# Labor TA1

## Macroeconomic Effects of Regulation and Deregulation in Goods and Labor Markets

Christina Håkanson, IIES

May 7th 2010

# Blanchard and Giavazzi, QJE (2003)

## Macroeconomic Effects of Regulation and Deregulation in Goods and Labor Markets

- "Product and labor market regulations are often blamed fro the poor European performance of the last 30 years. Remove (many of ) these regulations, and Europe will soar. Unemployment will decrease; output will increase" (1st paragraph)

- Deregulation
  - Reducing and redistributing rents.
  - Transition, dynamic effects.

# The environment

- Firms produce differentiated goods ($m$ goods, one good per firm) using labor
- Monopolistic competition in the goods market $=>$ rents
- Bargaining in the labor market $=>$ distribution of rents
- product market regulation:
  - determine entry cost for firms
- labormarket regulation:
  - determine workers bargaining power
- Short run: number of firms is given
- Long run: number of firms endogenous (entry condition)

# Main findings

PMDR:

- Direct effect: reduced rents (and thus reduced rents going to workers)
- But gain more as consumers than they loose as workers
- Higher real wages and lower unemployment in the long run

LMDR:

- Strong intertemporal tradeoff
  - SR likely both lower real wages and higher unemployment
  - LR: Lower unemployment

# The Model

## Workers/Consumers

- L workers, indexed by $j$
- Utility:

$$V_j = \left[ m^{-1/\sigma} \sum_{i=1}^{m} C_{ij}^{\sigma/(\sigma-1)} \right]^{\sigma/(\sigma-1)} \quad (1)$$

$\sigma = \overline{\sigma} g(m), g'(m) > 0$

1. - Symmetric eqm: workers consume all products in equal proportion $=>$ $C_{ij} = C_j/m$ and the utility function implies $V_j = C_j$ , i.e. number of products does not affect utility (comes from $m^{-1/\sigma}$)
   - Increase in $m =>$ increase in the elasticity of substitution between products (and by implication the elasticity of demand facing firms). Effect by reducing monopoly rents.

   (remember $\sigma = \overline{\sigma} g(m)$ Hotelling)

## Workers/Consumers cont.

- In each period worker $j$ supplies either one or zero unit of labor (no savings or capital)
- The budget constraint:

$$\sum_{i=1}^{m} P_i C_{ij} = w_j N_j + Pf(u)(1 - N_j) \tag{2}$$

$$P \equiv \left( \frac{1}{m} \sum_{i=1}^{m} P_i^{1-\sigma} \right)^{1/(1-\sigma)} \tag{3}$$

$f(u) > 0, f'(u) < 0$, decreasing function of the unemployment rate (higher unemployment makes it more painful to be unemployed)
substitute symmetry of consumption, $C_{ij} = C_j/m$ utility can be written as

$$(W_j/P - f(u))N_j + f(u) \tag{4}$$

# The Model

## Products and firms

- Each firm run by an entrepreneur.
- SR: n is fixed
- LR: endogenous n (entry condition)
- Entrepreneur spends profit on consumption goods.

Production function:

$$Y_i = N_i \tag{5}$$

Profits:

$$\pi_i = (P_i - W_i) N_i \tag{6}$$

# The Model

## Bargaining

- Each period firms bargain with $L/m$ workers

Nash Bargaining:

- Firm $i$ and the workers choose $W_i$ and $N_i$ as to maximize the log geometric surpluses from employment:

$$S = \beta \log((W_i - Pf(u))N_i) + (1-\beta)\log((P_i - W_i)N_i) \qquad (7)$$

  $\beta$ : relative bargaining power of workers

- Note: stronger workers (higher $\beta$) may get higher wage without suffering a decrease in employment (short run)

# The Model

## Entry

- Firms face a cost of entry $c$.
  - Shadow cost (legal and administrative restrictions rather than direct cost) implies that in long-run eqm existing firms make pure profits.
  - Proportional to output, implies long-run eqm profit rate $= c$

# The Model

## Regulation

Product Market Regulation

- determine the degree of competition among firms and the entry cost
  - decrease in $c$: reduction in red tape, elimination of monopolies etc.
  - increase in $\overline{\sigma}$ : ex standardization measures EU (reduced form, higher substitutability for whatever reason)

Labor Market Regulation

- determine the degree of bargaining power of workers

# Short Run Partial Equilibrium

Demand:

$$Y_i = (Y/m)(P_i/P)^{-\sigma} \tag{8}$$

- Firms and workers take $Y, P$ and $u$ as given and choose $N_i, \dot{P}_i$ and $W_i$ to maximize:

$$S = \beta \log((W_i - Pf(u))N_i) + (1-\beta)\log((P_i - W_i)N_i) \tag{9}$$

where demand is given by 8 and $Y_i = N_i$ from 5.

