# Labor Markets in Heterogeneous Sectors

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# Brazilian labor market

- the paper uses a DSGE model with DMP added
  - technically challenging
  - 39 deep parameters, 13 standard deviations....etc.
  - adjustment costs leaving the market
  - demographics
  - Metropolis-Hastings MCMC
- contributions
  - endogenous OLF
  - asymmetric cost of reallocation
- why such complexity? (the mode discussant response!)

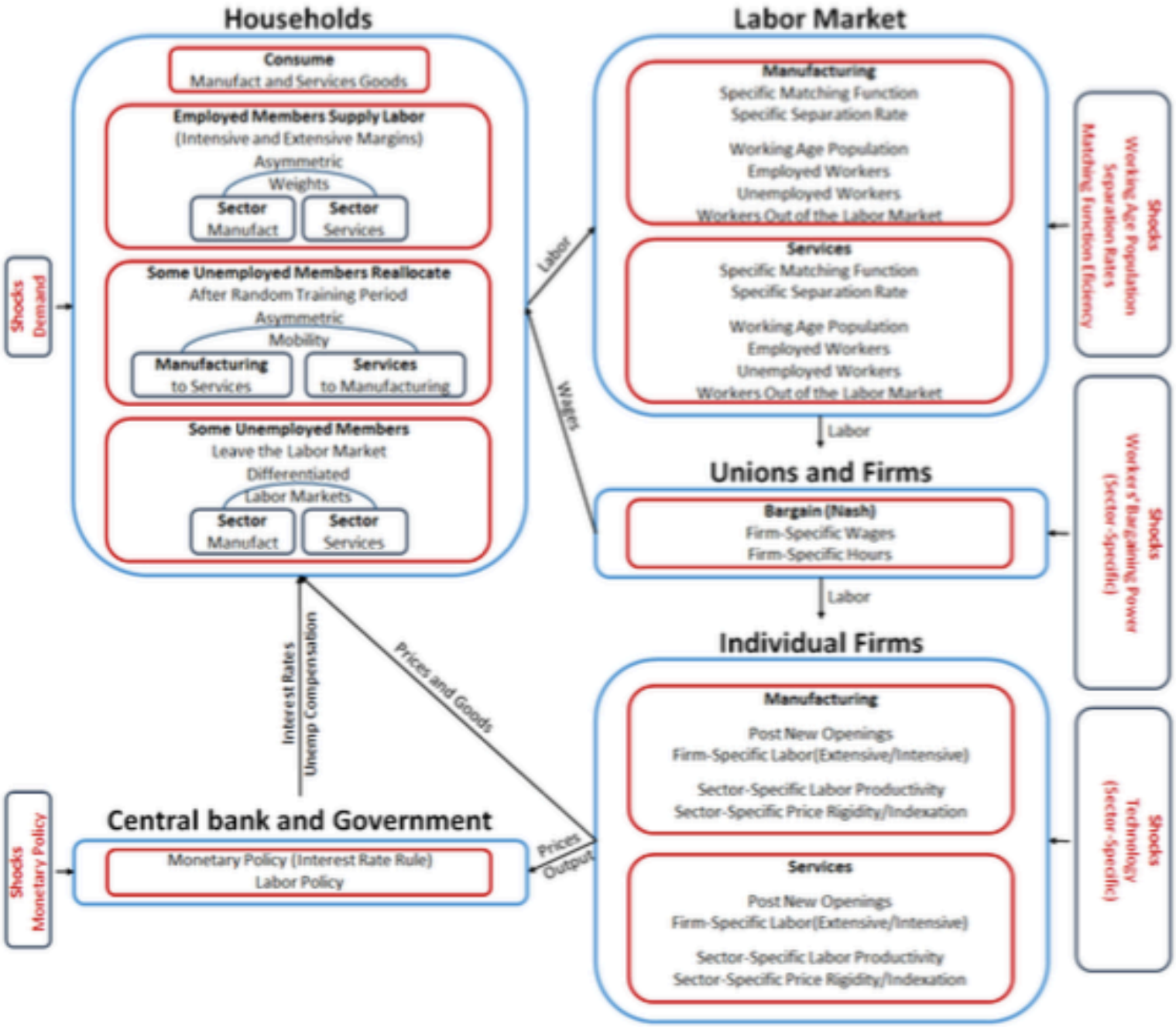



Figure 2: Model Structure

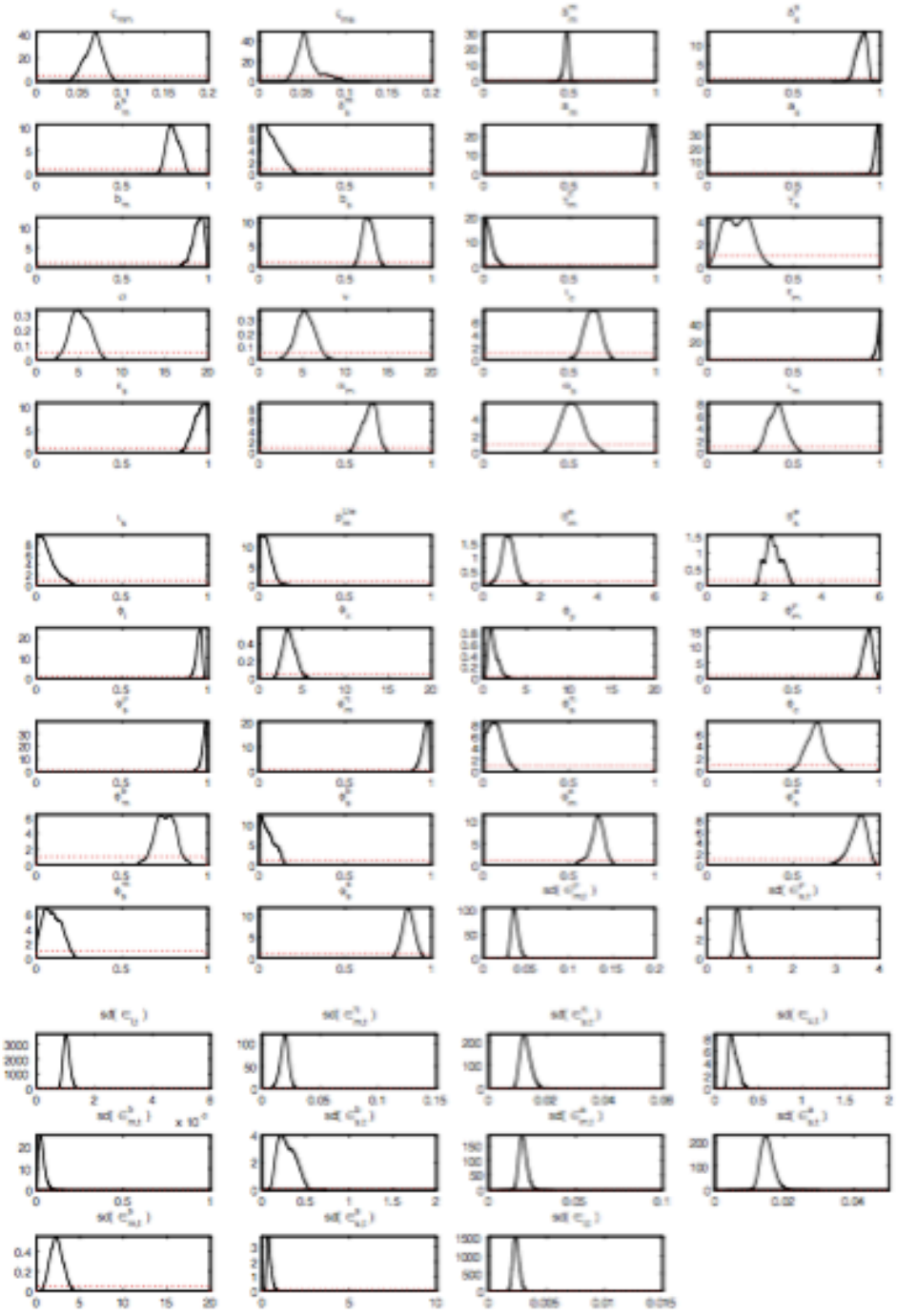


Figure 3: Posterior (black) and Prior (dotted) Marginal Densities - Heterogeneous Model

