

Discussion of "No-Arbitrage Taylor Rules" by
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Outline

- Technical comments
- What are affine models of the term structure?
- What can we learn from these models?

Technical comments

- Homoskedastic interest rate shocks?
- More lags could be useful
- Pricing errors should be for prices, not yields
- GDP growth not ideal for Taylor rule. Gap, or help wanted index would be better

What are affine models?

- No-Arbitrage \rightarrow there exist an m that prices all assets
 - but (almost) no restrictions on what m should be
- Theory adds content only by restricting what m is

$$m_{t+1} = \exp\left(-r_t - \frac{\lambda_t' \lambda_t}{2} - \lambda_t' \varepsilon_{t+1}\right)$$
$$\lambda_t = \lambda_0 + \lambda_1 X_t$$

- Pricing equation

$$P_t^n = E_t \left[m_{t+1} P_{t+1}^{n-1} \right]$$

- Yields are affine

$$r_t^n \equiv -\frac{\log(P_t^n)}{n} = \frac{A_n}{n} + \frac{B_n'}{n} Y_t$$

- A_n and B_n are restricted by No-Arbitrage

$$B_n' = \delta' + B_{n-1}' (\Phi - \Sigma \lambda_1) ,$$

$$A_n = \delta_0 + A_{n-1} - B_{n-1}' \lambda_0 - \frac{B_{n-1}' \Sigma \Sigma' B_{n-1}}{2} .$$

- Compare to unrestricted OLS: cross-equation restrictions

Variable	ir1	ir5	ir10	ir10	xr5
Fed Fund Rate	0.883	0.782	0.648	0.642	0.495
	36.85	24.93	19.61	22.67	2.75
Output Gap	-0.062	-0.262	-0.33	-0.113	-0.608
	-2.89	-9.28	-10.98	-2.96	-3.79
Inflation	-0.014	-0.076	-0.058	-0.032	-0.991
	-0.42	-1.75	-1.32	-0.85	-4.02
Deficit/GDP				0.343	
				7.78	
N	198	198	168	168	194
r2	0.934	0.869	0.842	0.885	0.119

- Holding returns are also affine

$$xr_{t \rightarrow t+\tau}^n \equiv \log \left(P_{t+\tau}^{n-\tau} \right) - \log \left(P_t^n \right) - \tau r_t^\tau$$

- State space should predict variations of expected excess returns over time

$$E_t \left[xr_{t \rightarrow t+\tau}^n \right] = A_n - A_{n-\tau} - A_\tau + \left(B'_n - B'_{n-\tau} \Phi^\tau - B'_\tau \right) Y_t$$