# Short Run Partial Equilibrium

## FOC:

$$max \left\{ \beta \log((W_i - Pf(u))\underbrace{(Y/m)(P_i/P)^{-\sigma}}_{N_i}) + (1-\beta)\log((P_i - W_i)\underbrace{(Y/m)(P_i/P)^{-\sigma}}_{N_i}) \right\}$$

$W_i$ :

$$\frac{\beta N_i}{(W_i - Pf(u))N_i} - \frac{(1-\beta)N_i}{(P_i - W_i)N_i} = 0$$

$P_i$ :

$$\frac{\beta}{(W_i - Pf(u))N_i}(W_i - Pf(u))\frac{Y}{m}\frac{-\sigma}{P}\left(\frac{P_i}{P}\right)^{-\sigma-1} + \frac{1-\beta}{(P_i - W_i)N_i}\left[N_i + (P_i - W_i)\frac{Y}{m}\frac{-\sigma}{P}\left(\frac{P_i}{P}\right)^{-\sigma-1}\right] = 0$$

# Short Run Partial Equilibrium

FOC=>

The relative price chosen by the firm:

$$P_i/P = (1+\mu(m))f(u) \tag{10}$$

Markup of relative price over reservation wage:

$$\mu(m) = 1/(\sigma-1) = 1/(\overline{\sigma}g(m)-1) \tag{11}$$

Real Wage:

