Note on the Interaction between Public-Sector Employment and the Minimum Wage in a Search and Matching Model

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Motivation

Two well-known facts of the labor markets in developing economies:

- The public sector accounts for a large fraction of employment (Mizala et al., 2011)
- There is a large mass of workers earning wages around the minimum wage levels (Maloney and Mendez, 2004; Boeri et al., 2008; Boeri, 2012)

For the case of Chile (CASEN 2013, males in their prime age):

- 13.5% of the workers are employed in the public sector.
- 31% and 18% of those employed in the private and public sectors, respectively, earn up to 1.2 minimum wages.

Changes in the minimum wage:

- Direct impact on the wage bill in both sectors.
- Indirect impact on employment in both sectors (that operate under different rules). There is some empirical evidence for Brazil, Costa Rica, Honduras and Nicaragua.

This Paper

Question: How would a minimum wage policy affect: (1) employment and wages of different types of workers across sectors, (2) unemployment of different worker types, and (3) aggregate productivity?

Our Approach:

- Develops a search and matching model with public and private sectors and a mandatory minimum wage.
- Structurally estimates the model to match the Chilean labor market data.
- Performs policy and counterfactual experiments.

Preview of the Results:

- The impact of the minimum wage in the labor market can be largely affected by public sector hiring and wage policies.
- We estimate a sizable productivity gap in favor of the private sector, lower job destruction rates and a pure wage premium in the public sector.
- Conditional on our estimation results, the bite of the minimum wage in both sectors is larger due to the existence of the public sector.

Literature

This paper is related with various streams of literature:

1. Search models with private and public sectors.
   - BM Models: Burdett (2011), Bradley et al. (2014).
   - DMP Models: Quadrini and Trigari (2007), Michaillat (2014), Gomes (2015a, 2015b), Albrecht et al. (2017).
2. Minimum wage in search models.
   - Flinn (2006), Hungerbuhler and Lehmann (2009), Flinn and Mabli (2009).
   - Two sector models with minimum wage: Acemoglu (2001) and Meghir et al. (2015).
3. Structural estimation of search models.
   - Flinn and Heckman (1982) and Flinn (2006).

- Workers Heterogeneity: Human Capital (H and L workers).
- There are no transitions across workers groups.
- The search process is random and no on-the-job search.
- Two sectors: Private (p) and Public (g) sectors.
- Jobs Heterogeneity: Match specific productivity $x \sim G_s^y(x)$ with $s = p, g$ and $y = H, L$.
- Cost of search: c for the private sector and zero for the public sector.
- Search frictions: CRS Matching Function $m(v_p + v_g, u)$.
- Private sector firms create vacancies v_p and the government sets v_g to achieve its employment target.
- Job termination is exogenous in both sectors.

- Unemployment:

$$\rho U_y = \left[\begin{array}{c} z_y + \alpha_w^p \int \max[N_{y,p}(x) - U_y, 0] dG_p^y(x) \\ + \alpha_w^g \int \max[N_{y,g}(x) - U_y, 0] dG_g^y(x) \end{array} \right], \quad y = H, L$$

where $\alpha_w^p = \phi m(\theta)$, $\alpha_w^g = (1-\phi)m(\theta)$, and $\phi = \frac{v_p}{v_p + v_g}$

- Employment in the private sector:

$$\rho N_{y,p}(x) = w_{y,p}(x) + \delta_p \left(U_y - N_{y,p}(x) \right), \quad y = H, L$$

- Employment in the public sector:

$$\rho N_{y,g}(x) = w_{y,g}(x) + \delta_g \left(U_y - N_{y,g}(x) \right), \quad y = H, L$$

- Private sector filled job:

$$\rho J_{y,p}(x) = x - w_{y,p}(x) + \delta_p \left(V_p - J_{y,p}(x) \right), \;\; y = H, L$$

- Unfilled vacancy in the private sector:

$$\rho V_p = \begin{array}{c} -c + \alpha_e^H \int \max[J_{H,p}(x) - V_p, 0] dG_p^H(x) \\ +\alpha_e^L \int \max[J_{L,p}(x) - V_p, 0] dG_p^L(x) \end{array}$$

where $\alpha_e^H = \eta \frac{m(\theta)}{\theta}$, $\alpha_e^L = (1-\eta)\frac{m(\theta)}{\theta}$, and $\eta = \frac{u_H}{u_L + u_H}$

- There is no vacancy creation problem in the public sector. Government uses v_g to reach a goal in e_g.

