Monetary Policy, Labor Market Rigidities and Oil Price Shocks

A Research Proposal

by

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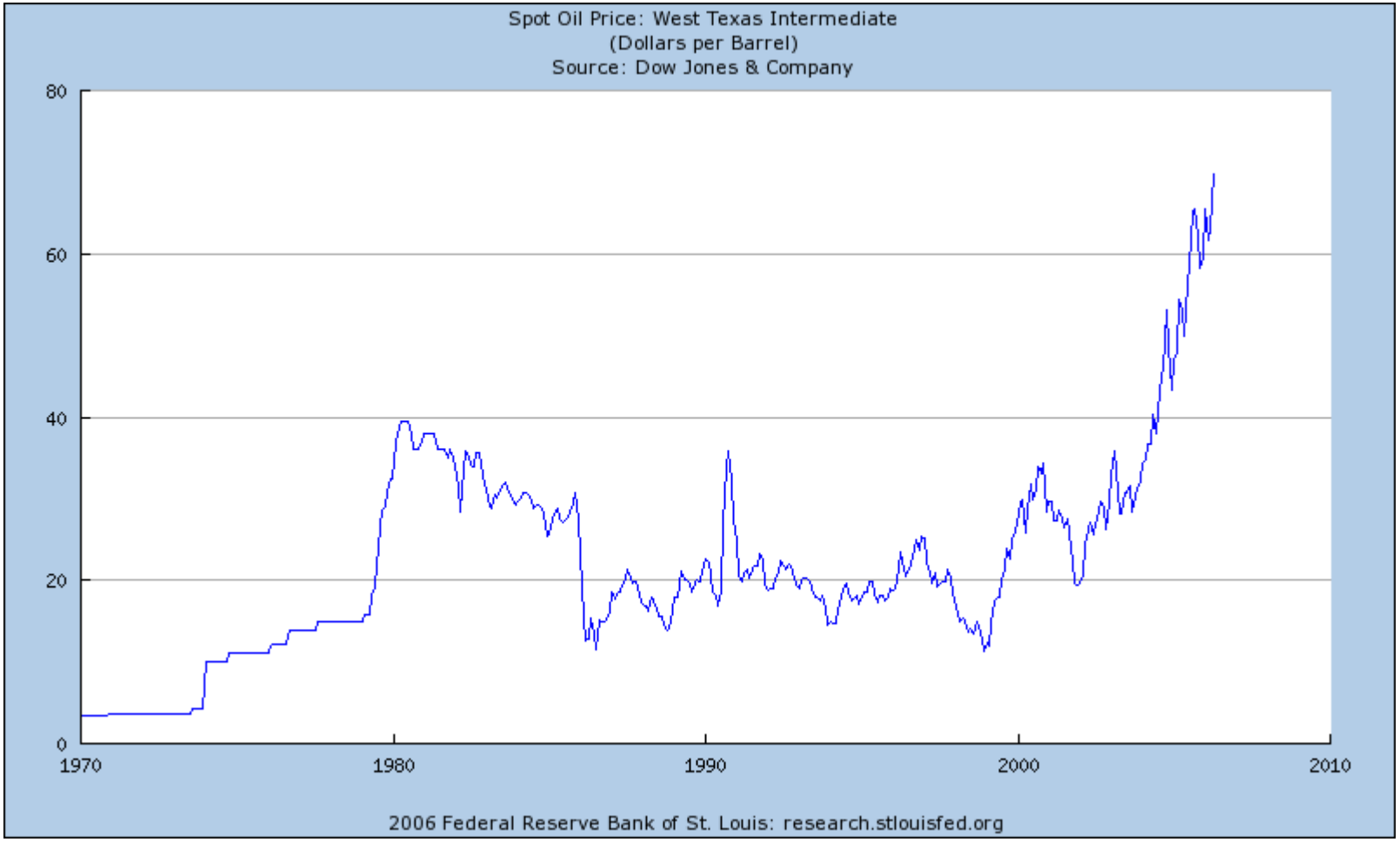
May 11, 2006


Spot Oil Price: West Texas Intermediate
(Dollars per Barrel)
Source: Dow Jones & Company
80
60
40
20
0
1970
1980
1990
2000
2010
2006 Federal Reserve Bank of St. Louis: research.stlouisfed.org

Motivation

Oil Prices

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

$\Longrightarrow$ perceived to generate a trade-off between output gap vs. inflation stability

$\Longrightarrow$ 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

$$\pi_t = \beta \; E\{\pi_{t+1}\} + \kappa \; (y_t - y_t^n)$$

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

$$y_t^* - y_t^n = \delta$$

Combining both:

$$\pi_t = \beta \; E\{\pi_{t+1}\} + \kappa \; (y_t - y_t^* + \delta)$$

$$\Longrightarrow \text{no tradeoff between output gap/inflation stabilization}$$

