Interaction between wage setting and monetary regime

Standard view:

- No link between real and nominal variables in the long run.
  - Long run Phillips curve is vertical
- Short run effects due to nominal rigidities

Two challenges to the standard view:

- Wage formation is affected by low inflation, e.g. downward nominal wage rigidity,
  - Downward sloping Phillips curve at low levels of inflation
- Strategic effects in the relationship between wage setting and monetary policy in economies with large wage setters
- Strictness of monetary policy may affect
  - The equilibrium rate of unemployment,
  - The relative size of traded and non-traded sectors
  - The degree of coordination in the wage setting
Strategic interaction between
the wage setting and the monetary regime,
in economies with large wage setters

Two approaches:

1) Unions are inflation averse

- Unions care about real wages and employment, but they also dislike inflation (Cubitt, OEP 1992, Skott, 1997, Cukierman and Lippi, EER 1999, Velasco and Guzzo, EER 1999)
- Unions have an incentive to reduce wage pressure to avoid to high inflation
- If the central bank is strict, ensuring that inflation will never be high, unions’ concern for inflation will no longer be relevant. The result will be higher wage pressure and higher equilibrium unemployment
- An accommodating CB gives lower equilibrium unemployment with no increase in inflation
- This result is theoretically consistent, but seems nevertheless empirically implausible.
2) **Standard assumptions on union preferences**

a) **Effect on equilibrium unemployment**

Bratsiotis and Martin (SJE, 1999), Soskice and Iversen (1998, QJE, 2000) and Coricelli, Cukierman and Dalmazzo (2000)

- Large wage setters, caring about real wages and employment, set wages to balance the gain from higher wages against the cost in the form of lower employment

- A strict monetary regime makes employment more sensitive to the real wage. This makes wage setters moderating their wage claims, leading to lower equilibrium unemployment

- The importance of the monetary regime depends on the degree of centralisation/coordination in wage setting. Strictness is less important under coordinated wage setting, as then low unemployment can be achieved in any case.

- Important application: For a small country in a monetary union, the union-wide interest rate is essentially exogenous. Thus, there is no monetary response to deter wage setters, implying that both wage pressure and unemployment are higher than they would have been under a country-specific inflation target
b) **Effect of relative size of traded and non-traded sectors**

Holden (Economica, 2003), Vartiainen (SJE, 2002)

- Comparison of inflation target and exchange rate target (the latter can be interpreted as small country in a monetary union)
- Assuming separate wage setting in the traded and non-traded sectors, by unions caring about real wages and employment
- Under an exchange rate target, a rise in non-traded wages is not countered by the central bank, but allowed to increase non-traded prices. This dampens the negative effect on non-traded employment and profits, which makes it more attractive to raise wages
  - non-traded wage setters respond by setting higher wages
- Under an inflation target, a wage rise in the traded sector has a contractionary effect on demand and thus a negative effect on non-traded price. This gives room for a depreciation of the currency, dampening the negative effect on traded sector employment and profits
  - traded-sector wage setters respond by setting higher wages
• The upshot is higher relative price on non-traded goods under an exchange rate target. If the elasticity of substitution is below unity, the higher relative price on non-traded goods increases the relative size of the non-traded sector. This holds in long run equilibrium, with balanced foreign trade.

• The welfare effects depend on the parameters of the model, but in most cases, inflation target yields higher household utility, and higher output and employment

• The corollary is higher relative non-traded price, and larger relative non-traded sectors in a monetary union, than for a country with an inflation target
c) **Effect on the coordination of wage setting**

Holden (EER, 2005)

- Theory and evidence suggest that coordination of wage setting leads to considerably lower equilibrium unemployment, without affecting real wages (average finding is 5-6 percentage points lower unemployment!)
- Why are unions in some countries unable to coordinate and reap those benefits?
- Model with endogenous coordination among industry unions (Holden and Raaum, OEP, 1991)
  - coordinated wage restraint gives higher payoff to the unions than uncoordinated wage setting
  - yet unions have an incentive to deviate from the coordination, and opt for higher wages
  - deviation from coordination will lead to a breakdown of coordination, followed by uncoordinated wage setting
  - unions will stick to the coordination if the costs associated with a breakdown are sufficient large to outweigh the short run gain from a deviation
- Does the monetary regime affect whether unions are able to sustain coordination?
2 The model

$k$ symmetric industries.

workers organised in $1 < n \leq k$ symmetric unions, so that each union covers the workers in $k/n$ industries. ($n$ is continuous)

time horizon is infinite number of years.

We first consider one year in isolation.

In each industry, there are several firms producing an identical product under constant returns to scale, with labour as the only input: $y_f = l_f$

Bertrand competition: output price equal to unit costs $p_f = w_f$, where $w_f$ is the wage.

