

Title

Exchange Rate, Risk Premium and Factors

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Motivation

■ Limited Success of Empirical Exchange Rate Models

- Difficulty in fitting the data
- Forecast: Underperform the Random Walk model.

■ This paper: Introduces the **currency risk premium**.

■ Features

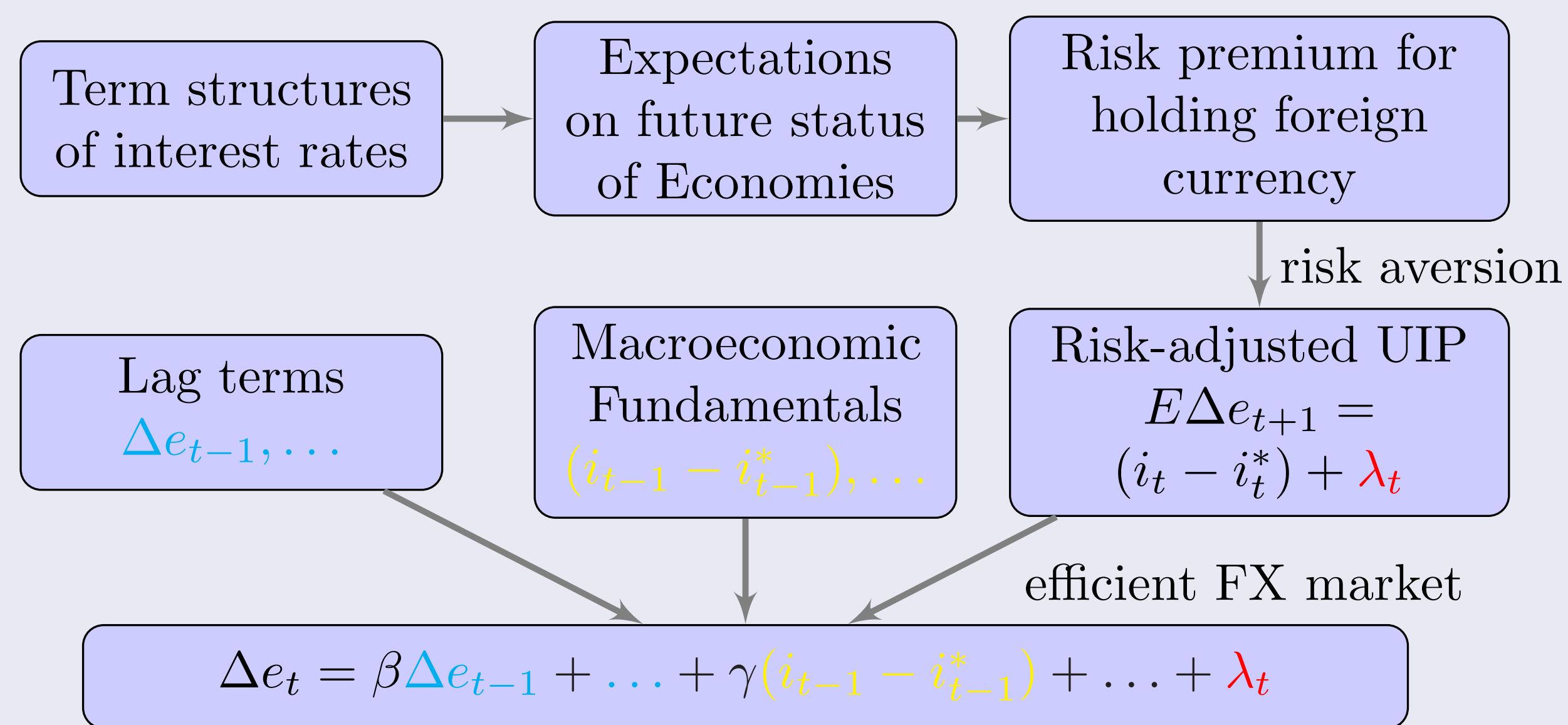
Forward-looking: Depends on expectations
Instruments: Factors for bond yields.

