currencies. In contrast, the average excess return from major currencies is far lower, albeit positive. These results similar to the ones in our study point to the fact that UIP fails for EMs in a different manner than for AE. Furthermore the evidence that EM currencies provide equity-like excess returns is indicative of large and persistent violations of the UIP that may be a result of compensation for exposure to a source of risk, including credit risk as in our work.

Corsetti, Lloyd, Marin, and Ostry (2023) develop a no-arbitrage framework to show that country risk, particularly long-term permanent country risk, can shape carry trade returns and convenience yields. Their model connects exchange rate dynamics with country risk through asset pricing mechanisms, emphasizing the role of country risk in long-term UIP deviations. We focus explicitly on credit risk on government bonds in local currency, as opposed to an all-encompassing long-run country risk. While we control for convenience yields in our analysis, we do not attempt to explain convenience yield differentials between countries.

Kalemli-Özcan and Varela (2021) find a positive comovement between policy uncertainty and short-term UIP premia at the 1-year maturity for EMs,while this relationship appears weaker or nonexistent for AEs. Their findings suggest that heightened policy uncertainty in EMs increases foreign investors' demand for compensation, raising UIP premia. This relationship underscores the importance of short-term risk factors captured through news-based indices, which reflect market reactions to shocks such as political instability or economic disruptions. In contrast, this paper focuses on long-run UIP (LRUIP) premia at the 7-year maturity and identifies a significant correlation with credit ratings. Unlike news-based indices, which capture transient policy shocks, credit ratings capture structural and persistent factors, such as macroeconomic fundamentals and sovereign solvency. By incorporating sovereign credit risk into UIP regressions, we argue that the coefficient on interest rate differentials approaches unity, providing evidence that long-run UIP holds in EMs when credit risk is accounted for.

Greenwood, Hanson, Stein, and Sunderam (2023) find that exchange rates are about as sensitive to changes in long-term interest rate differentials as they are to changes in short-term interest rate differentials. Moreover, the component of long-rate differentials that matters for exchange rates appears to be a term premium differential in AEs. We show that credit risk drives the ex-

change rate at long horizons in emerging markets, while the term premium explains a much smaller share of the exchange rate variance in these countries.

In the context of AE, the research of Meredith and Chinn (1998), Chinn and Meredith (2004), Chinn and Meredith (2005) and Gilmore and Hayashi (2011) underscore the role of term premium differentials in driving the sensitivity of the exchange rate to changes in interest rates. Empirical analyses by Bansal and Dahlquist (2000), Frankel and Poonawala (2010), and Gilmore and Hayashi (2011) show contrasting UIP behaviors between EMs and AEs, driven by various shocks and structural factors. We show that credit risk can reconcile the AEs and EMs evidence on LRUIP, and then the term premium (country risk premium) plays a quantitatively more important role in driving exchange rate dynamics in AEs (EMs). These findings offer insights into the factors affecting EM exchange rates and help design consistent exchange rates and fiscal policies in these economies.

The rest of the paper is organized as follows. Section 2 discusses the data sources and summary statistics underlying Figures 1 and 2. Section 3 reports the long-run UIP test results. Section 4 describes a no-arbitrage, incomplete-markets asset pricing framework we use to interpret our empirical findings. Section 5 reports evidence on exchange rate dynamics informed by our theoretical framework and tests of long-run UIP in EMs, conditional on measures of credit risk. Section 6 concludes. An Appendix reports data sources, definitions, summary statistics, as well as country and robustness estimation results.

2 Sample and Data

In our analysis, we focus on a currency sample comprising ten developed and ten developing markets. The first group corresponds to the typical sample of G10 currencies. This country group includes Australia, Canada, Switzerland, Denmark, the Euro Area, the United Kingdom, Japan, Norway, New Zealand, and Sweden. The second group, which we call EM10, includes countries that on average over our sample period score a rating of three or higher in the classification of the exchange rate regime in (Ilzetzki, Reinhart, & Rogoff, 2022). This country group includes Brazil, Chile, Colombia, Israel, Korea, Mexico, Philippines, Poland, South Africa and Thailand. For robustness, we also consider a broader sample of 14 EM currencies that score three and above

according to the measurability index of Covered Interest Parity (CIP) deviations in Du, Im, and Schreger (2018) and two advanced economies with very high government debt levels over our sample period. The additional countries considered are Indonesia, Peru, Russia, Turkey, Italy, and Greece.

The data frequency is monthly, where the data on exchange rates and interest rates are collected from Bloomberg and Refinitiv. The sample period is from 2000 to 2023, with some variation across countries depending on data availability. Detailed information on sources, including tickers and variable descriptions, is reported in the Appendix, together with a complete battery of country-specific summary statistics.

Table 1: Mean of UIP premium across different maturities

UIP Premium $\left(i_t - i_t^{US}\right) - (s_{t+h} - s_t)$	3M	1Y	2Y	3Y	5Y	7Y	10Y
G-10	0.05	0.39	1.11	1.91	1.09	0.32	-5.49
G-9	0.06	0.43	1.20	2.11	1.49	0.93	-0.63
EM10	0.40	1.73	3.66	5.71	8.73	11.34	11.68
EM14	0.22	1.07	2.32	3.59	5.09	2.26	-2.73

The table shows the average Uncovered Interest Parity (UIP) premium, in percent, for G9, G10, EM10, and EM14 countries across various maturities from January 2000 to December 2023.

Table 2: Mean of (ex-post) exchange rate change across different maturities

Exchange Rate Adjustment $(s_{t+h} - s_t)$	3M	1Y	2Y	3Y	5Y	7Y	10Y
G-10	-0.02	-0.31	-1.02	-2.00	-1.67	-1.05	4.44
G-9	-0.05	-0.44	-1.26	-2.40	-2.38	-2.08	-0.82
EM10	0.42	1.70	3.46	5.09	9.84	15.13	25.05
EM14	0.78	3.12	6.27	9.32	16.57	27.43	42.86

The table shows the mean of exchange rate adjustment for G9, G10, EM10, and EM14 countries across various maturities from January 2000 to December 2023.

Table 3: Mean of interest rate differential across different maturities

Interest Rate Differential $\left(i_t - i_t^{US}\right)$	3M	1Y	2Y	3Y	5Y	7Y	10Y
G-10	0.03	0.07	0.08	-0.09	-0.58	-0.74	-1.06
G-9	0.01	0.00	-0.06	-0.29	-0.89	-1.15	-1.45
EM10	0.83	3.42	7.13	10.80	18.56	26.48	36.73
EM14	1.01	4.19	8.59	12.91	21.65	29.68	40.13

The table shows the mean interest rate differential for G9, G10, EM10, and EM14 countries across various maturities from January 2000 to December 2023.

Table 1 reports the average UIP premium by a group of countries across different maturities plotted in Figure 1. Tables 2 and 3 decompose the average premium into interest rate differentials

and exchange rate change components by groups of countries. The G-9 group excludes Norway, whose 10Y exchange rate change appears to be a statistical outlier.

Excluding Norway's 10Y exchange rate change, the average UIP premia for the G10 countries has the familiar inverted U-shape, being close to zero at the 3M and 7Y maturity, as in Figure 1, and turning slightly negative at the 10Y. The average interest rate differential is close to zero at the short end of the curve and then turns negative as the horizon lengthens, peaking around 3-5Y maturity. The exchange rate change is negative and progressively more so as the horizon lengthens, with a significant change at the 10Y horizon. However, some heterogeneity is evident in the country-specific summary statistics reported in the Appendix, with funding currencies–Japan, Switzerland, and the Euro, behaving significantly differently than others.

In contrast, the average UIP premium for the EM10 group of countries increases monotonically across maturities, reaching 11% at the 7-10Y maturity. Both exchange rate changes and interest rate differentials increase monotonically across maturities.

3 Testing for long-run UIP Deviations

In this section, we present estimation results based on a standard Uncovered Interest Rate Parity (UIP) regression estimated over different time horizons. Here, we report results for pooled regressions. Country-specific regression results are in the Appendix.

The regression specification is given in Equation (1), which is estimated with the General Method of Moments (GMM) correcting the standard errors for the serial correlation of order $k-1$ as in Chinn and Meredith (2005), where k refers to the maturity in months for country-specific analysis. The panel regressions include country-fixed effects, and standard errors are calculated using the Driscoll and Kraay (1998) methodology, which corrects for heteroskedasticity, serial correlation, and cross-equation correlation.

$$\Delta s_{i,t,t+k} = \beta_{1,k}\left(i^{*}_{i,t,k} - i^{USD}_{i,t,k}\right) + \delta_{i,\kappa} + \epsilon_{i,t,t+k} \tag{1}$$

where $\Delta s_{i,t,t+k}$ is the log difference in the exchange rate for country $i's$ currency between time t and $t+k$ against the US dollar, where k denotes the maturity of the government bonds in months. A

positive value of $\Delta s_{i,t,t+k}$ indicates an appreciation of the U.S. dollar. $i^*_{i,t,k}$ is the logarithm of one plus the k period yield on the foreign government bonds at time t, with $i^*_{i,t,k}$ similarly denoting the corresponding U.S. government bonds yiled. $\delta_{i,\kappa}$ is a constant term in the country-specific regressions and the fixed effect in the panel regressions.

Table 4 reports panel estimation results. Table 5 also reports results for Italy and Greece, compared to Germany, where the exchange rate is the Euro but the interest rate differentials are country-specific. Several findings emerge from the analysis. Some of these results, to the best of our knowledge, are novel and have not been previously highlighted in the literature. In contrast, others align with the existing findings, providing support for our empirical approach and indicating that the results are not driven by the specific details of our analysis.

Table 4: Pooled regressions

	3M	1Y	2Y	3Y	5Y	7Y	10Y
G10	-0.330	-0.418	-0.193	-0.086^{*}	0.179	0.882	0.446
	(1.097)	(1.067)	(0.859)	(0.661)	(0.879)	(0.762)	(0.569)
G9	-0.330	-0.365	-0.113	0.008	0.0336	1.059	0.932
	(1.08)	(1.077)	(0.827)	(0.636)	(0.846)	(0.699)	(0.527)
EM14	0.394	-0.284^{***}	-0.535^{***}	-0.517^{**}	-0.310^{***}	-0.386^{***}	-0.586^{***}
	(0.891)	(0.401)	(0.250)	(0.180)	(0.175)	(0.144)	(0.0974)
EM10	0.315	-0.566^{***}	-0.811^{***}	-0.753^{**}	-0.515^{***}	-0.517^{***}	-0.748^{***}
	(0.864)	(0.518)	(0.299)	(0.242)	(0.281)	(0.316)	(0.189)

The table reports panel estimation results for (1), with Driscoll and Kraay (1998) standard errors in parentheses. Note: *, **, *** indicates that we can reject the null hypothesis that beta equals unity with 10%, 5%, and 1% significance levels.

Table 5: Country-specific regressions for Greece and Italy

	3M	**1Y**	**2Y**	**3Y**	**5Y**	**7Y**	**10Y**
GRC	-0.064^{***}	-0.020^{***}	-0.024^{***}	-0.116^{***}	-0.169^{***}	-0.082^{***}	
	(0.043)	(0.026)	(0.061)	(0.069)	(0.074)	(0.058)	
ITA	0.361	-0.0745	-0.459^{***}	-0.954^{***}	-0.869^{***}	-0.898^{***}	-0.630^{***}
	(1.284)	(0.925)	(0.572)	(0.421)	(0.318)	(0.273)	(0.268)
GER	-0.347	-0.302	-0.153	-0.214	-0.318	0.133	-0.733***
	(1.416)	(1.229)	(1.091)	(0.789)	(0.968)	(1.063)	(0.587)

The table reports country-specific estimation results for Equation (1), for Greece, Italy and Germany, with the standard errors adjusted for the serial correlation of order k-1. Note: *, **, *** shows that we can reject the null hypothesis that beta equals unity with 10%, 5%, and 1% significance level. "GER" reports the results for "EUR" in country-specific regressions.

Result 1. At the 3M maturity, UIP regression coefficients for EM10 and G10 countries have opposite signs, consistent with previous findings in the literature. However, due to the large standard errors, UIP cannot be rejected for either group. Additionally, the random walk hypothesis

for the exchange rate cannot be rejected.

Result 2. For maturities of 1Y and 2Y, for both EM10 and G10 countries, the coefficient on the interest rate differential has the wrong sign, suggesting that currencies with higher interest rates tend to appreciate. This anomaly is well-documented in the literature and is known as the forward premium puzzle.

Result 3. At the long end of the yield curve, the UIP regression coefficient G10 countries increases, turning positive at the 5Y horizon and approaching unity at the 7Y horizon, where we cannot reject the unitary hypothesis. This is consistent with the literature suggesting that UIP tends to hold over long horizons. However, the standard errors remain very large.

One puzzling observation from Table 4 is the hump-shaped relationship in the term structure of UIP deviations for G10 currencies. Specifically, the UIP coefficient declines at the 10Y horizon having a peak around unity at the 7Y horizon. However, the pattern is primarily driven by Norway, which we discussed earlier. Excluding Norway from the G10 sample results in an estimated coefficient that remains positive, close to unity, and exhibits slightly smaller standard errors.

Result 4. In the case of EM10 and EM14, the UIP coefficient is negative for all maturities longer than 3M, and the null hypothesis of a beta equal to one is rejected for all maturities except 3M, with much smaller standard errors than in G10 countries.

Result 5. For comparison, Table 5 reports the same estimation results for Greece, Italy, and Germany, which represents the Euro in Table 4. These regressions use the Euro/Dollar exchange and country-specific interest rates. Both Greece and Italy display a term structure of UIP deviations that is monotonically increasing as the EM10 or EM14 groups. This similarity is remarkable, particularly given Italy's recurring debt sustainability concerns and Greece's sovereign default during the European debt crisis.

Result 6. Tables 3A to 9A in the Appendix, report the country-specific results for each maturity. The tables also compare the pooled fixed effect estimate with the average estimated coefficient, which is not sensitive to the magnitude of the coefficient heterogeneity across countries. While there is considerable heterogeneity among individual country estimates, this heterogeneity does not appear to distort the pooled estimates, which are close to the average country-specific coefficients for all maturities except the 3M horizon.

4 Long-run UIP and sovereign risk: a no-arbitrage framework

In this section, we introduce a no-arbitrage asset pricing framework with incomplete markets to interpret our results and guide further empirical analysis in the next section. The model builds on Du and Schreger (2016) and Jiang et al. (2021) and introduces sovereign credit risk and convenience yield differentials in the standard exchange rate determination equation as in Froot and Ramadorai (2005) and Clarida and Taylor (1997). We consider both credit risk and convenience yield as we want to compare AEs and EMs in our empirical analysis. We first derive the model for one-period bonds. Next, we determine the term premium in a multi-period bond setting. Finally, we derive the exchange rate determination equation and the foreign exchange risk premium in the multi-period setting.

4.1 Single period bonds

Consider any country in our sample, the representative foreign economy (*), and the United States ($). Representative investors in each country trade zero-coupon government bonds with different maturities $k = 1, 2, 3, ..., \infty$ issued by the foreign and the U.S. economy. S_t denotes the nominal exchange rate in foreign currency units per U.S. dollar, so an increase is a depreciation (or a dollar appreciation). We denote with $y_t^{\$}$ the nominal (promised) yield on a one-period zero-coupon U.S. treasury bond denominated in US dollars, assumed to be risk-free. Similarly, y_t^* is the nominal yield on a one-period zero coupon foreign government bond denominated in foreign currency.

Foreign bonds are potentially subject to credit risk. Following Du and Schreger (2016) among several others in the literature, credit or default risk on foreign bonds is introduced by adding a loss-to-default component $L_{t+1}^{*,i}$ with $i = *, \$$ to the foreign bond yield, where $L_{t+1}^{*,i} = 0$ if there is no default and $L_{t+1}^{*,i} < 0$ when default materializes. For simplicity, we assume that default risk is not investor-specific.[2] Thus, $L_{t+1}^{*,*} = L_{t+1}^{*,\$} = L_{t+1}^*$, and the pecuniary yield on the foreign bond is $y_t^* + L_{t+1}^*$.

In addition to receiving a pecuniary return at maturity in local currency units, home and

[2]Different investors' perceptions of sovereign credit risk can be incorporated, allowing for selective default, where the sovereign defaults on the foreigners but not the home investors, but would deter for clarity of exposition.

foreign investors earn a non-pecuniary return or convenience yield from investing in sovereign bonds. As in Jiang et al. (2021), we denote the convenience yield attached by investor i to the bond issued by country j as $\lambda_t^{j,i}$.

Now denote the stochastic discount factors (SDFs) for the U.S. and foreign investors $M_t^{\$}$ and M_t^*, respectively. With these definitions and assumptions, the Euler equations for foreign and U.S. investors are, respectively, given by:

$$\mathbb{E}_t\left(M_{t+1}^* e^{y_t^* + L_{t+1}^*}\right) = e^{-\lambda_t^{*,*}} \tag{2}$$

$$\mathbb{E}_t\left(M_{t+1}^* \frac{S_{t+1}}{S_t} e^{y_t^{\$}}\right) = e^{-\lambda_t^{\$,*}} \tag{3}$$

$$\mathbb{E}_t\left(M_{t+1}^{\$} e^{y_t^{\$}}\right) = e^{-\lambda_t^{\$,\$}} \tag{4}$$

$$\mathbb{E}_t\left(M_{t+1}^{\$} \frac{S_t}{S_{t+1}} e^{y_t^* + L_{t+1}^*}\right) = e^{-\lambda_t^{*,\$}} \tag{5}$$

To invest across borders, investors must first convert their own currency into the one in which bonds are denominated, purchase the bonds, and finally convert the proceedings from the maturing zero-coupon bonds back into their currency at time $t+1$. Therefore, the exchange rate enters equation (3) and (5).

Given Equations (2) and (3), by assuming no arbitrage and log-normality, we can obtain a relationship between exchange rate, interest rate differentials, convenience yields, and sovereign credit risk. Denoting $m_t^* = log(M_t^*)$ and $\Delta s_{t+1} = log(S_{t+1}) - log(S_t)$ we have:

$$\mathbb{E}_t\left(m_{t+1}^*\right) + y_t^* + \mathbb{E}_t\left(L_{t+1}^*\right) + \frac{1}{2}\operatorname{var}_t\left(L_{t+1}^*\right) + \frac{1}{2}\operatorname{var}_t\left(m_{t+1}^*\right) + \operatorname{cov}_t\left(m_{t+1,1}^* L_{t+1}^*\right) + \lambda_t^{*,*} = 0 \tag{6}$$

$$\mathbb{E}_t\left(m_{t+1}^*\right) + y_t^{\$} + \mathbb{E}_t\left(\Delta s_{t+1}\right) + \frac{1}{2}\operatorname{var}_t\left(m_{t+1}^*\right) + \frac{1}{2}\operatorname{var}_t\left(\Delta s_{t+1}\right) + \operatorname{cov}_t\left(m_{t+1}^*, \Delta s_{t+1}\right) + \lambda_t^{\$,*} = 0 \tag{7}$$

where $RP_t^* = -\operatorname{cov}_t\left(m_{t+1}^*, \Delta s_{t+1}\right)$ and $CP_t^* = -\operatorname{cov}_t\left(m_{t+1}^*, L_{t+1}^*\right)$ are the level exchange rate risk premium and credit risk premium required by foreign investors, respectively. Similarly, from Equations (4) and (5), we have:

$$\mathbb{E}_t\left(m_{t+1}^{\$}\right) + y_t^{\$} + \frac{1}{2}\operatorname{var}_t\left(m_{t+1}^{\$}\right) + \lambda_t^{\$,\$} = 0 \tag{8}$$

$$\mathbb{E}_t\left(m_{t+1}^{\$}\right)+\frac{1}{2}\operatorname{var}_t\left(m_{t+1}^{\$}\right)-\mathbb{E}_t\left(\Delta s_{t+1}\right)+\frac{1}{2}\operatorname{var}_t\left(\Delta s_{t+1}\right)+y_t^*+\mathbb{E}_t\left(L_{t+1}^*\right)+\frac{1}{2}\operatorname{var}_t\left(L_{t+1}^*\right) \tag{9}$$

$$+\operatorname{cov}_t\left(m_{t+1}^{\$},L_{t+1}^*\right)+\operatorname{cov}_t\left(-\Delta s_{t+1},m_{t+1}^{\$}\right)+\operatorname{cov}_t\left(-\Delta s_{t+1},L_{t+1}^*\right)+\lambda_t^{*,\$}=0$$

where $RP_t^{\$}=-\operatorname{cov}_t\left(m_{t+1}^{\$},-\Delta s_{t+1}\right)$, $CP_t^{\$}=-\operatorname{cov}_t\left(m_{t+1}^{\$},L_{t+1}^*\right)$ are the level exchange rate risk premium and credit risk premium required by U.S. investors, respectively. $q_t=-\operatorname{cov}_t\left(-\Delta s_{t+1},L_{t+1}^*\right)$ is the so-called "quanto" term that prices the risk of "twin defaults," i.e., the risk that the foreign currency depreciates when the foreign country also defaults.[3] We further define log currency risk premia, log credit risk premia for foreign and U.S. investors as $rp_t^*=-\operatorname{cov}_t\left(m_{t+1}^*,\Delta s_{t+1}\right)-\frac{1}{2}\operatorname{var}_t\left(\Delta s_{t+1}\right)$, $rp_t^{\$}=-\operatorname{cov}_t\left(m_{t+1}^*,-\Delta s_{t+1}\right)-\frac{1}{2}\operatorname{var}_t\left(\Delta s_{t+1}\right)$, $cp_t^*=-\operatorname{cov}_t\left(m_{t+1}^*,L_{t+1}^*\right)-\frac{1}{2}\operatorname{var}_t\left(L_{t+1}^*\right)$, $cp_t^{\$}=-\operatorname{cov}_t\left(m_{t+1}^{\$},L_{t+1}^*\right)-\frac{1}{2}\operatorname{var}_t\left(L_{t+1}^*\right)$, respectively.

