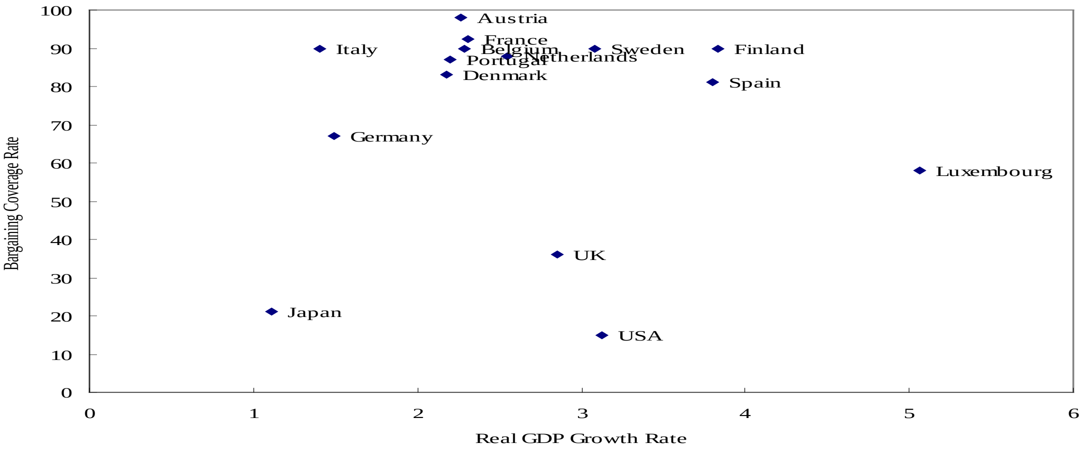
Trade Union and Economic Growth

1. Introduction

Figure 2: Real GDP Growth Rate and Bargaining Coverage Rate (unit:%)



(i) Given a *managerial* trade union, we explore the effects of unionization on unemployment and economic growth.

Internal conflict within a trade union: Pemberton (1988, EJ)

A "managerial" trade union's policy is influenced by both leadership (management) and membership preferences.

(Employment-oriented policy) The leadership desires to strengthen the union by building up membership and hence employment (we are easily convinced that the leadership is interested in union size, on the basis of the common notion that bureaucrats prefer large organizations).

(Wage-oriented policy) The membership has a conflicting interest in light of this and desires to extract higher excess wages from employers.

Conflicting interests between the leadership and membership within the union play a decisive role in the unemployment and growth effects of unionization. To be specific, the higher relative bargaining power of the union will result in a lower (higher) unemployment rate and a higher (lower) balanced-growth rate if the union is employment-oriented (wage-oriented), i.e. the leadership (membership) within the union has the dominant power.

(ii) Within the endogenous growth model characterized by equilibrium unemployment, we re-examine the effects of taxation, fully comparing them with those in the traditional full-employment growth model.

Besides unions, taxation may be another potential candidate for explaining the poor performance of employment and economic growth (see, for example, Nickell and Layard, 1999, and Daveri and Tabellini, 2000). Our second aim is to re-examine the taxation effects within the growth model with equilibrium unemployment (caused by the presence of the trade union) and compare our findings with those in the traditional full-employment growth models.

2. The Model

Consider a unionized economy consisting of four types of agents: households, firms, a (national) trade union and a government.

2.1 Firms, the trade union, and collective bargaining

Firms

● Firms hire physical capital k and labor l to produce a single good y which can be consumed or invested. In line with Romer (1989), production is subject to the following technology:

$$y = f(k, l, \bar{k}) = A(\bar{k})k^{\alpha}l^{\beta}, \quad 0 < \alpha < 1, \quad 0 < \beta < 1, \tag{1}$$

where $\bar{k}$ is the average economy-wide stock of capital. In (1) we impose the restriction that the individual firm's production technology exhibits decreasing returns to scale in its *internal* capital k and labor l factors, i.e. $0 < \alpha + \beta < 1$. This specification leads firms to have a positive profit when the employers' federation owns some degree of bargaining power, which can be justified by implicitly assuming that there exists another fixed factor (for example, land) that earns rent.

The external effect refers to the spillovers of knowledge that operate at the average level of the overall economy. For convenience, we specify that $A(\bar{k}) = A \cdot \bar{k}^{1-\alpha}$, implying that the aggregate production function exhibits constant returns to scale, thereby generating perpetual growth.

