Estimating a Small DSGE Model under Rational and Measured Expectations: Some Comparisons

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Two questions

- Can we learn using real-time data?

  Growing literature: Orphanides, Faust and Wright, Clark and McCracken

  "When estimating DSGE models using revised data, we may get biased parameter estimates and distorted policy implications"

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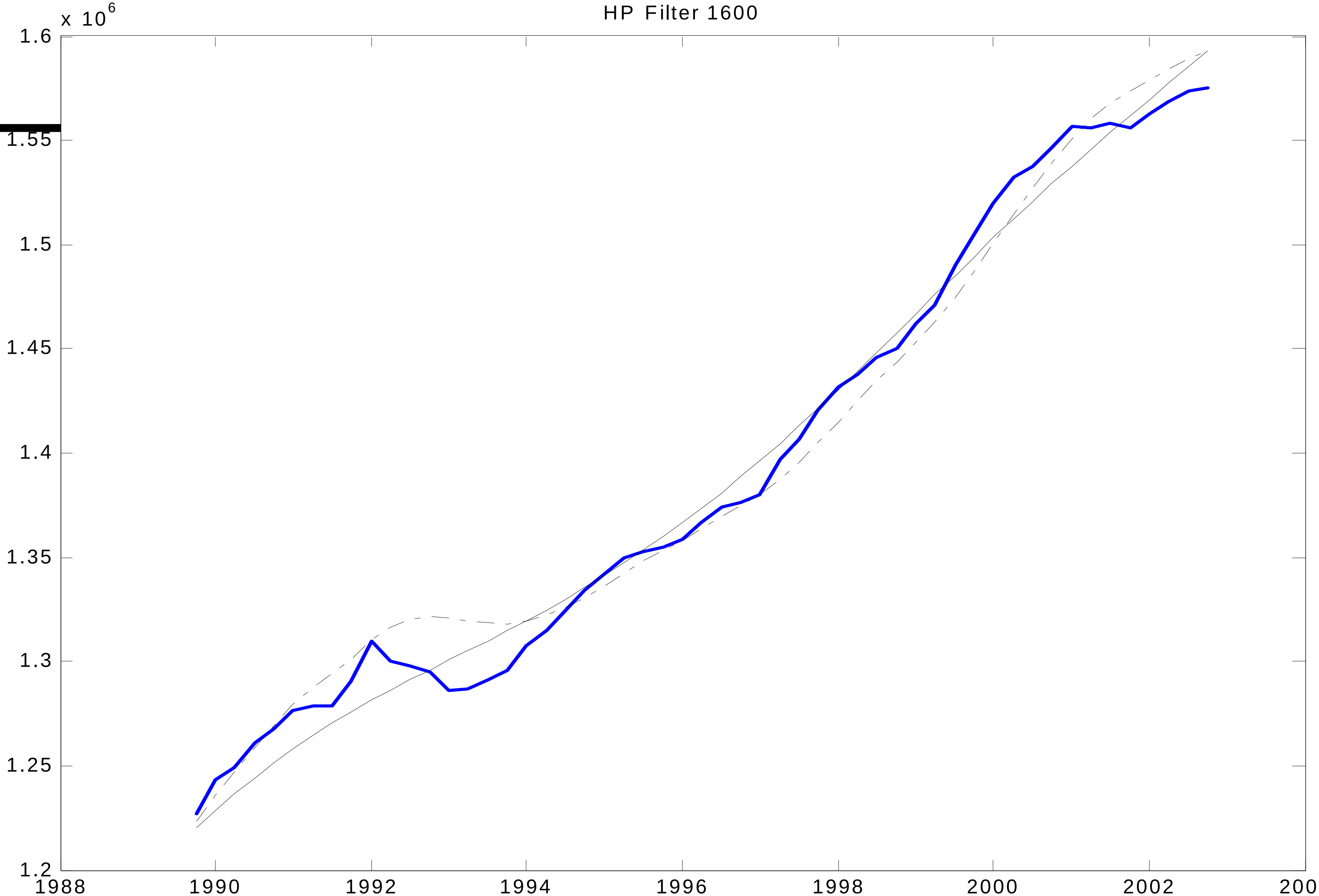
- Are expectations rational?