Next, combining (6) with (7) and (8) with (9), we obtain the following two no-arbitrage relationships for foreign and U.S. investors, respectively:

$$\begin{gathered}y_t^{\$}-y_t^*+\mathbb{E}_t\left(\Delta s_{t+1}\right)-\mathbb{E}_t\left(L_{t+1}^*\right)+\frac{1}{2}\operatorname{var}\left(\Delta s_{t+1}\right)-\frac{1}{2}\operatorname{var}_t\left(L_{t+1}^*\right)+\operatorname{cov}_t\left(m_{t+1}^*,\Delta s_{t+1}\right)\\-\operatorname{cov}_t\left(m_{t+1}^*,L_{t+1}^{*,*}\right)=-\left(\lambda_t^{\$,*}-\lambda_t^{*,*}\right)\end{gathered} \tag{10}$$

$$\begin{gathered}y_t^*-y_t^{\$}-\mathbb{E}_t\left(\Delta s_{t+1}\right)+\mathbb{E}_t\left(L_{t+1}^*\right)+\frac{1}{2}\operatorname{var}\left(\Delta s_{t+1}\right)+\frac{1}{2}\operatorname{var}_t\left(L_{t+1}^*\right)+\operatorname{cov}_t\left(m_{t+1}^{\$},L_{t+1}^*\right)\\+\operatorname{cov}_t\left(m_{t+1}^{\$},-\Delta s_{t+1}\right)+\operatorname{cov}_t\left(-\Delta s_{t+1},L_{t+1}^*\right)=\left(\lambda_t^{\$,\$}-\lambda_t^{*,\$}\right).\end{gathered} \tag{11}$$

Finally, by solving these last two equations for s_t and iterating forward, we have that the exchange rate must satisfy the following two conditions:

$$\begin{gathered}s_t=\mathbb{E}_t\sum_{\tau=0}^{\infty}\left(\lambda_{t+\tau}^{\$,*}-\lambda_{t+\tau}^{*,*}\right)+\mathbb{E}_t\sum_{\tau=0}^{\infty}\left(y_{t+\tau}^{\$}-y_{t+\tau}^*\right)+\mathbb{E}_t\sum_{\tau=0}^{\infty}cp_{t+\tau}^*-\mathbb{E}_t\sum_{\tau=0}^{\infty}rp_{t+\tau}^*\\+\mathbb{E}_t\left[\lim_{T\to\infty}s_{t+T}\right]-\mathbb{E}_t\left[\lim_{T\to\infty}L_{t+T}^*\right]\end{gathered} \tag{12}$$

$$\begin{gathered}s_t=\mathbb{E}_t\sum_{\tau=0}^{\infty}\left(\lambda_{t+\tau}^{\$,\$}-\lambda_{t+\tau}^{*,\$}\right)+\mathbb{E}_t\sum_{\tau=0}^{\infty}\left(y_{t+\tau}^{\$}-y_{t+\tau}^*\right)+\mathbb{E}_t\sum_{\tau=0}^{\infty}cp_{t+\tau}^{\$}+\mathbb{E}_t\sum_{\tau=0}^{\infty}rp_{t+\tau}^{\$}+\mathbb{E}_t\sum_{\tau=0}^{\infty}\mathrm{q}_{t+\tau}\\+\mathbb{E}_t\left[\lim_{T\to\infty}s_{t+T}\right]-\mathbb{E}_t\left[\lim_{T\to\infty}L_{t+T}^*\right].\end{gathered} \tag{13}$$

For example, Equation (12) says that the exchange rate is determined by convenience yield dif-

[3]This term only arises in the Euler equations of the U.S. investors as we assumed that the U.S. bond is risk-free.

ferentials, interest rate differentials, currency risk premia, as well as credit risk premia. Equation (13), also includes the quanto adjustment term. Equations (12) and (13) imply that an increase in credit risk depreciates the foreign currency. The quanto adjustment term in equation (13) captures the additional risk that can be induced by a positive covariance between the default risk and the currency depreciation when we consider the dollar return from the perspective of U.S. investors. If $\text{cov}_t\left(\Delta s_{t+1}, L^*_{t+1}\right) > 0$, which means that the times with high default risk are associated with foreign currency depreciation, then a larger positive covariance depreciates the foreign currency.

Equations (12) and (13) impose the following cross-country restriction on the foreign and U.S. investors' perception of the relative convenience of U.S. vs. foreign bonds, the log-risk premia, and the quanto adjustment term:

$$\left(\lambda_t^{\$,*} - \lambda_t^{*,*}\right) - \left(\lambda_t^{\$,\$} - \lambda_t^{*,\$}\right) = rp_t^* + rp_t^\$ - cp_t^* + cp_t^\$ + q_t. \tag{14}$$

Alternatively, assuming foreign bonds have no convenience yield, as we will do in the last part of our empirical analysis:

$$\left(\lambda_t^{\$,*}\right) - \left(\lambda_t^{\$,\$}\right) = rp_t^* + rp_t^\$ - cp_t^* + cp_t^\$ + q_t. \tag{15}$$

To interpret condition (13), consider the corresponding condition in Jiang et al. (2021):

$$\left(\lambda_t^{\$,*} - \lambda_t^{*,*}\right) - \left(\lambda_t^{\$,\$} - \lambda_t^{*,\$}\right) = rp_t^\$ + rp_t^*. \tag{16}$$

If the currency risk premia of foreign and U.S. investors are the same—i.e., $rp_t^* = -rp_t^\$$—then U.S. and foreign investors relative convenience yields will also agree. In our case, in which we also consider asymmetric credit risk, this also requires that U.S. and foreign investors have the same assessment of credit risk on foreign bonds, i.e., $cp_t^* = cp_t^\$$, and that $q_t = 0$, which is counterfactual. Alternatively, we can assume that the sum of all terms on the right-hand side of (15) cancels each out. This can be justified by the fact that the currency premium can be larger for foreign investors, while the credit risk premium could be larger for U.S. investors to accommodate for a positive quanto term and yet preserve the symmetric assessment of the relative convenience yield

on the LHS of the equation, which simplifies the rest of the analysis.

Next, following Jiang et al. (2021), we conjecture that an exchange rate process that satisfies all four of the Euler equations above has the following form:

$$\Delta s_{t+1} = m^{\$}_{t+1} - m^{*}_{t+1} + \eta_{t+1} + \lambda^{\$,\$}_{t} - \lambda^{\$,*}_{t} \tag{17}$$

where η_{t+1} is a wedge that can satisfy the necessary restrictions to enforce all Euler equations for bond investors. So we now must prove that we can recover Equations (12) and (13) by assuming that the exchange rate follows Equation (17), and Equation (14) is a valid assumption.

Consider the level version of Equation (17). Imposing convenience yield valuation symmetry as per Equation (14) above–i.e., $\left(\lambda^{\$,*}_{t} - \lambda^{*,*}_{t}\right) = \left(\lambda^{\$,\$}_{t} - \lambda^{*,\$}_{t}\right)$–and multiplying and dividing by L^{*}_{t+1}, we have:[4]

$$\frac{S_{t+1}}{S_t} = \frac{M^{\$}_{t+1}\mathrm{e}^{\lambda^{\$,\$}_{t}}}{M^{*}_{t+1}\mathrm{e}^{\lambda^{\$,*}_{t}}}\mathrm{e}^{\eta_{t+1}} = \frac{M^{\$}_{t+1}\mathrm{e}^{\lambda^{*,\$}_{t}}}{M^{*}_{t+1}\mathrm{e}^{\lambda^{*,*}_{t}}}\mathrm{e}^{\eta_{t+1}} = \frac{M^{\$}_{t+1}\mathrm{e}^{\lambda^{*,\$}_{t}+L^{*}_{t+1}}}{M^{*}_{t+1}\mathrm{e}^{\lambda^{**}_{t}+L^{*}_{t+1}}}\mathrm{e}^{\eta_{t+1}} \tag{18}$$

Next, imposing that home and foreign investors agree on the pricing of U.S. and foreign bonds and the convenience yield as in Equation (14) above, and the exchange rate satisfies the assumed process we have:

$$E_t\left(M^{\$}_{t+1}\mathrm{e}^{\lambda^{\$,\$}_{t}}\right) = E_t\left(M^{*}_{t+1}\frac{S_{t+1}}{S_t}\mathrm{e}^{\lambda^{\$,*}_{t}}\right) = E_t\left(M^{\$}_{t+1}\mathrm{e}^{\lambda^{\$,\$}_{t}}\mathrm{e}^{\eta_{t+1}}\right) = \mathrm{e}^{-y^{\$}_{t}} \tag{19}$$

$$E_t\left(M^{*}_{t+1}\mathrm{e}^{\lambda^{*,*}_{t}+L^{*}_{t+1}}\right) = E_t\left(M^{\$}_{t+1}\frac{S_t}{S_{t+1}}\mathrm{e}^{\lambda^{*,\$}_{t}+L^{*}_{t+1}}\right) = E_t\left(M^{*}_{t+1}\mathrm{e}^{\lambda^{\$,\$}_{t}+L^{*}_{t+1}}\mathrm{e}^{-\eta_{t+1}}\right) = \mathrm{e}^{-y^{*}_{t}} \tag{20}$$

The first and third equalities in Equations (19) and (20) follow from solving for $\mathrm{e}^{-y^{*}_{t}}$ and $\mathrm{e}^{-y^{\$}_{t}}$ from Euler equations (2) and (5) and (3) and (4), respectively. The second equality comes from Equation (18).

Assuming joint log-normality of the SDFs and η_{t+1}, Equations (19) and (20) imply that:

$$\mathrm{cov}_t\left(m^{\$}_{t+1}, \eta_{t+1}\right) = -\mathbb{E}_t\left(\eta_{t+1}\right) - \frac{1}{2}\mathrm{var}_t\left(\eta_{t+1}\right) \tag{21}$$

[4]This last step allows us to second equality in Equation (19), which provides an equivalent condition to Equation (20) for foreign bonds that are subject to credit risk.

$$\operatorname{cov}_t\left(m_{t+1}^*, \eta_{t+1}\right) = -\mathbb{E}_t\left(\eta_{t+1}\right) + \frac{1}{2}\operatorname{var}_t\left(\eta_{t+1}\right) - \operatorname{cov}_t\left(\eta_{t+1}, L_{t+1}^*\right) \tag{22}$$

Rearranging and taking expectations in Equation (17) we have:

$$s_t = -\mathbb{E}_t\left[m_{t+1}^{\$}\right] + \mathbb{E}_t\left[m_{t+1}^*\right] - \mathbb{E}_t\left[\eta_{t+1}\right] - \lambda_t^{\$,\$} + \lambda_t^{\$,*} + \mathbb{E}_t s_{t+1} \tag{23}$$

To derive expressions for $\mathbb{E}_t\left(m_{t+1}^*\right)$ and $\mathbb{E}_t\left(m_{t+1}^{\$}\right)$, recall that

$$E_t\left(M_{t+1}^{\$}\mathrm{e}^{\lambda_t^{\$,\$}}\right) = \mathrm{e}^{-y_t^{\$}} \tag{24}$$

$$E_t\left(M_{t+1}^*\mathrm{e}^{\lambda_t^{*,*}+L_{t+1}^*}\right) = \mathrm{e}^{-y_t^*}, \tag{25}$$

which yield:

$$\mathbb{E}_t\left[m_{t+1}^{\$}\right] = -y_t^{\$} - \frac{1}{2}\operatorname{var}_t\left[m_{t+1}^{\$}\right] - \lambda_t^{\$,\$} \tag{26}$$

$$\mathbb{E}_t\left[m_{t+1}^*\right] = -y_t^* - \frac{1}{2}\operatorname{var}_t\left[m_{t+1}^*\right] - \lambda_t^{*,*} - \frac{1}{2}\operatorname{var}_t\left[L_{t+1}^{*,*}\right] - \mathbb{E}_t\left(L_{t+1}^*\right) - \operatorname{cov}_t\left(m_{t+1}^*, L_{t+1}^*\right). \tag{27}$$

Therefore, Equation (23) becomes:

$$\begin{aligned} s_t = \left(y_t^{\$} - y_t^*\right) + \left(\lambda_t^{\$,*} - \lambda_t^{*,*}\right) + \frac{1}{2}\left[\operatorname{var}_t\left(m_{t+1}^{\$}\right) - \operatorname{var}_t\left(m_{t+1}^*\right) - \mathbb{E}_t\left[\eta_{t+1}\right]\right] \\ - \left[\operatorname{cov}_t\left(m_{t+1}^*, L_{t+1}^*\right) + \frac{1}{2}\operatorname{var}_t\left[L_{t+1}^*\right]\right] - \mathbb{E}_t\left(L_{t+1}^*\right) + \mathbb{E}_t s_{t+1} \end{aligned} \tag{28}$$

Note now that, as long as the incomplete market wedge satisfies the following restrictions:

$$\operatorname{cov}_t\left(m_{t+1}^{\$}, \eta_{t+1}\right) = -E_t\left(\eta_{t+1}\right) - \frac{1}{2}\operatorname{var}_t\left(\eta_{t+1}\right) \tag{29}$$

$$\operatorname{cov}_t\left(m_{t+1}^*, \eta_{t+1}\right) = -E_t\left(\eta_{t+1}\right) + \frac{1}{2}var_t\left(\eta_{t+1}\right) \tag{30}$$

We have that $\frac{1}{2}\left[\operatorname{var}_t\left(m_{t+1}^*\right) - \operatorname{var}_t\left(m_{t+1}^{\$}\right)\right] + \mathbb{E}_t\left[\eta_{t+1}\right] = rp_t^*$,

while $-\left[\operatorname{cov}_t\left(m_{t+1}^*, L_{t+1}^*\right) + \frac{1}{2}\operatorname{var}_t\left[L_{t+1}^*\right]\right] = cp_t^*$.

Finally, iterating forward Equation (28), we can recover the same exchange rate determination

equation given in (12) for foreign investors:

$$s_t = \mathbb{E}_t \sum_{\tau=0}^{\infty} \left(\lambda_{t+\tau}^{\$,*} - \lambda_{t+\tau}^{*,*} \right) + \mathbb{E}_t \sum_{\tau=0}^{\infty} \left(y_{t+\tau}^{\$} - y_{t+\tau}^{*} \right) + \mathbb{E}_t \sum_{\tau=0}^{\infty} cp_{t+\tau}^{*} - \mathbb{E}_t \sum_{\tau=0}^{\infty} rp_{t+\tau}^{*} + \mathbb{E}_t \left[\lim_{T \to \infty} s_{t+T} \right] - \mathbb{E}_t \left[\lim_{T \to \infty} L_{t+T}^{*} \right] \tag{31}$$

4.2 Multi-period bonds

To speak to long-run Uncovered Interest Parity (UIP) deviations, we need to move to a multi-period bond setting. To do this, we first derive a relationship between short-term and long-term rates and the bond term premium. We then link the exchange rate to long-term rates and the term premium via short rates.

Consider the following two Euler equations for a single-period and a multi-period foreign bonds held for one period by a foreign investor, respectively:

$$e^{-\lambda_t^{*,*(1)}} = \mathbb{E}_t \left[M_{t+1}^{*} e^{y_t^{*(1)} + L_{t+1}^{*}} \right] \tag{32}$$

$$e^{-\lambda_t^{*,*(n)}} = \mathbb{E}_t \left[M_{t+1}^{*} \frac{e^{n\left(y_t^{*(n)} + L_{t+1}^{*}\right)}}{e^{(n-1)\left(y_{t+1}^{*(n-1)} + L_{t+2}^{*}\right)}} e^{-\lambda_{t+1}^{*,*(n-1)}} \right] \tag{33}$$

where $y_t^{*(n)}$ denotes the nominal yield on a n-period zero coupon foreign government bond denominated in foreign currency. Taking logarithms and assuming normality, we have:

$$-\lambda_t^{*,*(1)} = \mathbb{E}_t \left(m_{t+1}^{*} \right) + \frac{1}{2} \operatorname{var}_t \left(m_{t+1}^{*} \right) + \mathbb{E}_t \left(L_{t+1}^{*} \right) + \frac{1}{2} \operatorname{var}_t \left(L_{t+1}^{*} \right) + \operatorname{cov}_t \left(m_{t+1}^{*}, L_{t+1}^{*} \right) \tag{34}$$

$$\begin{aligned} -\lambda_t^{*,*(n)} = {} & \mathbb{E}_t \left(m_{t+1}^{*} \right) + \frac{1}{2} \operatorname{var}_t \left(m_{t+1}^{*} \right) + n y_t^{*,(n)} + \mathbb{E}_t \left[n L_{t+1}^{*} - (n-1) L_{t+2}^{*} \right] - \mathbb{E}_t \left[\lambda_{t+1}^{*,*(n-1)} \right] \\ & - (n-1) \mathbb{E}_t \left(y_{t+1}^{*(n-1)} \right) + n^2 \operatorname{var}_t \left(L_{t+1}^{*} \right) + (n-1)^2 \operatorname{var}_t \left(L_{t+2}^{*} \right) \\ & + (n-1)^2 \operatorname{var}_t \left(y_{t+1}^{*(n-1)} \right) + \operatorname{var}_t \left(\lambda_{t+1}^{*,*(n-1)} \right) + n \operatorname{cov}_t \left(m_{t+1}^{*}, L_{t+1}^{*} \right) \\ & - \operatorname{cov}_t \left(m_{t+1}^{*}, \lambda_{t+1}^{*,*(n-1)} \right) - (n-1) \left[\operatorname{cov}_t \left(m_{t+1}^{*}, y_{t+1}^{*(n-1)} \right) + \operatorname{cov}_t \left(m_{t+1}^{*}, L_{t+2}^{*} \right) \right] \\ & + (n-1) \left[\operatorname{cov}_t \left(\lambda_{t+1}^{*,*(n-1)}, y_{t+1}^{*(n-1)} \right) + \operatorname{cov}_t \left(\lambda_{t+1}^{*,*(n-1)}, L_{t+2}^{*} \right) \right] \\ & + (n-1)^2 \operatorname{cov}_t \left(y_{t+1}^{*(n-1)}, L_{t+2}^{*} \right) - n(n-1) \operatorname{cov} \left(y_{t+1}^{*(n-1)}, L_{t+1}^{*} \right) \\ & - n(n-1) \operatorname{cov}_t \left(L_{t+2}^{*}, L_{t+1}^{*} \right) - n \operatorname{cov}_t \left(L_{t+1}^{*}, \lambda_{t+1}^{*,*(n-1)} \right) \end{aligned} \tag{35}$$

Now define the holding period return of an n period bond for a single period as

$$h^*_{n,t+1} = ny_t^{*(n)} + nL^*_{t+1} - (n-1)y_{t+1}^{*(n-1)} - (n-1)L^*_{t+2} + \lambda_t^{*,*(n)} - \lambda_{t+1}^{*,*(n-1)} \tag{36}$$

and $hy^*_{n,t+1}$ the difference between $h^*_{n,t+1}$ and the return to holding a single period bond:

$$\begin{aligned} hy^*_{n,t+1} &= h^*_{n,t+1} - \left(y_t^{*(1)} + L^*_{t+1} + \lambda_t^{*,*(1)}\right) \\ &= n\left(y_t^{*(n)} - y_t^{*(1)}\right) - (n-1)\left[L^*_{t+2} - L^*_{t+1} - \left(y_{t+1}^{*(n-1)} + y_t^{*(1)}\right)\right] \\ &\quad + \left(\lambda_t^{*,*(n)} - \lambda_t^{*,*(1)}\right) - \lambda_{t+1}^{*,*(n-1)}. \end{aligned} \tag{37}$$

