Monetary Policy, Labor Market Rigidities and Oil Price Shocks

A Research Proposal

by

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Motivation

Oil Prices

- Large, persistent fluctuations
- Exogenous, from the viewpoint of policymakers in most non-producing countries
- Observable
- Major Concern of Central Bankers

$\implies$ perceived to generate a trade-off between output gap vs. inflation stability
$\implies$ risk of stagflation
Two Questions

- How should central banks of oil importing countries respond to fluctuations in the price of oil? Should they focus on stabilizing inflation? If so, what measure of inflation?

- What is the role played by oil price shocks as a source of fluctuations in GDP and inflation in OECD economies? How has it evolved over time? What factors explain that evolution?

Our Approach

- Open Economy DSGE Model with Nominal Rigidities

- Utility-based Analysis of Optimal Monetary Policy

- Key Feature: Labor Market Rigidities
Background

Conventional Wisdom vs. the New Keynesian Model

\[ \pi_t = \beta E\{\pi_{t+1}\} + \kappa (y_t - y^n_t) \]

Underlying Real Model: constant gap between first best and second best output

\[ y^*_t - y^n_t = \delta \]

Combining both:

\[ \pi_t = \beta E\{\pi_{t+1}\} + \kappa (y_t - y^*_t + \delta) \]

\( \Rightarrow \) no tradeoff between output gap/inflation stabilization
• **Assessment:**

- strong policy implications: in response to an oil price increase, keep inflation constant
- at odds with central banks’ beliefs and practice (e.g. medium term inflation objectives)

• **Common Fix:** "cost-push shock"

\[
\pi_t = \beta \ E\{\pi_{t+1}\} + \kappa \ (y_t - y_t^*) + u_t
\]

• **Shortcomings:**

- ad-hoc fix (e.g. CGG 99): can’t know what shocks it captures
- micro-founded versions (e.g. SW 03): trade-off restricted to specific shocks
Motivation for assumption of real wage rigidities

Implications

- interaction of shocks with real wage rigidities $\implies$ fluctuations in $y_t^* - y_t^n$
- emergence of a policy trade-off: inflation stabilization $\neq$ stabilization of welfare-relevant output gap

Shortcomings

- lack of microfoundations for real wage rigidities $\implies$ BG 06 (work in progress)
- supply shocks modeled as exogenous changes in the endowment of non-produced input ("energy")
- closed economy
- limited quantitative or empirical analysis
Oil Price Shocks, Real Wage Rigidities, and Optimal Monetary Policy

A Simple Framework

- "Small" open economy, taking the world price of oil as given

- Two uses of imported oil:
  
  (i) consumed by households $\implies$ CPI
  
  (ii) used by firms as input $\implies$ marginal cost $\implies$ domestic prices

- Representative household, with preferences

  $$U(C_t, N_t) \equiv \log C_t - \frac{N_t^{1+\phi}}{1 + \phi}$$

  $$C_t \equiv \Theta \chi C_{M,t}^{\chi} C_{H,t}^{1-\chi}$$

- Representative firm, producing a differentiated good with technology:

  $$Q_t = M_t^\alpha N_t^{1-\alpha}$$
• Staggered Price Setting (à la Calvo)

\[ \pi_{H,t} = \beta E_t \{ \pi_{H,t+1} \} + \lambda \hat{m}_t \]

where \( \pi_{H,t} \equiv p_{H,t} - p_{H,t-1} \) is domestic inflation.

• Limited Real Wage Flexibility

\[ \frac{W_t}{P_t} = \Gamma MRS_t^{1-\gamma} \]

\[ = \Gamma \left( C_t N_t^\phi \right)^{1-\gamma} \]

where \( \Gamma \equiv \mathcal{M}_w \ MRS^\gamma \)
Strategy

1. Efficient Allocation \[ \implies \{ y_t^* \} \]

2. Flexible Prices, Real Wage Rigidities \[ \implies \{ y_t^n \} \]

3. Staggered Prices, Real Wage Rigidities

   Implied NKPC in the parametric example above:

   \[ \pi_{H,t} = \beta E_t\{\pi_{H,t+1}\} + \kappa (n_t - n_t^*) + \gamma \Phi v_t \]

4 Optimal Monetary Policy Design
   - welfare losses caused by deviations from efficient allocation
   - optimal monetary policy (discretion vs. commitment)
   - performance of simple rules (CPI inflation, domestic inflation, employment, oil prices, ...)

5 Robustness to alternative assumptions (financial markets, technology, ...
The Macroeconomic Effects of Oil Price Shocks

Motivation

- Conventional view: oil price shocks as main source of global recessions of the 70s
- Contrast with recent experience: limited inflationary and output effects

Our Empirical Approach: An Accounting Framework

\[
mc_t = (1 - \alpha) (w_t - p_{H,t}) + \alpha v_t
\]

\[
= (1 - \alpha) (w_t - p_t) + (\alpha + \chi(1 - \alpha)) v_t
\]

\[\uparrow v \implies \uparrow mc \quad \text{or} \quad \downarrow w_t - p_t\]

Generalized version (DRS, TFP):

\[
mc_t = (1 - \alpha_m) (w_t - p_{H,t}) + \alpha_m v_t + \alpha_k n_t - a_t
\]
Accounting for the Differential Response of Output and Inflation to Oil Price Shocks:

- Across countries, given episodes
- Over time, given country
- Candidate explanations: differences in
  - monetary policy
  - real wage rigidities
  - share of oil in output
Fig. 3. Inflation (continuous line) and marginal cost (dashed line) in selected OECD countries.

Source: Galí, Gertler and López-Salido (2001)