$$W_i/P = (1-\beta)f(u) + \beta(P_i/P) \tag{12}$$

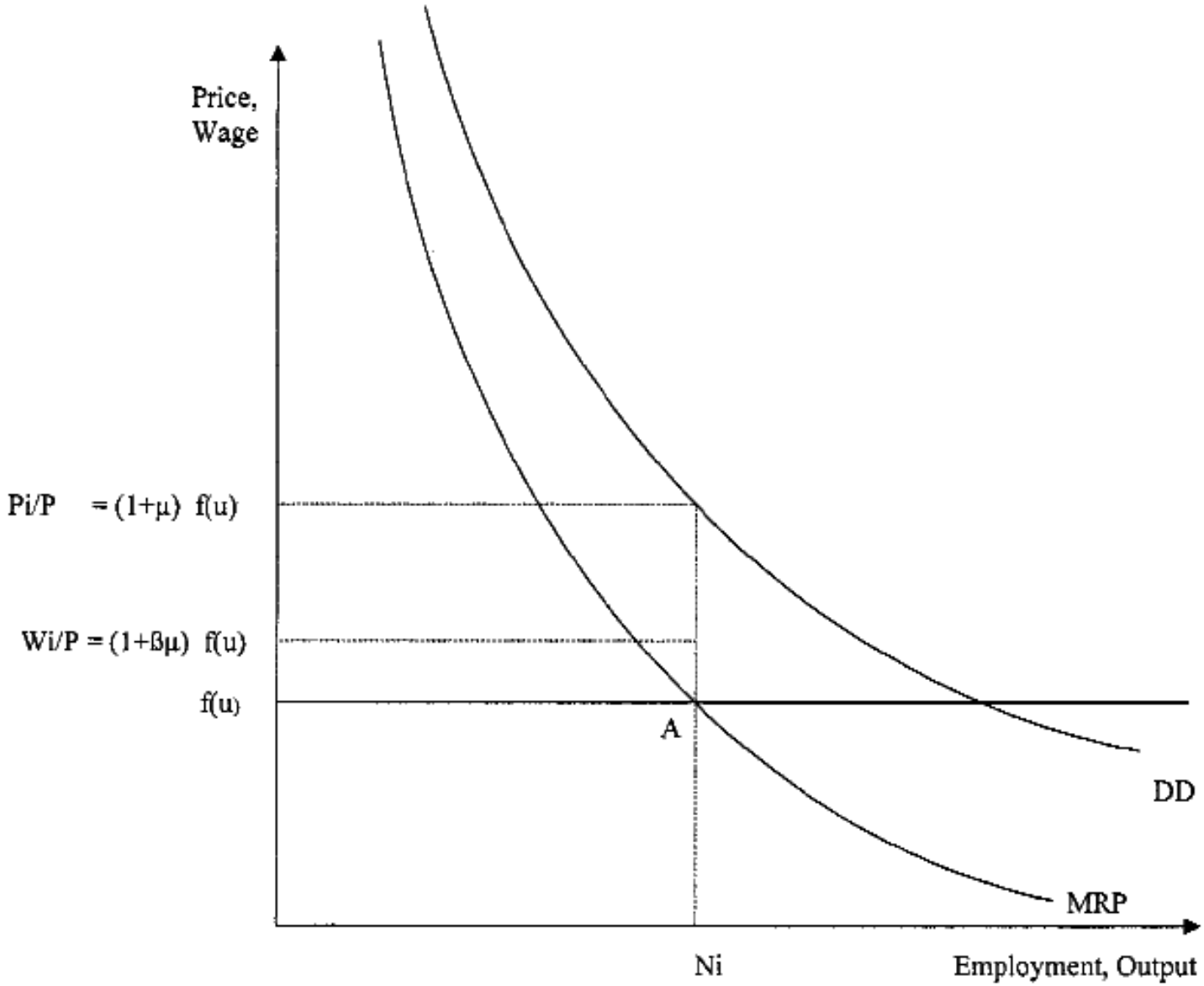



FIGURE I
Partial Equilibrium

- Efficient level of employment $MRP_L = f(u) => N_i$
- $N_i =>$ relative price $P_i/P = (1+\mu(m))f(u)$
- Given relative price rents are given by:

$$R = (P_i/P - f(u)) = \mu f(u) \tag{13}$$

- Substituting the relative price into real wage equation (12) we get:

$$\begin{aligned} W_i/P &= (1-\beta)f(u) + (1+\mu(m))f(u) \\ &= (1+\beta\mu(m))f(u) \end{aligned} \tag{14}$$

- $W_i/P$ increasing function of both $\beta$ and $\mu$ :
  - Higher $\beta =>$ higher proportion of rents to workers, reservation wage unaffected.
  - Higher $\mu =>$ higher rents and thus higher real wage

# Short Run General Equilibrium

Prices:

- Symmetry requires all prices equal in equilibrium $P_i/P = 1$, (10) becomes:

$$1 = (1 + \mu(m))f(u) \tag{15}$$

Unemployment:

- In the short run number of firms $m$ is given, so $\sigma = \overline{\sigma} g(m)$ is given, and by implication also $\mu(m)$, so (15) determines the equilibrium unemployment rate.