It follows that:

$$\begin{aligned} \mathrm{var}_t\left(hy_{n,t+1}\right) &= (n-1)^2\left[\mathrm{var}_t\left(\Delta L^*_{t+2}\right) + \mathrm{var}_t\left(y_{t+1}^{*(n-1)}\right) + \mathrm{var}_t\left(\lambda_{t+1}^{*,*(n-1)}\right)\right. \\ &\quad +2(n-1)^2\,\mathrm{cov}_t\left(\Delta L^*_{t+2}, y_{t+1}^{*(n-1)}\right) + 2(n-1)\,\mathrm{cov}_t\left(\Delta L^*_{t+2}, \lambda_{t+1}^{*,*(n-1)}\right) \\ &\quad \left. +2(n-1)\,\mathrm{cov}_t\left(y_{t+1}^{*(n-1)}, \lambda_{t+1}^{*,*(n-1)}\right)\right] \end{aligned} \tag{38}$$

$$\begin{aligned} &\mathrm{cov}_t\left(hy_{n,t+1}, m^*_{t+1}\right) \\ &= -(n-1)\,\mathrm{cov}_t\left(m^*_{t+1}, \Delta L^*_{t+2}\right) - (n-1)\,\mathrm{cov}_t\left(m^*_{t+1}, y_{t+1}^{*(n-1)}\right) \\ &\quad - \mathrm{cov}_t\left(m^*_{t+1}, \lambda_{t+1}^{*,*(n-1)}\right) \end{aligned} \tag{39}$$

$$\begin{aligned} &\mathbb{E}_t\left(hy_{n,t+1}\right) = ny_t^{*(n)} - (n-1)\mathbb{E}_t\left(y_{t+1}^{*(n-1)}\right) - y_t^{*(1)} - (n-1)\mathbb{E}_t\left(\Delta L^*_{t+2}\right) \\ &+ \lambda_t^{*,*(n)} - \lambda_t^{*,*(1)} - \mathbb{E}_t\left(\lambda_{t+1}^{*,*(n-1)}\right) \end{aligned} \tag{40}$$

where $\Delta L^*_{t+2} = L^*_{t+2} - L^*_{t+1}$. Equation (35) can therefore be rewritten as:

$$
\begin{aligned}
&-\lambda_t^{*,*(n)} = \mathbb{E}_t\left(m^*_{t+1}\right) + n y_t^{*(n)} - (n-1)\mathbb{E}_t\left[y_{t+1}^{*(n-1)}\right] - (n-1)\mathbb{E}_t\left[\Delta L^*_{t+2}\right] + \mathbb{E}_t\left[L^*_{t+1}\right] \\
&-\mathbb{E}_t\left[\lambda_{t+1}^{*,*(n-1)}\right] + \operatorname{cov}_t\left(m^*_{t+1}, L^*_{t+1}\right) - (n-1)\operatorname{cov}_t\left(m^*_{t+1}, \Delta L^*_{t+2}\right) \\
&-(n-1)\operatorname{cov}_t\left(m^*_{t+1}, y_{t+1}^{*(n-1)}\right) - \operatorname{cov}_t\left(m^*_{t+1}, \lambda_{t+1}^{*,*(n-1)}\right) \\
&+(n-1)^2\operatorname{cov}_t\left(y_{t+1}^{*(n-1)}, \Delta L^*_{t+2}\right) - (n-1)\operatorname{cov}_t\left(y_{t+1}^{*(n-1)}, L^*_{t+1}\right) \\
&+(n-1)\operatorname{cov}_t\left(y_{t+1}^{*(n-1)}, \lambda_{t+1}^{*,*(n-1)}\right) - (n-1)\operatorname{cov}_t\left(\Delta L^*_{t+2}, L^*_{t+1}\right) \\
&+(n-1)\operatorname{cov}_t\left(\Delta L^*_{t+2}, \lambda_{t+1}^{*,*(n-1)}\right) - \operatorname{cov}_t\left(\lambda_{t+1}^{*,*(n-1)}, L^*_{t+1}\right) \\
&+\frac{(n-1)^2}{2}\left[\operatorname{var}_t\left(y_{t+1}^{*(n-1)}\right) + \operatorname{var}_t\left(\Delta L^*_{t+2}\right)\right] + \frac{1}{2}\operatorname{var}_t\left(L^*_{t+1}\right) + \frac{1}{2}\operatorname{var}_t\left(\lambda_{t+1}^{*,*(n-1)}\right) \\
&+\frac{1}{2}\operatorname{var}_t\left(m^{*,*}_{t+1}\right)
\end{aligned}
\tag{41}
$$

Rearranging terms yields:

$$
\begin{aligned}
&n\left(y_t^{*(n)} - y_t^{*(1)}\right) \\
&\qquad = (n-1)\mathbb{E}_t\left[y_{t+1}^{*(n-1)} - y_t^{*(1)}\right] + (n-1)\mathbb{E}_t\left[\Delta L^*_{t+2}\right] + \left(\lambda_t^{*,*(1)} - \lambda_t^{*,*(n)}\right) \\
&\qquad + \mathbb{E}_t\left(\lambda_{t+1}^{*,*(n-1)}\right) + (n-1)\left[\operatorname{cov}_t\left(y_{t+1}^{*(n-1)}, L^*_{t+1}\right) + \operatorname{cov}_t\left(\Delta L^*_{t+2}, L^*_{t+1}\right)\right] \\
&\qquad + \operatorname{cov}_t\left(\lambda_{t+1}^{*,*(n-1)}, L^*_{t+1}\right) - \frac{1}{2}\operatorname{var}_t\left(hy^*_{n,t+1}\right) - \operatorname{cov}_t\left(hy^*_{n,t+1}, m^*_{t+1}\right)
\end{aligned}
\tag{42}
$$

where $\operatorname{cov}_t\left(hy^*_{n,t+1}, m^*_{t+1}\right) = tp_{t+1}^{*,*(n)}$ is the term premium on foreign bonds for foreign investors.

A similar relationship can be derived for U.S. bonds for U.S. investors. Recalling that U.S. bonds are risk-free, we have:

$$
e^{-\lambda_t^{\$,\$(1)}} = \mathbb{E}_t\left[M^{\$}_{t+1} e^{e_t^{\$(1)}}\right] \tag{43}
$$

$$
e^{-\lambda_t^{\$,\$(n)}} = \mathbb{E}_t\left[M^{\$}_{t+1}\frac{e^{n\left(y_t^{\$(n)}\right)}}{e^{(n-1)\left(y_{t+1}^{\$(n-1)}\right)}} e^{-\lambda_{t+1}^{\$,\$(n-1)}}\right] \tag{44}
$$

Following the same steps as for foreign investors, we can obtain:

$$
\begin{aligned}
y_t^{\$(n)} - y_t^{\$(1)} = &-\frac{1}{2n}\operatorname{var}_t\left(hy^{\$}_{n,t+1}\right) + \frac{n-1}{n}\mathbb{E}_t\left(y_{t+1}^{\$(n-1)} - y_{t+1}^{\$(1)}\right) + \frac{n-1}{n}\mathbb{E}_t\left[\Delta y_{t+1}^{\$(1)}\right] \\
&+\frac{1}{n}\mathbb{E}_t\left[\lambda_{t+1}^{\$,\$(n-1)}\right] + \frac{1}{n}\left[\lambda_t^{\$,\$(1)} - \lambda_t^{\$,\$(n)}\right] - \frac{1}{n}\operatorname{cov}_t\left(m^{\$}_{t+1}, hy^{\$}_{n,t+1}\right)
\end{aligned}
\tag{45}
$$

where

$$h^{\$}_{n,t+1} = n y^{\$(n)}_t - (n-1) y^{\$(n-1)}_{t+1} + \lambda^{\$,\$(n)}_t - \lambda^{\$,\$(n-1)}_{t+1} \tag{46}$$

$$hy^{\$}_{n,t+1} = h^{\$}_{n,t+1} - \left(y^{\$(1)}_t + \lambda^{*,*(1)}_t \right) \tag{47}$$

$$\text{var}_t \left(hy^{\$}_{n,t+1} \right) = (n-1)^2 \text{var}_t \left(y^{\$(n-1)}_{t+1} \right) + \text{var}_t \left(\lambda^{\$,\$(n-1)}_{t+1} \right) + 2(n-1) \text{cov}_t \left(y^{*(n-1)}_{t+1}, \lambda^{*,*(n-1)}_{t+1} \right) \tag{48}$$

$$\text{cov}_t \left(m^{\$}_{t+1}, hy^{\$}_{n,t+1} \right) = -(n-1) \text{cov}_t \left(m^{\$}_{t+1}, y^{\$(n-1)}_{t+1} \right) - \text{cov}_t \left(m^{\$}_{t+1}, \lambda^{\$,\$(n-1)}_{t+1} \right). \tag{49}$$

Now, defining $tp^{\$,\$(n)}_{t+1} = -\text{cov}_t \left(m^{\$}_{t+1}, hy^{\$}_{n,t+1} \right)$ the term premium for U.S bonds for U.S. investors and combining (45)-(49), we obtain the following expression for $y^{\$(1)}_t - y^{*(1)}_t$:

$$\begin{aligned} y^{\$(1)}_t - y^{*(1)}_t =& n \left(y^{s(n)}_t - y^{*(n)}_t \right) + \left[\left(\lambda^{*,*(1)}_t - \lambda^{*,*(n)}_t \right) - \left(\lambda^{\$,\$(1)}_t - \lambda^{\$,\$(n)}_t \right) \right] \\ & - (n-1) \mathbb{E}_t \left[y^{\$(n-1)}_{t+1} - y^{*(n-1)}_{t+1} \right] + \mathbb{E}_t \left[\lambda^{*,*(n-1)}_{t+1} - \lambda^{\$,\$(n-1)}_{t+1} \right] + (n-1) \mathbb{E}_t \left(\Delta L^{*,*}_{t+2} \right) \\ & - \left[tp^{\$,\$}_t - tp^{*,*}_t \right] + \frac{1}{2} \left[\text{var}_t \left(hy^{s}_{n,t+1} \right) - \text{var}_t \left(hy^{*}_{n,t+1} \right) \right] \\ & + (n-1) \left[\text{cov}_t \left(y^{*(n-1)}_{t+1}, L^{*}_{t+1} \right) + \text{cov}_t \left(\Delta L^{*}_{t+2}, L^{*}_{t+1} \right) \right] \\ & + \text{cov}_t \left(\lambda^{*,*(n-1)}_{t+1}, L^{*}_{t+1} \right) \end{aligned} \tag{50}$$

where $\Delta L^{*}_{t+2} = L^{*}_{t+2} - L^{*}_{t+1}$, and ignoring the Jensen's inequality $\text{var}_t \left(hy^{*}_{n,t+1} \right) - \text{var}_t \left(hy^{\$}_{n,t+1} \right)$, Equation (50) is simplified into:

$$\begin{aligned} y^{\$(1)}_t - y^{*(1)}_t =& n \left(y^{\$(n)}_t - y^{*(n)}_t \right) + \left[\left(\lambda^{*,*(1)}_t - \lambda^{*,*(n)}_t \right) - \left(\lambda^{\$,\$(1)}_t - \lambda^{\$,\$(n)}_t \right) \right] \\ & - (n-1) \mathbb{E}_t \left[y^{\$(n-1)}_{t+1} - y^{*(n-1)}_{t+1} \right] + \mathbb{E}_t \left[\lambda^{*,*(n-1)}_{t+1} - \lambda^{\$,\$(n-1)}_{t+1} \right] + (n-1) \mathbb{E}_t \left(\Delta L^{*}_{t+2} \right) \\ & - \left[tp^{\$,\$}_t - tp^{*,*}_t \right] + (n-1) \left[\text{cov}_t \left(y^{*(n-1)}_{t+1}, L^{*}_{t+1} \right) + \text{cov}_t \left(\Delta L^{*}_{t+2}, L^{*}_{t+1} \right) \right] \\ & + \text{cov}_t \left(\lambda^{*,*(n-1)}_{t+1}, L^{*}_{t+1} \right) \end{aligned} \tag{51}$$

Further assuming that $E_t \left(\lambda^{*,*(n-1)}_{t+1} - \lambda^{\$,\$(n-1)}_{t+1} \right) = 0$–i.e., there is no convenience yield if the bond is not held to maturity (Jiang, 2023), we obtain:

$$
\begin{aligned}
y_t^{\$(1)} - y_t^{*(1)} &= n\left(y_t^{\$(n)} - y_t^{*(n)}\right) + \left[\left(\lambda_t^{*,*(1)} - \lambda_t^{*,*(n)}\right) - \left(\lambda_t^{\$,\$(1)} - \lambda_t^{\$,\$(n)}\right)\right] \\
&- (n-1)\mathbb{E}_t\left[y_{t+1}^{\$(n-1)} - y_{t+1}^{*,(n-1)}\right] + (n-1)\mathbb{E}_t\left(\Delta \mathrm{L}_{t+2}^*\right) - \left[tp_t^{\$,\$} - tp_t^{*,*}\right] \\
&+ (n-1)\left[\mathrm{cov}_t\left(y_{t+1}^{*(n-1)}, L_{t+1}^*\right) + \mathrm{cov}_t\left(\Delta L_{t+2}^*, L_{t+1}^*\right)\right] \\
&+ \mathrm{cov}_t\left(\lambda_{t+1}^{*,*(n-1)}, L_{t+1}^*\right)
\end{aligned} \tag{52}
$$

where $(\lambda_t^{*,*(1)} - \lambda_t^{*,*(n)})$ and $(\lambda_t^{\$,\$(1)} - \lambda_t^{\$,\$(n)})$ captures the term structure of convenience yields. Finally, assuming a random walk process for the credit risk and that $\mathrm{cov}_t\left(y_{t+1}^{*(n-1)}, L_{t+1}^*\right) = \mathrm{cov}_t\left(\lambda_{t+1}^{*,*(1)}, L_{t+1}^*\right) = 0$, we have:

$$
\begin{aligned}
y_t^{\$(1)} - y_t^{*(1)} =& n\left(y_t^{\$(n)} - y_t^{*(n)}\right) + \left[\left(\lambda_t^{*,*(1)} - \lambda_t^{*,*(n)}\right) - \left(\lambda_t^{\$,\$(1)} - \lambda_t^{\$,\$(n)}\right)\right] \\
&- (n-1)\mathbb{E}_t\left[y_{t+1}^{\$(n-1)} - y_{t+1}^{*(n-1)}\right] + (n-1)\mathbb{E}_t\left(\Delta L_{t+2}^*\right) - \left[tp_t^{\$,\$} - tp_t^{*,*}\right].
\end{aligned} \tag{53}
$$

Imposing no-bubbles condition, i.e., $\mathbb{E}_t\left[\lim_{T\to\infty} s_{t+T}\right] = \bar{s}$ (Jiang, Krishnamurthy, Lustig, & Sun, 2024; Lustig et al., 2019), and assuming that $\mathbb{E}_t\left[\lim_{T\to\infty} L_{t+T}^*\right]$ goes to zero,[5] this equation permits us to rewrite Equation (12) as follows:

$$
\begin{aligned}
s_t = n\mathbb{E}_t\sum_{\tau=0}^{\infty}\left(y_{t+\tau}^{\$(n)} - y_{t+\tau}^{*(n)}\right) + \mathbb{E}_t\sum_{\tau=0}^{\infty}\left(\lambda_{t+\tau}^{\$,*} - \lambda_{t+\tau}^{*,*}\right) - \mathbb{E}_t\sum_{\tau=0}^{\infty} rp_{t+\tau}^* + \mathbb{E}_t\sum_{\tau=0}^{\infty} cp_{t+\tau}^* \\
+ \mathbb{E}_t\sum_{\tau=0}^{\infty}\left(tp_{t+\tau}^{*,*} - tp_{t+\tau}^{\$,\$}\right) + \mathbb{E}_t\sum_{\tau=0}^{\infty}\left[\left(\lambda_{t+\tau}^{*,*} - \lambda_{t+\tau}^{*,*(n)}\right) - \left(\lambda_{t+\tau}^{\$,\$} - \lambda_{t+\tau}^{\$,\$(n)}\right)\right] + \overline{s_t}
\end{aligned} \tag{54}
$$

or equivalently, Equation (13) as:

$$
\begin{aligned}
s_t = n\mathbb{E}_t\sum_{\tau=0}^{\infty}\left(y_{t+\tau}^{\$(n)} - y_{t+\tau}^{*(n)}\right) + \mathbb{E}_t\sum_{\tau=0}^{\infty}\left(\lambda_{t+\tau}^{\$,\$} - \lambda_{t+\tau}^{*,\$}\right) + \mathbb{E}_t\sum_{\tau=0}^{\infty} rp_{t+\tau}^{\$} + \mathbb{E}_t\sum_{\tau=0}^{\infty} cp_{t+\tau}^{\$} \\
+ \mathbb{E}_t\sum_{\tau=0}^{\infty}\left(tp_{t+\tau}^{*,*} - tp_{t+\tau}^{\$,\$}\right) + \mathbb{E}_t\sum_{\tau=0}^{\infty}\left[\left(\lambda_{t+\tau}^{*,*} - \lambda_{t+\tau}^{*,*(n)}\right) - \left(\lambda_{t+\tau}^{\$,\$} - \lambda_{t+\tau}^{\$,\$(n)}\right)\right] + \mathbb{E}_t\sum_{\tau=0}^{\infty} q_{t+\tau} + \overline{s_t}
\end{aligned} \tag{55}
$$

Equations (54) and (55) provide a framework through which we can interpret deviations from the LRUIP condition. If LRUIP holds, $s_t - \overline{s_t}$ must be equal to $n\mathbb{E}_t\sum_{\tau=0}^{\infty}\left(y_{t+\tau}^{\$(n)} - y_{t+\tau}^{*(n)}\right)$. However, (54) and (55) imply that LRUIP can fail because of several factors, including (i) relative convenience yields, (ii) FX risk premia, (iii) credit risk premia, (iv) relative term premia, (v) the relative term structure of convenience yields, and (vi) the quanto adjustment term. In particular,

[5] The assumption implies that the government will meet its obligations in the long run, and hence, the probability of default, from the perspective of risk-neutral investors, diminishes as the time horizon extends.

a higher credit risk premium, or quanto term in Equation (55) leads to more depreciated foreign currency.

5 Empirical Evidence

In this section, we examine the empirical implications of the model above, highlighting its significance for exchange rate dynamics and its importance in explaining LRUIP deviations. First, we present evidence that credit risk is a critical driver of exchange rate dynamics. To compare AEs with EMs, and for robustness, we also consider all other factors in Equations (54) and (55). Next, we show that augmenting the UIP regressions discussed in Section 3 with credit risk helps bring the coefficient on the long-run interest rate differential closer to unity, as implied by LRUIP.

5.1 Exchange rate dynamics

Given $\Delta s_{t+1} = (\mathbb{E}_{t+1} - \mathbb{E}_t)\, s_{t+1} + \mathbb{E}_t\left[\Delta s_{t+1}\right]$, our theory implies that innovations to exchange rate changes should be related to innovations to all the factors in Equation (54) :

$$\begin{aligned}
(\mathbb{E}_{t+1} - \mathbb{E}_t)\, s_{t+1} = &- (\mathbb{E}_{t+1} - \mathbb{E}_t) \sum_{\tau=1}^{\infty} \left(\lambda^{\$,*}_{t+\tau} - \lambda^{*,*}_{t+\tau}\right) + (\mathbb{E}_{t+1} - \mathbb{E}_t) \sum_{\tau=1}^{\infty} \left(y^{\$}_{t+\tau} - y^{*}_{t+\tau}\right) \\
&- (\mathbb{E}_{t+1} - \mathbb{E}_t) \sum_{\tau=1}^{\infty} rp^{*}_{t+\tau} + (\mathbb{E}_{t+1} - \mathbb{E}_t) \sum_{\tau=1}^{\infty} cp^{*}_{t+\tau} \\
&+ (\mathbb{E}_{t+1} - \mathbb{E}_t) \sum_{\tau=1}^{\infty} \left(tp^{*,*}_{t+\tau} - tp^{\$,\$}_{t+\tau}\right) \\
&+ (\mathbb{E}_{t+1} - \mathbb{E}_t) \sum_{\tau=1}^{\infty} \left[\left(\lambda^{*,*}_{t+\tau} - \lambda^{*,*(n)}_{t+\tau}\right) - \left(\lambda^{\$,\$}_{t+\tau} - \lambda^{\$,\$(n)}_{t+\tau}\right)\right] \\
&+ (\mathbb{E}_{t+1} - \mathbb{E}_t) \lim_{T\to\infty} s_{t+T} - (\mathbb{E}_{t+1} - \mathbb{E}_t) \lim_{T\to\infty} L^{*}_{t+T}
\end{aligned} \tag{56}$$

Following Corsetti et al. (2023) and Jiang et al. (2021) among others, we start by extracting innovations to the variables on the RHS of (56) by taking the residuals of the following regressions:

$$\Delta \overline{z}_t = \alpha + \beta_1 \overline{z}_{t-1} + \varepsilon^{z}_{t} \tag{57}$$

where z denotes a generic variable in Equation (56), and the overbar denotes the simple average across countries within country groups. We then run a battery of univariate regressions with the

one-month change in the exchange rate on the LHS and the estimated innovations on the RHS as follows:

$$\Delta\overline{s_t} = \delta_z \widehat{\epsilon_t}^z + \omega_{z,t}. \tag{58}$$

as well as a regression in which we include all variables at the same time:

$$\Delta\overline{s_t} = \delta_1 \widehat{\epsilon_t}^1 + \delta_2 \widehat{\epsilon_t}^2 + \delta_3 \widehat{\epsilon_t}^3 + ... + \omega_t. \tag{59}$$

We report precise definitions of all variables that we use in this part of the empirical analysis, their summary statistics, and sample variance-covariance matrices in the Appendix. We measure $\left(y_t^{\$(5y)} - y_t^{*(5y)}\right)$ with the 5-year interest rate differentials. The one-year convenience yield differential, $\lambda_t^{\$,*} - \lambda_t^{*,*}$, is measured with the treasury basis relative to the U.S., defined as:

$$x_t^{\text{tb}} = y_t^{\$} + \left(f_t^1 - s_t\right) - y_t^*. \tag{60}$$

with a more negative value (higher synthetic dollar) denoting dollar scarcity. In the case of EMs, the treasury basis is contaminated by credit risk (Du & Schreger, 2016; Gourinchas & Dao, 2023). To address this issue in a manner that is not dependent on the quality of the available data, here, we exclude the EMs' treasury basis from the computation of the average in (57).

Unfortunately, CDS spreads on local currency foreign bonds are not easily available. We measure credit risk, cp_t^*, with CDS spreads on countries' foreign currency bonds denominated in USD. This approach likely underestimates the significance of credit risk, as these CDS spreads do not account for the probability of twin defaults. To address this limitation, we conduct robustness checks using long-term credit rating data on local currency debt from S&P.

We measure the term premium differential, $\left(tp_t^{*,*} - tp_t^{\$,\$}\right)$ with the difference between the foreign and U.S. term premium (5-year and 1-year bond yields), where foreign term premium is "purified" of credit risk by subtracting the CDS spread of the corresponding maturity. Similarly, we measure term structure of the convenience yield, $\left[\left(\lambda_{t+\tau}^{*,*} - \lambda_{t+\tau}^{*,*(n)}\right) - \left(\lambda_{t+\tau}^{\$,\$} - \lambda_{t+\tau}^{\$,\$(n)}\right)\right]$, by taking the difference between the 5-year and 1-year treasury basis with respect to the U.S.[6]

[6]It is also important to note that there is also an FX risk premium term (rp_t^*) on the right-hand side of Equation (56), which is also excluded in the analysis in Jiang et al. (2021). For robustness, we proxy the FX risk premium by averaging the residuals from the 3M UIP regressions for EMs and AEs separately, under the assumption that there is no credit risk in the short term. This term is omitted from the main text as incorporating this variable does

In general, there are three ways to estimate a typical country-group relationship: (i) averaging the data as in Equations (57)-(59), (ii) pooling the data as in the panel regressions in Section 3, or (iii) averaging country-specific times series regression coefficient. As the relationships we are interested in are contemporaneous, if cross-country heterogeneity is not too large, they should yield similar estimation results (Pesaran & Smith, 1995). In the two tables below, we report simple OLS regressions averaging the data. Pooled panel regression results, as in Section 3, give us similar and are reported in the Appendix.

