Workplace Public Goods and Labour Regulation

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Motivation

- Recently there has been a lot of attention to work conditions and *non-wage* part of jobs across the world
- Of course, there is a long history of labour movements as well as labour regulation about work conditions and various rights
- Lately, these issues have often been in the news in India, in a negative way

No Need for Sundays

'How long can you stare at wife?' L&T chief wants employees to work on Sundays

L&T chairman SN Subrahmanyan's call for a 90-hour work week has reignited the work-life balance debate, adding to the uproar sparked by Narayana Murthy's 70-hour work week suggestion.

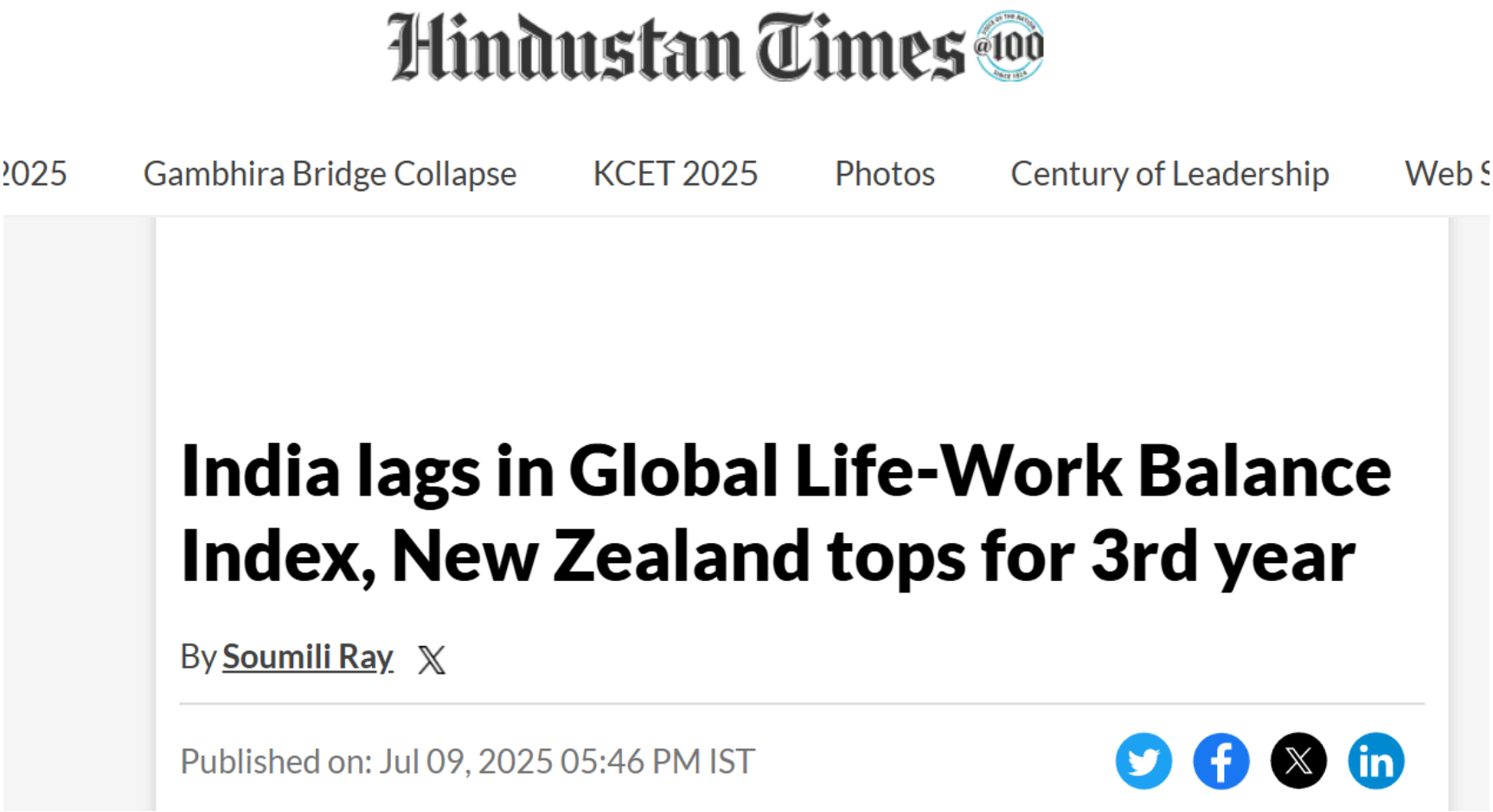
SN Subrahmanyan's comments came during an employee interaction. (Photo: Mandar Deodhar)

Long Hours

Narayana Murthy To Elon Musk, Business Leaders Who Support Long Work Hours

- Edited by:NDTV News Desk
- India News
- Jan 11, 2025 11:15 am IST

Work-Life Balance



Poor Safety

Business

Workplace safety lapses: Over 400 workers killed in India in 2024

The chemical and pharmaceutical sector saw some of the most severe accidents this year.

Image of a gas leak-triggered explosion and blaze at a pharmaceutical intermediates and speciality chemicals manufacturing unit at Eluru, Andhra Pradesh.(File Photo)

Online Desk

Updated on:

30 Dec 2024, 7:49 am

Economic Approach

- Economists typically think of work as an exchange of labour against wages, with great richness in terms of types of labour, investment in skills, various incentive/information/contracting issues that create frictions
- Yet, in the public domain as well as in proposed labour regulations, there is a lot of focus on non-wage aspects of work

Examples of Amenities

- Length of work hours, leave policy
- Work from home/flexible hours
- Workplace safety
- Workplace condition (e.g., not being exposed to pollution or extreme temperatures)
- Transportation
- Health insurance
- Childcare services
- Anti-sexual harrassment measures.
- Mental health support

The Economic Question

- Given that workers are compensated with a *bundle* consisting of wages and various amenities, some of which are workplace public goods, economic efficiency dictates not just the *level* but the *composition* of the bundle is right.
- If workers are willing to accept longer hours, poorer safety and fewer benefits in return for higher pay, why should governments intervene? Paternalistic and inefficient?
- Indeed, economists tend to take a negative view of labour regulations as an impediment to business growth and employment generation - is there an efficiency-equity trade-off?

Framework

- We take a model of wage-bargaining between firms and workers
- After training costs are sunk, workers can demand higher wages *ex post* and the firm cannot easily replace trained workers.
- Firms choose employment levels and workplace public goods
- *Multi-dimensional hold-up*: laissez-faire leads to underemployment and underprovision of workplace public goods.

Framework

- Two distortions in a non-unionized firm:
  - underemployment due to the higher cost of hiring.
  - underprovision due to more public goods inflating wages.
- In a unionized firm, only one distortion is present – the underemployment effect, but its size is larger.

