

Discussion of
“THE PEOPLE VERSUS THE MARKETS:
LONG-RUN INFLATION AND MONETARY POLICY”
by Ricardo Reis

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The views expressed here are mine and are not representative of the views of Deutsche Bundesbank or the Eurosystem.

Outline

- 1 Summary
- 2 Comments/questions
 - Fall of 2008: Liquidity or Disagreement?
 - Risk *and* disagreement or risk *through* disagreement?
 - Should central banks react to market signals? Reflection problems.
 - Minor comments.
- 3 Conclusion

Summary of the paper and some related literature

High-Level Summary of the Paper

- Shows discrepancy between market and survey-based measures of long-run inflation expectations correlated with inflation, monetary policy,
- Argues discrepancy partly due to disagreement between marginal trader and households, but standard model-based measures of inflation risk premium do not account for discrepancy.
- Proposes Grossman-Stiglitz type model of inflation risk with three agents: survey participants, market traders, noise traders. Uses model to map distribution of survey forecasts into traders' expectations. Model-implied disagreement bw traders and HH explains discrepancy.
- General equilibrium version of model to discuss inflation determinacy and anchoring of π^e when CB responds to different signals about π .

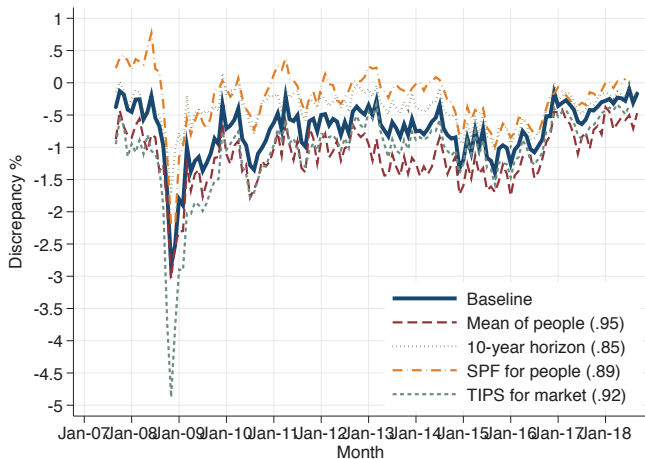
Inflation risk and disagreement: selective literature review

- Literature on heterogeneous beliefs in asset pricing: Detemple&Murphy 1994, Buraschi&Jiltsov 2006, Gallmeyer&Hollifield 2008, Ehling et al 2016, ...
- Most closely related: Xiong&Yan (RFS 2009) → dynamic equilibrium model of bond pricing with two investors having different priors about informativeness of signals about inflation target. Take speculative positions against each other ⇒ relative wealth fluctuates.
- Marginal investor's belief is wealth-weighted average belief. As wealth fluctuates between agents, marginal investor's risk assessment varies ⇒ affects equilibrium bond prices.
- Representative agent term structure models: sometimes used to estimate inflation risk premia and show comovement with fcst disagreement about π (e.g. Abrahams et al. 2016).

Comments

Fall of 2008: Liquidity or Disagreement?

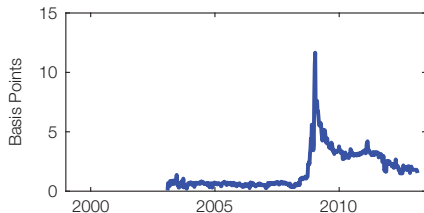
- Ricardo shows different measures of discrepancy comove strongly, all drop in 2008. Strong business cycle component?



Fall of 2008: Liquidity or Disagreement?

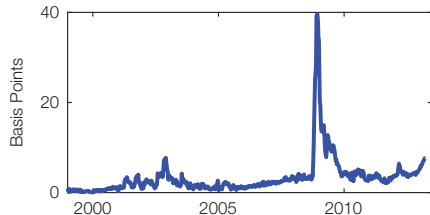
- Consensus in the literature: inflation-indexed less liquid than nominal bonds (Pflueger & Viceira 2009, Abrahams et al. 2016, ...).
- Illiquidity particularly pronounced after collapse of Lehman. Shows up in various measures of liquidity of market-based inflation comp.:

Graph A. TIPS Bid-Ask Spread



Source: D'Amico, Kim, Wei (2018).

