Unions Power, Collective Bargaining and Optimal Monetary Policy

Ester Faia* and Lorenza Rossi**
*Goethe University, IfW and Crepemap, **Università di Pavia

The importance of unions’ coverage

- In the US only about 15% of workers covered by collective contract agreements, in the UK 36% and in countries such as France, Italy or Sweden above 84%

- Centralized bargain tends to dampen wage dynamics and to amplify inefficient unemployment dynamics $\Rightarrow$ we try to match this stylized fact

- Question: should central banks take these facts into account in formulating monetary policy?
The link between unions’ coverage and wage rigidity

Dickens et. al 2008 JEP

Ester Faia* and Lorenza Rossi** *Goethe UrUnions Power, Collective Bargaining and Opti
Our paper

- DSGE with sticky prices and union wage bargaining: implications for wage/unemployment dynamic and design optimal monetary policy:
  1. Workers are represented by firm-specific monopoly unions
  3. Stackelberg game between unions and firms (unions do not internalize the effects of their decisions on employment dynamic)

- Optimal policy design follows Ramsey approach \(\rightarrow\) Schmitt-Grohe and Uribe JET 2003, Khan, King and Wolman ReStud 2004
Major results

- Collective Bargaining and unions’ monopoly power dampens wage fluctuations and amplify inefficient employment fluctuations relative to a standard NK-DSGE.

- Inefficient employment fluctuations calls for a monetary policy different from strict inflation targeting.

- Deviations from price stability increases with respect to the increase in real wage rigidity.
The representative agent’s maximization problem

- The intertemporal utility function is:

\[
U_t = E_0 \sum_{t=0}^{\infty} \beta^t \left\{ \frac{C_t^{1-\sigma}}{1-\sigma} - \chi \frac{N_t^{1+\phi}}{1+\phi} \right\}, \quad \sigma, \phi > 0 \tag{1}
\]

\[
(1+i_t)^{-1} B_{t+1} + C_t P_t - T_t = W_t N_t + B_t + \Pi_t \tag{2}
\]

- Assumptions of pooling resources to overcome heterogeneity issues
Intermediate good-producing firms

- Rotemberg (1982) pricing \(\implies\) Price quadratic adjustment costs.

- Labor demand and optimal pricing decisions:

\[
\frac{W_t(j)}{P_t} = \delta m_{ct} \frac{Y_t(j)}{N_t(j)}
\]

\[
0 = [1 - (1 - m_{ct}) \theta] Y^D_t - \varphi_p (\pi_t - 1) \pi_t + \\
+ \varphi_p \beta E_t \left( \frac{\lambda_{t+1}}{\lambda_t} \right) (\pi_{t+1} - 1) \pi_{t+1}
\]


We choose the Stone Geary utility function as it nests other functions

$$V \left( \frac{W_t(i)}{P_t}, N_t(i) \right) = \left( \frac{W_t(i)}{P_t} - \frac{W^r_t(i)}{P_t} \right)^\gamma N_t(i)^\zeta$$

\(\gamma\) and \(\zeta\) are the weights unions give to workers surplus and employment \(N_t(i)\).

Reservation wage

- \( \frac{W_t^r(i)}{P_t} \): reservation wage is the minimum accepted wage (threat point in negotiations)

- Assume that \( \frac{W_t^r(i)}{P_t} \) is a function of the past aggregate real wage and the competitive wage, \( \frac{W_t^r(i)}{P_t} \geq \frac{W_t^a}{P_t} = \chi C_t^\sigma N_t^\phi \):

- As in Blanchard Katz 1999, Ball and Moffit 2001, Howen 2004

\[
W_t^r(i) = \left( \frac{W_{t-1}}{P_t} \right)^{\phi_w} \left( \frac{W_t^a}{P_t} \right)^{1-\phi_w}
\]

- Past wages allow for path dependence, competitive wages allow to nest the walrasian model as benchmark
Stackelberg game between firms and unions: once the wage has been chosen, each firm decides the employment rate with labor demand.