Results

- There may be *efficiency* grounds for labour market interventions that are typically deemed inefficient
- Contrary to the usual efficiency-equity trade-off logic
- For example,
  - **Unionization** *may* increase employment and efficiency
  - Mandatory **standards** for workplace public goods increases employment and efficiency.
  - **Employment incentives** (e.g., wage subsidies) also raise labour standards and efficiency.

Results

- **Complementarity** between policies for promoting employment and improving work conditions.
- It is possible to restore first-best using
  - both wage subsidies and mandatory standards in non-unionized firms.
  - wage subsidies alone in unionized firms.

Related Literature

- Firms and workers with hold-up and specific investments (see Malcolmson, 1997 for a review) and also, the property rights literature Grossman-Hart-Moore
- Monopsonistic competition in the labour market (see Manning, 2003) and the search and matching literature due to Mortensen-Pissaredes-Burdett where firms have monopsonistic power in setting wages.
- Investment in general and specific training on workers by firms and how that depends on the presence of monopsonistic market power of firms (Acemoglu and Pischke, 1999).
- Our paper is related but departs in an important way: taking into account the non-wage aspect of jobs and how that interacts with the choice of the employment level

The Model

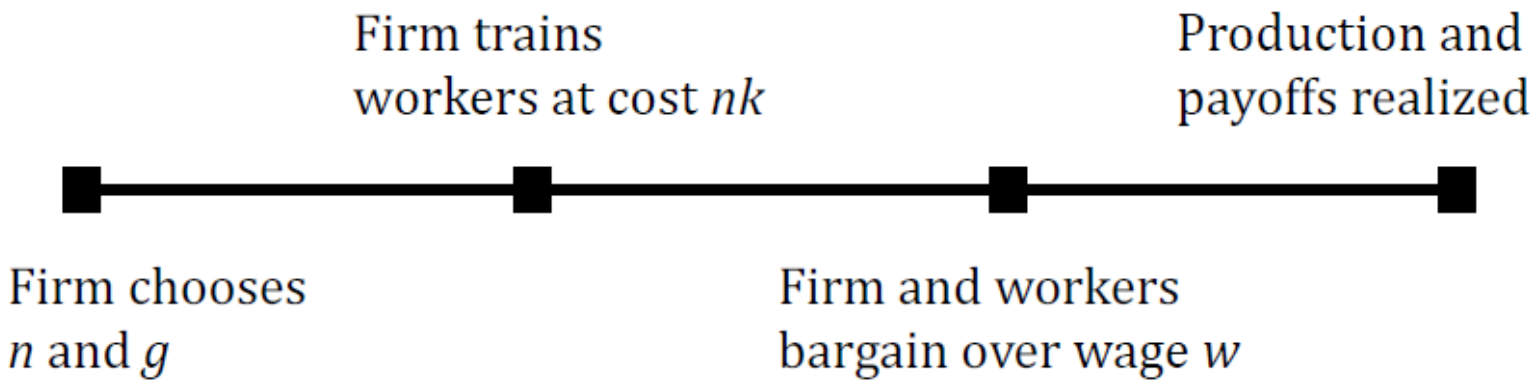
- A competitive firm hires workers and compensates them in wages (w) and a workplace public good (g).
- Firm's production function is $F(n, g)$; $F_n > 0$; $F_g < 0$.
- There is a training cost k per worker.
- Workers have quasilinear utility in w and g, where $v(g)$ is the utility of the public good; $v'(g) > 0$, $v''(g) < 0$.
- Workers are assumed to supply labour inelastically

The Model

- Workers' reservation utility $= u$.
- We are assuming u to be exogenous, which is contrary to what is assumed in the monopsony literature (to be relaxed)
- Net payoffs of the firm and worker:

$$\begin{aligned} \Pi &= F(n, g) - n(w + k) \\ V &= w + v(g) - u \end{aligned}$$

Time Line


Firm trains
workers at cost nk
Production and
payoffs realized
Firm chooses
n and g
Firm and workers
bargain over wage w

Some Applications

Work Hours: Each worker has 1 unit of time, of which g is allocated to leisure and $1-g$ to work. Due to team production, g must be common across workers. Production function:

$$F(n,g) = H\left(n(1-g)\right); \quad H'(.) > 0, H''(.) < 0$$

Pure Public Good: g is a pure public good (like air-conditioning and fire safety measures that are not subject to congestion effects. Production function:

$$F(n,g) = H(n) - g; \quad H'(.) > 0, H''(.) < 0$$

Some Applications

Club Good: g is a club good (like group health insurance or child care services) whose cost is proportional to the number of users. Production function:

$$F(n,g) = H(n) - ng; \quad H'(.) > 0, H''(.) < 0$$

Productivity enhancing investments: Total productivity is increasing in g although that comes at a cost $c(g)$, assumed additively separable. Production function:

$$F(n,g) = H(n(g)) - c(g)$$

$n(g)$ is the number of workers hired with $n'(g) > 0$

Social Surplus

- Social surplus is the sum of payoffs:

$$S(n,g) = \Pi + nV = F(n,g) + n\left[v(g) - u - k\right]$$

- **Assumption:** $S(n,g)$ is strictly concave.
- **Note:** This is a joint condition on the production technology and worker preferences

Social Planner's Solution

- The planner solves:

