8TH JACQUES POLAK ANNUAL RESEARCH CONFERENCE
NOVEMBER 15-16, 2007

Exchange Rate Models Are Not as Bad as You Think

Discussion by

Peter Westaway
Bank of England

Presentation given at the 8th Jacques Polak Annual Research Conference
Hosted by the International Monetary Fund
Washington, DC—November 15-16, 2007

Comments on Engel et al (2007) **'Exchange Rate Models are Not as Bad as You think'**

by

Mark Astley and Peter Westaway
Monetary Instruments & Markets Division
Bank of England

Plan

- Detail main strands of Engel et al (07)
- Bank of England approach for accounting for exchange rate movements

‘Policymaker’ Focus

Main Strands of Engel et al

- **ERs are forward-looking!**
- Engel-West (05) theorem: ERs should be *close to* random walks if discount factor close to unity
- Can get reasonable **variance ratios**
- **(Perceived) monetary policy reaction crucial in determining ER reaction to news**
- Panel results: long-horizon predictability!

Monetary Model

$$(8) \qquad s_t = \frac{1}{1+\lambda} E_t \left(\sum_{j=0}^{\infty} \left(\frac{\lambda}{1+\lambda} \right)^j \left(m_{t+j} - m^*_{t+j} - (y_{t+j} - y^*_{t+j}) \right) \right)$$

$$(3) \qquad m_t - p_t = \alpha + \gamma y_t - \lambda i_t + v_t \qquad (5) \qquad i_t - i^*_t = E_t s_{t+1} - s_t + \rho_t$$

→ Substitute out interest rates by inverting money demand eqns.

Taylor Rule Models

$$(25) \qquad q_t = b \sum_{j=0}^{\infty} b^j E_t z_{t+j}$$

$$z_t = -\left[(\gamma_\pi - 1)(E_t \pi_{t+1} - E_t \pi^*_{t+1}) + \gamma_y (y_t - y^*_t) + \delta (i_{t-1} - i^*_{t-1}) + (u_{mt} - u^*_{mt} - \rho_t) \right]$$

$$(23) \qquad i_t = \gamma_q q_t + \gamma_\pi E_t \pi_{t+1} + \gamma_y y_t + \delta i_{t-1} + u_{mt} \qquad (24) \qquad i^*_t = \gamma_\pi E_t \pi^*_{t+1} + \gamma_y y^*_t + \delta i^*_{t-1} + u^*_{mt}.$$

→ Focus on Taylor rule coefficients & expected future inflation & output gaps

→ Again substituting out (path of) interest rates

But Why Substitute Out Interest Rates?

Pros of *not* substituting out interest rates

- Link between ER news & interest rate news pre-requisite for ER-macro variable link
- Yield curves forward-looking – no need to get into VARs or surveys
- Timely info from financial markets

Cons of *not* substituting out interest rates

- Accounting framework..
- Can't get at deep issue of which shocks are driving ERs

Accounting for ER moves using UIP

Nominal UIP (ignoring risk premium):

$$e_t = E_t e_{t+1} + \left(i - i^*\right)_t$$

Integrate forwards:

$$e_t = E_t e_{t+n} + \sum_{k=1}^{n} E_t \left(i_{t+k-1} - i^*_{t+k-1}\right)$$

→ Long-run nominal exchange rate not well-defined

→ Cumulated differentials potentially unbounded

Accounting for ER moves using UIP

Real UIP (ignoring risk premium):

$$er_t = E_t er_{t+1} + \left(r - r^*\right)_t$$

Integrate forwards:

$$er_t = E_t er_{t+n} + \sum_{k=1}^{n} E_t \left(r_{t+k-1} - r^*_{t+k-1}\right)$$

→ Cumulated real rate differentials bounded

→ Unexplained component reflects revisions to "equilibrium rate" or risk premia

Brigden at al (1997) Bank of England *Quarterly Bulletin*.

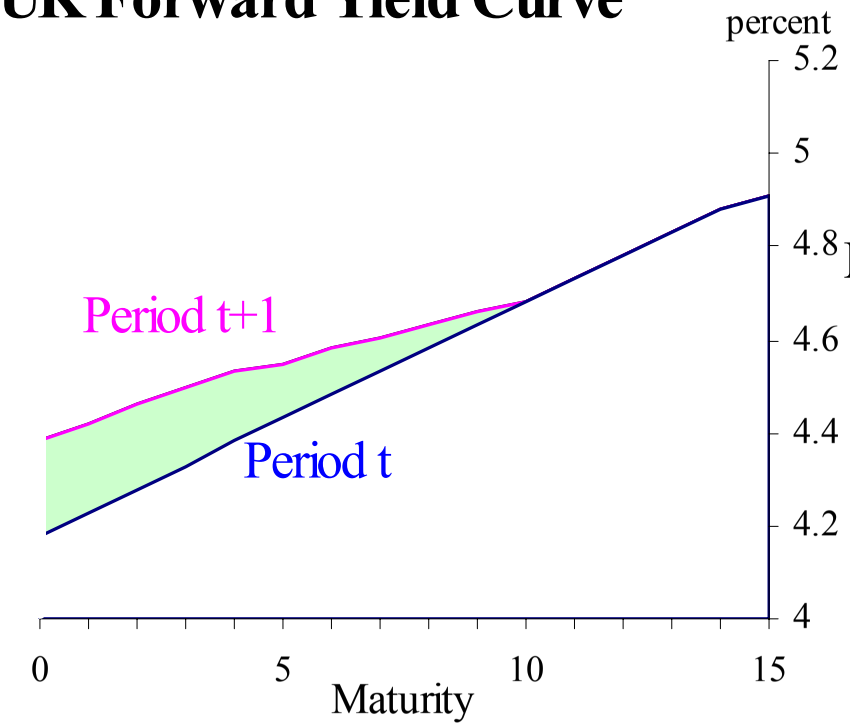
How to derive real rate expectations?:

- Requires yield curves provide good measures of interest rate expectations
- …and info on expected real interest rates

Outputs:

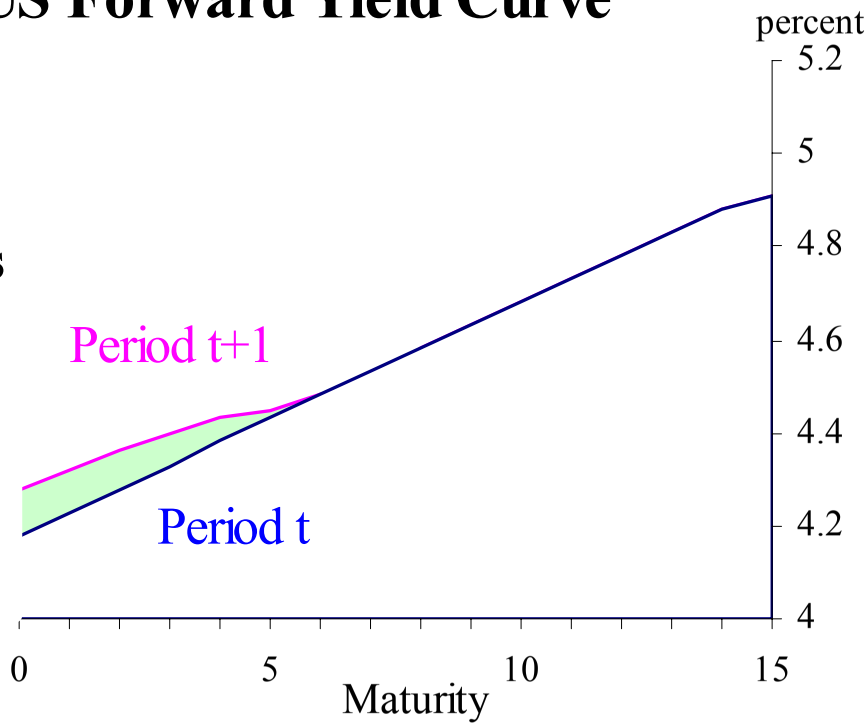
- Derive estimate of ‘interest rate news’, compared to observed ER *news*