Tables 6 and 7 report OLS estimation results, using monthly data from 2003m1 to 2020m1 for the G10 and EM10 group of currencies as in Section 3. The EM10 group excludes the Philippines and the G10 group excludes the United Kingdom due to CDS data availability.[7]

Table 6: Exchange rate changes and innovations to their drivers for AEs

	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta\left(y^{\$}-\bar{y}^{*}\right)$	1.068***					1.111***
	(0.205)					(0.295)
$\Delta\bar{x}^{\mathrm{tb}}$		-9.390***				-6.522***
		(1.797)				(1.569)
$\Delta\overline{cds}$			3.577***			2.122***
			(0.460)			(0.493)
$\Delta\left(\overline{tp^{*,*}-tp^{\$,\$}}\right)$				-1.169***		0.0166
				(0.196)		(0.259)
$\Delta\left(\overline{x^{\mathrm{tb,5y}}-x^{\mathrm{tb,1y}}}\right)$					-4.334***	-2.584***
					(0.638)	(0.646)
N	204	204	204	159	204	159
R^2	0.118	0.119	0.230	0.183	0.185	0.486

The table reports the coefficient estimates from equations (58) and (59) for advanced economies (AEs) with OLS standard errors. Note: *, **, *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

change the results, and the coefficient is found to be insignificant. The results are reported in the Appendix.

[7] The data is unbalanced. Hence, the group averages are calculated for each monthly observation, for the countries for which the data is available.

Table 7: Exchange rate changes and innovations to their drivers for EMs

	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta\left(y^{\$}-\bar{y}^{*}\right)$	-0.700***					-0.402**
	(0.129)					(0.191)
$\Delta\bar{x}^{\mathrm{tb,AE}}$		-9.874***				-4.865***
		(1.854)				(1.377)
$\Delta\overline{cds}$			1.728***			1.256***
			(0.115)			(0.188)
$\Delta\left(\overline{tp^{*,*}-tp^{\$,\$}}\right)$				-0.345**		-0.412**
				(0.156)		(0.203)
$\Delta\left(\overline{x^{\mathrm{tb,5y}}-x^{\mathrm{tb,1y}}}\right)$					-4.151***	-0.773
					(0.671)	(0.552)
N	204	204	204	204	204	204
R^2	0.127	0.123	0.528	0.023	0.159	0.574

The table reports the coefficient estimates from equations (58) and (59) for emerging markets (EMs) with OLS standard errors. Note: *, **, *** indicate statistical significance at the 10%, 5% and 1% level, respectively. The treasury basis average excludes observations for EMs.

Several remarks are in order here. First, the coefficient on the interest rate differential innovations should be positive. We find a positive coefficient for the G10 currencies and a negative one for the EM10 currencies. This is consistent with the evidence in AEs that exchange rates are more likely to be driven by autonomous changes in monetary policy, where an interest rate increase is associated with currency appreciation. In contrast, in EMs, the negative coefficient suggests a "leaning against the wind" type of policy, where interest rates are raised in response to currency depreciation.

Second, the coefficient on the innovations to treasury basis and its term structure have the expected negative signs and comparable magnitudes in both G10 and EM10 groups. Currencies should depreciate vis-a-vis the U.S. dollar i.e., an increase in s, when the convenience yield on U.S. bonds or the dollar increases.[8]

Third, and more surprisingly, credit risk turns out to affect both the G10 and the EM10 group of currencies in a statistically significant manner and in the expected direction, with higher credit risk leading to more depreciated currencies. In the G10 group, this might be driven by Japan and the Euro Area countries, which have significantly lower average long-term credit ratings compared to all other countries.[9] The bigger magnitude of the coefficient in the G10 group is misleading

[8] This is captured by a more negative treasury basis, the opposite sign than in the data of Du, Im, and Schreger (2020) as defined in Equation (60).

[9] Japan's average S&P LT rating on local currency bonds is A2-A3, compared to A1+ for most other countries. The average Euro Area country credit rating is A3-B, with only Germany and the Netherlands scoring an average

because, on average, CDS spreads are much higher in EMs than in AEs.[10] Therefore, credit risk can drive a significantly larger share of variance of the exchange rate in EMs than in AEs, as the R^2 of the two regressions shows.

Fourth, and similarly, the term premium also significantly affects the exchange rate in both groups of currencies, but it explains a much smaller share of the exchange rate variations in the EM10 group. Finally, the results are similar when we simultaneously enter all potential exchange rate drivers in the regression. The estimated coefficients reported in Column (6) of Tables 6 and 7 have the same sign and comparable magnitude to those obtained from the univariate regressions, except that the term premium innovations and the term structure of the convenience yield innovations lose statistical significance for the G10 and the EM10 currencies, respectively. We obtain very similar results when we estimate pooled panel regressions reported in the Appendix, with the only exception being that the term premium no longer appears significant in the EM10 group of currencies, while it explains the largest share of variance in the G10 currencies.

5.2 Augmented long-run UIP regressions

Once established that credit risk is an important source of exchange rate dynamics, we want to test the hypothesis that controlling for this factor, long-run UIP can no longer be rejected for EM10 currencies. To conduct this statistical test, we take two approaches. In the first specification, we rely on CDS data, and simply augment the standard UIP regression in Equation (1) with CDS spreads. In the second specification, we use data on credit ratings and interact the credit rating with the long-term interest rate differential. In both cases, the sample period is January 2000 to January 2020.

The estimated regression equations are as follows. First, with CDS data, we estimate:

$$\Delta s_{i,t,t+k} = \beta_{1,k}\left(i^*_{i,t,k} - i^{USD}_{i,t,k}\right) + \delta_{i,k} + \beta_{3,k} cds_{i,t,k} + \epsilon_{i,t,t+k} \tag{61}$$

where k is 5y and $cds_{i,t,k}$ denotes the logarithm of CDS spreads of country i at time t for the maturity of k. The data sources and descriptions are reported in the Appendix. Second, with

A1+ during the sample period.

[10] On average CDS spreads are 34 bps for AEs and 134 bps in EMs.

credit rating data, we estimate:

$$\Delta s_{i,t,t+k} = \beta_{1,k}\left(i^*_{i,t,k} - i^{USD}_{i,t,k}\right) + \beta_{2,k} c^{SP}_{i,t,LT} + \beta_{3,k} c^{SP}_{i,t,LT} * \left(i^*_{i,t,k} - i^{USD}_{i,t,k}\right) + \epsilon_{i,t,t+k} \tag{62}$$

where $c^{SP}_{i,t,LT}$ is the credit ratings for LT local currency bonds from S&P prevailing in month t.

Table 8: Augmented UIP regressions for EMs (5-year)

	(1)	(2)	(3)
$(i^*_{5y} - i^{USD}_{5y})$	-0.430***	0.725***	1.133***
	(0.0770)	(0.136)	(0.261)
cds_{5y}		-2.128***	
		(0.178)	
c^{SP}_{LT}			-0.008
			(0.0104)
$c^{SP}_{LT} * (i^*_{5y} - i^{USD}_{5y})$			-0.243***
			(0.0344)
$H_0 : \beta_1 = 1$	***	**	
N	1,455	1,340	1,446
R^2	0.021	0.090	0.074

The table reports the coefficient estimates from Equations (61) and (62) for emerging markets (EMs) for 5-year maturity, with bootstrapped standard errors. Note: *, **, *** indicates statistical significance at the 10%, 5% and 1% level, respectively.

Table 8 reports the estimation and test results for the EM10. Column (2) shows that once we control for CDS spreads, the coefficient on the interest rate differential turns positive and gets close to unity, although we can still reject the hypothesis that it is equal to one because of the tight standard errors. However, in column (2), the CDS spread enters with the wrong coefficient. The results are sharper in column (3), which reports the results from the estimation of the non-linear specification with credit ratings. The coefficient on the interest rate differential is positive and significant, and the data cannot reject the null hypothesis that it is equal to one. Interestingly, the interaction terms have a negative sign, suggesting that as credit rating moves closer to default (from A1+=1 to D=22, with an EM10 sample average close to 8), the total impact of the interest rate differential becomes progressively more negative, consistent with the rest of the evidence reported in the paper.

6 Conclusions

In this paper, we investigate the validity of long-run uncovered interest rate parity (UIP) for emerging market (EM) currencies. While prior studies establish that UIP holds for G10 currencies in the long run, we find that it does not hold for the ten most freely floating EM currencies (EM10) under the standard framework. However, when UIP regressions are augmented with measures of credit risk—such as credit default swaps (CDS) or interactions with country credit ratings—the coefficient on the interest rate differential approaches unity, and long-run UIP cannot be statistically rejected. Theoretically, we extend a no-arbitrage asset pricing framework with sovereign credit risk, and empirically, we show that credit risk significantly influences exchange rate dynamics, particularly in countries with weaker credit ratings. Our findings highlight the critical role of credit risk in reconciling UIP for EMs but also suggest that credit risk is an important ingredient in shaping currency behaviors for economies with less than stellar rating regardless of their level of market development.

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A Appendix

A.1 Data sources and descriptions

Table 1A: Data descriptions for Advanced Economies (AEs)

Cnt.	Var.	Ticker	Source	Sample	Definition	Unit of Measure	Transf.	Frequency	Mis. Val.
AUD	XR	AUD BGN Curncy	BLBG	2000m1-2023m12	AUSTRALIAN DOLLAR SPOT EXCHANGE RATE	1 AUD in USD	1/XR	M	
AUD	3M	C1273M Index	BLBG	2000m1-2023m12	BFV AUD AUSTRALIA SOVEREIGN 3 MO	%	log(1+y/100)	M	
AUD	1Y	C1271Y Index	BLBG	2000m1-2023m12	BFV AUD AUSTRALIA SOVEREIGN 1 YR	%	log(1+y/100)	M	
AUD	2Y	C1272Y Index	BLBG	2000m1-2023m12	BFV AUD AUSTRALIA SOVEREIGN 2 YR	%	log(1+y/100)	M	
AUD	3Y	C1273Y Index	BLBG	2000m1-2023m12	BFV AUD AUSTRALIA SOVEREIGN 3 YR	%	log(1+y/100)	M	
AUD	5Y	C1275Y Index	BLBG	2000m1-2023m12	BFV AUD AUSTRALIA SOVEREIGN 5 YR	%	log(1+y/100)	M	
AUD	7Y	C1277Y Index	BLBG	2000m1-2023m12	BFV AUD AUSTRALIA SOVEREIGN 7 YR	%	log(1+y/100)	M	
AUD	10Y	C12710Y Index	BLBG	2000m1-2023m12	BFV AUD AUSTRALIA SOVEREIGN 10 YR	%	log(1+y/100)	M	
CAD	XR	CAD BGN Curncy	BLBG	2000m1-2023m12	CANADIAN DOLLAR SPOT EXCHANGE RATE	1 USD in CAD		M	
CAD	3M	C1013M Index	BLBG	2000m1-2023m12	BFV CAD CANADA SOVEREIGN 3 MO	%	log(1+y/100)	M	
CAD	1Y	C1011Y Index	BLBG	2000m1-2023m12	BFV CAD CANADA SOVEREIGN 1 YR	%	log(1+y/100)	M	
CAD	2Y	C1012Y Index	BLBG	2000m1-2023m12	BFV CAD CANADA SOVEREIGN 2 YR	%	log(1+y/100)	M	
CAD	3Y	C1013Y Index	BLBG	2000m1-2023m12	BFV CAD CANADA SOVEREIGN 3 YR	%	log(1+y/100)	M	
CAD	5Y	C1015Y Index	BLBG	2000m1-2023m12	BFV CAD CANADA SOVEREIGN 5 YR	%	log(1+y/100)	M	
CAD	7Y	C1017Y Index	BLBG	2000m1-2023m12	BFV CAD CANADA SOVEREIGN 7 YR	%	log(1+y/100)	M	
CAD	10Y	C10110Y Index	BLBG	2000m1-2023m12	BFV CAD CANADA SOVEREIGN 10 YR	%	log(1+y/100)	M	
CHF	XR	CHF BGN Curncy	BLBG	2000m1-2023m12	SWISS FRANC SPOT EXCHANGE RATE	1 USD in CHF		M	
CHF	3M	C2563M Index	BLBG	2000m1-2023m12	BFV CHF SWITZERLAND SOVEREIGN 3 MO	%	log(1+y/100)	M	
CHF	1Y	C2561Y Index	BLBG	2000m1-2023m12	BFV CHF SWITZERLAND SOVEREIGN 1 YR	%	log(1+y/100)	M	
CHF	2Y	C2562Y Index	BLBG	2000m1-2023m12	BFV CHF SWITZERLAND SOVEREIGN 2 YR	%	log(1+y/100)	M	
CHF	3Y	C2563Y Index	BLBG	2000m1-2023m12	BFV CHF SWITZERLAND SOVEREIGN 3 YR	%	log(1+y/100)	M	
CHF	5Y	C2565Y Index	BLBG	2000m1-2023m12	BFV CHF SWITZERLAND SOVEREIGN 5 YR	%	log(1+y/100)	M	
CHF	7Y	C2567Y Index	BLBG	2000m1-2023m12	BFV CHF SWITZERLAND SOVEREIGN 7 YR	%	log(1+y/100)	M	
CHF	10Y	C25610Y Index	BLBG	2000m1-2023m12	BFV CHF SWITZERLAND SOVEREIGN 10 YR	%	log(1+y/100)	M	
DKK	XR	DKK BGN Curncy	BLBG	2000m1-2023m12	DANISH KRONE SPOT EXCHANGE RATE	1 USD in DKK		M	
DKK	3M	C2673M Index	BLBG	2000m1-2023m12	BFV DKK DANISH SOVEREIGN 3 MO	%	log(1+y/100)	M	
DKK	1Y	C2671Y Index	BLBG	2000m1-2023m12	BFV DKK DANISH SOVEREIGN 1 YR	%	log(1+y/100)	M	
DKK	2Y	C2672Y Index	BLBG	2000m1-2023m12	BFV DKK DANISH SOVEREIGN 2 YR	%	log(1+y/100)	M	
DKK	3Y	C2673Y Index	BLBG	2000m1-2023m12	BFV DKK DANISH SOVEREIGN 3 YR	%	log(1+y/100)	M	
DKK	5Y	C2675Y Index	BLBG	2000m1-2023m12	BFV DKK DANISH SOVEREIGN 5 YR	%	log(1+y/100)	M	
DKK	7Y	C2677Y Index	BLBG	2000m1-2023m12	BFV DKK DANISH SOVEREIGN 7 YR	%	log(1+y/100)	M	
DKK	10Y	C26710Y Index	BLBG	2000m1-2023m12	BFV DKK DANISH SOVEREIGN 10 YR	%	log(1+y/100)	M	
EUR	XR	EUR Curncy	BLBG	2000m1-2023m12	EURO SPOT EXCHANGE RATE	1 EUR in USD	1/XR	M	
EUR	3M	C9103M Index	BLBG	2000m1-2023m12	BFV EUR GERMANY SOVEREIGN 3 MO	%	log(1+y/100)	M	
EUR	1Y	C9101Y Index	BLBG	2000m1-2023m12	BFV EUR GERMANY SOVEREIGN 1 YR	%	log(1+y/100)	M	
EUR	2Y	C9102Y Index	BLBG	2000m1-2023m12	BFV EUR GERMANY SOVEREIGN 2 YR	%	log(1+y/100)	M	
EUR	3Y	C9103Y Index	BLBG	2000m1-2023m12	BFV EUR GERMANY SOVEREIGN 3 YR	%	log(1+y/100)	M	
EUR	5Y	C9105Y Index	BLBG	2000m1-2023m12	BFV EUR GERMANY SOVEREIGN 5 YR	%	log(1+y/100)	M	
EUR	7Y	C9107Y Index	BLBG	2000m1-2023m12	BFV EUR GERMANY SOVEREIGN 7 YR	%	log(1+y/100)	M	
EUR	10Y	EU10YT=RR	REFINITIV	2000m1-2023m12	EURO 10YEAR BENCHMARK	%	log(1+y/100)	M	
GBP	XR	GBP BGN Curncy	BLBG	2000m1-2023m12	BRITISH POUND SPOT EXCHANGE RATE	1 GBP in USD	1/XR	M	
GBP	3M	C1103M Index	BLBG	2000m1-2023m12	BFV GBP UK GILTS 3 MO	%	log(1+y/100)	M	
GBP	1Y	C1101Y Index	BLBG	2000m1-2023m12	BFV GBP UK GILTS 1 YR	%	log(1+y/100)	M	
GBP	2Y	C1102Y Index	BLBG	2000m1-2023m12	BFV GBP UK GILTS 2 YR	%	log(1+y/100)	M	
GBP	3Y	C1103Y Index	BLBG	2000m1-2023m12	BFV GBP UK GILTS 3 YR	%	log(1+y/100)	M	
GBP	5Y	C1105Y Index	BLBG	2000m1-2023m12	BFV GBP UK GILTS 5 YR	%	log(1+y/100)	M	
GBP	7Y	C1107Y Index	BLBG	2000m1-2023m12	BFV GBP UK GILTS 7 YR	%	log(1+y/100)	M	
GBP	10Y	C11010Y Index	BLBG	2000m1-2023m12	BFV GBP UK GILTS 10 YR	%	log(1+y/100)	M	
GRC	3M	I15603M Index	BLBG	2004m3-2023m12	EUR Greek Sovereign Zero Coupon Yield 3 month	%	log(1+y/100)	M	
GRC	1Y	I15601Y Index	BLBG	2004m3-2023m12	EUR Greek Sovereign Zero Coupon Yield 1 year	%	log(1+y/100)	M	
GRC	2Y	I15602Y Index	BLBG	2004m3-2023m12	EUR Greek Sovereign Zero Coupon Yield 2 year	%	log(1+y/100)	M	
GRC	3Y	I15603Y Index	BLBG	2004m3-2023m12	EUR Greek Sovereign Zero Coupon Yield 3 year	%	log(1+y/100)	M	
GRC	5Y	I15605Y Index	BLBG	2004m3-2023m12	EUR Greek Sovereign Zero Coupon Yield 5 year	%	log(1+y/100)	M	
GRC	7Y	I15607Y Index	BLBG	2004m3-2023m12	EUR Greek Sovereign Zero Coupon Yield 7 year	%	log(1+y/100)	M	
GRC	10Y	I15610Y Index	BLBG	2004m3-2023m12	EUR Greek Sovereign Zero Coupon Yield 10 year	%	log(1+y/100)	M	
ITA	3M	I04003M Index	BLBG	2000m1-2023m12	EUR Italy Sovereign Zero Coupon Yield 3 month	%	log(1+y/100)	M	
ITA	1Y	I04001Y Index	BLBG	2000m1-2023m12	EUR Italy Sovereign Zero Coupon Yield 1 year	%	log(1+y/100)	M	
ITA	2Y	I04002Y Index	BLBG	2000m1-2023m12	EUR Italy Sovereign Zero Coupon Yield 2 year	%	log(1+y/100)	M	
ITA	3Y	I04003Y Index	BLBG	2000m1-2023m12	EUR Italy Sovereign Zero Coupon Yield 3 year	%	log(1+y/100)	M	
ITA	5Y	I04005Y Index	BLBG	2000m1-2023m12	EUR Italy Sovereign Zero Coupon Yield 5 year	%	log(1+y/100)	M	
ITA	7Y	I04007Y Index	BLBG	2000m1-2023m12	EUR Italy Sovereign Zero Coupon Yield 7 year	%	log(1+y/100)	M	
ITA	10Y	I04010Y Index	BLBG	2000m1-2023m12	EUR Italy Sovereign Zero Coupon Yield 10 year	%	log(1+y/100)	M	
JPY	XR	JPY BGN Curncy	BLBG	2000m1-2023m12	JAPANESE YEN SPOT EXCHANGE RATE	1 USD in JPY		M	
JPY	3M	C1053M Index	BLBG	2000m1-2023m12	BFV JPY JAPAN SOVEREIGN 3 MO	%	log(1+y/100)	M	
JPY	1Y	C1051Y Index	BLBG	2000m1-2023m12	BFV JPY JAPAN SOVEREIGN 1 YR	%	log(1+y/100)	M	
JPY	2Y	C1052Y Index	BLBG	2000m1-2023m12	BFV JPY JAPAN SOVEREIGN 2 YR	%	log(1+y/100)	M	
JPY	3Y	C1053Y Index	BLBG	2000m1-2023m12	BFV JPY JAPAN SOVEREIGN 3 YR	%	log(1+y/100)	M	
JPY	5Y	C1055Y Index	BLBG	2000m1-2023m12	BFV JPY JAPAN SOVEREIGN 5 YR	%	log(1+y/100)	M	
JPY	7Y	C1057Y Index	BLBG	2000m1-2023m12	BFV JPY JAPAN SOVEREIGN 7 YR	%	log(1+y/100)	M	
JPY	10Y	C10510Y Index	BLBG	2000m1-2023m12	BFV JPY JAPAN SOVEREIGN 10 YR	%	log(1+y/100)	M	
NOK	XR	NOK BGN Curncy	BLBG	2000m1-2023m12	NORWEGIAN KRONE SPOT EXCHANGE RATE	1 USD in NOK		M	
NOK	3M	C2663M Index	BLBG	2000m1-2023m12	BFV NOK NORWAY SOVEREIGN 3 MO	%	log(1+y/100)	M	
NOK	1Y	C2661Y Index	BLBG	2000m1-2023m12	BFV NOK NORWAY SOVEREIGN 1 YR	%	log(1+y/100)	M	
NOK	2Y	C2662Y Index	BLBG	2000m1-2023m12	BFV NOK NORWAY SOVEREIGN 2 YR	%	log(1+y/100)	M	
NOK	3Y	C2663Y Index	BLBG	2000m1-2023m12	BFV NOK NORWAY SOVEREIGN 3 YR	%	log(1+y/100)	M	
NOK	5Y	C2665Y Index	BLBG	2000m1-2023m12	BFV NOK NORWAY SOVEREIGN 5 YR	%	log(1+y/100)	M	
NOK	7Y	C2667Y Index	BLBG	2000m1-2023m12	BFV NOK NORWAY SOVEREIGN 7 YR	%	log(1+y/100)	M	
NOK	10Y	NO10YT=RR	REFINITIV	2011m4-2023m12	NORWAY 10 YEAR BENCHMARK	%	log(1+y/100)	M	
NZD	XR	NZD BGN Curncy	BLBG	2000m1-2023m12	NEW ZEALAND DOLLAR SPOT EXCHANGE RATE	1 NZD in USD	1/XR	M	
NZD	3M	C2503M Index	BLBG	2000m1-2023m12	BFV NZD NEW ZEALAND GOVERNMENT 3 MO	%	log(1+y/100)	M	
NZD	1Y	C2501Y Index	BLBG	2000m1-2023m12	BFV NZD NEW ZEALAND GOVERNMENT 1 YR	%	log(1+y/100)	M	
NZD	2Y	C2502Y Index	BLBG	2000m1-2023m12	BFV NZD NEW ZEALAND GOVERNMENT 2 YR	%	log(1+y/100)	M	
NZD	3Y	C2503Y Index	BLBG	2000m1-2023m12	BFV NZD NEW ZEALAND GOVERNMENT 3 YR	%	log(1+y/100)	M	
NZD	5Y	C2505Y Index	BLBG	2000m1-2023m12	BFV NZD NEW ZEALAND GOVERNMENT 5 YR	%	log(1+y/100)	M	
NZD	7Y	C2507Y Index	BLBG	2000m1-2023m12	BFV NZD NEW ZEALAND GOVERNMENT 7 YR	%	log(1+y/100)	M	
NZD	10Y	C25010Y Index	BLBG	2000m1-2023m12	BFV NZD NEW ZEALAND GOVERNMENT 10 YR	%	log(1+y/100)	M	
SEK	XR	SEK BGN Curncy	BLBG	2000m1-2023m12	SWEDISH KRONA SPOT EXCHANGE RATE	1 USD in SEK		M	
SEK	3M	C2593M Index	BLBG	2000m1-2023m12	SWEDISH GOVERNMENT 3 MO	%	log(1+y/100)	M	
SEK	1Y	C2591Y Index	BLBG	2000m1-2023m12	SWEDISH GOVERNMENT 1 YR	%	log(1+y/100)	M	
SEK	2Y	C2592Y Index	BLBG	2000m1-2023m12	SWEDISH GOVERNMENT 2 YR	%	log(1+y/100)	M	
SEK	3Y	C2593Y Index	BLBG	2000m1-2023m12	SWEDISH GOVERNMENT 3 YR	%	log(1+y/100)	M	
SEK	5Y	C2595Y Index	BLBG	2000m1-2023m12	SWEDISH GOVERNMENT 5 YR	%	log(1+y/100)	M	
SEK	7Y	C2597Y Index	BLBG	2000m1-2023m12	SWEDISH GOVERNMENT 7 YR	%	log(1+y/100)	M	
SEK	10Y	C25910Y Index	BLBG	2000m1-2023m12	SWEDISH GOVERNMENT 10 YR	%	log(1+y/100)	M	
USD	3M	C0823M Index	BLBG	2000m1-2023m12	BFV USD US TREASURY BONDS/NOTE 3 MO	%	log(1+y/100)	M	
USD	1Y	C0821Y Index	BLBG	2000m1-2023m12	BFV USD US TREASURY BONDS/NOTE 1 YR	%	log(1+y/100)	M	
USD	2Y	C0822Y Index	BLBG	2000m1-2023m12	BFV USD US TREASURY BONDS/NOTE 2 YR	%	log(1+y/100)	M	
USD	3Y	C0823Y Index	BLBG	2000m1-2023m12	BFV USD US TREASURY BONDS/NOTE 3 YR	%	log(1+y/100)	M	
USD	5Y	C0825Y Index	BLBG	2000m1-2023m12	BFV USD US TREASURY BONDS/NOTE 5 YR	%	log(1+y/100)	M	
USD	7Y	C0827Y Index	BLBG	2000m1-2023m12	BFV USD US TREASURY BONDS/NOTE 7 YR	%	log(1+y/100)	M	
USD	10Y	C08210Y Index	BLBG	2000m1-2023m12	BFV USD US TREASURY BONDS/NOTE 10 YR	%	log(1+y/100)	M	

