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Wage Rigidity or Fiscal Redistribution: The credibility Issue

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Abstract

We show that lack of commitment in the policymaking process may explain the prevalence of the minimum wage to redistribute income, despite its negative impact on unemployment. In the absence of commitment, firms anticipate the government's willingness to use a minimum wage policy to reduce the tax collecting costs implied by fiscal transfers. This expectation leads to a reduction in the labor demand that generates unemployment.

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1 Introduction

Basically, two kinds of policy instruments are available to transfer labor incomes from high skilled to low skilled workers: fiscal transfers and wage rigidities such as the minimum wage. Both kinds of instruments induce distortions. On the one hand, fiscal transfers distort labor supply and generate administrative costs in collecting taxes. On the other hand, wage rigidities reduce labor demand thereby worsening unemployment for the low skilled. The normative issue of the optimal mix between these two kinds of instruments has been extensively questioned in the optimal income tax literature. Allen (1987) and Guesnerie Roberts (1987) have shown that a minimum wage policy is useless when nonlinear income taxation is available. This result has been recently confirmed by Hungerbühler and Lehmann (2009) and Cahuc and Laroque (2011) among others. The negative impact of minimum wage on labor demand always dominates the distortive impact of taxes on labor supply. One may therefore wonder why so many countries are enforcing minimum wage policies.

In this paper, we argue that political-economic consideration such as the lack of commitment can explain the prevalence of the minimum wage as a redistributive tool. Let's suppose the government announces a redistributive tax and no minimum wage, firms trust this announcement and adjust their labor demand accordingly. Once employment is set, the government is tempted to deviate from its announcement by implementing a minimum wage to reduce tax collecting costs. In the absence of commitment, the announced policy is thus not credible: firms anticipate the implementation of a minimum wage and, consequently, restrict the employment level. The political equilibrium is thus trapped in an equilibrium with unemployment. Firms do not trust the government and fix the employment level independently of the government's announcements. The government has no mean to influence the level of employment and choose to implement a minimum wage to limit fiscal distortions. Hence, lack of credibility in redistributive policy leads to an "unemployment bias", just as lack of credibility in monetary policy leads to an inflation bias (see Kydland Prescott (1977) and Barro and Gordon (1983)).

The paper is organized as follows. Section 2 presents the framework. Section 3 determines the equilibrium with commitment as a benchmark. Section 4 determines the equilibrium without commitment.

2 The model

There are two types of workers in the economy: high and low skilled, respectively indexed by $i = h, \ell$. The sizes of high and low skilled workforces are normalized to 1. High skilled labor market is competitive. High skilled workers receive gross wage W_h , pay a payroll tax τ , and consume their net wage w_h . A minimum wage $\bar{W}_\ell$ may arise in the low skilled labor market in which case unemployment occurs. Low skilled employed workers receive gross wage W_ℓ , pay the payroll tax τ , receive a subsidy $s \geq 0$, and consume their net income w_ℓ . Low skilled unemployed workers receive and consume unemployment benefits b and pay no tax. Net incomes of respectively, high skilled workers, low skilled workers and low skilled unemployed are thus given by:

$$w_h = (1 - \tau) W_h \quad , \quad w_\ell = (1 - \tau) W_\ell + s \quad \text{and} \quad b \quad (1)$$

A representative firm produces the consumption good using high skilled H and low skilled L workers according to the production function $F(H, L)$. The technology exhibits constant return to scale and is increasing and concave in both arguments. The good is sold on a competitive market at a price normalized to 1. Since high skilled labor market is competitive, one gets $H = 1$ and output depends on low skilled employment L through $f(L) \equiv F(1, L)$ with: $f'(\cdot) > 0 > f''(L)$ and $f(L) - L \cdot f'(L) > 0$. The elasticity of substitution is denoted $\sigma(L)$ and verifies:

$$\sigma(L) = \frac{f'(L) (f(L) - L f'(L))}{-L f''(L) f(L)} > 0 \quad (2)$$

Individuals' preferences are described by the increasing, concave and differentiable utility function $v(\cdot)$. The government is concerned about high skilled workers' utility $v(w_h)$ and low skilled workers' expected utility $Lv(w_\ell) + (1 - L)v(b)$. Low-skilled workers are thus treated "behind the veil of ignorance" about their unemployment risk. The government's objective is:

$$\mathcal{P}(v(w_h); L v(w_\ell) + (1 - L)v(b)) \quad (3)$$

Function $\mathcal{P}(\cdot; \cdot)$ is assumed differentiable and weakly concave. There are many possible micro-foundations for such a political objective (see Persson and Tabellini (2000)). The government sets unemployment benefits b , subsidy s , tax rate τ and the low skilled gross wage W_ℓ (the minimum wage level), subject to its budget constraint. We assume tax collecting costs: for 1 unit of tax levied, only $1 - \varepsilon$ unit is available for expenditures, with $\varepsilon > 0$. ε corresponds to the time or resources spent by fiscal authorities to collect relevant information or to levy taxes. Therefore, the budget constraint of the government is:

$$(1 - \varepsilon) \tau (W_h + L \cdot W_\ell) = (1 - L) b + L s \quad (4)$$

We assume that the government considers the *laissez faire* economy (i.e. $s = \tau = b = 0$ and $L = 1$) to be unfair at the expense of low skilled workers. More precisely, we consider that, starting from the *laissez faire*, a budget-balanced increase in s and in τ improves the government's objective. Hence we assume:¹

$$\varepsilon < \theta \equiv \left(1 - \frac{\mathcal{P}_h^0 \cdot v'(f(1) - f'(1))}{\mathcal{P}_\ell^0 \cdot v'(f'(1))}\right) \cdot \frac{f(1) - f'(1)}{f(1)} \quad (5)$$

where $\mathcal{P}_i^0$ denotes $\mathcal{P}'_i(f(1) - f'(1); f'(1))$ for $i = h, \ell$.

The timing of the model is:

1. The government announces a policy $\Sigma^a = \{b^a, s^a, \tau^a, W_\ell^a\}$
2. Firms determine their labor demand to maximize their profits.
3. The government implements the policy $\Sigma = \{b, s, \tau, W_\ell\}$. Two scenarios are contrasted.

¹In the policy change we are considering, the minimum wage is not introduced, so full employment remains. Using (1) and (4), high skilled workers get $w_h = (1 - \tau)(f(1) - f'(1))$, while low skilled ones obtain $w_\ell = (1 - \tau)f'(1) + (1 - \varepsilon)\tau f(1)$. Assuming that the function $\tau \mapsto P(v((1 - \tau)(f(1) - f'(1))); v((1 - \tau)f'(1) + (1 - \varepsilon)\tau f(1)))$ admits a positive derivative at $\tau = 0$ leads to 5

- (a) Under commitment, the government is constrained to implement the announced policy, so $\Sigma = \Sigma^a$.
 - (b) Without commitment, the government freely selects Σ .
4. Production and payments occur.

3 The equilibrium with commitment

In this Section, we assume the government commits to the redistributive policy, that is, it is constrained to implement the policy announced. Firms determine their labor demand as a function of the announced minimum wage, which will be effective. Profit-maximization leads to:

$$W_\ell = f'(L) \quad \text{and} \quad W_h = f(L) - L f'(L) \quad (6)$$

The government acts as a Stackelberg leader: it determines its policy $\Sigma = \{b, s, \tau, W_\ell\}$ taking into account the consequence of the minimum wage W_ℓ on firms' labor demand L according to (6). . The policymaker maximizes its objective $\mathcal{P}(\cdot, \cdot)$ subject to labor demands (6) and workers and government budget constraints (1) and (4):

$$\max_{b, s, \tau, W_\ell} \mathcal{P}(v(w_h); L v(w_\ell) + (1 - L) v(b)) \quad s.t. : (1), (4), (6) \quad L \leq 1 \text{ and } s \geq 0$$

Let suppose that the constraint $s \geq 0$ is not binding, a presumption that we will ex-post verify. In this case, the government perfectly insures the low skilled workers against the unemployment risk, i.e. $b = w_\ell$. To show this, let consider the choice between unemployment benefit b and subsidy s for given tax rate τ minimum wage W_ℓ , thereby employment L . As this choice does not affect the welfare of high skilled worker $v(w_h)$,² the optimal mix between s and b maximizes the expected utility of low skilled workers $L v(w_\ell) + (1 - L) v(b)$ subject to the budget constraint (4). This obviously leads to perfect insurance.

Given perfect insurance of low skilled workers, the budget constraint (4) and firms' labor demand (6), the low skilled individuals earn

$$w_\ell = (1 - \tau) \cdot L f'(L) + (1 - \varepsilon) \tau f(L)$$

while high skilled workers get

$$w_h = (1 - \tau) (f(L) - L f'(L))$$

The government's problem is then reduced to choose the tax rate τ and the employment level L to maximize

$$\mathbb{P}(L, \tau) \equiv \mathcal{P}(v((1 - \tau) (f(L) - L f'(L))); v((1 - \tau) \cdot L f'(L) + (1 - \varepsilon) \tau f(L))) \quad (7)$$

In the absence of tax collecting cost (i.e. $\varepsilon = 0$), there is a perfect dichotomy in the role of τ and L : employment L determines the total amount of ressources while tax rate τ determines how these ressources are shared between high and low skilled individuals. In

²This follows $w_h = (1 - \tau) (f(L) - L f'(L))$ from (1) and (6).

such a case, full employment is optimal and redistribution occurs thanks to positive tax rate τ and subsidy s . The presence of tax collecting costs breaks this dichotomy and induces an equity-efficiency tradeoff as a redistribution through taxation reduces the total amount of resources. Nevertheless, full employment and positive tax rate and subsidy remain optimal if tax collecting costs are positive but small enough.