Graph C. Average Absolute TIPS Curve-Fitting Errors



Fall of 2008: Liquidity or Disagreement?

- Suggest to emphasize the role of illiquidity in explaining discrepancy between market-based and survey-based measure of expected inflation.
- Possible in your framework. In Grossman-Stiglitz liquidity is driven by supply shocks and precision of informed traders' signals: "speculative market where prices reveal a lot of information will be very thin because it will be composed of individuals with very similar beliefs."
- Illiquidity in fall of 2008 likely due to TIPS being dumped by Lehman Bros, scarce balance sheet capacity of arbitrageurs rather than extremely precise information.

Risk *and* disagreement or risk *through* disagreement?

- Ricardo's decomposition separates risk from disagreement:

$$\phi_t = \underbrace{E_t^*(\pi_{t,T}) - E_t^m(\pi_{t,T})}_{\text{risk}} + \underbrace{E_t^m(\pi_{t,T}) - E_t^P(\pi_{t,T})}_{\text{disagreement}}$$

where

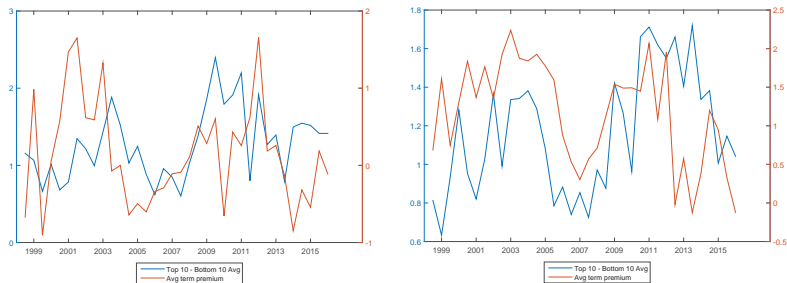
- $E_t^m(\pi_{t,T})$ subjective belief of the marginal trader
- $E_t^P(\pi_{t,T})$ subjective belief of the average household
- Different from asset pricing models with heterogeneous beliefs in which risk premia arise *because of* disagreement, e.g. Xiong & Yan (2009).

Risk *and* disagreement or risk *through* disagreement?

- Cao, Crump, Eusepi, Moench (2018): quantitative term structure model with two investors disagreeing about long-run level of rates.
- SDF of representative investor approximated by weighted average of SDFs of two investors, weights given by shares of total wealth.
- In this model, changes in term premia arise because of
 - Common response of investors to changes in pricing factors.
 - Heterogenous signals: impact representative investor's term premium as long as as the relative wealth ratio is different from one.
 - Relative wealth effect: investors disagree about expected returns, choose different portfolios. Given previous period's portfolio choice, return realization changes relative market power \Rightarrow moves term premium of representative investor.

Risk *and* disagreement or risk *through* disagreement?

Figure 4: Consensus term premium and disagreement about short rates



- Our paper (and Xiong and Yan 2009 etc.): disagreement between traders (beliefs measured by professional forecasts) drives risk premia.
- In Ricardo's model: disagreement between marginal trader and average household, who doesn't trade. As far as I understand no role for disagreement between traders driving relative wealth and risk premia.

Should CB react to market signals? Reflection problems.

- Ricardo's GE model suggests that CB should react forcefully to large deviations of market-based from survey-based π^e .
- Recent literature discusses reflection problems in financial markets (Bond et al. 2009, Morris&Shin 2018, Gai et al. 2019).
- Models where the *use of market data is self-defeating in the sense that the reflection of the expected market-based action in the price destroys the informational content of the price.* (Bond et al. 2009)
- Crucial difference to Ricardo's analysis: price in financial market affects real value of a security via information it provides to decision makers. In Grossman-Stiglitz type models security value *exogenous*.

Should CB react to market signals? Reflection problems.