Table 2A: Data descriptions for Emerging Markets (EMs)

Cnt.	Var.	Ticker	Source	Sample	Definition	Unit of Measure	Transf.	Freq.	Mis. Val.
BRL	XR	BRL BGN Curncy	BLBG	2000m2-2023m12	BRAZILIAN REAL TO US $ - EXCHANGE RATE	1 USD in BRL		M	
BRL	3M	I39303M Index	BLBG	2007m3 -2023m12	BRL BRAZIL GOVT BENCHMARK 3 MO	%	log(1+y/100)	M	
BRL	1Y	I39301Y Index	BLBG	2007m3 -2023m12	BRL BRAZIL GOVT BENCHMARK 1 YR	%	log(1+y/100)	M	
BRL	2Y	I39302Y Index	BLBG	2007m3 -2023m12	BRL BRAZIL GOVT BENCHMARK 2 YR	%	log(1+y/100)	M	
BRL	3Y	I39303Y Index	BLBG	2007m3 -2023m12	BRL BRAZIL GOVT BENCHMARK 3 YR	%	log(1+y/100)	M	
BRL	5Y	I39305Y Index	BLBG	2007m3 -2023m12	BRL BRAZIL GOVT BENCHMARK 5 YR	%	log(1+y/100)	M	
BRL	7Y	I39307Y Index	BLBG	2007m3 -2023m12	BRL BRAZIL GOVT BENCHMARK 7 YR	%	log(1+y/100)	M	
BRL	10Y	I39310Y Index	BLBG	2007m3 -2023m12	BRL BRAZIL GOVT BENCHMARK 10 YR	%	log(1+y/100)	M	
CHL	XR	CLP BGN Curncy	BLBG	2000m1-2023m12	CHILEAN PESO TO US $ - EXCHANGE RATE	1 USD in CLP		M	
CHL	3M	I35103M Index	BLBG	2005m9-2023m12	CLP Chile Government Zero Coupon Yield 3 month	%	log(1+y/100)	M	
CHL	1Y	I35101Y Index	BLBG	2005m9-2023m12	CLP Chile Government Zero Coupon Yield 1 year	%	log(1+y/100)	M	
CHL	2Y	I35102Y Index	BLBG	2005m9-2023m12	CLP Chile Government Zero Coupon Yield 2 year	%	log(1+y/100)	M	
CHL	3Y	I35103Y Index	BLBG	2005m9-2023m12	CLP Chile Government Zero Coupon Yield 3 year	%	log(1+y/100)	M	
CHL	5Y	I35105Y Index	BLBG	2005m9-2023m12	CLP Chile Government Zero Coupon Yield 5 year	%	log(1+y/100)	M	
CHL	7Y	I35107Y Index	BLBG	2005m9-2023m12	CLP Chile Government Zero Coupon Yield 7 year	%	log(1+y/100)	M	
CHL	10Y	I35110Y Index	BLBG	2005m9-2023m12	CLP Chile Government Zero Coupon Yield 10 year	%	log(1+y/100)	M	
COL	XR	COP BGN Curncy	BLBG	2000m1-2023m12	COLOMBIAN PESO TO US $ - EXCHANGE RATE	1 USD in COP		M	
COL	3M	C4773M Index	BLBG	2003m8-2023m12	BFV COP COLOMBIA SOVEREIGN 3 MO	%	log(1+y/100)	M	
COL	1Y	C4771Y Index	BLBG	2003m8-2023m12	BFV COP COLOMBIA SOVEREIGN 1 YR	%	log(1+y/100)	M	
COL	2Y	C4772Y Index	BLBG	2003m8-2023m12	BFV COP COLOMBIA SOVEREIGN 2 YR	%	log(1+y/100)	M	
COL	3Y	C4773Y Index	BLBG	2003m8-2023m12	BFV COP COLOMBIA SOVEREIGN 3 YR	%	log(1+y/100)	M	
COL	5Y	C4775Y Index	BLBG	2003m8-2023m12	BFV COP COLOMBIA SOVEREIGN 5 YR	%	log(1+y/100)	M	
COL	7Y	C4777Y Index	BLBG	2003m8-2023m12	BFV COP COLOMBIA SOVEREIGN 7 YR	%	log(1+y/100)	M	
COL	10Y	C47710Y Index	BLBG	2003m8-2023m12	BFV COP COLOMBIA SOVEREIGN 10 YR	%	log(1+y/100)	M	
IDR	XR	IDR BGN Curncy	BLBG	2000m1-2023m12	INDONESIAN RUPIAH SPOT EXCHANGE RATE	1 USD in IDR		M	
IDR	3M	C1323M Index	BLBG	2003m2-2023m12	INDONESIA GOVERNMENT 3 MO	%	log(1+y/100)	M	
IDR	1Y	C1321Y Index	BLBG	2003m2-2023m12	INDONESIA GOVERNMENT 1 YR	%	log(1+y/100)	M	
IDR	2Y	C1322Y Index	BLBG	2003m2-2023m12	INDONESIA GOVERNMENT 2 YR	%	log(1+y/100)	M	
IDR	3Y	C1323Y Index	BLBG	2003m2-2023m12	INDONESIA GOVERNMENT 3 YR	%	log(1+y/100)	M	
IDR	5Y	C1325Y Index	BLBG	2003m2-2023m12	INDONESIA GOVERNMENT 5 YR	%	log(1+y/100)	M	
IDR	7Y	C1327Y Index	BLBG	2003m2-2023m12	INDONESIA GOVERNMENT 7 YR	%	log(1+y/100)	M	
IDR	10Y	C13210Y Index	BLBG	2003m2-2023m12	INDONESIA GOVERNMENT 10 YR	%	log(1+y/100)	M	
ISR	XR	ILS BGN Curncy	BLBG	2000m1-2023m12	ISRAELI SHEKEL TO US $ - EXCHANGE RATE	1 USD in ILS		M	
ISR	3M	I32503M Index	BLBG	2005m3-2023m12	ILS ISRAEL SOVEREIGN 3 MO	%	log(1+y/100)	M	2006m8
ISR	1Y	I32501Y Index	BLBG	2005m3-2023m12	ILS ISRAEL SOVEREIGN 1 YR	%	log(1+y/100)	M	2006m8
ISR	2Y	I32502Y Index	BLBG	2005m3-2023m12	ILS ISRAEL SOVEREIGN 2 YR	%	log(1+y/100)	M	2006m8
ISR	3Y	I32503Y Index	BLBG	2005m3-2023m12	ILS ISRAEL SOVEREIGN 3 YR	%	log(1+y/100)	M	2006m8
ISR	5Y	I32505Y Index	BLBG	2005m3-2023m12	ILS ISRAEL SOVEREIGN 5 YR	%	log(1+y/100)	M	2006m8
ISR	7Y	I32507Y Index	BLBG	2005m3-2023m12	ILS ISRAEL SOVEREIGN 7 YR	%	log(1+y/100)	M	2006m8
ISR	10Y	I32510Y Index	BLBG	2005m3-2023m12	ILS ISRAEL SOVEREIGN 10 YR	%	log(1+y/100)	M	2006m8
KOR	XR	KRW BGN Curncy	BLBG	2000m1-2023m12	USDKRW SPOT EXCHANGE RATE	1 USD In KRW		M	
KOR	3M	C2323M Index	BLBG	2000m1-2023m12	BFV KRW KOREA TREASURY 3 MO	%	log(1+y/100)	M	
KOR	1Y	C2321Y Index	BLBG	2000m1-2023m12	BFV KRW KOREA TREASURY 1 YR	%	log(1+y/100)	M	
KOR	2Y	C2322Y Index	BLBG	2000m1-2023m12	BFV KRW KOREA TREASURY 2 YR	%	log(1+y/100)	M	
KOR	3Y	C2323Y Index	BLBG	2000m1-2023m12	BFV KRW KOREA TREASURY 3 YR	%	log(1+y/100)	M	
KOR	5Y	C2325Y Index	BLBG	2000m1-2023m12	BFV KRW KOREA TREASURY 5 YR	%	log(1+y/100)	M	
KOR	7Y	C2327Y Index	BLBG	2000m1-2023m12	BFV KRW KOREA TREASURY 7 YR	%	log(1+y/100)	M	
KOR	10Y	C23210Y Index	BLBG	2000m10-2023m12	BFV KRW KOREA TREASURY 10 YR	%	log(1+y/100)	M	
MEX	XR	MXN BGN Curncy	BLBG	2000m1-2023m12	MEXICAN PESO TO US $ - EXCHANGE RATE	1 USD In MXN		M	
MEX	3M	C4763M Index	BLBG	2002m9-2023m12	BFV MXN MEXICO SOVEREIGN 3 MO	%	log(1+y/100)	M	
MEX	1Y	C4761Y Index	BLBG	2002m9-2023m12	BFV MXN MEXICO SOVEREIGN 1 YR	%	log(1+y/100)	M	
MEX	2Y	C4762Y Index	BLBG	2002m9-2023m12	BFV MXN MEXICO SOVEREIGN 2 YR	%	log(1+y/100)	M	
MEX	3Y	C4763Y Index	BLBG	2002m9-2023m12	BFV MXN MEXICO SOVEREIGN 3 YR	%	log(1+y/100)	M	
MEX	5Y	C4765Y Index	BLBG	2002m9-2023m12	BFV MXN MEXICO SOVEREIGN 5 YR	%	log(1+y/100)	M	
MEX	7Y	C4767Y Index	BLBG	2002m9-2023m12	BFV MXN MEXICO SOVEREIGN 7 YR	%	log(1+y/100)	M	
MEX	10Y	C47610Y Index	BLBG	2003m2-2023m12	BFV MXN MEXICO SOVEREIGN 10 YR	%	log(1+y/100)	M	
PEN	XR	PEN BGN Curncy	BLBG	2000m1-2023m12	PERUVIAN SOL TO US $ - EXCHANGE RATE	1 USD In PEN		M	
PEN	3M	C9953M Index	BLBG	2006m2-2023m12	PEN PERU SOVEREIGN 3 MO	%	log(1+y/100)	M	
PEN	1Y	C9951Y Index	BLBG	2006m2-2023m12	PEN PERU SOVEREIGN 1 YR	%	log(1+y/100)	M	
PEN	2Y	C9952Y Index	BLBG	2006m2-2023m12	PEN PERU SOVEREIGN 2 YR	%	log(1+y/100)	M	
PEN	3Y	C9953Y Index	BLBG	2006m2-2023m12	PEN PERU SOVEREIGN 3 YR	%	log(1+y/100)	M	
PEN	5Y	C9955Y Index	BLBG	2006m2-2023m12	PEN PERU SOVEREIGN 5 YR	%	log(1+y/100)	M	
PEN	7Y	C9957Y Index	BLBG	2006m2-2023m12	PEN PERU SOVEREIGN 7 YR	%	log(1+y/100)	M	
PEN	10Y	C99510Y Index	BLBG	2006m2-2023m12	PEN PERU SOVEREIGN 10 YR	%	log(1+y/100)	M	
PHL	XR	PHP BGN Curncy	BLBG	2000m1-2023m12	USDPHP Spot Exchange rate	1 USD in PHP		M	
PHL	3M	PDSR3MO Index	BLBG	2000m12-2018m10	PDEX PDST-R1 FIXING 3 MO	%	log(1+y/100)	M	
PHL	1Y	PDSR1YR Index	BLBG	2000m12-2018m10	PDEX PDST-R1 FIXING 1 YR	%	log(1+y/100)	M	
PHL	2Y	PDSR2YR Index	BLBG	2000m12-2018m10	PDEX PDST-R1 FIXING 2 YR	%	log(1+y/100)	M	
PHL	3Y	PDSR3YR Index	BLBG	2001m10-2018m10	PDEX PDST-R1 FIXING 3 YR	%	log(1+y/100)	M	
PHL	5Y	PDSR5YR Index	BLBG	2000m12-2018m10	PDEX PDST-R1 FIXING 5 YR	%	log(1+y/100)	M	
PHL	7Y	PDSR7YR Index	BLBG	2000m12-2018m10	PDEX PDST-R1 FIXING 7 YR	%	log(1+y/100)	M	
PHL	10Y	PDSR10YR Index	BLBG	2000m12-2018m10	PDEX PDST-R1 FIXING 10 YR	%	log(1+y/100)	M	
POL	XR	PLN BGN Curncy	BLBG	2000m1-2023m12	POLISH ZLOTY TO US $ - EXCHANGE RATE	1 USD in PLN		M	
POL	3M	C1193M Index	BLBG	2000m1-2023m12	BFV PLN POLAND SOVEREIGN 3 MO	%	log(1+y/100)	M	
POL	1Y	C1191Y Index	BLBG	2000m1-2023m12	BFV PLN POLAND SOVEREIGN 1 YR	%	log(1+y/100)	M	
POL	2Y	C1192Y Index	BLBG	2000m1-2023m12	BFV PLN POLAND SOVEREIGN 2 YR	%	log(1+y/100)	M	
POL	3Y	C1193Y Index	BLBG	2000m1-2023m12	BFV PLN POLAND SOVEREIGN 3 YR	%	log(1+y/100)	M	
POL	5Y	C1195Y Index	BLBG	2000m1-2023m12	BFV PLN POLAND SOVEREIGN 5 YR	%	log(1+y/100)	M	
POL	7Y	C1197Y Index	BLBG	2000m1-2023m12	BFV PLN POLAND SOVEREIGN 7 YR	%	log(1+y/100)	M	
POL	10Y	C11910Y Index	BLBG	2000m1-2023m12	BFV PLN POLAND SOVEREIGN 10 YR	%	log(1+y/100)	M	
RUS	XR	USDRUB BGN Curncy	BLBG	2000m1-2023m12	USDRUB Spot (T+1) TOM Exchange rate	1 USD in RUB		M	
RUS	3M	C4963M Index	BLBG	2006m4-2022m2	RUB RUSSIA SOVEREIGN 3 MO	%	log(1+y/100)	M	
RUS	1Y	C4961Y Index	BLBG	2006m4-2022m2	RUB RUSSIA SOVEREIGN 1 YR	%	log(1+y/100)	M	
RUS	2Y	C4962Y Index	BLBG	2006m4-2022m2	RUB RUSSIA SOVEREIGN 2 YR	%	log(1+y/100)	M	
RUS	3Y	C4963Y Index	BLBG	2006m4-2022m2	RUB RUSSIA SOVEREIGN 3 YR	%	log(1+y/100)	M	
RUS	5Y	C4965Y Index	BLBG	2006m4-2022m2	RUB RUSSIA SOVEREIGN 5 YR	%	log(1+y/100)	M	
RUS	7Y	C4967Y Index	BLBG	2006m4-2022m2	RUB RUSSIA SOVEREIGN 7 YR	%	log(1+y/100)	M	2010m3 2010m4
RUS	10Y	C49610Y Index	BLBG	2007m6-2022m2	RUB RUSSIA SOVEREIGN 10 YR	%	log(1+y/100)	M	2010m3 2010m4
SAF	XR	ZAR BGN Curncy	BLBG	2000m1-2023m12	SOUTH AFRICA RAND TO US $ - EXCHANGE RATE			M	
SAF	3M	C2623M Index	BLBG	2000m1-2023m12	BFV ZAR SOUTH AFRICA SOVEREIGN 3 MO	%	log(1+y/100)	M	
SAF	1Y	C2621Y Index	BLBG	2000m1-2023m12	BFV ZAR SOUTH AFRICA SOVEREIGN 1 YR	%	log(1+y/100)	M	
SAF	2Y	C2622Y Index	BLBG	2000m1-2023m12	BFV ZAR SOUTH AFRICA SOVEREIGN 2 YR	%	log(1+y/100)	M	
SAF	3Y	C2623Y Index	BLBG	2000m1-2023m12	BFV ZAR SOUTH AFRICA SOVEREIGN 3 YR	%	log(1+y/100)	M	
SAF	5Y	C2625Y Index	BLBG	2000m1-2023m12	BFV ZAR SOUTH AFRICA SOVEREIGN 5 YR	%	log(1+y/100)	M	
SAF	7Y	C2627Y Index	BLBG	2000m1-2023m12	BFV ZAR SOUTH AFRICA SOVEREIGN 7 YR	%	log(1+y/100)	M	
SAF	10Y	C26210Y Index	BLBG	2000m1-2023m12	BFV ZAR SOUTH AFRICA SOVEREIGN 10 YR	%	log(1+y/100)	M	
THA	XR	THB BGN Curncy	BLBG	2000m1-2023m12	USDTHB Spot Exchange Rate	1 USD in THB		M	
THA	3M	C1223M Index	BLBG	2000m1-2023m12	BFV THB THAILAND SOVEREIGN 3 MO	%	log(1+y/100)	M	
THA	1Y	C1221Y Index	BLBG	2000m1-2023m12	BFV THB THAILAND SOVEREIGN 1 YR	%	log(1+y/100)	M	
THA	2Y	C1222Y Index	BLBG	2000m1-2023m12	BFV THB THAILAND SOVEREIGN 2 YR	%	log(1+y/100)	M	
THA	3Y	C1223Y Index	BLBG	2000m1-2023m12	BFV THB THAILAND SOVEREIGN 3 YR	%	log(1+y/100)	M	
THA	5Y	C1225Y Index	BLBG	2000m1-2023m12	BFV THB THAILAND SOVEREIGN 5 YR	%	log(1+y/100)	M	
THA	7Y	C1227Y Index	BLBG	2000m1-2023m12	BFV THB THAILAND SOVEREIGN 7 YR	%	log(1+y/100)	M	
THA	10Y	C12210Y Index	BLBG	2000m1-2023m12	BFV THB THAILAND SOVEREIGN 10 YR	%	log(1+y/100)	M	
TUR	XR	TRY BGN Curncy	BLBG	2000m1-2023m12	NEW TURKISH LIRA TO US $ - EXCHANGE RATE	1 USD in TRY		M	
TUR	3M	C9653M Index	BLBG	2005m2-2023m12	BFV TRY TURKEY SOVEREIGN 3 MO	%	log(1+y/100)	M	
TUR	1Y	C9651Y Index	BLBG	2005m2-2023m12	BFV TRY TURKEY SOVEREIGN 1 YR	%	log(1+y/100)	M	
TUR	2Y	C9652Y Index	BLBG	2005m2-2023m12	BFV TRY TURKEY SOVEREIGN 2 YR	%	log(1+y/100)	M	
TUR	3Y	C9653Y Index	BLBG	2005m2-2023m12	BFV TRY TURKEY SOVEREIGN 3 YR	%	log(1+y/100)	M	
TUR	5Y	C9655Y Index	BLBG	2005m2-2023m12	BFV TRY TURKEY SOVEREIGN 5 YR	%	log(1+y/100)	M	2007m2 2007m3 2007m4
TUR	7Y	C9657Y Index	BLBG	2010m6-2023m12	BFV TRY TURKEY SOVEREIGN 7 YR	%	log(1+y/100)	M	2011m10
TUR	10Y	C96510Y Index	BLBG	2010m6-2023m12	BFV TRY TURKEY SOVEREIGN 10 YR	%	log(1+y/100)	M	2011m11 2011m12

