

PREEMPTIVE POLICIES AND RISK-OFF SHOCKS IN EMERGING MARKETS

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BIG PICTURE

- ① There is an **extensive literature** on the effectiveness (or lack of) capital flow management (CFM), macroprudential (MPM) and FXI policies on:
 - Capital Flows
 - Exchange Rate Fluctuations
 - GDP Growth
- ② **Not much empirical work on:**
 - **Effects of “Preemptive” (before the shock) use of CFMs and CFM/MPMs on outcomes**
⇒ Optimal policy in recent theoretical literature: (Korinek (2011); Bianchi and Mendoza (2018); Bianchi et al. (2016); Farhi and Werning (2016); Basu et al. (2020))

TWO KEY ISSUES WITH THE EXISTING EMPIRICAL LITERATURE

- **Endogeneity:** Policies used as a response to shock to manage capital flows and exchange rate
- **Data on policies—too coarse:** Mostly annual, mix capital inflow-outflow (domestics vs. foreigners), limited granularity (macro prudential/capital control vs. currency reserve requirement, limits on foreign currency lending, bans..)

OUR CONTRIBUTION

- We use a brand new data based on IMF taxonomy—Binici, Das, Pugacheva, 2020
- We mimic the identification in micro policy evaluation literature (minimum wage)—DD with previously assigned status
- We run a month-country panel DD with country and country \times year fixed effects conditional on policies used during the shock (monetary policy, FXI, easing/tightening of MPM/CFM)
- We show that “preemptive” inflow CFMs, CFM/MPMs can reduce EMDE external finance (UIP) premia and reduce exchange rate volatility during risk-off shocks.

DATA

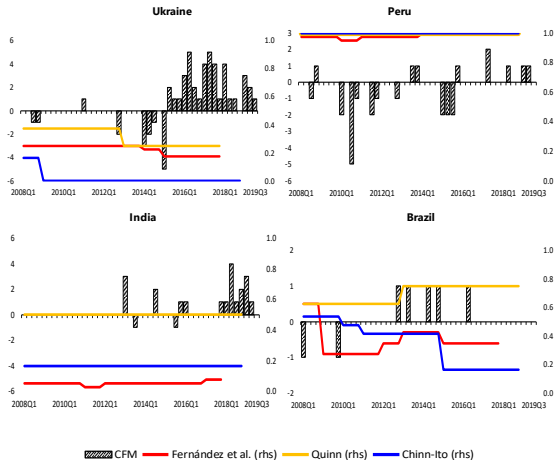
Risk-off shocks: Taper Tantrum (May-Dec 2013) and COVID-19 (Feb-June 2020)

Unbalanced panel of 48 EMDE during 1996m1–2020m4; drop hard pegs based on time-varying classification of Ilzhetzki, Reinhart and Rogoff (2020).

- MPM: iMAPP (Alam et al 2019), IMF Covid Policy Tracker
- CFM: IMF Taxonomy, Binici, Das and Pugacheva (2020), IMF Covid Policy Tracker, Pasricha et al (2018)
- FXI: Authors' compilation (central bank websites), IFS (FX Reserves)
- Monetary Policy: IFS, Bloomberg, Haver

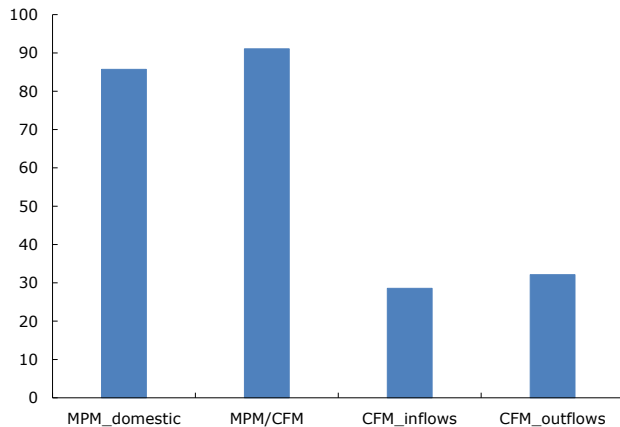
Figure 1. Capital Flow Management Measures in EMs, 2008-2019