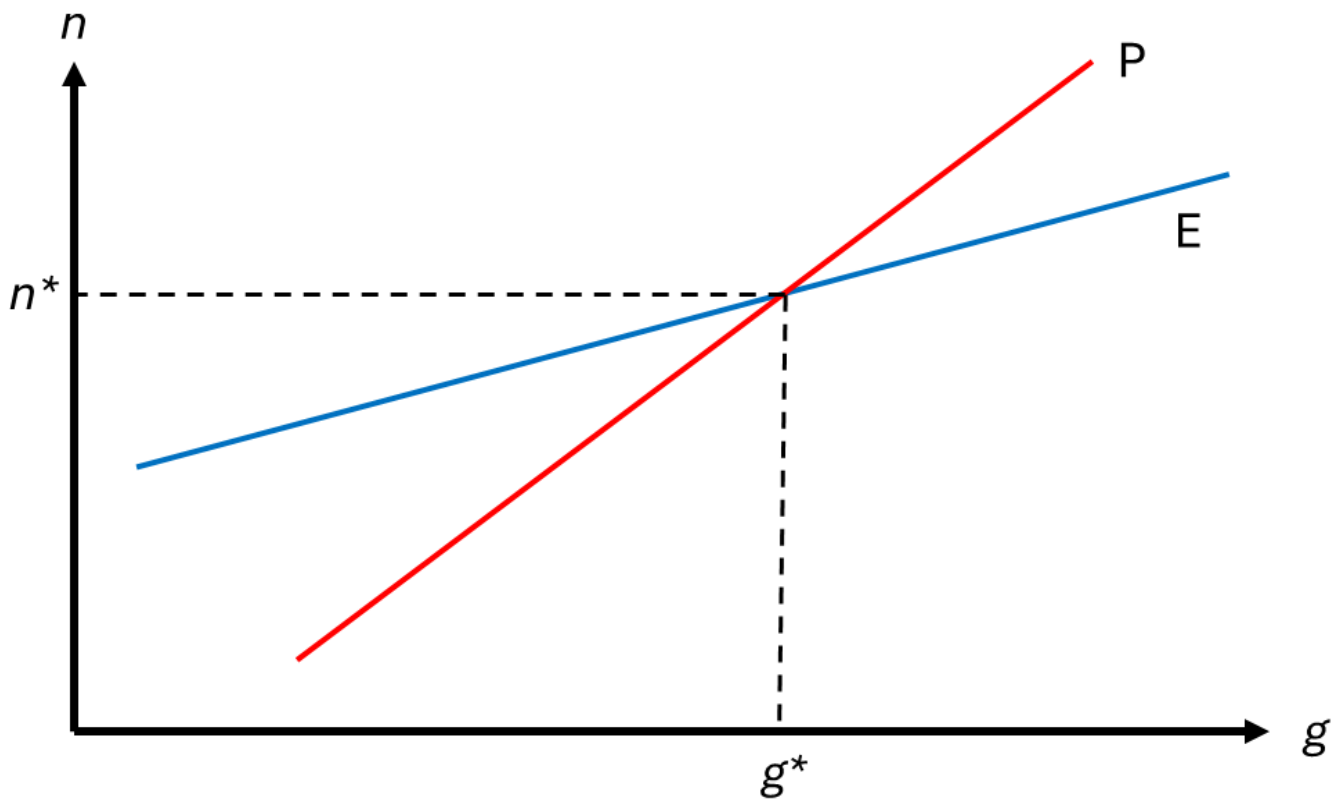
$$\max_{n,g} S(n,g)$$

- The F.O.C:

$$S_n = 0 \Rightarrow F_n = u + k - v(g) \quad (1)$$
$$S_g = 0 \Rightarrow -F_g = nv'(g) \quad (2)$$

- (1) and (2) give us conditional employment $n(g)$ and conditional public goods provision $g(n)$
- Complementarity follows from $S_{ng} > 0$
- Their solution gives us the social optimum (n^*, g^*).
- Complete contracting will deliver the same outcome.

Social Planner's Solution



The Hold-up Problem

- Under complete contracting a firm can choose its workers' compensation package (w, g) in a cost minimizing way to meet their reservation utility u.
- We assume incomplete contracting. After the training cost k is sunk, workers can renegotiate wages.
- Workers can grab their outside option even after receiving training, but the firm cannot hire and retrain new workers.
- The ex-post surplus is

$$\widehat{S}(n, g) = S(n, g) + nk$$

- The ex-post marginal suplus is

$$\widehat{S}_n = S_n + k$$

Individual vs Collective Bargaining

- **The non-unionized firm:** Workers bargain individually with the firm. Each worker claims her reservation utility plus half the ex-post *marginal surplus*:

$$w_i = u - v(g) + \frac{1}{2}(S_n + k)$$

- **The unionized firm:** Workers bargain collectively. Workers as a group get their reservation utility plus half the ex-post *total surplus*.

$$w_c = u - v(g) + \frac{1}{2n}(S + nk)$$

- Bargaining weights can be changed without altering qualitative results.

The Non-Unionized Firm

- The firm solves

$$\begin{aligned} \max_{n,g} \Pi_i(n,g) &\equiv F(n,g) - n(w_i + k) \\ &= S(n,g) - \underbrace{\frac{n}{2}(S_n + k)}_{\text{hold-up cost}} \end{aligned}$$

- If marginal surplus is negative, the optimal renegotiation is for the worker to leave the firm.
- Will not arise at the optimum.

The Non-Unionized Firm

- The F.O.C for employment:

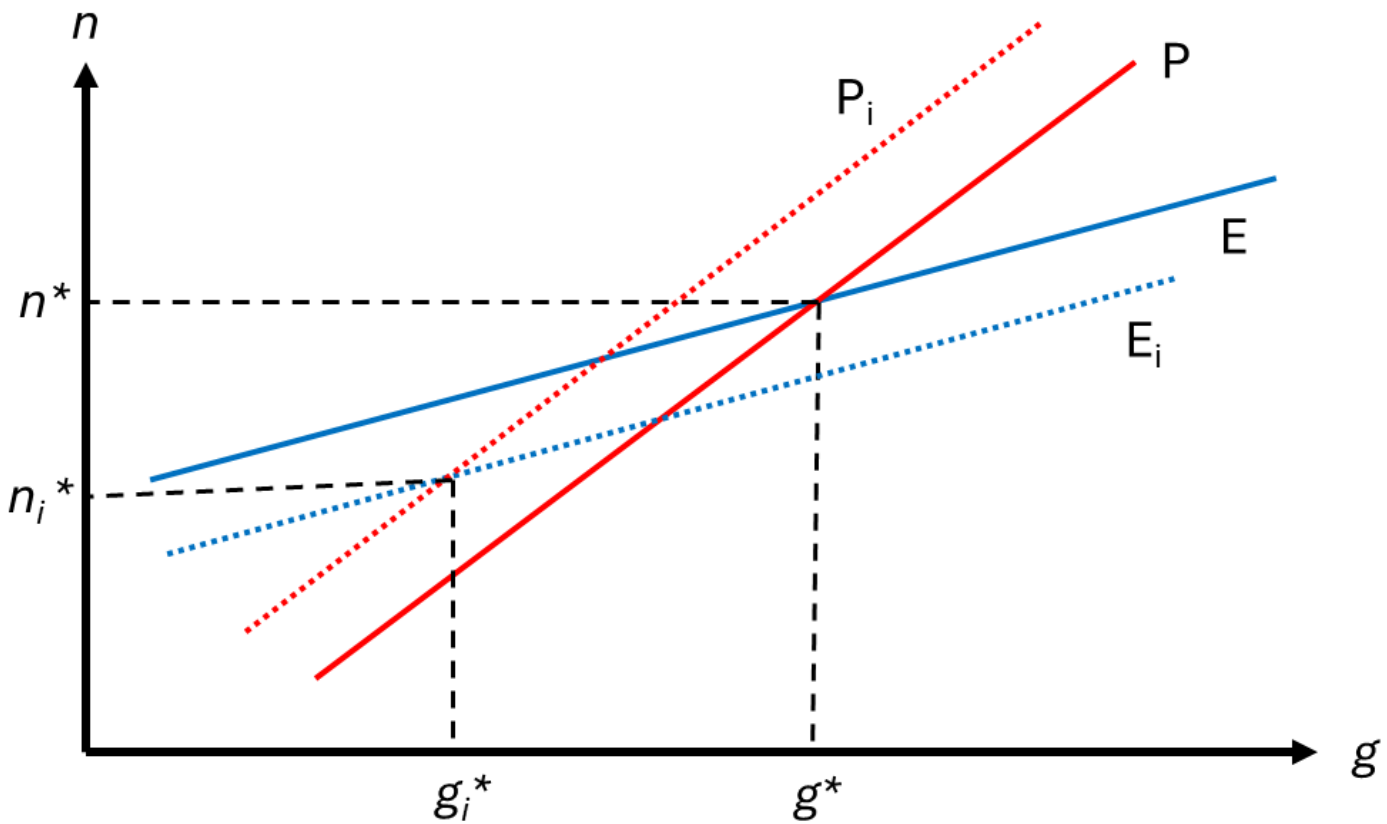
$$S_n = \underbrace{k}_{\text{cost-push}} + \underbrace{nS_{nn}}_{\text{surplus-squeeze}} \quad (3)$$