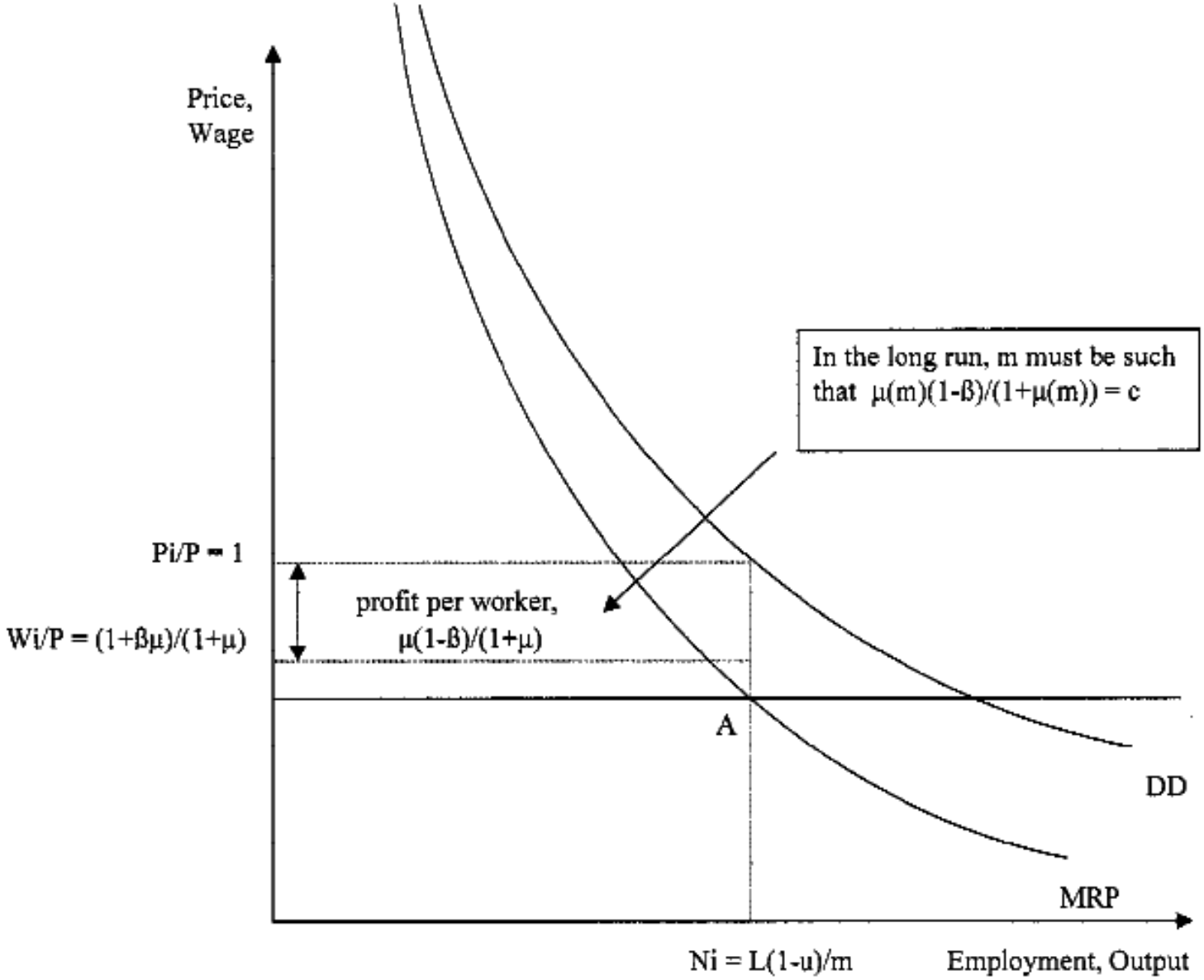



FIGURE II
General Equilibrium

# Short Run General Equilibrium

cont.

Real Wage:

- Substitute $f(u) = 1/(1+\mu(m))$ into the wage equation (14):

$$W_i/P = \frac{1+\mu(m)\beta}{1+\mu(m)} \tag{16}$$

- $W_i/P$ is now increasing in $\beta$ and *decreasing* in $\mu$ :
  - Higher $\beta$ => higher proportion of rents to workers, reservation wage unaffected.
  - Higher $\mu$ => two effects:
    - Partial equilibrium effect: higher rents and thus higher real wage.
    - General equilibrium effect: The rents come from the consumers. Get only proportion $\beta$ back so the total effect is negative.

# Long Run General Equilibrium

- $m$ is now endogenously determined
- Rents determine entry/exit.
- Rents must cover entry costs $c$:

$$\frac{\mu(m)(1-\beta)}{1+\mu(m)} = c \tag{17}$$

  Profit per worker: $P_i/P - W_i/P = \frac{\mu(m)(1-\beta)}{1+\mu(m)} = c$

- (17) determines equilibrium number of products (firms) $m$.
- Number of products such as to generate a degree of competition consistent with profits equal to entry cost.

# Long Run General Equilibrium

## number of products

Rewrite (17) using (11) $\mu(m) = 1/(\overline{\sigma} g(m) - 1)$

$$\overline{\sigma} g(m) = (1 - \beta)/c \tag{18}$$

- $g' > 0 =>$ so $m$ is a decreasing function of $\overline{\sigma}$
  - more competition given $m =>$ decrease rents $=>$ entry less attractive
- $m$ is a decreasing function of $\beta$
  - larger share of rents going to workers make entry less attractive
- $m$ is a decreasing function of $c$
  - higher entry cost require higher rents

# Long Run General Equilibrium

## unemployment

Substitute markup from (17) into (15)

$$f(u) = 1 - \frac{c}{(1-\beta)} \tag{19}$$

The higher $c$ or $\beta$ $=>$ the higher markup is required to cover entry costs $=>$ the smaller $f(u)$ $=>$ the higher $u$

# Long Run General Equilibrium

## Real Wage

Substitute (17) into (16)

$$W_i / P = 1 - c \tag{20}$$

- Productivity is equal to one, firms must have $c$ to cover entry costs.
- Response in $W_i / P$ to changes in $\beta$ and $\mu$:
  - Higher $\beta$ $=>$ Lower rents for firms. Given $c$ : fewer firms, higher markup, lower reservation wage, higher unemployment. Real wage is unaffected.
  - $\mu$ no longer exogenous, determined in eqm by $c$ and$\beta$.
  - higher $c$ $=>$lower $W_i / P$, lower $m$, higher $\mu$, lower $f(u)$ and higher $u$

# Product Market Deregulation:

Increase in $\overline{\sigma}$ (elimination of tariff barriers, standardization measures etc.)