● Given the production technology (1), the representative firm attempts to maximize its profit π as follows:

$$\pi = y - wl - rk, \tag{2}$$

where w and r are the wage rate and the rental rate of capital, respectively.

Trade union

● In line with Pemberton (1988), the managerial trade union's objective function has the following Stone-Geary form:

$$U = (\hat{w} - \hat{b})^{\delta} l^{v}, \tag{3}$$

where $\hat{w} = \dfrac{(1-\tau)w - \tilde{T}}{(1+\tau_c)}$ and $\hat{b} = \dfrac{(1-\varepsilon\tau)b - \varepsilon\tilde{T}}{1+\tau_c}$ are the after-tax wage rate and unemployment benefits in terms of the real variables, respectively. $\tilde{T}$ is a lump-sum tax, τ is income tax rate, τ_c is the consumption tax rate.

● The parameters $\delta \geq 0$ and $v \geq 0$ correspond to the excess wage $(\hat{w} - \hat{b})$ and to the employment level *l* elasticities of the union's objective *U*, respectively.

v and δ is thought of as the distribution of the internal power of leadership and membership, respectively. The larger the difference ($\delta - v$), the more the union approaches the extreme of a "democratic" (or "populist") one.

Mezzetti and Dinopoulos (1991): the union is "wage oriented" if $\delta > v$, while it is "employment oriented" if $\delta < v$.

● There exist various institutional arrangements for taxing unemployment benefits in the European countries.

Unemployment benefits are subject to income taxation (the United Kingdom, France, Belgium, and Sweden), but in the other countries (Germany, Austria, and Portugal) unemployment benefits are exempted from taxation.

$$\hat{b} = \frac{(1-\varepsilon\tau)b - \varepsilon\tilde{T}}{1+\tau_c}. \tag{4}$$

If $\varepsilon = 1$, the unemployment benefits are taxable and if $\varepsilon = 0$, the unemployment benefits are exempted from taxation.

Collective bargaining

● $$\max_{w,l} \Omega \equiv [(\hat{w}-\hat{b})^{\delta} l^{v}]^{\theta} \cdot [A(\bar{k})k^{\alpha} l^{\beta} - wl - rk]^{1-\theta},$$

$$\text{s.t. } k = \arg\max_{k} \pi ,$$

$\theta \in (0,1)$ is the relative bargaining strength of the union.

The optimal conditions for the wages and employment are given by:

$$\hat{w}-\hat{b} = \frac{\delta}{v}\frac{1-\tau}{1+\tau_c}[w - \beta A(\bar{k})k^{\alpha} l^{\beta-1}], \tag{5}$$

$$w = \left[\beta + \frac{\theta v(1-\alpha-\beta)}{1-\theta+\theta v}\right] A(\bar{k})k^{\alpha} l^{\beta-1}, \tag{6}$$

$$r = \alpha A(\bar{k})k^{\alpha-1} l^{\beta}. \tag{7}$$

● (5) describes the *contract curve* in the (w, l) space: It is upward (downward) sloping, iff union is employment (wage) oriented $\delta < v$ ($\delta > v$).

(6) is the *rent division curve*: As the union's bargaining power θ increases, the negotiated wage rate rises.

● The representative firm's profit function is given by:

$$\pi = \frac{(1-\theta)(1-\alpha-\beta)}{1-\theta+\theta v} A(\bar{k})k^{\alpha} l^{\beta} \geq 0. \tag{8}$$

The firm's profit is positive as long as the employers' federation has a positive bargaining power, i.e. $0 < \theta < 1$. In the extreme case where the union's bargaining power is absolute ($\theta = 1$), the firm's profit is reduced to zero.

2.2 Households

The individual household chooses c so as to maximize the discounted sum of future instantaneous utilities.

$$\max \int_0^\infty [\frac{c^{1-\sigma}-1}{1-\sigma} - Zl]\cdot e^{-\rho t} dt, \quad (9)$$

$$s.t. \quad \dot{k} = (1-\tau)(rk+\pi+wl) + (1-\varepsilon\tau)b(1-l) - (1+\tau_c)c - [l+\varepsilon(1-l)]\tilde{T}, \quad (10)$$

● In a unionized economy, the labor market may be characterized by an equilibrium unemployment rate, say, $1-l$. When the worker is unemployed, he will receive unemployment benefits b from the government.

● **Big Family Assumption**: all workers, employed and unemployed, belong to the same family.