Capital Account: Overall Convertibility vs. High-Frequency CFMs



Sources: Binici, Das, and Pugacheva (2020), Fernández, Klein, Rebucci, Schindler and Uribe (2016); Chinn and Ito (2006); Quinn (1997).
 Notes: Positive values indicate more openness. Red lines are the overall restrictions index from Fernández et al (2016), inverted. Blue lines are the normalized capital account openness index from Chinn and Ito (2006). Yellow lines are the lack of financial restrictions on capital account transactions index from Quinn (1997), divided by 100. Data from all sources reflects the most recent data updates.

MPMs, CFM/MPMs AND CFMs USAGE IN EMERGING MARKETS, 1996-2020



EXTERNAL FINANCE PREMIA: UIP PREMIA

(KALEMLI-OZCAN-VARELA, 2019)

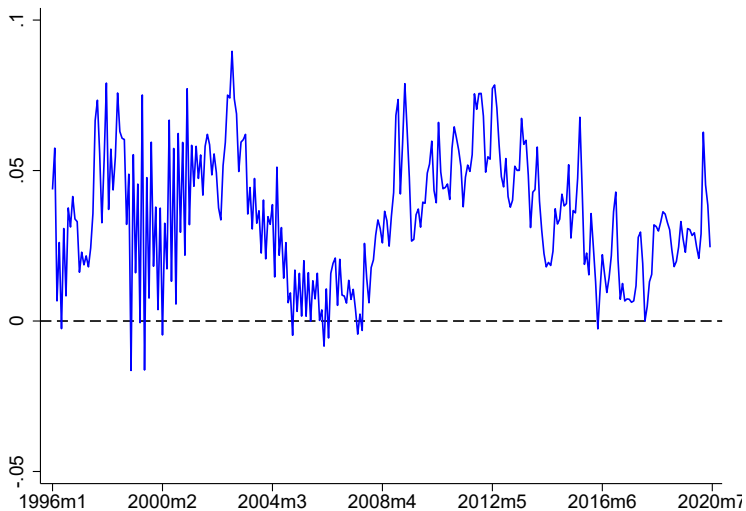
Define the UIP premium (in logs) for ‘domestic’ economy where ‘foreign’ is always the U.S.

$$\underbrace{\lambda_{t+h}^e}_{\text{UIP Premium}} = \underbrace{(i_t - i_t^{US})}_{\text{IR Differential}} + \underbrace{(s_t - s_{t+h}^e)}_{\text{ER Adjustment}} \quad (\text{where } s \text{ in LC/\$}) \quad (1)$$

i = deposit rates, money market rates (h: 12 month horizon)

s_{t+h}^e = Expected exchange rate from Consensus Forecast—more countries available to IMF than academics (e.g. Kalemli-Ozcan and Varela use only 22 EM)

UIP PREMIA IN EM, 1996-2020



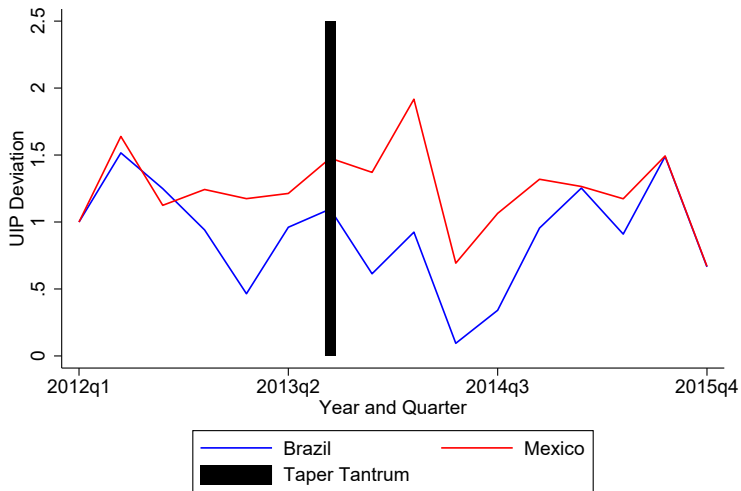
IDENTIFICATION

Build on policy evaluation micro literature (e.g. Katz and Murphy (1992) and Card et al. (1994))