# Brazilian labor market...some facts

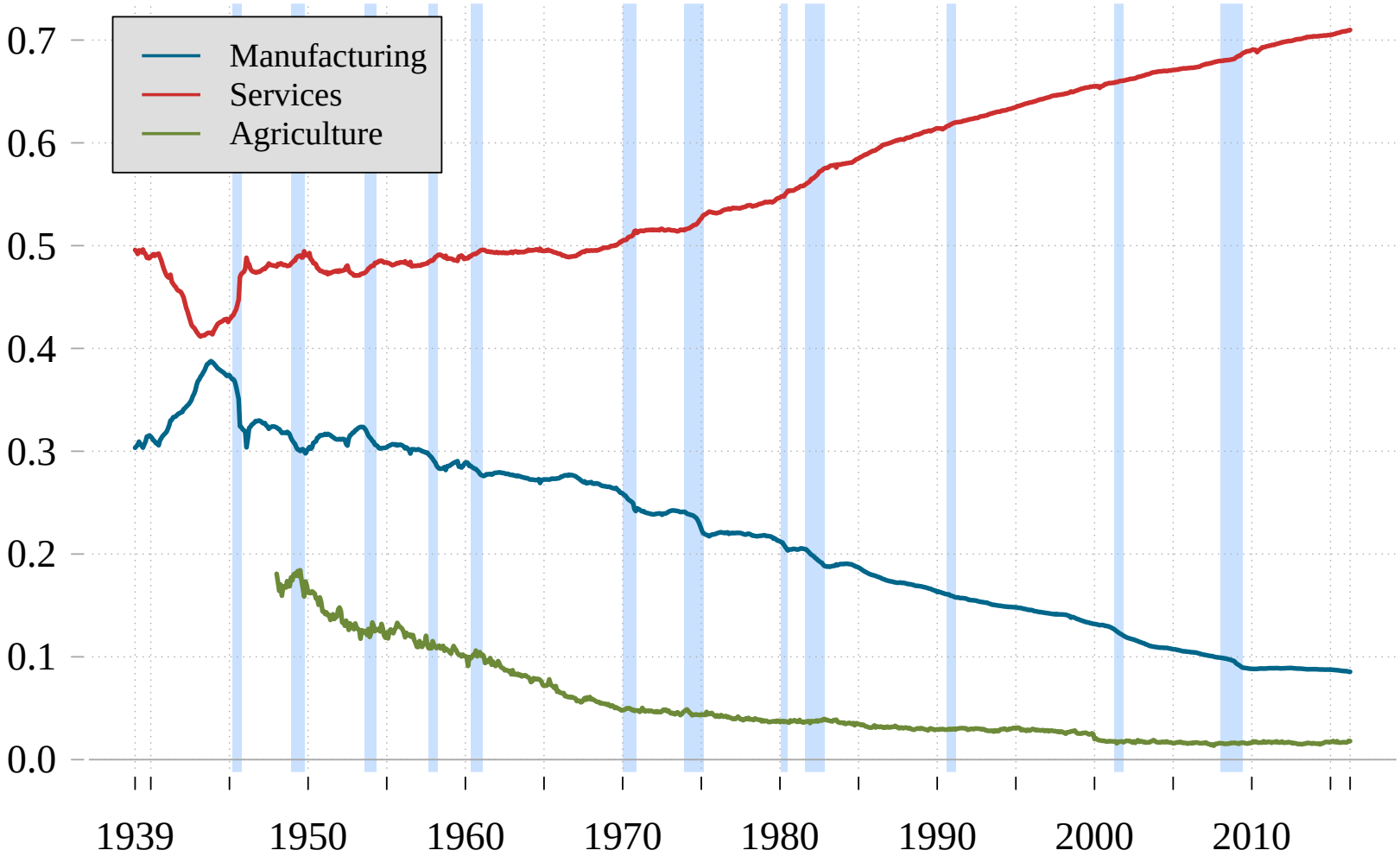
- Brazilian labor market heterogeneity?
  - manufacturing continues to decline
  - services sector increasing (until lately)
- IBGE report for first three quarters of 2015:
  - labor market shed 9.1 million jobs
  - professional services down 668,000 jobs
  - agribusiness lost 179,000 jobs last year
- household services UP 315,000

