The Optimal Stability-Oriented Monetary Policy: Monetary Policy Under Low Trend Inflation

Guido Ascari and Tiziano Ropele

Discussion by

Marc Giannoni
Columbia University

Workshop on Small Monetary Macro Models, Banque de France
September 2004
Outline

- Praise
- Review of the paper
- Some comments
  1. Relevance of analysis of trend inflation (praise!)
  2. Welfare function
  3. Discretionary MP
     - relevance
     - indeterminacy
  4. Commitment
     - Some analytical results
  5. Misc. items
  6. Conclusion
Review of the Paper: Motivation

- Paper’s main contribution: Extend optimal MP analysis to case of positive (trend) inflation

- Motivation for trend inflation:
  - Most papers on NKPC log-linearize around 0-inflation steady-state
  - But zero-inflation:
    - unrealistic (inflation positive in most countries)
    - not a target of CBs (e.g., ECB inflation target “below, but close to, 2%”: helps prevent deflations)
    - simple models may miss other important features that warrant positive steady-state inflation (paper cites: debt burden, downward nominal rigidities ??)
Comment #1: Relevance of analysis of trend inflation

- Makes sense to study optimal MP with non-zero inflation

  - Ideally, would want to model above frictions
    (e.g., Reifschneider and Williams, 2000, Adam and Billi, 2003, Eggertson and Woodford, 2003)

  - But first attempt: reasonable to assume exogenous trend inflation
Economic Framework

- Framework similar to Ascari (2004), RED:
  - Simple micro-founded model
    - Households maximize utility
    - Intermediate and final goods producers
    - Calvo price setting
    - Extended for trend inflation: $\gamma \geq 1$ gross rate of money supply growth

- Generalized NKPC (log-lin. around st-st with trend inflation)

  \[
  \hat{\pi}_t = \alpha_0 \hat{Y}_t + \beta \gamma E_t \hat{\pi}_{t+1} + \alpha_2 \hat{\phi}_t \\
  \hat{\phi}_t = \alpha_1 \hat{Y}_t + \alpha_3 \left[ (\theta - 1) E_t \hat{\pi}_{t+1} + E_t \hat{\phi}_{t+1} \right]
  \]

  where $\alpha_1, \alpha_2, \alpha_3$ functions of $\gamma$
Economic Framework (2)

- Alternative formulation of NKPC

\[ \hat{\pi}_t = (\alpha_0 + \alpha_1 \alpha_2) \hat{Y}_t + [\beta \gamma + \alpha_2 \alpha_3 (\theta - 1)] E_t \hat{\pi}_{t+1} \]

\[ + \alpha_2 \alpha_3 E_t \left\{ \sum_{j=0}^{\infty} \alpha_3^j \left[ \alpha_1 \hat{\pi}_{t+j} + \alpha_3 (\theta - 1) \hat{\pi}_{t+1+j} \right] \right\} \]

- Special case: \( \gamma = 1 \) (canonical NKPC)

\[ \pi_t = \kappa \hat{Y}_t + \beta E_t \pi_{t+1} \]
Model Implications

- Model implications (Ascari, 2004): With trend inflation ...
  - ... both long-run and short-run properties of Calvo-type model change “dramatically”:
    - steady-state output is much lower
    - IRFs to monetary shocks look different
  - ... canonical NKPC misspecified
    - May not be appropriate to compare basic model with data
  - ... correct NKPC more forward-looking

- Comment: Clearly worth studying optimal MP with trend inflation!
Caveat: Inflation Indexation

- Ascari (2004) shows:
  - Full inflation indexation (to trend inflation [Yun, 1996], or to past inflation [CEE, 2001]): cancels effect of trend inflation

- Maury and Sahuc (2004):
  - Partial inflation indexation: higher indexation reduces effect of trend inflation

**Comment:** With inflation indexation, optimal MP conclusions may remain similar to standard case (worth mentioning)
Optimal Monetary Policy

- Postulate CB objective function

\[
\frac{1}{2} E_0 \left\{ \sum_{t=0}^{\infty} \beta^t [\pi_t^2 + \chi Y_t^2] \right\}
\]

- Appears conventional
- But implicitly assumes that deviations of inflation from 0 are costly!

