

Discussion of “Trend and Uncertainty in the Long-term Real Interest Rate: Bayesian Exponential Tilting with Survey Data”

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Summary

- Time-varying parameter VAR(1) with stochastic volatility
- Annual data 1915-2016: real consumption growth, real dividend growth, CPI inflation, 10-year nominal yield, price-dividend ratio
- Compute trend real-rate as the difference between the 10-year nominal rate and the 10-year average inflation forecast from the model.
 - These forecasts take in to account the uncertainty over the next 10 years from the point of forecast, in addition to parameter uncertainty.
- Also use SPF 10-year forecast to anchor the model forecast (tilting).
- In the non-tilted results, modest decline in trend real rate with a huge degree of uncertainty.

Del Negro et al. vs. Doh (Simplified)

- **Del Negro et al:**

$$y_t = \bar{y}_t + \tilde{y}_t$$

$$\bar{y}_t = \bar{y}_{t-1} + e_t$$

$$\tilde{y}_t = \rho y_{t-1} + \varepsilon_t$$

- Estimated using nominal rate, inflation, inflation expectations etc.
- Using $\bar{\pi}_t$ from above, real rate trend $\bar{r}_t$ computed as $\bar{r}_t = R_t - \bar{\pi}_t - \tilde{R}_t$

- **Doh:**

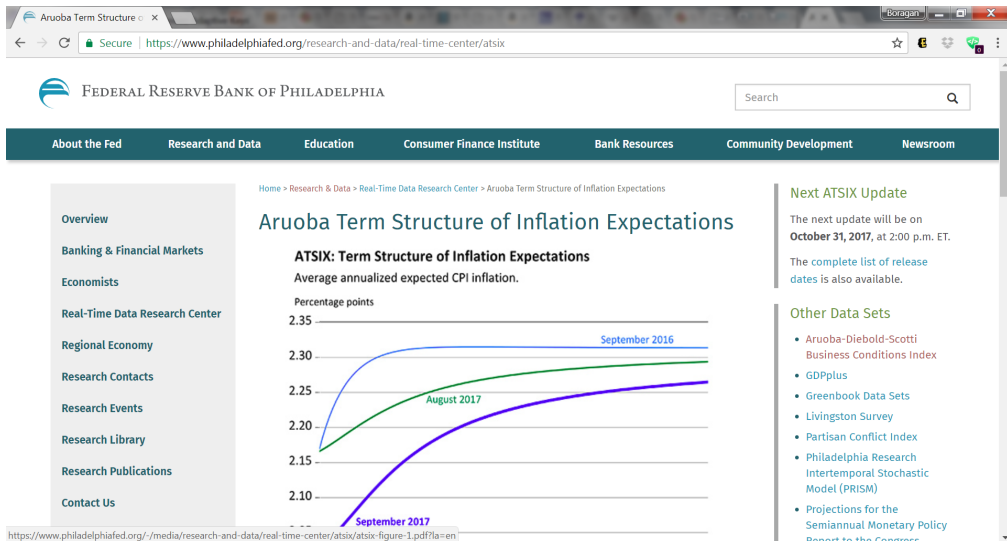
$$y_t = \theta_{0,t} + \theta_{1,t}y_{t-1} + u_t \text{ where } u_t \sim N(0, \sigma_t^2)$$

- Estimated using nominal rate, inflation, inflation expectations etc.
- Using $\hat{\pi}_{t+H}$ from above, real rate trend $\bar{r}_t$ computed as $\bar{r}_t = R_t - \hat{\pi}_{t+H}$.

- The “only” use of the estimated model is to produce a good long-horizon inflation forecast.
- Extensive literature (e.g. Faust and Wright, 2013) argues simple models that anchor short-run survey forecasts are superior.
 - TVP-VAR with inflation, treasury bill yields and unemployment rate where the coefficients are allowed to slowly drift, performs much worse than the surveys or a simple model.
- How good is the inflation forecast?
- Use of a complicated forecasting model introduces a lot of uncertainty.
 - The wide uncertainty bands a bug, not a feature.

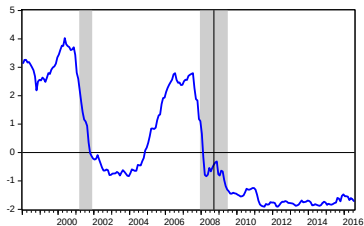
How to Find an Accurate Forecast of Inflation at Any Arbitrary Horizon?

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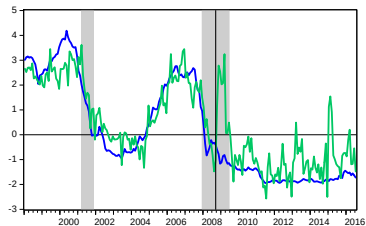


