Long-run Uncovered Interest Parity in Emerging Markets*

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Abstract

Long-run uncovered interest rate parity (LRUIP) 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, LRUIP cannot be rejected statistically for these currencies.

JEL Codes: F31, G12, G15, F30

Keywords: LRUIP, Credit risk, Credit ratings, G10 currencies, Emerging markets, U.S. Dollar.

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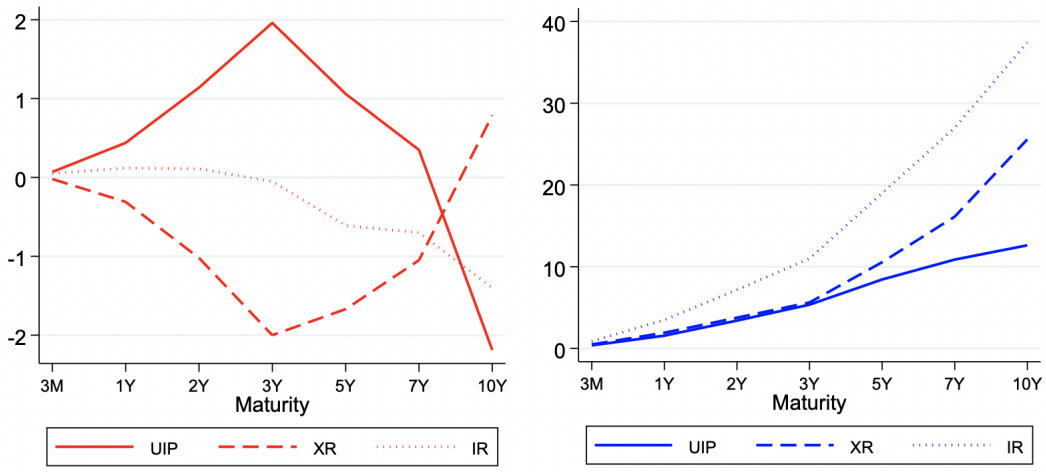
1 Introduction

The Uncovered Interest Parity (UIP) is a fundamental 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 some role in explaining exchange rate dynamics in countries with less than stellar credit ratings, regardless of their level of market development.

Figure 1 plots the average interest rate differential, the ex-post exchange rate change, and unconditional UIP deviation between the U.S. 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 for EM currencies, in line with the findings in Kalemli-Özcan and Varela (2021), which suggest that the UIP premium is generally higher in EMs than in AEs.

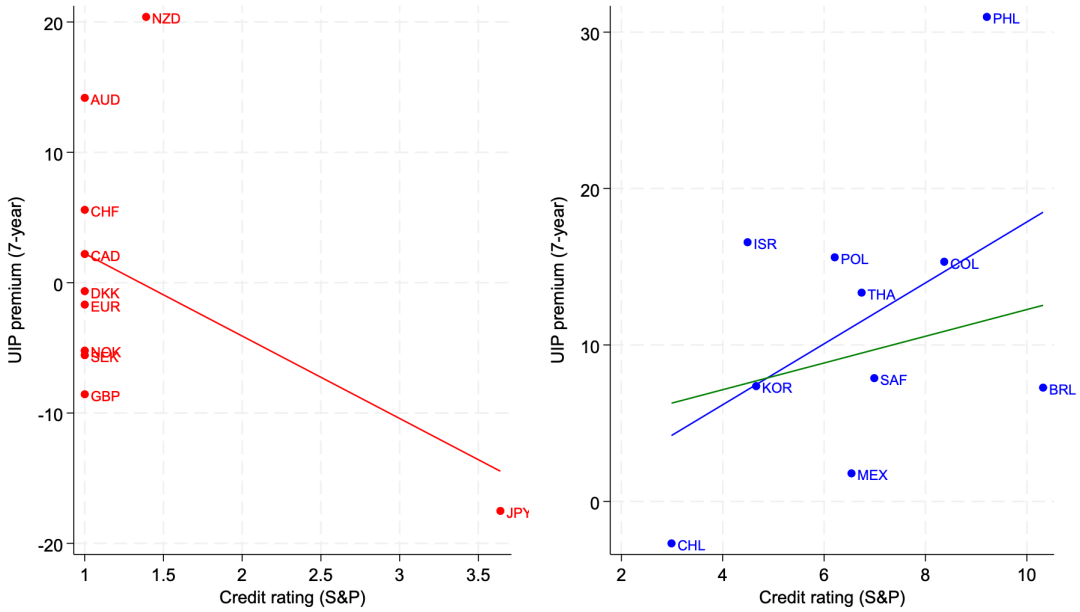
Figure 1: Decomposition of mean UIP premium across different maturities



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 G10 (left panel) and EM10 (right-panel) currencies. Note: See Section 2 for details on data sources, sample period, and country sample.

Figure 2 plots average sovereign credit ratings on long-term debt against average unconditional 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 evidence 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 (S&P) and UIP premium



The figure shows the average UIP premium at 7-year maturity and average long-term sovereign debt credit ratings for G10 (left panel) and EM10 (right-panel) currencies. The green fitted line for EMs excludes Brazil and Philippines.

By tying these two stylized facts together, this paper contends that when credit risk is accounted for, LRUIP also holds for EMs. 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 gets closer to unity when we account for the credit risk with either credit default swaps (CDS) or by 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 framework with incomplete markets as in Jiang, Krishnamurthy, and Lustig (2021) and show that credit risk premia should play a role in explaining exchange rate dynamics in countries whose solvency is a recurring issue, like in several emerging economies in our sample, and in some European countries after the Global Financial Crisis.

The empirical literature on UIP has documented persistent deviations from this theoretical prediction, a phenomenon also referred to as the "forward premium puzzle" (Fama, 1984). Many explanations have been advanced for the interpretation of UIP premia, some based time-varying risk premia, others on market frictions or behavioral biases. Yet, no consensus exists on the dominant mechanism. In this paper, we focus specifically on LRUIP and credit risk.

Meredith and Chinn (1998), Chinn and Meredith (2004), and Chinn and Meredith (2005) find that UIP holds more closely at five- to ten-year maturities for AEs. Using data for G7 countries, they show that short-run UIP failures arise from time-varying risk premia and endogenous monetary policy, but over longer horizons, exchange rate movements are increasingly driven by fundamentals. Relatedly, Lustig et al. (2019) show that currency excess returns decline with maturity, with average excess returns approaching zero. Our paper complements this literature by focusing on LRUIP in EMs. We find that, unlike in AEs, LRUIP fails in EMs unless credit risk is accounted for. Controlling for CDS spreads or interacting interest rate differentials with credit ratings brings slope coefficients closer to unity.

Chernov and Dahlquist (2023) has provided an extensive review of the UIP literature from a multi-horizon perspective and pointed out the differences in the behavior of AEs and EMs. The discussion suggests that credit risk might be the critical driver of the differences between AEs and EMs but the argument is cast in terms of omitted variable bias. In our study, we directly test the conjecture that credit risk is a critical driver of exchange rates in EMs and show that once we condition CDS spreads or credit ratings, LRUIP cannot be rejected.

Della Corte, Sarno, Schmeling, and Wagner (2022) and Della Corte, Jeanneret,

and Patelli (2023) also identify a link between sovereign risk and currency excess returns, but do not focus on long-term bonds. Specifically, Della Corte et al. (2022) demonstrate that exchange rate movements are more affected by the expectations about a country defaulting on its debt, reflected in CDS prices, than by the extra compensation investors demand for taking on that risk. Put differently, it is the actual perceived risk of default, not the extra "fear premium", that mainly drives exchange rate changes.

Della Corte et al. (2023) develop a theory that links currency risk to a country's credit risk, using information in CDS traded in different currencies. They show that the differences in these CDS prices help explain why some currencies offer higher returns, especially for countries with weaker credit profiles, i.e. where the likelihood of default, capital flight or macroeconomic instability is more pronounced. Our findings align with these studies in pointing out the sovereign credit risk as a critical driver of long-run 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), focusing on the sign of the deviation and the implied relationship between interest rate differentials and expected exchange rate changes. They tended to find that EMs exhibit a relationship between interest rate differentials and exchange rates with the opposite sign compared to AEs.

Gilmore and Hayashi (2011) examine the foreign exchange excess return from long-positions in 20 EM currencies for the U.S. 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 but generally statistically insignificant. These results align with the ones reported in our study, and corroborate the fact that there are significant UIP deviations for EMs. Furthermore, the paper shows that EM currencies provide equity-like excess returns, indicative of large and persistent violations of the UIP that may be the result of compensation for risk exposure. It is important to note that, unlike our paper, UIP deviations are computed only over a short maturity tenor (1-month) and the sources of risk leading high excess returns are not explored.

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 correlation between policy uncertainty indexes and short-term UIP premia at the 1-year maturity for EMs, with a weaker or nonexistent relationship 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 LRUIP and identifies a significant correlation with credit ratings and CDS

spreads. Credit ratings capture structural and persistent factors, such as macroeconomic fundamentals and sovereign solvency. By incorporating sovereign credit risk into UIP regressions, we find that the coefficient on interest rate differentials approaches unity, providing evidence that LRUIP holds in EMs when credit risk is accounted for.

Our paper also relates to Andrews, Colacito, Croce, and Gavazzoni (2024), which highlights the dynamic interaction of global inflation news and country-specific risk premia in shaping currency returns, as inflation can be seen as a form of default on local currency debt. The heterogeneous exposure to inflation risks among countries adds another layer to the understanding of UIP deviations in EMs. Our work on explicit credit default complements the analysis of inflation risk.

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

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 main stylized facts on LRUIP in EMs. 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 LRUIP in EMs, conditional on measures of credit risk. Section 6 concludes. An

Appendix reports data sources, definitions, summary statistics, additional empirical results and all model derivations.

2 Sample and Data

In our empirical analysis, we focus on a sample comprising ten developed and ten developing market currencies. The first group includes G10 currencies: Australia, Canada, Switzerland, Denmark, the Euro Area (represented by Germany), the United Kingdom, Japan, Norway, New Zealand, and Sweden. The second group, which we refer to as EM10, comprises countries that, on average over our sample period, receive a rating of three or higher in the classification of the exchange rate regime in (Ilzetzki, Reinhart, & Rogoff, 2022). This group includes Brazil, Chile, Colombia, Israel, Korea, Mexico, the Philippines, Poland, South Africa, and Thailand. For robustness, we also consider a broader EM14 group—adding Indonesia, Peru, Russia, and Turkey— as well as two other countries in the Euro Area that experienced debt sustainability problems over our sample period, Italy and Greece.

Exchange rates and interest rates data are sourced from Bloomberg and Refinitiv. The frequency is monthly, and the data sample period spans from 2000 to 2023, with some variation in the starting period across countries due to data availability.[1] The interest rates are zero-coupon yields. Exchange rates are monthly period averages. We do not attempt to measure expected future exchange rates, as there is evidence that the distinction between expected and realized exchange rate changes does not make a significant difference for emerging markets, given the

[1]However, note that the sample period in estimation ends earlier than 2023, depending on the maturity, losing up to 120 monthly observations when we focus on the 10Y horizon. See also the discussion of the empirical framework in Section 5.

available expectation measures (Kalemli-Özcan & Varela, 2021).

In the empirical analysis, we also use data on sovereign credit ratings and covered interest rate parity deviations. Sovereign credit ratings are from Standard and Poor's. To construct average credit ratings, we assign each rating to a number, with a smaller number corresponding to a higher rating. Data on covered interest rate parity deviations are from Du, Im, and Schreger (2020). Detailed information on tickers and variable descriptions is provided in the Appendix B, along with a comprehensive set of country-specific summary statistics.

Table 1: Average CDS spreads across maturities and countries (AEs)

Maturity	AUS	CAN	CHF	DKK	EUR	JPY	NOR	NZE	SEK	Mean
1Y	61.35	84.98	47.21	51.16	37.24	64.15	30.79	63.62	33.32	52.65
5Y	16.79	18.32	12.41	14.67	2.63	15.00	6.46	20.62	11.19	13.12
10Y	42.15	54.33	32.02	33.08	22.27	39.54	18.92	45.41	23.00	34.52

The table shows the average CDS spreads, in basis points, for AEs across maturities. The sample period is from January 2000 to January 2020, subject to data availability.

Table 2: Average CDS spreads across maturities and countries (EMs)

Maturity	BRL	CHL	COL	ISR	KOR	MEX	PHL	POL	SAF	THA	Mean
1Y	77.91	30.57	60.51	35.66	40.08	50.65	65.92	48.41	71.82	36.67	51.82
5Y	186.95	74.81	157.73	88.57	76.20	120.69	168.41	107.81	166.81	92.12	124.01
10Y	241.55	101.60	212.95	115.42	96.18	166.43	223.26	141.10	208.76	122.88	163.01

The table shows the average CDS spreads, in basis points, for EMs across maturities. The sample period is from January 2000 to January 2020, subject to data availability.

Tables 1 and 2 report the average credit default swap (CDS) spreads across different maturities and groups of countries, over the period from January 2000 to January 2020. On average, CDS spreads are significantly higher in EMs than in AEs, particularly at longer maturities. For instance, the mean 10-year CDS spread is 163.01 basis points in EMs versus 34.52 in AEs. Additionally, while CDS spreads tend to decline with maturity in AEs, they trend upward in EMs.

Table 3: Average credit ratings from S&P for AEs

	AUS	CAN	CHF	DKK	EUR	GBP	JPY	NOR	NZE	SEK	G10
ST	1.00	1.00	1.00	1.00	1.00	1.00	1.21	1.00	1.00	1.00	1.02
LT	1.00	1.00	1.00	1.00	1.00	1.34	3.64	1.00	1.39	1.00	1.34

The table shows the average short-term and long-term credit ratings from S&P for AEs. The numerical rating are computed as follows with 1 assigned to AAA, 2 to AA+ etc. In general the higher the number the lower the rating. The sample period is from January 1999 to December 2019, subject to data availability.

Table 4: Average credit ratings from S&P for EMs

	BRL	CHL	COL	IDR	ISR	KOR	MEX	PEN	PHL	POL	RUS	SAF	THA	TUR	EM10	EM14
ST	4.23	1.00	3.31	5.04	1.24	1.69	2.50	3.74	3.92	2.29	3.79	2.79	2.74	4.77	2.57	3.07
LT	10.32	2.99	8.37	12.17	4.49	4.66	6.54	8.88	9.21	6.21	10.11	6.99	6.74	11.97	6.65	7.83

The table shows the average short-term and long-term credit ratings from S&P for EMs. The numerical rating are computed as follows with 1 assigned to AAA, 2 to AA+ etc. In general the higher the number the lower the rating. The sample period is from January 1999 to December 2019, subject to data availability.

Tables 3 and 4 report the average long-term (LT) and short-term (ST) credit ratings for AEs and EMs, respectively, between January 1999 and December 2019. All AEs except Japan consistently receive top short-term rating, on average over the sample period. In contrast, the average short-term rating is EMs is about 3. Similar average differences are present for long-term rating. EMs also display more heterogeneity across countries. For instance, long-term ratings range from 2.99 (Chile) to 12.17 (Colombia), with the EM10 average at 6.65 and EM14 at 7.83.

3 Testing for LRUIP

In this section, we present results from the estimation of standard Uncovered Interest Rate Parity (UIP) regressions at different time horizons as in Chinn and Meredith (2005). The regression specification, estimated with the General Method of Moments

(GMM), is as follows:

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

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 U.S. dollar with k denoting the maturity of the government bonds in months, with an increase indicating a dollar appreciation of a foreign currency depreciation. $i^{*}_{i,t,k}$ 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 yield. $\delta_{i,\kappa}$ is a constant term in the country-specific regressions and the fixed effect in the panel regressions.

Table 5 reports panel estimation results. Country-specific results are reported in the appendix. The reported standard errors are computed by bootstrap using the methodology described in Appendix C. Several findings emerge from the analysis. Some results are novel, while others are consistent with existing findings in the literature, suggesting that our new findings are not driven by the specific details of our empirical analysis.

Table 5: Pooled regressions

	3M	**1Y**	**2Y**	**3Y**	**5Y**	**7Y**	**10Y**
G10	-0.238*	-0.339***	-0.152***	-0.110***	0.184***	0.581	0.707
	(0.661)	(0.418)	(0.287)	(0.224)	(0.249)	(0.276)	(0.189)
EM10	-0.129*	-0.509***	-0.693***	-0.634***	-0.392***	-0.467***	-0.571***
	(0.636)	(0.313)	(0.210)	(0.162)	(0.127)	(0.121)	(0.095)
EM14	0.340	-0.356***	-0.814***	-0.630***	-0.524***	-0.497***	-0.502***
	(0.593)	(0.310)	(0.179)	(0.150)	(0.116)	(0.109)	(0.088)

The table reports panel estimation results for different country groupings. Standard errors are computed by bootstrapping using a block-bootstrapping methodology as in Horowitz (2019). *, **, *** indicate that we can reject the null hypothesis that beta equals unity with 10%, 5%, and 1% significance level, respectively.

First, consistent with previous studies, UIP can only be rejected at 10% significance level for either group of countries at the 3M maturity due to the large standard errors. However, the coefficients have opposite signs only for the EM14 currencies, which add to the sample relatively less freely floating currencies of Indonesia, Peru, Russia, and Turkey.

Second, for maturities of 1Y to 3Y, the coefficient on the interest rate differential is negative for both the EM10 and G10 countries. This implies that currencies with higher interest rates tend to appreciate. Statistically, the null hypothesis of UIP can be rejected, but the standard errors are very large.

Third, at the longer end of the yield curve, the UIP regression coefficient increases for G10 currencies, and the standard errors decline. The coefficient turns positive but is statistically insignificant at the 5Y maturity. We cannot reject UIP at the 7Y and 10Y maturities, and the coefficients are statistically different than zero. This is consistent with the previous literature and suggests that UIP tends to hold over long horizons in advanced economies.

Fourth and last, in the case of EM10 and EM14, the UIP coefficient is negative for all maturities, and the null hypothesis of unitary coefficient is rejected for all maturities except 3M, with much smaller standard errors than in G10 countries.

Finally, Tables 6A to 12A in the Appendix D.1 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 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 maturi-

ties except the 3M horizon. Individual currency estimates are often not statistically significant due to large standard errors, the likely consequence of a relatively short sample, especially for longer maturity where we lose up to 120 monthly observations at the end of the sample.

Table 6: Comparing Greece and Italy

	3M	**1Y**	**2Y**	**3Y**	**5Y**	**7Y**	**10Y**
GRC	-0.064***	-0.020***	-0.024***	-0.116***	-0.169***	-0.082***	n.a.
	(0.189)	(0.152)	(0.118)	(0.082)	(0.066)	(0.051)	n.a.
ITA	0.361	-0.075	-0.459**	-0.954***	-0.869***	-0.898***	n.a.
	(1.833)	(0.969)	(0.597)	(0.375)	(0.325)	(0.273)	n.a.

The table reports country-specific estimation results for Italy and Greece, where interest rates are country-specific, and the exchange rate is the Euro. Standard errors are bootstrapped. Note: *, **, *** indicate that we can reject the null hypothesis that beta equals unity with 10%, 5%, and 1% significance level, respectively.

For comparison, Table 6 reports the same estimation results for Greece and Italy. 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. Negative coefficients are statistically significant from the 3Y maturity. This similarity is interesting given Italy's recurring debt sustainability concerns and Greece's sovereign default during the European debt crisis.

4 A simple no-arbitrage framework

In this section, we describe a simple no-arbitrage asset pricing framework with incomplete markets that we derive in the Appendix to interpret the results above and guide further empirical analysis in the paper. The model builds on Du and Schreger (2016) and Jiang et al. (2021), introducing sovereign credit risk and convenience

yield in the standard exchange rate determination equation as in Clarida and Taylor (1997), Froot and Ramadorai (2005), and Engel (2016). We consider both credit risk and convenience yield as we want to compare AEs and EMs in our empirical analysis.

Consider the representative foreign economy (*) in our sample 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 in local currency. S_t denotes the nominal exchange rate in foreign currency units per U.S. dollar, so an increase is a dollar appreciation or a depreciation of the foreign currency. We denote with $y_t^{\$}$ the nominal (promised) yield on a one-period zero-coupon U.S. treasury bill, denominated in U.S dollars and 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 subject to credit risk. Following Du and Schreger (2016), credit or default risk on foreign bonds is introduced by adding a random 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 promised 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 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 $\lambda_t^{j,i}$.

[2]Allowing for selective default with the foreign government discriminating between U.S. and domestic investors is possible but would detract from the clarity of exposition.

To derive the asset pricing implication of this simple setup, we first price the exchange rate assuming only short-term bonds are traded. We then introduce and price long-term bonds and the term premium. And finally, we derive the exchange rate implications of trading both short and long term bonds.

4.1 Exchange rate, convenience yield and credit risk with one-period bonds

Denote now 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 then convert the proceeds 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 yield, 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 exchange rate risk premium and credit risk premium required by foreign investors, respectively. Similarly, from Equations (4) and (5), we have:

$$\mathbb{E}_t\left(m^{\$}_{t+1}\right)+y^{\$}_t+\frac{1}{2}\operatorname{var}_t\left(m^{\$}_{t+1}\right)+\lambda^{\$,\$}_t=0 \tag{8}$$

$$\begin{aligned}\mathbb{E}_t\left(m^{\$}_{t+1}\right)+\frac{1}{2}\operatorname{var}_t\left(m^{\$}_{t+1}\right)-\mathbb{E}_t\left(\Delta s_{t+1}\right)+\frac{1}{2}\operatorname{var}_t\left(\Delta s_{t+1}\right)+y^*_t+\mathbb{E}_t\left(L^*_{t+1}\right)+\frac{1}{2}\operatorname{var}_t\left(L^*_{t+1}\right)\\ +\operatorname{cov}_t\left(m^{\$}_{t+1},L^*_{t+1}\right)+\operatorname{cov}_t\left(-\Delta s_{t+1},m^{\$}_{t+1}\right)+\operatorname{cov}_t\left(-\Delta s_{t+1},L^*_{t+1}\right)+\lambda^{*,\$}_t=0\end{aligned} \tag{9}$$

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

Lets now redefine the 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, combine (6) with (7) and (8)

with (9), to obtain the following two no-arbitrage relationships for foreign and U.S. investors, respectively:

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

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

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:

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

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

Equation (12) says that the exchange rate is determined by convenience yield differentials, 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. Furthermore, in the Appendix, we show that by imposing mild restrictions on the foreign and U.S. valuation of their risk exposure, the foreign and U.S. value of the exchange rate coincide. Moreover, there exists an exchange rate process that is consistent with the assumption that markets are incomplete and priced as specified above.

4.2 Introducing multi-period bonds

To asses the impact of credit risk and convenience yield on 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.

Denote $y_t^{*(n)}$ and $y_t^{\$(n)}$ the nominal yields and on n-period zero coupon foreign and U.S. government bonds, $\lambda_t^{i,j(n)}$ their convenience yields, $h^*_{n,t+1}$ the one-period holding return of an n period bond, and $hy^*_{n,t+1}$ the difference between $h^*_{n,t+1}$ and the return to holding a single period bond. In appendix, we show that the

$$
\begin{aligned}
n\left(y_t^{*(n)} - y_t^{*(1)}\right) & \\
&= (n-1)\mathbb{E}_t\left[y_{t+1}^{*(n-1)} - y_{t+1}^{*(1)}\right] + (n-1)\mathbb{E}_t\left[\Delta L^*_{t+2}\right] + \left(\lambda_t^{*,*(1)} - \lambda_t^{*,*(n)}\right) \\
&+ \mathbb{E}_t\left(\lambda_{t+1}^{*,*(n-1)}\right) + (n-1)\left[\text{cov}_t\left(y_{t+1}^{*(n-1)}, L^*_{t+1}\right) + \text{cov}_t\left(\Delta L^*_{t+2}, L^*_{t+1}\right)\right] \\
&+ \text{cov}_t\left(\lambda_{t+1}^{*,*(n-1)}, L^*_{t+1}\right) - \frac{1}{2}\,\text{var}_t\left(hy^*_{n,t+1}\right) - \text{cov}_t\left(hy^*_{n,t+1}, m^*_{t+1}\right)
\end{aligned}
\tag{14}
$$

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

investors and $\Delta L^*_{t+2} = L^*_{t+2} - L^*_{t+1}$. A similar relationship can be derived for U.S. bonds for U.S. investors:

$$n\left(y_t^{\$(n)} - y_t^{\$(1)}\right) = -\frac{1}{2}\operatorname{var}_t\left(hy^{\$}_{n,t+1}\right) + (n-1)\mathbb{E}_t\left(y_{t+1}^{\$(n-1)} - y_{t+1}^{\$(1)}\right) + (n-1)\mathbb{E}_t\left[\Delta y_{t+1}^{\$(1)}\right] + \mathbb{E}_t\left[\lambda_{t+1}^{\$,\$(n-1)}\right] + \left[\lambda_t^{\$,\$(1)} - \lambda_t^{\$,\$(n)}\right] - \operatorname{cov}_t\left(m^{\$}_{t+1}, hy^{\$}_{n,t+1}\right), \tag{15}$$

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

Now, under some simplifying assumptions that facilitate exposition,[3] it is possible to show that the short-term interest rate differential must satisfy the following relationship

$$\begin{aligned} y_t^{\$(1)} - y_t^{*(1)} =& n\left(y_t^{\$(n)} - y_t^{*(n)}\right) - (n-1)\mathbb{E}_t\left[y_{t+1}^{\$(n-1)} - y_{t+1}^{*(n-1)}\right] \\ &+ \left[\left(\lambda_t^{*,*(1)} - \lambda_t^{*,*(n)}\right) - \left(\lambda_t^{\$,\$(1)} - \lambda_t^{\$,\$(n)}\right)\right] \\ &+ (n-1)\mathbb{E}_t\left(\Delta L^*_{t+2}\right) - \left[tp_t^{\$,\$} - tp_t^{*,*}\right]. \end{aligned} \tag{16}$$

where $(\lambda_t^{*,*(1)} - \lambda_t^{*,*(n)})$ and $(\lambda_t^{\$,\$(1)} - \lambda_t^{\$,\$(n)})$ captures the term structure of convenience yields. Finally, further assuming for expositional purposes that $\mathbb{E}_t\left[\lim_{T\to\infty} s_{t+T}\right] = \bar{s}$ and assuming that $\mathbb{E}_t\left[\lim_{T\to\infty} L^*_{t+T}\right] = \bar{L}$, Equations (12) and (13) can be rewritten, respectively, in the following way:

$$\begin{aligned} s_t = n\mathbb{E}_t\sum_{\tau=0}^{\infty}\left(y_{t+\tau}^{\$(n)} - y_{t+\tau}^{*(n)}\right) + \mathbb{E}_t\sum_{\tau=0}^{\infty}\left(\lambda_{t+\tau}^{\$,*} - \lambda_{t+\tau}^{*,*}\right) - \mathbb{E}_t\sum_{\tau=0}^{\infty} rp^*_{t+\tau} + \mathbb{E}_t\sum_{\tau=0}^{\infty} cp^*_{t+\tau} \\ + \mathbb{E}_t\sum_{\tau=0}^{\infty}\left(tp_{t+\tau}^{*,*} - tp_{t+\tau}^{\$,\$}\right) + \mathbb{E}_t\sum_{\tau=0}^{\infty}\left[\left(\lambda_{t+\tau}^{*,*} - \lambda_{t+\tau}^{*,*(n)}\right) - \left(\lambda_{t+\tau}^{\$,\$} - \lambda_{t+\tau}^{\$,\$(n)}\right)\right] + \overline{s} + \overline{L}, \end{aligned} \tag{17}$$

[3]These include ignoring the Jensen's inequality term, $\operatorname{var}_t\left(hy^*_{n,t+1}\right) - \operatorname{var}_t\left(hy^{\$}_{n,t+1}\right)$, assuming that $E_t\left(\lambda_{t+1}^{*,*(n-1)} - \lambda_{t+1}^{\$,\$(n-1)}\right) = 0$ so that there there is no convenience yield if the bond is not held to maturity as in (Jiang, 2023), and that $\operatorname{cov}_t\left(y_{t+1}^{*(n-1)}, L^*_{t+1}\right) = \operatorname{cov}_t\left(\lambda_{t+1}^{*,*(1)}, L^*_{t+1}\right) = 0$.

and:

$$
\begin{aligned}
s_t = n\mathbb{E}_t \sum_{\tau=0}^{\infty} \left(y_{t+\tau}^{\$(n)} - y_{t+\tau}^{*(n)} \right) + \mathbb{E}_t \sum_{\tau=0}^{\infty} \left(\lambda_{t+\tau}^{\$,\$} - \lambda_{t+\tau}^{*,\$} \right) + \mathbb{E}_t \sum_{\tau=0}^{\infty} rp_{t+\tau}^{\$} + \mathbb{E}_t \sum_{\tau=0}^{\infty} cp_{t+\tau}^{\$} \\
+ \mathbb{E}_t \sum_{\tau=0}^{\infty} \left(tp_{t+\tau}^{*,*} - tp_{t+\tau}^{\$,\$} \right) + \mathbb{E}_t \sum_{\tau=0}^{\infty} \left[\left(\lambda_{t+\tau}^{*,*} - \lambda_{t+\tau}^{*,*(n)} \right) - \left(\lambda_{t+\tau}^{\$,\$} - \lambda_{t+\tau}^{\$,\$(n)} \right) \right] \\
+ \mathbb{E}_t \sum_{\tau=0}^{\infty} q_{t+\tau} + \overline{s} + \overline{L}.
\end{aligned}
\tag{18}
$$

Equations (17) and (18) 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, (17) and (18) also show that LRUIP can fail because of several main 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, as well as investors' long term view on the foreign government creditworthiness captured by $\overline{L}$. In particular, a higher credit risk premium or quanto term in Equation (18) would lead to a more depreciated foreign currency.