**Short Run:**

- $\overline{\sigma} \uparrow \quad \Longrightarrow \sigma \uparrow$(given m) $\quad \Longrightarrow \mu \downarrow \quad \Longrightarrow \frac{W_i}{P} \uparrow, u \downarrow$

**Long Run:**

- unchanged $c$, lower profits $\quad \Longrightarrow m \downarrow \quad \Longrightarrow$profits $\uparrow$ (return) $\Longrightarrow u \uparrow \quad \Longrightarrow \frac{W_i}{P} \downarrow$
- Deregulation self defeating
- No intertemporal trade-offs
- Higher real wages and lower unemployment in the short run, but no effects in the long run.

# Product Market Deregulation:

Increase in $\overline{\sigma}$ (increased substitutability $=>$ increase competition in product market)

**Short Run:**

- more elastic demand$\sigma \uparrow \quad \Longrightarrow \mu \downarrow \quad \Longrightarrow \frac{W_i}{P} \uparrow, u \downarrow$

**Long Run: effect vanishes:**

- $\Longrightarrow$exit $m \downarrow \quad \Longrightarrow$profits $\uparrow$by $\mu \uparrow \quad$ and so $\Longrightarrow \frac{W_i}{P} \downarrow, u \uparrow$ (restored)

# Product Market Deregulation:

Decrease in $c$ (elimination of monopolies, decrease red tape etc.)

**Short Run:**

- No effect

**Long Run:**

- $c \downarrow \quad \Longrightarrow$entry $m \uparrow \quad \Longrightarrow$profits
  $\Longrightarrow m \downarrow \quad \Longrightarrow \sigma \uparrow \quad \Longrightarrow \mu \downarrow \quad \Longrightarrow \frac{W_i}{P} \uparrow, u \downarrow$
- This dimension of deregulation "works"
- No intertemporal trade-offs
- No short run effects, higher real wages and lower unemployment in the long run.

# Labor Market Deregulation:

Decrease in $\beta$

**Short Run:**

- $\beta \downarrow \quad \Longrightarrow$worker rents$\downarrow$(profits up) $\quad \Longrightarrow \frac{W_i}{P} \downarrow$, $u$ unchanged

**Long Run:**

- higher profits $\Longrightarrow$entry $m \uparrow$ until profit rate$=c$ $\Longrightarrow \sigma \uparrow \Longrightarrow \mu \downarrow \Longrightarrow \frac{W_i}{P} \uparrow, u \downarrow$

- Lon Run $u$ lower than before deregulation.
- Real wage back to initial level.
- Intertemporal trade-off
- Labor market deregulation works by changing the distribution of rents, leading to more competition and lower unemployment.

# Application: Political Economy of Deregulation

- Who gains and looses from deregulation?
- Intertemporal effects?
- Why do workers often oppose product market regulation?
- Interactions?

# Application: Political Economy of Deregulation

## Labor Market Deregulation

**Short Run:**

- $\beta \downarrow \quad \Longrightarrow$worker rents$\downarrow$(profits up) $\quad \Longrightarrow \frac{W_i}{P} \downarrow$, $u$ unchanged

**Long Run:**

- higher profits $\Longrightarrow$entry $m \uparrow$ until profit rate=$c$ $\Longrightarrow \sigma \uparrow \Longrightarrow \mu \downarrow \Longrightarrow \frac{W_i}{P} \uparrow, u \downarrow$

- A worker employed in both periods is worse off (lower wage + possible unemployment effects).
- Those who would have been unemployed in the future gain (lower $u$ and higher $f(u)$)

# Application: Political Economy of Deregulation

## Product Market Deregulation

Decrease in $\mu$ (short run from increase in $\overline{\sigma}$, or long run from decrease in $c$)