Real Interest Rate Measures from ATSiX

6-Month

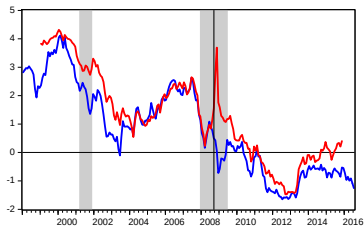


1-Year



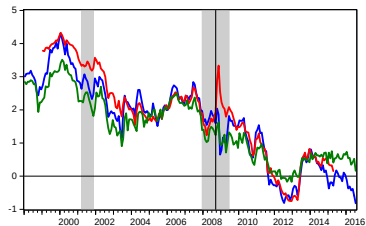
Model Cleveland

5-Year



Model TIPS Yield

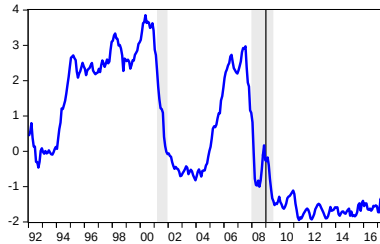
10-Year



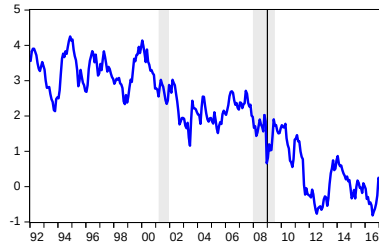
Model TIPS Yield Cleveland

Real Interest Rate Measures from ATSIx

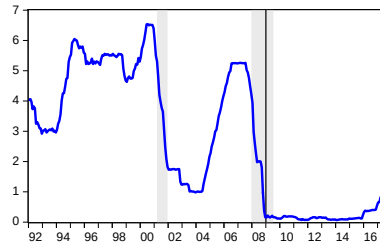
3-Month Real Rate



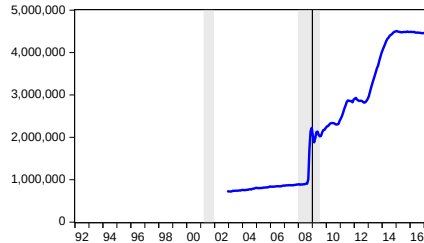
10-Year Real Rate

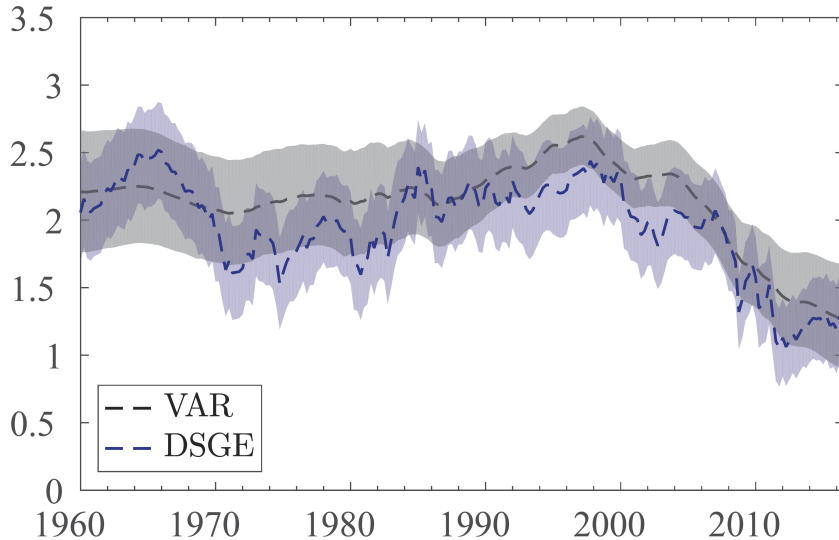


Federal Funds Rate



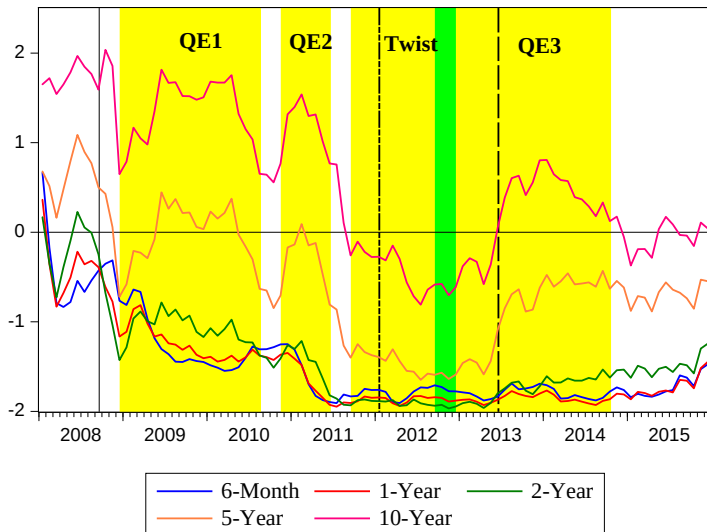
Assets of the Federal Reserve





Real Interest Rate Measures from AT SIX

Key Real Interest Rates and Fed Programs



Evolution of r^*

- r^* is **not** the trend real rate.
- Del Negro et al (and others): It is the return on a short-term safe and liquid asset in a model with no nominal rigidities (i.e. with no monetary policy).
- No question long-run real rates declined significantly over the last 15 years, relative to previous decades.
- But did r^* come down significantly?
 - 1990s were higher than average.
 - The decline in 2000s consistent with mean reversion.
 - Also consistent with a structural change regarding demand for treasuries. (Krishnamurthy and Vissing-Jorgensen, 2012 and/or Bernanke, 2015 and/or heightened uncertainty)
 - Decline after 2008 mostly reflect unconventional monetary policy actions by the Fed. (don't change r^*)