Omitting credit risk from the UIP regression leads to a downward bias in the estimated coefficient on the interest rate differential, β, particularly for EMs. Credit risk—proxied by CDS spreads—is typically negatively correlated with interest rate differentials, as lower foreign interest rates are often associated with easier borrowing conditions and reduced sovereign risk, leading to a bias in the estimate of β away from its theoretical value of one (Chernov & Dahlquist, 2023). Intuitively, higher interest rates in EMs often compensate investors for default risk rather than anticipated currency depreciation. Ignoring this distinction results in a misspecification of the true relationship between interest rate differentials and exchange rate

movements.

5 Empirical Evidence

In this section, we examine the empirical implications of the model presented, highlighting its significance for exchange rate dynamics and its importance in explaining LRUIP deviations. First, we present some evidence on the association between all other factors in Equations (17) and (18) and bilateral exchange rates vis-a-vis the U.S. dollar. Next, we show that augmenting the UIP regressions discussed in Section 4 with credit risk helps to 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 are related to innovations in all factors in Equation (17).

$$
\begin{aligned}
(\mathbb{E}_{t+1} - \mathbb{E}_t)\, s_{t+1} = &- (\mathbb{E}_{t+1} - \mathbb{E}_t) \sum_{\tau=1}^{\infty} \left(\lambda^{\$,*}_{t+\tau} - \lambda^{*,*}_{t+\tau}\right) + (\mathbb{E}_{t+1} - \mathbb{E}_t) \sum_{\tau=1}^{\infty} \left(y^{\$}_{t+\tau} - y^{*}_{t+\tau}\right) \\
&- (\mathbb{E}_{t+1} - \mathbb{E}_t) \sum_{\tau=1}^{\infty} rp^{*}_{t+\tau} + (\mathbb{E}_{t+1} - \mathbb{E}_t) \sum_{\tau=1}^{\infty} cp^{*}_{t+\tau} \\
&+ (\mathbb{E}_{t+1} - \mathbb{E}_t) \sum_{\tau=1}^{\infty} \left(tp^{*,*}_{t+\tau} - tp^{\$,\$}_{t+\tau}\right) \\
&+ (\mathbb{E}_{t+1} - \mathbb{E}_t) \sum_{\tau=1}^{\infty} \left[\left(\lambda^{*,*}_{t+\tau} - \lambda^{*,*(n)}_{t+\tau}\right) - \left(\lambda^{\$,\$}_{t+\tau} - \lambda^{\$,\$(n)}_{t+\tau}\right)\right] \\
&+ (\mathbb{E}_{t+1} - \mathbb{E}_t) \lim_{T\to\infty} s_{t+T} - (\mathbb{E}_{t+1} - \mathbb{E}_t) \lim_{T\to\infty} L^{*}_{t+T}.
\end{aligned}
\tag{19}
$$

We start by extracting innovations to the variables on the RHS of (19) by taking

the residuals of the following regressions:

$$\Delta \overline{z}_t = \alpha + \beta_1 \overline{z}_{t-1} + \varepsilon_t^z \tag{20}$$

where z denotes a generic variable in (20), 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:

$$\Delta \overline{s_t} = \delta_z \widehat{\epsilon_t}^z + \omega_{z,t}. \tag{21}$$

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

$$\Delta \overline{s_t} = \delta_1 \widehat{\epsilon_t}^1 + \delta_2 \widehat{\epsilon_t}^2 + \delta_3 \widehat{\epsilon_t}^3 + ... + \omega_t. \tag{22}$$

We report the definitions of all variables that we use in this part of the empirical analysis, their summary statistics in Appendix D.2. We measure $\left(y_t^{\$(n)} - y_t^{*(n)}\right)$ 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:

$$x_t^{\text{tb}} = y_t^{\$} + \left(f_t^1 - s_t\right) - y_t^*. \tag{23}$$

where a more negative value (higher synthetic dollar) denotes 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 (20).

Unfortunately, data on CDS spreads on local currency foreign bonds are not available for our sample of EM10. Hence, 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 credit rating data on long-term debt in local currency 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.

In general, there are three ways to estimate representative country-group relationships: (i) averaging the data as in Equations (20)-(22), (ii) pooling the data as in the panel regressions in Section 4, 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 tables below, we report OLS regressions based on averaging the data. Pooled panel regression results, as in Section 4, yield similar results and are reported in the Appendix.

Tables 7 and 8 report OLS estimation results, using monthly data from 2003m1 to 2020m1 for the G10 and EM10 group of currencies as in Section 4. Due to CDS

data availability, the EM10 group excludes the Philippines, and the G10 group excludes the United Kingdom. As the panel data is unbalanced, the data group averages are calculated for each monthly observation, for the countries for which the data is available. Standard errors are block-bootstrapped with the same procedure described in the Appendix.

Table 7: 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 (21) and (22) for advanced economies (AEs) Note: *, **, *** indicate statistical significance at the 10%, 5% and 1% level, respectively.

Table 8: 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)
$\Delta\bar{x}^{\text{tb,AE}}$		-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)
$\Delta\left(\overline{x^{\text{tb,5y}}-x^{\text{tb,1y}}}\right)$					-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 (21) and (22) for emerging markets (EMs). 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. The evidence for AEs is closely in line with this prior, with higher interest rates in foreign economies associated with their appreciation against the U.S. dollar. In contrast, in EMs, the estimated coefficient has the opposite sign, suggesting that higher rates in foreign economies depreciate their currencies against the U.S. dollar, even at long horizons.

Second, the coefficient on the innovations to treasury basis and its term structure have the expected negative signs and are comparable magnitudes in both the G10 and EM10 groups. Currencies should depreciate vis-a-vis the U.S. dollar when the convenience yield on U.S. bonds or the dollar increases, given that with our sign conventions, a more negative basis signals more dollar scarcity.

Third, and more surprisingly, credit risk affects 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 may be driven by Japan and the Euro Area countries that have significantly lower average long-term credit ratings compared to all other countries.[4] The bigger magnitude of the coefficient in the G10 group is misleading because, on average, CDS spreads are much higher and more volatile in EMs than in AEs.[5] Therefore, credit risk can drive a significantly larger share of variance in the exchange rate in EMs, 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 also similar when we simultaneously enter all potential exchange rate drivers in the regression. The estimated coefficients reported in Column (6) of Tables 7 and 8 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 is the variable that has the highest R^2 in the G10 currencies. In additional robustness checks, we also consider FX risk premium term (rp_t^*) on the right-hand side of Equation (19), which is also excluded in the analysis in Jiang et al. (2021). We measure by

[4]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 A1+ during the sample period.

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

averaging the residuals from the UIP regressions for EMs and AEs separately with the shortest 3-month maturity tenor, under the assumption that there is little to no credit risk in short-term rates. Incorporating this variable does change the results, and the coefficient is found to be insignificant. The results are reported in the Appendix.

5.2 Augmented LRUIP 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, LRUIP can no longer be rejected for EM10 currencies. To conduct the test, we take two approaches. In the first specification, we use CDS data, augmenting the standard UIP regression 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:

$$\Delta s_{i,t,t+k} = \beta_{1,k}\left(i^*_{i,t,k} - i^{USD}_{i,t,k}\right) + \delta_{i,k} + \beta_{3,k} cds_{i,t,k} + \epsilon_{i,t,t+k} \tag{24}$$

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 credit rating data, we estimate:

$$\Delta s_{i,t,t+k} = \beta_{1,k}\left(i^*_{i,t,k} - i^{USD}_{i,t,k}\right) + \beta_{2,k} c^{SP}_{i,t,LT} + \beta_{3,k} c^{SP}_{i,t,LT} * \left(i^*_{i,t,k} - i^{USD}_{i,t,k}\right) + \epsilon_{i,t,t+k} \tag{25}$$

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

in month t.

Table 9: Augmented UIP regressions for EMs (5-year) with additional controls

	(1)	(2)	(3)	(4)	(5)	(6)
$(i^*_{5y} - i^{USD}_{5y})$	-0.430**	1.133*	0.734**	0.806***	0.837***	0.728***
	(0.187)	(0.640)	(0.308)	(0.284)	(0.277)	(0.276)
cds_{5y}			-2.144***	-1.788***	-1.241**	-1.105**
			(0.397)	(0.409)	(0.488)	(0.482)
c^{SP}_{LT}		-0.008				
		(0.028)				
$c^{SP}_{LT} * (i^*_{5y} - i^{USD}_{5y})$		-0.243***				
		(0.081)				
$\overline{rp}^*$				0.413***		0.212**
				(0.099)		(0.098)
$\overline{x}^{tb}_{AE}$					7.995***	6.905***
					(1.375)	(1.471)
$H_0 : \beta_1 = 1$	***					
N	1,446	1,446	1,331	1,275	1,275	1,275
R^2	0.021	0.074	0.091	0.169	0.220	0.230

The table reports the coefficient estimates for augmented LR-UIP regressions in the main text with additional variables for 5-year maturity, with bootstrapped standard errors. $\overline{rp}^*$ captures the risk premium which is calculated as the average of the residuals from the 1-year UIP regressions for EMs, and $\overline{x}^{tb}_{AE}$ is the average CIP deviations for AEs for 5-year maturity. Note: *, **, *** indicates statistical significance at the 10%, 5% and 1% level, respectively.

Table 9 reports estimation and test results for the EM10 countries. Column (1) replicates the baseline regressions from Table 5, though the coefficient differs slightly due to a change in the sample period, where the augmented regressions use data from 2000M1 to 2020M1, excluding the COVID period. Column (3) shows that once we control for CDS spreads, the coefficient on the interest rate differential turns positive and approaches unity. In this specification, we can no longer reject the null hypothesis that it equals one.

Notably, the CDS spread enters with a negative and statistically significant coefficient. This result likely reflects the fact that CDS spreads capture not only pure default risk but also broader time-varying risk premia. The CDS term may also absorb both the cost of credit risk hedging, which theory suggests should enter with a coefficient of minus one. Therefore, the negative coefficient may reflect a combination of both direct and indirect effects of sovereign risk on exchange rate returns.

To address this issue, column (6) augments the LRUIP regressions with controls for risk premia and average CIP deviations in AEs. Specifically, we incorporate the foreign exchange risk premium, $\overline{rp}^*$—calculated as the average residual from 1-year UIP regressions for EMs—and the average AE CIP deviation, $\overline{x}^{tb}_{AE}$, measured at the 5-year maturity. The augmented regression shows that the coefficient on the CDS spread moves close to minus one, aligning closely with its expected sign based on the cost of hedging.

Column (2) evaluates the role of credit risk using credit ratings. The coefficient on the interest rate differential is positive and statistically significant, and we cannot reject the null hypothesis that the coefficient is equal to one. Moreover, the interac-

tion term enters with a negative sign, indicating that as credit ratings deteriorate, the overall effect of the interest rate differential becomes increasingly negative. This pattern is consistent with the broader findings in the paper. The level term for credit ratings, however, is not statistically significant.

We repeat this exercise for AEs at the 5-year maturity, with results reported in Appendix D.8. The findings for AEs differ markedly from those for EMs. While incorporating credit ratings sharpens the interpretation of LRUIP failure in EMs—supporting our argument that omission of credit risk drives the bias—the same does not apply to AEs.

Estimation results for other maturities, including 1-year and 7-year are reported in Appendix D.5. At the 1-year maturity, the CDS coefficient is negative, and the interest rate differential remains far from one. For the 7-year maturity, while the sign of the coefficients aligns more closely with the theoretical prior, the results are less robust; in particular, the coefficient on the interest rate differential is not closer to one, in contrast to the 5-year case. This may be because 5-year maturities are typically the most liquid point on the sovereign yield curve, and CDS contracts at this maturity are also the most actively traded, making them a more reliable proxy for market-implied credit risk.

6 Conclusions

In this paper, we investigate LRUIP for EM currencies. While prior studies established that UIP tend to hold for G10 currencies in the long run, we find that it does not hold for the ten most freely-floating EM currencies when tested with with standard Fama regressions. However, when this regression is augmented with

measures of credit risk, such as CDS or interactions with country credit ratings, the coefficient on the interest rate differential approaches unity, and LRUIP cannot be statistically rejected. Theoretically, we use a standard no-arbitrage asset pricing framework with sovereign credit risk and convenience yield to interpret our results.

Declaration of generative AI and AI-assisted technologies in the writing process:

During the preparation of this work, the author(s) used GPT and Deepseek in order to improve the writing of certain portions of the manuscript. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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A Appendix: Model

In this appendix, we derive the no-arbitrage asset pricing framework that we use in the paper to interpret our results and guide the empirical analysis. The model builds on Du and Schreger (2016) and Jiang et al. (2021) and introduces sovereign credit risk and convenience yield in the standard exchange rate determination equation as in Clarida and Taylor (1997), Froot and Ramadorai (2005), and Engel (2016). We first derive the model for one-period bonds. Next, we determine the term premium in a multi-period bond setting. Finally, we determine the exchange rate in the multi-period setting.

A.1 Single period bonds

Consider the representative foreign economy (*) in our sample and the United States ($). Representative investors in each country trade zero-coupon government bonds with different maturities $k = 1, 2, 3, ..., \infty$ issued by both 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 dollar appreciation or a depreciation of the foreign currency. We denote with $y_t^{\$}$ the nominal (promised) yield on a one-period zero-coupon U.S. treasury bill, denominated in U.S dollars and 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 subject to credit risk. Following Du and Schreger (2016), credit or default risk on foreign bonds is introduced by adding a loss-to-default $L_{t+1}^{*,i}$ 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.[6] 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 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 $\lambda_t^{j,i}$.

Denote now 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:

$$\mathbb{E}_t\left(M_{t+1}^* e^{y_t^* + L_{t+1}^*}\right) = e^{-\lambda_t^{*,*}} \tag{26}$$

$$\mathbb{E}_t\left(M_{t+1}^* \frac{S_{t+1}}{S_t} e^{y_t^{\$}}\right) = e^{-\lambda_t^{\$,*}} \tag{27}$$

$$\mathbb{E}_t\left(M_{t+1}^{\$} e^{y_t^{\$}}\right) = e^{-\lambda_t^{\$,\$}} \tag{28}$$

$$\mathbb{E}_t\left(M_{t+1}^{\$} \frac{S_t}{S_{t+1}} e^{y_t^* + L_{t+1}^*}\right) = e^{-\lambda_t^{*,\$}} \tag{29}$$

[6] 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 detract from the clarity of exposition.

To invest across borders, investors must first convert their own currency into the one in which bonds are denominated, purchase the bonds, and then convert the proceeds from the maturing zero-coupon bonds back into their currency at time $t+1$. Therefore, the exchange rate enters equation (27) and (29).

Given Equations (26) and (27), by assuming no-arbitrage and log-normality, we can obtain a relationship between exchange rate, interest rate differentials, convenience yield, and sovereign credit risk. Denoting $m_t^* = log(M_t^*)$ and $\Delta s_{t+1} = log(S_{t+1}) - log(S_t)$ we have:

$$\mathbb{E}_t\left(m_{t+1}^*\right)+y_t^*+\mathbb{E}_t\left(L_{t+1}^*\right)+\frac{1}{2}\operatorname{var}_t\left(L_{t+1}^*\right)+\frac{1}{2}\operatorname{var}_t\left(m_{t+1}^*\right)+\operatorname{cov}_t\left(m_{t+1,1}^* L_{t+1}^*\right)+\lambda_t^{*,*}=0 \tag{30}$$

$$\mathbb{E}_t\left(m_{t+1}^*\right)+y_t^{\$}+\mathbb{E}_t\left(\Delta s_{t+1}\right)+\frac{1}{2}\operatorname{var}_t\left(m_{t+1}^*\right)+\frac{1}{2}\operatorname{var}_t\left(\Delta s_{t+1}\right)+\operatorname{cov}_t\left(m_{t+1}^*, \Delta s_{t+1}\right)+\lambda_t^{\$,*}=0 \tag{31}$$

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 (28) and (29), we have:

$$\mathbb{E}_t\left(m_{t+1}^{\$}\right)+y_t^{\$}+\frac{1}{2}\operatorname{var}_t\left(m_{t+1}^{\$}\right)+\lambda_t^{\$,\$}=0 \tag{32}$$

$$\begin{aligned}\mathbb{E}_t\left(m_{t+1}^{\$}\right)+\frac{1}{2}\operatorname{var}_t\left(m_{t+1}^{\$}\right)-\mathbb{E}_t\left(\Delta s_{t+1}\right)+\frac{1}{2}\operatorname{var}_t\left(\Delta s_{t+1}\right)+y_t^*+\mathbb{E}_t\left(L_{t+1}^*\right)+\frac{1}{2}\operatorname{var}_t\left(L_{t+1}^*\right)\\ +\operatorname{cov}_t\left(m_{t+1}^{\$}, L_{t+1}^*\right)+\operatorname{cov}_t\left(-\Delta s_{t+1}, m_{t+1}^{\$}\right)+\operatorname{cov}_t\left(-\Delta s_{t+1}, L_{t+1}^*\right)+\lambda_t^{*,\$}=0\end{aligned} \tag{33}$$

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.[7]

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 (30) with (31) and (32) with (33), we obtain the following two no-arbitrage relationships for foreign and U.S. investors, respectively:

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

$$\begin{aligned}y_t^*-y_t^{\$}-\mathbb{E}_t\left(\Delta s_{t+1}\right)+\mathbb{E}_t\left(L_{t+1}^*\right)+\frac{1}{2}\operatorname{var}\left(\Delta s_{t+1}\right)+\frac{1}{2}\operatorname{var}_t\left(L_{t+1}^*\right)+\operatorname{cov}_t\left(m_{t+1}^{\$}, L_{t+1}^*\right)\\ +\operatorname{cov}_t\left(m_{t+1}^{\$}, -\Delta s_{t+1}\right)+\operatorname{cov}_t\left(-\Delta s_{t+1}, L_{t+1}^*\right)=\left(\lambda_t^{\$,\$}-\lambda_t^{*,\$}\right).\end{aligned} \tag{35}$$

Finally, by solving these last two equations for s_t and iterating forward, we have

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

that the exchange rate must satisfy the following two conditions:

$$s_t = \mathbb{E}_t \sum_{\tau=0}^{\infty} \left(\lambda_{t+\tau}^{\$,*} - \lambda_{t+\tau}^{*,*}\right) + \mathbb{E}_t \sum_{\tau=0}^{\infty} \left(y_{t+\tau}^{\$} - y_{t+\tau}^{*}\right) + \mathbb{E}_t \sum_{\tau=0}^{\infty} cp_{t+\tau}^{*} - \mathbb{E}_t \sum_{\tau=0}^{\infty} rp_{t+\tau}^{*} + \mathbb{E}_t \left[\lim_{T\to\infty} s_{t+T}\right] - \mathbb{E}_t \left[\lim_{T\to\infty} L_{t+T}^{*}\right] \tag{36}$$

$$s_t = \mathbb{E}_t \sum_{\tau=0}^{\infty} \left(\lambda_{t+\tau}^{\$,\$} - \lambda_{t+\tau}^{*,\$}\right) + \mathbb{E}_t \sum_{\tau=0}^{\infty} \left(y_{t+\tau}^{\$} - y_{t+\tau}^{*}\right) + \mathbb{E}_t \sum_{\tau=0}^{\infty} cp_{t+\tau}^{\$} + \mathbb{E}_t \sum_{\tau=0}^{\infty} rp_{t+\tau}^{\$} + \mathbb{E}_t \sum_{\tau=0}^{\infty} \mathrm{q}_{t+\tau} + \mathbb{E}_t \left[\lim_{T\to\infty} s_{t+T}\right] - \mathbb{E}_t \left[\lim_{T\to\infty} L_{t+T}^{*}\right]. \tag{37}$$

For example, Equation (36) says that the exchange rate is determined by convenience yield differentials, interest rate differentials, currency risk premia, as well as credit risk premia. Equation (37), also includes the quanto adjustment term. Equations (36) and (37) imply that an increase in credit risk depreciates the foreign currency. The quanto adjustment term in equation (37) 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 $\mathrm{cov}_t\left(\Delta s_{t+1}, L_{t+1}^{*}\right) > 0$, 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 (36) and (37) 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:

$$\left(\lambda_t^{\$,*} - \lambda_t^{*,*}\right) - \left(\lambda_t^{\$,\$} - \lambda_t^{*,\$}\right) = rp_t^{*} + rp_t^{\$} - cp_t^{*} + cp_t^{\$} + q_t. \tag{38}$$

Alternatively, assuming foreign bonds have no convenience yield, as we do in our empirical analysis, we have:

$$\left(\lambda_t^{\$,*}\right) - \left(\lambda_t^{\$,\$}\right) = rp_t^{*} + rp_t^{\$} - cp_t^{*} + cp_t^{\$} + q_t. \tag{39}$$

To interpret condition (37), consider the corresponding condition in Jiang et al. (2021):

$$\left(\lambda_t^{\$,*} - \lambda_t^{*,*}\right) - \left(\lambda_t^{\$,\$} - \lambda_t^{*,\$}\right) = rp_t^{\$} + rp_t^{*}. \tag{40}$$

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 (39) 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:

$$\Delta s_{t+1} = m^{\$}_{t+1} - m^{*}_{t+1} + \eta_{t+1} + \lambda^{\$,\$}_{t} - \lambda^{\$,*}_{t} \tag{41}$$

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 (36) and (37) by assuming that the exchange rate follows Equation (41), and Equation (38) is a valid assumption.

Consider the level version of Equation (41). Imposing convenience yield valuation symmetry as per Equation (38) 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:[8]

$$\frac{S_{t+1}}{S_t} = \frac{M^{\$}_{t+1}\mathrm{e}^{\lambda^{\$,\$}_{t}}}{M^{*}_{t+1}\mathrm{e}^{\lambda^{\$,*}_{t}}}\mathrm{e}^{\eta_{t+1}} = \frac{M^{\$}_{t+1}\mathrm{e}^{\lambda^{*,\$}_{t}}}{M^{*}_{t+1}\mathrm{e}^{\lambda^{*,*}_{t}}}\mathrm{e}^{\eta_{t+1}} = \frac{M^{\$}_{t+1}\mathrm{e}^{\lambda^{*,\$}_{t}+L^{*}_{t+1}}}{M^{*}_{t+1}\mathrm{e}^{\lambda^{**}_{t}+L^{*}_{t+1}}}\mathrm{e}^{\eta_{t+1}} \tag{42}$$

Next, imposing that home and foreign investors agree on the pricing of U.S. and foreign bonds and the convenience yield as in Equation (38) above, and the exchange rate satisfies the assumed process we have:

$$E_t\left(M^{\$}_{t+1}\mathrm{e}^{\lambda^{\$,\$}_{t}}\right) = E_t\left(M^{*}_{t+1}\frac{S_{t+1}}{S_t}\mathrm{e}^{\lambda^{\$,*}_{t}}\right) = E_t\left(M^{\$}_{t+1}\mathrm{e}^{\lambda^{\$,\$}_{t}}\mathrm{e}^{\eta_{t+1}}\right) = \mathrm{e}^{-y^{\$}_{t}} \tag{43}$$

$$E_t\left(M^{*}_{t+1}\mathrm{e}^{\lambda^{*,*}_{t}+L^{*}_{t+1}}\right) = E_t\left(M^{\$}_{t+1}\frac{S_t}{S_{t+1}}\mathrm{e}^{\lambda^{*,\$}_{t}+L^{*}_{t+1}}\right) = E_t\left(M^{*}_{t+1}\mathrm{e}^{\lambda^{\$,\$}_{t}+L^{*}_{t+1}}\mathrm{e}^{-\eta_{t+1}}\right) = \mathrm{e}^{-y^{*}_{t}} \tag{44}$$

The first and third equalities in Equations (43) and (44) follow from solving for $\mathrm{e}^{-y^{*}_{t}}$ and $\mathrm{e}^{-y^{\$}_{t}}$ from Euler equations (26) and (29) and (27) and (28), respectively. The second equality comes from Equation (42).

Assuming joint log-normality of the SDFs and η_{t+1}, Equations (43) and (44) imply that:

$$\mathrm{cov}_t\left(m^{\$}_{t+1}, \eta_{t+1}\right) = -\mathbb{E}_t\left(\eta_{t+1}\right) - \frac{1}{2}\mathrm{var}_t\left(\eta_{t+1}\right) \tag{45}$$

$$\mathrm{cov}_t\left(m^{*}_{t+1}, \eta_{t+1}\right) = -\mathbb{E}_t\left(\eta_{t+1}\right) + \frac{1}{2}\mathrm{var}_t\left(\eta_{t+1}\right) - \mathrm{cov}_t\left(\eta_{t+1}, L^{*}_{t+1}\right) \tag{46}$$

Rearranging and taking expectations in Equation (41) we have:

$$s_t = -\mathbb{E}_t\left[m^{\$}_{t+1}\right] + \mathbb{E}_t\left[m^{*}_{t+1}\right] - \mathbb{E}_t\left[\eta_{t+1}\right] - \lambda^{\$,\$}_{t} + \lambda^{\$,*}_{t} + \mathbb{E}_t s_{t+1} \tag{47}$$

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

$$E_t\left(M^{\$}_{t+1}\mathrm{e}^{\lambda^{\$,\$}_{t}}\right) = \mathrm{e}^{-y^{\$}_{t}} \tag{48}$$

$$E_t\left(M^{*}_{t+1}\mathrm{e}^{\lambda^{*,*}_{t}+L^{*}_{t+1}}\right) = \mathrm{e}^{-y^{*}_{t}}, \tag{49}$$

[8]This last step allows us to impose the second equality in Equation (43), which provides an equivalent condition to Equation (44) for foreign bonds that are subject to credit risk.

which yield:

$$\mathbb{E}_t\left[m_{t+1}^{\$}\right] = -y_t^{\$} - \frac{1}{2}\operatorname{var}_t\left[m_{t+1}^{\$}\right] - \lambda_t^{\$,\$} \tag{50}$$

$$\mathbb{E}_t\left[m_{t+1}^{*}\right] = -y_t^{*} - \frac{1}{2}\operatorname{var}_t\left[m_{t+1}^{*}\right] - \lambda_t^{*,*} - \frac{1}{2}\operatorname{var}_t\left[L_{t+1}^{*,*}\right] - \mathbb{E}_t\left(L_{t+1}^{*}\right) - \operatorname{cov}_t\left(m_{t+1}^{*}, L_{t+1}^{*}\right). \tag{51}$$

Therefore, Equation (47) becomes:

$$\begin{aligned} s_t = \left(y_t^{\$} - y_t^{*}\right) + \left(\lambda_t^{\$,*} - \lambda_t^{*,*}\right) + \frac{1}{2}\left[\operatorname{var}_t\left(m_{t+1}^{\$}\right) - \operatorname{var}_t\left(m_{t+1}^{*}\right) - \mathbb{E}_t\left[\eta_{t+1}\right]\right] \\ - \left[\operatorname{cov}_t\left(m_{t+1}^{*}, L_{t+1}^{*}\right) + \frac{1}{2}\operatorname{var}_t\left[L_{t+1}^{*}\right]\right] - \mathbb{E}_t\left(L_{t+1}^{*}\right) + \mathbb{E}_t s_{t+1}. \end{aligned} \tag{52}$$

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

$$\operatorname{cov}_t\left(m_{t+1}^{\$}, \eta_{t+1}\right) = -E_t\left(\eta_{t+1}\right) - \frac{1}{2}\operatorname{var}_t\left(\eta_{t+1}\right) \tag{53}$$

$$\operatorname{cov}_t\left(m_{t+1}^{*}, \eta_{t+1}\right) = -E_t\left(\eta_{t+1}\right) + \frac{1}{2}var_t\left(\eta_{t+1}\right) \tag{54}$$

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 (52), we can recover the same exchange rate determination equation given in (36) for foreign investors:

$$\begin{aligned} s_t = \mathbb{E}_t\sum_{\tau=0}^{\infty}\left(\lambda_{t+\tau}^{\$,*} - \lambda_{t+\tau}^{*,*}\right) + \mathbb{E}_t\sum_{\tau=0}^{\infty}\left(y_{t+\tau}^{\$} - y_{t+\tau}^{*}\right) + \mathbb{E}_t\sum_{\tau=0}^{\infty}cp_{t+\tau}^{*} - \mathbb{E}_t\sum_{\tau=0}^{\infty}rp_{t+\tau}^{*} \\ + \mathbb{E}_t\left[\lim_{T\to\infty} s_{t+T}\right] - \mathbb{E}_t\left[\lim_{T\to\infty} L_{t+T}^{*}\right]. \end{aligned} \tag{55}$$