- We calculate UIP premium, λ for every country, every month
- Run a DD regression of λ to see the effect of preemptive policy during the shock by comparing behavior of external finance premia before and after the shock
- We define “preemptive” policy as policy in place 5-year prior to the shock
 - If there is “at least” one preemptive tightening measure
 - An aggregate measure: Tightening “net of” easing overall

$$\lambda_{c,m} = \alpha_c + \omega_m + \alpha \times \omega_y + \beta \text{Preemptive Policy}_c \times \text{Risk-Off Shock}_m + \epsilon_{c,m} \quad (2)$$

VISUALIZATION OF IDENTIFICATION



Source: Authors' Calculations

Table 1. Preemptive MPM and CFM Policies: Taper Tantrum

Dependent Variable:	UIP _{c,t}						
	Emerging Market Economies, 1996m1-2020m6						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Preemptive MPM _c ^{domestic} × TT _t	0.015*** (0.004)					0.024*** (0.004)	0.013*** (0.004)
Preemptive CFM/MPM _c × TT _t		-0.025*** (0.003)				-0.027*** (0.003)	-0.003 (0.004)
Preemptive CFM _c ^{total} × TT _t			0.006** (0.003)				
Preemptive CFM _c ^{inflows} × TT _t				-0.013*** (0.004)		-0.055*** (0.006)	-0.019** (0.010)
Preemptive CFM _c ^{outflows} × TT _t					0.006** (0.003)	0.043*** (0.004)	0.016** (0.006)
Observations	6299	6299	6299	6299	6299	6299	6299
Adjusted R ²	0.335	0.337	0.335	0.335	0.335	0.340	0.729
No. Countries	48	48	48	48	48	48	48
Country FE	yes	yes	yes	yes	yes	yes	yes
Month FE	yes	yes	yes	yes	yes	yes	yes
Country×Year	no	no	no	no	no	no	yes

THREATS TO IDENTIFICATION

- ① **No Parallel trends:** UIP in treatment and control countries were on a different trend before the risk-off shock and hence differences after the shock cannot be attributed to the use of preemptive policies
- ② **Omitted Variable Bias:** Policies used as a response to the risk-off shock are omitted variables that might be positively or negatively correlated with preemptive policies and have an effect on the UIP premium

Figure 2. Trends in UIP in Treatment vs. Control Countries—Parallel Trends
Pre-Avg UIP Treatment: 5.2%; Pre-Avg UIP control: 4.8%