- The F.O.C for workplace public goods:

$$S_g = \underbrace{\frac{n}{2}S_{ng}}_{\text{surplus-inflation}} \quad (4)$$

- These define conditional functions $n_i(g)$ and $g_i(n)$, and the solution (n_i^*, g_i^*)
- Assuming k is not too small and $S_{ng} > 0$ we can show that for any given g, n will fall and vice versa.

The Non-Unionized Firm



Public Goods Exacerbate Hold-up

Lemma

In all three applications considered, $S_{ng} = F_{ng}(n, g) + v'(g) > 0$ *in the relevant range of values of* (n, g)*. Higher levels of workplace public goods increase hold-up cost for the firm.*

Proposition 1: *Assume* $S_{ng} > 0$ *and* k *exceeds a minimum threshold. Then, relative to the first-best, the non-unionized firm produces conditional and unconditional underemployment, as well as conditional and unconditional under-provision of the workplace public good.*

$$\begin{aligned} n_i(g) &< n(g); \quad & n_i^* &< n^* \\ g_i(n) &< g(n); \quad & g_i^* &< g^* \end{aligned}$$

The Unionized Firm

- The firm solves

$$\begin{aligned} \max_{n,g} \Pi_c(n,g) &\equiv F(n,g) - n(w_c + k) \\ &= \frac{1}{2}\left[S(n,g) - \underbrace{nk}_{\text{hold-up cost}}\right] \end{aligned}$$

- The firm effectively faces a tax on input (training) and also a proportional tax on profits due to hold-up. The latter is non-distortionary.

The Unionized Firm

- The F.O.C for employment:

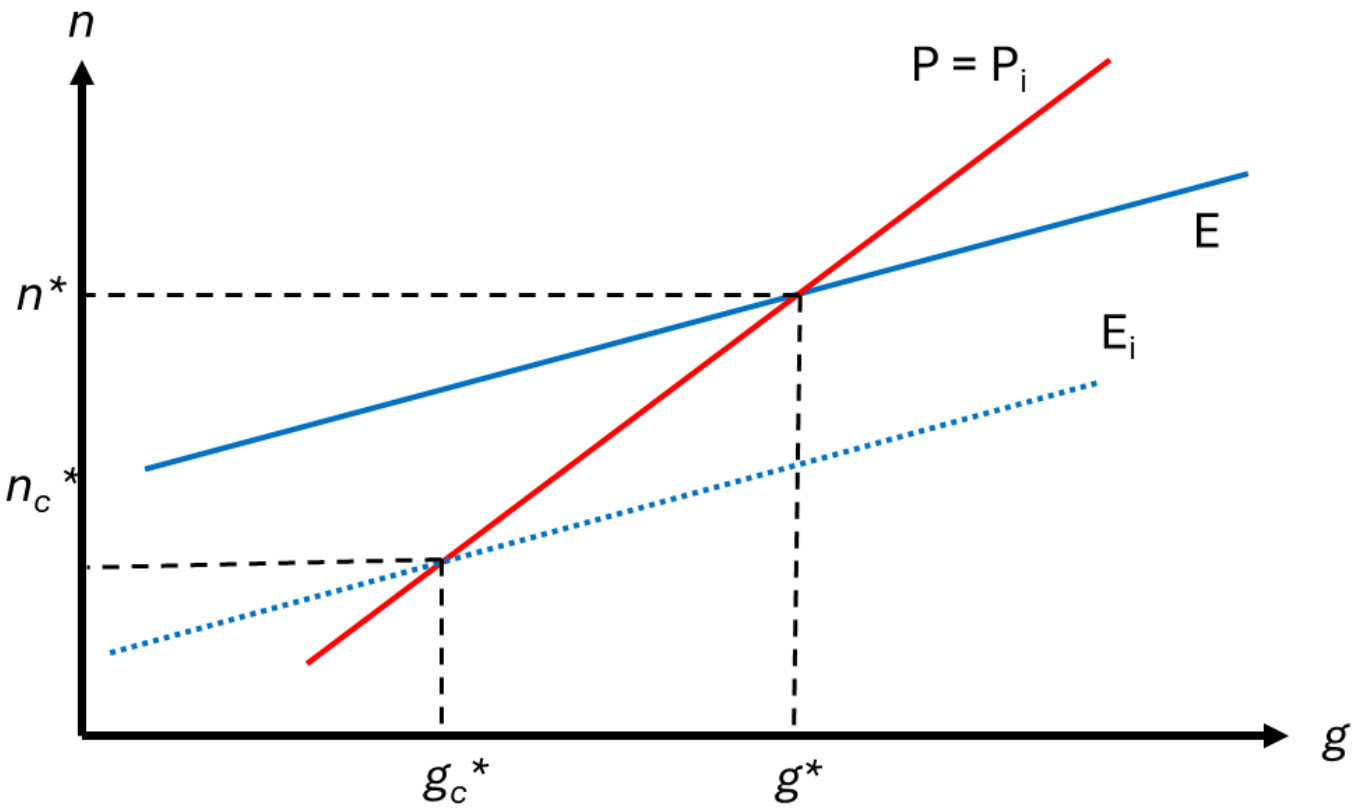
$$S_n = \underbrace{k}_{\text{cost-push}} \tag{5}$$

- The F.O.C for workplace public goods:

$$S_g = 0 \tag{6}$$

- These define conditional functions $n_c(g)$ and $g_c(n)$, and the solution (n_c^*, g_c^*).
- Unlike the non-unionized firm, the unionized firm only faces the cost-push effect and no surplus-squeeze effect in n, and no distortion in g.

