Incorporating Diagnostic Expectations into the New Keynesian Framework

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Introduction

- ▶ What are Diagnostic Expectations (DE)?
  - ▶ "Representativeness heuristic" (Kahneman & Tversky)
  - ▶ Tendency to exaggerate how representative a small sample is
  - ▶ Advantages: Microfounded & tractable; realistic & portable

- ▶ DE can be productively integrated into the NK framework
  How do we show this?
  First: Start off with technical contribution: solution method
  Then:
  A) Analytically, address 4 key issues
    1. Amplification
    2. Supply shocks
    3. Fiscal policy
    4. Overreaction of expectations
  B) Empirically
    - ▶ Show DE improve the fit of medium-scale models

Amplification: NK vs. RBC

- ▶ New Keynesian Model
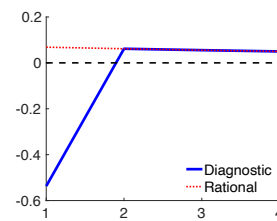
Variable	RE	DE	Percentage Increase
Output	0.0048	0.0085	77%

Volatility of output **increases**

- ▶ (Frictionless) Real Business Cycle Model

Variable	RE	DE	Percentage Increase
Output	0.0064	0.0059	-7%
Consumption	0.0015	0.0030	100%
Investment	0.0533	0.0503	-6%

Volatility of output **falls**

"Covid" Shock:
Fall of Output Gap After Negative TFP Shock

Intuition: DE agent expects TFP to fall by a lot
(in excess of reality)
$\implies$ Sharp drop in consumption

Fiscal Policy

Proposition

Consider i.i.d. government spending shocks.

1. *Under DE, the multiplier is greater than 1 iff $\theta > \phi_\pi$.*
2. *The multiplier is greater under DE than under RE.*
3. *The multiplier is increasing in θ, and tends to ∞ as $\theta \to \phi_\pi + \kappa^{-1}$.*

- ▶ Diagnostic Fisher equation:
  $\hat{r}_t = \hat{i}_t - \mathbb{E}_t^\theta[\pi_{t+1}] - \theta(\pi_t - \mathbb{E}_{t-1}[\pi_t])$

- ▶ Role of **endogenous** extrapolation of inflation

- ▶ Dominates effect of monetary policy if $\theta > \phi_\pi$

Bayesian Estimation

- ▶ Rich model with host of frictions and shocks

  Question: Do DE improve the fit to the data, even in the presence of all these other nominal, real, and informational frictions?

- ▶ θ post. mode: 0.99, conf. interval: [0.77; 1.21]
  Marginal likelihoods:
  - ▶ RE model: -1590.66
  - ▶ DE model: improvement to -1584.31

- ▶ $2\log(BF) = 12.70$
  Strong evidence in favor of DE