■ Main results

Better goodness of fit and forecasts.
Interesting implications: policy responses and the UIP-Puzzle.

Model Basic Features

■ Flow chart of the intuition



■ Forward-looking component

Risk-adjusted UIP.
Efficient adjustment of the exchange rate.

■ Pre-beliefs on exchange rate change

■ The risk premium instruments: bond yield factors

$$\lambda_t = H(\tilde{F}_t) = (C + D\tilde{F}_t)' \tilde{F}_t$$

■ Term structure of interest rates

$$F_t = \tilde{c} + \tilde{\rho}F_{t-1} + v_t$$

$$y_t = A + BF_t + \mu_t$$

Note: $\tilde{F}_t = [F_t', F_t^*]' = [f_{1,t}, f_{2,t}, f_{3,t}, f_{1,t}^*, f_{2,t}^*, f_{3,t}^*]'$ and $f_{i,t} \cdot f_{j,t} = F_{t-1}' Q_{ij} F_{t-1}$

The Empirical Model

$$\Delta e_t = \beta_0 + \beta_1 \Delta e_{t-1} + \dots + \beta_p \Delta e_{t-p} + \gamma_1 (i_{t-1} - i_{t-1}^*) + \dots + \gamma_q (i_{t-q} - i_{t-q}^*) + \underbrace{(C + D\tilde{F}_t)' \tilde{F}_t}_{\lambda_t} + u_t$$

Empirical Results

■ Data: Eight currencies, monthly, 1990s-2009.05

■ Model selection on pre-believed models

	Models				
	M1 (PPP)	M2 (FP)	M3 (UIP)	M4 (TR)	M5 (ARDL)
GBP					
93.01-06.04	-0.0010	0.0306	-0.0030	-0.0053	0.0557 (7,2)
SEK					
97.01-09.05	0.02411	0.0407	-0.0004	0.0006	0.1504 (2,1)

■ Regression

	GBP (93.01-09.05)		
	ARDL	ARDL + F ^{1st}	ARDL + F ^{1st, 2nd}
...
Adj. - R ²	0.014807	0.154524	0.188009
AIC	9.577392	9.453952	9.469410
Prob χ _{C=0} ²	-	0.000***	0.0017***
Prob χ _{D=0} ²	-	-	0.0000***
Prob χ _{C=0, D=0} ²	-	-	0.0000***