The Unionized Firm



Unionization Removes One Distortion

Proposition 2: *Relative to the first-best, the unionized firm produces conditional underemployment, but no conditional under-provision of the public good. However, unconditionally, there is both underemployemnt and under-provision of the public good relative to first-best.*

$$\begin{aligned} n_c(g) &< n(g); \quad & n_i^* < n^* \\ g_c(n) &= g(n); \quad & g_i^* < g^* \end{aligned}$$

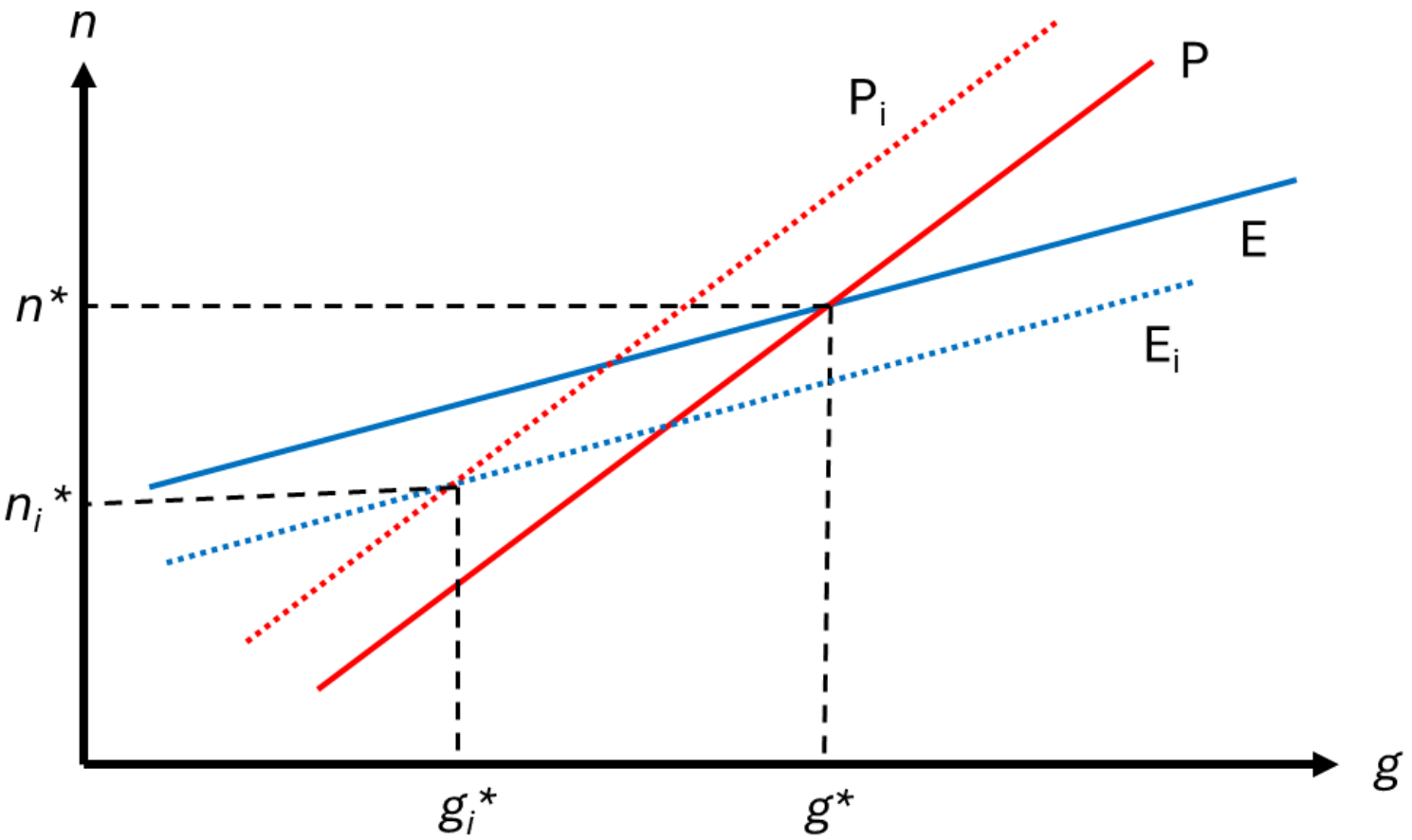
Proposition 3: *The non-unionized firm creates less conditional underemployment than the unionized firm, but more conditional under-provision of the public good. The unconditional magnitudes depend on the strength of these two effects.*