- Gai et al. (2019) ingredients for CB reflection problem:
 - i) CB relies on market-based signal reflecting average action \bar{a} of market participants, public signal y (e.g. survey data), and private signal z (own research) about fundamental θ :

$$r = \lambda \bar{a} + (1 - \lambda)[(1 - \mu)y + \mu z].$$

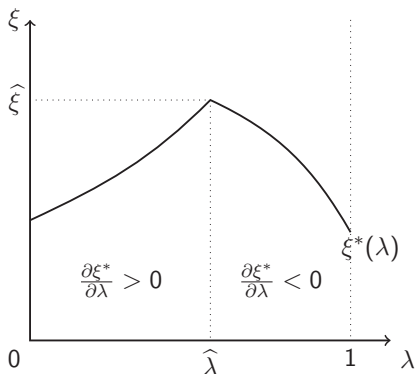
- ii) Market participants try to match weighted average of central bank action as well as fundamental using public signal y and private signal x_i . Maximize:

$$u_i = -\omega(a_i - r)^2 - (1 - \omega)(a_i - \theta)^2.$$

- iii) Equilibrium determination via Stackelberg game: CB chooses policy rule $r(\bar{a}, y, z)$ and investors choose optimal action $a_i(r, y, x_i)$.

Should CB react to market signals? Reflection problems.

- Since r depends on market-based signal \bar{a} , market participants' actions a_i exhibit strategic complementarity: optimal choice increases in $\bar{a} \Rightarrow$ for CB's weight λ on \bar{a} large enough information value of market signal decreases in that weight:



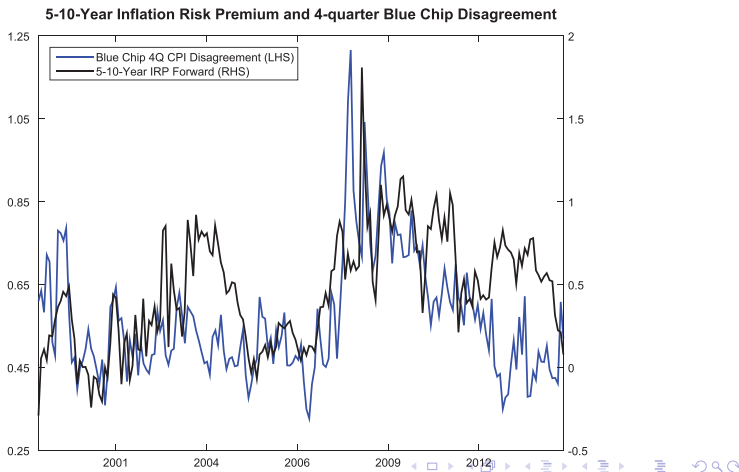
Should CB react to market signals? Reflection problems.

- Why does this issue not arise in Ricardo's model with CB rule responding to market expected inflation?
- As long as CB reacts to market signal, and traders' utility depends on policy rate, their bond pricing decisions should be strategic complements.
- Somehow the equilibrium bond price doesn't seem to depend on policy rate in determinate equilibrium. Correct? If so, why?

Minor Comments

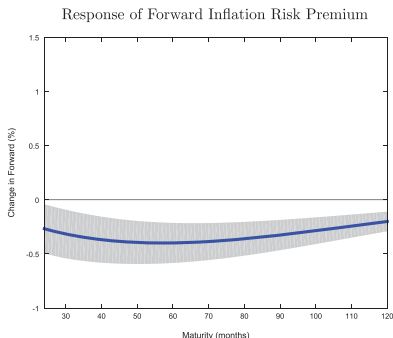
Minor Comment I

- Some empirical measures of inflation risk premia do covary with forecast disagreement about inflation. Figure 6 from Abrahams et al. (JME 2016):



Minor Comment II

- Finding that discrepancy responds negatively to MP shock consistent with prior evidence. Figure 7 from Abrahams et al. (JME 2016):



- Consistent with structural term structure models (Piazzesi&Schneider 2007; Rudebusch&Swanson 2012) → Disinflationary shocks increase real payoff of nominal bonds. When $cov(\Delta y, \pi) > 0$, nominal bonds hedge against bad times. MP shocks raise $cov(\Delta y, \pi) > 0$ so reduce IRP.

Conclusion

Conclusion

- Very nice paper that looks at an old problem with fresh eyes.
- Disagreement among market participants and households partially explains discrepancy between market and survey-based inflation compensation.
- Argues CB should respond to this discrepancy when large.
- I suggest to discuss illiquidity, risk premia arising from disagreement among traders, and potential reflection problems in paper.
- Look forward (and recommend everyone) to reading!