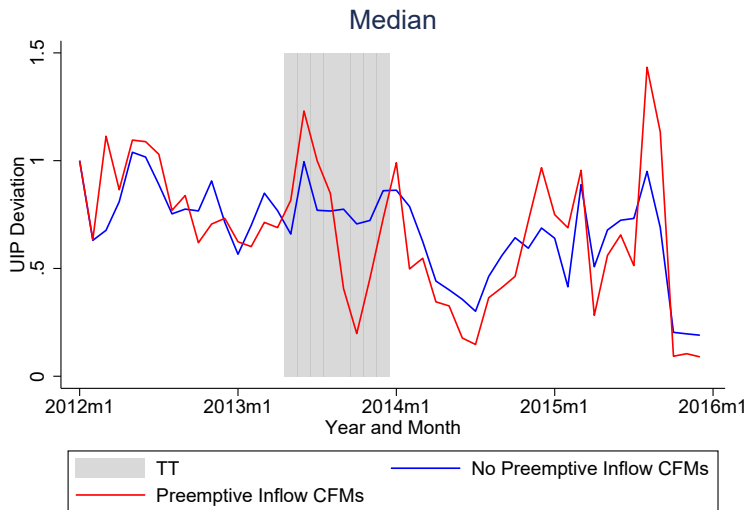


Figure 3. Policy Responses During Risk-Off Shocks

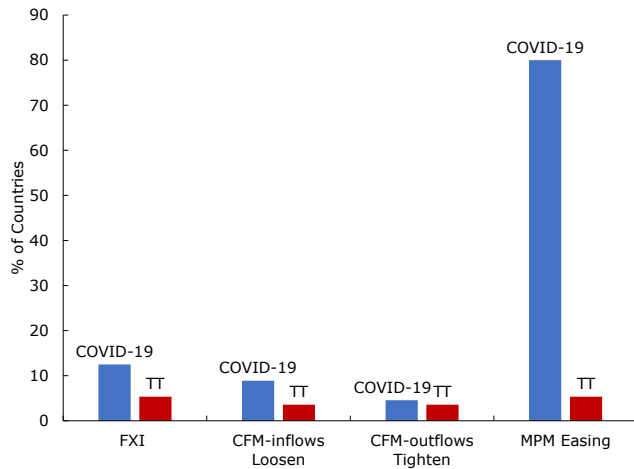


Figure 4. Monetary Policy Responses During Risk-Off Shocks

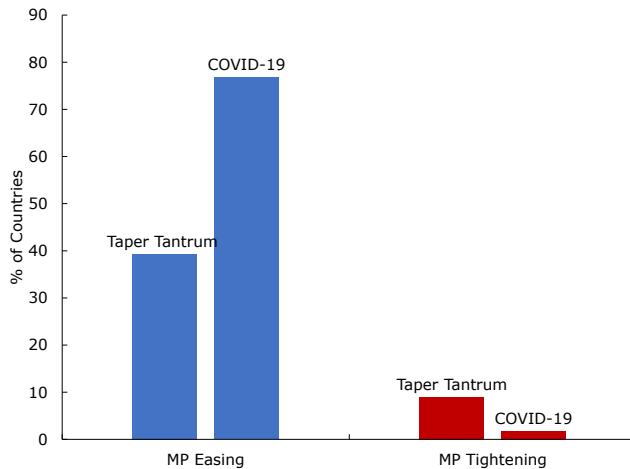


Table 2. Omitted Variables: Policies During the Shock

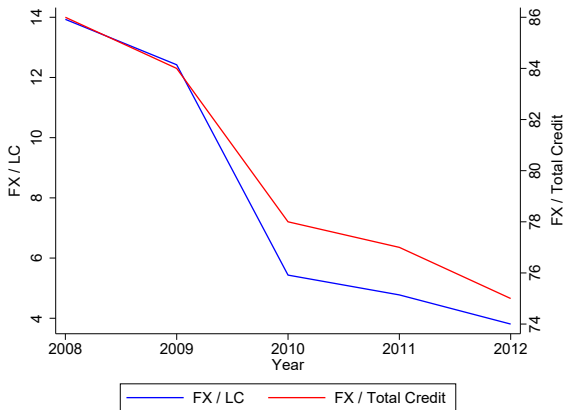
Dependent Variable:	UIP _{c,t}				
	Emerging Market Economies, 1996m1-2020m6				
	(1)	(2)	(3)	(4)	(5)
Preemptive MPM _c ^{domestic} × TT _t	0.018*** (0.003)	0.023*** (0.005)		0.022*** (0.004)	0.016*** (0.004)
Preemptive CFM/MPM _c × TT _t	-0.027*** (0.003)	-0.029*** (0.003)	-0.116*** (0.007)	-0.018*** (0.003)	-0.023*** (0.003)
Preemptive CFM _c ^{inflows} × TT _t	-0.040*** (0.006)	-0.054*** (0.006)	0.002 (0.010)	-0.056*** (0.006)	-0.046*** (0.006)
Preemptive CFM _c ^{outflows} × TT _t	0.035*** (0.004)	0.040*** (0.004)		0.053*** (0.004)	0.042*** (0.005)
Monetary Policy Interest Rate _c × TT _t	0.503*** (0.056)				0.256*** (0.065)
Tightening Outflow CFMs/Easing Inflow CFMs _c × TT _t		0.008* (0.005)			0.014*** (0.004)
Actual FXI _c × TT _t			-1.678* (0.927)		
Change in FX Reserves _c × TT _t				-0.001*** (0.000)	-0.001*** (0.000)
Observations	5729	6299	1068	6088	5551
Adjusted R ²	0.332	0.340	0.323	0.345	0.338
No. Countries	44	48	8	48	44
Country FE	yes	yes	yes	yes	yes
Month FE	yes	yes	yes	yes	yes