In this paper

- 3 equation New Keynesian model
- GMM system estimation
- European panel data
- Real time data

  output gap, expected inflation, expected output gap


HP Filter 1600
x 10^6
1.6
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1.4
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1.3
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1.2
1988
1990
1992
1994
1996
1998
2000
2002
2004

Main results

- Statistical evidence against rational expectations

  Autocorrelated expectational errors, related to past information, etc

- Estimation bias: larger coefficients in real variables using real time data

  Especially Taylor rule

$$y_t = (1-\mu)E_t y_{t+1} + \mu y_{t-1} - \phi(r_r - E_t\pi_{t+1} - r^*)$$
$$\pi_t = (1-\delta)E_t\pi_{t+1} + \delta\pi_{t-1} + \lambda y_t$$
$$r_t = \alpha_1 D_{EMU} + \alpha_2(1 - D_{EMU}) + \beta E_t\pi_{t+1}^{EMU} + \gamma y_t^{EMU}$$

	μ	ϕ	r^*	δ	λ	α_1	α_2	β	γ	$p-value$
Revised	0.47	–0.04	3.44	0.46	0.07	–1.39	1.70	2.16	–0.15	0.12
data	(0.04)	(0.02)	(1.07)	(0.04)	(0.02)	(0.27)	(0.41)	(0.08)	(0.12)	
Real time	0.70	–0.09	2.18	0.40	0.14	–1.01	0.17	2.31	0.30	0.02
data	(0.05)	(0.03)	(1.28)	(0.07)	(0.02)	(0.22)	(0.44)	(0.10)	(0.13)	

Can we learn using real-time data?

- Larger coefficients on real variables

  But sometimes imprecise. Is the sample large enough?

- But is the model well specified?

  Low p-values: bad specification or bad instruments?

The model

$$y_t = (1-\mu)E_t y_{t+1} + \mu y_{t-1} - \phi(r_r - E_t \pi_{t+1} - r^*)$$

$$\pi_t = (1-\delta)E_t \pi_{t+1} + \delta \pi_{t-1} + \lambda y_t$$

$$r_t = \alpha_1 D_{EMU} + \alpha_2(1 - D_{EMU}) + \beta \pi_t^{EMU} + \gamma y_t^{EMU}$$

The model

$$y_t^i = (1-\mu)E_t y_{t+1}^i + \mu y_{t-1}^i - \phi(r_r^i - E_t \pi_{t+1}^i - r^*)$$

$$\pi_t^i = (1-\delta)E_t \pi_{t+1}^i + \delta \pi_{t-1}^i + \lambda y_t^i$$

$$r_t^i = \alpha_1 D_{EMU} + \alpha_2 (1 - D_{EMU}) + \beta \pi_t^{EMU} + \gamma y_t^{EMU}$$