A.2 Country-specific LRUIP regressions

Table 3A: Country-specific regressions (3-month)

	3-month						
	$\boldsymbol{\beta}$	s.e.	**N**		$\boldsymbol{\beta}$	s.e.	**N**
BRL	-0.171	(1.199)	199	AUD	-0.890	(1.455)	285
CHL	0.609	(0.849)	217	CAD	2.326	(2.229)	285
COL	-0.288	(1.632)	242	CHF	-0.180	(1.077)	285
IDR	-0.918**	(0.916)	248	DKK	-0.434	(1.253)	285
ISR	0.523	(1.110)	223	EUR	-0.347	(1.416)	285
KOR	0.624	(1.281)	285	GBP	0.650	(1.776)	285
MEX	-1.194	(1.759)	253	**GRC**	-0.064***	(0.043)	285
PEN	-0.455*	(0.798)	212	**ITA**	0.361	(1.284)	285
PHL	0.749	(0.505)	274	JPY	-0.351	(0.868)	285
POL	0.337	(0.566)	285	NOK	-0.331	(1.384)	285
RUS	0.067	(1.967)	210	NZD	-0.320	(1.640)	285
SAF	-3.604**	(1.767)	285	SEK	-0.684	(1.429)	285
THA	-0.383*	(0.802)	285				
TUR	0.921	(1.235)	224				
EM-14	0.394	(0.795)	3237	G-10	-0.330	(1.097)	2850
EM-10	0.315	(0.864)	2448				
EM-14†	-0.227			G-10†	-0.056		
EM-10†	-0.280						

The table reports the country-specific regression results from Equation (1) with the standard errors adjusted for the serial correlation of order k-1 for 3-month horizon. Note: *, **, *** shows that we can reject the null hypothesis that beta equals unity with 10%, 5%, and 1% significance level. † represents the simple average of the coefficients.

Table 4A: Country-specific regressions (1-year)

	1-year						
	$\boldsymbol{\beta}$	s.e.	**N**		$\boldsymbol{\beta}$	s.e.	**N**
BRL	-0.690*	(1.004)	190	AUD	-0.883	(1.219)	276
CHL	0.484	(0.865)	208	CAD	1.067	(2.245)	276
COL	-1.502**	(1.236)	233	CHF	0.155	(0.980)	276
IDR	-1.309***	(0.707)	239	DKK	-0.423	(1.116)	276
ISR	0.802	(0.904)	214	EUR	-0.302	(1.229)	276
KOR	-0.550*	(0.904)	276	GBP	-0.0235	(1.575	276
MEX	-1.339*	(1.391)	244	**GRC**	-0.020***	(0.026)	226
PEN	-0.624*	(0.865)	203	**ITA**	-0.0745	(0.925)	276
PHL	0.331	(0.465)	265	JPY	0.134	(1.100)	276
POL	-0.097**	(0.467)	276	NOK	-0.755	(1.193)	276
RUS	0.963	(0.924)	201	NZD	-0.732	(1.599	276
SAF	-4.901***	(1.507)	276	SEK	-0.811	(1.420)	276
THA	0.094	(0.777)	276				
TUR	0.954	(1.029)	215				
EM-14	−0.284**	(0.477)	3111	G-10	-0.418	(1.067)	2760
EM-10	−0.566**	(0.518)	2358				
EM-14†	-0.527			G-10†	-0.257		
EM-10†	-0.737						

The table reports the country-specific regression results from Equation (1) with the standard errors adjusted for the serial correlation of order k-1 for 1-year horizon. Note: *, **, *** shows that we can reject the null hypothesis that beta equals unity with 10%, 5%, and 1% significance level. † represents the simple average of the coefficients.

Table 5A: Country-specific regressions (2-year)

	2-year						
	$\boldsymbol{\beta}$	s.e.	**N**	$\boldsymbol{\beta}$	s.e.	**N**	
BRL	-0.634**	(0.736)	178	AUD	-0.570**	(0.775)	264
CHL	0.018	(0.811)	196	CAD	-0.252	(2.044)	264
COL	-2.028***	(0.837)	221	CHF	0.430	(0.761)	264
IDR	-1.366***	(0.647)	227	DKK	-0.365	(1.043)	264
ISR	0.446	(0.362)	202	EUR	-0.153	(1.091)	264
KOR	-1.503***	(0.621)	264	GBP	-0.168	(1.305)	264
MEX	-2.388***	(1.109)	232	**GRC**	-0.024***	(0.061)	214
PEN	-0.612**	(0.689)	191	**ITA**	-0.459**	(0.572)	264
PHL	-0.053***	(0.388)	253	JPY	1.465	(1.248)	264
POL	-0.340***	(0.342)	264	NOK	-0.772	(1.149)	264
RUS	-0.618**	(0.738)	189	NZD	-0.950**	(0.884)	264
SAF	-4.533***	(1.422)	264	SEK	-0.567	(1.115)	264
THA	0.593	(0.619)	264				
TUR	0.674	(0.977)	203				
EM-14	−0.535***	(0.357)	2943	G-10	-0.193	(0.859)	2640
EM-10	−0.811***	(0.299)	2238				
EM-14†	-0.882			G-10†	-0.190		
EM-10†	-1.042						

The table reports the country-specific regression results from Equation (1) with the standard errors adjusted for the serial correlation of order k-1 for 2-year horizon. Note: *, **, *** shows that we can reject the null hypothesis that beta equals unity with 10%, 5%, and 1% significance level. † represents the simple average of the coefficients.

Table 6A: Country-specific regressions (3-year)

	3-year						
	$\boldsymbol{\beta}$	s.e.	**N**	$\boldsymbol{\beta}$	s.e.	**N**	
BRL	-0.505**	(0.590)	166	AUD	-0.102	(0.829)	252
CHL	0.371	(0.853)	184	CAD	-0.296	(2.054)	252
COL	-2.137***	(0.400)	209	CHF	0.454	(0.774)	252
IDR	-0.989***	(0.520)	215	DKK	-0.382*	(0.785)	252
ISR	0.472***	(0.179)	190	EUR	-0.214	(0.789)	252
KOR	-1.715***	(0.491)	252	GBP	-0.689*	(1.016)	252
MEX	-2.515***	(0.730)	220	**GRC**	-0.116***	(0.069)	202
PEN	-0.369**	(0.608)	179	**ITA**	-0.954***	(0.421)	252
PHL	-0.568***	(0.436)	231	JPY	2.100	(0.998)	252
POL	-0.550***	(0.236)	252	NOK	-0.851*	(0.960)	252
RUS	-0.444***	(0.500)	177	NZD	-0.787***	(0.541)	252
SAF	-3.303***	(1.112)	252	SEK	-0.622**	(0.705)	252
THA	0.977	(0.549)	252				
TUR	0.066	(0.754)	191				
EM-14	−0.517***	(0.263)	2775	G-10	−0.086*	(0.661)	2520
EM-10	−0.753***	(0.242)	2118				
EM-14†	-0.801			G-10†	-0.139		
EM-10†	-0.947						

The table reports the country-specific regression results from Equation (1) with the standard errors adjusted for the serial correlation of order k-1 for 3-year horizon. Note: *, **, *** shows that we can reject the null hypothesis that beta equals unity with 10%, 5%, and 1% significance level. † represents the simple average of the coefficients.

Table 7A: Country-specific regressions (5-year)

	5-year						
	$\boldsymbol{\beta}$	s.e.	**N**	$\boldsymbol{\beta}$	s.e.	**N**	
BRL	0.224***	(0.255)	142	AUD	1.200	(1.142)	228
CHL	0.947	(0.704)	160	CAD	-0.392	(2.221)	228
COL	-1.769***	(0.466)	185	CHF	0.953	(0.750)	228
IDR	-0.583***	(0.339)	191	DKK	-0.447	(0.915)	228
ISR	0.212***	(0.282)	166	EUR	-0.318	(0.968)	228
KOR	-1.605***	(0.407)	228	GBP	-0.0303*	(0.620)	228
MEX	-1.730***	(0.748)	196	**GRC**	-0.169***	(0.073)	178
PEN	0.651	(0.474)	155	**ITA**	-0.869***	(0.330)	228
PHL	-0.585***	(0.199)	217	JPY	2.023	(0.974)	228
POL	-0.817***	(0.348)	228	NOK	-1.064*	(1.171)	228
RUS	-0.137**	(0.484)	153	NZD	0.114	(0.991)	228
SAF	-1.120*	(1.259)	228	SEK	-0.694**	(0.852)	228
THA	1.043	0.442)	228				
TUR	-0.381**	(0.692)	167				
EM-14	−0.310***	(0.220)	2439	G-10	0.179	(0.879)	2280
EM-10	−0.515***	(0.281)	1878				
EM-14†	-0.405			G-10†	0.134		
EM-10†	-0.520						

The table reports the country-specific regression results from Equation (1) with the standard errors adjusted for the serial correlation of order k-1 for 5-year horizon. Note: *, **, *** shows that we can reject the null hypothesis that beta equals unity with 10%, 5%, and 1% significance level. † represents the simple average of the coefficients.

Table 8A: Country-specific regressions (7-year)

	7-year						
	$\boldsymbol{\beta}$	s.e.	**N**		$\boldsymbol{\beta}$	s.e.	**N**
BRL	-0.052	(0.693)	118	AUD	2.683**	(0.847)	204
CHL	1.603**	(0.258)	136	CAD	-1.352	(1.629)	204
COL	-1.599***	(0.623)	161	CHF	1.637	(0.550)	204
IDR	-0.763***	(0.222)	167	DKK	-0.0269	(1.125)	204
ISR	0.453***	(0.192)	142	EUR	0.133	(1.063)	204
KOR	-1.086***	(0.151)	204	GBP	0.866	(0.707)	204
MEX	-0.676**	(0.530)	172	**GRC**	-0.082***	(0.058)	154
PEN	0.736	(0.389)	131	**ITA**	-0.898***	(0.273)	204
PHL	-0.643***	(0.100)	193	JPY	2.061*	(0.647)	204
POL	-1.233***	(0.422)	204	NOK	-0.456	(1.310)	204
RUS	-0.041**	(0.487)	129	NZD	1.848	(1.045)	204
SAF	-1.269***	(0.588)	204	SEK	-0.089	(0.960)	204
THA	1.322*	(0.165)	204				
TUR	-	-					
EM-14	−0.386***	(0.273)	2101	G-10	0.882	(0.762)	2520
EM-10	−0.517***	(0.316)	1638				
EM-14†	-0.250			G-10†	0.730		
EM-10†	-0.318						

The table reports the country-specific regression results from Equation (1) with the standard errors adjusted for the serial correlation of order k-1 for 7-year horizon. Note: *, **, *** shows that we can reject the null hypothesis that beta equals unity with 10%, 5%, and 1% significance level. † represents the simple average of the coefficients.

Table 9A: Country-specific regressions (10-year)

	10-year						
	$\boldsymbol{\beta}$	s.e.	N		$\boldsymbol{\beta}$	s.e.	**N**
BRL	-	-		AUD	3.786***	(0.519)	168
CHL	-	-		CAD	-4.021***	0.425	168
COL	-	-		CHF	1.516	(0.521)	168
IDR	-0.304***	(0.040)	126	DKK	-1.089**	(0.656	168
ISR	-	-		EUR	-0.733***	(0.587)	168
KOR	-0.967***	(0.177)	159	GBP	0.849	(0.384)	168
MEX	-1.007***	(0.242)	131	**GRC**	-	-	
PEN	-	-		**ITA**	-0.630***	(0.268)	168
PHL	-0.602***	(0.062)	157	JPY	2.662***	(0.167)	168
POL	-1.014***	(0.173)	168	NOK	-	-	
RUS	-	-		NZD	2.017*	(0.581)	168
SAF	-2.061***	(0.447)	168	SEK	-1.988***	(0.519)	168
THA	1.230	(0.344)	168				
TUR	-	-					
EM-14	−0.585***	(0.174)	1596	G-10	0.446	(0.569)	1680
EM-10	−0.748***	(0.189)	1277				
EM-14†	-0.675			G-10†	0.333		
EM-10†	-0.737						

The table reports the country-specific regression results from Equation (1) with the standard errors adjusted for the serial correlation of order k-1 for 10-year horizon. Note: *, **, *** shows that we can reject the null hypothesis that beta equals unity with 10%, 5%, and 1% significance level. † represents the simple average of the coefficients.

A.3 Summary statistics on extracted innovations

Table 10A: Country-specific summary statistics for RHS variables from Equation (56) for AEs

Countries	Mean	SD	Min	Max	Skewness	Kurtosis	N
RHS#1: 5-year interest rate differential							
AUS	-0.072	0.058	-0.186	0.048	0.232	2.223	205
CAN	-0.001	0.029	-0.084	0.049	-0.349	2.315	205
CHF	0.081	0.042	-0.006	0.167	0.067	1.982	205
DKK	0.033	0.059	-0.081	0.155	0.179	2.063	205
EUR	0.041	0.055	-0.061	0.157	0.322	2.038	205
JAP	0.099	0.044	0.018	0.179	0.115	2.050	205
NOR	-0.010	0.046	-0.111	0.068	-0.093	1.838	205
NZE	-0.088	0.057	-0.208	0.047	0.805	2.851	205
SEK	0.025	0.059	-0.067	0.143	0.310	1.827	205
GBP	-0.003	0.045	-0.091	0.096	0.326	2.405	205
RHS#2 (TB): (Not purified) 1-year relative convenience yield							
AUS	0.001	0.002	-0.006	0.005	-0.793	6.470	205
CAN	-0.001	0.002	-0.015	0.001	-3.695	21.825	205
CHF	-0.004	0.002	-0.017	0.002	-1.146	6.680	205
DKK	-0.003	0.003	-0.019	0.001	-2.628	14.928	205
EUR	-0.002	0.002	-0.012	0.002	-2.080	11.754	205
JAP	-0.004	0.002	-0.019	-0.001	-1.978	10.930	205
NOR	-0.001	0.003	-0.024	0.005	-3.926	25.109	205
NZE	0.002	0.003	-0.010	0.011	-0.153	5.277	205
SEK	-0.001	0.003	-0.013	0.007	-0.585	5.316	205
RHS#4: 5-year CDS spreads							
AUS	0.021	0.012	0.007	0.079	1.751	7.290	139
CAN	0.027	0.001	0.025	0.029	-0.038	2.448	18
CHF	0.016	0.012	0.004	0.084	2.727	14.359	133
DKK	0.016	0.015	0.005	0.072	2.238	7.253	128
EUR	0.011	0.011	0.001	0.056	1.873	6.326	203
JPY	0.020	0.016	0.001	0.073	0.906	3.411	205
NOR	0.009	0.005	0.002	0.029	1.517	5.570	145
NZE	0.023	0.014	0.007	0.089	1.774	7.378	133
SEK	0.011	0.012	0.001	0.070	2.219	9.126	180
RHS#5: Relative term premium component							
AUS	0.027	0.044	-0.046	0.125	0.163	1.871	139
CAN	-0.043	0.010	-0.054	-0.027	0.445	1.599	18
CHF	-0.087	0.027	-0.137	-0.037	0.015	1.890	133
DKK	-0.060	0.039	-0.129	0.017	0.286	2.030	128
EUR	-0.109	0.013	-0.128	-0.083	0.319	1.942	23
JPY	-0.095	0.019	-0.137	-0.052	-0.174	2.592	151
NOR	-0.005	0.032	-0.057	0.056	-0.054	1.580	145
NZE	0.038	0.042	-0.047	0.115	-0.408	2.057	133
SEK	-0.037	0.044	-0.116	0.038	-0.206	1.702	160
RHS#6: (Not purified) Term structure of relative convenience yields							
AUS	0.014	0.011	-0.007	0.045	0.403	2.940	205
CAN	0.002	0.011	-0.042	0.021	-0.769	3.958	205
CHF	-0.012	0.009	-0.041	0.006	-0.710	4.002	205
DKK	-0.009	0.011	-0.053	0.007	-1.774	7.341	205
EUR	-0.006	0.009	-0.038	0.012	-0.116	3.010	205
JPY	-0.024	0.010	-0.057	-0.009	-0.951	3.799	205
NOR	0.007	0.012	-0.033	0.040	0.550	3.401	205
NZE	0.015	0.0112	-0.022	0.036	-0.925	3.585	205
SEK	0.006	0.0130	-0.024	0.029	-0.171	1.712	205

The table reports the country-specific summary statistics for the right-hand side (RHS) variables from Equation (56) for AEs.

Table 11A: Country-specific summary statistics for RHS variables from Equation (56) for EMs

Countries	Mean	SD	Min	Max	Skewness	Kurtosis	N
RHS#1: 5-year interest rate differential							
BRL	-0.454	0.114	-0.769	-0.204	0.119	2.940	155
CHL	-0.136	0.061	-0.258	-0.032	-0.231	1.772	173
COL	-0.264	0.085	-0.519	-0.111	-0.952	3.348	198
ISR	-0.038	0.070	-0.155	0.083	0.141	1.642	178
KOR	-0.057	0.054	-0.178	0.043	-0.111	1.629	205
MEX	-0.215	0.041	-0.345	-0.123	-0.174	2.995	205
PHL	-0.182	0.098	-0.430	-0.040	-0.973	3.023	190
POL	-0.093	0.072	-0.219	0.024	-0.114	1.583	205
SAF	-0.266	0.054	-0.370	-0.106	0.916	3.533	205
THA	-0.034	0.049	-0.141	0.071	-0.325	2.348	205
RHS#4: 5-year CDS spreads							
BRL	0.126	0.110	0.031	0.799	3.148	15.583	205
CHL	0.036	0.021	0.007	0.132	1.342	6.081	205
COL	0.096	0.065	0.036	0.387	1.996	6.932	205
ISR	0.043	0.025	0.009	0.136	0.863	3.358	184
KOR	0.038	0.031	0.007	0.212	2.931	13.620	205
MEX	0.062	0.029	0.014	0.226	2.183	10.881	205
PHL	0.095	0.068	0.017	0.300	1.232	3.303	205
POL	0.043	0.033	0.004	0.178	1.456	5.178	184
SAF	0.081	0.039	0.013	0.225	0.659	4.275	205
THA	0.044	0.026	0.013	0.147	1.140	4.670	205
RHS#5: Relative term premium component							
BRL	0.289	0.079	0.125	0.530	-0.294	2.556	155
CHL	0.076	0.042	-0.045	0.175	0.460	2.396	173
COL	0.142	0.044	0.050	0.287	0.588	3.161	198
ISR	-0.008	0.049	-0.092	0.089	-0.091	1.561	178
KOR	0.008	0.033	-0.059	0.082	0.120	1.903	184
MEX	0.118	0.025	0.043	0.182	0.225	2.833	205
PHL	0.060	0.036	-0.038	0.167	0.141	3.072	169
POL	0.025	0.039	-0.041	0.106	0.028	1.679	139
SAF	0.141	0.027	0.043	0.206	-0.696	4.140	205
THA	-0.010	0.029	-0.098	0.052	-0.187	3.260	184

The table reports the country-specific summary statistics for the right hand side (RHS) variables from Equation (56) for EMs.

Table 12A: Variance covariance matrix for AEs for the innovations exercise

	$\Delta\left(y^{\$}-\bar{y}^{*}\right)$	$\Delta\bar{x}^{\text{ptb}}$	$\Delta\overline{cds}$	$\Delta\left(\overline{tp^{*,*}-tp^{\$,\$}}\right)$	$\Delta\left(\overline{x^{\text{ptb,5y}}-x^{\text{ptb,1y}}}\right)$
$\Delta\left(y^{\$}-\bar{y}^{*}\right)$	0.0873				
$\Delta\bar{x}^{\text{tb}}$	-0.0874	2.4615			
$\Delta\overline{cds}$	0.0356	0.0944	0.2433		
$\Delta\left(\overline{tp^{*,*}-tp^{\$,\$}}\right)$	0.0581	-0.0596	0.0483	0.0673	
$\Delta\left(\overline{x^{\text{tb,5y}}-x^{\text{tb,1y}}}\right)$	0.0085	-0.0874	0.1263	0.0007	0.4177

The table shows the variance-covariance matrix for AEs, which corresponds to Table 6, column 6 in the main text.

