Discussion of

“Using a Projection Method to Analyze Inflation Bias in a Micro-Founded Model”

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November 22, 2008
Motivation: What is the inflation bias?

- Quantify the inflation bias due to lack of policy commitment in a nonlinear model.
- Compare the precision of a *local* approximation to a *global* approximation.
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- Quantify the inflation bias due to lack of policy commitment in a nonlinear model.
- Compare the precision of a local approximation to a global approximation.
Framework

- Steady state output is inefficiently low which allows for positive steady state inflation à la Yun (2005).
- The policymaker maximizes welfare for the representative agent, but does not pre-commit to a path for future actions.
- Find a smooth global approximation of the optimal policy through standard Chebyshev polynomials à la Judd (1998).

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Main Point: Should we linearize our models...

- This is a very interesting exercise for a number of reasons:
  - inflation ultimately reduces standards of living;
  - linearity is a stark assumption;
  - better models/methods/solutions may foster better policies.

- For the model in the paper, however, a local approximation may seem a good approximation because it underestimates the inflation bias up to a tenth only.

- . . . for sake of simplicity, we should linearize our models if the nonlinearity is of second order.
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Check precision beyond the steady state

- A local approximation is a good approximation for the steady state, but is it a good approximation beyond the steady state?
- Turn on the productivity shock, solve the stochastic model, and perform stochastic simulations:
  - Compare impulse responses of inflation for local and global approximation.
  - Compare unconditional moments of the long-run stationary distribution of inflation—mean, variance, skewness, and kurtosis.
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- Compare unconditional moments of the long-run stationary distribution of inflation—mean, variance, skewness, and kurtosis.
Could quantify inflation bias due to key nonlinearities

- Both a *linear* approximation and a *smooth* global approximation fail to capture key nonlinearities such as the zero lower bound (ZLB) on nominal interest rates.

- Billi (2007) uses a *non-smooth* global approximation to quantify the optimal long-run rate of inflation subject to the ZLB—the policymaker can pre-commit to a path for future actions.

- Billi (2008) compares price-level targeting and inflation targeting when the economy is stuck at the ZLB—the policymaker can pre-commit to a simple interest-rate rule.

- If the policymaker cannot pre-commit, how much larger is the inflation bias subject to the ZLB?
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Optimal Simple IT Rule $\pi^* = 1\%$

- Long-Run Distribution
  - Skewness = 0.0
  - Kurtosis = 3.0

Optimal Simple PLT Rule $\pi^* = 1\%$

- Long-Run Distribution
  - Skewness = 0.0
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Aggressive Simple IT Rule $\pi^* = 1\%$

- Long-Run Distribution
  - Skewness = -0.3
  - Kurtosis = 3.8

Aggressive Simple PLT Rule $\pi^* = 1\%$

- Long-Run Distribution
  - Skewness = 0.0
  - Kurtosis = 3.0
Conclusions

- A local approximation is good enough if the nonlinearity in our models is of second order. Otherwise should use a global approximation.
- Finding the inflation bias is a very interesting exercise.
- Could quantify the inflation bias due to key nonlinearities such as the ZLB.
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