- $\mu \downarrow \quad \Longrightarrow \frac{W_i}{P} \uparrow, u \downarrow$
- Effects on workers seem favorable - Why oppose PM deregulation?
- Recall partial eqm: deregulation reduce rents - and thus rents to workers. (this disappeared in general eqm due to symmetry)
  - If deregulation only affects part of the economy (no symmetry) partial eqm effects may go through.
  - Possible unemployment effect (as above)

# Application: Political Economy of Deregulation

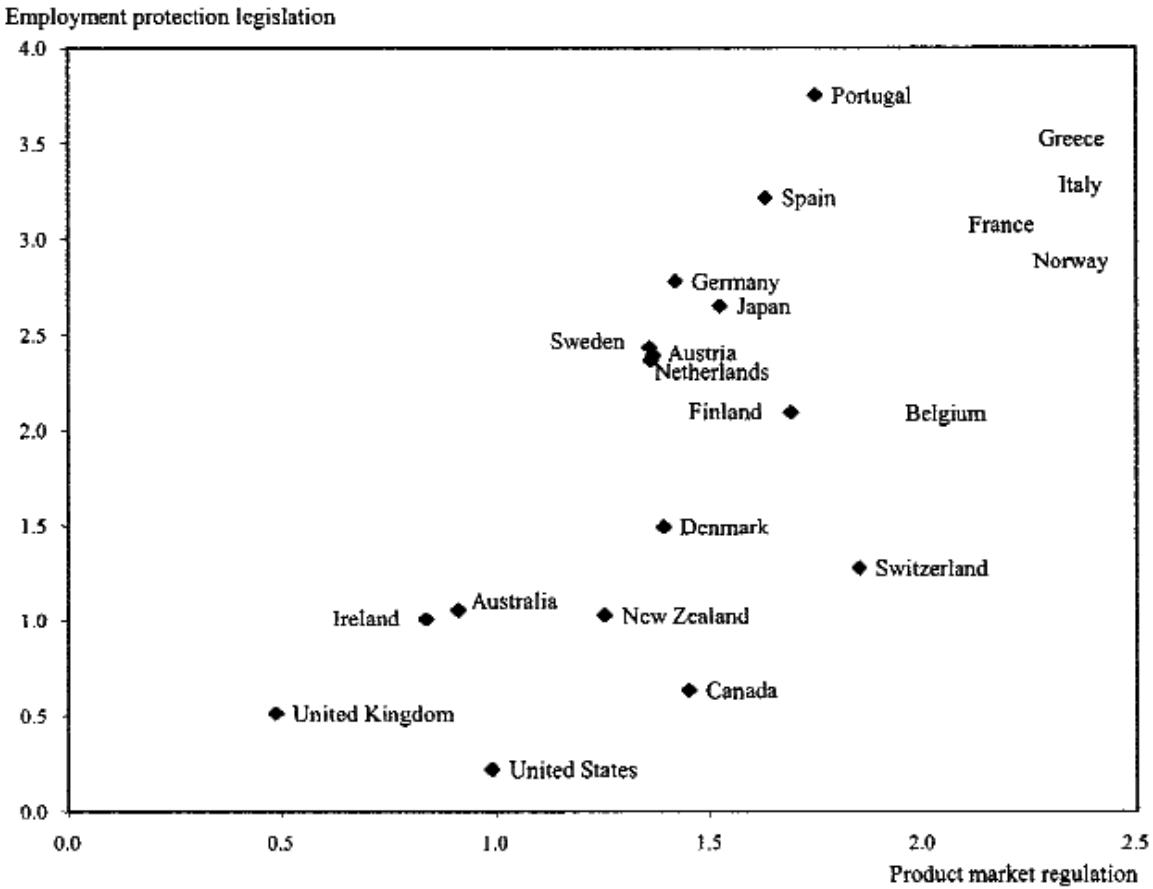



FIGURE IV
Product Market Regulation and Employment Protection Legislation
(from Nicoletti et al. [1999])

# Application: Political Economy of Deregulation

## Interactions

- In countries where product markets are highly regulated workers tend to be highly protected.
- Possible explanation: If product market regulation increases rents, incentive for workers to appropriate a portion of these rents are increased (and vice versa)