# current paper...perspective

- is this really about frictions?
- how can it take 10 years to move from services to manufacturing?
- why a training period when changing sectors?
  - that seems more like occupational changes
- why is the cost of reallocation asymmetric?

## Share of Total Employment

Percent, SA




Source: BLS

# technology: intensive vs. extensive margin

- how do sectors respond to shocks?
- manufacturing
  - variable workweek, shift work, etc.
- services
  - more flexible responses to shocks
- are prices more flexible in services?

# a comment on New-Keynesian models

- all is not as it appears
- need to be careful when interpreting
  - the mechanism is not through the Keynesian real interest rate channel

# Peter Ireland, New Palgrave Dictionary (2015)

- Real effects of monetary policy in NK models

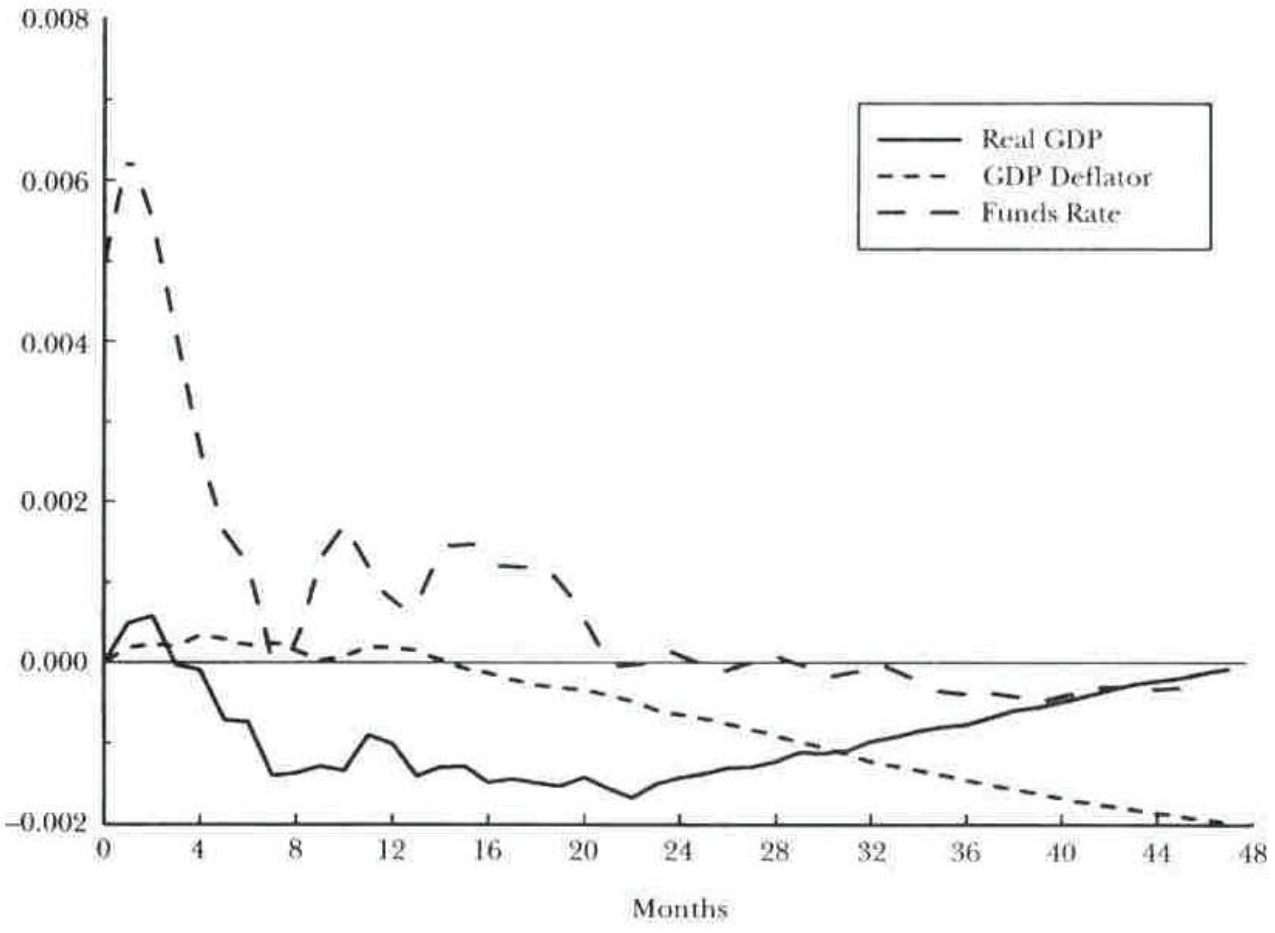
"*In this benchmark New Keynesian model, monetary policy operates through the traditional Keynesian interest rate channel. A monetary tightening, in the form of a shock to the Taylor rule, that increases the short-term nominal interest rate translates into an increase in the real interest rate as well when nominal prices move sluggishly due to costly or staggered price setting. This rise in the real interest rate then causes households to cut back on their spending as summarized by the IS curve. Finally, through the Phillips curve, the decline in output puts downward pressure on inflation, which adjusts only gradually after the shock.*"

