Bank of England

The Liquidity State-Dependence of Monetary Policy

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Discussion by **Alex Kontoghiorghes (BoE)**

New evidence on the monetary transmission mechanism workshop
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Paper Summary

- This paper studies the **pass-through of monetary policy shocks** (MPS) to the **yield curve** in **different liquidity states** and links the different liquidity states to the **wealth of arbitrageurs**.

- **Main empirical specification** of the paper is to separate the effect of monetary policy shocks on forward rates (and their components) into high liquidity states, and low liquidity states ’00-’19:

$$\Delta f_{j,t}^{(\tau)} = \alpha + \beta_{j,hl}^{(\tau)} \cdot [mps_t \times \mathbb{1}_{\text{HighLiq}_{t-1}}] + \beta_{j,ll}^{(\tau)} \cdot [mps_t \times \mathbb{1}_{\text{LowLiq}_{t-1}}] + \epsilon_{j,t}^{(\tau)}$$

- Paper brings together an impressive collection of empirical data from multiple studies and **creates a new arbitrageur classification** from transaction level data without relying on self-reporting.

- Paper further **studies the implications for the real economy** in different liquidity states.

- Understanding state-dependent effects of different monetary policy tools is of **1st order concern to policy makers**, and paper can make an important contribution to literature & policy makers.

Main Findings

- The paper finds that: MP transmission to **long-term nominal interest rates is strong** and only happens when markets are more liquid, the so-called **liquidity state-dependence**.

  High liquid state -> significant response in nominal rates even beyond 15 years
  Low liquid state -> no significant response in nominal rates beyond 3 years

- Effect on nominal interest rates **driven entirely by real rates**, with **no effect on the inflation component**, deepening the non-neutrality puzzle (Nakamura & Steinsson, 2018).

- **Real term premium** accounts for all of the the state-dependence, in-line with Hanson & Stein (2015).

- They find that the state dependent **liquidity effects are highly persistent**, and last over a quarter.

- Through their proxy of **arbitrageur wealth**, they find that **limits to arbitrage** can explain the documented liquidity state dependence, which is **additional to macroeconomic fundamentals**.

- They also find **significant** and **persistent** effects for the **mortgage market.**

Main Comment 1

Are results robust to different proxies of liquidity, and does using the yield curve noise measure make sense in this setting?

- Liquidity state-dependence is the **main research question of the paper**, and the paper would therefore benefit by demonstrating the **robustness of results to the choice of liquidity measure**.

Furthermore, the yield curve noise measure of Hu, Pan, and Wang (2013) in this exercise might be problematic:

$$\Delta f_{j,t}^{(\tau)} = \alpha + \beta_{j,hl}^{(\tau)} \cdot [mps_t \times \mathbb{1}_{\text{HighLiq}_{t-1}}] + \beta_{j,ll}^{(\tau)} \cdot [mps_t \times \mathbb{1}_{\text{LowLiq}_{t-1}}] + \epsilon_{j,t}^{(\tau)}$$

- High yield curve noise means it's difficult to fit a yield curve, but forward rates (the regression dependent variable) are being estimated from the same high noise yield curve.

- In the low liquidity state, the high yield curve fitting error might obscure actual bond prices changes.
  -> CI's for β_{ll} are considerably larger.

- Monetary policy shocks are estimated using treasury futures, which might also be affected by illiquidity.

Main Comment 1 continued

Suggestions:

- Use a different measure of liquidity to address this possibility, ideally one not derived directly from bond prices, e.g. Pastor and Stambaugh (2003), Amihud (2002)

- Create a different liquidity measure from separate parts of the yield curve, or an average of on-the-run premiums as an alternative liquidity measure.

Main Comment 2

Is the estimated liquidity state and arbitrageur wealth simply a business cycle proxy?

A crude time-series plot suggests a relationship between the interest rate cycle and the yield curve noise measure, and therefore arbitrageur returns.