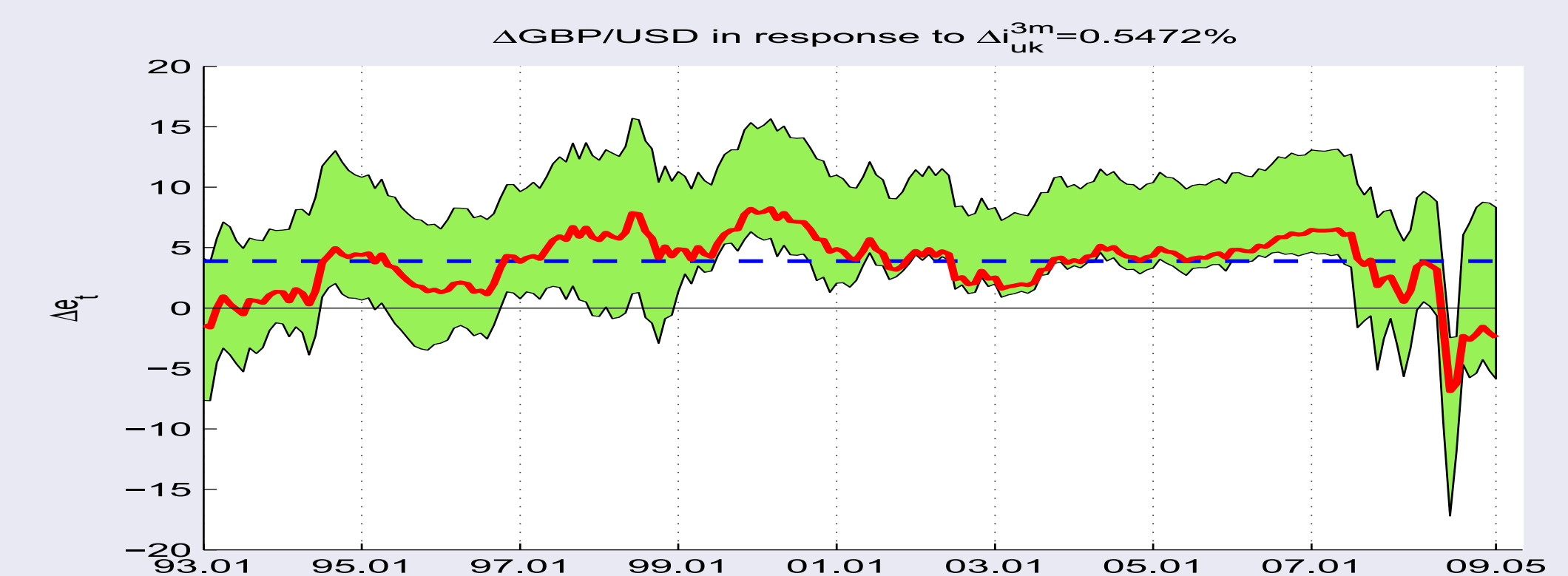
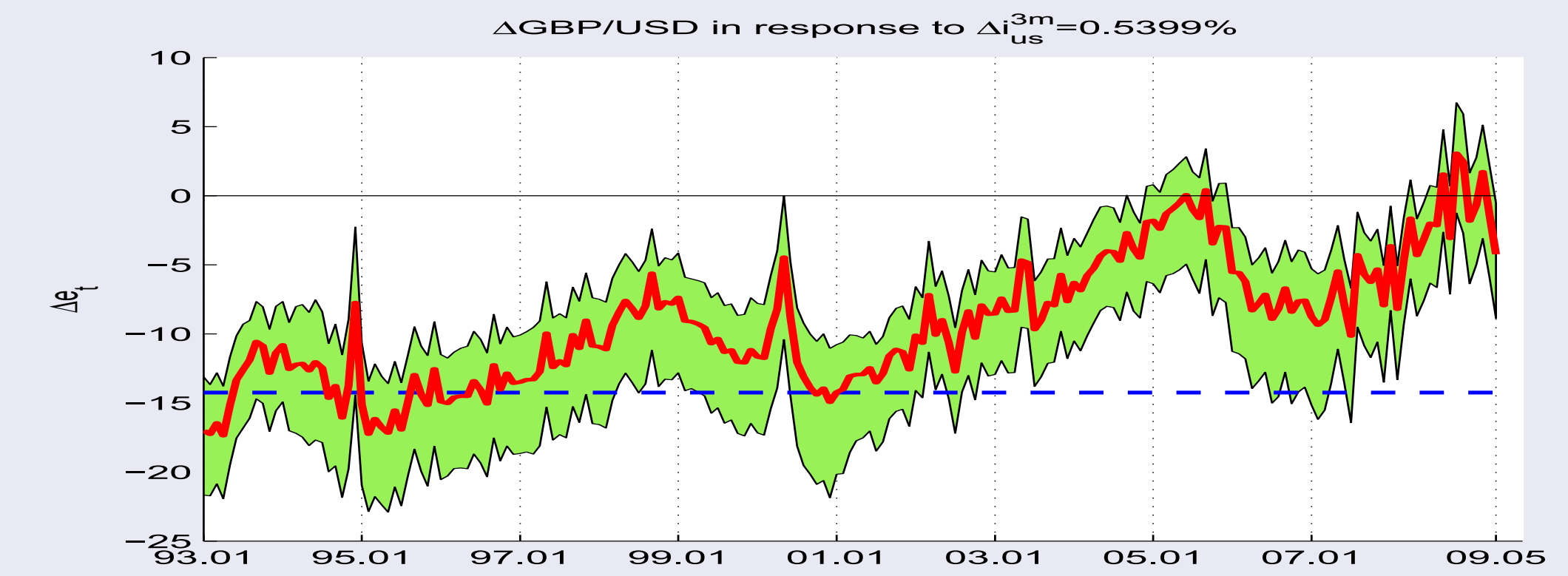
	SEK (93.01-09.05)		
	ARDL	ARDL + F ^{1st}	ARDL + F ^{1st, 2nd}
...
Adj. - R ²	0.162717	0.208140	0.260814
AIC	9.598535	9.571922	9.558223
Prob χ _{C=0} ²	-	0.0505***	0.0001***
Prob χ _{D=0} ²	-	-	0.0000***
Prob χ _{C=0, D=0} ²	-	-	0.0000***