Table 13A: Variance covariance matrix for EMs for the innovations exercise

	$\Delta\left(y^{\$}-\bar{y}^{*}\right)$	$\Delta\bar{x}^{\text{tb,AE}}$	$\Delta\overline{cds}$	$\Delta\left(\overline{tp^{*,*}-tp^{\$,\$}}\right)$	$\Delta\left(\overline{x^{\text{tb,5y,AE}}-x^{\text{tb,1y,AE}}}\right)$
$\Delta\left(y^{\$}-\bar{y}^{*}\right)$	0.0366				
$\Delta\bar{x}^{\text{tb,AE}}$	-0.0443	1.8964			
$\Delta\overline{cds}$	0.0261	0.0050	0.0354		
$\Delta\left(\overline{tp^{*,*}-tp^{\$,\$}}\right)$	0.0328	-0.0193	0.0264	0.0410	
$\Delta\left(\overline{x^{\text{tb,5y,AE}}-x^{\text{tb,1y,AE}}}\right)$	0.0136	-0.0596	0.0410	0.0120	0.3046

The table shows the variance-covariance matrix for EMs, which corresponds to Table 7, column 6 in the main text.

Table 14A: Variance covariance matrix for augmented UIP regressions (CDS spread)

	$(i^* - i^\$)$	cds_{5y}
$(i^* - i^\$)$	0.01855	
cds_{5y}	0.01898	0.0319

The table shows the variance-covariance matrix for the augmented UIP regression for EMs, which corresponds to Table 8, column 2 in the main text.

Table 15A: Variance covariance matrix for augmented UIP regressions (S&P LT credit ratings)

	$(i^* - i^\$)$	cp_{LT}^{SP}	$cp_{LT}^{SP} * (i^* - i^\$)$
$(i^* - i^\$)$	0.06787		
cp_{LT}^{SP}	0.00153	0.00011	
$cp_{LT}^{SP} * (i^* - i^\$)$	-0.0085	-0.00019	0.00118

The table shows the variance-covariance matrix for the augmented UIP regression for EMs, which corresponds to Table 8, column 3 in the main text.

A.4 Panel pooled exchange rate dynamics regressions on innovations

Table 16A: Panel regression results for AEs

	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta\left(y^{\$}-y^{*}\right)$	1.150***					1.522
	(0.107)					(0.966)
Δx^{tb}		-5.161***				-3.528***
		(0.908)				(0.748)
Δcds			3.101***			2.609**
			(0.337)			(0.973)
$\Delta\left(tp^{*,*}-tp^{\$,\$}\right)$				-1.685***		0.205
				(0.165)		(1.005)
$\Delta\left(x^{\mathrm{tb,5y}}-x^{\mathrm{tb,1y}}\right)$					-1.938***	-1.520**
					(0.225)	(0.406)
N	1,632	1,428	1,054	854	1,428	710
R^2	0.125	0.051	0.161	0.243	0.067	0.384

The table reports panel regression results with country-fixed effects for the innovations exercise in the main text for AEs. Note: *, **, *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Table 17A: Panel regression results for EMs

	(1)	(2)	(3)	(4)	(5)	(6)
$\Delta\left(y^{\$}-\bar{y}^{*}\right)$	-0.484***					-0.320
	(0.106)					(0.323)
$\Delta\bar{x}^{\mathrm{tb,AE}}$		-9.284***				-4.148***
		(1.333)				(0.995)
$\Delta\overline{cds}$			1.406***			1.220***
			(0.201)			(0.260)
$\Delta\left(\overline{tp^{*,*}-tp^{\$,\$}}\right)$				-0.0566		-0.183
				(0.131)		(0.313)
$\Delta\left(\overline{x^{\mathrm{tb,5y,AE}}-x^{\mathrm{tb,1y,AE}}}\right)$					-3.965***	-1.087**
					(0.452)	(0.447)
N	1,908	2,040	1,998	1,779	2,040	1,779
R^2	0.079	0.062	0.292	0.001	0.083	0.352

The table reports panel regression results with country-fixed effects for the innovations exercise in the main text for EMs. Note: *, **, *** indicate statistical significance at the 10%, 5% and 1% level, respectively. $\lambda_t^{\$,*}-\lambda_t^{*,*}$ measured with the average treasury basis of the AEs.

A.5 Innovations analysis with risk premium component

Table 18A: Exchange rate changes and innovations to their drivers for AEs (with risk premium)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Delta\left(y^{\$}-\bar{y}^{*}\right)$	1.068***					1.111***		1.089***
	(0.205)					(0.295)		(0.303)
$\Delta\bar{x}^{\text{tb}}$		-9.390***				-6.522***		-6.585***
		(1.797)				(1.569)		(1.585)
$\Delta\overline{cds}$			3.577***			2.122***		2.097***
			(0.460)			(0.493)		(0.492)
$\Delta\left(\overline{tp^{*,*}-tp^{\$,\$}}\right)$				-1.169***		0.0166		0.000752
				(0.196)		(0.259)		(0.261)
$\Delta\left(\overline{x^{\text{tb,5y}}-x^{\text{tb,1y}}}\right)$					-4.334***	-2.584***		-2.629***
					(0.638)	(0.646)		(0.650)
$\overline{rp}^{*}$							0.0430	0.0175
							(0.0407)	(0.0353)
N	204	204	204	159	204	159	201	156
R^2	0.118	0.119	0.230	0.183	0.185	0.486	0.006	0.498

The table reports the coefficient estimates from equations (58) and (59) for advanced economies (AEs) including the risk premium with OLS standard errors. Note: *, **, *** indicate statistical significance at the 10%, 5% and 1% level, respectively. $\overline{rp}^{*}$ represents the innovations where we took the average of the residuals from the 3M UIP regressions for AEs.

Table 19A: Exchange rate changes and innovations to their drivers for EMs (with risk premium)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Delta\left(y^{\$}-\bar{y}^{*}\right)$	-0.700***					-0.402**		-0.389**
	(0.129)					(0.191)		(0.189)
$\Delta\bar{x}^{\text{tb,AE}}$		-9.874***				-4.866***		-4.868***
		(1.854)				(1.377)		(1.381)
$\Delta\overline{cds}$			1.728***			1.256***		1.243***
			(0.115)			(0.188)		(0.186)
$\Delta\left(\overline{tp^{*,*}-tp^{\$,\$}}\right)$				-0.345**		-0.412**		-0.398**
				(0.156)		(0.203)		(0.199)
$\Delta\left(\overline{x^{\text{tb,5y}}-x^{\text{tb,1y}}}\right)$					-4.151***	-0.773		-0.870
					(0.671)	(0.552)		(0.548)
$\overline{rp}^{*}$							0.0519	0.0298
							(0.0390)	(0.0263)
N	204	204	204	204	204	204	201	201
R^2	0.127	0.123	0.528	0.023	0.159	0.574	0.009	0.588

The table reports the coefficient estimates from equations (58) and (59) for emerging markets (EMs) including the risk premium with OLS standard errors. Note: *, **, *** indicate statistical significance at the 10%, 5% and 1% level, respectively. The treasury basis average excludes observations for EMs. $\overline{rp}^{*}$ represents the innovations where we took the average of the residuals from the 3M UIP regressions for EMs.

A.6 UIP deviations summary statistics

Table 20A: Country-specific summary statistics for 3-month maturity for UIP premium and its components

3-month	Mean			SD			Min			Max			Skewness			Kurtosis			Obs
Countries	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	
AUD	0.43	-0.06	0.49	0.44	6.23	6.27	-0.45	-22.61	-33.16	1.32	34.43	23.22	-0.05	0.81	-0.69	1.96	7.22	6.66	285
CAD	0.07	-0.07	0.14	0.17	4.19	4.18	-0.24	-15.64	-16.63	0.54	16.84	15.71	0.28	0.10	-0.07	2.55	5.00	4.95	285
CHF	-0.33	-0.68	0.34	0.33	4.47	4.49	-1.05	-13.22	-12.48	0.27	12.49	13.09	-0.50	-0.05	0.12	2.01	3.15	3.12	285
DKK	-0.08	-0.12	0.04	0.37	4.79	4.82	-0.79	-13.02	-19.44	1.02	20.15	13.49	0.18	0.32	-0.21	2.59	3.79	3.56	285
EUR	-0.13	-0.12	-0.01	0.34	4.80	4.82	-0.81	-12.88	-19.76	0.63	20.38	13.28	0.03	0.33	-0.23	2.29	3.81	3.59	285
GBP	0.10	0.26	-0.16	0.31	4.56	4.56	-0.46	-13.89	-20.24	0.83	21.04	13.94	0.64	0.64	-0.55	2.81	5.56	5.17	285
JPY	-0.41	0.34	-0.75	0.45	4.96	5.00	-1.52	-15.76	-14.50	0.11	14.33	15.66	-0.94	-0.03	0.06	2.66	3.56	3.44	285
NOK	0.21	0.26	-0.05	0.44	5.91	5.93	-0.52	-16.50	-26.09	1.39	27.06	17.67	0.62	0.60	-0.50	2.87	5.13	4.78	285
NZD	0.51	-0.22	0.73	0.40	6.36	6.38	-0.29	-24.60	-23.12	1.54	24.37	25.26	-0.04	0.26	-0.20	2.29	4.21	4.02	285
SEK	-0.07	0.20	-0.27	0.40	5.65	5.69	-0.78	-17.79	-24.38	0.80	25.02	17.82	0.17	0.36	-0.27	2.06	4.51	4.21	285
BRL	2.01	1.36	0.65	0.81	8.42	8.48	0.41	-19.17	-31.82	0.41	-19.17	21.83	0.83	0.83	-0.75	2.04	4.70	4.58	199
CHL	0.74	0.71	0.03	0.71	6.17	6.16	-0.03	-16.80	-26.85	-0.03	-16.80	17.90	0.67	0.67	-0.55	53.40	5.45	5.11	217
COL	1.09	0.41	0.67	0.46	7.01	7.03	0.25	-17.96	-26.22	0.25	-17.96	19.68	0.54	0.54	-0.46	2.59	4.20	4.10	242
ISR	0.11	-0.19	0.31	0.37	3.96	3.95	-0.56	-11.77	-10.70	-0.56	-11.77	12.34	0.32	0.32	-0.21	2.32	3.46	3.44	223
KOR	0.33	0.16	0.17	0.35	4.99	4.99	-0.48	-20.08	-29.08	-0.48	-20.08	20.50	0.91	0.91	-0.85	2.06	9.37	8.93	285
MEX	1.16	0.64	0.52	0.34	5.82	5.85	0.38	-14.84	-25.33	0.38	-14.84	16.54	1.40	1.40	-1.30	2.45	7.07	6.67	253
PEN	0.59	0.18	0.41	0.40	2.97	3.03	-0.07	-8.62	-8.21	-0.07	-8.62	10.04	0.04	0.04	0.08	2.38	3.59	3.74	212
THA	0.08	-0.07	0.16	0.41	3.48	3.52	-0.97	-14.76	-9.88	-0.97	-14.76	14.06	0.03	0.03	-0.17	3.19	3.50	3.33	285
TUR	2.62	4.11	-1.49	0.90	9.39	9.35	0.89	-22.63	-44.07	0.89	-22.63	27.78	1.34	1.34	-1.15	3.07	6.59	6.26	224
RUS	1.38	1.73	-0.36	0.66	10.52	10.53	-0.11	-52.18	-45.81	-0.11	-52.18	54.65	0.07	0.07	0.11	3.07	9.26	9.47	210
PHL	0.66	0.14	0.52	0.48	2.91	2.89	-0.54	-8.84	-9.23	-0.54	-8.84	8.85	0.13	0.13	-0.20	2.34	3.48	3.26	274
POL	0.73	-0.03	0.76	0.84	6.80	6.82	-0.35	-15.40	-28.92	-0.35	-15.40	16.63	0.86	0.86	-0.74	4.16	5.24	5.01	285
SAF	1.35	1.13	0.23	0.44	8.07	8.17	0.52	-24.24	-26.68	0.52	-24.24	25.69	0.21	0.21	-0.14	2.72	4.14	4.03	285
IDR	1.23	0.69	0.54	0.53	4.68	4.76	0.04	-15.32	-28.22	0.04	-15.32	17.36	1.19	1.19	-0.93	4.62	10.80	9.79	248

The table shows the country specific summary statistics for 3-month maturity for UIP premium and its components for EMs and AEs.

Table 21A: Country-specific summary statistics for 1-year maturity for UIP premium and its components

1-year	Mean			SD			Min			Max			Skewness			Kurtosis			Obs
Countries	**Diff**	**XR**	**Premium**	**Diff**	**XR**	**Premium**	**Diff**	**XR**	**Premium**	**Diff**	**XR**	**Premium**	**Diff**	**XR**	**Premium**	**Diff**	**XR**	**Premium**	
AUD	1.64	-0.62	2.25	1.62	12.40	12.68	-1.42	-33.74	-32.74	4.89	37.62	35.70	0.08	0.01	0.14	1.87	3.35	3.06	276
CAD	0.26	-0.42	0.69	0.69	8.22	8.18	-0.97	-21.61	-24.93	2.35	25.62	21.71	0.30	0.25	-0.15	2.62	3.50	3.43	276
CHF	-1.30	-2.75	1.45	1.16	7.89	7.95	-4.13	-30.18	-21.96	0.75	21.76	30.00	-0.46	-0.41	0.58	1.92	3.88	4.06	276
DKK	-0.37	-0.70	0.34	1.40	9.63	9.81	-3.33	-23.37	-25.09	3.15	24.99	25.19	-0.01	0.16	0.04	2.41	2.58	2.64	276
EUR	-0.55	-0.70	0.15	1.32	9.62	9.76	-3.44	-23.22	-24.89	2.22	24.93	24.81	-0.16	0.16	0.04	2.30	2.59	2.62	276
GBP	0.31	0.84	-0.53	1.17	9.28	9.36	-1.98	-17.25	-30.43	3.10	32.87	19.21	0.49	0.85	-0.63	2.79	4.04	3.52	276
JPY	-1.68	1.16	-2.84	1.67	9.98	10.08	-6.41	-20.94	-26.92	0.00	26.62	19.06	-0.95	0.32	-0.24	2.92	2.59	2.40	276
NOK	0.78	0.79	-0.01	1.64	11.58	11.87	-1.87	-27.70	-28.46	5.22	30.07	31.54	0.54	0.25	-0.04	2.82	2.93	2.84	276
NZD	1.96	-1.34	3.30	1.51	12.75	12.97	-0.99	-33.23	-41.18	5.51	46.69	35.50	-0.21	0.38	-0.15	2.14	3.90	3.34	276
SEK	-0.31	0.62	-0.93	1.53	12.03	12.28	-3.28	-23.57	-35.60	2.73	37.96	25.49	0.08	0.34	-0.16	2.08	2.67	2.46	276
BRL	8.29	6.21	2.08	3.14	16.78	17.47	2.21	-28.27	-37.70	14.08	48.20	40.07	-0.33	0.23	-0.07	2.03	2.56	2.48	190
CHL	2.70	2.67	0.03	1.89	11.04	11.04	-0.07	-28.60	-28.49	6.51	30.51	34.68	0.22	0.06	-0.02	1.66	2.74	2.95	208
COL	4.46	2.29	2.17	1.77	13.59	14.04	1.16	-28.29	-41.74	8.82	46.33	35.17	0.61	0.49	-0.31	2.89	3.36	3.10	233
ISR	0.40	-1.16	1.56	1.46	8.04	7.96	-2.36	-23.79	-16.77	3.74	18.98	23.01	0.10	0.23	-0.16	2.26	2.82	2.61	214
KOR	1.49	0.60	0.89	1.33	10.08	10.26	-0.97	-27.98	-45.91	3.88	49.10	29.87	-0.06	1.32	-1.09	1.66	7.07	6.21	276
MEX	4.56	2.54	2.02	1.25	10.28	10.55	1.76	-19.59	-29.74	7.96	35.34	25.69	-0.09	0.57	-0.47	2.84	3.02	2.89	244
PEN	2.37	0.80	1.57	1.52	6.33	6.73	-0.16	-14.59	-13.84	6.63	14.40	18.89	0.00	0.28	-0.19	2.28	2.46	2.40	203
THA	0.42	-0.65	1.06	1.50	6.38	6.52	-3.57	-14.61	-21.24	3.34	18.06	14.73	-0.38	0.39	-0.58	3.26	2.71	3.34	276
TUR	10.70	16.06	-5.35	3.55	18.86	18.56	4.53	-22.74	-61.75	20.30	78.27	36.10	0.76	0.78	-0.45	2.75	4.09	3.70	215
RUS	5.94	6.97	-1.03	2.96	18.13	17.90	-0.06	-33.86	-62.28	14.65	68.11	48.51	0.46	0.92	-0.72	3.46	3.77	3.84	201
PHL	3.64	0.40	3.25	2.19	6.37	6.50	-1.11	-18.71	-14.69	10.56	18.82	17.80	0.41	-0.17	-0.10	2.48	3.17	2.45	265
POL	2.85	-0.17	3.02	3.09	12.68	13.13	-1.40	-29.69	-41.57	11.24	45.91	33.12	1.03	0.64	-0.56	3.78	4.38	3.60	276
SAF	5.44	4.24	1.19	1.57	16.32	17.12	1.98	-41.92	-40.82	10.08	45.63	52.00	0.39	-0.50	0.62	2.88	3.08	3.17	276
IDR	5.36	2.91	2.45	1.98	8.54	9.34	0.79	-26.73	-22.97	14.10	27.98	38.57	0.59	-0.16	0.60	4.24	4.28	4.86	239

The table shows the country-specific summary statistics for 1-year maturity for UIP premium and its components for EMs and AEs.

Table 22A: Country-specific summary statistics for 2-year maturity for UIP premium and its components

2-year	Mean			SD			Min			Max			Skewness			Kurtosis			Obs
Countries	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	
AUD	3.19	-2.01	5.20	2.96	16.78	17.33	-2.09	-46.63	-26.38	9.85	31.46	50.28	0.11	-0.42	0.47	2.00	2.60	2.50	264
CAD	0.51	-1.23	1.73	1.33	11.49	11.61	-1.86	-27.63	-24.94	4.65	26.45	30.41	0.28	0.01	0.16	2.56	2.59	2.58	264
CHF	-2.63	-5.49	2.86	2.05	10.04	10.07	-7.19	-32.59	-16.88	1.12	16.48	30.56	-0.45	-0.52	0.73	2.06	2.75	2.91	264
DKK	-0.81	-1.49	0.68	2.64	12.80	13.27	-6.94	-37.07	-25.71	4.80	25.20	39.52	-0.19	-0.38	0.60	2.47	2.99	3.26	264
EUR	-1.14	-1.48	0.34	2.41	12.80	13.09	-7.03	-37.29	-25.58	3.84	25.26	38.87	-0.32	-0.38	0.59	2.53	3.01	3.25	264
GBP	0.59	1.59	-0.99	2.16	12.38	12.63	-4.18	-27.63	-30.29	5.59	31.76	30.69	0.22	0.37	-0.08	2.75	2.73	2.64	264
JPY	-3.54	1.53	-5.07	3.04	15.53	14.94	-12.37	-29.44	-37.29	-0.19	36.35	22.64	-0.89	0.28	-0.20	2.95	2.16	2.02	264
NOK	1.36	1.11	0.24	2.82	15.66	16.29	-3.48	-33.68	-35.25	8.75	37.61	39.02	0.38	0.26	-0.06	2.57	2.52	2.45	264
NZD	3.86	-3.28	7.14	2.83	16.67	17.36	-2.25	-48.83	-29.82	10.72	33.69	53.87	-0.37	-0.52	0.57	2.26	2.80	2.75	264
SEK	-0.54	0.53	-1.06	2.86	15.99	16.52	-6.59	-37.70	-28.07	5.04	29.03	40.36	-0.12	-0.21	0.38	2.13	2.38	2.54	264
BRL	17.30	13.28	4.02	5.89	20.93	22.73	6.23	-36.05	-37.32	28.57	57.69	56.74	-0.30	-0.22	0.33	1.95	2.42	2.49	178
CHL	5.35	5.84	-0.50	3.36	13.28	13.68	0.42	-31.57	-32.70	12.81	34.63	41.99	0.25	-0.27	0.39	1.76	3.01	3.29	196
COL	9.41	5.52	3.89	3.43	18.42	19.98	2.82	-35.52	-41.40	18.41	49.79	43.50	0.71	0.37	-0.25	3.20	2.86	2.59	221
ISR	1.01	-2.76	3.77	2.89	9.58	9.63	-4.55	-33.45	-24.94	6.89	24.51	35.28	0.02	-0.20	0.31	2.12	3.35	3.80	202
KOR	3.13	0.62	2.50	2.53	12.97	13.93	-1.91	-30.69	-48.32	8.39	48.82	35.32	-0.07	0.70	-0.61	1.72	3.87	3.78	264
MEX	9.03	5.65	3.38	2.18	13.04	14.05	4.50	-23.16	-32.79	15.79	39.00	35.28	0.21	0.39	-0.45	3.28	2.72	2.84	232
PEN	4.88	2.20	2.69	2.81	9.35	10.25	-0.31	-20.28	-19.39	13.61	22.99	25.90	0.17	0.23	-0.10	2.50	2.24	2.13	191
THA	1.01	-1.75	2.77	2.68	8.73	8.65	-5.70	-21.22	-19.97	6.57	19.98	21.66	-0.05	0.05	-0.17	2.90	2.33	2.73	264
TUR	21.08	31.44	-10.36	6.68	28.88	28.61	9.87	-25.78	-84.40	41.72	116.61	52.48	0.87	0.84	-0.48	3.05	3.67	3.14	203
RUS	11.40	13.82	-2.41	4.79	23.22	24.30	1.53	-29.60	-73.21	25.83	83.95	46.76	0.20	0.95	-0.64	3.52	3.89	3.46	189
PHL	8.36	0.68	7.68	4.43	9.35	10.45	0.77	-25.22	-10.43	23.07	19.03	33.42	0.62	-0.62	0.46	2.64	2.78	2.32	253
POL	5.45	0.22	5.23	5.65	15.37	17.03	-2.44	-40.60	-38.49	21.92	46.57	40.58	0.98	-0.05	0.03	3.67	2.94	2.06	264
SAF	11.21	7.34	3.87	2.75	22.66	24.29	4.18	-58.81	-49.26	19.74	59.34	74.64	0.18	-0.73	0.82	3.40	3.45	3.47	264
IDR	11.67	5.70	5.96	3.67	11.54	13.54	5.17	-31.27	-21.72	28.42	30.55	56.84	1.03	-0.15	0.53	4.88	3.74	4.53	227

The table shows the country-specific summary statistics for 2-year maturity for UIP premium and its components for EMs and AEs.