This big family assumption implies that there is no heterogeneity associated to the risk of becoming unemployed.

Facing a pooled resource, the representative "large" household has a unified preference capturing enjoyment of all its members.

$wl + b(1-l)$ can be thought of as the "average" labor income of an individual household.

2.3 Government

The government budget constraint:

$$b(1-l) = \tau(rk + \pi + wl) + \varepsilon\tau b(1-l) + \tau_c c + [l + \varepsilon(1-l)]\tilde{T}, \qquad (12)$$

We assume that the government balances its budget (12) in each period by adjusting (i) lump-sum taxes $\tilde{T}$ or (ii) unemployment benefits *b*.

Since unemployment benefits will give rise to an additional distortionary effect, the assumption that b serves as the balancing item will result in distinctive taxation effects on economic growth.

2.4 Equilibrium

- In a symmetric equilibrium ($k = \bar{k}$), we summarize the equilibrium conditions of the economy as follows:

$$\hat{w} - \hat{b} = \frac{\delta}{v}\frac{1-\tau}{1+\tau_c}(w - \beta Akl^{\beta-1}), \qquad (5)$$

$$w = \frac{\theta v(1-\alpha) + (1-\theta)\beta}{1-\theta+\theta v} Akl^{\beta-1}, \qquad (6)$$

$$r = \alpha A l^{\beta}, \qquad (7)$$

$$\pi = \frac{(1-\theta)(1-\alpha-\beta)}{1-\theta+\theta v} Akl^{\beta}, \qquad (8)$$

$$[l + \varepsilon(1-l)]\tilde{T} = b(1-l) - \tau(rk + \pi + wl) - \varepsilon\tau b(1-l) - \tau_c c, \qquad (12)$$

$$\dot{k} = Akl^{\beta} - c, \qquad (13)$$

$$\frac{\dot{c}}{c} = \frac{1}{\sigma}[(1-\tau)\alpha A l^{\beta} - \rho], \qquad (11)$$

● Balanced-growth-path Equilibrium

Define a transformed variable $x = c/k$. The dynamic system in terms of the variable x as follows:

$$\frac{\dot{x}}{x} = \frac{\dot{c}}{c} - \frac{\dot{k}}{k} = \frac{(1-\tau)\alpha - \sigma}{\sigma} A l^{\beta} + x - \frac{\rho}{\sigma}. \tag{14}$$

in the $\varepsilon = 1$ case,

$$l = l(\underset{\pm}{\theta}, \underset{-}{s}), \tag{15a}$$

where $l_s = -l/s < 0$ and $l_\theta = \Theta_\theta[1-(\delta/v)]/s \gtreqless 0$; iff $v \gtreqless \delta$.

In the $\varepsilon = 0$ case,

$$l = l(\underset{+}{x}; \underset{\pm}{\theta}, \underset{?}{\tau}, \underset{+}{\tau_c}, \underset{-}{s}), \tag{15b}$$

where $l_x = l/\beta x > 0$, $l_\tau = -\left\{\Theta[1-(\delta/v)] + (\beta\delta/v) - 1\right\} A l^{\beta+1}/(\beta\tau_c x) \gtreqless 0$, $l_{\tau_c} = l/(\beta\tau_c) > 0$, $l_s = -A l^{\beta+1}/(\beta\tau_c x) < 0$, and $l_\theta = \Theta_\theta[1-(\delta/v)](1-\tau) A l^{\beta+1}/(\beta\tau_c x) \gtreqless 0$; iff $v \gtreqless \delta$.