- Wages in the private sector are determined by Nash Bargaining:

$$w_{y,p}(x) = \arg\max_{w \geq m} \left(N_{y,p}(x) - U_y\right)^{\beta} \left(J_{y,p}(x) - V_p\right)^{1-\beta} \quad y = H, L$$

- Flinn (2006): The minimum wage (m) is a side constraint in the bargaining problem.
- The wage schedule in the private sector is:

$$w_{y,p}(x) = \begin{cases} m & if\; x \leq \widetilde{x}_{y,p} = \frac{m-(1-\beta)\rho U_y}{\beta} \\ \beta x + (1-\beta)\rho U_y & otherwise \end{cases}$$

- In the public sector workers are paid a *public sector premium* over the private sector wage (Gomez, 2015a):

$$w_{y,g}(x) = \lambda_y w_{y,p}(x) \;\; y = H, L$$

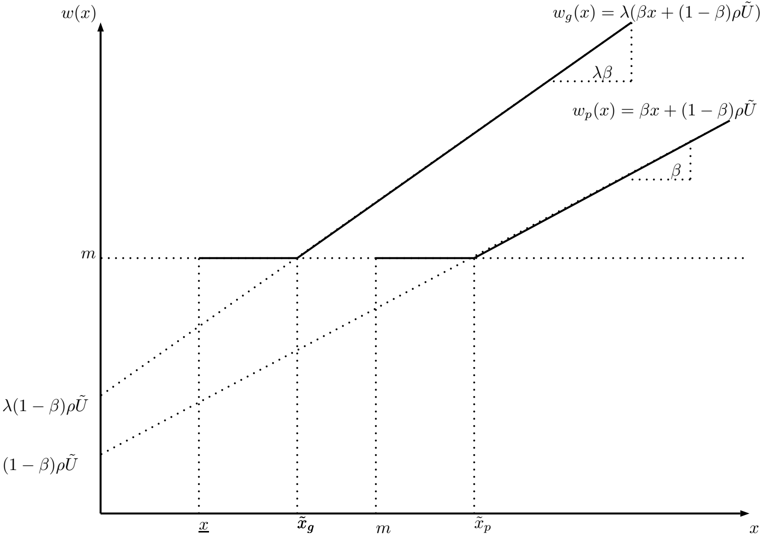
- By construction public sector never pays below the minimum wage.
- The hiring rule of the government is exogenous ($x > \underline{x}_y$).
- Combining the wage schedule with the hirihg rule:

$$w_{y,g}(x) = \begin{cases} m & if \; \underline{x}_y \leq x \leq \widetilde{x}_{y,g} \\ \lambda_y w_{y,p}(x) & if \; x > \widetilde{x}_{y,g} \end{cases}$$

where $\widetilde{x}_{y,g} = \frac{\frac{m}{\lambda_y} - (1-\beta)\rho U_y}{\beta}$.

The Model

Wage Determination



- The following table shows the equilibrium hiring rules in the relevant case:

	No Binding $m < x^*_{L,p} < x^*_{H,p}$	Binding L $x^*_{L,p} \leq m < x^*_{H,p}$	Binding L,H $x^*_{L,p} < x^*_{H,p} \leq m$
H	$x^*_{H,p} = \rho U_H$	$x^*_{H,p} = \rho U_H$	m and $\widetilde{x}_{H,p}$
	$x^*_{H,g} = \Phi_H \rho U_H$	$x^*_{H,g} = \Phi_H \rho U_H$	$\underline{x}_H$ and $\widetilde{x}_{H,g}$
L	$x^*_{L,p} = \rho U_L$	m and $\widetilde{x}_{L,p}$	m and $\widetilde{x}_{L,p}$
	$x^*_{L,g} = \Phi_L \rho U_L$	$\underline{x}_L$ and $\widetilde{x}_{L,g}$	$\underline{x}_L$ and $\widetilde{x}_{L,g}$

where $\Phi_j = 1 + \frac{1}{\beta}\left(\frac{1-\lambda_j}{\lambda_j}\right)$.

