

Discussion of
"Optimal Monetary Policy with Heterogeneous
Agents"

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1 Summary of the Paper

- Incomplete markets model with heterogeneous agents.
- 1 government and 3 agent groups:
 - Risk-neutral foreign investors (SOE).
 - Continuum of low-income risk-averse domestic households.
 - Continuum of high-income risk-averse domestic households.
All HH can each be either debtors or creditors.
- Other features:
 - Only uncertainty = Poisson income process.
 - Risk aversion pins down the wealth distribution.
 - Non-contingent nominal long-term bonds + costly inflation.
 - Central bank chooses inflation.
 - Optimal policy under commitment or discretion.
- Significant methodological contributions.
- Intuitive results (mostly).

2 Results

2.1 Preliminaries: Price of Long-Term Bonds Q_t

- Q_t implies current nominal yield r_t .
- Q_t incorporates expectations for entire future inflation path $\{\pi_{t+s}\}_{s=0}^{\infty}$.
- Therefore current nominal yield is a function of **future average** inflation.
- But current real yield $r_t - \pi_t$ is mostly driven by **current** inflation.
- \implies **Initially high followed by low inflation temporarily reduces real yields.**

2.2 The Costs and Benefits of Inflation

Inflation Benefits

Redistribution Gains
through a *high level* of inflation
(under commitment and discretion)

Foreign-to-Domestic
to soak the foreigners

Rich-to-Poor
to equalize MU of Wealth

Incredible because an anticipated high level of inflation
does not significantly reduce real yields

Inflation Costs

Redistribution Gains
through a *negative path tilt* of inflation,
with low long-term inflation
(only under commitment)

+

Quadratic utility cost of inflation
(under commitment and discretion);
under commitment, any tilted path
cannot start too high and must end lower
than under discretion

Credible because, with long-term bonds, a downward-tilted
path of inflation does significantly reduce real yields

2.3 Optimal Policy

- Optimal Discretion - Barro-Gordon-type Outcome:
 - High steady-state inflation.
 - Unsuccessful at redistribution.
- Optimal Commitment - Time-Inconsistent Outcome:
 - Inflation initially high, close to zero in steady state.
 - Successful at redistribution.
 - Welfare advantage of around 0.3% of s/s consumption.
- These results are not surprising, at least qualitatively.
- The main contributions, in my view, are therefore:
 - Methodological contribution to solving these models.
 - Quantitative results on wealth distribution.

3 High-Level Comments

- This is a very complex paper. Is this necessary?
 - The appendix is as long as the paper! (43 pages each).
 - The methodological investment is huge.
 - Could this have been done more simply?
 - How about a model with 3 representative agents?
 - Most of the key economic channels should still be there.
 - The intuition would be much easier to see.
 - Do these continuous-time techniques carry over to that case?
 - Or are there challenges?
 - E.g. in computing the multi-agent discretion case?
- Including welfare results for the timeless perspective would add value.
- The discussion of the economic intuition could be significantly improved.

4 Intuition: Nominal versus Real Yields

4.1 The Intuition Presented in the Paper

- Paper repeatedly claims that nominal yields matter irrespective of inflation:
 - “...incentive to reduce nominal yields for an economy that is a net debtor...” (p. 4).
 - “...a lower (nominal) yield gives the HH an incentive to save less and consume more...” (p. 11).
 - “...the central bank understands that a commitment to higher inflation in the future lowers (nominal) bond prices today, which slows down asset accumulation...” (p. 17)
 - “...Under commitment, the central bank internalizes the fact that higher future inflation ... raises nominal bond yields, which hurts net bond issuers.” (p. 28)

– “...central bank ... commits to gradually reducing inflation in order to prevent inflation expectations from permanently raising nominal yields.”
(p. 28)

- What really matters economically is real yields, not nominal yields.
- This is stated in other parts of the paper.
- But then there are repeated claims that sound like the level of nominal yields per se matters.

4.2 The Intuition in a Simpler Model

- Discrete time for simplicity.

- Utility function:

$$U_0 = \sum_{t=0}^{\infty} \left(\frac{1}{1 + \rho} \right)^t (u(c_t) - v(\pi_t))$$

- Budget constraint:

$$A_{t+1} = A_t \left(1 + \frac{\delta}{Q_t} - \delta \right) + P_t \frac{y_t - c_t}{Q_t}$$

- Euler equation:

$$1 = \frac{1}{1 + \rho} \frac{u_{c_{t+1}}}{u_{c_t}} \frac{(1 - \delta) \frac{Q_{t+1}}{Q_t} + \delta \frac{1}{Q_t}}{1 + \pi_{t+1}}$$

- $(1 - \delta) \frac{Q_{t+1}}{Q_t}$ = nominal capital gains on non-amortized portion.
- $\delta \frac{1}{Q_t}$ = nominal amortization payment.

- For one-period bonds ($\delta = 1$):

$$1 = \frac{1}{1 + \rho} \frac{u_{c_{t+1}}}{u_{c_t}} \frac{1 + i_t}{1 + \pi_{t+1}} = \frac{1 + r_{t+1}}{1 + \rho} \frac{u_{c_{t+1}}}{u_{c_t}}$$

- This is a completely standard equation.
- Real yields matter for allocations, not nominal yields.

- For five-period bonds ($\delta \cong 0.2$):

$$1 = \frac{1}{1 + \rho} \frac{u_{c_{t+1}}}{u_{c_t}} \frac{(1 - \delta) \frac{i_t + \delta}{i_{t+1} + \delta} + (i_t + \delta)}{1 + \pi_{t+1}}$$

- Assume $\pi \uparrow$ by 0.04, $i \uparrow$ by 0.02, i smooth thereafter ($i_{t+1} \cong i_t$).

- Then we have:

$$1 \cong \frac{1}{1 + \rho} \frac{u_{c_{t+1}}}{u_{c_t}} \frac{1 + i_t}{1 + \pi_{t+1}}$$

- This is approximately equal to the standard equation.
- Lower real yields matter for allocations, not higher nominal yields.
- c_t jumps up and asset accumulation decreases.

4.3 Why Does CB Really Commit to Lower Long-Run π ?

- Reminder of what the paper says: “...CB ... commits to gradually reducing inflation in order to prevent inflation expectations from permanently raising nominal yields.” (p. 28)
- But the problem is not the level of inflation or of nominal yields.
- Instead, the central bank does this:
 - To engineer a temporary drop in real interest rates.
 - While minimizing the long-run utility cost of high inflation.

5 Conclusions

- This will be a really influential paper.
- The key contribution is methodological and looks to me to be major.
- For the economics, it should be possible to get the same results with a much simpler model.
- Including welfare results for the timeless perspective would add value.
- A more in-depth discussion of the economic intuition behind the welfare results would help the reader.