- Assume workers maximize utility net of lobbying costs:

$$\frac{(1+\beta\mu)}{(1+\mu)} - (\frac{\alpha}{2})\beta^2$$

- Max w.r.t $\beta$ :

$$\beta = (\frac{1}{\alpha})(\frac{\mu}{1+\mu})$$

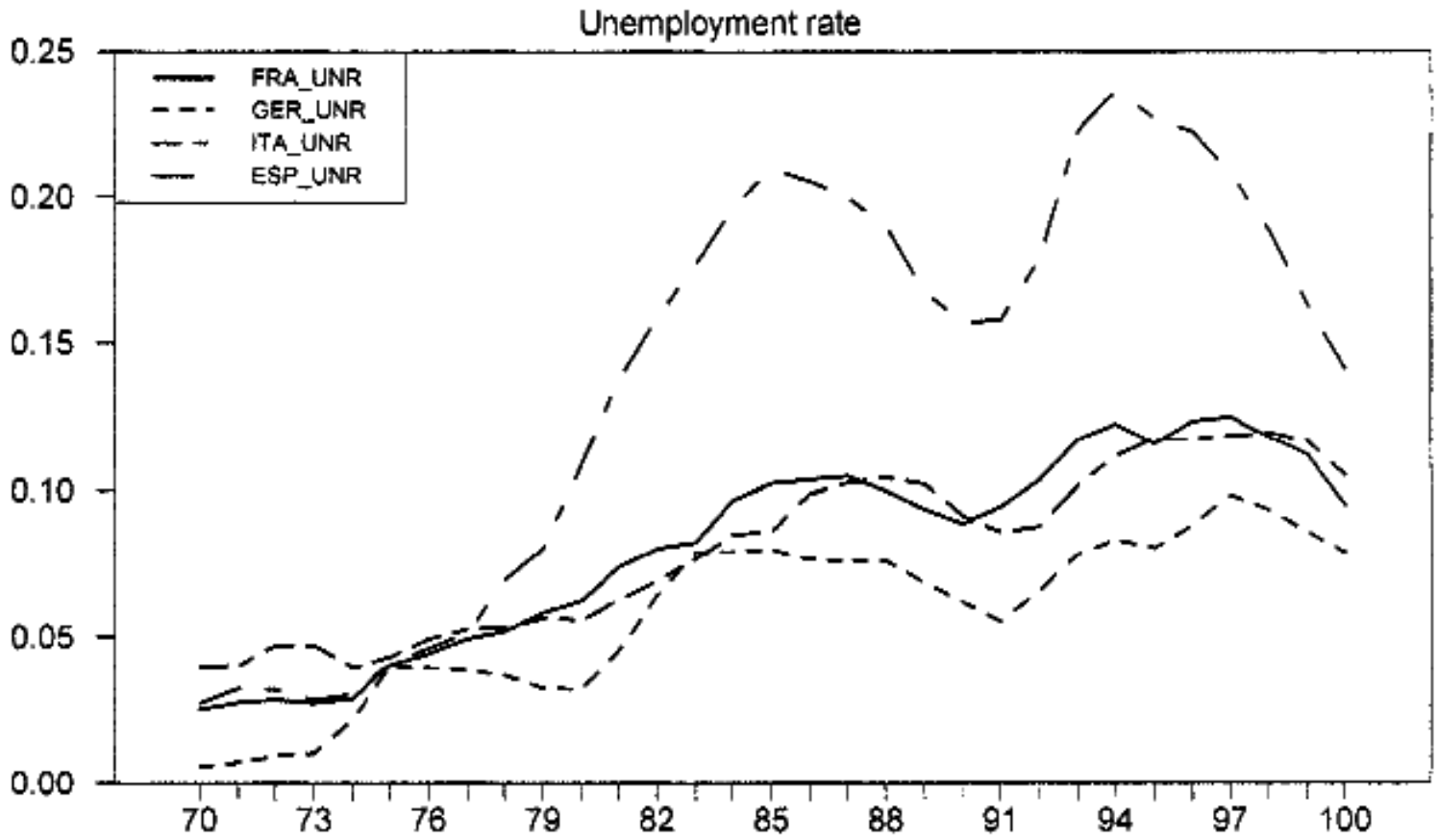
so $\beta$ increasing in $\mu$

# Application: Labor share and unemployment share in Europe

- Rise of unemployment in 1970's and1980's
- Shift in factor income distribution same period - labor share has declined since early 80's
- 2 major explanations in the literature:
  1. wage increases in the 60's and 70's
  2. wage moderation in the 80's