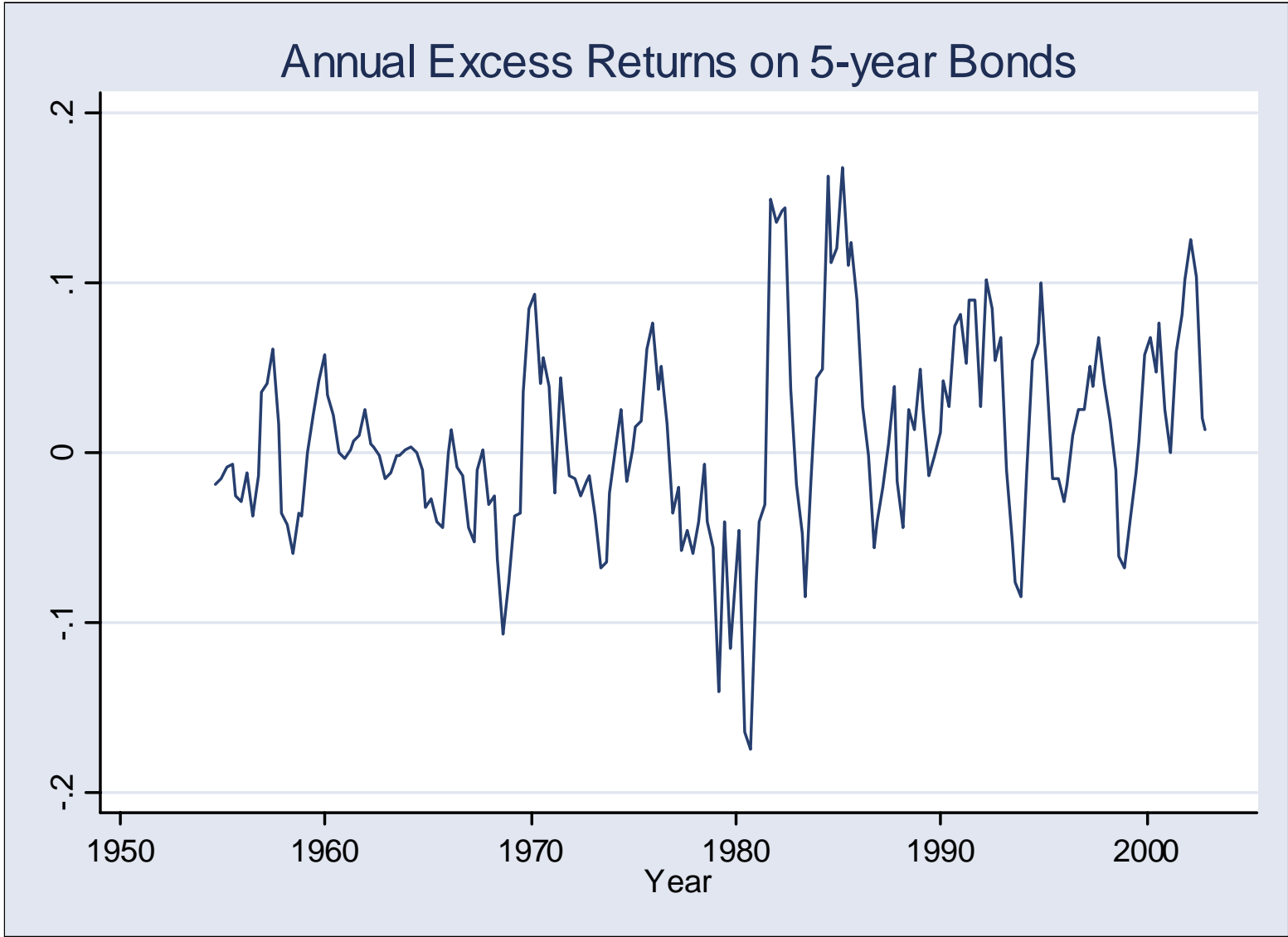


Figure 1:

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In this paper

- Do affine restrictions help us identify Taylor rule / monetary shocks?
- Before reading the paper, I thought there were 2 possible scenarios
 - good case scenario
 - bad case scenario

Good case scenario

- NA will help us estimate forward Taylor rule and get rid of the price puzzle

$$\pi_t = \pi_{t-1} - \beta r_t + u_t + v_t$$

$$r_t = \alpha E_t^{CB} [\pi_{t+1}] + \gamma g_t + \varepsilon_t$$

and

$$E_t^{CB} [v_{t+1}] = v_{t+1}$$

this creates bias and price puzzle when

– β is small

– $\sigma_v \gg \sigma_\varepsilon$

- Can the yield curve help?
 - yes if and only if the term structure contains information about future inflation not captured by lagged macro variables

$$E_t^{yields} [v_{t+1}] \approx E_t^{CB} [v_{t+1}]$$

- Direct test: construct predicted inflation and estimate forward looking rule. Are $\hat{\varepsilon}_t$ more or less correlated with Romer-Romer shocks if one uses yields in forecasting? Do yields help reduce the price puzzle?
 - Unfortunately, no
 - Consistent with the results of this paper

Bad case scenario

- Remove genuine policy shocks because of “measurement errors” or remove anticipated policy shocks
- Shocks from NA Taylor rule are much smaller than the RR shocks