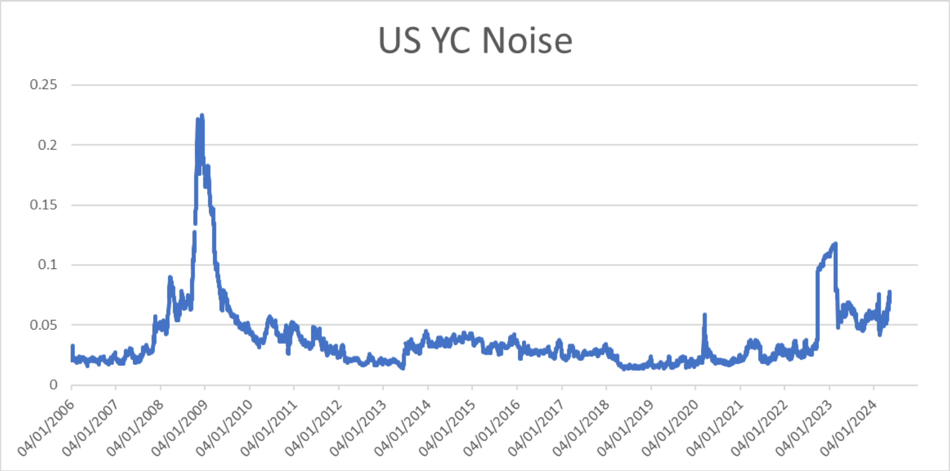
Difficult to argue that arbitrageur wealth is independent of the business cycle without a clean identification strategy.

→ H_1: liquidity state / arbitrageur wealth are a better estimate of the business cycle.

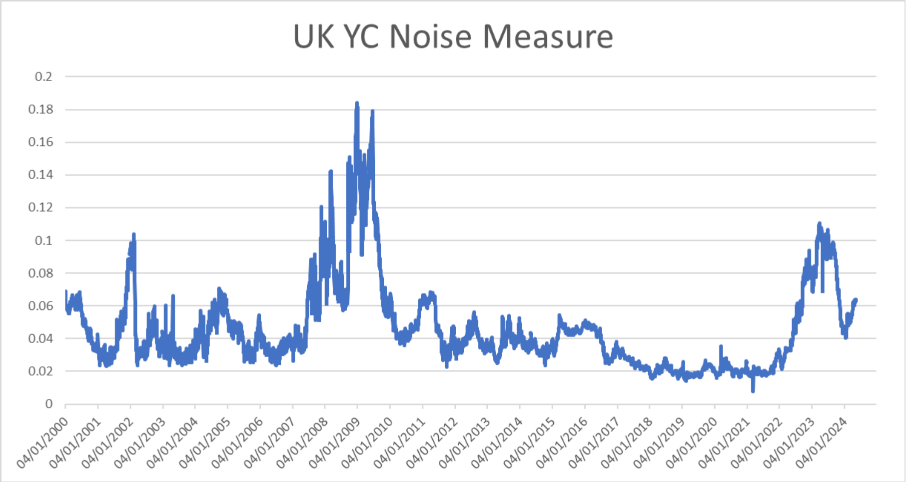
Main Comment 2 continued

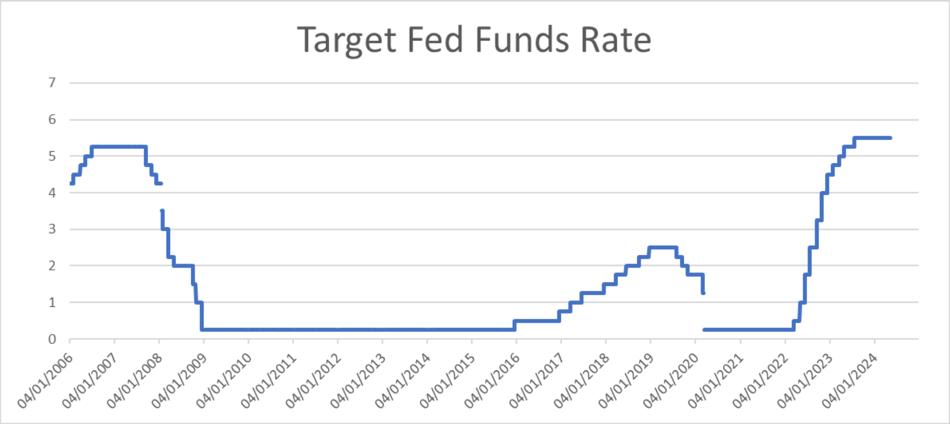
Is the liquidity state and arbitrageur wealth independent to the business cycle?