$$\begin{aligned} n_i(g) &> n_c(g) \\ g_i(n) &< g_c(n) \end{aligned}$$

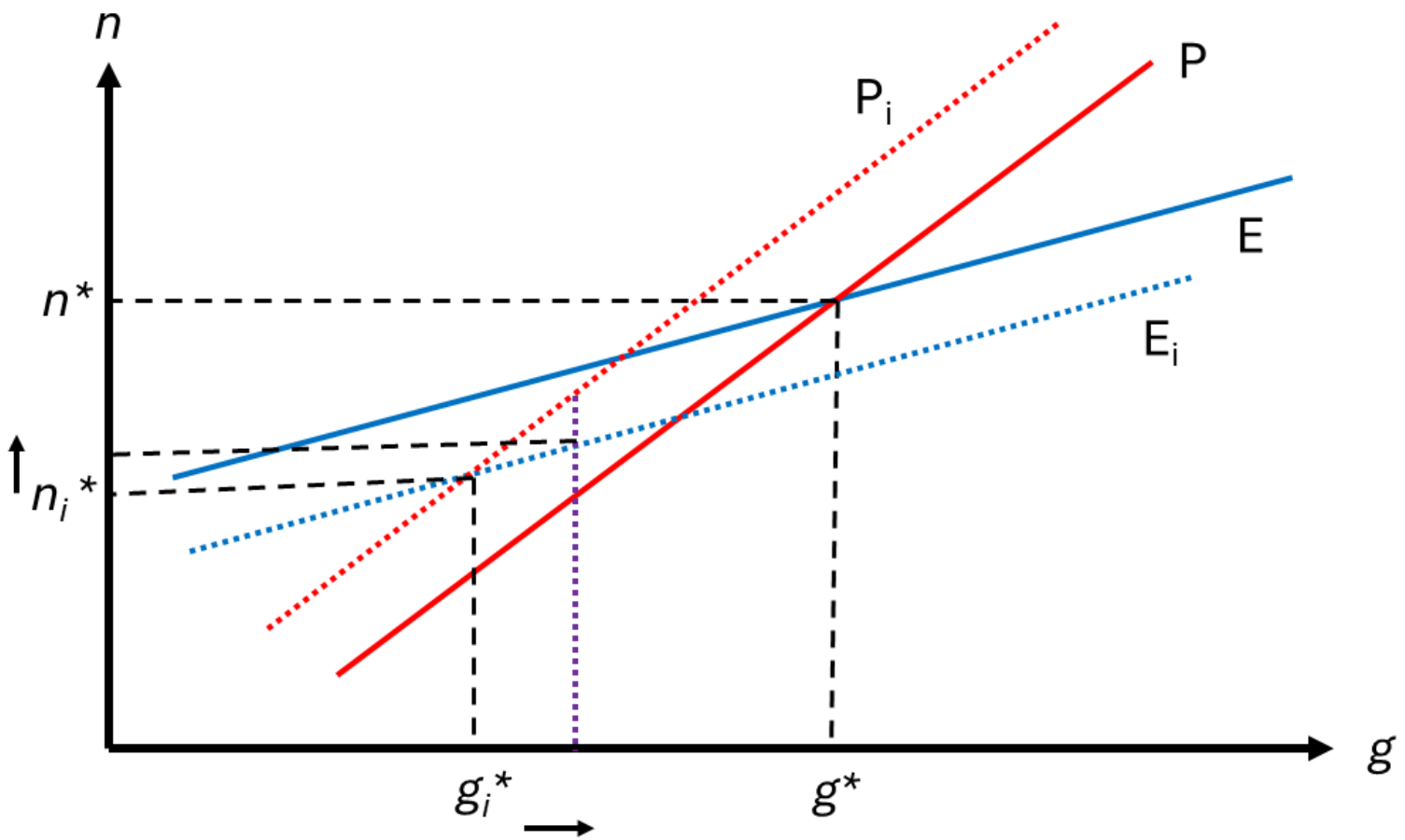
Mandatory Public Goods

- Suppose regulation requires $g \geq \underline{g} > 0$.
- Assume that $\underline{g}$ is higher than the initial equilibrium level so that the policy has bite
- Then in the post-regulation equilibrium n will be higher

Mandatory Public Goods: Non-Unionized Firm



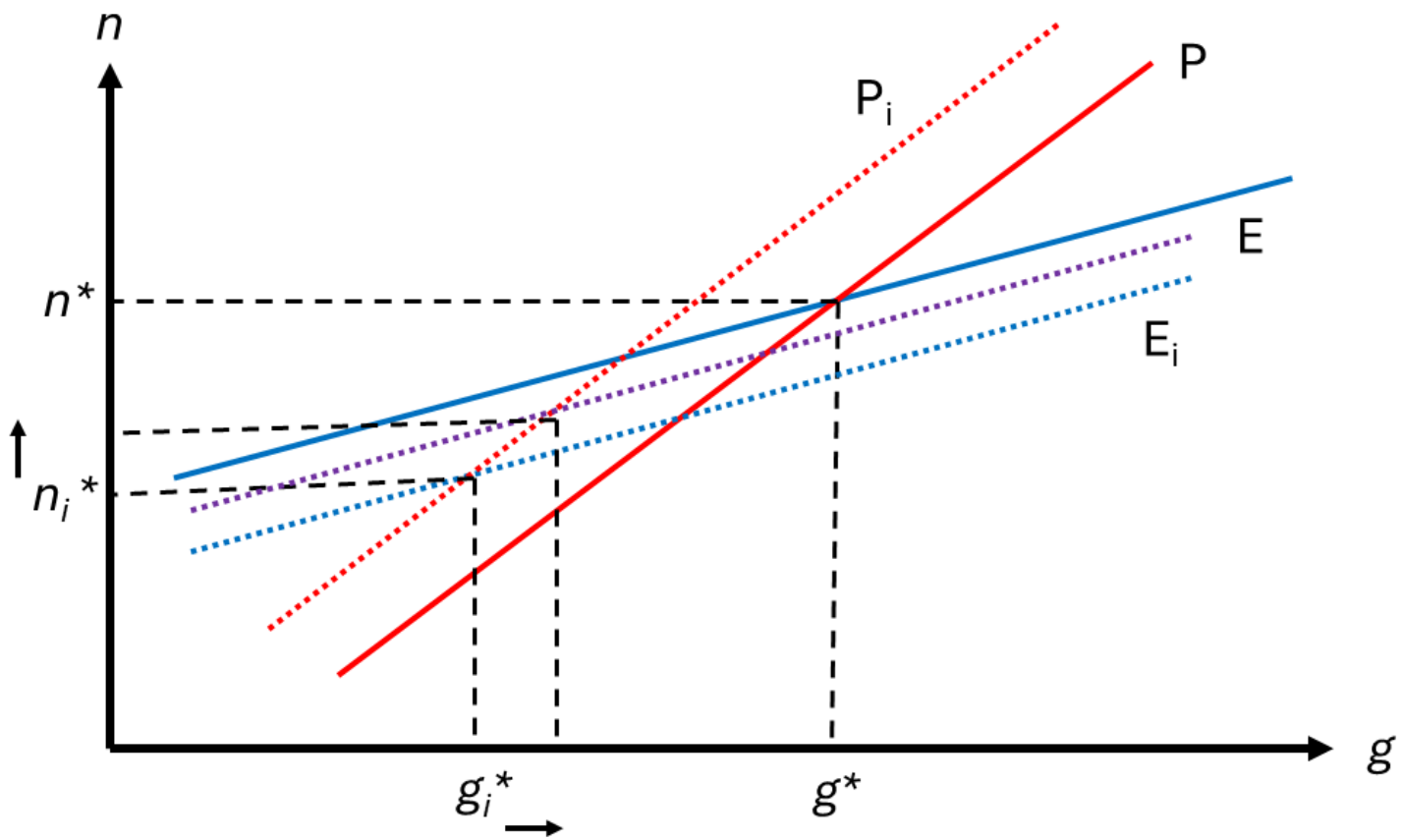
Mandatory Public Goods: Non-Unionized Firm



