The New Keynesian Model with Sticky Wages and Prices

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June 2016

The New Keynesian Model with Sticky Prices and Wages

- Fraction of households/trade unions adjusting nominal wage: $1 - \theta_w$
- Constant elasticity of labor demand ϵ_w

  flexible wages $\Rightarrow w_t = \mu^w + mrs_t + p_t$ where $\mu^w \equiv \log(\frac{\epsilon_w}{\epsilon_w - 1})$
- Aggregate wage dynamics

$$w_t = \theta_w w_{t-1} + (1 - \theta_w) w_t^*$$

- Optimal wage setting rule:

$$w_t^* = \mu^w + (1 - \beta\theta_w) \sum_{k=0}^{\infty} (\beta\theta_w)^k E_t\{mrs_{t+k|t} + p_{t+k}\}$$

  where $mrs_{t+k|t} \equiv \sigma c_t + \varphi n_{t+k|t}$
- Implied wage inflation equation

$$\pi_t^w = \beta E_t\{\pi_{t+1}^w\} - \lambda_w(\mu_t^w - \mu^w)$$

  where $\mu_t^w \equiv (w_t - p_t) - mrs_t$, $mrs_t \equiv \sigma c_t + \varphi n_t$ and

$\lambda_w \equiv \frac{(1-\beta\theta_w)(1-\theta_w)}{\theta_w(1+\varphi\epsilon_w)}$

Some Results

- The New Keynesian Phillips curve revisited

$$\begin{aligned}\mu_t^p &= p_t - (w_t - a_t) \\ &= a_t - (\mu_t^w + \sigma c_t + \varphi n_t) \\ &= (1+\varphi)a_t - (\sigma+\varphi)y_t - \mu_t^w\end{aligned}$$

implying

$$\widehat{\mu}_t^p = -(\sigma+\varphi)\widetilde{y}_t - \widehat{\mu}_t^w$$

which combined with the inflation equation yields

$$\pi_t^p = \beta E_t\{\pi_{t+1}^p\} + \kappa_p \widetilde{y}_t + \lambda_p \widehat{\mu}_t^w$$

$\Rightarrow$ tradeoff between output gap and inflation stabilization

- *Natural* equilibrium allocation is no longer feasible

$$\widehat{\mu}_t^p = \widehat{\mu}_t^w = 0 \quad \Rightarrow \quad \pi_t^p = \pi_t^w = 0 \quad \Rightarrow \quad \text{constant real wage}$$