Table 23A: Country-specific summary statistics for 3-year maturity for UIP premium and its components

3-year	Mean			SD			Min			Max			Skewness			Kurtosis			Obs
Countries	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	
AUD	4.60	-3.61	8.21	4.10	19.24	19.76	-3.05	-51.85	-32.92	13.83	39.12	57.23	0.07	-0.13	0.25	2.08	2.72	2.36	252
CAD	0.65	-2.35	3.00	1.96	14.39	14.60	-2.56	-31.07	-31.12	6.12	33.76	35.61	0.26	0.20	0.10	2.21	2.66	2.59	252
CHF	-4.27	-8.24	3.97	2.90	11.27	11.30	-10.58	-37.75	-15.63	1.81	14.58	35.20	-0.30	-0.50	0.75	2.02	2.89	3.01	252
DKK	-1.33	-2.59	1.27	3.73	14.37	15.20	-9.99	-41.97	-27.68	6.33	26.40	44.55	-0.24	-0.58	0.74	2.39	3.18	3.28	252
EUR	-1.87	-2.59	0.72	3.50	14.39	14.98	-10.19	-42.12	-28.02	5.36	26.75	43.53	-0.34	-0.57	0.72	2.42	3.17	3.25	252
GBP	0.76	2.11	-1.35	3.08	13.72	14.52	-6.12	-30.41	-29.18	7.43	30.88	34.00	-0.01	0.01	0.29	2.53	2.65	2.51	252
JPY	-5.93	1.03	-6.96	4.20	18.99	17.44	-17.70	-36.17	-46.81	-0.26	46.11	29.52	-0.69	0.35	-0.21	2.70	2.66	2.48	252
NOK	1.72	1.60	0.13	3.74	18.04	19.06	-4.70	-38.80	-43.13	11.60	46.32	44.73	0.31	0.15	0.14	2.43	2.72	2.56	252
NZD	5.64	-5.41	11.05	3.97	18.73	19.79	-3.31	-54.49	-26.52	15.23	30.23	61.50	-0.50	-0.85	0.74	2.42	3.27	2.87	252
SEK	-0.88	0.03	-0.91	4.06	16.48	17.57	-9.46	-45.97	-33.35	6.28	34.67	48.65	-0.23	-0.38	0.58	2.02	3.14	2.91	252
BRL	26.71	21.80	4.91	8.17	23.04	25.79	10.62	-32.91	-46.30	45.28	70.79	68.26	-0.31	-0.13	0.10	2.11	2.30	2.43	166
CHL	8.13	9.16	-1.03	4.65	14.39	14.58	0.66	-31.36	-27.66	17.63	41.21	45.83	0.26	-0.11	0.46	1.75	2.55	2.78	184
COL	14.96	8.59	6.37	5.29	22.82	25.85	4.69	-36.71	-49.61	31.26	61.54	61.76	0.81	0.20	0.04	3.33	2.24	2.13	209
ISR	1.83	-4.25	6.08	4.42	8.29	8.36	-6.13	-31.14	-17.15	10.36	17.14	34.91	-0.02	-0.50	0.52	1.92	3.66	4.22	190
KOR	4.39	0.28	4.12	3.62	13.98	15.92	-2.81	-31.57	-45.04	12.14	45.75	39.79	-0.06	0.16	-0.15	1.67	3.03	2.75	252
MEX	13.41	9.30	4.11	3.00	14.74	16.48	7.01	-29.49	-35.61	22.98	46.37	44.21	0.31	0.13	-0.21	3.46	3.13	2.71	220
PEN	7.71	4.20	3.51	3.88	11.40	12.50	1.28	-19.37	-23.51	21.06	30.80	33.82	0.30	0.08	-0.01	2.79	2.10	2.39	179
THA	1.52	-3.23	4.75	3.81	10.18	9.47	-7.87	-22.35	-23.54	9.54	23.20	21.21	0.12	0.47	-0.60	2.57	2.32	2.89	252
TUR	29.99	45.74	-15.75	9.13	34.44	35.47	15.04	-13.03	-105.97	62.40	137.84	46.72	1.06	0.76	-0.33	3.81	3.09	2.69	191
RUS	17.06	21.46	-4.40	7.12	24.52	26.40	2.79	-21.21	-76.22	38.57	92.34	59.78	0.21	1.02	-0.45	3.41	3.42	3.11	177
PHL	12.08	-0.18	12.25	6.27	11.02	14.34	2.00	-30.98	-11.32	35.80	16.83	54.62	0.72	-0.53	0.63	2.84	2.69	3.05	231
POL	8.02	-0.02	8.03	7.73	16.80	20.19	-2.86	-49.02	-25.56	30.94	32.58	52.89	0.93	-0.52	0.57	3.57	2.68	2.06	252
SAF	16.92	9.45	7.48	3.84	24.47	26.66	6.38	-74.73	-45.35	29.36	60.19	94.59	-0.12	-0.69	0.76	3.72	3.84	3.81	252
IDR	17.96	8.15	9.81	5.12	13.25	15.93	9.12	-30.48	-27.15	42.14	42.38	69.03	1.16	0.38	0.25	5.55	3.44	4.54	215

The table shows the country-specific summary statistics for 3-year maturity for UIP premium and its components for EMs and AEs.

Table 24A: Country-specific summary statistics for 5-year maturity for UIP premium and its components

5-year	Mean			SD			Min			Max			Skewness			Kurtosis			Obs
Countries	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	
AUD	7.32	-3.93	11.25	5.19	25.36	24.60	-3.66	-52.12	-26.62	18.62	38.88	63.33	0.03	-0.05	0.15	2.15	1.69	1.63	228
CAD	0.53	-2.67	3.20	2.93	20.03	20.41	-4.91	-50.22	-30.47	8.41	33.38	57.20	0.20	-0.08	0.42	2.26	2.20	2.49	228
CHF	-7.82	-12.14	4.32	3.98	14.62	14.12	-16.74	-44.94	-23.89	0.65	21.05	33.18	-0.18	0.03	0.05	2.23	2.04	1.74	228
DKK	-2.19	-2.27	0.08	5.43	18.85	20.28	-15.47	-42.49	-29.28	8.14	26.39	44.18	-0.42	-0.52	0.69	2.45	2.22	2.41	228
EUR	-3.15	-2.31	-0.84	5.05	18.91	19.98	-15.69	-42.65	-29.70	6.12	26.68	43.03	-0.53	-0.53	0.71	2.51	2.23	2.44	228
GBP	0.93	5.51	-4.58	4.19	17.30	17.82	-9.62	-33.16	-31.87	9.09	32.84	35.86	-0.48	-0.67	0.88	2.89	2.29	2.58	228
JPY	-11.46	0.76	-12.23	5.80	21.87	19.39	-27.25	-45.90	-47.33	-1.78	41.92	28.47	-0.45	-0.12	0.17	2.59	2.33	2.20	228
NOK	2.21	4.70	-2.49	5.18	24.65	26.30	-6.80	-43.09	-39.54	15.94	45.15	52.25	0.17	-0.16	0.42	2.28	1.85	2.04	228
NZD	9.31	-6.47	15.77	4.88	23.01	23.40	-4.69	-57.54	-22.51	20.76	31.64	63.85	-0.68	-0.59	0.50	3.14	2.15	2.08	228
SEK	-1.50	2.09	-3.59	5.59	21.67	23.32	-14.32	-44.17	-40.05	9.04	37.79	46.95	-0.45	-0.35	0.49	2.22	2.12	2.36	228
BRL	47.27	42.04	5.23	9.88	21.18	22.41	26.17	-11.98	-37.97	76.93	88.09	73.25	0.11	-0.30	0.66	3.39	2.93	3.16	166
CHL	14.21	15.01	-0.80	5.93	16.32	15.33	4.63	-26.70	-32.96	25.82	41.55	45.57	0.16	-0.49	0.44	1.76	2.10	2.84	184
COL	27.00	16.66	10.34	8.47	29.78	34.83	11.12	-37.76	-37.62	51.88	58.35	85.70	0.90	-0.21	0.31	3.28	1.48	1.63	209
ISR	4.52	-5.92	10.45	6.75	9.95	11.19	-8.30	-29.29	-15.79	15.47	13.04	37.21	-0.30	-0.29	0.08	1.83	2.19	2.71	190
KOR	6.84	0.36	6.48	5.16	15.62	18.87	-4.35	-36.27	-24.01	17.79	26.55	50.58	-0.18	-0.71	0.47	1.70	2.56	2.25	252
MEX	21.50	18.13	3.37	4.40	15.97	18.47	12.34	-15.83	-27.43	36.87	46.87	44.36	0.63	-0.01	0.16	3.92	2.12	2.08	220
PEN	14.17	7.45	6.72	5.29	13.70	13.39	3.31	-19.10	-12.68	31.11	23.87	41.36	0.30	-0.78	0.70	2.95	2.11	2.32	179
THA	2.68	-6.44	9.12	5.31	12.43	11.12	-8.82	-31.14	-15.02	14.12	18.12	38.21	0.20	0.05	-0.15	2.35	2.10	2.57	252
TUR	45.20	73.64	-28.44	14.18	45.63	49.35	24.59	1.58	-124.29	98.54	173.41	67.36	1.25	0.52	-0.03	4.23	2.39	1.98	191
RUS	27.85	37.65	-9.80	11.74	27.08	30.15	5.38	-8.32	-71.35	61.77	95.72	70.03	0.21	0.31	0.22	3.18	1.77	2.36	177
PHL	21.04	-0.80	21.84	12.07	13.15	22.11	4.01	-29.87	-17.29	57.53	24.90	71.82	0.81	-0.06	0.31	2.56	2.02	1.96	231
POL	12.96	0.31	12.64	10.28	23.89	29.14	-2.45	-63.24	-29.31	43.90	44.66	77.90	0.85	-0.57	0.78	3.41	2.59	2.32	252
SAF	27.58	18.99	8.59	5.88	26.93	28.94	10.65	-53.49	-58.97	45.47	84.73	88.27	-0.63	-0.18	0.53	3.64	3.25	3.39	252
IDR	30.30	14.83	15.47	8.23	15.46	19.64	16.40	-14.52	-21.10	64.07	49.77	63.31	1.00	0.47	-0.06	4.33	2.13	2.56	215

The table shows the country-specific summary statistics for 5-year maturity for UIP premium and its components for EMs and AEs.

Table 25A: Country-specific summary statistics for 7-year maturity for UIP premium and its components

7-year	Mean			SD			Min			Max			Skewness			Kurtosis			Obs
Countries	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	
AUD	9.84	-4.34	14.18	5.34	29.59	27.41	-1.51	-63.52	-39.30	21.86	53.03	68.96	0.10	-0.10	0.13	2.20	1.84	1.84	204
CAD	0.45	-1.75	2.20	3.55	23.67	24.63	-6.76	-47.97	-30.42	9.83	32.53	48.64	0.24	-0.25	0.48	2.61	1.70	1.80	204
CHF	-10.84	-16.43	5.59	4.16	17.38	16.21	-21.72	-56.26	-30.31	2.26	23.17	44.86	0.14	-0.09	0.16	2.58	2.02	2.09	204
DKK	-2.29	-1.64	-0.65	5.46	22.93	23.61	-15.41	-61.58	-32.39	10.93	38.81	60.85	-0.14	-0.81	1.05	2.30	2.88	2.94	204
EUR	-3.35	-1.66	-1.68	5.18	22.97	23.40	-16.90	-61.83	-34.48	8.14	38.61	59.25	-0.36	-0.81	1.01	2.33	2.87	2.90	204
GBP	1.50	10.07	-8.56	3.68	15.90	15.58	-9.56	-36.67	-32.63	10.29	30.33	35.22	-0.06	-1.51	1.30	2.89	4.55	3.98	204
JPY	-16.90	0.61	-17.51	7.17	22.96	19.15	-35.73	-40.40	-50.05	-3.65	38.90	18.31	-0.26	-0.11	0.18	2.51	1.72	1.81	204
NOK	2.94	8.16	-5.22	5.52	30.16	31.11	-7.00	-60.71	-53.68	18.17	57.61	70.42	0.25	-0.45	0.65	2.54	2.10	2.29	204
NZD	12.76	-7.63	20.39	4.54	23.56	22.35	2.62	-67.46	-20.71	23.49	34.04	74.43	-0.30	-0.54	0.37	2.39	2.65	2.47	204
SEK	-1.47	4.09	-5.56	5.42	24.73	25.42	-14.39	-59.01	-39.49	10.02	41.69	59.61	-0.27	-0.47	0.57	2.10	2.32	2.29	204
BRL	67.62	60.35	7.27	11.49	21.41	24.57	35.68	9.28	-43.54	103.60	100.84	74.27	0.61	-0.40	0.65	5.14	2.44	3.09	118
CHL	20.04	22.72	-2.68	6.70	15.25	11.55	5.73	-12.30	-29.29	33.13	59.24	26.31	-0.08	-0.38	0.24	2.08	3.10	2.91	136
COL	39.58	24.26	15.32	11.49	36.23	43.21	17.22	-47.60	-56.20	72.40	80.09	120.00	0.94	-0.55	0.66	3.16	1.87	2.47	161
ISR	9.34	-7.23	16.57	7.21	9.06	9.33	-4.17	-24.61	-6.16	21.49	17.87	36.16	-0.42	0.10	0.02	1.95	2.57	2.31	142
KOR	9.17	1.80	7.37	5.79	11.51	15.46	-1.96	-30.19	-21.84	23.79	22.27	47.57	-0.13	-0.85	0.42	1.88	3.18	2.50	204
MEX	29.00	27.21	1.79	5.91	16.38	18.72	17.44	-19.99	-46.90	47.89	68.93	54.11	0.89	-0.27	0.24	3.78	2.87	2.66	172
PEN	20.73	12.43	8.29	7.23	14.08	13.18	4.43	-26.29	-19.49	39.56	37.34	44.34	0.18	-0.86	0.32	2.84	3.19	2.61	131
THA	4.20	-9.15	13.35	5.98	13.57	11.20	-10.77	-36.76	-4.47	18.67	11.25	40.15	0.12	-0.37	0.43	2.75	1.59	2.05	204
TUR	47.66	141.20	-93.54	6.67	39.86	37.29	33.20	79.84	-168.23	60.88	221.35	-33.55	-0.22	0.51	-0.42	2.40	2.15	2.02	79
RUS	39.52	57.47	-17.95	18.62	28.36	34.34	7.89	-8.34	-85.65	82.55	104.48	71.62	0.23	-0.75	0.79	2.63	2.42	3.25	129
PHL	30.73	-0.25	30.97	17.79	16.58	31.60	6.38	-29.54	-10.33	80.85	23.72	92.96	0.65	-0.27	0.44	2.22	1.70	1.65	193
POL	17.72	2.12	15.60	12.52	27.83	36.30	-0.41	-72.88	-43.10	54.93	60.62	123.60	1.03	-0.65	1.24	3.83	2.80	3.77	204
SAF	37.37	29.49	7.88	8.23	25.78	30.07	15.23	-33.90	-39.66	57.47	74.24	91.37	-0.52	-0.44	0.65	3.06	2.29	2.39	204
IDR	42.88	21.54	21.34	10.98	16.52	24.03	24.65	-9.35	-23.72	85.54	54.45	77.52	1.09	0.04	0.10	4.68	1.95	2.12	167

The table shows the country-specific summary statistics for 7-year maturity for UIP premium and its components for EMs and AEs.

Table 26A: Country-specific summary statistics for 10-year maturity for UIP premium and its components

10-year	Mean			SD			Min			Max			Skewness			Kurtosis			Obs
Countries	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	Diff	XR	Premium	
AUD	13.11	-4.38	17.49	5.70	37.00	33.99	-1.60	-76.80	-35.84	24.67	48.34	86.84	-0.16	-0.54	0.58	2.66	2.03	2.16	168
CAD	1.11	0.59	0.51	4.15	27.79	30.47	-6.28	-48.50	-33.87	12.74	34.06	59.54	0.50	-0.63	0.67	3.08	1.74	1.79	168
CHF	-15.11	-23.24	8.13	4.53	21.03	20.01	-27.85	-78.75	-29.13	-1.10	14.26	62.43	-0.14	-0.57	0.72	2.93	2.55	2.73	168
DKK	-1.38	2.03	-3.41	5.19	23.69	25.44	-12.18	-53.27	-34.27	11.71	31.28	54.08	-0.10	-0.90	0.84	2.31	2.41	2.23	168
EUR	-3.05	2.00	-5.05	4.46	23.75	24.76	-11.91	-53.54	-34.00	7.71	30.89	51.25	-0.14	-0.89	0.86	2.26	2.39	2.26	168
GBP	1.91	16.08	-14.17	4.22	15.86	15.46	-11.81	-15.42	-46.20	10.91	46.21	14.01	-0.71	-0.02	-0.05	3.87	2.34	2.21	168
JPY	-25.05	2.31	-27.36	8.62	27.67	21.09	-45.65	-56.86	-71.80	-7.15	62.29	24.04	0.11	-0.12	0.43	2.70	2.36	2.72	168
NOK	2.48	51.78	-49.30	1.79	7.53	8.16	-1.10	38.92	-63.53	5.37	64.26	-33.93	-0.26	-0.01	0.20	2.25	1.77	1.93	33
NZD	16.95	-10.64	27.59	5.15	29.52	28.12	4.59	-75.40	-22.04	26.64	39.36	90.52	-0.38	-0.53	0.54	2.69	2.16	2.28	168
SEK	-1.57	7.84	-9.40	5.47	29.62	32.03	-12.62	-55.91	-58.99	11.86	54.49	56.58	0.05	-0.52	0.61	2.58	2.11	2.07	168
BRL	88.34	86.17	2.17	13.37	23.75	26.50	49.50	41.61	-35.22	142.45	123.92	87.93	0.62	-0.13	0.87	7.89	1.92	3.84	82
CHL	26.47	36.02	-9.55	8.48	15.49	12.61	7.55	1.65	-34.52	42.07	71.29	31.44	-0.47	0.01	0.89	2.09	2.15	4.23	100
COL	51.55	50.36	1.19	13.49	27.26	36.52	25.11	-22.18	-68.85	88.06	100.99	110.24	0.74	-0.13	0.39	3.03	2.30	2.88	111
ISR	18.13	-8.96	27.09	5.84	7.49	9.88	0.61	-21.64	-1.78	29.92	13.69	47.09	-0.31	0.80	-0.42	3.16	3.18	3.28	106
KOR	12.27	2.60	9.67	6.77	13.26	17.61	-4.47	-31.08	-23.03	27.91	26.73	54.95	-0.27	-0.11	0.09	2.37	2.04	2.24	159
MEX	40.05	40.82	-0.77	8.15	14.76	20.45	24.39	11.58	-39.37	62.45	67.48	47.61	0.62	-0.35	0.49	2.90	2.15	2.34	131
PEN	26.13	19.55	6.58	8.65	13.65	13.61	6.96	-1.67	-20.96	53.81	42.89	44.62	0.53	0.19	0.56	3.78	1.63	3.51	95
THA	6.29	-11.12	17.41	6.62	16.22	14.11	-13.72	-42.91	-8.44	21.51	21.47	55.02	-0.15	-0.17	0.52	3.18	2.06	2.53	168
TUR	59.27	205.37	-146.09	7.22	39.88	41.28	42.87	146.44	-208.69	70.07	266.00	-82.65	-0.80	0.00	-0.05	2.72	1.52	1.45	43
RUS	49.51	86.59	-37.08	21.11	13.30	30.11	10.48	51.32	-74.49	105.13	128.35	34.66	0.68	-0.18	0.90	3.39	3.47	2.77	79
PHL	49.48	-0.21	49.70	25.80	18.61	42.58	3.82	-29.30	-19.95	115.48	34.48	135.19	0.30	0.05	0.16	2.09	1.61	1.63	157
POL	24.55	8.63	15.92	14.98	27.29	37.75	0.91	-49.04	-37.46	68.26	57.57	117.29	0.92	-0.50	0.87	3.68	1.83	2.72	168
SAF	50.14	46.21	3.93	11.94	34.89	44.13	21.95	-41.48	-69.41	75.07	96.44	113.48	-0.16	-0.98	0.84	2.74	2.76	2.61	168
IDR	59.59	37.96	21.63	17.16	8.57	23.39	33.95	14.59	-11.93	119.03	58.35	102.04	0.87	-0.33	0.65	3.77	2.83	3.32	126

The table shows the country-specific summary statistics for 10-year maturity for UIP premium and its components for EMs and AEs.