Rationing Under Sticky Prices

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Summary

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  - Standard NK models assume firms *must* satisfy demand *unconditionally*
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- **Empirics**:
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- **Sticky-price model with rationing:**
  - Rationing constrains expansionary monetary policy
  - Rationing reduces welfare costs of positive trend inflation

Key Ingredient

- Standard NK model:

$$Y_t^j = \left(\frac{P_t^j}{P_t}\right)^{-\varepsilon} Y_t \qquad \Pi_t^j = \left(\frac{P_t^j}{P_t} - \frac{W_t}{A_t}\right) Y_t^j \gtrless 0$$

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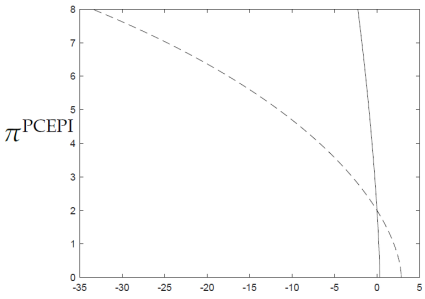
- More refined: DRS + iid demand shocks

Welfare Implications



Relative welfare:

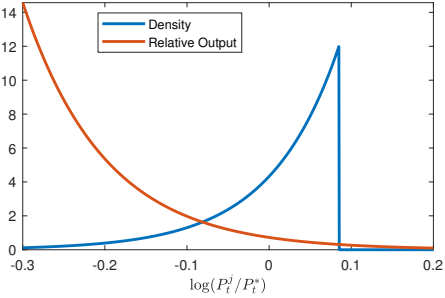
- Welfare losses due to misallocation:

$$Y_t = A_t L_t \left[\int_0^1 \left(\frac{P_t^j}{P_t} \right)^{-\varepsilon} dj \right]^{-1}$$

- Welfare loss of inflation moving from 2% to 8%:
  - 2.5% with rationing
  - 33% without rationing
- $\Longrightarrow$ very large gains from rationing!

Welfare Implications: Calvo model

- With $\zeta_t \approx const$ and (only) time-dependent Calvo adjustment intensity λ_t:



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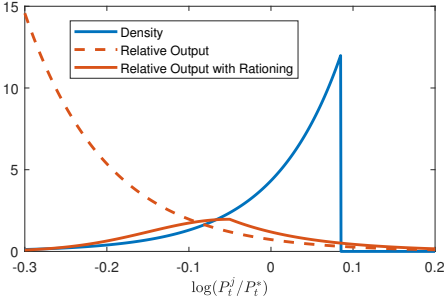

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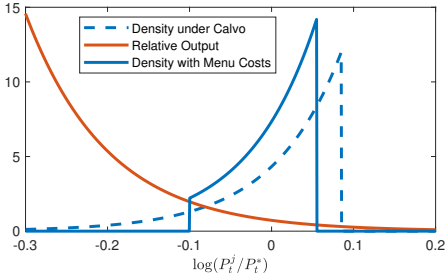
- Rationing removes the right tail of Y_t^j/Y_t
- $\Longrightarrow$ reduces misallocation

Welfare Implications: Adding State-Dependence

- Allowing firms to adjust any time s.t. a fixed cost:



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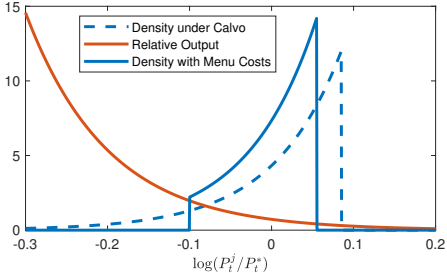

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- Are welfare gains from rationing maximized under Calvo?

  Nakamura, Steinsson, Sun and Villar (2018)

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  - Stockouts due to frictions
- Is there a way to estimate the rate of 'efficient' stockouts?

Minor Comments

- Can you explore heterogeneity in sector-level inflation rates?
  - Should we expect fewer shortages in sectors with falling prices?
- Can you introduce a cost of rationing $c(\overline{\psi}_{\zeta,\tau,t})$?
  - Could allow for a more direct comparison with a model without rationing by setting $c(\overline{\psi}) \to \infty \quad \forall \overline{\psi} \in [0, 1)$
  - Would also generate some trade-off between rationing and price adjustment (if firms are allowed to choose adjustment rates as function of idiosyncratic states)

Final Remarks

- Well-executed empirical analysis and carefully designed dynamic model of rationing under sticky prices
- Important implications for welfare and effects of monetary policy
- Quantification is key!