OTHER ROBUSTNESS/RESULTS

- Shorter-Longer “preemptive” windows
- Granularity in MPM/CFM
- Placebo Shocks
- Exchange Rate Volatility

POSSIBLE MECHANISM: FX AND LC PORTFOLIO DEBT FLOWS IN TREATMENT COUNTRIES

An implication of the theoretical work on the optimality of preemptive policies is the decrease in share of FX debt due to these policies.

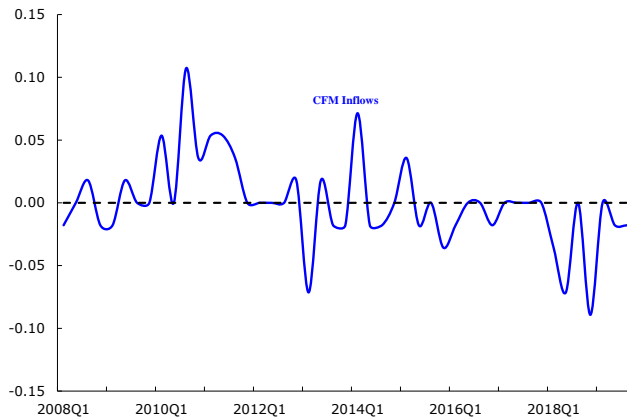


CONCLUSION

- By using high frequency, counter-cyclical CFM measures and DD identification, we show that preemptive use of CFMs and CFM/MPMs on inflows can reduce external finance premia and exchange rate volatility during risk-off shocks
- Preemptive use of CFMs on outflows have the opposite effect.
- Consistent with theory: preemptive CFMs prevent build up of FX debt, making the economy less vulnerable to a risk-off shock and ER movements are smaller \Rightarrow UIP premia move less.
- By reducing the impact of risk-off shocks on countries' funding costs and exchange rate volatility, preemptive policies enable countries' continued access to international capital markets during the troubled times.
- **Important policy implication**: Turbulent times are not only times when countries need the international capital market access the most, but also the times when policies used in response to the shock may not be effective due to rising risk premia.

EXTRA Slides

Figure 5. Capital Flow Management Measures in EMs, 2008-2019



OMITTED VARIABLE BIAS FROM CONTEMPORANEOUS CFM

True Model $\Rightarrow \text{UIP} = \beta_0 + \beta_1 \text{ Pre} + \beta_2 \text{ Contemp} + \epsilon$

Estimate $\Rightarrow \text{UIP} = \tilde{\beta}_0 + \tilde{\beta}_1 \text{ Pre} + \phi$

Omitted $\Rightarrow \text{Contemp} = a + \delta \text{ Pre}$

If $\hat{\beta}_1$ and $\hat{\beta}_2$ are unbiased $\Rightarrow E(\tilde{\beta}_1) = E(\hat{\beta}_1 + \hat{\beta}_2 \tilde{\delta}) = \beta_1 + \beta_2 \tilde{\delta}$

Bias in $\tilde{\beta}_1 = E(\tilde{\beta}_1) - \beta_1 = \beta_2 \tilde{\delta}$

$\beta_2 > 0, \tilde{\delta} > 0 \Rightarrow \text{Positive Bias}$

\Rightarrow Larger (-) effect of preemptive CFM when we control for contemporaneous CFM

BIAS FROM INCLUDING ENDOGENOUS POLICIES—SHOCK RESPONSE (ACEMOGLU ET AL 2001):

True Model \Rightarrow $UIP = \beta_0 + \beta_1 \text{ Pre} + \beta_2 \text{ Contemp} + \epsilon$

Estimate \Rightarrow $UIP = \hat{\beta}_0 + \hat{\beta}_1 \text{ Pre} + \hat{\beta}_2 \text{ Contemp} + \epsilon$; $\hat{\beta}_1 < 0, \hat{\beta}_2 > 0$