  None works

# Application: Labor share and unemployment share in Europe



# Application: Labor share and unemployment share in Europe

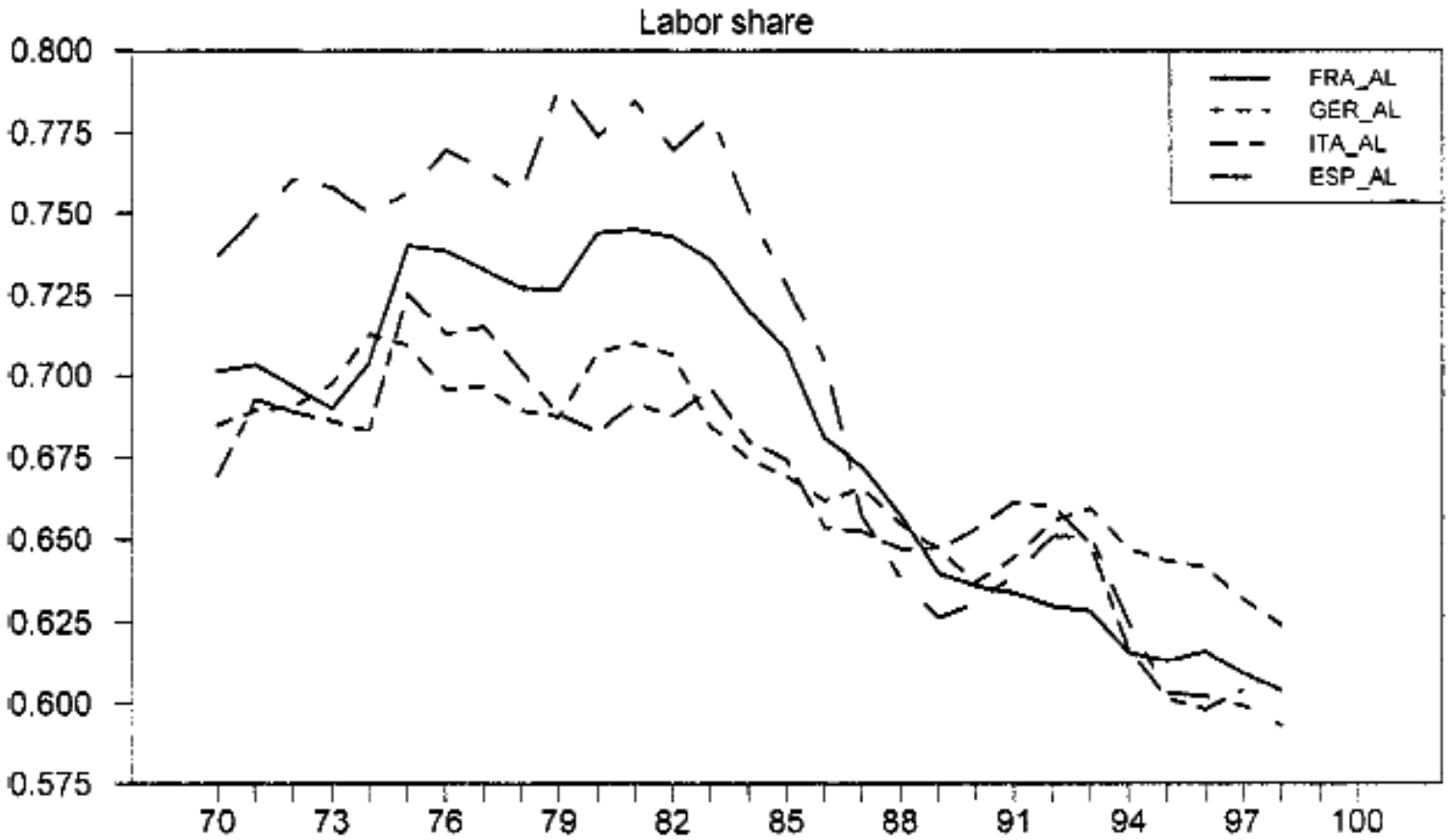



FIGURE V

# Application: Labor share and unemployment share in Europe

Blanchard Giavazzi interpretation:

- Linear technology and productivity=1 $\Longrightarrow$ labor share equal to wage

$$labor\ share = \frac{(1+\beta\mu)}{(1+\mu)}$$

Labor share can decrease if:

- markup goes up (unlikely explanation)
- $\beta$ goes down: model predicts both decrease in the share in the and increased unemployment (need concave utility) in the short run