Some Results

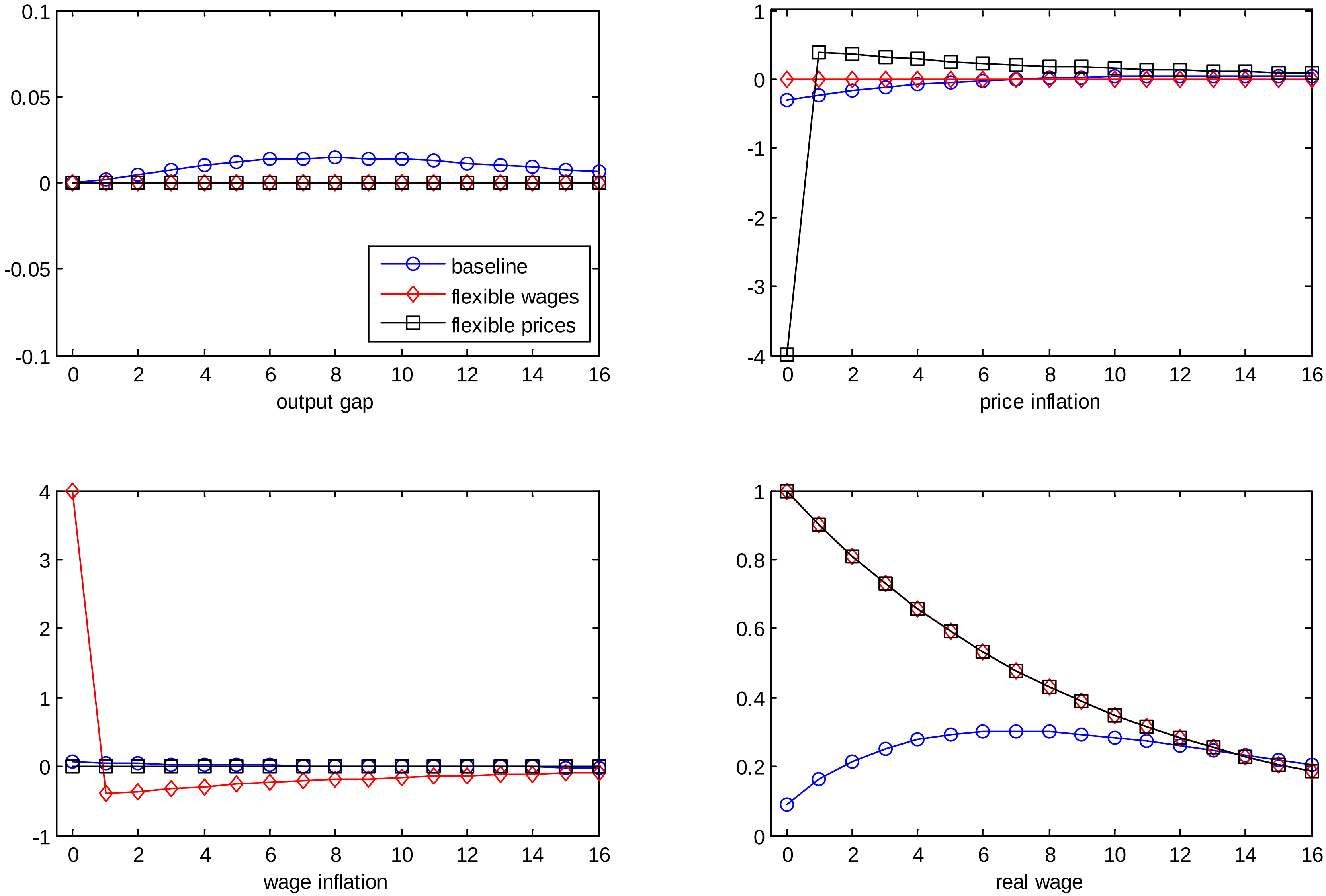
- Welfare losses (second order approximation)

$$\mathbb{L} = (\sigma + \varphi) \ var(\widetilde{y}_t) + \frac{\epsilon_p}{\lambda_p} \ var(\pi_t^p) + \frac{\epsilon_w}{\lambda_w} \ var(\pi_t^w)$$

$\Longrightarrow$ strict price inflation targeting is no longer optimal

- Optimal Policy (fig.)

Figure 6.3 Dynamic Responses to a Technology Shock under the Optimal Monetary Policy



Some Results

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- Optimal Policy (fig.)
- "Composite inflation" and the output gap

$$\pi_t = \beta E_t\{\pi_{t+1}\} + \kappa \widetilde{y}_t$$

where

$$\pi_t \equiv (1 - \vartheta)\pi_t^p + \vartheta \pi_t^w$$

with $\vartheta \equiv \frac{\lambda_p}{\lambda_p + \lambda_w} \in [0, 1]$ and $\kappa \equiv \frac{\lambda_w \kappa_p}{\lambda_p + \lambda_w}$

- Evaluation of Alternatives Policies (see table and fig.)

(i) Strict inflation targeting: $\pi_t^x = 0$ (price, wage or composite)

(ii) Flexible inflation targeting : $i_t = 1.5\pi_t^x$

Table 6.1 Evaluation of Simple Rules

	Optimal	*Strict Targeting*			*Flexible Targeting*		
		Price	Wage	Composite	Price	Wage	Composite
Technology shocks							
$\sigma(\pi^p)$	0.11	0	0.13	0.12	0.29	0.24	0.24
$\sigma(\pi^w)$	0.03	0.26	0	0.02	0.23	0.16	0.16
$\sigma(\widetilde{y})$	0.04	3.38	0.20	0	0.84	1.18	1.11
$\mathbb{L}$	0.0330	0.78	0.039	0.0337	0.47	0.305	0.307
Demand shocks							
$\sigma(\pi^p)$	0	0	0	0	0.02	0.04	0.03
$\sigma(\pi^w)$	0	0	0	0	0.05	0.06	0.06
$\sigma(\widetilde{y})$	0	0	0	0	1.08	1.05	1.06
$\mathbb{L}$	0	0	0	0	0.061	0.067	0.066