Contemp is a response to high UIP \Rightarrow $\text{Contemp} = a_0 + a_1 UIP + \mu$; $a_1 > 0$

And, as above, $\text{Contemp} = a + \delta \text{ Pre}$

$$plim \hat{\beta}_1 = \beta_1 - \delta cov(contemp, \epsilon) / var(Pre)$$

$$plim \hat{\beta}_1 = \beta_1 - \underbrace{\left[\underbrace{cov(\epsilon, \mu)}_{+/-} + \underbrace{a_1 var(\epsilon)}_{+} \right] \times \underbrace{\delta}_{+}}_{-; if (cov(\epsilon, \mu) < 0)} / (+ \text{ with } a_1 \beta_2 < 1)$$

Table 3. CFM/MPM Policies: Preemptive and Contemporaneous

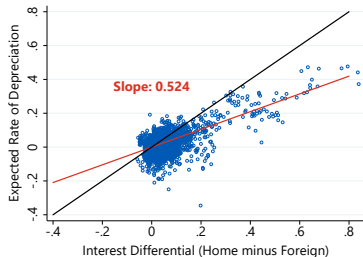
Country	TT Treatment	TT Threats	Covid Treatment	Covid Threats
	(net preemptive tightening 2008:1-2013:4)	(contemporaneous shock CFM/MPM 2013:5-2013:12)	(net preemptive tightening 2014:1- 2016:12)	(contemporaneous shock CFM/MPM 2020:2-2020:6)
Argentina	X		X	
Bolivia			X	
Brazil	X	X		
China, P.R.	X	X	X	X
Country Z	X			
Country Z	X			
Country Z	X			
Country Z	X	X		
Georgia	X			
India		X	X	X
Indonesia	X		X	
Kazakhstan	X		X	
Malaysia	X	X		
Mexico		X		
Peru	X	X	X	X
Russia		X		
Sri Lanka			X	X
Turkey				X
Ukraine	X			

Table 4. Granular Preemptive Measures of CFMs

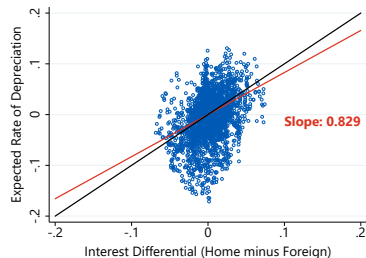
Dependent Variable:	UIP _{c,t}										
	Emerging Market Economies, 1996m1-2020m6										
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
MPM _c ^{domestic} × TT _t	0.024*** (0.003)	0.024*** (0.003)	0.032*** (0.003)	0.032*** (0.004)	0.032*** (0.004)	0.024*** (0.003)	0.034*** (0.004)	0.024*** (0.003)	0.032*** (0.004)	0.035*** (0.004)	0.024*** (0.003)
MPM/CFM _c × TT _t	-0.023*** (0.003)	-0.023*** (0.003)	-0.036*** (0.003)	-0.036*** (0.003)	-0.036*** (0.003)	-0.023*** (0.003)	-0.036*** (0.003)	-0.023*** (0.003)	-0.037*** (0.003)	-0.041*** (0.003)	-0.023*** (0.003)
Approval Requirement _c ^{outflows} × TT _t	0.094*** (0.006)										
Bans _c ^{outflows} × TT _t		0.094*** (0.006)									
Holding Period _c ^{inflows} × TT _t			-0.008 (0.009)								
Limit _c ^{inflows} × TT _t				0.001 (0.003)							
Limit _c ^{outflows} × TT _t					0.004 (0.003)						
Limit + Approval Requirement _c ^{outflows} × TT _t						0.094*** (0.006)					
Reserve Requirement _c ^{inflows} × TT _t							-0.008*** (0.002)				
Surrender + Repatriation Requirement _c ^{outflows} × TT _t								0.094*** (0.006)			
Tax _c ^{inflows} × TT _t									0.006 (0.006)		
Other _c ^{inflows} × TT _t										-0.035*** (0.008)	
Other _c ^{outflows} × TT _t											0.094*** (0.006)
Observations	6299	6299	6299	6299	6299	6299	6299	6299	6299	6299	6299
Adjusted R ²	0.343	0.343	0.340	0.339	0.340	0.343	0.340	0.343	0.340	0.340	0.343
No. Countries	48	48	48	48	48	48	48	48	48	48	48
Country FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes
Month FE	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes	yes