US **UK**

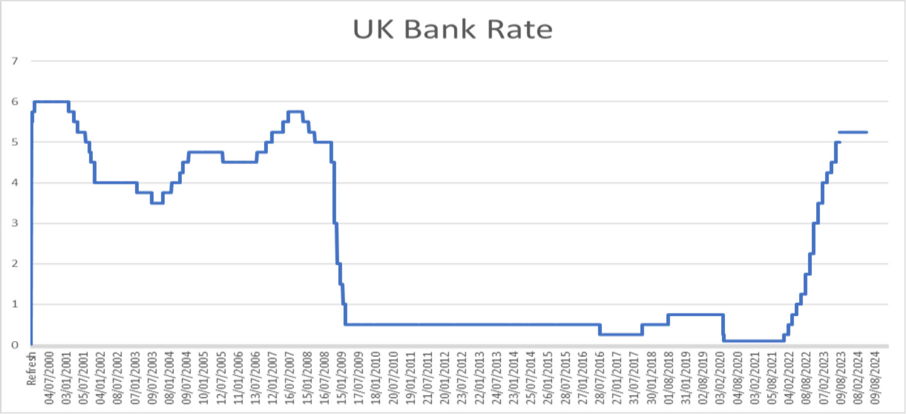


<-YC noise ->





<- Policy rate ->



Main Comment 2

Is the liquidity state and arbitrageur wealth independent to the business cycle?

Crude time-series plot suggests a relationship between the interest rate cycle and the yield curve noise measure, and therefore their measure of arbitrageur returns.

Difficult to argue that arbitrageur wealth is independent of the business cycle without a clean identification strategy.

→ H_1: liquidity state / aggregate hedge fund returns are a better estimate of the business cycle.

Suggestion:

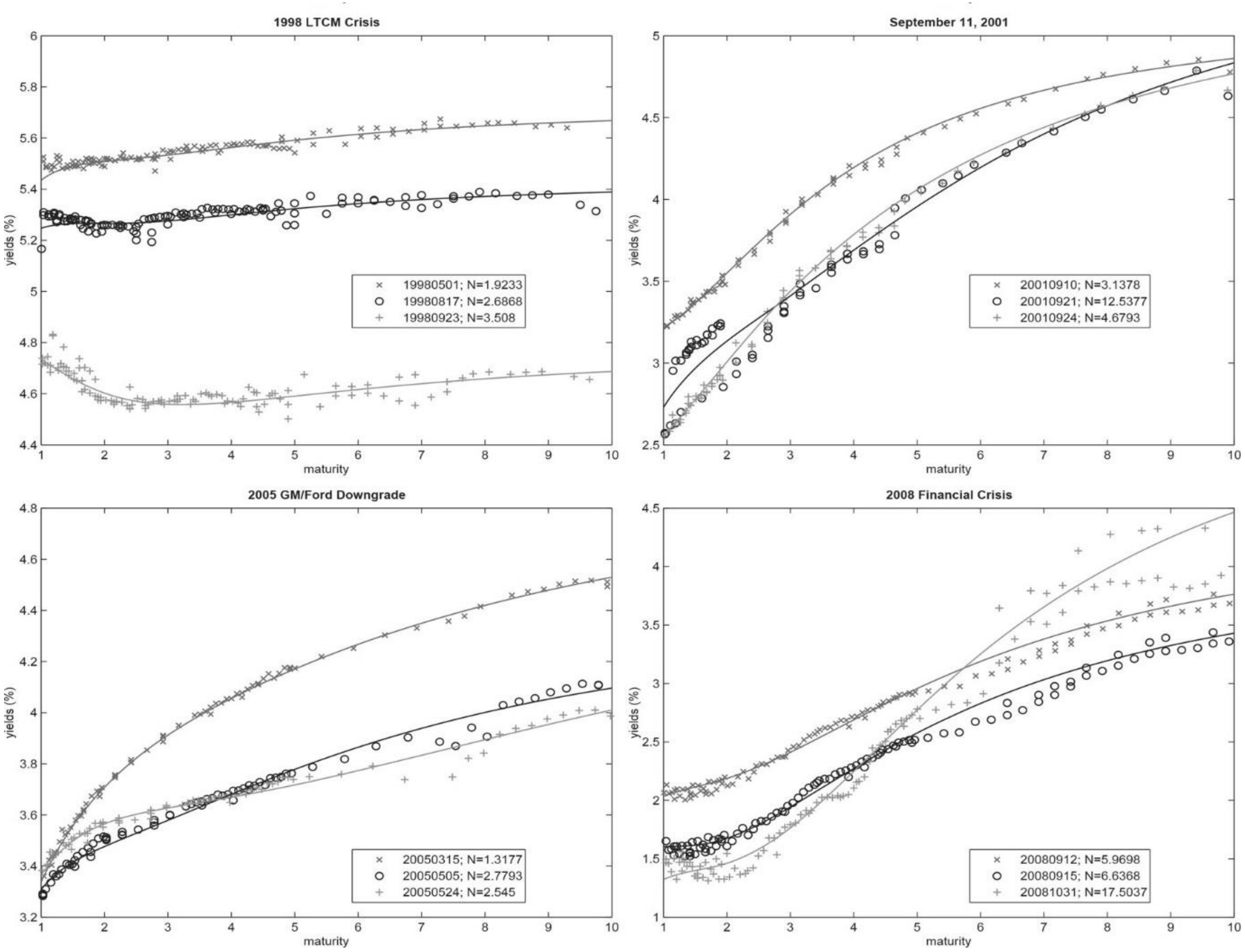
Do more to rule out the hypothesis that their liquidity state measure and estimated arbitrageur wealth is not capturing interest rate cycles and the yield curve slope. For example, provide case studies when arbitrageur wealth behaved contrary to H_1.