# Bernanke and Gertler (1995)

- a real rate channel in VARs

*Figure 1*

**Responses of Output, Prices and Federal Funds Rate to a Monetary Policy Shock**



# NK model—no capital

- cashless economy, monetary policy as Taylor Rule
- preferences of a representative household

$$u = \log c - \frac{l^{1+\eta}}{1+\eta}, \quad \eta \geq 0$$

- intermediate goods aggregator

$$y = \left[ \int y(j)^{\varepsilon} dj \right]^{\frac{1}{\varepsilon}}, \quad \varepsilon \in (0,1)$$

- $j \in [0,1]$ monopolists with sticky prices $\implies$ NK Phillips Curve

# NKPC

- FOC for optimal price, log-lin around zero s/s infl. rate
- Rotemberg: quadratic cost of price adjustment

$$\pi_t = -\frac{1}{\phi(\varepsilon - 1)}(\chi_t - \chi) + \beta E_t \pi_{t+1}, \quad \phi \geq 0$$

- Calvo: extensive margin of price adjustment

$$\pi_t = \frac{(1-\theta)(1-\theta\beta)}{\theta}(\chi_t - \chi) + \beta E_t \pi_{t+1}, \quad \theta \in [0, 1]$$

- Rotemberg: $\exists$ resource loss in goods market clearing condition
- Calvo: $\exists$ aggregation bias in aggregate prod. fn.
- both disappear in a log-lin version of the model