- Steady State Equilibrium: the inflows and outflows to each state are equalized.

$$
\begin{aligned}
\delta_p e_{y,p} &= \phi m(\theta) \widetilde{G}^y_p(\max\{m, x^*_{y,p}\}) u_y \\
\delta_g e_{y,g} &= (1-\phi)\, m(\theta) \widetilde{G}^y_g(\max\{\underline{x}_y, x^*_{y,g}\}) u_y \\
u_H + e_{H,p} + e_{H,g} &= \kappa \\
u_L + e_{L,p} + e_{L,g} &= (1-\kappa) \\
u &= u_H + u_L
\end{aligned}
$$

Definition (Equilibrium - m binding for low skilled workers)

Given $(\kappa, z_H, z_L, \rho, \beta, c, \delta_p, \delta_g, \lambda_H, \lambda_L, \underline{x}_L, m)$, $m(\cdot)$, and $G_p^y(x)$ and $G_g^y(\cdot)$ for $y = H, L$, a steady-state equilibrium is θ, ϕ and η, together with ρU_H, $\rho \tilde{U}_L$, u, $e_{y,p}$ and $e_{y,g}$ for $y = H, L$ such that:

1. Given η, ϕ and θ, ρU_H and $\rho \tilde{U}_L$ solve equations:

$$\begin{aligned}
\rho U_H &= \Bigg[z_H + \alpha_w^p \int_{\rho U_H} \beta \left(\frac{x - \rho U_y}{\rho + \delta_p} \right) dG_p^H(x) \\
&\quad + \alpha_w^g \int_{\Phi_H \rho U_H} \lambda_H \beta \left(\frac{x - \Phi_H \rho U_H}{\rho + \delta_g} \right) dG_g^H(x) \Bigg] \\
\rho \tilde{U}_L &= z_L + \alpha_w^p \left\{ \int_m^{\tilde{x}_{y,p}} \left(\frac{m - \rho \tilde{U}_L}{\rho + \delta_p} \right) dG_p^L(x) + \int_{\tilde{x}_{y,p}} \beta \left(\frac{x - \rho \tilde{U}_L}{\rho + \delta_p} \right) dG_p^L(x) \right\} \\
&\quad + \alpha_w^g \left\{ \int_{\underline{x}_L}^{\tilde{x}_{L,g}} \left(\frac{m - \rho \tilde{U}_L}{\rho + \delta_g} \right) dG_g^L(x) + \int_{\tilde{x}_{L,g}} \lambda_L \beta \left(\frac{x - (1 + \varphi_L) \rho \tilde{U}_L}{\rho + \delta_g} \right) dG_g^L(x) \right\}
\end{aligned}$$

Definition (Equilibrium - m binding for low skilled workers)

II. Given η and ϕ, θ solve equation:

$$\begin{aligned} c &= \alpha_e^H \int_{\rho U_H} \frac{(1-\beta)(x-\rho U_H)}{\rho+\delta_p} dG_p^H(x) \\ &+ \alpha_e^L \left[\int_m^{\widetilde{x}_{L,p}} \frac{x-m}{\rho+\delta_p} dG_p^L(x) + \int_{\widetilde{x}_{L,p}} \frac{(1-\beta)\left(x-\rho\tilde{U}_L\right)}{\rho+\delta_p} dG_p^L(x) \right] \end{aligned}$$

and it is consistent with ρU_H and $\rho\tilde{U}_L$ in (I).

III. η and ϕ solve equations:

$$\eta = \frac{u_H}{u_H+u_L} \quad \text{and} \quad \phi = \frac{u\theta - v_g}{u\theta}$$

(using the steady state u ,e_p and e_g) and they are consistent with ρU_H and $\rho\tilde{U}_L$ and θ in (I) and (II).

Data

- The data available is:
  - CASEN 2013:
    - Type of worker: $\{I(y = H), I(y = L)\}$
    - Hourly wages in private and public sector: $\{w_{y,p}, w_{y,g}\}$, $y = H, L$
    - Unemployment duration (on going): $\{t_y, t_y\}$, $y = H, L$
    - States in the labor market: $\{I_y(u = 1), I_y(e_p = 1), I_y(e_g = 1)\}$, $y = H, L$.
  - Social Protection Survey (2002-2009):
    - Exits from unemployment: $\{\%_y(u \to e_p), \%_y(u \to e_g)\}$, $y = H, L$
- Sample:
  - Males actively participating in the labor market, living in urban areas, and aged between 30 and 55 years.
  - Full-time employees in both sectors who have a contract.
  - Skilled worker is defined as a worker who has a university degree or higher.