Smaller Comments

- The GFC and unscheduled FOMC meeting are excluded. What happens to results when included?
- Should we expect liquidity effects to be persistent, especially if MP can act to improve liquidity?
- Currently term premia component includes the liquidity premium and noise component of their estimated term structure model. Can they run analysis directly on the liquidity premium component?
- Does it make sense to treat the number of arbitrageurs in their Vayanos & Vila (2021) exercise as an exogenous variable?
- Be clearer in the messaging: authors use liquidity, arbitrageur's wealth, arbitrageur's effective risk aversion, noise, and term premium interchangeably in the paper.

Summary: very interesting paper which I enjoyed reading!

Noise measure from Hu, Pan, Wang (2013, JF).

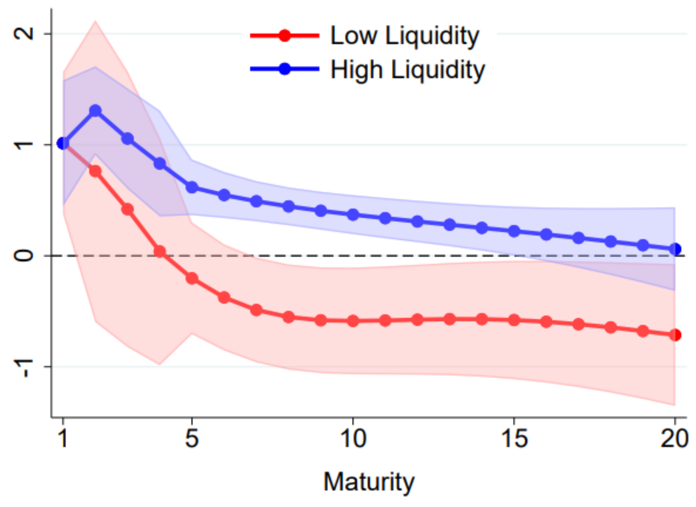


Bigger confidence intervals for β_{ll}

$$\Delta f_{n,t}^{(\tau)} = \alpha + \beta_{n,hl}^{(\tau)} \cdot [mps_t \times \mathbb{1}_{\text{HighLiq}_{t-1}}] + \beta_{n,ll}^{(\tau)} \cdot [mps_t \times \mathbb{1}_{\text{LowLiq}_{t-1}}] + \epsilon_{n,t}^{(\tau)}$$

$$\Delta y_{n,t}^{(\tau)} = \alpha + \beta_{n,hl}^{(\tau)} \cdot [mps_t \times \mathbb{1}_{\text{HighLiq}_{t-1}}] + \beta_{n,ll}^{(\tau)} \cdot [mps_t \times \mathbb{1}_{\text{LowLiq}_{t-1}}] + \epsilon_{n,t}^{(\tau)}$$

Nominal Forward Curve ‣ Spot ‣ Raw



Nominal Spot Curve