Proposition 1 *Under commitment, if $\varepsilon < \min[\sigma(L), \theta]$, the government implements positive subsidy, no minimum wage and so full employment occurs.*

Proof: The first-order condition $\mathbb{P}'_\tau = 0$ of (7) implies:

$$1 - \frac{\mathcal{P}'_h v'_h}{\mathcal{P}'_\ell v'_\ell} = \varepsilon \frac{f(L)}{f(L) - Lf'(L)}$$

where for $i = \ell, h$, $\mathcal{P}'_i = \mathcal{P}'_i(v(w_h); v(w_\ell))$ and $v'_i = v'(w_i)$. Incorporating this condition into $\mathbb{P}'_L$ of (7) gives:

$$\mathbb{P}'_L = \mathcal{P}'_\ell v'_\ell \left\{ (1 - \tau) \varepsilon \frac{L f''(L) f(L)}{f(L) - Lf'(L)} + (1 - \varepsilon \tau) f'(L) \right\}$$

Using (2), this gives:

$$\mathbb{P}'_L = \mathcal{P}'_\ell v'_\ell f'(L) (1 - \tau) \left\{ \frac{1 - \varepsilon \tau}{1 - \tau} - \frac{\varepsilon}{\sigma(L)} \right\}$$

$\mathbb{P}'_L$ is then always positive whenever $\varepsilon < \sigma(L)$. Hence, if the tax collecting cost ε is smaller than the elasticity of substitution $\sigma(L)$ for all employment levels, the government chooses an allocation with full employment, i.e. $L = 1$, and thus implements no minimum wage. One then obtains $W_\ell = w_\ell^0 = f'(1)$ and $W_h = w_h^0 = f(1) - f'(1)$.

Finally, it remains to verify our presumption that the constraint $s \geq 0$ is not binding. From (5), the government wants to reduce income inequality from the *laissez faire*. Therefore, whenever $\varepsilon < \theta$, one has

$$\frac{w_\ell}{w_h} > \frac{w_\ell^0}{w_h^0}$$

However, using (1), we get:

$$\frac{w_\ell}{w_h} = \frac{(1 - \tau) w_\ell^0 + s}{(1 - \tau) w_h^0} = \frac{w_\ell^0}{w_h^0} + \frac{s}{(1 - \tau) w_h^0}$$

so $s > 0$. $\square$

4 The equilibrium without commitment

In this Section, we assume the government can not commit to the redistributive policy, that is, it is free to implement a different policy than the announced one. Firms determine their labor demand as a function of the expected minimum wage, which does not depend

on the announced one. The government has therefore no mean to credibly influence firms' expectations and therefore selects its policy taking the employment level L as given. From firms' zero-profit condition, one obtains

$$W_h = f(L) - L \cdot W_\ell \quad (8)$$

Hence, the government perceives that the minimum wage W_ℓ transfers income from high to low skilled workers without any reduction in the total amount of resources. Conversely, transferring income from high to low skilled workers through taxation τ and subsidy s generates tax collecting costs thereby reducing available resources.

Proposition 2 *Without commitment, if $\varepsilon < \theta$, the government implements a binding minimum wage, no subsidy and so unemployment occurs.*

Proof: Taking (1) and (8) condition, the government solves

$$\begin{aligned} \max_{\tau, s, b, W_\ell} \quad & \mathcal{P}(v[(1-\tau)(f(L) - L W_\ell)]; L v[(1-\tau)W_\ell + s] + (1-L)v[b]) \\ \text{s.t.} \quad & (1-\varepsilon)\tau \cdot f(L) = L \cdot s + (1-L)b \quad s \geq 0 \end{aligned}$$

Denoting λ and μ the Lagrange multipliers associated to, respectively, the budget constraint (4) and the nonnegativity constraint on subsidy s , the first order conditions are:

$$\begin{aligned} W_\ell : \quad & 0 = (1-\tau)L(\mathcal{P}'_\ell v'_\ell - \mathcal{P}'_h v'_h) \\ b : \quad & 0 = (1-L)(\mathcal{P}'_\ell v'(b) - \lambda) \\ s : \quad & 0 = L(\mathcal{P}'_\ell v'_\ell - \lambda) + \mu \quad \mu \geq 0 \quad \mu s = 0 \\ \tau : \quad & 0 = \lambda(1-\varepsilon)f(L) - \mathcal{P}'_h v'_h \cdot (f(L) - L W_\ell) - \mathcal{P}'_\ell v'_\ell L W_\ell \end{aligned}$$

Using $\mathcal{P}'_\ell v'_\ell = \mathcal{P}'_h v'_h$ from the condition on W_ℓ , the condition on τ simplifies to $\mathcal{P}'_\ell v'_\ell = \lambda(1-\varepsilon)$. The condition on s then leads to $\mu = \lambda\varepsilon > 0$. Therefore, the exclusion relation $\mu s = 0$ requires $s = 0$, i.e. the government implements no subsidy.

Assume by contradiction that the government does not implement a binding minimum wage. Then perfect expectation from firms implies that full employment prevails. The absence of subsidy then implies no tax rate according to (4), so the *laissez faire* occurs. One then obtains $\mathcal{P}'_\ell v'_\ell > \mathcal{P}'_h v'_h$ from (5) and $\varepsilon < \theta$, which is inconsistent with the first-order condition on W_ℓ . $\square$

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