UK Forward Yield Curve



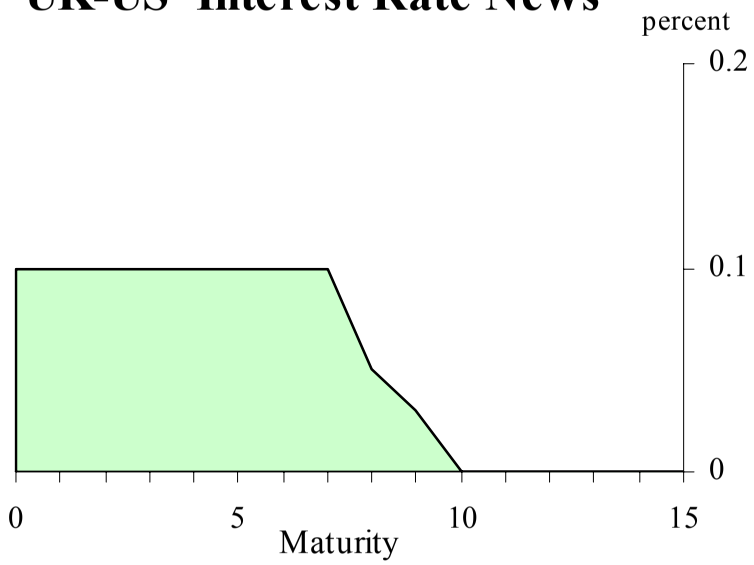
Minus

US Forward Yield Curve

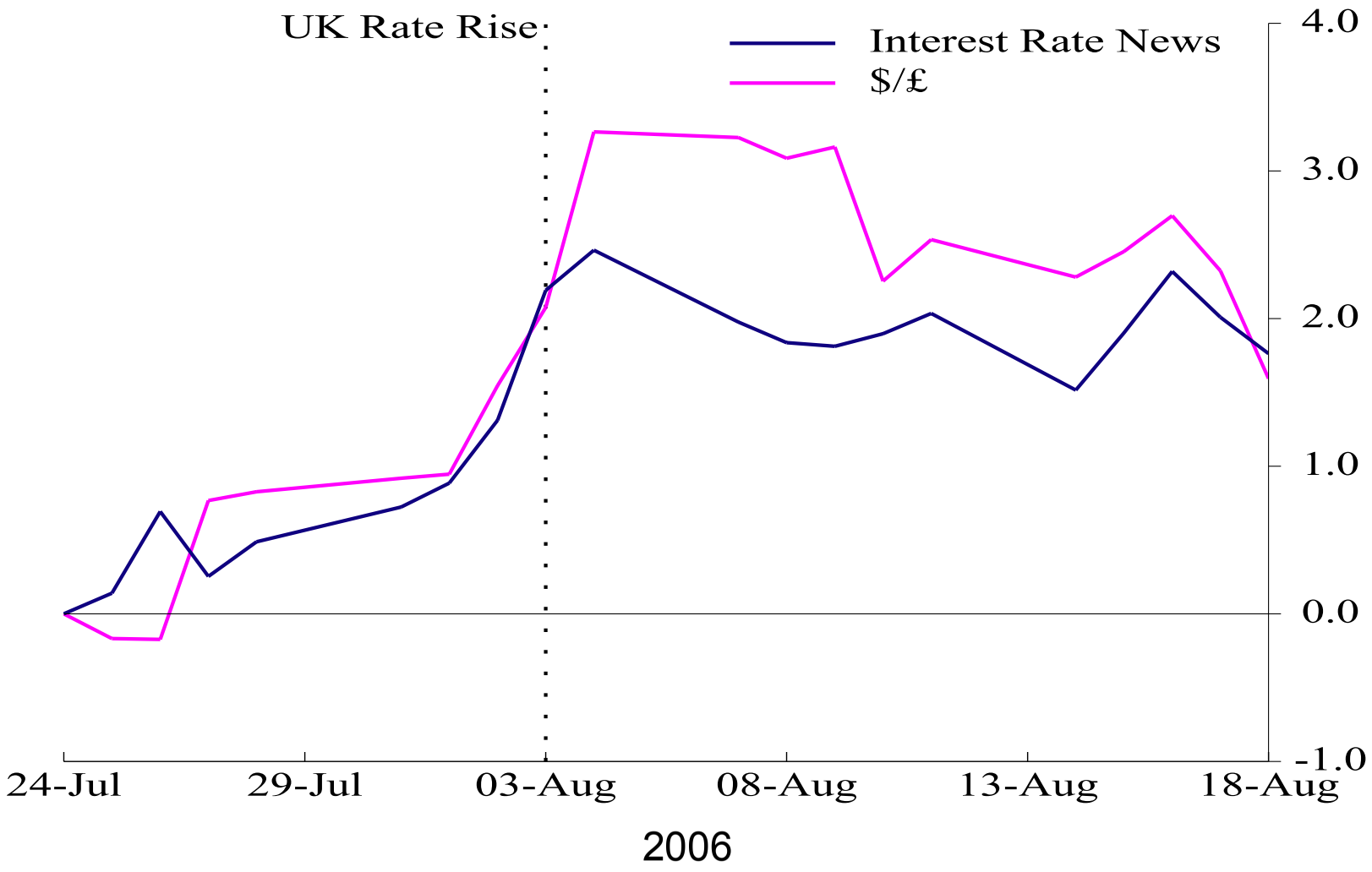


UK-US 'Interest Rate News'