# Characterization

- log-linearized 3-equation system

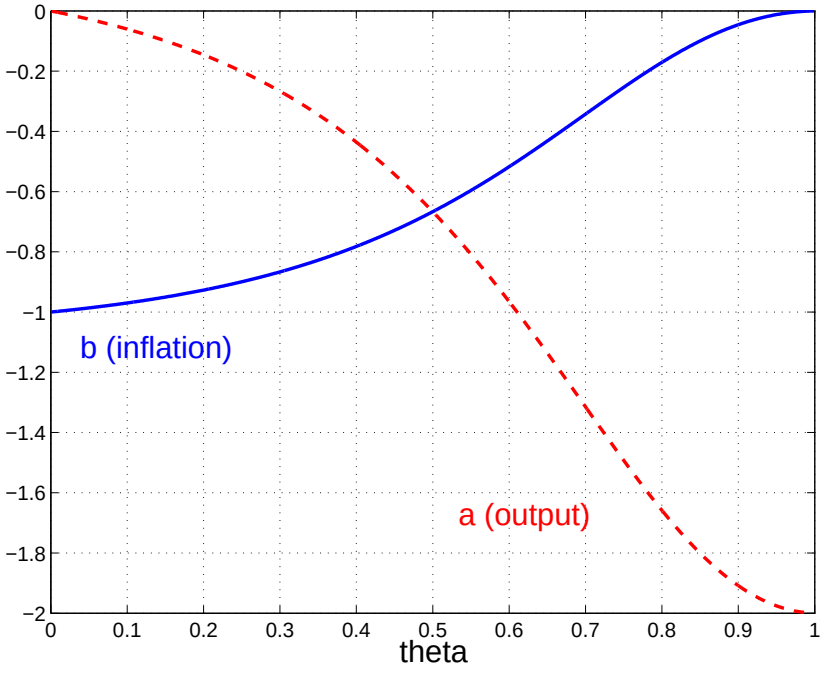
$$\widehat{y}_t = E_t \widehat{y}_{t+1} - (\widehat{i}_t - E_t \pi_{t+1}) \qquad \text{Euler}$$

$$\pi_t = \Omega \widehat{y}_t + \beta E_t \pi_{t+1} \qquad \text{NKPC}$$

$$\widehat{i}_t = \nu \pi_t + \xi_t \qquad \text{Taylor Rule}$$

- where $\widehat{y}_t \equiv (y_t - y)/y$ and $\widehat{i}_t \equiv i_t - i$

# The effect of price stickiness ($\theta$)



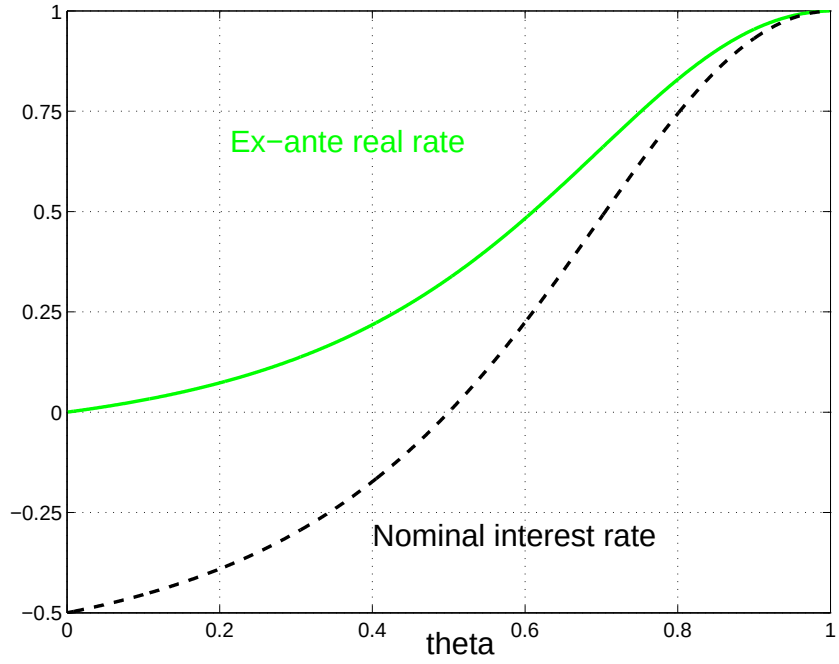




Figure: $\beta = 0.99$, $\eta = 1$, $\nu = 1.5$, and $\rho = 0.5$.

# aggregation bias

- price dispersion $\Longrightarrow$ output dispersion across firms
- $\Longrightarrow$ employment dispersion
  - should realocate production (labor) from firms with high production (high labor) to firms with low production (low labor) to equalize MPL across firms
- bias shows up as TFP in the aggregate production function.

# summary

- while technically impressive...needs focus
- what to focus on?
  - not price flexibility
  - not OLF
  - short and long term labor market responses