Data

Descriptive Statistics

	High Skilled	Low Skilled
Hourly Wage - Private Sector (US$/hour)	10.1190	3.2509
Hourly Wage - Public Sector (US$/hour)	9.7304	3.6800
Ratio of Average Wages	1.0399	0.8834
Unemployment Duration (Months)	3.0091	2.2625
Unemployment Rate	0.0073	0.0661
Employment in the Private Sector	0.1089	0.6928
Employment in the Public Sector	0.0418	0.0830
Proportion of Transitions $u \to e_p$	0.6723	0.9003
Proportion of Transitions $u \to e_g$	0.3277	0.0997
Proportion of Workers with $w_p = m$	-	0.2101
Proportion of Workers with $w_g = m$	-	0.1471
Proportion of Workers	0.1580	0.8420

Minimum Wage: 1.7978 (US$/hour)

Two step estimation (Supply and Demand sides)

1. *Supply side*: Simulated Method of Moments (SMM) assuming constant arrival rates of jobs.

$$\Theta^{SS} = \left\{\alpha_p, \alpha_g, \delta_p, \delta_g, z_H, z_L, \lambda_H, \lambda_L, G_p^H(x), G_g^H(x), G_p^L(x), G_g^L(x), \underline{x}_L\right\}$$

2. *Demand side*: Results of step 1 and Equilibrium conditions of the vacancy creation problem (given $m(v,u)$).

$$\Theta^{DS} = \{\phi, c, \theta, v_g\}$$

- Simulated Method of Moments (SMM):

$$\min_{\Theta^{SS}} \quad \left\{ \left(\Gamma \left(\Theta^{SS} \right) - \Gamma_N \right)' W \left(\Gamma \left(\Theta^{SS} \right) - \Gamma_N \right) \right\}$$
$$s.t.$$
$$m > \rho \tilde{U}_L \qquad m < \tilde{x}_{Lp} \qquad \underline{x}_L < \tilde{x}_{Lg}$$

- Moments to Match:

$$\Gamma_N = \begin{array}{l} \{u, \eta, e_{Hp}, e_{Hg}, e_{Lp}, e_{Lg}, \Pr[u_H \to e_{Hp}], \Pr[u_L \to e_{Lp}], \\ \bar{t}_H, \bar{t}_L, \bar{w}_{Hp}, \bar{w}_{Hg}, \bar{w}_{Lp}, \bar{w}_{Lg}, \sigma_{w_{Hp}}, \sigma_{w_{Hg}}, \sigma_{w_{Lp}}, \sigma_{w_{Lg}}, \\ \bar{w}_{Hp}/\bar{w}_{Hg}, \bar{w}_{Lp}/\bar{w}_{Lg}, \Pr[w_{Lp} = m], \Pr[w_{Lg} = m]\} \end{array}$$

- Parametric assumption:

$$\ln x | y, s \sim N(\mu_{ys}, \sigma_{ys}) \qquad y = L, H \text{ and } s = p, g$$

Identification discussion:

- Dynamic of the labor market (ins and outs):
  - Unemployment duration.
  - Transitions from unemployment to both sectors.
  - Steady state unemployment and employment rates.
- Productivity distributions:
  - Mapping observed wages to productivity (wage equation + cut-off productivity).
  - Location and scale family of distributions.
  - Ratio of average wages has information on the "wage premium".
- Cut-off productivities:
  - Flinn and Heckman (1982): $w_p(x^*_{H,p}) = \hat{x}^*_{H,p} = \min\{w^{obs}_{H,p}\}$
  - The minimum wage.
- We do not attempt to estimate (β, ρ). We set $\beta = 0.5$ and $\rho = 0.067$.