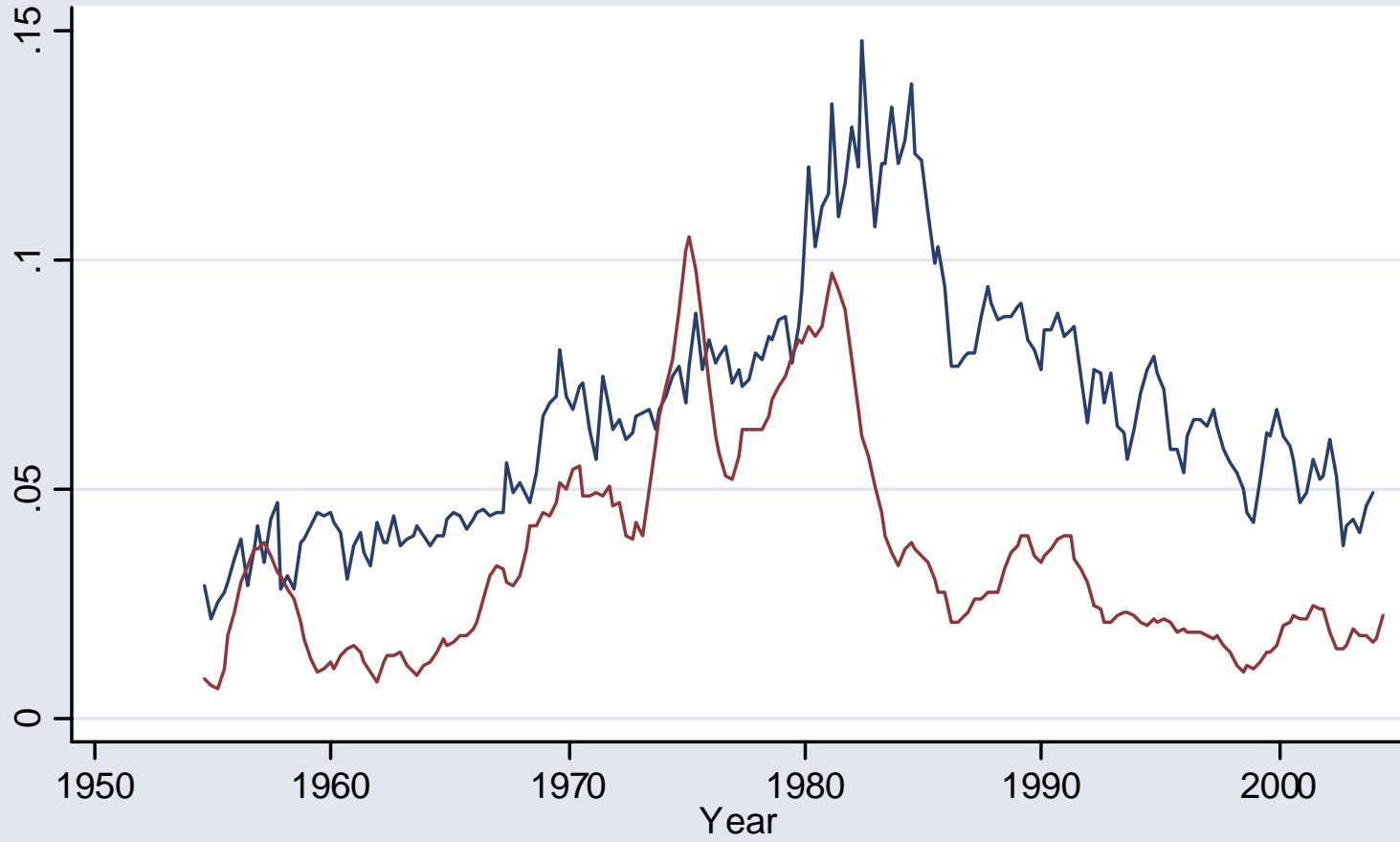
Tentative conclusion. NA seems unlikely to help us identify monetary policy shocks better, especially compared to Romer-Romer approach (also conclusion reached by the authors)

What can we learn from affine models?

- Failure of good case scenario could just mean that Fed knows more than the private sector
 - But we can still use term structure to back out private sector expectations
 - Alternative to using forecast data
 - Estimate learning models, commitment, etc..
 - Practical question of how reliable risk premia estimates are

- We can use these models to test economic theories
 - What drives risk premia, what are the links between treasury and corporate bonds?
 - Welfare costs of bad monetary policy could be high risk premia on long bonds
 - Recent episode: long rates at 4.25%. Interpretation? Look at Forward Rate. Low risk premia or low expectation of future short rates?
 - Banks made a lot of money on carry-trades in past 2 years.

4-Year ahead Forward Rate



— f4 — Inflation

Conclusion

- Information in bond yields can help us test economic theories
 - This paper provides many useful tools and results
- Not entirely clear to me they will help us estimate monetary policy shocks