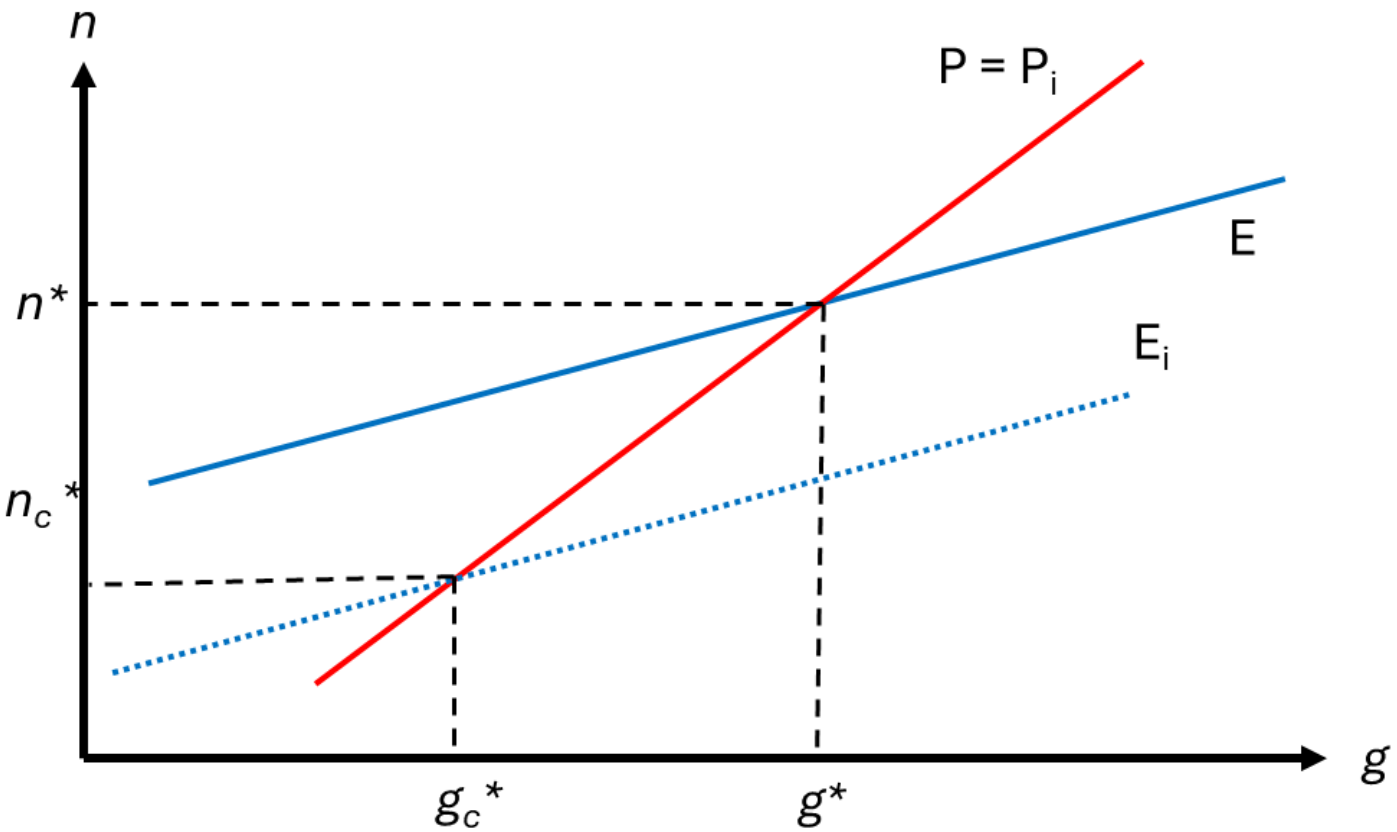
Wage Subsidies

- Consider a wage subsidy policy where the firm is given $s > 0$ per worker
- Now the firm's profits are $F(n, g) - n(w_i - s + k)$
- For any given g, it will push n up.