The model

$$y_t^i = (1-\mu)E_t y_{t+1}^i + \mu y_{t-1}^i - \phi(r_r^i - E_t \pi_{t+1}^i - r^*)$$
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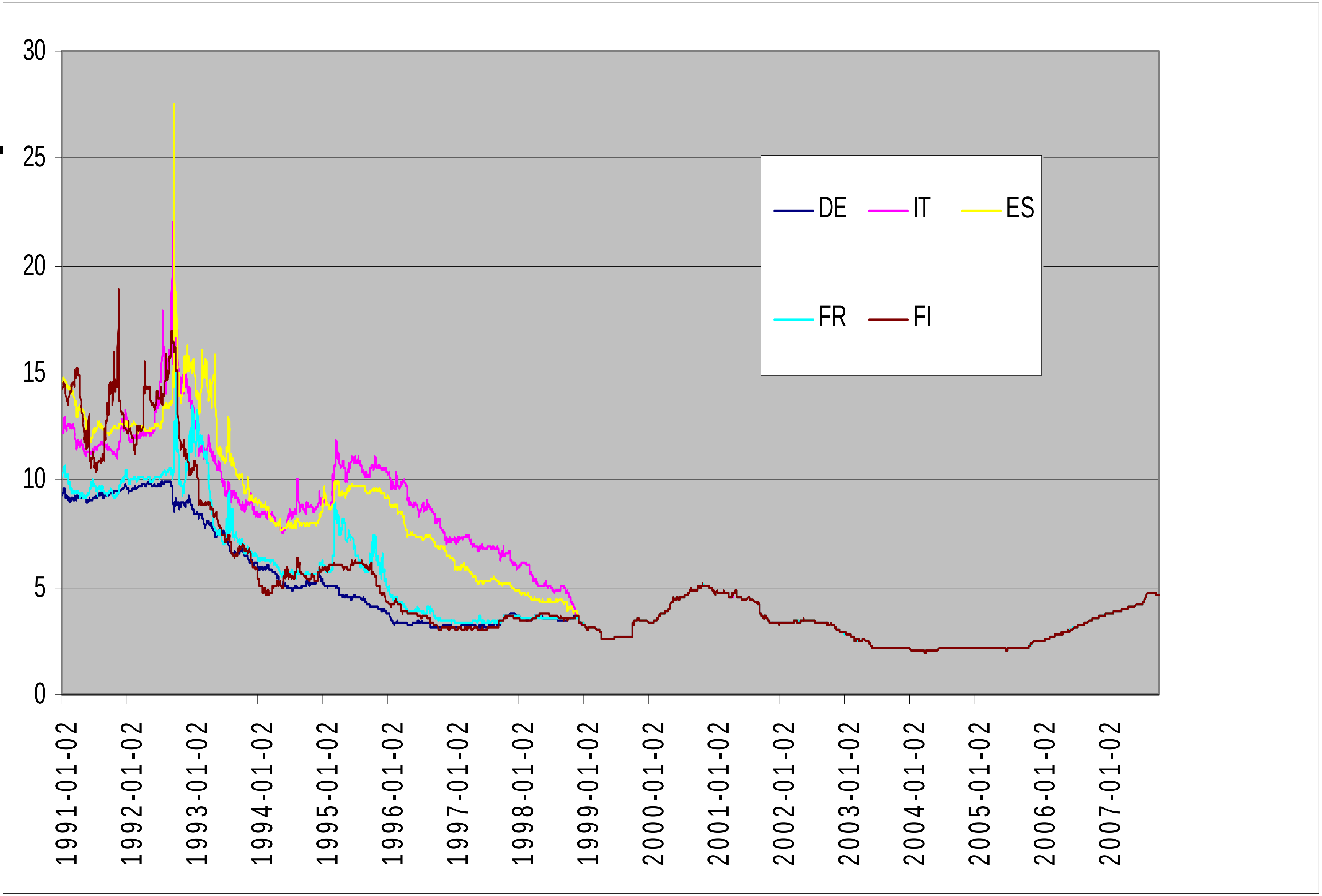
$$r_t^i = \alpha_1 D_{EMU} + \alpha_2 (1 - D_{EMU}) + \beta \pi_t^{EMU} + \gamma y_t^{EMU}$$

- Real number of observations is lower
- Does the last equation make sense before 1999?

  Size of shocks?



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2007-01-02

Taylor rule

$$
\begin{aligned}
r_t^i = \alpha_1 D_{EMU} + \alpha_2 (1 - D_{EMU}) + \beta \pi_t^{EMU} + \gamma y_t^{EMU} \\
+ \beta_2 (1 - D_{EMU}) \pi_t^i + \gamma_2 (1 - D_{EMU}) y_t^i \\
+ \beta_3 (1 - D_{EMU}) \pi_t^{EMU} + \gamma_3 (1 - D_{EMU}) y_t^{EMU}
\end{aligned}
$$

- Fixed effects?
- Real time inflation?

Conclusions

- Interesting and promising area of research
- Maritta’s effort is very appreciated
- More attention needed about country specific effects and choice of instruments