The demand for products from industry $i$ is

$$y_i = \bar{g} + \alpha(m - p) - \eta(p_i - p) \quad \alpha, \quad \eta > 0$$
Unions care about real wages and employment. The loss function of union j is

\[ \Omega_j = \frac{1}{2}(w_j - p - \omega^*)^2 + \frac{\theta}{2}(l_j - l_j^*)^2 \]

\( \omega^* > 0 \) and \( l_j^* = l^* \) are target levels. \( l^* \) is the total labour force (uniform across unions), \( \theta > 0 \) is unions’ relative concern for employment.

Within the year, the sequence of events is as follows.

1) All unions simultaneously set the nominal wages.

2) The central bank sets the nominal money stock according to a predetermined rule

\[ m = \bar{m} + \rho w \]

where \( \bar{m} \) is exogenous, \( w \) is the aggregate wage level, and \( \rho \) is the rate of accommodation. If \( \rho = 1 \), there is complete accommodation.

3) Firms set prices to maximise profits as derived above, and then supply the demanded output.
**Wage setting**

We first consider wage setting without co-ordination. The first order condition of union $j$ is

$$\frac{d\Omega_j}{dw_j} = (w_j - p - \omega^*)\left(1 - \frac{dp}{dw_j}\right) + \theta(l_j - l_j^*) \frac{dl_j}{dw_j} = 0$$

The first order conditions (5) jointly determine a Nash equilibrium in the wage setting game among the unions.

From price setting,

$$\begin{align*}
(6) \quad (i) \quad & \frac{dp}{dw_j} = \frac{1}{n} \\
(ii) \quad & \frac{dl_j}{dw_j} = -\alpha(1 - \rho) \frac{dp}{dw_j} - \eta(1 - \frac{dp}{dw_j})
\end{align*}$$

Substituting out, invoking symmetry $w_j = w$ and $u_j = u$, we obtain

$$w - p = \omega^* - \left(\alpha(1 - \rho)\sigma + \eta\right)\theta u$$

where $\sigma = (dp/dw_j)/(1-dp/dw_j)$ is an indicator for centralisation of wage setting. Using (6), $\sigma = 1/(n-1)$, so $\sigma$ can take values in the interval $1/(k-1)$ ($n = k$, i.e. decentralisation) to infinity.
Combining wage and price setting yields:

**Proposition 1:** Under uncoordinated wage setting, equilibrium unemployment is given by

\[
\nu^N = \frac{\omega^*}{\theta(\alpha(1-\rho)\sigma + \eta)}.
\]

Proposition 1 entails standard properties in the literature.

- Money is neutral (\(\bar{m}\) does not affect \(\nu^N\)).
- Any factor that increases wage pressure raises \(\nu^N\).
- \(\nu^N\) is lower, the stricter the central bank (\(\rho\) small).
- A strict central bank (\(\rho\) small) makes labour demand more elastic, inducing unions to set lower nominal wages.

A stricter monetary regime (a lower value of \(\rho\)) increases the wage elasticity of employment, shifting the wage curve down and decreasing the equilibrium level of unemployment.
3  Co-ordination of wage setting

All wage setters would gain from co-ordinated wage restraint. But is this feasible without binding agreement?

If the wage setting in one year is viewed in isolation, an agreement on wage restraint by the unions will not be credible.

Consider the following strategy for the unions:
1. Stick to the agreement until some union alone deviates from the agreement.
2. If some union alone has ever deviated, play uncoordinated until an exogenous event Q takes place.

Co-operation can be sustained if any participant would lose from a unilateral deviation, i.e. that sticking to the agreement involves lower or equal discounted total loss than a unilateral deviation involving a short run gain, but inducing a reversion to the uncoordinated equilibrium.
Formally, the condition making the agreement sustainable is

\[
\frac{-(\Omega^\delta - \Omega^\iota)}{-(\Omega^\iota - \Omega^N)} \leq \frac{\delta}{1-\delta}
\]

where \(\delta = q\beta\), \(0 < \delta < 1\),

where \(-(\Omega^D - \Omega^A)\) denotes reduced loss for a deviator (i.e. the gain), while the \(-(\Omega^A - \Omega^N)\) is the costs of a breakdown

- Under coordinated wage setting, low unemployment can be achieved even without a strict monetary regime.
- This implies that a tighter monetary regime reduces the gains from co-ordination.
- In other words the costs of a breakdown of coordination is smaller under a strict monetary regime
Results on coordination:

- Under some circumstances, coordinated wage restraint is possible under an accommodating monetary regime, but not under a strict monetary regime.
- A stricter monetary regime may imply that coordinated wage restraint must be less ambitious, leading to higher equilibrium unemployment.
- However, if coordinated wage restraint is infeasible in any case, the disciplining effect prevails, and a more accommodating regime (higher $\rho$) raises the rate of unemployment.

- **Corollary for participation in a monetary union:** A monetary union involves less discipline on wage setters than independent inflation targeting, implying that the incentives for wage setters to voluntarily co-ordinate wage setting at the national level are higher.
  - The result may be lower equilibrium unemployment.
Centralisation of wage setting and monetary regime 16 OECD countries