=

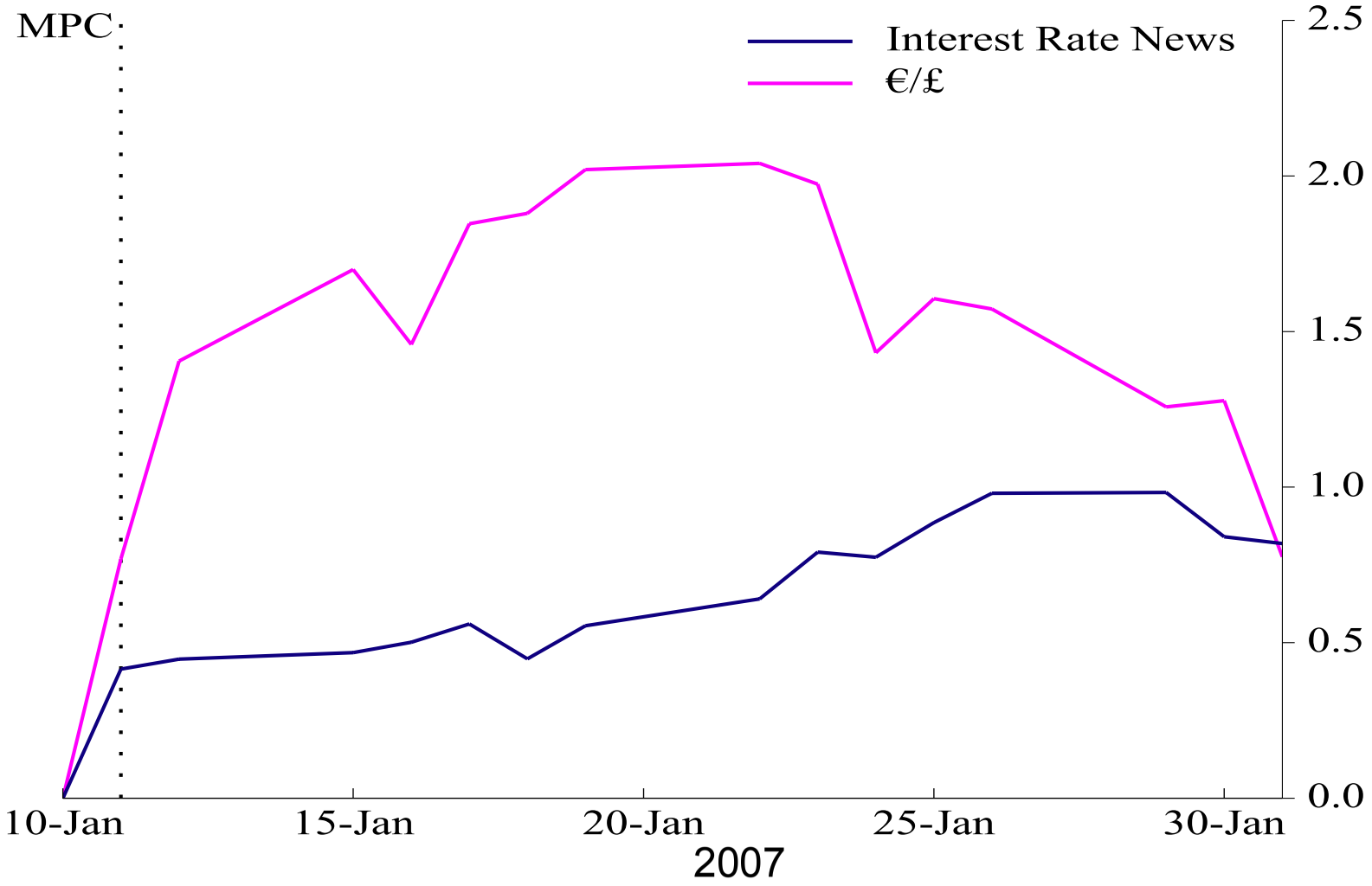


How well does it do?



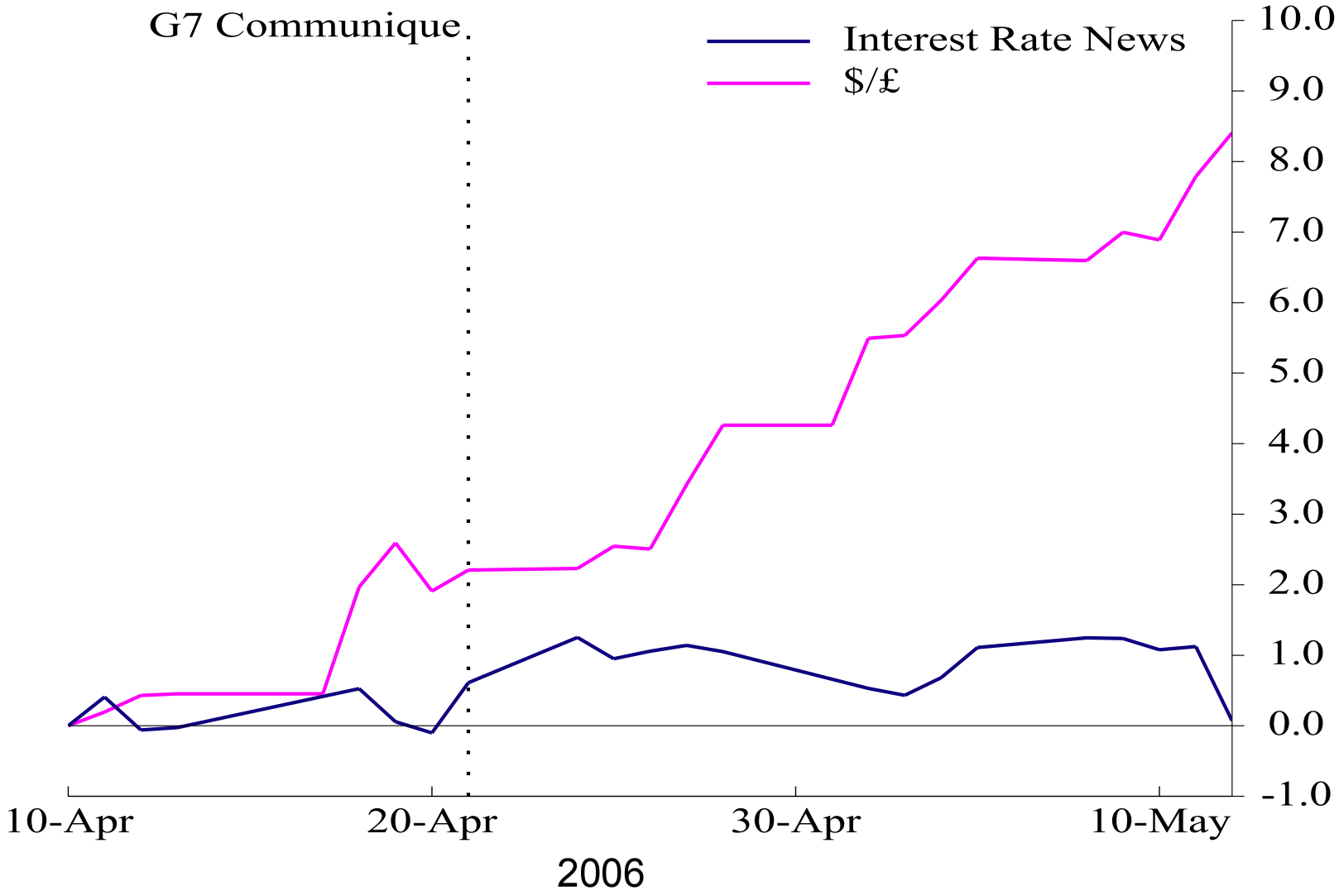
- Event study: close link around some policy rate changes

How well does it do?