A.2 Multi-period bonds

To address 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 bond, respectively, held by a foreign investor for one period:

$$e^{-\lambda_t^{*,*(1)}} = \mathbb{E}_t\left[M_{t+1}^{*} e^{y_t^{*(1)} + L_{t+1}^{*}}\right] \tag{56}$$

$$e^{-\lambda_t^{*,*(n)}} = \mathbb{E}_t\left[M_{t+1}^{*}\frac{e^{n\left(y_t^{*(n)} + L_{t+1}^{*}\right)}}{e^{(n-1)\left(y_{t+1}^{*(n-1)} + L_{t+2}^{*}\right)}} e^{-\lambda_{t+1}^{*,*(n-1)}}\right] \tag{57}$$

where $y_t^{*(n)}$ denotes the nominal yield and on a n-period zero coupon foreign government bond denominated in foreign currency and $\lambda_t^{*,*(n)}$ its convenience yield. Taking

logarithms and assuming normality, we have:

$$-\lambda_t^{*,*(1)} = \mathbb{E}_t\left(m_{t+1}^*\right) + \frac{1}{2}\operatorname{var}_t\left(m_{t+1}^*\right) + \mathbb{E}_t\left(L_{t+1}^*\right) + \frac{1}{2}\operatorname{var}_t\left(L_{t+1}^*\right) + \operatorname{cov}_t\left(m_{t+1}^*, L_{t+1}^*\right) \tag{58}$$

$$\begin{aligned}
-\lambda_t^{*,*(n)} = {} & \mathbb{E}_t\left(m_{t+1}^*\right) + \frac{1}{2}\operatorname{var}_t\left(m_{t+1}^*\right) + ny_t^{*,(n)} + \mathbb{E}_t\left[nL_{t+1}^* - (n-1)L_{t+2}^*\right] - \mathbb{E}_t\left[\lambda_{t+1}^{*,*(n-1)}\right] \\
& - (n-1)\mathbb{E}_t\left(y_{t+1}^{*(n-1)}\right) + n^2\operatorname{var}_t\left(L_{t+1}^*\right) + (n-1)^2\operatorname{var}_t\left(L_{t+2}^*\right) \\
& + (n-1)^2\operatorname{var}_t\left(y_{t+1}^{*(n-1)}\right) + \operatorname{var}_t\left(\lambda_{t+1}^{*,*(n-1)}\right) + n\operatorname{cov}_t\left(m_{t+1}^*, L_{t+1}^*\right) \\
& - \operatorname{cov}_t\left(m_{t+1}^*, \lambda_{t+1}^{*,*(n-1)}\right) - (n-1)\left[\operatorname{cov}_t\left(m_{t+1}^*, y_{t+1}^{*(n-1)}\right) + \operatorname{cov}_t\left(m_{t+1}^*, L_{t+2}^*\right)\right] \\
& + (n-1)\left[\operatorname{cov}_t\left(\lambda_{t+1}^{*,*(n-1)}, y_{t+1}^{*(n-1)}\right) + \operatorname{cov}_t\left(\lambda_{t+1}^{*,*(n-1)}, L_{t+2}^*\right)\right] \\
& + (n-1)^2\operatorname{cov}_t\left(y_{t+1}^{*(n-1)}, L_{t+2}^*\right) - n(n-1)\operatorname{cov}\left(y_{t+1}^{*(n-1)}, L_{t+1}^*\right) \\
& - n(n-1)\operatorname{cov}_t\left(L_{t+2}^*, L_{t+1}^*\right) - n\operatorname{cov}_t\left(L_{t+1}^*, \lambda_{t+1}^{*,*(n-1)}\right).
\end{aligned} \tag{59}$$

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

$$h_{n,t+1}^* = ny_t^{*(n)} + nL_{t+1}^* - (n-1)y_{t+1}^{*(n-1)} - (n-1)L_{t+2}^* + \lambda_t^{*,*(n)} - \lambda_{t+1}^{*,*(n-1)} \tag{60}$$

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

$$\begin{aligned}
hy_{n,t+1}^* &= h_{n,t+1}^* - \left(y_t^{*(1)} + L_{t+1}^* + \lambda_t^{*,*(1)}\right) \\
&= n\left(y_t^{*(n)} - y_t^{*(1)}\right) - (n-1)\left[L_{t+2}^* - L_{t+1}^* - \left(y_{t+1}^{*(n-1)} + y_t^{*(1)}\right)\right] \\
&\quad + \left(\lambda_t^{*,*(n)} - \lambda_t^{*,*(1)}\right) - \lambda_{t+1}^{*,*(n-1)}.
\end{aligned} \tag{61}$$

Denoting $\Delta L_{t+2}^* = L_{t+2}^* - L_{t+1}^*$, it follows that:

$$\begin{aligned}
\operatorname{var}_t\left(hy_{n,t+1}\right) = {} & (n-1)^2\left[\operatorname{var}_t\left(\Delta L_{t+2}^*\right) + \operatorname{var}_t\left(y_{t+1}^{*(n-1)}\right) + \operatorname{var}_t\left(\lambda_{t+1}^{*,*(n-1)}\right)\right. \\
& + 2(n-1)^2\operatorname{cov}_t\left(\Delta L_{t+2}^*, y_{t+1}^{*(n-1)}\right) + 2(n-1)\operatorname{cov}_t\left(\Delta L_{t+2}^*, \lambda_{t+1}^{*,*(n-1)}\right) \\
& \left. + 2(n-1)\operatorname{cov}_t\left(y_{t+1}^{*(n-1)}, \lambda_{t+1}^{*,*(n-1)}\right)\right];
\end{aligned} \tag{62}$$

$$\begin{aligned}
\operatorname{cov}_t\left(hy_{n,t+1}, m_{t+1}^*\right) = {} & -(n-1)\operatorname{cov}_t\left(m_{t+1}^*, \Delta L_{t+2}^*\right) \\
& -(n-1)\operatorname{cov}_t\left(m_{t+1}^*, y_{t+1}^{*(n-1)}\right) - \operatorname{cov}_t\left(m_{t+1}^*, \lambda_{t+1}^{*,*(n-1)}\right);
\end{aligned} \tag{63}$$

$$\begin{aligned}
\mathbb{E}_t\left(hy_{n,t+1}\right) = {} & ny_t^{*(n)} - (n-1)\mathbb{E}_t\left(y_{t+1}^{*(n-1)}\right) - y_t^{*(1)} \\
& - (n-1)\mathbb{E}_t\left(\Delta L_{t+2}^*\right) + \lambda_t^{*,*(n)} - \lambda_t^{*,*(1)} - \mathbb{E}_t\left(\lambda_{t+1}^{*,*(n-1)}\right).
\end{aligned} \tag{64}$$

Equation (59) can therefore be rewritten as:

$$
\begin{aligned}
&-\lambda_t^{*,*(n)} = \mathbb{E}_t\left(m_{t+1}^*\right) + n y_t^{*(n)} - (n-1)\mathbb{E}_t\left[y_{t+1}^{*(n-1)}\right] - (n-1)\mathbb{E}_t\left[\Delta L_{t+2}^*\right] + \mathbb{E}_t\left[L_{t+1}^*\right] \\
&- \mathbb{E}_t\left[\lambda_{t+1}^{*,*(n-1)}\right] + \operatorname{cov}_t\left(m_{t+1}^*, L_{t+1}^*\right) - (n-1)\operatorname{cov}_t\left(m_{t+1}^*, \Delta L_{t+2}^*\right) \\
&- (n-1)\operatorname{cov}_t\left(m_{t+1}^*, y_{t+1}^{*(n-1)}\right) - \operatorname{cov}_t\left(m_{t+1}^*, \lambda_{t+1}^{*,*(n-1)}\right) \\
&+ (n-1)^2\operatorname{cov}_t\left(y_{t+1}^{*(n-1)}, \Delta L_{t+2}^*\right) - (n-1)\operatorname{cov}_t\left(y_{t+1}^{*(n-1)}, L_{t+1}^*\right) \\
&+ (n-1)\operatorname{cov}_t\left(y_{t+1}^{*(n-1)}, \lambda_{t+1}^{*,*(n-1)}\right) - (n-1)\operatorname{cov}_t\left(\Delta L_{t+2}^*, L_{t+1}^*\right) \\
&+ (n-1)\operatorname{cov}_t\left(\Delta L_{t+2}^*, \lambda_{t+1}^{*,*(n-1)}\right) - \operatorname{cov}_t\left(\lambda_{t+1}^{*,*(n-1)}, L_{t+1}^*\right) \\
&+ \frac{(n-1)^2}{2}\left[\operatorname{var}_t\left(y_{t+1}^{*(n-1)}\right) + \operatorname{var}_t\left(\Delta L_{t+2}^*\right)\right] + \frac{1}{2}\operatorname{var}_t\left(L_{t+1}^*\right) + \frac{1}{2}\operatorname{var}_t\left(\lambda_{t+1}^{*,*(n-1)}\right) \\
&+ \frac{1}{2}\operatorname{var}_t\left(m_{t+1}^{*,*}\right).
\end{aligned}
\tag{65}
$$

Rearranging terms yields:

$$
\begin{aligned}
&n\left(y_t^{*(n)} - y_t^{*(1)}\right) \\
&\qquad = (n-1)\mathbb{E}_t\left[y_{t+1}^{*(n-1)} - y_t^{*(1)}\right] + (n-1)\mathbb{E}_t\left[\Delta L_{t+2}^*\right] + \left(\lambda_t^{*,*(1)} - \lambda_t^{*,*(n)}\right) \\
&\qquad + \mathbb{E}_t\left(\lambda_{t+1}^{*,*(n-1)}\right) + (n-1)\left[\operatorname{cov}_t\left(y_{t+1}^{*(n-1)}, L_{t+1}^*\right) + \operatorname{cov}_t\left(\Delta L_{t+2}^*, L_{t+1}^*\right)\right] \\
&\qquad + \operatorname{cov}_t\left(\lambda_{t+1}^{*,*(n-1)}, L_{t+1}^*\right) - \frac{1}{2}\operatorname{var}_t\left(hy_{n,t+1}^*\right) - \operatorname{cov}_t\left(hy_{n,t+1}^*, m_{t+1}^*\right)
\end{aligned}
\tag{66}
$$

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:

$$
e^{-\lambda_t^{\$,\$(1)}} = \mathbb{E}_t\left[M_{t+1}^{\$} e^{e_t^{\$(1)}}\right] \tag{67}
$$

$$
e^{-\lambda_t^{\$,\$(n)}} = \mathbb{E}_t\left[M_{t+1}^{\$}\frac{e^{n\left(y_t^{\$(n)}\right)}}{e^{(n-1)\left(y_{t+1}^{\$(n-1)}\right)}} e^{-\lambda_{t+1}^{\$,\$(n-1)}}\right] \tag{68}
$$

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

$$
\begin{aligned}
y_t^{\$(n)} - y_t^{\$(1)} = &-\frac{1}{2n}\operatorname{var}_t\left(hy_{n,t+1}^{\$}\right) + \frac{n-1}{n}\mathbb{E}_t\left(y_{t+1}^{\$(n-1)} - y_{t+1}^{\$(1)}\right) + \frac{n-1}{n}\mathbb{E}_t\left[\Delta y_{t+1}^{\$(1)}\right] \\
&+ \frac{1}{n}\mathbb{E}_t\left[\lambda_{t+1}^{\$,\$(n-1)}\right] + \frac{1}{n}\left[\lambda_t^{\$,\$(1)} - \lambda_t^{\$,\$(n)}\right] - \frac{1}{n}\operatorname{cov}_t\left(m_{t+1}^{\$}, hy_{n,t+1}^{\$}\right)
\end{aligned}
\tag{69}
$$

where

$$
h_{n,t+1}^{\$} = n y_t^{\$(n)} - (n-1) y_{t+1}^{\$(n-1)} + \lambda_t^{\$,\$(n)} - \lambda_{t+1}^{\$,\$(n-1)} \tag{70}
$$

$$
hy_{n,t+1}^{\$} = h_{n,t+1}^{\$} - \left(y_t^{\$(1)} + \lambda_t^{*,*(1)}\right); \tag{71}
$$

$$\text{var}_t\left(hy^{\$}_{n,t+1}\right) = (n-1)^2\,\text{var}_t\left(y^{\$(n-1)}_{t+1}\right) + \text{var}_t\left(\lambda^{\$,\$(n-1)}_{t+1}\right) + 2(n-1)\,\text{cov}_t\left(y^{*(n-1)}_{t+1}, \lambda^{*,*(n-1)}_{t+1}\right); \tag{72}$$

$$\text{cov}_t\left(m^{\$}_{t+1}, hy^{\$}_{n,t+1}\right) = -(n-1)\,\text{cov}_t\left(m^{\$}_{t+1}, y^{\$(n-1)}_{t+1}\right) - \text{cov}_t\left(m^{\$}_{t+1}, \lambda^{\$,\$(n-1)}_{t+1}\right). \tag{73}$$

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 (69)-(73), we obtain the following expression for $y^{\$(1)}_t - y^{*(1)}_t$:

$$\begin{aligned} y^{\$(1)}_t - y^{*(1)}_t =& n\left(y^{s(n)}_t - y^{*(n)}_t\right) + \left[\left(\lambda^{*,*(1)}_t - \lambda^{*,*(n)}_t\right) - \left(\lambda^{\$,\$(1)}_t - \lambda^{\$,\$(n)}_t\right)\right] \\ &- (n-1)\mathbb{E}_t\left[y^{\$(n-1)}_{t+1} - y^{*(n-1)}_{t+1}\right] + \mathbb{E}_t\left[\lambda^{*,*(n-1)}_{t+1} - \lambda^{\$,\$(n-1)}_{t+1}\right] + (n-1)\mathbb{E}_t\left(\Delta L^*_{t+2}\right) \\ &- \left[tp^{\$,\$}_t - tp^{*,*}_t\right] + \frac{1}{2}\left[\text{var}_t\left(hy^{s}_{n,t+1}\right) - \text{var}_t\left(hy^{*}_{n,t+1}\right)\right] \\ &+ (n-1)\left[\text{cov}_t\left(y^{*(n-1)}_{t+1}, L^*_{t+1}\right) + \text{cov}_t\left(\Delta L^*_{t+2}, L^*_{t+1}\right)\right] \\ &+ \text{cov}_t\left(\lambda^{*,*(n-1)}_{t+1}, L^*_{t+1}\right) \end{aligned} \tag{74}$$

which ignoring the Jensen's inequality $\text{var}_t\left(hy^{*}_{n,t+1}\right) - \text{var}_t\left(hy^{\$}_{n,t+1}\right)$, simplifies to:

$$\begin{aligned} y^{\$(1)}_t - y^{*(1)}_t =& n\left(y^{\$(n)}_t - y^{*(n)}_t\right) + \left[\left(\lambda^{*,*(1)}_t - \lambda^{*,*(n)}_t\right) - \left(\lambda^{\$,\$(1)}_t - \lambda^{\$,\$(n)}_t\right)\right] \\ &- (n-1)\mathbb{E}_t\left[y^{\$(n-1)}_{t+1} - y^{*(n-1)}_{t+1}\right] + \mathbb{E}_t\left[\lambda^{*,*(n-1)}_{t+1} - \lambda^{\$,\$(n-1)}_{t+1}\right] + (n-1)\mathbb{E}_t\left(\Delta L^*_{t+2}\right) \\ &- \left[tp^{\$,\$}_t - tp^{*,*}_t\right] + (n-1)\left[\text{cov}_t\left(y^{*(n-1)}_{t+1}, L^*_{t+1}\right) + \text{cov}_t\left(\Delta L^*_{t+2}, L^*_{t+1}\right)\right] \\ &+ \text{cov}_t\left(\lambda^{*,*(n-1)}_{t+1}, L^*_{t+1}\right). \end{aligned} \tag{75}$$

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 as in (Jiang, 2023), we obtain:

$$\begin{aligned} &y^{\$(1)}_t - y^{*(1)}_t = n\left(y^{\$(n)}_t - y^{*(n)}_t\right) + \left[\left(\lambda^{*,*(1)}_t - \lambda^{*,*(n)}_t\right) - \left(\lambda^{\$,\$(1)}_t - \lambda^{\$,\$(n)}_t\right)\right] \\ &- (n-1)\mathbb{E}_t\left[y^{\$(n-1)}_{t+1} - y^{*,(n-1)}_{t+1}\right] + (n-1)\mathbb{E}_t\left(\Delta \text{L}^*_{t+2}\right) - \left[tp^{\$,\$}_t - tp^{*,*}_t\right] \\ &+ (n-1)\left[\text{cov}_t\left(y^{*(n-1)}_{t+1}, L^*_{t+1}\right) + \text{cov}_t\left(\Delta L^*_{t+2}, L^*_{t+1}\right)\right] \\ &+ \text{cov}_t\left(\lambda^{*,*(n-1)}_{t+1}, L^*_{t+1}\right), \end{aligned} \tag{76}$$

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

$$\begin{aligned} y^{\$(1)}_t - y^{*(1)}_t =& n\left(y^{\$(n)}_t - y^{*(n)}_t\right) + \left[\left(\lambda^{*,*(1)}_t - \lambda^{*,*(n)}_t\right) - \left(\lambda^{\$,\$(1)}_t - \lambda^{\$,\$(n)}_t\right)\right] \\ &- (n-1)\mathbb{E}_t\left[y^{\$(n-1)}_{t+1} - y^{*(n-1)}_{t+1}\right] + (n-1)\mathbb{E}_t\left(\Delta L^*_{t+2}\right) - \left[tp^{\$,\$}_t - tp^{*,*}_t\right]. \end{aligned} \tag{77}$$

Imposing the no-bubble condition $\mathbb{E}_t\left[\lim_{T\to\infty} s_{t+T}\right] = \bar{s}$ and assuming that

$\mathbb{E}_t\left[\lim_{T\to\infty} L^*_{t+T}\right] = 0$, we can rewrite Equation (36) in the following way:

$$\begin{aligned} s_t = n\mathbb{E}_t \sum_{\tau=0}^{\infty}\left(y^{\$(n)}_{t+\tau} - y^{*(n)}_{t+\tau}\right) + \mathbb{E}_t \sum_{\tau=0}^{\infty}\left(\lambda^{\$,*}_{t+\tau} - \lambda^{*,*}_{t+\tau}\right) - \mathbb{E}_t \sum_{\tau=0}^{\infty} rp^*_{t+\tau} + \mathbb{E}_t \sum_{\tau=0}^{\infty} cp^*_{t+\tau} \\ + \mathbb{E}_t \sum_{\tau=0}^{\infty}\left(tp^{*,*}_{t+\tau} - tp^{\$,\$}_{t+\tau}\right) + \mathbb{E}_t \sum_{\tau=0}^{\infty}\left[\left(\lambda^{*,*}_{t+\tau} - \lambda^{*,*(n)}_{t+\tau}\right) - \left(\lambda^{\$,\$}_{t+\tau} - \lambda^{\$,\$(n)}_{t+\tau}\right)\right] + \overline{s_t} \end{aligned} \tag{78}$$

or equivalently, Equation (37) as:

$$\begin{aligned} s_t = n\mathbb{E}_t \sum_{\tau=0}^{\infty}\left(y^{\$(n)}_{t+\tau} - y^{*(n)}_{t+\tau}\right) + \mathbb{E}_t \sum_{\tau=0}^{\infty}\left(\lambda^{\$,\$}_{t+\tau} - \lambda^{*,\$}_{t+\tau}\right) + \mathbb{E}_t \sum_{\tau=0}^{\infty} rp^{\$}_{t+\tau} + \mathbb{E}_t \sum_{\tau=0}^{\infty} cp^{\$}_{t+\tau} \\ + \mathbb{E}_t \sum_{\tau=0}^{\infty}\left(tp^{*,*}_{t+\tau} - tp^{\$,\$}_{t+\tau}\right) + \mathbb{E}_t \sum_{\tau=0}^{\infty}\left[\left(\lambda^{*,*}_{t+\tau} - \lambda^{*,*(n)}_{t+\tau}\right) - \left(\lambda^{\$,\$}_{t+\tau} - \lambda^{\$,\$(n)}_{t+\tau}\right)\right] \\ + \mathbb{E}_t \sum_{\tau=0}^{\infty} q_{t+\tau} + \overline{s_t} \end{aligned} \tag{79}$$

B Appendix: Data

B.1 Data sources and variable definitions

Table 1A: Advanced Economies (AEs)

Country	Var.	Ticker	Source	Sample	Definition	Unit of Measure	Transf.	Frequency	Mis. Val.
AUD	XR	AUD BGN Curncy	BLOOMBERG	2000m1-2023m12	AUSTRALIAN DOLLAR SPOT EXCHANGE RATE	1 AUD in USD	1/XR	monthly	
AUD	3M	I00101Y Index	BLOOMBERG	2000m1-2023m12	AUD Australia Sovereign (IYC 1) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
AUD	1Y	I00103M Index	BLOOMBERG	2000m1-2023m12	AUD Australia Sovereign (IYC 1) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
AUD	2Y	I00102Y Index	BLOOMBERG	2000m1-2023m12	AUD Australia Sovereign (IYC 1) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
AUD	3Y	I00103Y Index	BLOOMBERG	2000m1-2023m12	AUD Australia Sovereign (IYC 1) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
AUD	5Y	I00105Y Index	BLOOMBERG	2000m1-2023m12	AUD Australia Sovereign (IYC 1) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
AUD	7Y	I00107Y Index	BLOOMBERG	2000m1-2023m12	AUD Australia Sovereign (IYC 1) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
AUD	10Y	I00110Y Index	BLOOMBERG	2000m1-2023m12	AUD Australia Sovereign (IYC 1) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
CAD	XR	CAD BGN Curncy	BLOOMBERG	2000m1-2023m12	CANADIAN DOLLAR SPOT EXCHANGE RATE	1 USD in CAD		monthly	
CAD	3M	I00703M Index	BLOOMBERG	2000m1-2023m12	CAD Canada Sovereign (IYC7) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
CAD	1Y	I00701Y Index	BLOOMBERG	2000m1-2023m12	CAD Canada Sovereign (IYC7) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
CAD	2Y	I00702Y Index	BLOOMBERG	2000m1-2023m12	CAD Canada Sovereign (IYC7) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
CAD	3Y	I00703Y Index	BLOOMBERG	2000m1-2023m12	CAD Canada Sovereign (IYC7) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
CAD	5Y	I00705Y Index	BLOOMBERG	2000m1-2023m12	CAD Canada Sovereign (IYC7) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
CAD	7Y	I00707Y Index	BLOOMBERG	2000m1-2023m12	CAD Canada Sovereign (IYC7) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
CAD	10Y	I00710Y Index	BLOOMBERG	2000m1-2023m12	CAD Canada Sovereign (IYC7) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
CHF	XR	CHF BGN Curncy	BLOOMBERG	2000m1-2023m12	SWISS FRANC SPOT EXCHANGE RATE	1 USD in CHF		monthly	
CHF	3M	I08203M Index	BLOOMBERG	2000m1-2023m12	CHF Switzerland Sovereign (IYC 82) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
CHF	1Y	I08201Y Index	BLOOMBERG	2000m1-2023m12	CHF Switzerland Sovereign (IYC 82) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
CHF	2Y	I08202Y Index	BLOOMBERG	2000m1-2023m12	CHF Switzerland Sovereign (IYC 82) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
CHF	3Y	I08203Y Index	BLOOMBERG	2000m1-2023m12	CHF Switzerland Sovereign (IYC 82) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
CHF	5Y	I08205Y Index	BLOOMBERG	2000m1-2023m12	CHF Switzerland Sovereign (IYC 82) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
CHF	7Y	I08207Y Index	BLOOMBERG	2000m1-2023m12	CHF Switzerland Sovereign (IYC 82) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
CHF	10Y	I08210Y Index	BLOOMBERG	2000m1-2023m12	CHF Switzerland Sovereign (IYC 82) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
DKK	XR	DKK BGN Curncy	BLOOMBERG	2000m1-2023m12	DANISH KRONE SPOT EXCHANGE RATE	1 USD in DKK		monthly	
DKK	3M	I01103M Index	BLOOMBERG	2000m1-2023m12	DKK Denmark Sovereign (IYC 11) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
DKK	1Y	I01101Y Index	BLOOMBERG	2000m1-2023m12	DKK Denmark Sovereign (IYC 11) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
DKK	2Y	I01102Y Index	BLOOMBERG	2000m1-2023m12	DKK Denmark Sovereign (IYC 11) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
DKK	3Y	I01103Y Index	BLOOMBERG	2000m1-2023m12	DKK Denmark Sovereign (IYC 11) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
DKK	5Y	I01105Y Index	BLOOMBERG	2000m1-2023m12	DKK Denmark Sovereign (IYC 11) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
DKK	7Y	I01107Y Index	BLOOMBERG	2000m1-2023m12	DKK Denmark Sovereign (IYC 11) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
DKK	10Y	I01110Y Index	BLOOMBERG	2000m1-2023m12	DKK Denmark Sovereign (IYC 11) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
EUR	XR	EUR Curncy	BLOOMBERG	2000m1-2023m12	EURO SPOT EXCHANGE RATE	1 EUR in USD	1/XR	monthly	
EUR	3M	I01603M Index	BLOOMBERG	2000m1-2023m12	EUR German Sovereign (IYC 16) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
EUR	1Y	I01601Y Index	BLOOMBERG	2000m1-2023m12	EUR German Sovereign (IYC 16) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
EUR	2Y	I01602Y Index	BLOOMBERG	2000m1-2023m12	EUR German Sovereign (IYC 16) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
EUR	3Y	I01603Y Index	BLOOMBERG	2000m1-2023m12	EUR German Sovereign (IYC 16) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
EUR	5Y	I01605Y Index	BLOOMBERG	2000m1-2023m12	EUR German Sovereign (IYC 16) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
EUR	7Y	I01607Y Index	BLOOMBERG	2000m1-2023m12	EUR German Sovereign (IYC 16) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
EUR	10Y	I01610Y Index	BLOOMBERG	2000m1-2023m12	EUR German Sovereign (IYC 16) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
GBP	XR	GBP BGN Curncy	BLOOMBERG	2000m1-2023m12	BRITISH POUND SPOT EXCHANGE RATE	1 GBP in USD	1/XR	monthly	
GBP	3M	I02203M Index	BLOOMBERG	2000m1-2023m12	GBP United Kingdom (IYC 22) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
GBP	1Y	I02201Y Index	BLOOMBERG	2000m1-2023m12	GBP United Kingdom (IYC 22) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
GBP	2Y	I02202Y Index	BLOOMBERG	2000m1-2023m12	GBP United Kingdom (IYC 22) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
GBP	3Y	I02203Y Index	BLOOMBERG	2000m1-2023m12	GBP United Kingdom (IYC 22) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
GBP	5Y	I02205Y Index	BLOOMBERG	2000m1-2023m12	GBP United Kingdom (IYC 22) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
GBP	7Y	I02207Y Index	BLOOMBERG	2000m1-2023m12	GBP United Kingdom (IYC 22) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
GBP	10Y	I02210Y Index	BLOOMBERG	2000m1-2023m12	GBP United Kingdom (IYC 22) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
GRC	3M	I15603M Index	BLOOMBERG	2004m3-2023m12	EUR Greek Sovereign Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
GRC	1Y	I15601Y Index	BLOOMBERG	2004m3-2023m12	EUR Greek Sovereign Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
GRC	2Y	I15602Y Index	BLOOMBERG	2004m3-2023m12	EUR Greek Sovereign Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
GRC	3Y	I15603Y Index	BLOOMBERG	2004m3-2023m12	EUR Greek Sovereign Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
GRC	5Y	I15605Y Index	BLOOMBERG	2004m3-2023m12	EUR Greek Sovereign Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
GRC	7Y	I15607Y Index	BLOOMBERG	2004m3-2023m12	EUR Greek Sovereign Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
GRC	10Y	I15610Y Index	BLOOMBERG	2004m3-2023m12	EUR Greek Sovereign Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
ITA	3M	I04003M Index	BLOOMBERG	2000m1-2023m12	EUR Italy Sovereign (IYC 40) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
ITA	1Y	I04001Y Index	BLOOMBERG	2000m1-2023m12	EUR Italy Sovereign (IYC 40) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
ITA	2Y	I04002Y Index	BLOOMBERG	2000m1-2023m12	EUR Italy Sovereign (IYC 40) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
ITA	3Y	I04003Y Index	BLOOMBERG	2000m1-2023m12	EUR Italy Sovereign (IYC 40) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
ITA	5Y	I04005Y Index	BLOOMBERG	2000m1-2023m12	EUR Italy Sovereign (IYC 40) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
ITA	7Y	I04007Y Index	BLOOMBERG	2000m1-2023m12	EUR Italy Sovereign (IYC 40) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
ITA	10Y	I04010Y Index	BLOOMBERG	2000m1-2023m12	EUR Italy Sovereign (IYC 40) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
JPY	XR	JPY BGN Curncy	BLOOMBERG	2000m1-2023m12	JAPANESE YEN SPOT EXCHANGE RATE	1 USD in JPY		monthly	
JPY	3M	I01803M Index	BLOOMBERG	2000m1-2023m12	JPY Japan Sovereign (IYC 18) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
JPY	1Y	I01801Y Index	BLOOMBERG	2000m1-2023m12	JPY Japan Sovereign (IYC 18) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
JPY	2Y	I01802Y Index	BLOOMBERG	2000m1-2023m12	JPY Japan Sovereign (IYC 18) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
JPY	3Y	I01803Y Index	BLOOMBERG	2000m1-2023m12	JPY Japan Sovereign (IYC 18) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
JPY	5Y	I01805Y Index	BLOOMBERG	2000m1-2023m12	JPY Japan Sovereign (IYC 18) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
JPY	7Y	I01807Y Index	BLOOMBERG	2000m1-2023m12	JPY Japan Sovereign (IYC 18) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
JPY	10Y	I01810Y Index	BLOOMBERG	2000m1-2023m12	JPY Japan Sovereign (IYC 18) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
NOK	XR	NOK BGN Curncy	BLOOMBERG	2000m1-2023m12	NORWEGIAN KRONE SPOT EXCHANGE RATE	1 USD in NOK		monthly	
NOK	3M	I07803M Index	BLOOMBERG	2000m1-2023m12	NOK Norway Sovereign (IYC 78) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
NOK	1Y	I07801Y Index	BLOOMBERG	2000m1-2023m12	NOK Norway Sovereign (IYC 78) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
NOK	2Y	I07802Y Index	BLOOMBERG	2000m1-2023m12	NOK Norway Sovereign (IYC 78) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
NOK	3Y	I07803Y Index	BLOOMBERG	2000m1-2023m12	NOK Norway Sovereign (IYC 78) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
NOK	5Y	I07805Y Index	BLOOMBERG	2000m1-2023m12	NOK Norway Sovereign (IYC 78) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
NOK	7Y	I07807Y Index	BLOOMBERG	2000m1-2023m12	NOK Norway Sovereign (IYC 78) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
NOK	10Y	I07810Y Index	REFINITIV	2011m4-2023m12	NOK Norway Sovereign (IYC 78) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
NZD	XR	NZD BGN Curncy	BLOOMBERG	2000m1-2023m12	NEW ZEALAND DOLLAR SPOT EXCHANGE RATE	1 NZD in USD	1/XR	monthly	
NZD	3M	I04903M Index	BLOOMBERG	2000m1-2023m12	NZD New Zealand Sovereign (IYC 49) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
NZD	1Y	I04901Y Index	BLOOMBERG	2000m1-2023m12	NZD New Zealand Sovereign (IYC 49) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
NZD	2Y	I04902Y Index	BLOOMBERG	2000m1-2023m12	NZD New Zealand Sovereign (IYC 49) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
NZD	3Y	I04903Y Index	BLOOMBERG	2000m1-2023m12	NZD New Zealand Sovereign (IYC 49) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
NZD	5Y	I04905Y Index	BLOOMBERG	2000m1-2023m12	NZD New Zealand Sovereign (IYC 49) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
NZD	7Y	I04907Y Index	BLOOMBERG	2000m1-2023m12	NZD New Zealand Sovereign (IYC 49) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
NZD	10Y	I04910Y Index	BLOOMBERG	2000m1-2023m12	NZD New Zealand Sovereign (IYC 49) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
SEK	XR	SEK BGN Curncy	BLOOMBERG	2000m1-2023m12	SWEDISH KRONA SPOT EXCHANGE RATE	1 USD in SEK		monthly	
SEK	3M	I02103M Index	BLOOMBERG	2000m1-2023m12	SEK Sweden Sovereign (IYC 21) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
SEK	1Y	I02101Y Index	BLOOMBERG	2000m1-2023m12	SEK Sweden Sovereign (IYC 21) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
SEK	2Y	I02102Y Index	BLOOMBERG	2000m1-2023m12	SEK Sweden Sovereign (IYC 21) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
SEK	3Y	I02103Y Index	BLOOMBERG	2000m1-2023m12	SEK Sweden Sovereign (IYC 21) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
SEK	5Y	I02105Y Index	BLOOMBERG	2000m1-2023m12	SEK Sweden Sovereign (IYC 21) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
SEK	7Y	I02107Y Index	BLOOMBERG	2000m1-2023m12	SEK Sweden Sovereign (IYC 21) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
SEK	10Y	I02110Y Index	BLOOMBERG	2000m1-2023m12	SEK Sweden Sovereign (IYC 21) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
USD	3M	I02503M Index	BLOOMBERG	2000m1-2023m12	USD Treasury Actives (IYC 25) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
USD	1Y	I02501Y Index	BLOOMBERG	2000m1-2023m12	USD Treasury Actives (IYC 25) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
USD	2Y	I02502Y Index	BLOOMBERG	2000m1-2023m12	USD Treasury Actives (IYC 25) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
USD	3Y	I02503Y Index	BLOOMBERG	2000m1-2023m12	USD Treasury Actives (IYC 25) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
USD	5Y	I02505Y Index	BLOOMBERG	2000m1-2023m12	USD Treasury Actives (IYC 25) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
USD	7Y	I02507Y Index	BLOOMBERG	2000m1-2023m12	USD Treasury Actives (IYC 25) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
USD	10Y	I02510Y Index	BLOOMBERG	2000m1-2023m12	USD Treasury Actives (IYC 25) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	