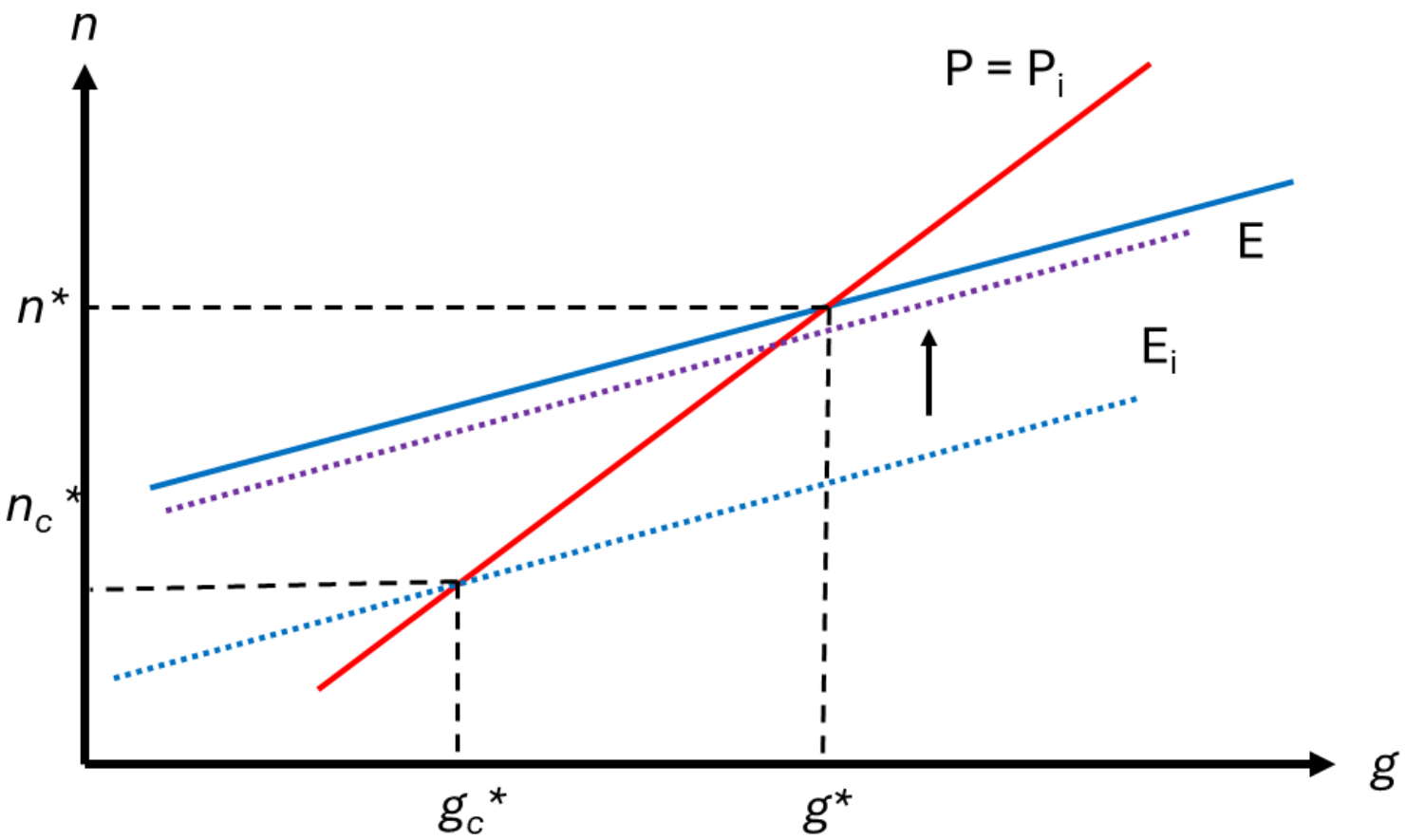
Wage Subsidies: Non-Unionized Firm



Wage Subsidies: Unionized Firm



Wage Subsidies: Unionized Firm



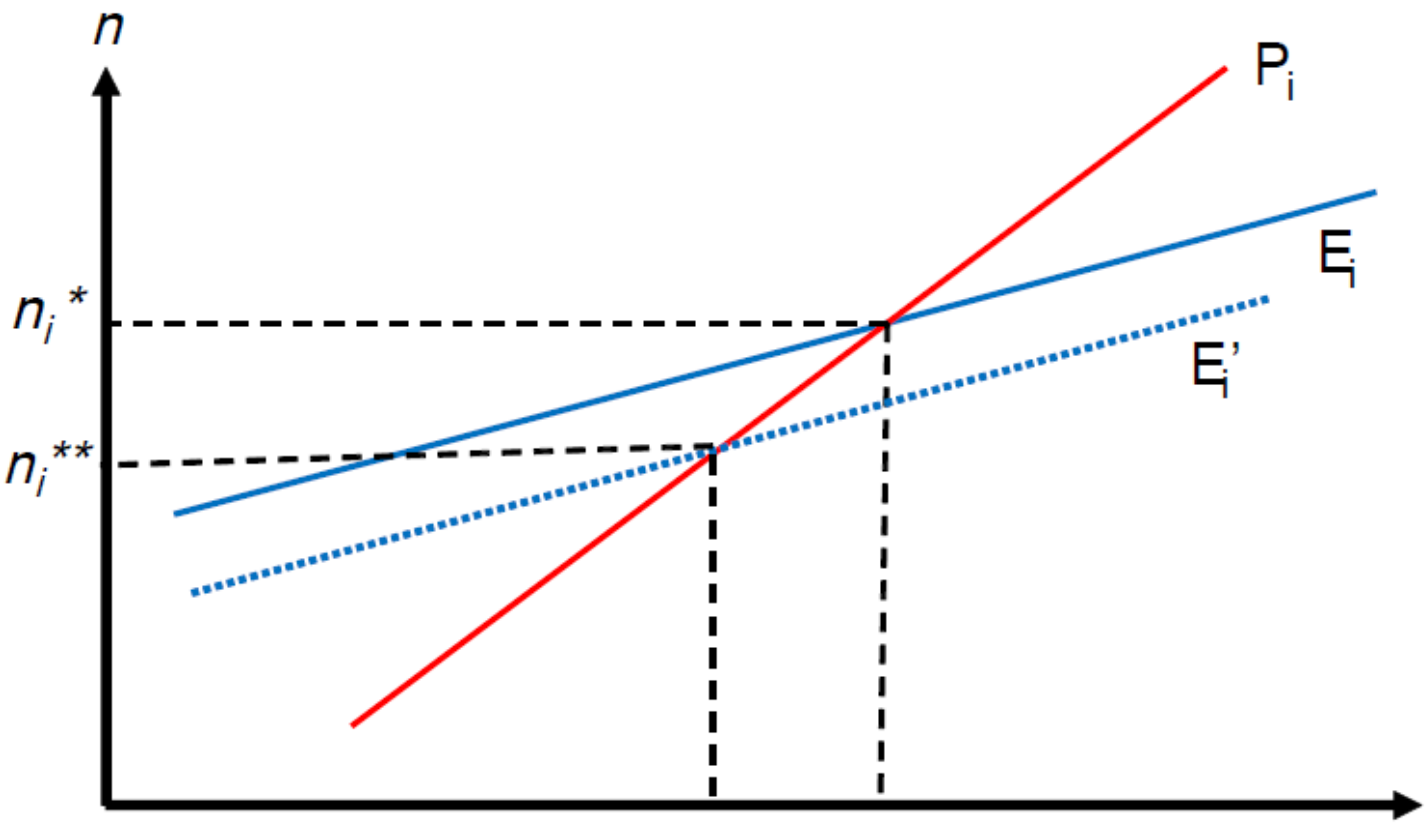
Industry Collusion

- Suppose $u = u(N - n)$ with $u'(.) < 0$, N is size of work force.
- This represents endogenous outside option as a function of the crowding of workers in the alternative employment source (agriculture, informal sector).
- Exogenous for a single firm, endogenous at the industry level.
- An industry cartel will satisfy the FOC:

$$\begin{aligned} S_n &= k + nS_{nn} - 2nu'(N - n) \\ S_g &= \frac{n}{2} S_{ng} \end{aligned}$$

- The cartel internalizes the effect of depressing the outside option through underemployment.

Industry Collusion



Monopsony vs Competition

- Let λ be the share of the worker in the bargaining game (we assumed $\lambda = \frac{1}{2}$)
- In the non-unionized case we have:

$$w_i = u - v(g) + \lambda (S_n + k)$$

- The firm's first-order conditions are now:

$$\begin{aligned} S_n &= \frac{\lambda}{1-\lambda}(k + nS_{nn}) \\ S_g &= \lambda n S_{ng} \end{aligned}$$

- For $\lambda = 0$ (the firm is a monopsonist) we get the first-best
- However, assuming u as exogenous when the firm is a monopsonist is not plausible
- Once we allow that there are two competing forces in operation - firm-level hold-up and equilibrium market wage effect

Policy Conclusions

- Mandated minimum provision of workplace public goods also boosts employment.
- Wage subsidies, targeted at employment, also increase the provision of workplace public goods.
- There is complementarity, not substitutability, between the policy objectives of employment generation and improving working conditions.
- In a unionized firm, since there is only one distortion (underemployment), wage subsidies suffice to reach first-best.
- In a non-unionized firm, there are two distortions, so both instruments are needed to reach first-best.

Concluding Observations

- Our model is simple and stylized and addressed only a limited number of issues
- Many interesting theoretical issues in labour economics are emerging as
  - the nature of work evolves rapidly
  - policy grapples with balancing with fairness with efficiency as the architecture of firms and labour markets evolve in the digital era