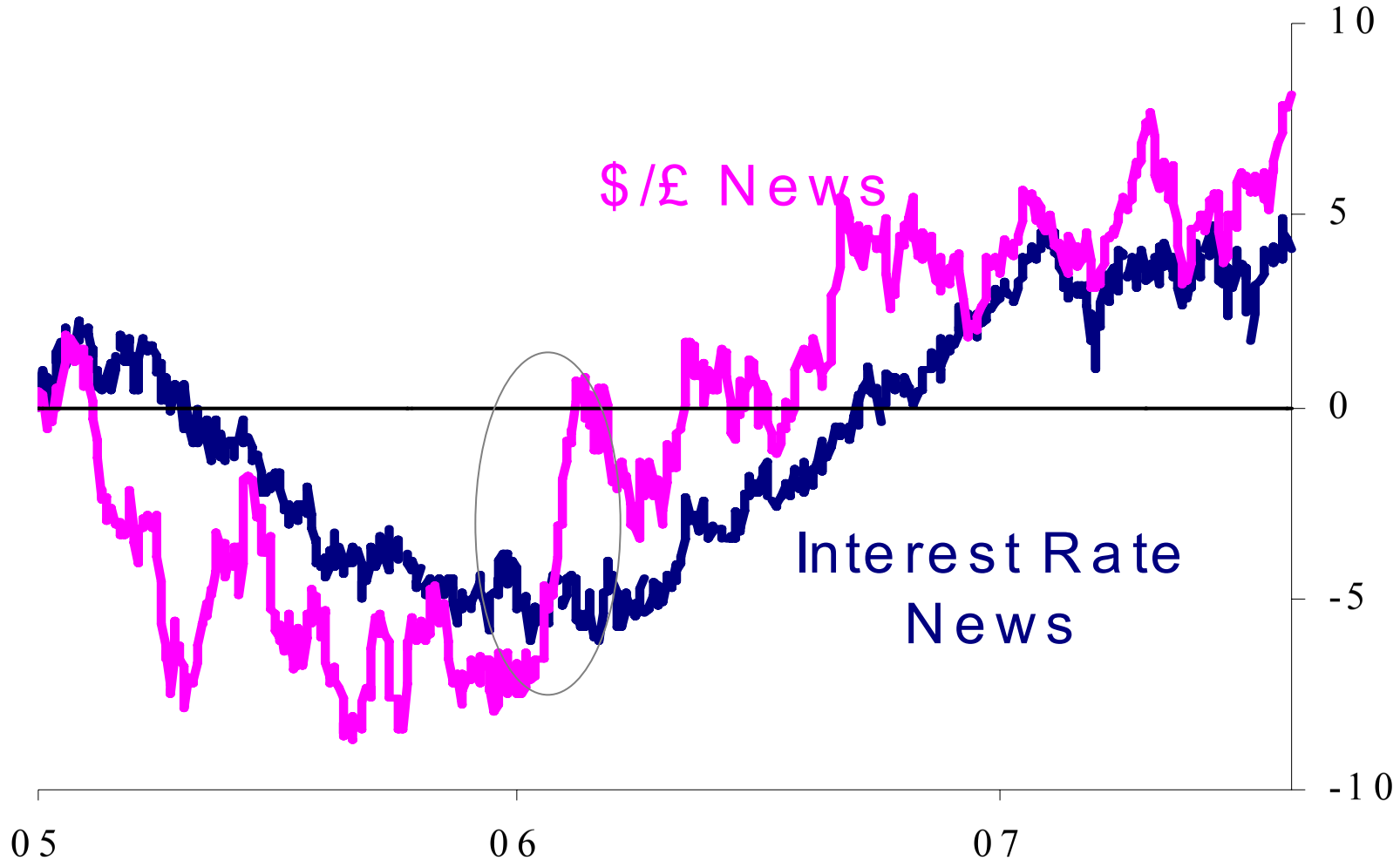
- Understates €/£ move on UK rate rise in Jan-2007.

How well does it do?



- Can't account for sharp $ depreciation in April 2006

How well does it do?