Table 2A: Emerging Markets (EMs)

Country	Var.	Ticker	Source	Sample	Definition	Unit of Measure	Transf.	Freq.	Mis. Val.
BRL	3M	I39303M Index	BLOOMBERG	2007m3 -2023m12	BRL Brazil Govt Benchmark (IYC393) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
BRL	1Y	I39301Y Index	BLOOMBERG	2007m3 -2023m12	BRL Brazil Govt Benchmark (IYC393) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
BRL	2Y	I39302Y Index	BLOOMBERG	2007m3 -2023m12	BRL Brazil Govt Benchmark (IYC393) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
BRL	3Y	I39303Y Index	BLOOMBERG	2007m3 -2023m12	BRL Brazil Govt Benchmark (IYC393) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
BRL	5Y	I39305Y Index	BLOOMBERG	2007m3 -2023m12	BRL Brazil Govt Benchmark (IYC393) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
BRL	7Y	I39307Y Index	BLOOMBERG	2007m3 -2023m12	BRL Brazil Govt Benchmark (IYC393) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
BRL	10Y	I39310Y Index	BLOOMBERG	2007m3 -2023m12	BRL Brazil Govt Benchmark (IYC393) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
CHL	XR	CLP BGN Curncy	BLOOMBERG	2000m1-2023m12	CHILEAN PESO TO US $ - EXCHANGE RATE	1 USD in CLP		monthly	
CHL	3M	I35103M Index	BLOOMBERG	2005m9-2023m12	CLP Chile Government (IYC 351) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
CHL	1Y	I35101Y Index	BLOOMBERG	2005m9-2023m12	CLP Chile Government (IYC 351) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
CHL	2Y	I35102Y Index	BLOOMBERG	2005m9-2023m12	CLP Chile Government (IYC 351) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
CHL	3Y	I35103Y Index	BLOOMBERG	2005m9-2023m12	CLP Chile Government (IYC 351) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
CHL	5Y	I35105Y Index	BLOOMBERG	2005m9-2023m12	CLP Chile Government (IYC 351) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
CHL	7Y	I35107Y Index	BLOOMBERG	2005m9-2023m12	CLP Chile Government (IYC 351) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
CHL	10Y	I35110Y Index	BLOOMBERG	2005m9-2023m12	CLP Chile Government (IYC 351) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
COL	XR	COP BGN Curncy	BLOOMBERG	2000m1-2023m12	COLOMBIAN PESO TO US $ - EXCHANGE RATE	1 USD in COP		monthly	
COL	3M	F47703M Index	BLOOMBERG	2005m4-2022m10	COP Colombia Sovereign (FMC 477) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
COL	1Y	F47701Y Index	BLOOMBERG	2005m4-2022m10	COP Colombia Sovereign (FMC 477) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
COL	2Y	F47702Y Index	BLOOMBERG	2005m4-2022m10	COP Colombia Sovereign (FMC 477) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
COL	3Y	F47703Y Index	BLOOMBERG	2005m4-2022m10	COP Colombia Sovereign (FMC 477) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
COL	5Y	F47705Y Index	BLOOMBERG	2005m4-2022m10	COP Colombia Sovereign (FMC 477) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
COL	7Y	F47707Y Index	BLOOMBERG	2005m4-2022m10	COP Colombia Sovereign (FMC 477) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
COL	10Y	F47710Y Index	BLOOMBERG	2005m4-2022m10	COP Colombia Sovereign (FMC 477) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
IDR	XR	IDR BGN Curncy	BLOOMBERG	2000m1-2023m12	INDONESIAN RUPIAH SPOT EXCHANGE RATE	1 USD in IDR		monthly	
IDR	3M	I26603M Index	BLOOMBERG	2003m5-2023m12	IDR Indonesia Sovereign (IYC 266) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
IDR	1Y	I26601Y Index	BLOOMBERG	2003m5-2023m12	IDR Indonesia Sovereign (IYC 266) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
IDR	2Y	I26602Y Index	BLOOMBERG	2003m5-2023m12	IDR Indonesia Sovereign (IYC 266) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
IDR	3Y	I26603Y Index	BLOOMBERG	2003m5-2023m12	IDR Indonesia Sovereign (IYC 266) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
IDR	5Y	I26605Y Index	BLOOMBERG	2003m5-2023m12	IDR Indonesia Sovereign (IYC 266) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
IDR	7Y	I26607Y Index	BLOOMBERG	2003m5-2023m12	IDR Indonesia Sovereign (IYC 266) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
IDR	10Y	I26610Y Index	BLOOMBERG	2003m5-2023m12	IDR Indonesia Sovereign (IYC 266) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
ISR	XR	ILS BGN Curncy	BLOOMBERG	2000m1-2023m12	ISRAELI SHEKEL TO US $ - EXCHANGE RATE	1 USD in ILS		monthly	
ISR	3M	I32503M Index	BLOOMBERG	2005m3-2023m12	ILS Israel Sovereign (IYC 325) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	2006m8
ISR	1Y	I32501Y Index	BLOOMBERG	2005m3-2023m12	ILS Israel Sovereign (IYC 325) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	2006m8
ISR	2Y	I32502Y Index	BLOOMBERG	2005m3-2023m12	ILS Israel Sovereign (IYC 325) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	2006m8
ISR	3Y	I32503Y Index	BLOOMBERG	2005m3-2023m12	ILS Israel Sovereign (IYC 325) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	2006m8
ISR	5Y	I32505Y Index	BLOOMBERG	2005m3-2023m12	ILS Israel Sovereign (IYC 325) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	2006m8
ISR	7Y	I32507Y Index	BLOOMBERG	2005m3-2023m12	ILS Israel Sovereign (IYC 325) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	2006m8
ISR	10Y	I32510Y Index	BLOOMBERG	2005m3-2023m12	ILS Israel Sovereign (IYC 325) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	2006m8
KOR	XR	KRW BGN Curncy	BLOOMBERG	2000m1-2023m12	USDKRW SPOT EXCHANGE RATE	1 USD In KRW		monthly	
KOR	3M	F23203M Index	BLOOMBERG	2000m1-2022m10	KRW Korea Treasury (FMC 232) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
KOR	1Y	F23201Y Index	BLOOMBERG	2000m1-2022m10	KRW Korea Treasury (FMC 232) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
KOR	2Y	F23202Y Index	BLOOMBERG	2000m1-2022m10	KRW Korea Treasury (FMC 232) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
KOR	3Y	F23203Y Index	BLOOMBERG	2000m1-2022m10	KRW Korea Treasury (FMC 232) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
KOR	5Y	F23205Y Index	BLOOMBERG	2000m1-2022m10	KRW Korea Treasury (FMC 232) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
KOR	7Y	F23207Y Index	BLOOMBERG	2000m1-2022m10	KRW Korea Treasury (FMC 232) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
KOR	10Y	F23210Y Index	BLOOMBERG	2000m1-2022m10	KRW Korea Treasury (FMC 232) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
MEX	XR	MXN BGN Curncy	BLOOMBERG	2000m1-2023m12	MEXICAN PESO TO US $ - EXCHANGE RATE	1 USD In MXN		monthly	
MEX	3M	I25103M Index	BLOOMBERG	2003m8-2023m12	MXN Mexico Sovereign (IYC I251) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
MEX	1Y	I25101Y Index	BLOOMBERG	2003m8-2023m12	MXN Mexico Sovereign (IYC I251) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
MEX	2Y	I25102Y Index	BLOOMBERG	2003m8-2023m12	MXN Mexico Sovereign (IYC I251) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
MEX	3Y	I25103Y Index	BLOOMBERG	2003m8-2023m12	MXN Mexico Sovereign (IYC I251) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
MEX	5Y	I25105Y Index	BLOOMBERG	2003m8-2023m12	MXN Mexico Sovereign (IYC I251) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
MEX	7Y	I25107Y Index	BLOOMBERG	2003m8-2023m12	MXN Mexico Sovereign (IYC I251) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
MEX	10Y	I25110Y Index	BLOOMBERG	2003m8-2023m12	MXN Mexico Sovereign (IYC I251) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
PEN	XR	PEN BGN Curncy	BLOOMBERG	2000m1-2023m12	PERUVIAN SOL TO US $ - EXCHANGE RATE	1 USD In PEN		monthly	
PEN	3M	I36103M Index	BLOOMBERG	2006m5-2023m12	PEN Peru Sovereign (IYC361) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
PEN	1Y	I36101Y Index	BLOOMBERG	2006m5-2023m12	PEN Peru Sovereign (IYC361) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
PEN	2Y	I36102Y Index	BLOOMBERG	2006m5-2023m12	PEN Peru Sovereign (IYC361) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
PEN	3Y	I36103Y Index	BLOOMBERG	2006m5-2023m12	PEN Peru Sovereign (IYC361) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
PEN	5Y	I36105Y Index	BLOOMBERG	2006m5-2023m12	PEN Peru Sovereign (IYC361) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
PEN	7Y	I36107Y Index	BLOOMBERG	2006m5-2023m12	PEN Peru Sovereign (IYC361) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
PEN	10Y	I36110Y Index	BLOOMBERG	2006m5-2023m12	PEN Peru Sovereign (IYC361) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
PHL	XR	PHP BGN Curncy	BLOOMBERG	2000m1-2023m12	USDPHP Spot Exchange rate	1 USD in PHP		monthly	
PHL	3M	I10503M Index	BLOOMBERG	2000m1-2023m12	PHP Philippine Government Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
PHL	1Y	I10501Y Index	BLOOMBERG	2000m1-2023m12	PHP Philippine Government Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
PHL	2Y	I10502Y Index	BLOOMBERG	2000m1-2023m12	PHP Philippine Government Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
PHL	3Y	I10503Y Index	BLOOMBERG	2000m1-2023m12	PHP Philippine Government Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
PHL	5Y	I10505Y Index	BLOOMBERG	2000m1-2023m12	PHP Philippine Government Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
PHL	7Y	I10507Y Index	BLOOMBERG	2000m1-2023m12	PHP Philippine Government Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
PHL	10Y	I10510Y Index	BLOOMBERG	2000m1-2023m12	PHP Philippine Government Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
POL	XR	PLN BGN Curncy	BLOOMBERG	2000m1-2023m12	POLISH ZLOTY TO US $ - EXCHANGE RATE	1 USD in PLN		monthly	
POL	3M	F11903M Index	BLOOMBERG	2000m1-2022m10	PLN Poland Sovereign (FMC 119) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
POL	1Y	F11901Y Index	BLOOMBERG	2000m1-2022m10	PLN Poland Sovereign (FMC 119) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
POL	2Y	F11902Y Index	BLOOMBERG	2000m1-2022m10	PLN Poland Sovereign (FMC 119) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
POL	3Y	F11903Y Index	BLOOMBERG	2000m1-2022m10	PLN Poland Sovereign (FMC 119) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
POL	5Y	F11905Y Index	BLOOMBERG	2000m1-2022m10	PLN Poland Sovereign (FMC 119) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
POL	7Y	F11907Y Index	BLOOMBERG	2000m1-2022m10	PLN Poland Sovereign (FMC 119) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
POL	10Y	F11910Y Index	BLOOMBERG	2000m1-2022m10	PLN Poland Sovereign (FMC 119) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
RUS	XR	USDRUB BGN Curncy	BLOOMBERG	2000m1-2023m12	USDRUB Spot (T+1) TOM Exchangee rate	1 USD in RUB		monthly	
RUS	3M	F49603M Index	BLOOMBERG	2007m1-2022m2	RUB Russia Sov (FMC 496) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
RUS	1Y	F49601Y Index	BLOOMBERG	2007m1-2022m2	RUB Russia Sov (FMC 496) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
RUS	2Y	F49602Y Index	BLOOMBERG	2007m1-2022m2	RUB Russia Sov (FMC 496) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
RUS	3Y	F49603Y Index	BLOOMBERG	2007m1-2022m2	RUB Russia Sov (FMC 496) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
RUS	5Y	F49605Y Index	BLOOMBERG	2007m1-2022m2	RUB Russia Sov (FMC 496) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
RUS	7Y	F49607Y Index	BLOOMBERG	2007m1-2022m2	RUB Russia Sov (FMC 496) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
RUS	10Y	F49610Y Index	BLOOMBERG	2007m1-2022m2	RUB Russia Sov (FMC 496) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
SAF	XR	ZAR BGN Curncy	BLOOMBERG	2000m1-2023m12	SOUTH AFRICA RAND TO US $ - EXCHANGE RATE			monthly	
SAF	3M	I09003M Index	BLOOMBERG	2000m1-2023m12	ZAR South Africa Sovereign (IYC 90) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
SAF	1Y	I09001Y Index	BLOOMBERG	2000m1-2023m12	ZAR South Africa Sovereign (IYC 90) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
SAF	2Y	I09002Y Index	BLOOMBERG	2000m1-2023m12	ZAR South Africa Sovereign (IYC 90) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
SAF	3Y	I09003Y Index	BLOOMBERG	2000m1-2023m12	ZAR South Africa Sovereign (IYC 90) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
SAF	5Y	I09005Y Index	BLOOMBERG	2000m1-2023m12	ZAR South Africa Sovereign (IYC 90) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
SAF	7Y	I09007Y Index	BLOOMBERG	2000m1-2023m12	ZAR South Africa Sovereign (IYC 90) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
SAF	10Y	I09010Y Index	BLOOMBERG	2000m1-2023m12	ZAR South Africa Sovereign (IYC 90) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
THA	XR	THB BGN Curncy	BLOOMBERG	2000m1-2023m12	USDTHB Spot Exchange Rate	1 USD in THB		monthly	
THA	3M	F12203M Index	BLOOMBERG	2000m1-2022m10	THB Thailand Sovereign (FMC 122) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
THA	1Y	F12201Y Index	BLOOMBERG	2000m1-2022m10	THB Thailand Sovereign (FMC 122) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
THA	2Y	F12202Y Index	BLOOMBERG	2000m1-2022m10	THB Thailand Sovereign (FMC 122) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
THA	3Y	F12203Y Index	BLOOMBERG	2000m1-2022m10	THB Thailand Sovereign (FMC 122) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
THA	5Y	F12205Y Index	BLOOMBERG	2000m1-2022m10	THB Thailand Sovereign (FMC 122) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
THA	7Y	F12207Y Index	BLOOMBERG	2000m1-2022m10	THB Thailand Sovereign (FMC 122) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
THA	10Y	F12210Y Index	BLOOMBERG	2000m1-2022m10	THB Thailand Sovereign (FMC 122) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	
TUR	XR	TRY BGN Curncy	BLOOMBERG	2000m1-2023m12	NEW TURKISH LIRA TO US $ - EXCHANGE RATE	1 USD in TRY		monthly	
TUR	3M	F96503M Index	BLOOMBERG	2005m4-2022m12	TRY Turkey Sovereign (FMC 965) Zero Coupon Yield 3 Month	%	log(1+y/100)	monthly	
TUR	1Y	F96501Y Index	BLOOMBERG	2005m4-2022m12	TRY Turkey Sovereign (FMC 965) Zero Coupon Yield 1 Year	%	log(1+y/100)	monthly	
TUR	2Y	F96502Y Index	BLOOMBERG	2005m4-2022m12	TRY Turkey Sovereign (FMC 965) Zero Coupon Yield 2 Year	%	log(1+y/100)	monthly	
TUR	3Y	F96503Y Index	BLOOMBERG	2005m4-2022m12	TRY Turkey Sovereign (FMC 965) Zero Coupon Yield 3 Year	%	log(1+y/100)	monthly	
TUR	5Y	F96505Y Index	BLOOMBERG	2005m4-2022m12	TRY Turkey Sovereign (FMC 965) Zero Coupon Yield 5 Year	%	log(1+y/100)	monthly	
TUR	7Y	F96507Y Index	BLOOMBERG	2005m4-2022m12	TRY Turkey Sovereign (FMC 965) Zero Coupon Yield 7 Year	%	log(1+y/100)	monthly	
TUR	10Y	F96510Y Index	BLOOMBERG	2005m4-2022m12	TRY Turkey Sovereign (FMC 965) Zero Coupon Yield 10 Year	%	log(1+y/100)	monthly	

B.2 Selected Summary Statistics

Table 3A: Average UIP deviations across maturities

$\left(i_t - i_t^{US}\right) - (s_{t+h} - s_t)$	3M	1Y	2Y	3Y	5Y	7Y	10Y
G10	0.07	0.44	1.14	1.96	1.06	0.35	-2.19
EM10	0.38	1.57	3.41	5.36	8.44	10.87	12.62
EM14	0.19	0.91	2.12	3.52	5.08	6.17	5.88

The table shows the average unconditional UIP deviation, in percent, for G9, G10, EM10, and EM14 countries across maturities. The sample period is from January 2000 to December 2023 subject to data availability.

Table 4A: Average (ex-post) exchange rate change across maturities

$(s_{t+h} - s_t)$	3M	1Y	2Y	3Y	5Y	7Y	10Y
G10	-0.02	-0.31	-1.02	-2.00	-1.67	-1.05	0.79
EM10	0.49	1.92	3.76	5.63	10.55	16.12	25.57
EM14	0.83	3.34	6.53	9.68	17.10	25.34	38.58

The table shows the average exchange rate change from January 2000 to December 2023, in percent, for G9, G10, EM10, and EM14 countries across maturities.

Table 5A: Average interest rate differential across maturities

$\left(i_t - i_t^{US}\right)$	3M	1Y	2Y	3Y	5Y	7Y	10Y
G10	0.05	0.12	0.11	-0.05	-0.61	-0.70	-1.40
EM10	0.87	3.50	7.17	11.00	19.00	26.98	37.42
EM14	1.02	4.25	8.66	13.20	22.18	31.51	43.28

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

Table 3A reports the average unconditional UIP deviation by group of countries, across maturities, also plotted in Figure 1. Tables 4A and 5A decompose the total deviation into interest rate differentials and exchange rate changes. The average UIP deviation for the G10 countries exhibits an inverted U-shape, close to zero at the 3M, peaking at the 3Y maturity, and approaching zero at the 7Y maturity. At the 10-year maturity, the average deviation is negative due to the loss of monthly observations at the end of the sample period in computing long-run exchange rate changes. For example, the monthly 10Y exchange rate change series ends in 2013. The average G10 interest rate differential is close to zero at the short end of the curve and turns monotonically more negative as the horizon lengthens. The exchange rate change is negative, and this trend becomes progressively more pronounced up to the 5-year horizon, indicating that the exchange rate appreciated; however, the pattern

starts to revert at the 7-year horizon. Significant heterogeneity is evident in the country-specific summary statistics reported in the Appendix D.10.

In contrast, the average UIP premium for the EM10 group of countries increases monotonically across maturities, reaching more than 10% at the 7-10Y maturity (Table 3A), with unconditional deviations even larger for the EM14 currencies. Both exchange rate changes and interest rate differentials increase monotonically across maturities. Country-specific statistics in Appendix D.10 show that the pattern is more homogeneous across countries than in advanced economies.

C Appendix: Block Bootstrap Inference

To obtain valid inference in the presence of serial and cross-sectional dependence, we construct standard errors using a block bootstrap procedure, following Horowitz (2019). The main motivation for this approach lies in the temporal dependence inherent in macro-financial time series, such as long-term interest rates, which exhibit strong persistence. Additionally, since exchange rates are measured relative to the U.S. dollar, this introduces an additional layer of cross-country dependence. As a result, assuming i.i.d. errors would be misleading. To account for these dependencies, we implement block bootstrapping in both the cross-sectional (by country) and time dimensions. The procedure we adopt is outlined below:

1. Block Length Selection

The block length l is determined using the rule-of-thumb proposed by Hall, Horowitz, and Jing (1995):

$$l = T^{1/3}$$

where T is the number of time observations. In the case of advanced economies (AEs), where $T = 288$, this yields $l = 6$. For consistency, the same block length is also applied to emerging markets (EMs).

2. Bootstrap Procedure

- For each of 1,000 replications, a bootstrap sample is drawn by resampling blocks of length 6 with replacement from the residuals.
- For each replication, the panel fixed effects regression is re-estimated:

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

  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 U.S. dollar with k denoting the maturity of the government bonds in months.
- The slope coefficient $\hat{\beta}^{(b)}$ is stored in each replication b.

3. Inference

- The bootstrap standard error is computed as the standard deviation of $\hat{\beta}^{(b)}$ across replications.

- A test statistic for the null hypothesis $H_0 : \beta = 1$ is calculated as:

$$z = \frac{\hat{\beta} - 1}{\mathrm{SE}_{\mathrm{boot}}}$$

with associated p-value:

$$p = 2 \cdot (1 - \Phi(|z|))$$

where $\Phi(\cdot)$ denotes the standard normal cumulative distribution function. We use the slope coefficient estimated from the original regression, together with the bootstrapped standard errors obtained from the procedure described above, to report whether the coefficient is significantly different from unity.[9]

[9] A similar procedure is applied to the country-specific regressions for Greece and Italy, reported in Table 6, using block bootstrapping along the time dimension only.