REALIZED VS EXPECTED CHANGES IN EXCHANGE RATE

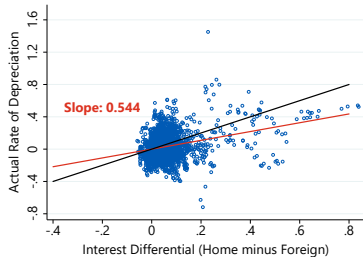
Emerging Markets: Survey Data



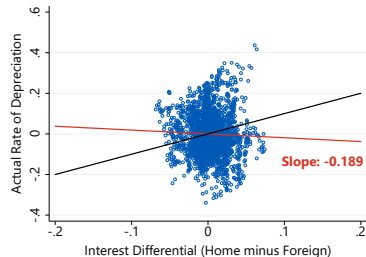
Advanced Economies: Survey Data on Expectations



Emerging Markets: Realized Exchange Rates



Advanced Economies: Realized Exchange Rates



DOES UIP PREMIUM FLUCTUATIONS CAPTURE FLUCTUATIONS IN CIP DEVIATIONS? KV (2019)

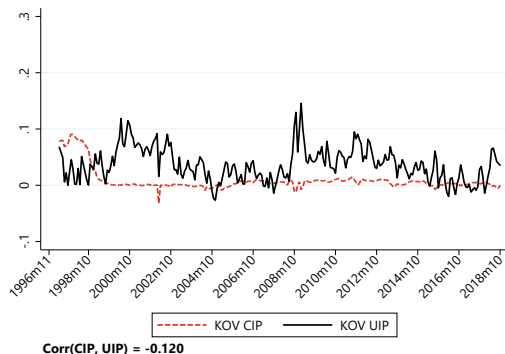
- CIP equation, no risk but harder to measure for EM:

$$\underbrace{\lambda_{t+h}^C}_{\text{CIP Deviation}} = \underbrace{(i_t - i_t^{US})}_{\text{IR Differential}} + \underbrace{(s_t - \text{forward}_{t+h})}_{\text{Currency Risk Cover}} \quad (\text{where } s \text{ in LC/\$}) \quad (3)$$

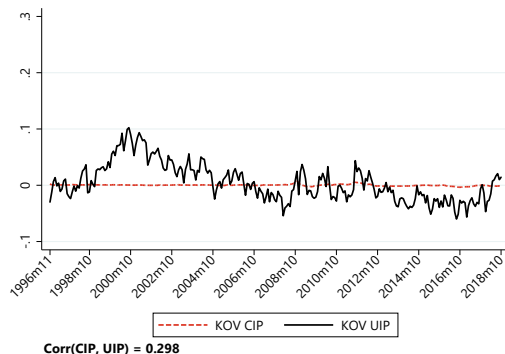
- There should not be any CIP deviation: Either due to regulation or shallow hedging markets (hard to measure the forward rate)—Du and Schreger (2020)
- Difference between expected exchange rates and forward rates.
- UIP is 10x larger than CIP deviations.

UIP PREMIA vs. CIP DEVIATIONS: KV (2019)

Emerging Markets

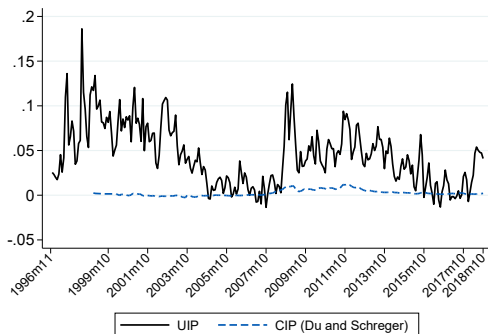


Advanced Economies



UIP PREMIA VS. DU AND SCHREGER BASIS: KV (2019)

Emerging Markets



Advanced Economies