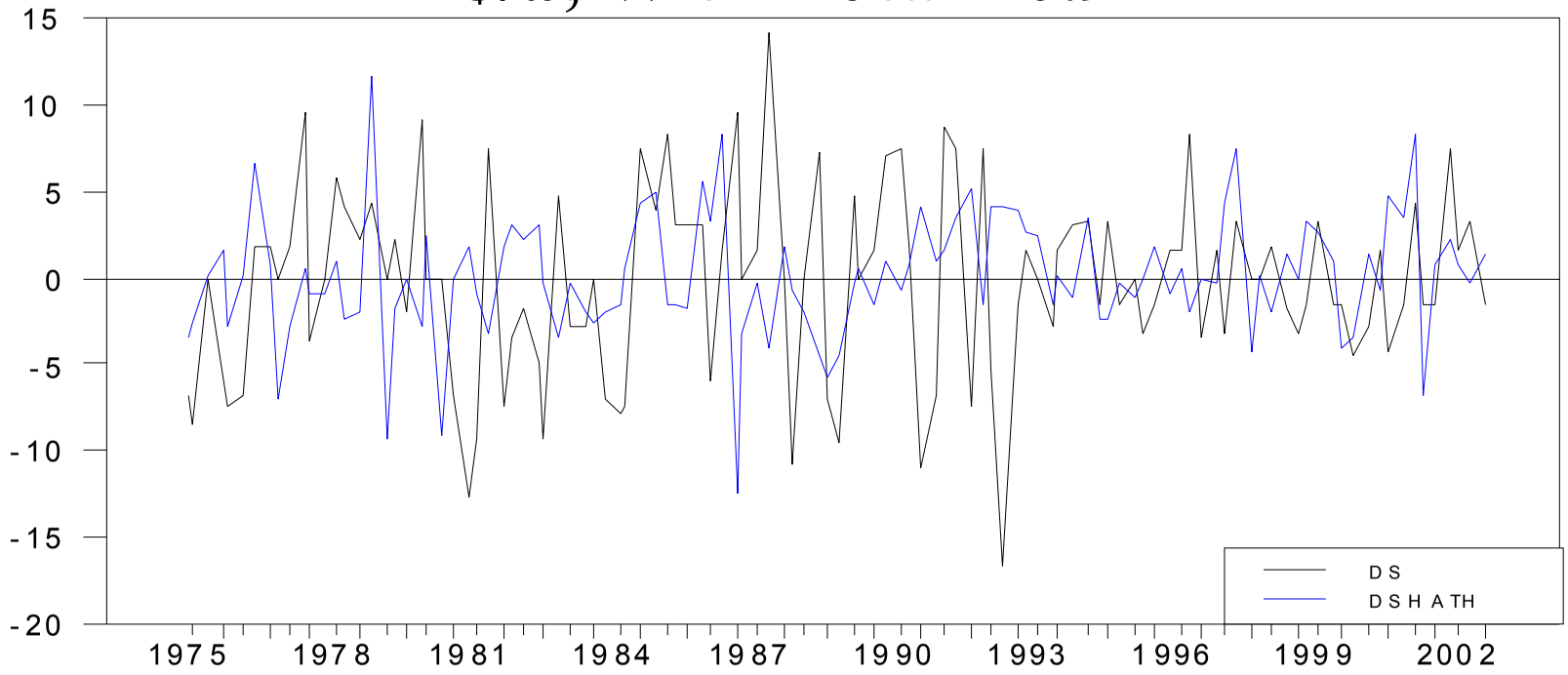


- But broadly accounts for $/£ news since 2005Q1

Links to Engel et al Approach?

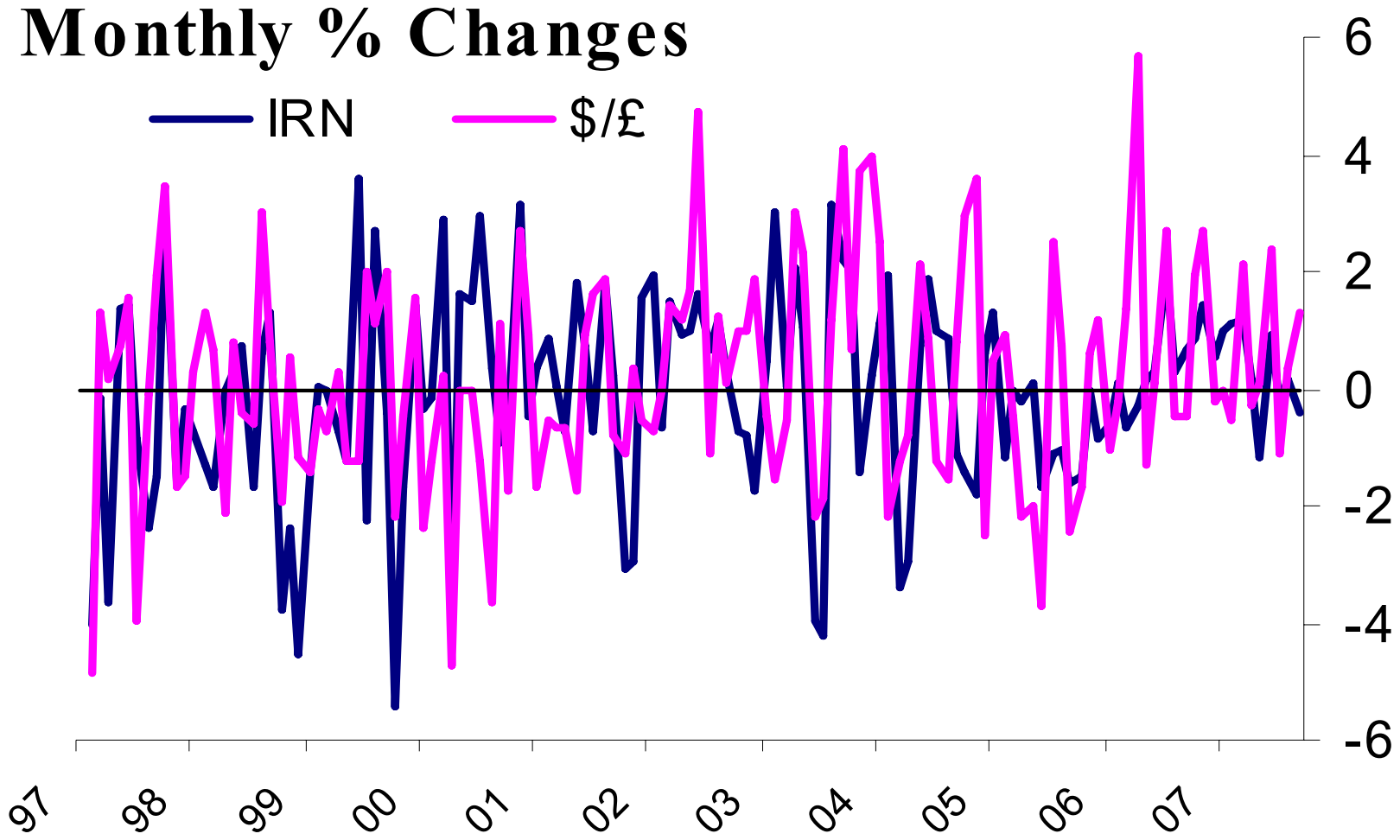
- Focus on variance ratios: EW (2004) find can account for 20-40% of ER variance
- But based upon VARS – so can we tell stories?