D Appendix: Additional Empirical Results

D.1 Country-specific UIP Regressions

Table 6A: Country-specific regressions 3-month

	β	s.e.	H_0: β=1	N		β	s.e.	H_0: β=1	N
BRL	-0.175	1.703		199	AUD	-0.976	1.973		285
CHL	0.598	1.895		217	CAD	1.963	3.213		285
COL	1.825	2.763		211	CHF	-0.062	1.547		285
IDR	-0.518	1.212		245	DKK	-0.470	1.818		285
ISR	0.595	1.804		223	EUR	-0.322	2.097		285
KOR	0.509	2.227		271	GBP	1.006	2.792		285
MEX	-1.409	3.009		242	GRC	-0.064	0.189	***	285
PEN	-0.324	1.123		209	ITA	0.361	1.833		285
PHL	-0.132	0.613	*	285	JPY	-0.393	1.320		285
POL	0.291	1.009		271	NOK	-0.206	1.947		285
RUS	1.047	2.787		179	NZD	0.047	2.528		285
SAF	-2.746	2.194	*	285	SEK	-0.503	2.117		285
THA	-0.578	1.324		263					
TUR	1.122	1.693		208					
EM14	0.340	0.593			G10	-0.238	0.661	*	
EM10	-0.129	0.636	*						
EM14	0.008†				G10	0.008†			
EM10	-0.122†								

The table reports the country-specific regression results from standard UIP regression for 3-month horizon zero coupon bonds. Standard errors are bootstrapped. 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 (1-year)

	β	s.e.	H_0: β=1	N		β	s.e.	H_0: β=1	N
BRL	-0.692	1.083		190	AUD	-0.810	1.215		276
CHL	0.477	0.982		208	CAD	1.394	2.258		276
COL	-0.617	1.634		213	CHF	0.089	0.954		276
IDR	-1.061	0.805	**	236	DKK	-0.322	1.112		276
ISR	0.791	0.920		214	EUR	-0.198	1.241		276
KOR	-0.729	1.018	*	276	GBP	0.230	1.563		276
MEX	-2.149	1.434	**	233	GRC	-0.02	0.152	***	226
PEN	-0.504	0.798	*	200	ITA	-0.075	0.969		276
PHL	0.022	0.404	**	276	JPY	0.212	1.093		276
POL	-0.097	0.506	**	276	NOK	-0.720	1.166		276
RUS	0.159	1.338		192	NZD	-0.702	1.583		276
SAF	-3.932	1.356	***	276	SEK	-0.672	1.365		276
THA	0.133	0.875		276					
TUR	0.568	1.236		199					
EM14	-0.356	0.31	***		G10	-0.339	0.418	***	
EM10	-0.509	0.313	***						
EM14†	-0.545				G10†	-0.150			
EM10†	-0.679								

The table reports the country-specific regression results from standard UIP regression for 1-year horizon for zero coupon bonds. Standard errors are bootstrapped. 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 (2-year)

	β	s.e.	H_0: β=1	N		β	s.e.	H_0: β=1	N
BRL	-0.627	0.721	**	178	AUD	-0.575	0.716	**	264
CHL	0.032	0.742		196	CAD	-0.179	1.557		264
COL	-1.545	1.011	**	201	CHF	0.484	0.703		264
IDR	-1.379	0.572	***	224	DKK	-0.283	0.864		264
ISR	0.467	0.423		202	EUR	-0.097	0.904		264
KOR	-1.608	0.744	***	264	GBP	-0.141	1.022		264
MEX	-2.977	1.116	***	221	GRC	-0.024	0.118	***	214
PEN	-0.587	0.549	***	188	ITA	-0.459	0.597	**	264
PHL	-0.369	0.239	***	264	JPY	1.468	1.039		264
POL	-0.421	0.383	***	264	NOK	-0.694	0.920	*	264
RUS	-1.628	0.734	***	180	NZD	-0.957	0.819	**	264
SAF	-4.270	1.174	***	264	SEK	-0.527	0.961		264
THA	0.607	0.519		264					
TUR	-0.821	0.528	***	187					
EM14	-0.814	0.179	***		G10	-0.152	0.287	***	
EM10	-0.693	0.21	***						
EM14†	-1.081				G10†	-0.150			
EM10†	-1.071								

The table reports the country-specific regression results from standard UIP regression for 2-year horizon for zero coupon bonds. Standard errors are bootstrapped. 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 (3-year)

	β	s.e.	H_0: β=1	N		β	s.e.	H_0: β=1	N
BRL	-0.492	0.596	**	166	AUD	-0.152	0.589	*	252
CHL	0.390	0.611		184	CAD	-0.430	1.337		252
COL	-1.683	0.626	***	189	CHF	0.475	0.560		252
IDR	-0.984	0.458	***	212	DKK	-0.413	0.559	**	252
ISR	0.492	0.208	**	190	EUR	-0.225	0.575	**	252
KOR	-1.857	0.504	***	252	GBP	-0.694	0.721	**	252
MEX	-2.999	0.640	***	209	GRC	-0.116	0.082	***	202
PEN	-0.444	0.543	***	176	ITA	-0.954	0.375	***	252
PHL	-0.397	0.228	***	252	JPY	2.071	0.847		252
POL	-0.653	0.268	***	252	NOK	-0.802	0.720	**	252
RUS	-0.990	0.619	***	168	NZD	-0.898	0.575	***	252
SAF	-3.337	0.893	***	252	SEK	-0.656	0.577	***	252
THA	1.001	0.420		252					
TUR	-0.407	0.576	**	175					
EM14	-0.63	0.15	***		G10	-0.11	0.224	***	
EM10	-0.634	0.162	***						
EM14	-0.883				G10	-0.172			
EM10	-0.953								

The table reports the country-specific regression results from standard UIP regression for 3-year horizon for zero coupon bonds. Standard errors are bootstrapped. 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 10A: Country-specific regressions (5-year)

	β	s.e.	H_0: β=1	N		β	s.e.	H_0: β=1	N
BRL	0.232	0.559		142	AUD	1.169	0.808		228
CHL	0.986	0.544		160	CAD	-0.589	1.433		228
COL	-1.412	0.680	***	165	CHF	1.061	0.611		228
IDR	-0.539	0.303	***	188	DKK	-0.493	0.588	**	228
ISR	0.215	0.301	***	166	EUR	-0.297	0.656	**	228
KOR	-1.774	0.383	***	228	GBP	0.040	0.675		228
MEX	-1.576	0.547	***	185	GRC	-0.169	0.066	***	178
PEN	0.541	0.613		152	ITA	-0.869	0.325	***	228
PHL	-0.384	0.135	***	228	JPY	1.978	0.608		228
POL	-0.935	0.303	***	228	NOK	-1.044	0.837	**	228
RUS	-0.622	0.592	***	144	NZD	0.048	0.836		228
SAF	-1.199	0.884	**	228	SEK	-0.718	0.639	***	228
THA	1.109	0.330		228					
TUR	-1.263	0.407	***	151					
EM14	-0.524	0.116	***		G10	0.184	0.249	***	
EM10	-0.392	0.127	***						
EM14†	-0.473				G10†	0.115			
EM10†	-0.474								

The table reports the country-specific regression results from standard UIP regression for 5-year horizon for zero coupon bonds. Standard errors are bootstrapped. 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 11A: Country-specific regressions (7-year)

	β	s.e.	H_0: β=1	N		β	s.e.	H_0: β=1	N
BRL	-0.061	0.702		118	AUD	2.352	0.832		204
CHL	1.609	0.365	*	136	CAD	-1.895	0.932	***	204
COL	-0.399	0.815	*	141	CHF	1.369	-		204
IDR	-0.723	0.293	***	164	DKK	-0.233	0.725	*	204
ISR	0.453	-		142	EUR	-0.155	0.749		204
KOR	-1.214	0.239	***	204	GBP	0.734	0.755		204
MEX	-0.700	0.523	***	161	GRC	-0.082	0.051	***	154
PEN	0.675			128	ITA	-0.898	0.273	***	294
PHL	-0.443	0.097	***	204	JPY	2.035	0.614	*	204
POL	-1.342	0.343	***	204	NOK	-0.649	0.948	*	204
RUS	-0.038	-		120	NZD	1.404	-		204
SAF	-1.241	0.456	***	204	SEK	-0.336	0.745	*	204
THA	1.249	0.271		204					
TUR	-1.070	0.428	***	127					
EM14	-0.497	0.109	***		G10	0.581	0.276		
EM10	-0.467	0.121	***						
EM14†	-0.232				G10†	0.463			
EM10†	-0.209								

The table reports the country-specific regression results from standard UIP regression for 7-year horizon for zero coupon bonds. Standard errors are bootstrapped. 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 12A: Country-specific regressions (10-year)

	β	s.e.	H_0: β=1	N		β	s.e.	H_0: β=1	N
BRL	-	-			AUD	4.148	0.796	***	168
CHL	-	-			CAD	-4.442	0.907	***	168
COL	-	-			CHF	1.775	-		168
IDR	-0.290	0.082	***	128	DKK	-0.961	-		168
ISR	-	-			EUR	-0.452	-		168
KOR	-0.775	-		168	GBP	1.368	-		168
MEX	-0.879	0.275	***	125	GRC	-	-		
PEN	-	-			ITA	-	-		
PHL	-0.448	0.073	***	168	JPY	2.662	0.382	***	168
POL	-1.006	-		168	NOK	-	-		
RUS	-	-			NZD	2.291	0.921		168
SAF	-1.729	0.366	***	168	SEK	-2.002	1.037	***	168
THA	0.780	0.414		168					
TUR	-	-							
EM14	-0.502	0.088	***		G10	0.707	0.189		
EM10	-0.571	0.095	***						
EM14	-0.621				G10	0.487			
EM10	-0.676								

The table reports the country-specific regression results from standard UIP regression for 10-year horizon for zero coupon bonds. Standard errors are bootstrapped. 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.

D.2 Summary statistics on extracted innovations

Table 13A: Country-specific summary statistics for RHS variables from Equation (19) 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 (19) for AEs.

Table 14A: Country-specific summary statistics for RHS variables from Equation (19) 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 (19) for EMs.

D.3 Panel exchange rate regressions on innovations

Table 15A: 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 16A: 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.

D.4 Innovation analysis with risk premium component

Table 17A: AEs with risk premium - I

	(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 (21) and (22) 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 18A: AEs with risk premium - II

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Delta\left(y^{\$}-\bar{y}^{*}\right)$	1.068***					1.111***		1.182***
	(0.205)					(0.295)		(0.301)
$\Delta\bar{x}^{\text{tb}}$		-9.390***				-6.522***		-7.086***
		(1.797)				(1.569)		(1.583)
$\Delta\overline{cds}$			3.577***			2.122***		2.036***
			(0.460)			(0.493)		(0.496)
$\Delta\left(\overline{tp^{*,*}-tp^{\$,\$}}\right)$				-1.169***		0.0167		0.0516
				(0.196)		(0.259)		(0.260)
$\Delta\left(\overline{x^{\text{tb,5y}}-x^{\text{tb,1y}}}\right)$					-4.334***	-2.584***		-2.850***
					(0.638)	(0.646)		(0.660)
$\overline{rp}^{*}$							-0.0201	0.00296
							(0.0212)	(0.0175)
N	204	204	204	159	204	159	192	147
R^2	0.118	0.119	0.230	0.183	0.185	0.486	0.005	0.519

The table reports the coefficient estimates from Equations (21) and (22) 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 1-year UIP regressions for AEs.

Table 19A: EMs with risk premium - I

	(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 (21) and (22) 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.

Table 20A: EMs with risk premium - II

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$\Delta\left(y^{\$}-\bar{y}^{*}\right)$	-0.700***					-0.402**		-0.316*
	(0.129)					(0.191)		(0.190)
$\Delta\bar{x}^{\text{tb,AE}}$		-9.874***				-4.866***		-5.593***
		(1.854)				(1.377)		(1.356)
$\Delta\overline{cds}$			1.728***			1.256***		1.257***
			(0.115)			(0.188)		(0.187)
$\Delta\left(\overline{tp^{*,*}-tp^{\$,\$}}\right)$				-0.345**		-0.412**		-0.369*
				(0.156)		(0.203)		(0.200)
$\Delta\left(\overline{x^{\text{tb,5y}}-x^{\text{tb,1y}}}\right)$					-4.151***	-0.773		-1.051*
					(0.671)	(0.552)		(0.548)
$\overline{rp}^{*}$							-0.00779	0.00895
							(0.0204)	(0.0133)
N	204	204	204	204	204	204	192	192
R^2	0.127	0.123	0.528	0.023	0.159	0.574	0.001	0.603

The table reports the coefficient estimates from equations (21) and (22) 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 1-year UIP regressions for EMs.

D.5 Augmented LRUIP regressions with additional variables

Table 21A: Augmented UIP regressions for EMs (5-year) with additional controls

	(1)	(2)	(3)	(4)	(5)	(6)
$(i^*_{5y} - i^{USD}_{5y})$	-0.430**	1.133*	0.734**	0.806***	0.837***	0.728***
	(0.187)	(0.640)	(0.308)	(0.284)	(0.277)	(0.276)
cds_{5y}			-2.144***	-1.788***	-1.241**	-1.105**
			(0.397)	(0.409)	(0.488)	(0.482)
c^{SP}_{LT}		-0.008				
		(0.028)				
$c^{SP}_{LT} * (i^*_{5y} - i^{USD}_{5y})$		-0.243***				
		(0.081)				
$\overline{rp}^*$				0.413***		0.212**
				(0.099)		(0.098)
$\overline{x}^{tb}_{AE}$					7.995***	6.905***
					(1.375)	(1.471)
$H_0 : \beta_1 = 1$	***					
N	1,446	1,446	1,331	1,275	1,275	1,275
R^2	0.021	0.074	0.091	0.169	0.220	0.230

The table reports the coefficient estimates for augmented LR-UIP regressions in the main text with additional variables for 5-year maturity, with bootstrapped standard errors. $\overline{rp}^*$ captures the risk premium which is calculated as the average of the residuals from the 1-year UIP regressions for EMs, and $\overline{x}^{tb}_{AE}$ is the average CIP deviations for AEs for 5-year maturity. Note: *, **, *** indicates statistical significance at the 10%, 5% and 1% level, respectively.

D.6 Augmented UIP regressions for alternative specifications

Table 22A: Augmented UIP regressions for EMs with alternative specifications (5-year)

	(1)	(2)
$(i^*_{5y} - i^{USD}_{5y})$	-0546***	1.324***
	(0.358)	(0.304)
cds_{5y}		-0.049
		(0.618)
c^{SP}_{LT}	-0.056**	
	(0.024)	
$cds_{5y} * (i^*_{5y} - i^{USD}_{5y})$		-8.292***
		1.779
$H_0 : \beta_1 = 1$	***	
N	1,446	1.331
R^2	0.047	0.153

The table reports the coefficient estimates for alternative specifications where credit ratings enter linearly (column (1)) and where CDS spreads enter together with their interaction with the interest rate differential for emerging markets (EMs) for 5-year maturity, with bootstrapped standard errors. Note: *, **, *** indicates statistical significance at the 10%, 5% and 1% level, respectively.

D.7 Augmented UIP regressions for other maturities

Table 23A: Augmented UIP regressions for EMs (1-year)

	(1)	(2)	(3)
$(i^*_{1y} - i^{USD}_{1y})$	-0.329	0.875	0.357
	(0.389)	(0.548)	(0.765)
cds_{1y}		-8.983***	
		(1.463)	
c^{SP}_{ST}			-0.017
			(0.013)
$c^{SP}_{ST} * (i^*_{1y} - i^{USD}_{1y})$			-0.313
			(0.279)
$H_0 : \beta_1 = 1$	***		
N	1,926	1,661	1,926
R^2	0.003	0.135	0.026

The table reports the coefficient estimates from Equations (24) and (25) for emerging markets (EMs) for 1-year maturity, with bootstrapped standard errors. Note: *, **, *** indicates statistical significance at the 10%, 5% and 1% level, respectively.

Table 24A: Augmented UIP regressions for EMs (7-year)

	(1)	(2)	(3)
$(i^*_{7y} - i^{USD}_{7y})$	-0.401**	0.466	0.425
	(0.195)	(0.296)	(0.785)
cds_{7y}		-0.972**	
		(0.383)	
c^{SP}_{ST}			-0.073**
			(0.030)
$c^{SP}_{LT} * (i^*_{7y} - i^{USD}_{7y})$			-0.142
			(0.093)
$H_0 : \beta_1 = 1$	***	*	
N	1,206	1,661	1,206
R^2	0.032	0.135	0.149

The table reports the coefficient estimates from Equations (24) and (25) for emerging markets (EMs) for 7-year maturity, with bootstrapped standard errors. Note: *, **, *** indicates statistical significance at the 10%, 5% and 1% level, respectively.

D.8 Augmented UIP regressions for AEs

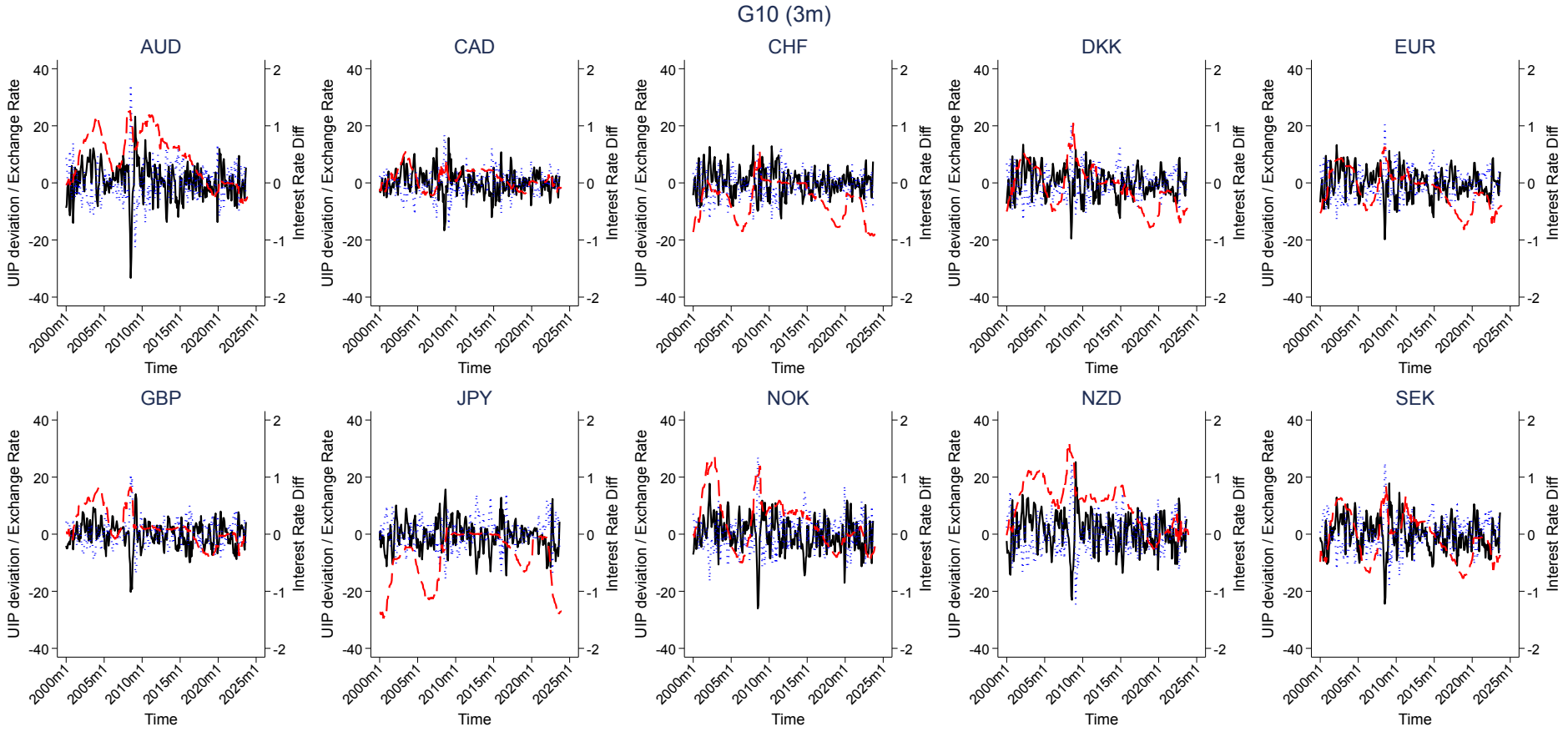
Table 25A: Augmented UIP regressions for AEs (5-year)

	(1)	(2)	(3)
$(i^*_{5y} - i^{USD}_{5y})$	1.776***	1.976***	0.233
	(0.358)	(0.503)	(0.546)
cds_{5y}		0.616	
		(1.619)	
c^{SP}_{LT}			0.108**
			(0.044)
$c^{SP}_{LT} * (i^*_{5y} - i^{USD}_{5y})$			1.087***
			(0.177)
$H_0 : \beta_1 = 1$	*		
Country #	10	8	9
N	1,450	786	1,305
R^2	0.112	0.171	0.216

The table reports the coefficient estimates from Equations (24) and (25) for advanced economies (AEs) for 5-year maturity, with bootstrapped standard errors. Note: *, **, *** indicates statistical significance at the 10%, 5% and 1% level, respectively.

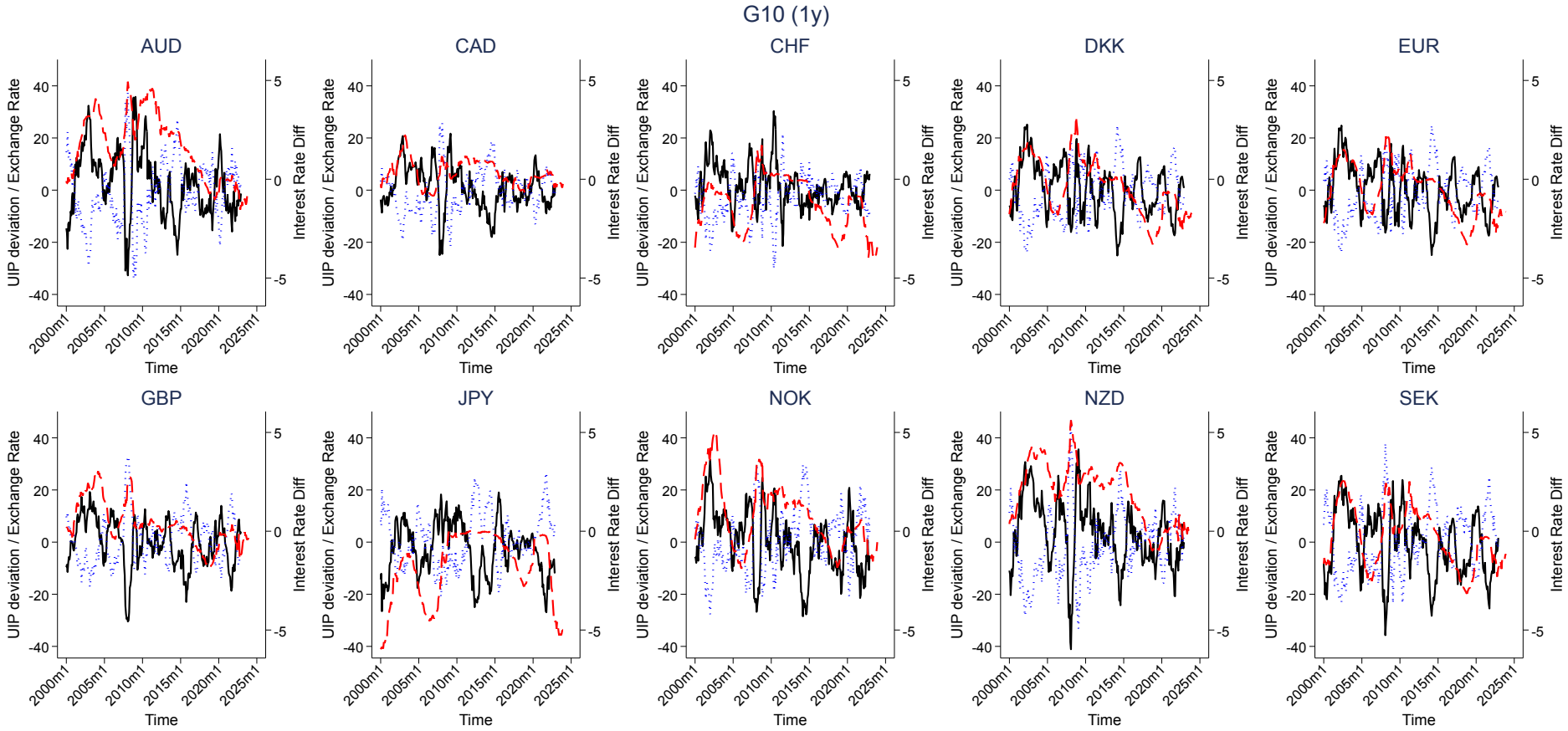
D.9 Country-specific figures for UIP and its components

Figure 1A: UIP premium and its components for G10 (3m)



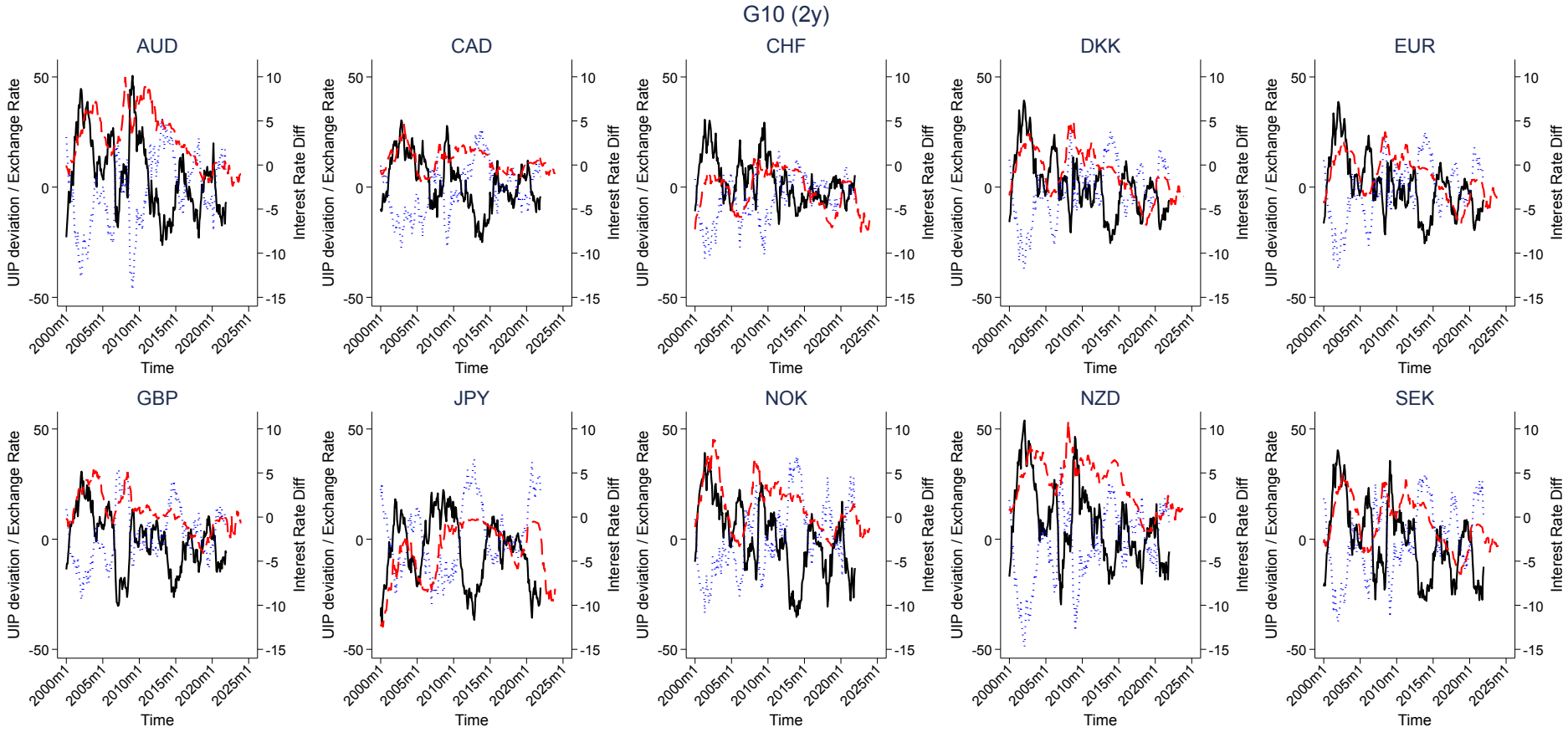
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 2A: UIP premium and its components for G10 (1y)



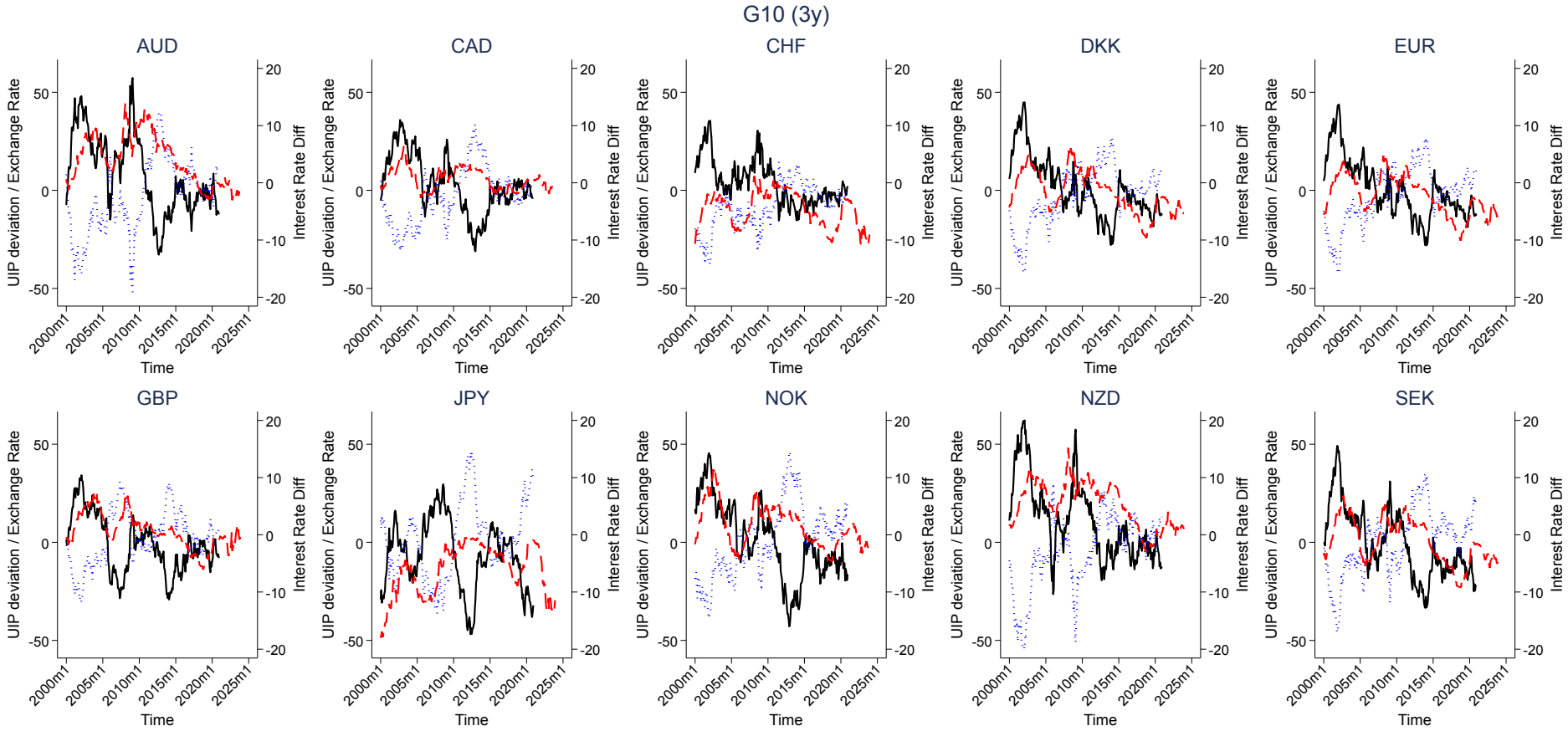
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 3A: UIP premium and its components for G10 (2y)