■ Forecasts

GBP Forecasts, $\widehat{\Delta e_{t+h}}|I_t$

H	Root of Mean Sq. Errors			H	Direction of Change		
	ARDL	... + F ^{1st, 2nd}	RW		ARDL	... + F ^{1st, 2nd}	Naive
1	0.0291	0.0262	0.0289	1	0.5333	0.5500	0.5
2	0.0468	0.0425	0.0458	2	0.5085	0.5763	0.5
3	0.0641	0.0600	0.0615	3	0.4310	0.7069	0.5
4	0.0805	0.0781	0.0760	4	0.3860	0.6842	0.5
5	0.097	0.0995	0.0902	5	0.3393	0.6786	0.5
6	0.1108	0.1066	0.1011	6	0.2909	0.7091	0.5
7	0.1235	0.1231	0.111	7	0.2593	0.6852	0.5
8	0.1344	0.1280	0.119	8	0.2075	0.6792	0.5
9	0.1438	0.1391	0.1255	9	0.1731	0.6731	0.5
10	0.1519	0.1512	0.1308	10	0.1765	0.6275	0.5
11	0.1573	0.1603	0.1343	11	0.1600	0.6000	0.5
12	0.1627	0.1682	0.1379	12	0.1224	0.5510	0.5

Policy Analysis



Robustness Check

- At different time periods.
- With macro fundamentals

Implication - Revisit the UIP Puzzle

■ The Fama regression with a risk premium

$$\Delta e_t = \alpha + \beta(i_{t-1} - i_{t-1}^*) + \gamma \hat{\lambda}_t + u_t$$

- 1 $\hat{\lambda}_t^{tp} = (tp_t - tp_t^*)$, where $tp = i_{10y} - i_{3m}$
- 2 $\hat{\lambda}_t^{\tilde{F}_t} = (\hat{C} + \hat{D}\tilde{F}_t)' \tilde{F}_t$

■ Results

	GBP (79.01-09.05)			JPY (85.01-09.05)		
	UIP _{γ=0}	UIP + $\hat{\lambda}_t^{tp}$	UIP + $\hat{\lambda}_t^{\tilde{F}}$	UIP _{γ=0}	UIP + $\hat{\lambda}_t^{tp}$	UIP + $\hat{\lambda}_t^{\tilde{F}}$
α	-4.636*	-4.583	6.886***	11.35***	5.856	-44.971**
β	-1.761**	-1.396	0.538	-2.656**	-1.097	8.895**
γ	-	0.583	0.990***	-	2.494	0.652***

Conclusions

- Shed light on the **unexplained part** of exchange rate dynamics by existing models
 - By introducing the risk premium component
 - Found proper and effective instruments
- Better **short-run forecast** accuracy
- **State-dependent responses** to monetary policy changes
- The risk premium helps in **solving the UIP Puzzle**