- *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

BG (2005): A New Keynesian Model with Real Wage Rigidities

Motivation for assumption of real wage rigidities

Implications

- interaction of shocks with *real* wage rigidities $\Longrightarrow$ 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 $\Longrightarrow$ 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 $\Longrightarrow$ CPI
  (ii) used by firms as input $\Longrightarrow$ marginal cost $\Longrightarrow$ 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)

$$\pi_{H,t} = \beta \; E_t\{\pi_{H,t+1}\} + \lambda \; \widehat{mc}_t$$

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

- Limited Real Wage Flexibility

$$\begin{aligned} \frac{W_t}{P_t} &= \Gamma \; MRS_t^{1-\gamma} \\ &= \Gamma \; \left(C_t N_t^{\phi}\right)^{1-\gamma} \end{aligned}$$

where $\Gamma \equiv \mathcal{M}_w \; MRS^{\gamma}$

Strategy

1. Efficient Allocation $\Longrightarrow$ $\{y_t^*\}$

2. Flexible Prices, Real Wage Rigidities $\Longrightarrow$ $\{y_t^n\}$

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

$$\begin{aligned} mc_t &= (1-\alpha)\,(w_t - p_{H,t}) + \alpha\, v_t \\ &= (1-\alpha)\,(w_t - p_t) + (\alpha + \chi(1-\alpha))\, v_t \end{aligned}$$

$$\uparrow v \Longrightarrow \uparrow mc \quad \text{or} \quad \downarrow w_t - p_t$$