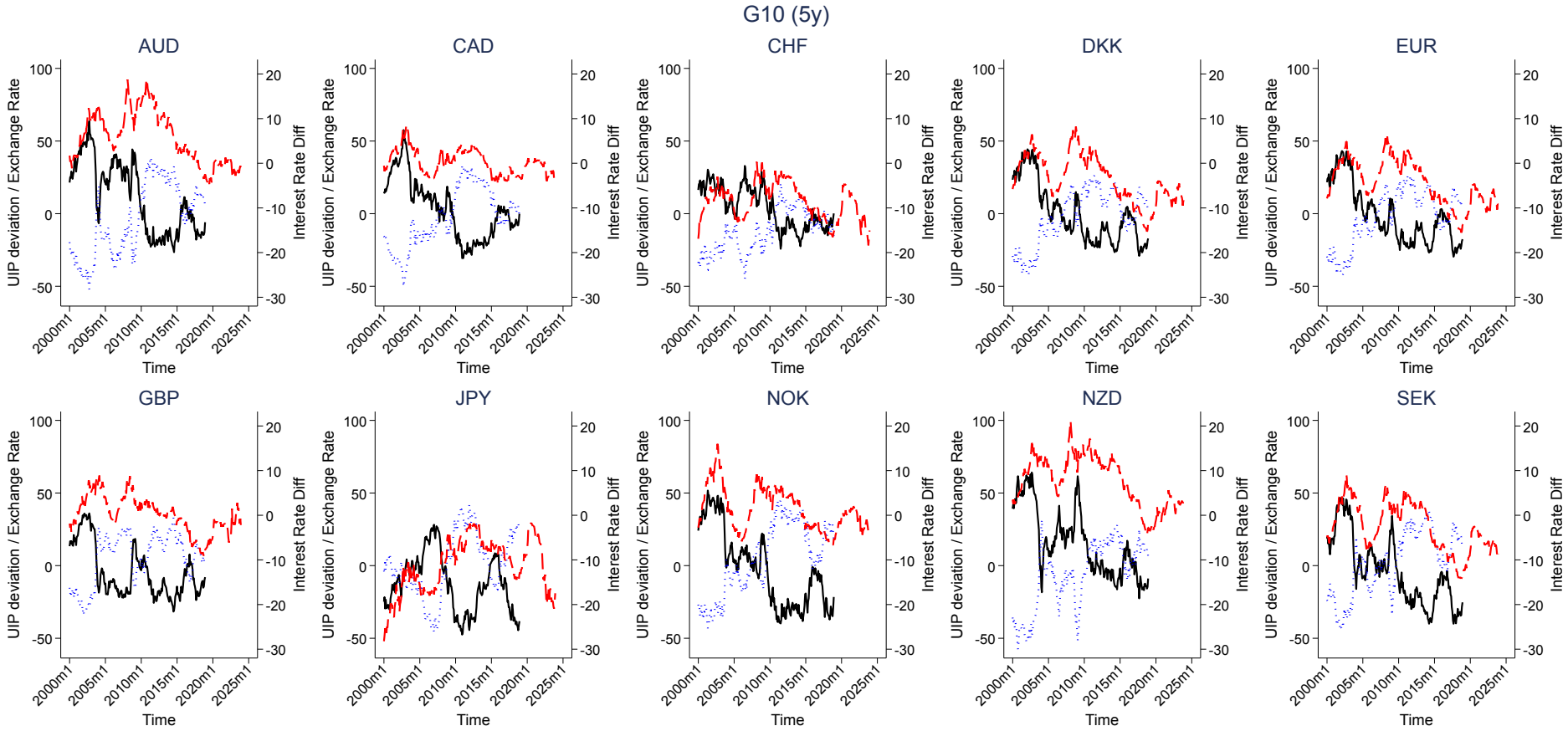
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 4A: UIP premium and its components for G10 (3y)



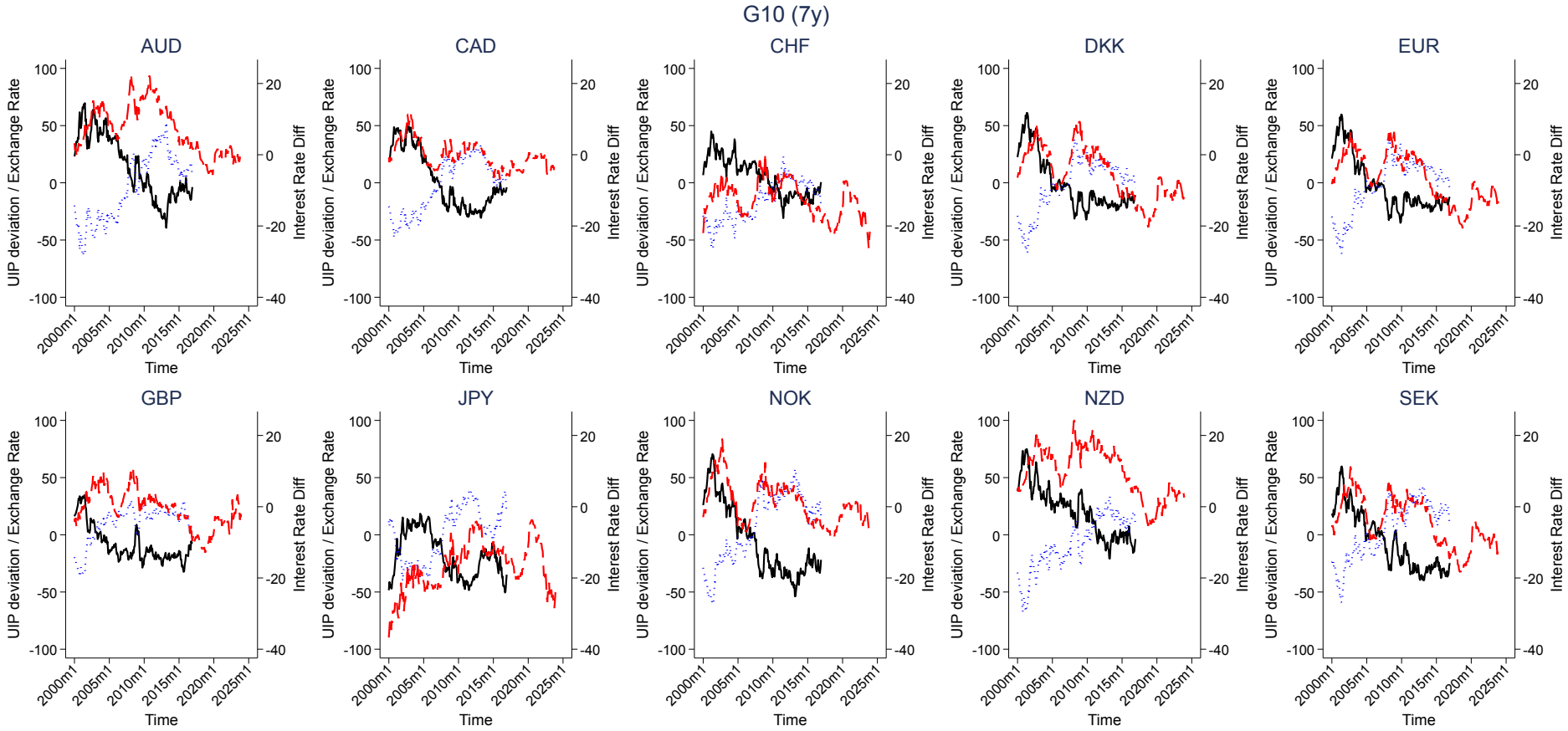
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 5A: UIP premium and its components for G10 (5y)



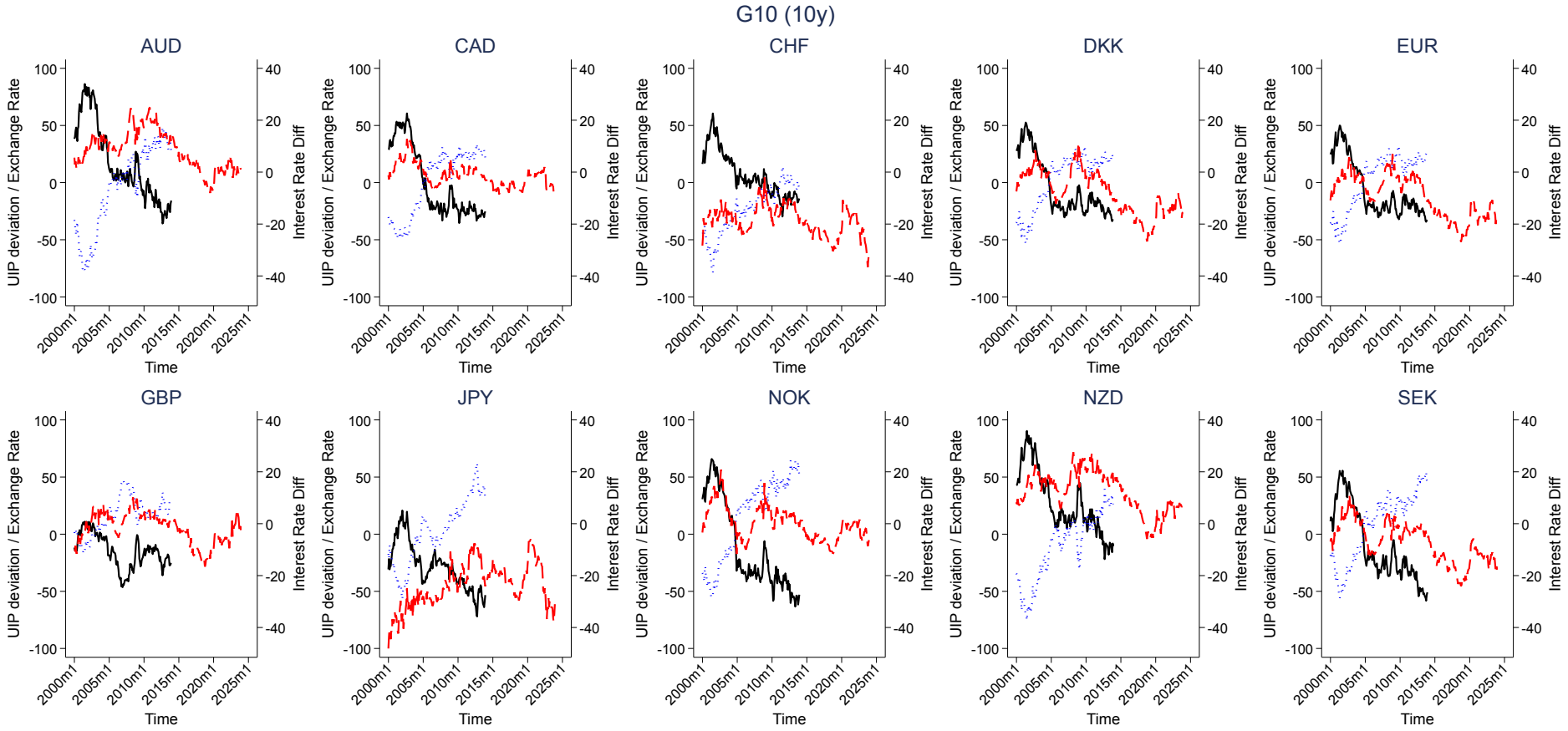
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 6A: UIP premium and its components for G10 (7y)



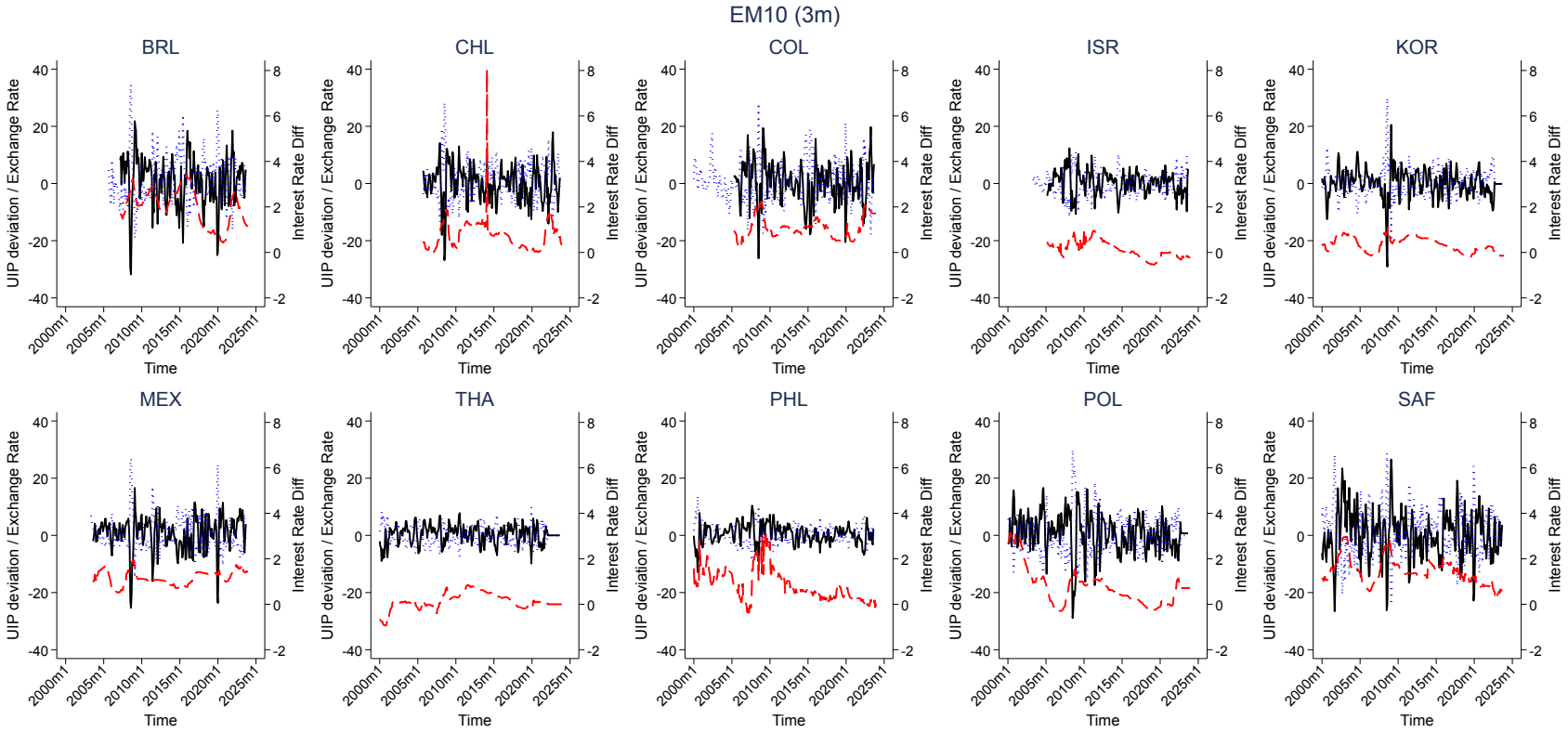
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 7A: UIP premium and its components for G10 (10y)



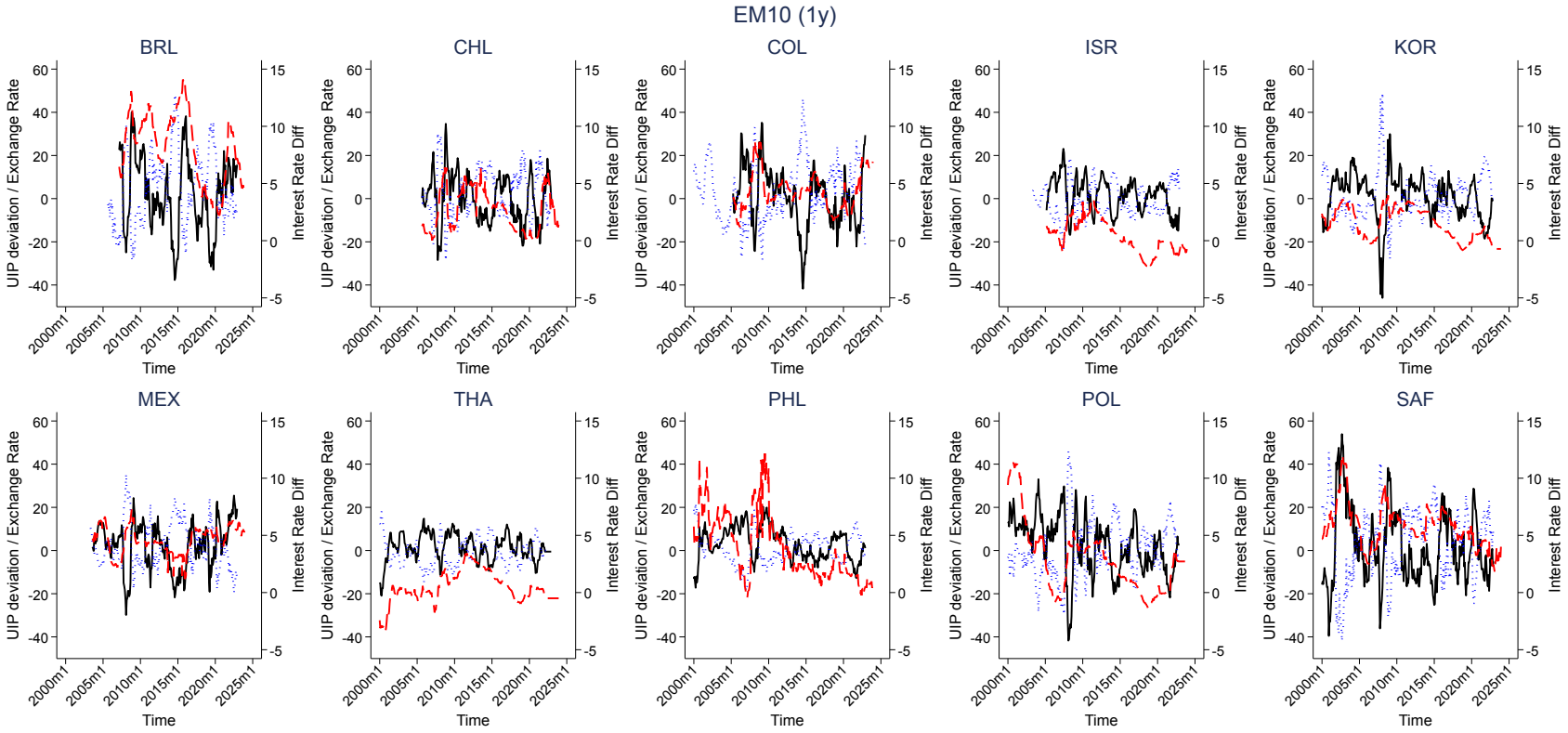
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 8A: UIP premium and its components for EM10 (3m)



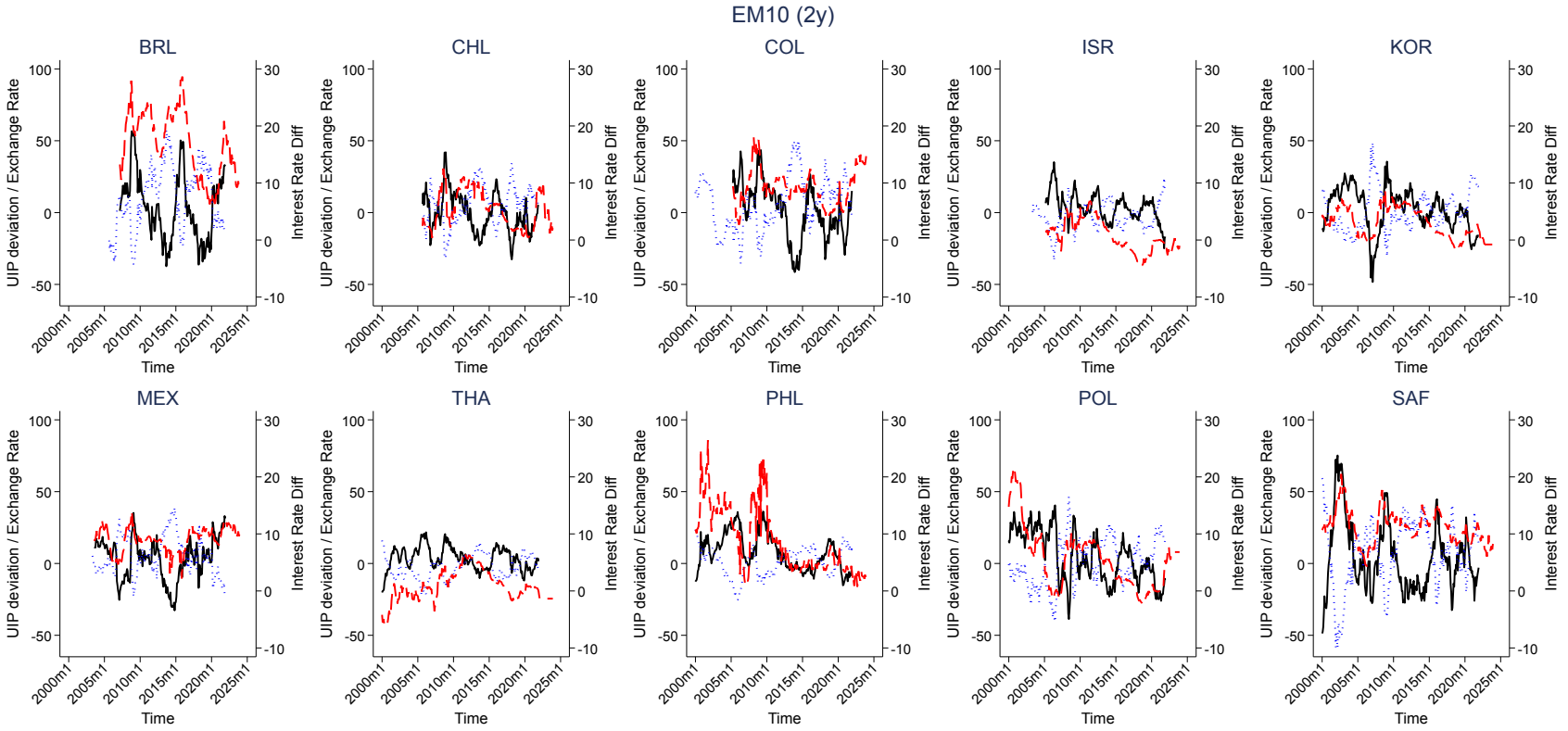
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 9A: UIP premium and its components for EM10 (1y)



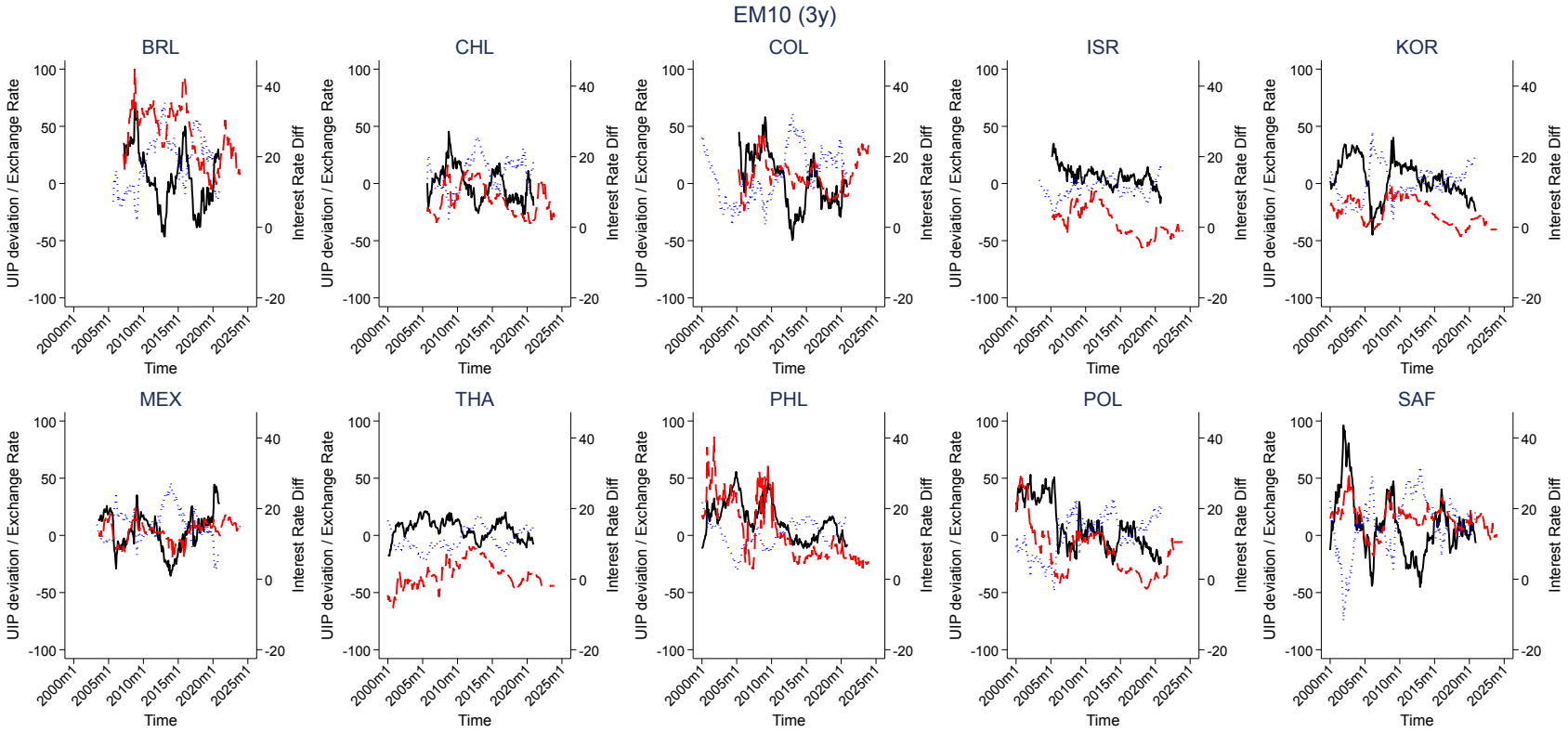
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 10A: UIP premium and its components for EM10 (2y)



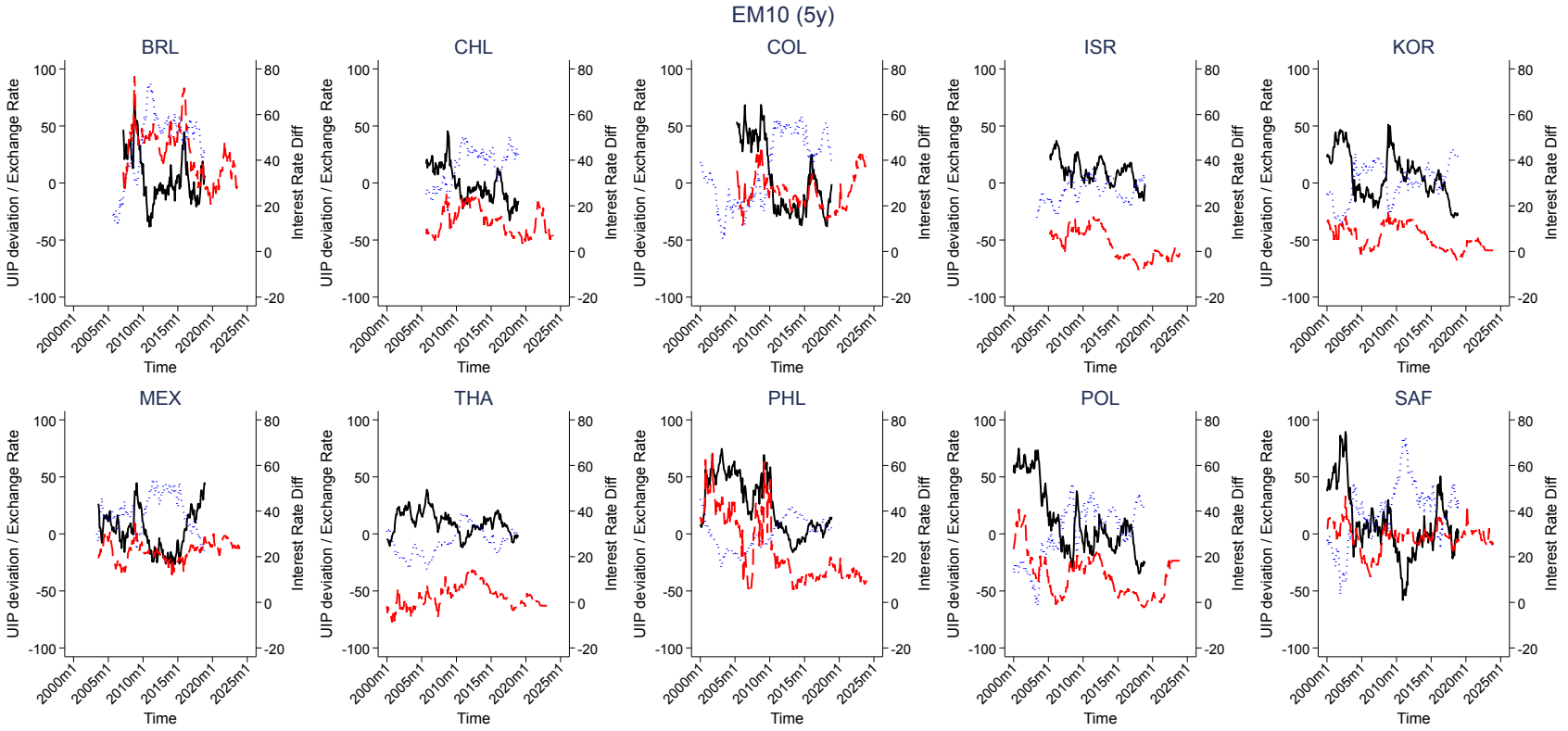
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 11A: UIP premium and its components for EM10 (3y)