- **Peculiar:** Why would CB prefer positive inflation if it is more costly than 0-inflation?
More desirable loss function:

\[ \frac{1}{2} E_0 \left\{ \sum_{t=0}^{\infty} \beta^t \left[ (\pi_t - \pi^*)^2 + \chi Y_t^2 \right] \right\} \text{ where } \pi^* = \gamma - 1. \]

Even better, could determine micro-founded objective function (2nd order approx. to expected utility)

This should affect some conclusions, e.g.:

- “ECB-like MP (i.e., 2% target inflation rate in the medium term) determines a substantial percentage loss in welfare with respect to a zero inflation target policy.
- Instead, if ECB conducts optimal MP (according to its objective function), should achieve lowest possible loss!

Ascari-Ropele implicitly assume that CB loss function (with \( \pi^* > 0 \)) ≠ social loss function (with \( \pi^* = 0 \)). Why?
Optimal Policy under Discretion

- **Relevance?**
  - Personal view: not most interesting exercise (but needs to be done, as this is debatable)

- Ascari-Ropele finding: Indeterminacy prevalent
  - Yes, ...
  - But there may be ways around (form of "policy rule" plays a key role): **price-level rule** likely to yield determinacy (Giannoni, 2000)
Optimal Policy under Commitment

- More relevant (especially, if consider “commitment from timeless perspective” [Woodford, 1999])

- Commitment: numerical results
  - Interesting, but could get more analytical results

- FOCs from CB optimal problem (log util.)
  \[
  0 = (\pi_t - \pi^*) + \psi_{2t} - \gamma \psi_{2,t-1} - \psi_{3,t-1} \alpha_3 (\theta - 1) \\
  0 = \chi Y_t - \alpha_0 \psi_{2,t} \\
  0 = -\alpha_2 \psi_{2,t} + \psi_{3,t} - \alpha_3 \psi_{3,t-1}
  \]

where \( \psi_{2,t}, \psi_{3,t} \) are Lagrange multipliers.
A Robustly Optimal Target Criterion

- Can use system of FOCs (only) to obtain an optimal target criterion or optimal interest-rate rule (Giannoni and Woodford, 2002, 2003, 2004)
  
  - Eliminate $\psi_{2,t}, \psi_{3,t}$ in FOC1 using FOC2 and FOC3 and obtain

  \[
  0 = [\pi_t - \alpha_3 \pi_{t-1} - (1 - \alpha_3)\pi^*] \\
  + \frac{\chi}{\alpha_0} [Y_t - (1 + \alpha_2(\theta - 1))\alpha_3 Y_{t-1} - \gamma(Y_{t-1} - \alpha_3 Y_{t-2})]
  \]

- Properties (see Giannoni and Woodford, 2002):
  - results in determinate equilibrium
  - equilibrium is optimal
  - is robust to stochastic properties of exog. shocks
  - involves only target variables
Misc. Items

- Conduct of monetary policy: peculiar (?)
  - CB sets: long-run targets for $M_s$
  - CB optimally chooses short-run interest rate at each date
  - Yet, $M_s$ and $i$ cannot be determined separately

- How can one formally model 2 pillars of ECB strategy?
Conclusion

- Ascari-Ropele paper: Very interesting and relevant!

- Analysis of optimal MP with trend inflation: important

- Discretion case:
  - Not most interesting exercise (but needs to be done)
  - Indeterminacy may be avoided

- Commitment case:
  - Can do more analytically (e.g., derive optimal target criterion)

- Welfare conclusions (e.g., large loss of optimal policy with 2% trend inflation compared to 0%)
  - Depends crucially on postulated (implausible?) loss function