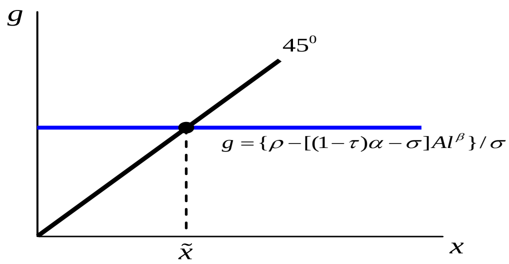


Figure 1: The $\varepsilon = 1$ case

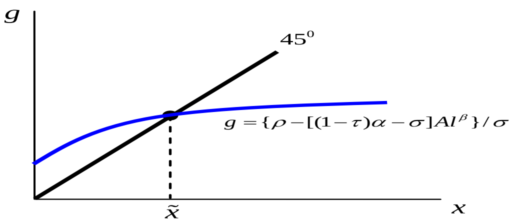


Figure 2a: The $\varepsilon = 0$ case with $(1-\tau)\alpha - \sigma < 0$

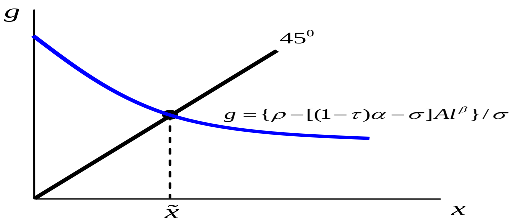


Figure 2b: The $\varepsilon = 0$ case with $(1-\tau)\alpha - \sigma > 0$

3.1 The unemployment and growth effects of unionization

● ***The Effects of Unionization: A higher relative bargaining power θ will result in a lower (higher) unemployment rate and a higher (lower) balanced-growth rate if the union is employment-oriented $v > \delta$ (wage-oriented $v < \delta$).***

This result holds true regardless of whether unemployment benefits are subject to taxation or not.

(i) When the union is employment-oriented, an increase in its bargaining power will result in not only a higher negotiated wage rate but also a higher level of employment (an upward-sloping contract curve guarantees a positive relationship between wages and the employment level).

As a result, the unemployment rate $(1-l)$ will fall. Meanwhile, a higher level of employment increases the productivity of capital and hence the balanced-growth rate.

(ii) A wage-oriented union will be more aggressive in extracting the excess wage for its members. In exchange for a higher bargained wage, it will be willing to incur a loss in terms of the reduction in employment (a downward-sloping contract curve implies the wage is negatively correlated with employment).

Once the unemployment rate rises, the rate of economic growth will also fall in response. In other words, when the union is more *democratic*, unionization is more likely to result in an increase in unemployment and a slowdown in growth.

● ***The Effects of Taxation:***

(i) if the government budget is financed by adjusting lump-sum taxes,

(1) in the case where $\varepsilon = 1$, a consumption tax has no impact on unemployment and economic growth, whereas income tax will reduce the balanced-growth rate even though it leaves unemployment unchanged;

(2) in the case where $\varepsilon = 0$, an increase in the income tax rate has ambiguous effects on unemployment and growth and a higher consumption tax rate is favorable to unemployment and economic growth.

(ii) If the government budget is financed by adjusting unemployment benefits, both income and consumption taxes are harmful to unemployment and economic growth, regardless of whether $\varepsilon = 1$ or $\varepsilon = 0$.

(1) $\varepsilon = 1$: If the government budget is financed by lump-sum taxes, neither the income tax rate τ nor the consumption tax rate τ_c will alter the relationship between income while employed and income while unemployed. As a result, unemployment is independent of taxation. This result conforms to that in the static model, e.g., Calmfors and Holmlund (2000).

Since the after-tax marginal productivity of capital decreases with τ, but is independent of τ_c, the balanced-growth rate falls as the income tax increases and remains unchanged as the consumption tax increases.

(2) $\varepsilon = 0$: a higher tax rate τ will drive a wedge between income if employed and income if unemployed ($\hat{w} - \hat{b}$). If the union is wage-oriented, $\delta > v$, this distortion will lead the trade union to accept a lower level of employment in exchange for a higher bargained excess wage.

To balance the budget, a higher τ allows the government to reduce the lump-sum tax imposed on wage incomes. This tends to dissuade the union from raising wages, which alleviates the negative distortionary effect on employment.

(3) A higher τ_c leads government to reduce the lump-sum tax, boosting employment.

This result obviously standing in sharp contrast to the effect in the existing endogenous growth models with either a fixed labor supply (which indicates that $\partial\tilde{\gamma}/\partial\tau < 0$ and $\partial\tilde{\gamma}/\partial\tau_c = 0$, see Rebelo, 1991) or a flexible labor supply (which indicates that $\partial\tilde{\gamma}/\partial\tau < 0$ and $\partial\tilde{\gamma}/\partial\tau_c < 0$, see Turnovsky, 2000), while a large body of empirical research (e.g., Easterly and Rebelo, 1993, Mendoza, Razin, and Tesar, 1994, and Widmalm, 2001) supports our comparative statics case where $\partial\tilde{\gamma}/\partial\tau \gtreqless 0$ and $\partial\tilde{\gamma}/\partial\tau_c > 0$.

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