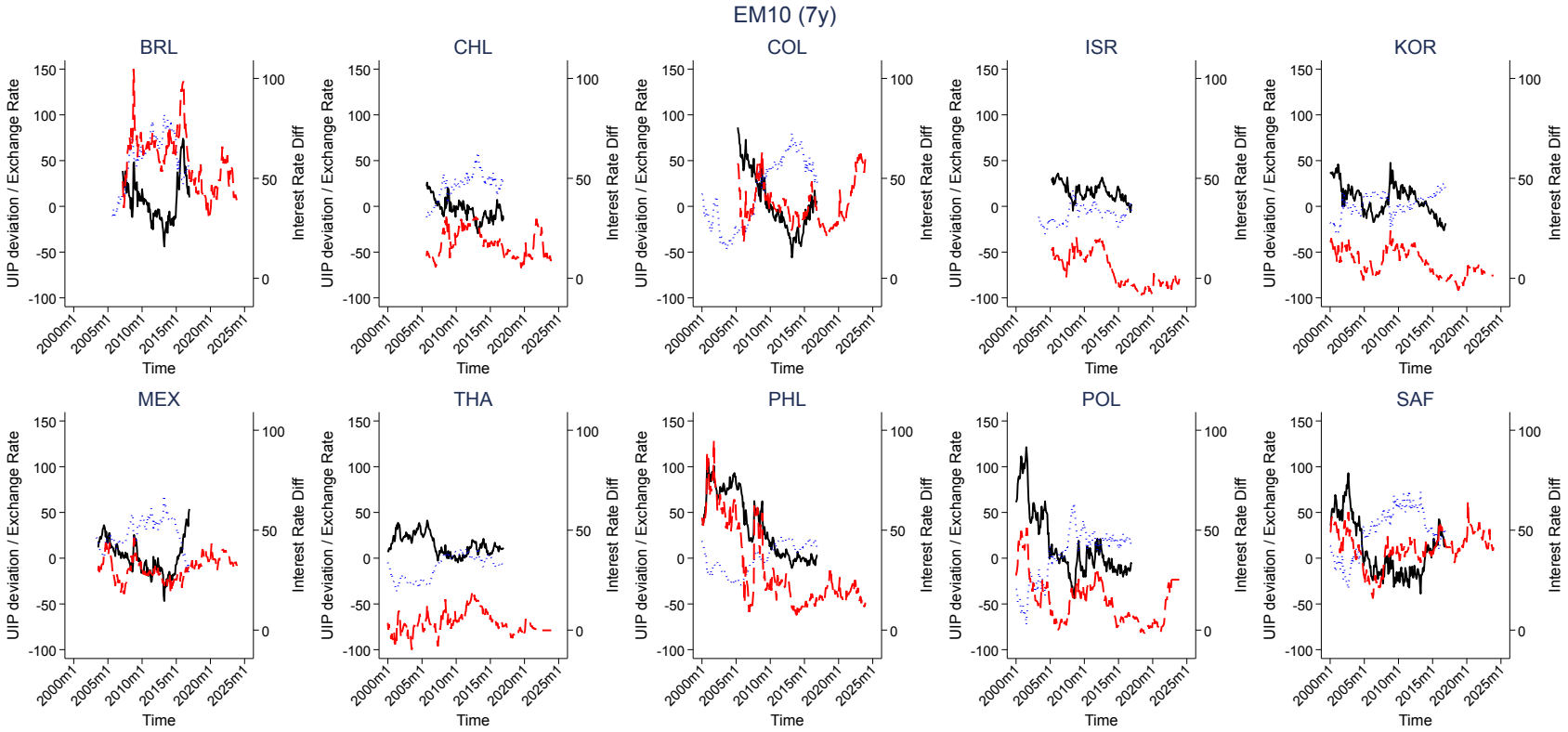
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 12A: UIP premium and its components for EM10 (5y)



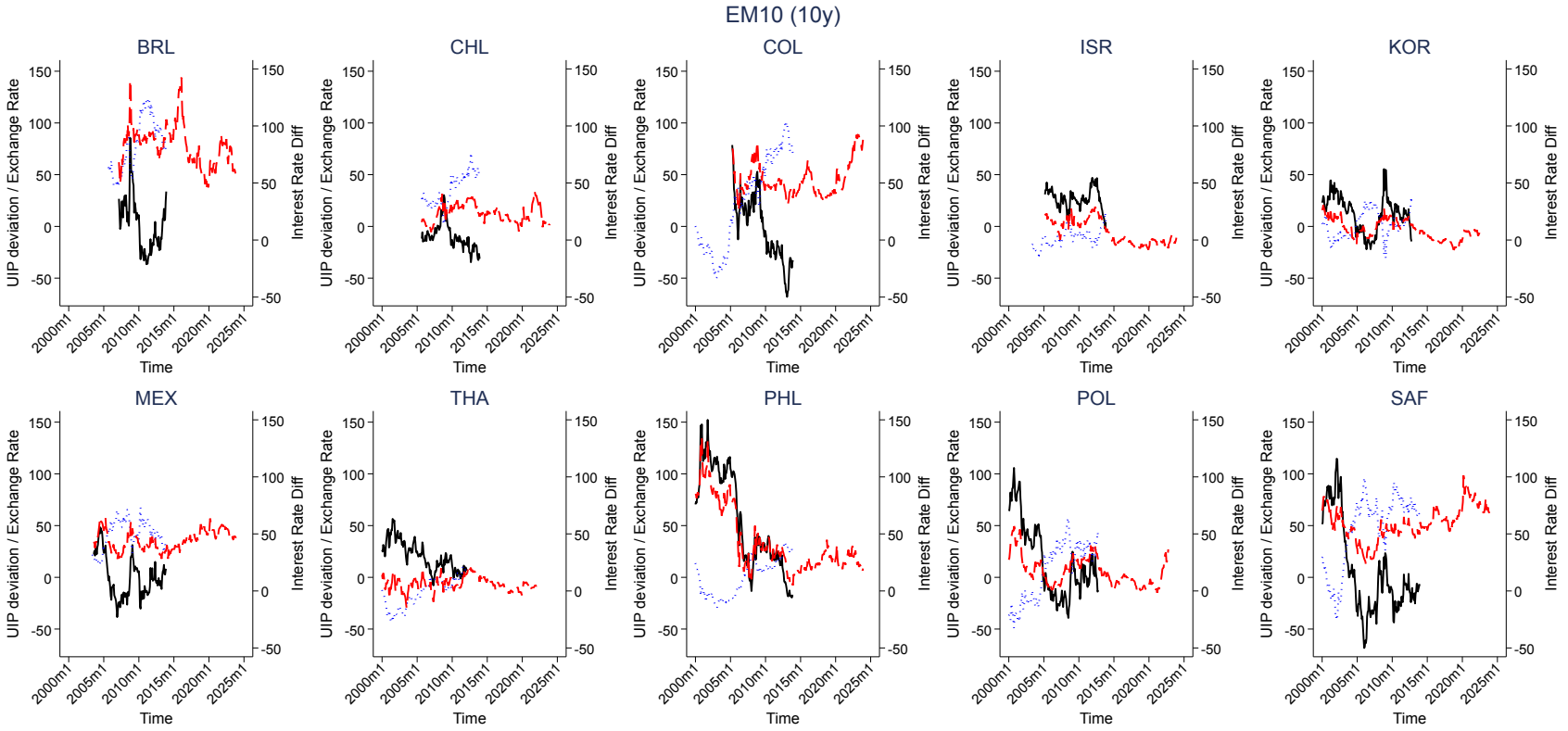
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 13A: UIP premium and its components for EM10 (7y)



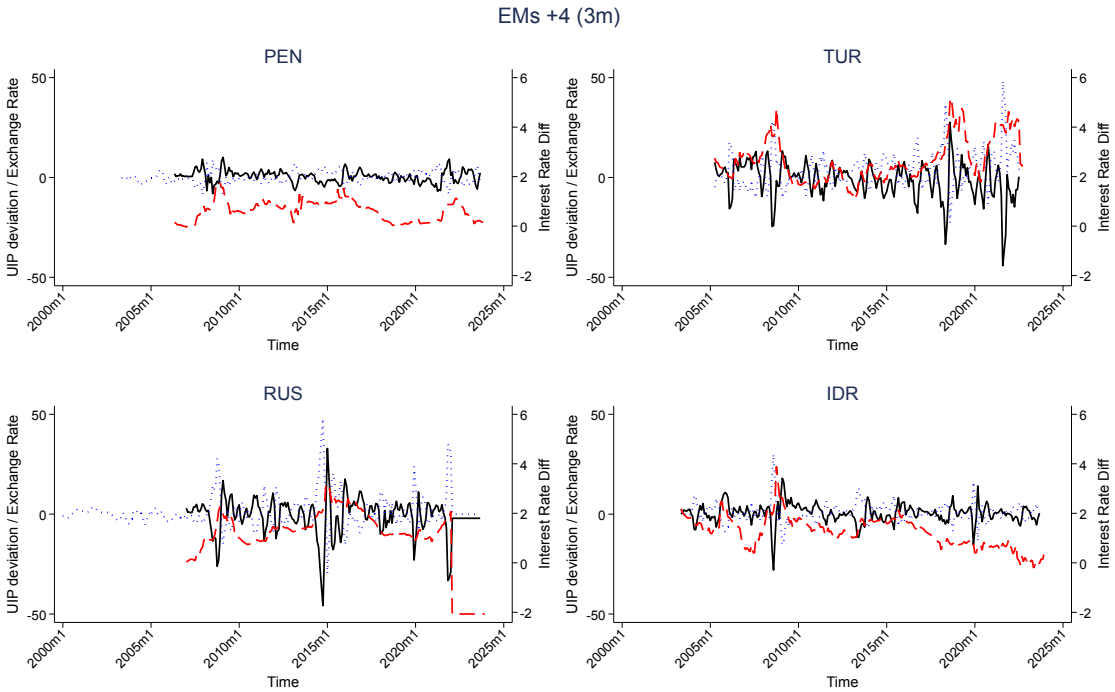
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 14A: UIP premium and its components for EM10 (10y)



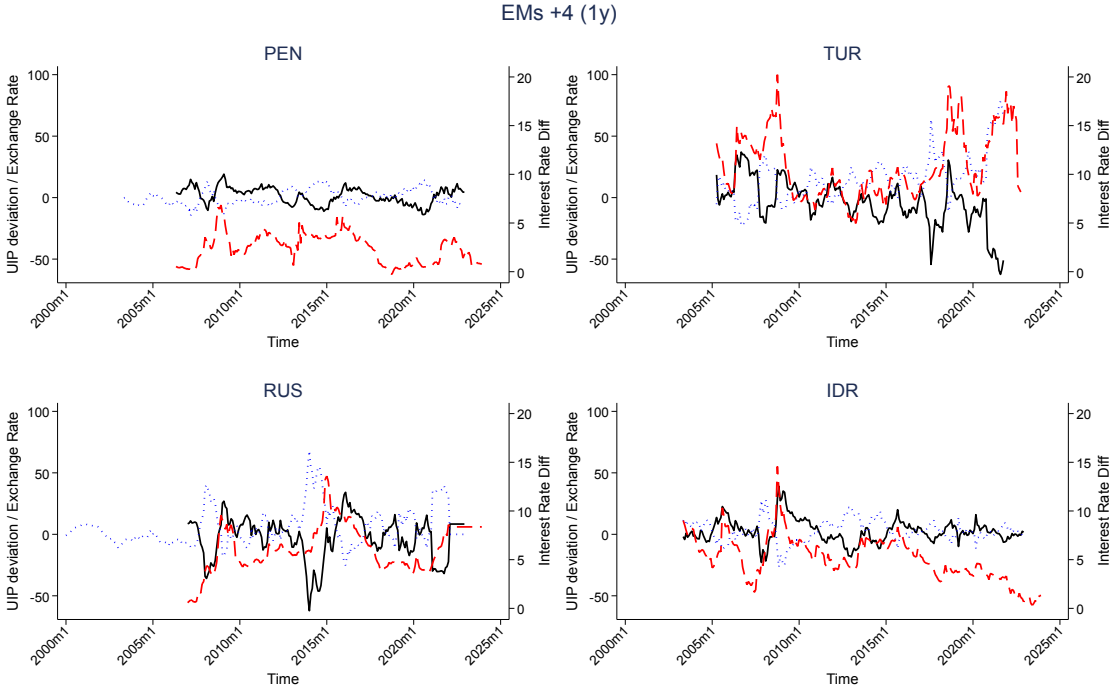
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 15A: UIP premium and its components for EMs +4 (3m)



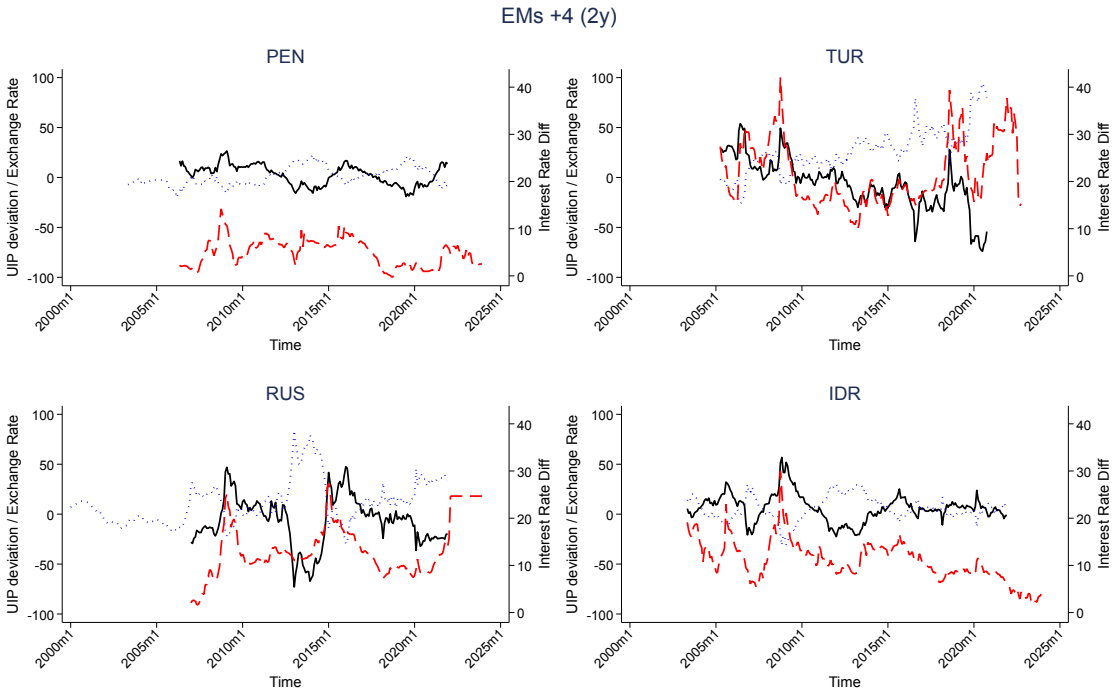
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 16A: UIP premium and its components for EMs +4 (1y)



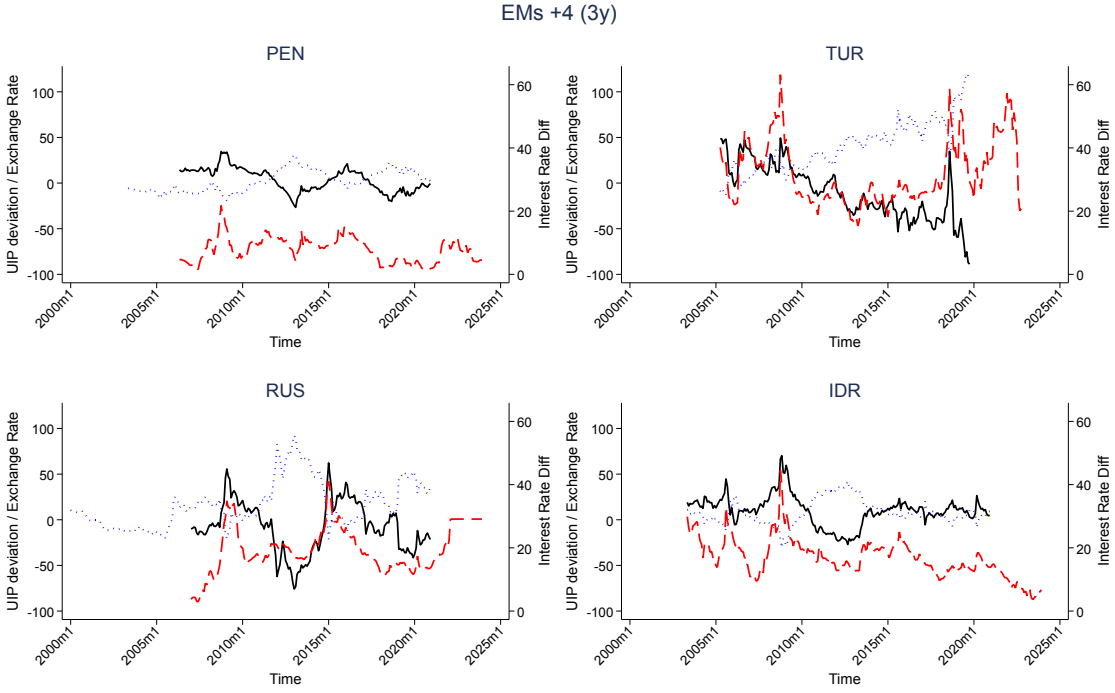
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 17A: UIP premium and its components for EMs +4 (2y)



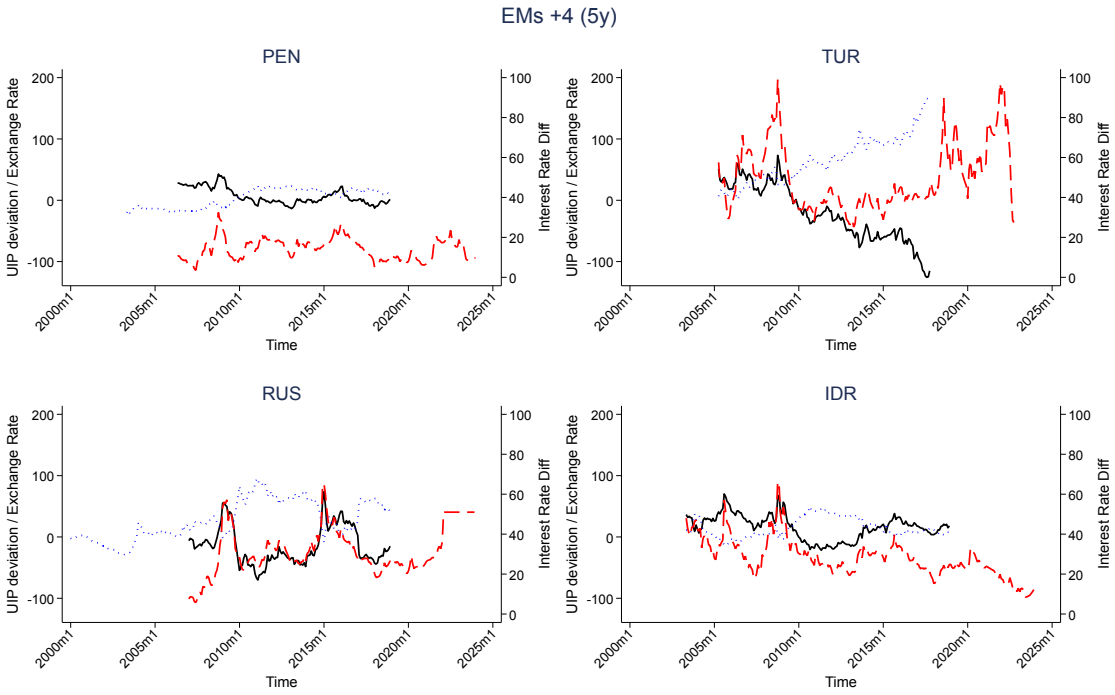
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 18A: UIP premium and its components for EMs +4 (3y)



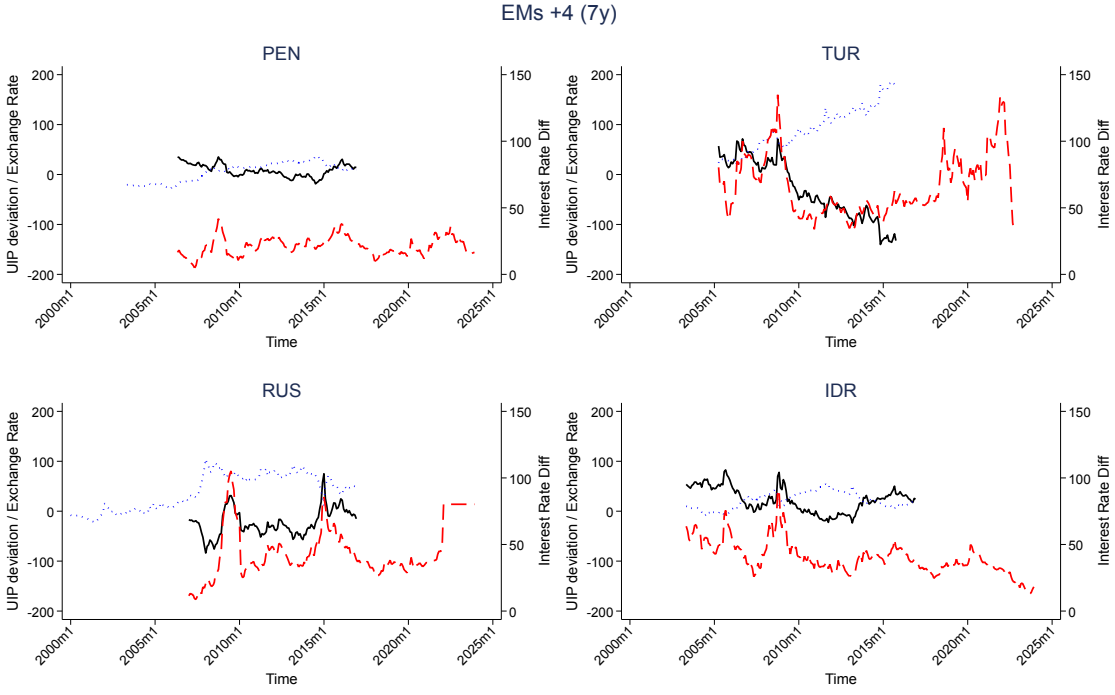
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 19A: UIP premium and its components for EMs +4 (5y)



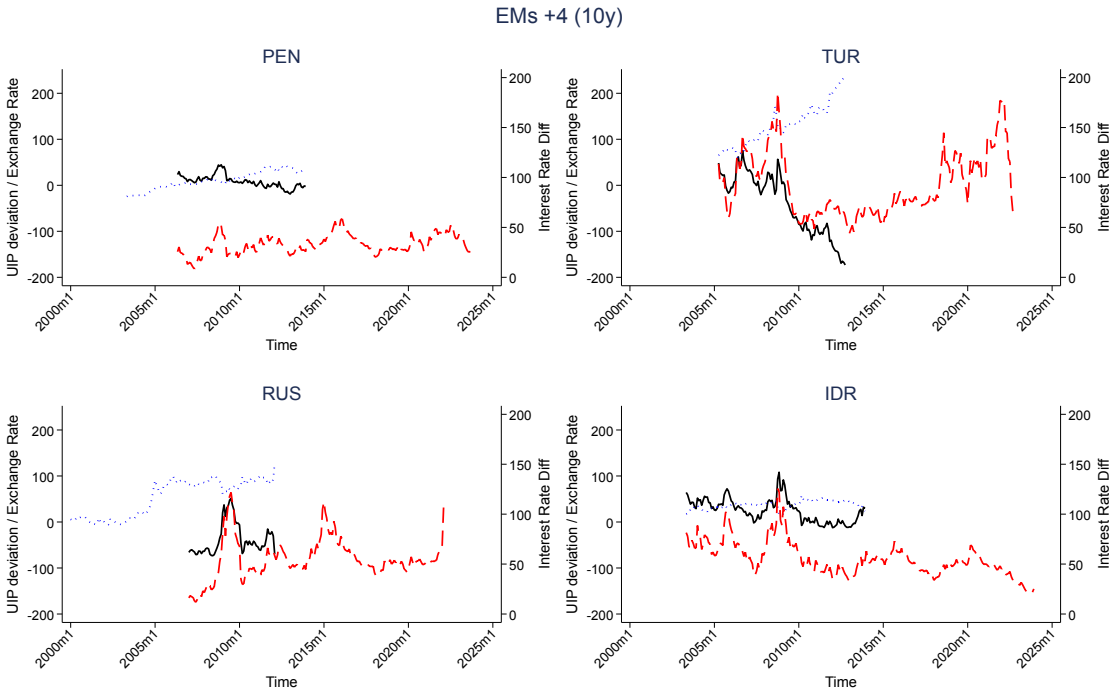
Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 20A: UIP premium and its components for EMs +4 (7y)



Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

Figure 21A: UIP premium and its components for EMs +4 (10y)



Black: UIP deviation (Solid) | Blue: Exchange Rate Change (Dotted) | Red: Interest Rate Diff. (Dashed)

D.10 Country-specific UIP deviations summary statistics

Table 26A: 3-month maturity UIP premia 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	0.45	-0.06	0.51	0.43	6.23	6.27	-0.36	-22.61	-33.27	1.27	34.43	23.23	0.02	0.81	-0.70	1.90	7.22	6.70	285
CAD	0.07	-0.07	0.14	0.17	4.19	4.18	-0.22	-15.64	-16.65	0.55	16.84	15.75	0.25	0.10	-0.07	2.56	5.00	4.97	285
CHF	-0.29	-0.68	0.39	0.32	4.47	4.49	-0.93	-13.22	-12.49	0.56	12.49	13.10	-0.32	-0.05	0.12	2.25	3.15	3.11	285
DKK	-0.07	-0.12	0.05	0.36	4.79	4.82	-0.79	-13.02	-19.50	1.05	20.15	13.44	0.15	0.32	-0.21	2.59	3.79	3.57	285
EUR	-0.12	-0.12	0.01	0.33	4.80	4.82	-0.82	-12.88	-19.75	0.63	20.38	13.28	-0.01	0.33	-0.23	2.29	3.81	3.59	285
GBP	0.13	0.26	-0.13	0.30	4.56	4.55	-0.42	-13.89	-20.22	0.83	21.04	14.03	0.62	0.64	-0.56	2.85	5.56	5.20	285
JPY	-0.40	0.34	-0.73	0.44	4.96	5.00	-1.48	-15.76	-14.49	0.11	14.33	15.68	-0.92	-0.03	0.06	2.61	3.56	3.44	285
NOK	0.21	0.26	-0.04	0.45	5.91	5.93	-0.52	-16.50	-26.03	1.37	27.06	17.69	0.59	0.60	-0.50	2.83	5.13	4.78	285
NZD	0.52	-0.22	0.75	0.41	6.36	6.37	-0.29	-24.60	-23.00	1.61	24.37	25.27	0.07	0.26	-0.19	2.46	4.21	4.00	285
SEK	-0.06	0.20	-0.26	0.39	5.65	5.68	-0.78	-17.79	-24.39	0.84	25.02	17.84	0.11	0.36	-0.27	2.04	4.51	4.23	285
BRL	2.02	1.36	0.66	0.81	8.42	8.48	0.42	-19.17	-31.82	3.44	34.61	21.84	-0.28	0.83	-0.75	2.06	4.70	4.58	199
CHL	0.75	0.71	0.04	0.71	6.17	6.16	-0.01	-16.80	-26.83	8.06	28.36	17.95	5.12	0.67	-0.55	53.12	5.45	5.11	217
COL	1.06	0.73	0.33	0.46	7.17	7.17	0.26	-17.96	-26.21	2.24	28.12	19.76	0.71	0.46	-0.38	2.85	4.04	3.99	222
ISR	0.13	-0.19	0.32	0.36	3.96	3.95	-0.54	-11.77	-10.69	0.98	11.00	12.33	0.22	0.32	-0.21	2.37	3.46	3.44	223
KOR	0.35	0.25	0.10	0.33	4.81	4.81	-0.19	-20.08	-29.08	1.11	29.92	20.51	0.01	1.13	-1.03	1.81	10.29	9.81	285
MEX	1.16	0.57	0.59	0.32	5.85	5.89	0.50	-14.84	-25.31	1.98	26.92	16.61	-0.02	1.47	-1.36	2.41	7.26	6.84	242
PEN	0.63	0.20	0.43	0.41	2.98	3.03	-0.04	-8.62	-8.09	1.78	8.98	10.08	0.22	0.02	0.09	2.51	3.59	3.77	209
THA	0.13	-0.15	0.29	0.36	3.13	3.18	-0.95	-7.40	-9.85	0.87	9.76	7.80	-0.44	0.41	-0.49	3.82	3.00	3.17	285
TUR	2.64	3.76	-1.12	0.87	9.21	9.16	1.20	-22.63	-44.16	5.18	48.26	27.63	0.85	1.33	-1.13	2.91	6.96	6.58	208
RUS	1.08	2.08	-1.00	1.21	9.50	9.44	-2.07	-29.76	-45.80	3.18	47.94	32.92	-1.49	1.57	-1.33	5.03	7.92	7.67	201
PHL	0.86	0.33	0.54	0.72	3.17	3.27	-0.45	-8.84	-12.87	3.12	13.81	10.41	1.01	0.45	-0.31	3.69	4.18	3.94	285
POL	0.75	0.14	0.61	0.83	6.66	6.68	-0.31	-15.40	-28.90	3.16	30.00	16.63	1.19	0.88	-0.76	4.25	5.53	5.29	285
SAF	1.44	1.13	0.31	0.57	8.07	8.20	0.32	-24.24	-26.56	2.97	28.75	26.55	0.67	0.21	-0.10	3.34	4.14	4.04	285
IDR	1.26	0.76	0.50	0.62	4.65	4.74	-0.21	-15.32	-27.96	3.89	30.04	17.99	0.20	1.22	-0.90	3.90	11.05	9.88	245

The table reports country-specific summary statistics for UIP premia and its components for EMs and AEs at 3-month maturity with zero coupon bonds.