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

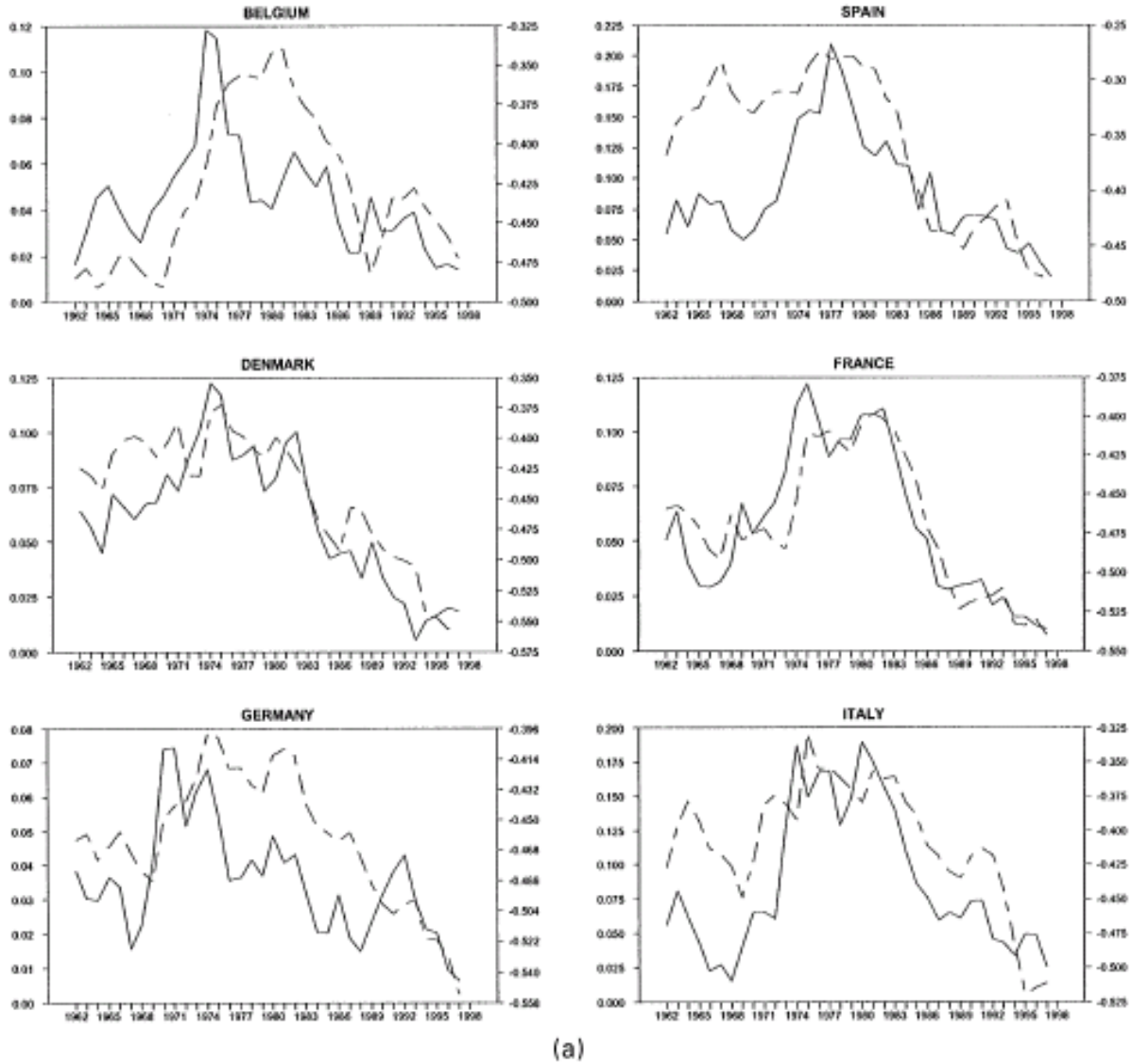
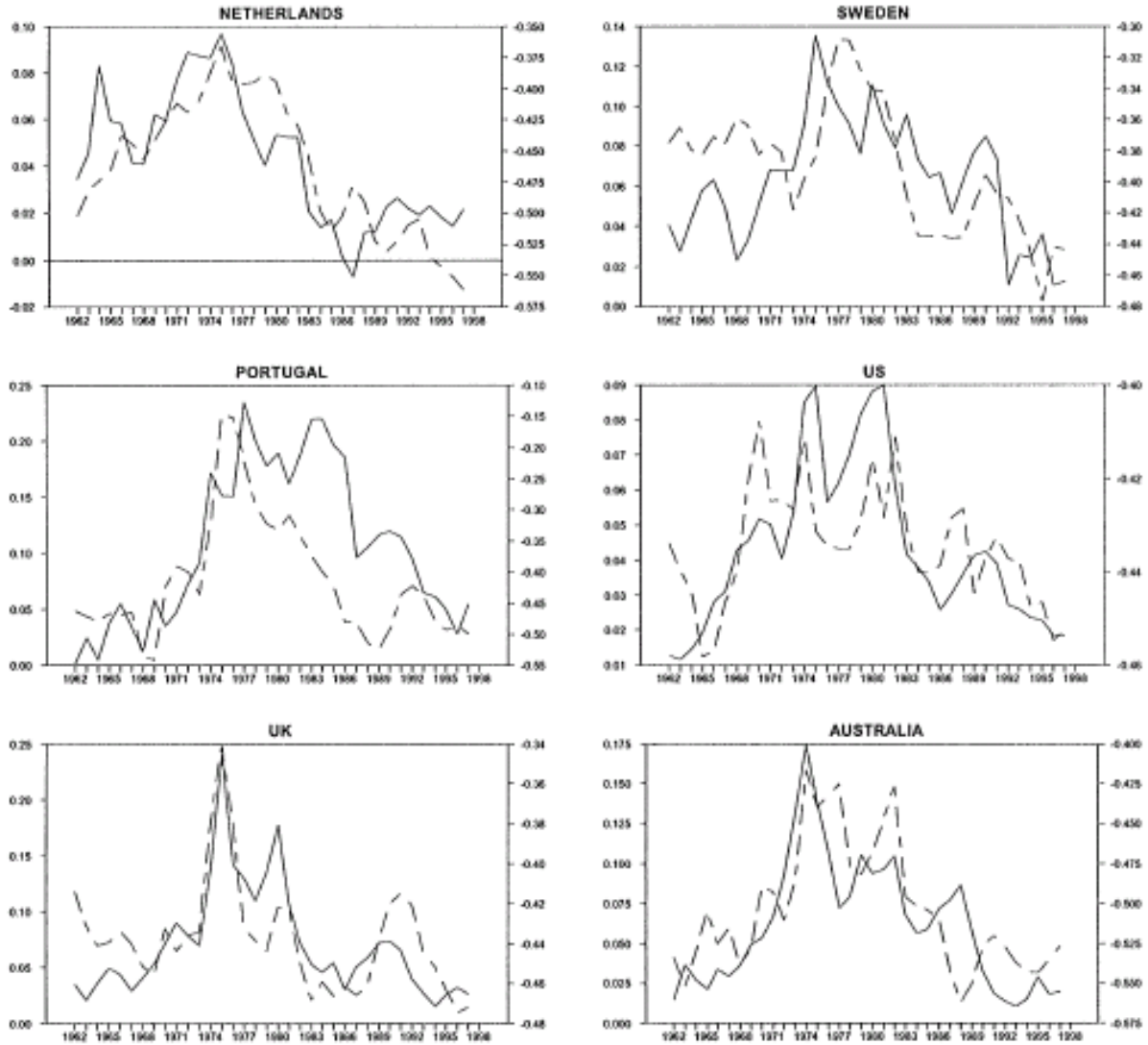


Fig. 3. Inflation (continuous line) and marginal cost (dashed line) in selected OECD countries.

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



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