$/£, With Beta = 0.9



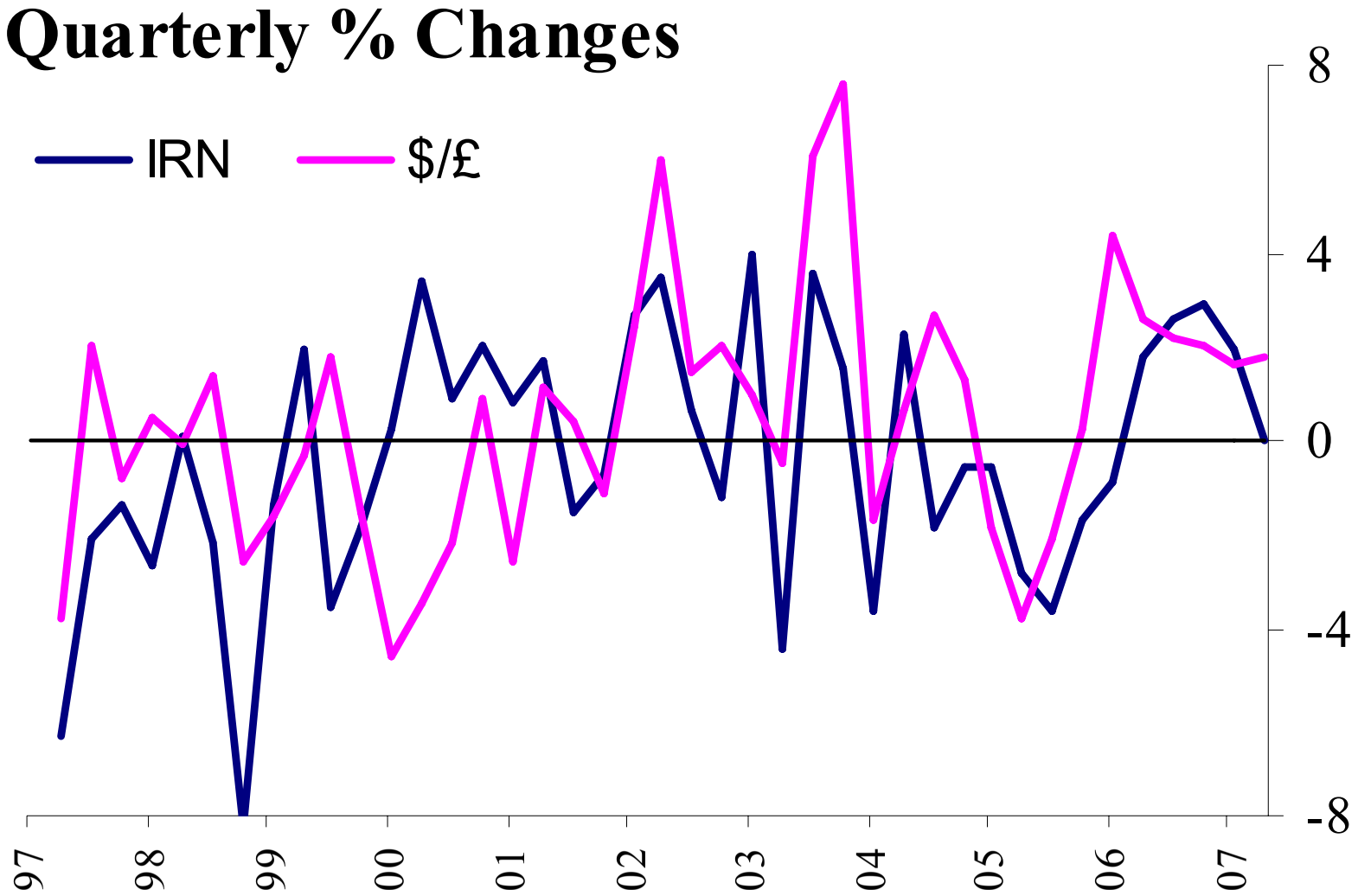
Variance Ratio = 0.44; Correl. = -0.07

How well does UIP Decomp. do?



• Impressive performance for $/£ at monthly frequency: Variance Ratio = 0.88; Correl. =0.32

How well does UIP Decomp. do?



• More impressive performance for quarterly $/£ moves: Variance Ratio = 1.04; Correl. =0.44

What is Driving the Results?