Table 27A: 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	1.70	-0.62	2.32	1.62	12.40	12.67	-1.53	-33.74	-32.69	4.93	37.62	35.79	0.07	0.01	0.14	1.91	3.35	3.05	276
CAD	0.31	-0.42	0.74	0.65	8.22	8.17	-0.85	-21.61	-24.90	2.24	25.62	21.67	0.26	0.25	-0.16	2.63	3.50	3.44	276
CHF	-1.14	-2.75	1.61	1.24	7.89	7.97	-3.98	-30.18	-21.43	1.72	21.76	30.34	-0.23	-0.41	0.60	2.04	3.88	4.03	276
DKK	-0.33	-0.70	0.37	1.39	9.63	9.79	-3.29	-23.37	-25.08	3.20	24.99	25.17	-0.06	0.16	0.04	2.40	2.58	2.64	276
EUR	-0.52	-0.70	0.18	1.27	9.62	9.74	-3.31	-23.22	-24.92	2.24	24.93	24.78	-0.18	0.16	0.03	2.35	2.59	2.62	276
GBP	0.37	0.84	-0.47	1.14	9.28	9.32	-1.89	-17.25	-30.46	3.05	32.88	19.25	0.45	0.85	-0.64	2.84	4.04	3.54	276
JPY	-1.66	1.16	-2.82	1.63	9.98	10.06	-5.97	-20.94	-26.91	0.01	26.62	19.07	-0.88	0.32	-0.23	2.73	2.59	2.40	276
NOK	0.80	0.79	0.01	1.64	11.58	11.86	-1.90	-27.70	-28.45	5.07	30.07	31.57	0.53	0.25	-0.04	2.73	2.93	2.84	276
NZD	2.00	-1.34	3.33	1.54	12.75	12.97	-0.99	-33.23	-41.08	5.61	46.69	35.60	-0.24	0.38	-0.14	2.20	3.90	3.32	276
SEK	-0.29	0.62	-0.91	1.50	12.03	12.24	-3.16	-23.57	-35.69	2.56	37.96	25.45	0.04	0.34	-0.17	2.04	2.67	2.48	276
BRL	8.31	6.21	2.10	3.14	16.78	17.47	2.23	-28.27	-37.66	14.12	48.20	40.06	-0.32	0.23	-0.07	2.03	2.56	2.48	190
CHL	2.71	2.67	0.04	1.89	11.04	11.05	0.03	-28.60	-28.46	6.53	30.51	34.67	0.22	0.06	-0.02	1.65	2.74	2.95	208
COL	4.21	3.52	0.69	1.62	13.52	13.73	1.20	-28.29	-41.70	8.77	46.33	35.19	0.67	0.38	-0.22	3.39	3.44	3.31	213
ISR	0.42	-1.16	1.58	1.46	8.04	7.96	-2.35	-23.79	-16.77	3.73	18.98	23.10	0.10	0.23	-0.16	2.27	2.82	2.62	214
KOR	1.54	0.97	0.57	1.32	10.33	10.54	-0.84	-27.98	-45.96	3.95	49.10	29.91	-0.07	1.20	-0.99	1.66	6.35	5.58	276
MEX	4.51	2.32	2.18	1.20	10.44	10.80	1.19	-19.59	-29.86	7.28	35.34	25.45	-0.40	0.62	-0.51	2.86	3.01	2.80	233
PEN	2.49	0.88	1.61	1.55	6.35	6.72	-0.27	-14.59	-13.81	6.85	14.40	19.10	0.16	0.26	-0.16	2.43	2.45	2.42	200
THA	0.50	-0.92	1.42	1.40	6.06	6.18	-3.46	-14.61	-20.93	3.44	18.06	14.79	-0.20	0.39	-0.62	3.29	3.00	3.77	276
TUR	10.57	14.81	-4.23	3.20	18.69	18.65	4.96	-22.74	-62.40	20.23	78.27	37.04	0.73	0.96	-0.54	2.76	4.65	4.02	199
RUS	6.06	8.87	-2.81	2.41	17.28	17.40	0.59	-25.31	-62.12	13.59	68.11	34.16	0.32	0.94	-0.82	3.40	3.59	3.50	192
PHL	4.03	0.95	3.07	2.90	6.93	7.49	-0.50	-18.71	-17.24	12.17	21.94	20.33	0.79	0.13	-0.04	2.88	3.40	2.53	276
POL	2.86	0.40	2.46	3.10	12.68	13.13	-1.39	-29.69	-41.70	11.38	45.91	33.03	1.06	0.56	-0.48	3.91	4.28	3.53	276
SAF	5.87	4.24	1.62	1.84	16.32	17.21	2.28	-41.92	-39.52	12.06	45.63	53.93	0.80	-0.50	0.67	4.30	3.08	3.23	276
IDR	5.35	2.98	2.37	2.08	8.57	9.32	0.67	-26.73	-22.89	14.57	27.98	39.04	0.52	-0.18	0.68	4.20	4.29	5.04	236

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

Table 28A: 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	3.28	-2.01	5.29	2.97	16.78	17.34	-2.04	-46.63	-26.31	9.98	31.46	50.54	0.11	-0.42	0.46	1.99	2.60	2.50	264
CAD	0.52	-1.23	1.75	1.32	11.49	11.59	-1.90	-27.63	-24.97	4.64	26.45	30.35	0.27	0.01	0.15	2.57	2.59	2.58	264
CHF	-2.64	-5.49	2.85	2.08	10.04	10.05	-7.29	-32.59	-16.81	0.78	16.48	30.61	-0.45	-0.52	0.74	1.99	2.75	2.92	264
DKK	-0.75	-1.49	0.74	2.58	12.80	13.20	-6.84	-37.07	-25.45	4.83	25.20	39.35	-0.17	-0.38	0.60	2.48	2.99	3.26	264
EUR	-1.14	-1.48	0.34	2.37	12.80	13.06	-6.84	-37.29	-25.53	3.76	25.26	38.71	-0.30	-0.38	0.59	2.47	3.01	3.25	264
GBP	0.61	1.59	-0.97	2.15	12.38	12.61	-4.14	-27.63	-30.28	5.66	31.76	30.69	0.26	0.37	-0.09	2.76	2.73	2.64	264
JPY	-3.54	1.53	-5.07	3.07	15.53	14.93	-12.46	-29.44	-37.49	-0.11	36.35	22.34	-0.91	0.28	-0.20	3.00	2.16	2.02	264
NOK	1.40	1.11	0.29	2.82	15.66	16.25	-3.35	-33.68	-35.30	8.82	37.61	39.18	0.40	0.26	-0.06	2.59	2.52	2.46	264
NZD	3.94	-3.28	7.22	2.83	16.67	17.36	-2.04	-48.83	-29.64	10.95	33.69	53.86	-0.36	-0.52	0.56	2.28	2.80	2.74	264
SEK	-0.54	0.53	-1.07	2.83	15.99	16.49	-6.51	-37.70	-28.04	4.99	29.03	40.38	-0.09	-0.21	0.38	2.08	2.38	2.54	264
BRL	17.32	13.28	4.04	5.89	20.93	22.72	6.28	-36.05	-37.33	28.66	57.69	56.69	-0.30	-0.22	0.33	1.95	2.42	2.49	178
CHL	5.35	5.84	-0.49	3.36	13.28	13.67	0.39	-31.57	-32.61	12.55	34.63	41.98	0.24	-0.27	0.39	1.73	3.01	3.29	196
COL	8.82	7.30	1.52	3.03	18.26	19.26	2.69	-35.52	-41.42	17.96	49.79	43.47	0.71	0.26	-0.20	3.91	2.92	2.67	201
ISR	1.01	-2.76	3.77	2.86	9.58	9.61	-4.45	-33.45	-24.90	6.84	24.51	35.14	0.05	-0.20	0.30	2.13	3.35	3.78	202
KOR	3.21	1.08	2.12	2.56	13.57	14.55	-1.84	-30.69	-48.30	8.57	48.82	35.49	-0.06	0.68	-0.60	1.71	3.46	3.41	264
MEX	8.81	5.65	3.16	2.09	13.33	14.42	2.20	-23.16	-32.66	14.03	39.00	35.21	-0.49	0.38	-0.41	2.92	2.62	2.70	221
PEN	5.06	2.49	2.56	2.98	9.11	10.11	-0.30	-15.83	-19.06	14.21	22.99	26.53	0.20	0.30	-0.11	2.48	2.15	2.18	188
THA	1.04	-2.36	3.39	2.70	8.05	7.95	-5.81	-21.22	-20.17	6.71	15.99	21.71	-0.06	-0.08	-0.05	2.95	2.35	2.92	264
TUR	20.58	26.87	-6.29	6.22	23.46	25.55	10.03	-25.78	-73.89	42.02	94.39	53.87	1.00	0.54	-0.30	3.47	3.83	3.44	187
RUS	12.13	18.88	-6.75	4.73	22.62	24.64	1.66	-29.60	-72.91	27.36	83.95	47.50	0.59	0.70	-0.25	3.96	3.38	3.04	180
PHL	9.24	1.29	7.95	5.81	9.70	12.36	1.05	-25.22	-15.21	26.43	23.36	36.19	0.75	-0.50	0.39	2.53	2.85	2.26	264
POL	5.43	0.88	4.55	5.59	15.94	17.65	-2.38	-40.60	-38.67	21.69	46.57	40.46	0.96	-0.06	0.00	3.61	2.71	2.00	264
SAF	11.47	7.34	4.13	2.87	22.66	24.33	4.30	-58.81	-48.67	20.50	59.34	75.22	0.20	-0.73	0.84	3.31	3.45	3.50	264
IDR	11.77	5.69	6.08	3.78	11.61	13.73	5.30	-31.27	-22.44	29.94	30.55	56.81	1.08	-0.14	0.57	5.18	3.70	4.53	224

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

Table 29A: 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	4.75	-3.61	8.36	4.13	19.24	19.81	-3.00	-51.85	-32.80	13.88	39.12	57.32	0.04	-0.13	0.25	2.09	2.72	2.36	252
CAD	0.70	-2.35	3.05	1.99	14.39	14.64	-2.63	-31.07	-31.07	6.41	33.76	35.94	0.26	0.20	0.11	2.26	2.66	2.60	252
CHF	-4.28	-8.24	3.96	2.92	11.27	11.29	-10.66	-37.75	-15.48	1.19	14.58	35.49	-0.32	-0.50	0.78	1.95	2.89	3.09	252
DKK	-1.29	-2.59	1.30	3.71	14.37	15.22	-9.67	-41.97	-27.87	6.05	26.40	44.92	-0.21	-0.58	0.76	2.33	3.18	3.33	252
EUR	-1.91	-2.59	0.68	3.46	14.39	14.98	-10.12	-42.12	-28.01	5.01	26.75	43.80	-0.34	-0.57	0.74	2.40	3.17	3.30	252
GBP	0.81	2.11	-1.29	3.09	13.72	14.53	-6.10	-30.41	-29.19	7.55	30.88	34.24	0.00	0.01	0.30	2.54	2.65	2.52	252
JPY	-5.92	1.03	-6.95	4.25	18.99	17.43	-18.01	-36.17	-46.84	-0.30	46.11	29.63	-0.74	0.35	-0.22	2.81	2.66	2.48	252
NOK	1.75	1.60	0.15	3.80	18.04	19.06	-4.63	-38.80	-42.88	11.80	46.32	45.51	0.35	0.15	0.15	2.45	2.72	2.58	252
NZD	5.80	-5.41	11.20	3.95	18.73	19.86	-2.99	-54.49	-26.42	15.19	30.23	62.16	-0.50	-0.85	0.75	2.37	3.27	2.89	252
SEK	-0.87	0.03	-0.90	4.05	16.48	17.59	-9.26	-45.97	-33.40	6.83	34.67	49.20	-0.18	-0.38	0.60	2.00	3.14	2.97	252
BRL	26.73	21.80	4.93	8.16	23.04	25.75	10.66	-32.91	-46.27	44.81	70.79	67.80	-0.31	-0.13	0.09	2.10	2.30	2.43	166
CHL	8.13	9.16	-1.03	4.64	14.39	14.55	0.67	-31.36	-27.59	17.65	41.21	45.36	0.24	-0.11	0.46	1.75	2.55	2.77	184
COL	13.99	11.87	2.12	4.46	21.44	23.38	4.60	-36.46	-49.56	26.85	61.54	57.98	0.63	0.15	0.02	3.48	2.38	2.25	189
ISR	1.83	-4.25	6.08	4.36	8.29	8.31	-6.00	-31.14	-17.14	10.33	17.14	34.81	-0.01	-0.50	0.51	1.94	3.66	4.25	190
KOR	4.56	0.76	3.80	3.68	14.46	16.52	-2.73	-31.57	-44.87	12.41	45.75	40.16	-0.06	0.15	-0.14	1.67	2.79	2.56	252
MEX	13.25	9.62	3.64	2.78	15.03	16.73	5.69	-29.49	-35.37	20.18	46.37	44.37	-0.37	0.08	-0.15	2.66	3.04	2.69	209
PEN	8.02	4.38	3.64	4.10	11.40	12.72	1.36	-19.37	-26.62	21.78	30.80	34.53	0.32	0.05	0.01	2.78	2.10	2.42	176
THA	1.61	-3.86	5.47	3.83	9.29	8.47	-8.08	-22.35	-17.82	9.69	18.25	21.18	0.09	0.36	-0.35	2.62	2.34	2.65	252
TUR	30.27	40.30	-10.03	9.42	27.80	30.56	15.28	-13.03	-88.78	63.18	118.76	49.34	1.06	0.54	0.04	3.56	3.14	2.42	175
RUS	18.27	26.25	-7.98	7.13	25.10	27.95	2.99	-21.21	-75.77	41.06	92.34	62.27	0.57	0.60	-0.07	3.75	2.63	2.62	168
PHL	14.54	1.13	13.41	8.78	11.61	16.53	2.48	-30.98	-11.07	40.31	28.65	55.55	0.58	-0.40	0.44	2.15	2.83	2.27	252
POL	7.99	0.67	7.32	7.62	17.35	20.85	-2.79	-49.02	-25.50	30.18	32.58	53.13	0.88	-0.50	0.50	3.45	2.54	2.03	252
SAF	17.34	9.45	7.89	3.97	24.47	26.82	6.51	-74.73	-45.23	30.22	60.19	96.24	-0.09	-0.69	0.77	3.69	3.84	3.85	252
IDR	18.26	8.24	10.02	5.39	13.33	16.25	9.46	-30.48	-27.02	44.52	42.38	70.22	1.23	0.36	0.29	5.84	3.40	4.61	212

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

Table 30A: 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	7.49	-3.93	11.43	5.20	25.36	24.63	-3.50	-52.12	-26.54	19.00	38.88	63.75	0.05	-0.05	0.15	2.18	1.69	1.64	228
CAD	0.57	-2.67	3.24	2.95	20.03	20.50	-4.92	-50.22	-30.65	8.75	33.38	57.57	0.26	-0.08	0.43	2.37	2.20	2.50	228
CHF	-7.92	-12.14	4.23	3.95	14.62	14.00	-16.90	-44.94	-24.22	0.31	21.05	32.92	-0.16	0.03	0.05	2.22	2.04	1.76	228
DKK	-2.33	-2.27	-0.06	5.33	18.85	20.29	-15.30	-42.49	-29.09	8.21	26.39	44.34	-0.36	-0.52	0.70	2.45	2.22	2.41	228
EUR	-3.24	-2.31	-0.93	4.96	18.91	19.92	-15.54	-42.65	-29.63	5.97	26.68	43.12	-0.51	-0.53	0.71	2.51	2.23	2.45	228
GBP	0.95	5.51	-4.56	4.11	17.30	17.74	-9.40	-33.16	-31.64	8.90	32.84	36.01	-0.45	-0.67	0.88	2.94	2.29	2.58	228
JPY	-11.57	0.76	-12.33	5.91	21.87	19.37	-28.22	-45.90	-47.47	-1.84	41.92	28.20	-0.48	-0.12	0.17	2.66	2.33	2.19	228
NOK	2.08	4.70	-2.63	5.12	24.65	26.24	-6.75	-43.09	-39.81	15.99	45.15	51.72	0.20	-0.16	0.42	2.33	1.85	2.05	228
NZD	9.44	-6.47	15.91	4.88	23.01	23.47	-4.57	-57.54	-22.54	21.25	31.64	64.19	-0.68	-0.59	0.50	3.20	2.15	2.09	228
SEK	-1.61	2.09	-3.70	5.53	21.67	23.32	-14.18	-44.17	-40.02	9.23	37.79	46.70	-0.41	-0.35	0.50	2.21	2.12	2.36	228
BRL	47.22	42.04	5.18	9.87	21.18	22.37	25.80	-11.98	-38.20	76.85	88.09	73.18	0.12	-0.30	0.66	3.42	2.93	3.16	142
CHL	14.14	15.01	-0.88	5.93	16.32	15.24	4.39	-26.70	-32.91	25.37	41.55	45.49	0.15	-0.49	0.44	1.77	2.10	2.85	160
COL	25.34	21.14	4.20	6.66	28.31	31.17	11.36	-37.40	-38.01	46.27	58.35	68.59	0.69	-0.45	0.43	3.68	1.72	1.69	165
ISR	4.44	-5.92	10.37	6.67	9.95	11.16	-8.27	-29.29	-15.64	15.31	13.04	37.02	-0.28	-0.29	0.08	1.84	2.19	2.68	166
KOR	7.11	0.89	6.22	5.27	16.33	19.82	-4.24	-36.27	-30.21	18.33	29.25	51.11	-0.17	-0.55	0.32	1.70	2.53	2.33	228
MEX	21.67	19.14	2.54	4.26	15.85	18.07	12.04	-15.83	-27.69	34.85	46.87	44.58	0.18	-0.12	0.21	2.86	2.22	2.22	185
PEN	14.86	7.93	6.93	5.53	13.39	13.29	3.52	-19.10	-13.60	32.46	23.87	42.72	0.32	-0.84	0.75	2.97	2.25	2.52	152
THA	2.86	-7.13	9.99	5.35	11.81	10.23	-8.80	-31.14	-11.83	14.33	18.12	38.75	0.18	0.09	0.06	2.34	2.35	2.67	228
TUR	44.65	66.38	-21.73	13.78	38.69	46.54	25.14	1.58	-125.64	98.93	166.19	73.10	1.43	0.47	-0.06	4.76	2.68	2.15	151
RUS	30.17	44.54	-14.38	11.72	25.82	31.23	5.73	-8.26	-70.12	65.43	95.72	73.69	0.45	-0.15	0.69	3.55	1.77	2.64	144
PHL	26.03	0.31	25.72	15.50	13.85	24.83	5.35	-29.87	-16.18	65.63	30.56	74.55	0.42	0.00	0.14	1.87	2.10	1.60	228
POL	12.70	1.07	11.63	9.75	24.50	29.55	-2.34	-63.24	-34.61	40.90	44.66	74.90	0.70	-0.56	0.67	3.10	2.50	2.27	228
SAF	28.45	18.99	9.46	6.09	26.93	29.18	11.06	-53.49	-57.98	46.74	84.73	89.55	-0.55	-0.18	0.54	3.51	3.25	3.36	228
IDR	30.91	15.00	15.91	8.93	15.52	20.17	15.21	-14.52	-21.64	66.36	49.77	70.12	1.04	0.45	0.05	4.59	2.11	2.69	188

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

Table 31A: 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	10.25	-4.34	14.60	5.30	29.59	27.78	-0.70	-63.52	-39.34	22.65	53.03	69.68	0.11	-0.10	0.14	2.19	1.84	1.83	204
CAD	0.65	-1.75	2.40	3.91	23.67	25.17	-6.96	-47.97	-30.62	11.56	32.53	50.76	0.44	-0.25	0.49	2.86	1.70	1.81	204
CHF	-10.95	-16.43	5.49	4.14	17.38	16.50	-21.98	-56.26	-30.85	0.30	23.17	44.97	0.07	-0.09	0.17	2.37	2.02	2.07	204
DKK	-2.35	-1.64	-0.71	5.67	22.93	23.93	-15.32	-61.58	-32.18	9.37	38.81	61.17	-0.11	-0.81	1.06	2.15	2.88	2.91	204
EUR	-3.46	-1.66	-1.80	5.34	22.97	23.77	-17.14	-61.83	-35.01	6.66	38.61	59.71	-0.35	-0.81	1.02	2.28	2.87	2.88	204
GBP	1.54	10.07	-8.53	3.91	15.90	15.67	-9.60	-36.67	-32.38	10.32	30.33	34.58	0.11	-1.51	1.25	2.67	4.55	3.78	204
JPY	-17.10	0.61	-17.71	7.01	22.96	19.39	-36.72	-40.40	-50.41	-4.05	38.90	18.49	-0.32	-0.11	0.19	2.71	1.72	1.81	204
NOK	2.84	8.16	-5.33	5.75	30.16	31.39	-7.04	-60.71	-53.83	19.00	57.61	70.52	0.32	-0.45	0.65	2.63	2.10	2.27	204
NZD	13.10	-7.63	20.73	4.63	23.56	22.72	3.60	-67.46	-20.85	24.23	34.04	75.01	-0.27	-0.54	0.36	2.34	2.65	2.44	204
SEK	-1.55	4.09	-5.65	5.65	24.73	25.79	-14.59	-59.01	-39.89	11.29	41.69	59.81	-0.21	-0.47	0.57	2.14	2.32	2.28	204
BRL	67.25	60.35	6.90	11.48	21.41	24.61	35.26	9.28	-43.82	104.65	100.84	74.05	0.65	-0.40	0.65	5.27	2.44	3.09	118
CHL	19.69	22.72	-3.04	6.70	15.25	11.53	5.40	-12.30	-29.53	32.39	59.24	26.06	-0.08	-0.38	0.25	2.07	3.10	2.94	136
COL	37.23	32.72	4.51	8.42	30.20	32.24	17.86	-29.16	-55.92	63.49	80.09	86.28	0.84	-0.80	0.48	3.84	2.46	2.41	141
ISR	8.99	-7.23	16.21	7.22	9.06	9.33	-4.58	-24.61	-6.29	20.43	17.87	36.01	-0.39	0.10	0.05	1.93	2.57	2.31	142
KOR	9.74	2.40	7.34	5.99	12.19	16.48	-1.75	-30.19	-26.21	23.89	25.78	47.67	-0.17	-0.66	0.20	1.84	3.02	2.45	204
MEX	29.21	27.65	1.55	5.47	16.80	18.82	18.09	-19.99	-46.81	46.24	68.93	53.85	0.62	-0.34	0.31	3.45	2.80	2.75	161
PEN	21.93	13.29	8.64	7.38	13.05	12.30	4.92	-18.67	-18.58	41.84	37.34	35.19	0.11	-0.77	0.13	2.90	3.10	2.30	128
THA	4.78	-9.92	14.71	5.70	13.18	11.18	-9.79	-36.76	-4.71	18.88	11.25	41.24	0.13	-0.28	0.39	2.85	1.64	2.17	204
TUR	60.80	91.95	-31.15	21.49	44.93	58.90	33.88	17.89	-140.11	134.90	186.68	71.44	1.15	0.28	-0.02	3.55	2.27	1.81	127
RUS	43.86	66.47	-22.61	20.50	18.18	27.98	8.71	10.70	-83.72	105.30	104.48	74.91	0.79	-0.68	0.56	3.67	3.00	3.52	120
PHL	36.38	0.02	36.36	22.31	16.39	34.75	7.50	-29.54	-10.71	94.99	23.72	106.04	0.45	-0.30	0.30	1.87	1.73	1.57	204
POL	17.35	2.97	14.38	11.74	28.10	36.03	-0.37	-72.88	-43.77	51.16	60.62	121.34	0.87	-0.71	1.19	3.50	2.78	3.60	204
SAF	39.21	29.49	9.72	8.97	25.78	30.74	15.83	-33.90	-38.81	59.10	74.24	93.00	-0.42	-0.44	0.66	2.99	2.29	2.33	204
IDR	44.68	21.87	22.82	12.03	16.49	25.02	25.88	-9.35	-23.47	91.39	54.45	82.71	1.09	0.01	0.17	4.51	1.97	2.20	164

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

Table 32A: 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	13.21	-4.38	17.59	5.56	37.00	33.81	0.87	-76.80	-35.79	24.97	48.34	86.29	0.07	-0.54	0.58	2.43	2.03	2.16	168
CAD	0.75	0.59	0.15	4.04	27.79	30.56	-6.49	-48.50	-35.36	12.77	34.06	60.59	0.70	-0.63	0.67	3.46	1.74	1.79	168
CHF	-15.98	-23.24	7.26	4.45	21.03	19.79	-28.32	-78.75	-29.66	-1.48	14.26	60.54	0.18	-0.57	0.70	3.04	2.55	2.71	168
DKK	-1.93	2.03	-3.96	4.95	23.69	25.16	-12.09	-53.27	-33.76	11.53	31.28	52.58	0.03	-0.90	0.84	2.53	2.41	2.23	168
EUR	-3.53	2.00	-5.53	4.14	23.75	24.42	-11.48	-53.54	-34.26	6.96	30.89	50.03	-0.07	-0.89	0.86	2.44	2.39	2.29	168
GBP	1.34	16.08	-14.74	4.32	15.86	14.80	-11.61	-15.42	-46.38	10.19	46.21	11.00	-0.75	-0.02	-0.15	3.54	2.34	2.25	168
JPY	-25.85	2.31	-28.16	8.90	27.67	20.57	-48.08	-56.86	-72.00	-7.12	62.29	20.79	0.19	-0.12	0.39	2.62	2.36	2.69	168
NOK	3.27	15.29	-12.02	6.31	35.29	38.28	-11.65	-55.44	-63.36	20.78	64.26	65.86	0.21	-0.58	0.68	3.02	1.91	1.96	168
NZD	16.89	-10.64	27.53	4.97	29.52	27.98	5.69	-75.40	-21.82	27.62	39.36	90.36	-0.19	-0.53	0.54	2.49	2.16	2.29	168
SEK	-2.19	7.84	-10.02	5.11	29.62	31.75	-12.69	-55.91	-58.25	11.42	54.49	55.62	0.04	-0.52	0.62	2.61	2.11	2.08	168
BRL	87.58	86.17	1.41	13.11	23.75	26.40	49.21	41.61	-36.57	140.20	123.92	85.68	0.60	-0.13	0.85	7.93	1.92	3.78	82
CHL	25.77	36.02	-10.25	8.42	15.49	12.41	7.04	1.65	-34.62	40.61	71.29	30.20	-0.41	0.01	0.87	2.08	2.15	4.22	100
COL	50.98	53.36	-2.38	12.26	24.71	31.82	25.69	1.45	-68.07	86.23	100.99	78.68	0.75	0.08	0.09	3.51	1.94	2.47	105
ISR	17.45	-8.96	26.41	5.98	7.49	10.12	0.32	-21.64	-2.35	29.25	13.69	47.05	-0.19	0.80	-0.36	2.93	3.18	3.20	106
KOR	13.69	3.41	12.39	7.59	13.95	17.02	-4.79	-31.08	-22.16	30.71	30.56	55.46	-0.24	0.06	-0.10	2.40	2.18	2.48	154
MEX	41.73	41.93	-0.21	8.49	14.17	19.99	26.06	11.58	-38.44	63.65	67.48	48.78	0.62	-0.43	0.58	2.85	2.38	2.59	125
PEN	28.46	20.14	8.32	8.98	13.45	13.47	8.56	0.78	-18.87	53.22	42.89	44.55	0.31	0.17	0.60	3.30	1.62	3.60	92
THA	5.93	-12.07	20.65	6.33	14.92	14.49	-15.04	-42.91	-7.81	20.28	11.07	56.50	-0.45	-0.42	0.36	3.71	1.97	2.42	146
TUR	92.21	131.71	-39.50	32.22	46.02	66.90	48.49	59.51	-173.10	185.10	234.02	74.93	0.68	0.44	-0.29	2.45	2.48	1.85	91
RUS	48.45	94.96	-37.58	28.20	17.99	34.83	11.81	60.40	-73.24	121.72	128.35	51.25	0.96	0.34	1.18	3.19	2.07	3.22	62
PHL	55.64	-0.06	55.69	31.84	18.17	47.46	4.98	-29.30	-19.58	134.64	34.48	152.21	0.36	0.02	0.16	2.03	1.67	1.65	168
POL	23.23	9.66	16.43	13.22	28.23	35.61	1.02	-49.04	-39.29	56.74	57.57	105.78	0.47	-0.46	0.64	2.80	1.79	2.39	154
SAF	52.26	46.21	6.05	12.94	34.89	44.32	22.78	-41.48	-68.29	83.04	96.44	114.71	0.01	-0.98	0.83	2.98	2.76	2.58	168
IDR	62.58	37.65	24.93	19.13	8.85	25.62	32.54	14.59	-12.30	125.52	58.35	108.11	0.74	-0.36	0.55	3.40	2.79	3.03	128

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