Final wage:

\[
\frac{W_t}{P_t} = \mu_w \frac{W_t^r}{P_t}
\]

\[
= \mu_w \left( \frac{W_{t-1}}{P_t} \right)^{\phi_w} \left( \chi C_t^\sigma N_t^\phi \right)^{1-\phi_w}
\]

where \( \mu_w = \frac{\zeta}{\zeta - \gamma (1-\delta)} \) is wage mark-up

NOTICE: the wage mark-up increases when, \( \gamma \), the weight that unions attach to the excess wage \( \frac{W_t(i)}{P_t} - \frac{W_t^r}{P_t} \), increases.
Wage Markup

Wage markup: effect of varying $\gamma$ $\zeta = 0.5$
The role of unions for model dynamics

- The reservation wage responds sluggishly to shocks (because of the indexation to past wage)
- The higher the wage indexation, the higher the degree of path dependence of wages, marginal costs and inflation
- Unemployment fluctuates beyond the Pareto-efficient level: inefficient fluctuations are higher with higher unions’ power and indexation to past wages
The Role of labor market wedges for optimal policy design

- Marginal costs depend on wage mark-up and reservation wage which act as endogenous cost push shocks \( \implies \) monetary policy trade-offs
- Employment is lower than in the walrasian market:

\[
N_t = \left[ \frac{\delta A_t m c_t}{\mu_w} \left( \frac{W_{t-1}}{P_{t-1}} \right)^{-\phi_w} \left( \chi C_t^\sigma \right)^{(\phi_w - 1)} \right]^{\frac{1}{1-\delta + \phi(1-\phi)}} \\
\leq N_t^w = \left[ \delta A_t m c_t \left( \chi C_t^\sigma \right)^{(-1)} \right]^{\frac{1}{1-\delta + \phi}}
\]

- Wedge in the labour market \( \Rightarrow \) the monetary authority deviates from full price stability, uses inflation as a tax on unions’ rent
- Trade off- between closing the cost of adjusting prices and reducing inefficient unemployment fluctuations
Responses to productivity shocks under Taylor rules

$\phi_w = 0$ (solid line), $\phi_w = 0.4$ (dashed line)
Responses to productivity shocks under Taylor rules

\[ \mu_w = 1.1 \text{ (solid line), } \mu_w = 1.4 \text{ (dashed line)} \]
The monetary authority maximizes the discounted sum of utilities of all agents given the constraints of the competitive economy.

The policy maker acts under timeless perspective.
IRFs of Ramsey policy under a productivity shock

Consumption

Employment

Marginal Cost

Inflation (annualized, %)
IRFs of Ramsey policy under a government expenditure shock
Optimal rules

For the analysis of the optimal rules and the welfare comparison with ad hoc rules we consider the following Taylor-type class of rules:

\[
\ln \left( \frac{i_t}{i} \right) = (1 - \phi_r) \left( \phi_\pi \ln \left( \frac{\pi_t}{\pi} \right) + \phi_y \ln \left( \frac{Y_t}{Y} \right) + \phi_n \ln \left( \frac{N_t}{N} \right) \right) + \phi_r \ln \left( \frac{i_{t-1}}{i} \right)
\]

Numerically we search for the specification \( \{\phi_\pi, \phi_y, \phi_n, \phi_r\} \) that maximizes household’s *conditional* welfare.
Welfare Analysis: Effects of varying the Responses to inflation and employment

Effect on Welfare of Varying the Response to Inflation and Employment

Ester Faia* and Lorenza Rossi**  *Goethe UrUnions Power, Collective Bargaining and Opti
Welfare Analysis: Results

- Optimal Simple Rule: \( \phi_\pi = 6.6; \phi_y = 0; \phi_n = 0.6; \phi_r = 0.3 \).
- The optimal rule carries a positive weight on Employment: the monetary authority aims to push the economy toward the Pareto frontier.
- Targeting employment performs better than the standard Taylor rule.
Conclusions

We introduce labor unions in an NK model: this leads to higher volatilities of employment and higher persistence in wage, marginal cost and inflation dynamic.

As with many other labor market frictions the presence of labour unions revives the unemployment/inflation trade-offs.

However in this case optimality of positive inflation volatility must be interpreted as optimality of taxing unions’ rents.

Future research: Optimal labor income taxation.