Variance Ratios

10 Year

	$/£
1997-2007	0.88
1999-2007	0.82

5 Year

	$/£
1997-2007	0.22
1999-2007	0.2

2 Year

	$/£
1997-2007	0.04
1999-2007	0.04

- Most of variance of IRN reflects long-maturity effects
  - Accords with Engel et al (07) argument

What is Driving the Results? (Robustness)

Variance Ratios

10 Year				
	$/£	$/€	€/£	Y/£
1997-2007	0.88			
1999-2007	0.82	0.26	0.22	0.52

5 Year				
	$/£	$/€	€/£	Y/£
1997-2007	0.22			
1999-2007	0.2	0.08	0.1	0.16

2 Year				
	$/£	$/€	€/£	Y/£
1997-2007	0.04			
1999-2007	0.04	0.01	0.03	0.03

- Similar result for other exchange rates
- Although variance ratios are lower than for $/£

Robustness II: Economic Content

Correlation Coefficients

10 Year

	$/£	$/€	€/£	Y/£
1997-2007	0.32			
1999-2007	0.26	0.18	0.1	0.16

5 Year

	$/£	$/€	€/£	Y/£
1997-2007	0.41			
1999-2007	0.35	0.17	0.16	0.12

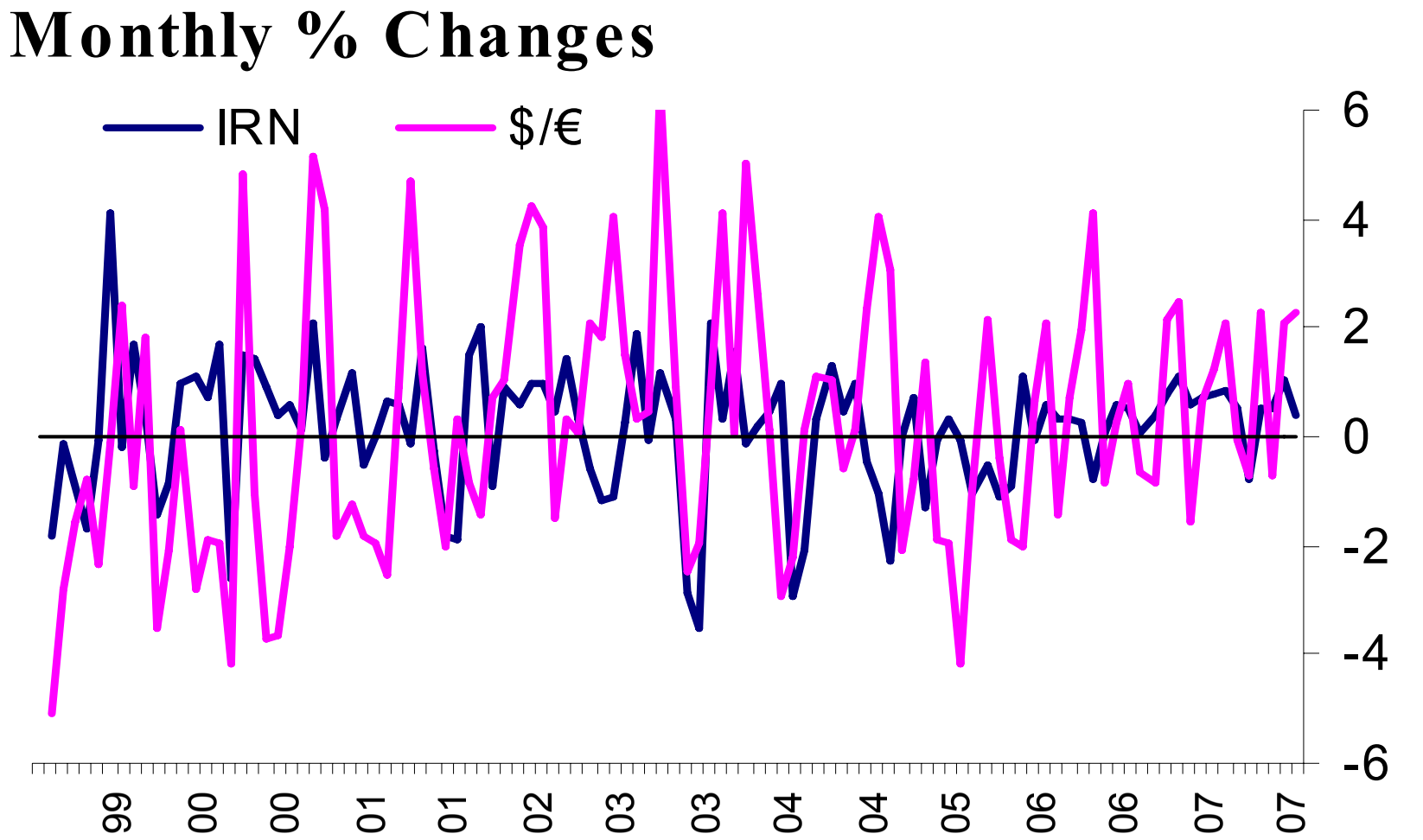
2 Year

	$/£	$/€	€/£	Y/£
1997-2007	0.38	0.13		
1999-2007	0.33	0.14	0.13	0.08

- Correlation between ER news & interest rate news little affected by maturity used
- Correlations strongest for $/£

How well does it do?

H



- Performance less impressive for **$/€** at macro horizons:

Variance Ratio = 0.26; Correl. =0.18

- But short sample!

Conclusions

- Engel et al (07) important focus on role of future expected fundamentals…useful counter to nihilistic random walk approach.
- Have shown analysis based on intermediate conditioning on interest rates.
- Complementary approach to Engel at al – examines one half of joint hypothesis
  - 1)UIP/RE
  - 2) Interest rate rule
- More work required - paper forthcoming!