Estimation and Identification discussion:

- The link between the supply and the demand sides are the arrival rates:

$$\begin{aligned} \hat{\alpha}_w^p &= \phi m(\theta) \\ \hat{\alpha}_w^g &= (1-\phi) m(\theta) \end{aligned}$$

- The key is the matching function (Flinn, 2006): (1) Cobb-Douglas or (2) exponential function. We set $\gamma = 0.5$.
- Vacancy creation:
  - Free entry condition allows the recovery of the cost of posting vacancies.
  - The number of vacancies in the public sector is recovered:

$$v_g = (1-\hat{\phi})\hat{u}\hat{\theta}$$

Supply Side Estimated Parameters

	Parameter	Std.Err.(*)
$E[x\|H,p]$	17.8246	0.4791
$E[x\|H,g]$	12.9670	1.8506
$E[x\|L,p]$	3.4343	0.0885
$E[x\|L,g]$	1.6014	0.1393
δ_p	0.0447	0.0033
δ_g	0.0216	0.0059
$\lambda_{H,g}$	1.2749	0.1711
$\lambda_{L,g}$	1.0238	0.0340
α_p	0.7408	0.0493
α_g	0.1255	0.0372
$\underline{x}_L$	1.9600	0.1017
$x^*_{H,g}$	1.3694	0.4698
$\tilde{x}_{L,p}$	2.3075	0.0181
$\tilde{x}_{L,g}$	2.2240	0.1143
$x^*_{H,p}$	2.4078	-

(*) Bootstrapped standard errors (500 replications).

Demand Side Estimated Parameters

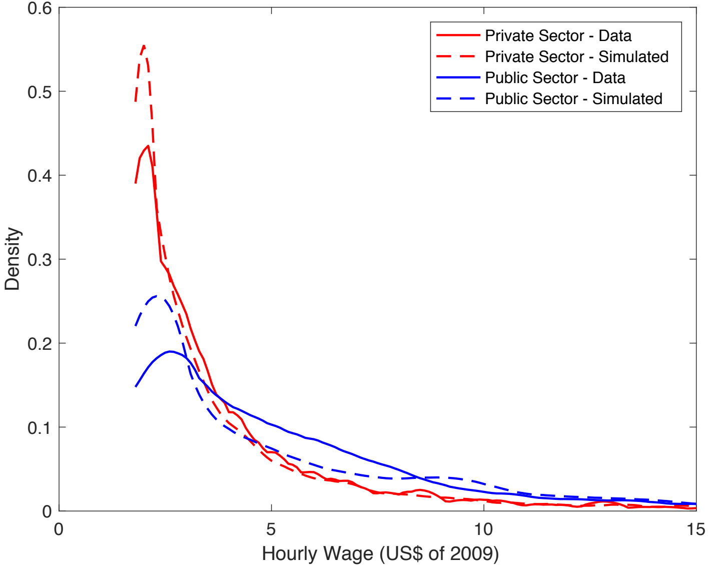
	Parameter	Std.Err.(*)
ϕ	0.8551	0.0381
θ	0.7505	0.1027
c	17.6048	2.3665
v_g	0.0081	0.0027

(*) Bootstrapped standard errors (500 replications).

Fit of the Model (Selected Moments)

Moment	Model	Data	Moment	Model	Data
u	0.0745	0.0735	$\overline{w}_{H,p}$	10.1977	10.1190
η	0.0912	0.0996	$\overline{w}_{H,g}$	9.8198	9.7304
$e_{H,p}$	0.1117	0.1089	$\overline{w}_{L,p}$	3.1288	3.2509
$e_{H,g}$	0.0395	0.0418	$\overline{w}_{L,g}$	3.2732	3.6800
$e_{L,p}$	0.6898	0.6928	$\sigma_{w_{H,p}}$	7.5118	7.5509
$e_{L,g}$	0.0845	0.0830	$\sigma_{w_{H,g}}$	6.1860	6.5096
$\Phi_{H,u\to p}$	0.8542	0.6723	$\sigma_{w_{L,p}}$	2.0319	1.9152
$\Phi_{L,u\to p}$	0.9442	0.9003	$\sigma_{w_{L,g}}$	2.8356	2.1537
$\overline{t}_H$	1.1631	3.0091	$\Pr[w_{L,g} = m]$	0.1307	0.1471
$\overline{t}_L$	2.0739	2.2625	$\Pr[w_{L,p} = m]$	0.1808	0.2101

Fit of the model: Wages Densities



Policy and Counterfactual Experiments

1. Minimum wage: $+10\%$ in m from the benchmark case.

2. Size of the public sector: $+10\%$ in the target public employment (e_p) from the benchmark case.

3. Public sector hiring rule: - 100% in the productivity requirement for hiring in the public sector ($\underline{x}_L$) from the benchmark case.

4. Productivity: Equal productivity distributions between sectors.

Policy Experiments

Effect of a 10% increase in the minimum wage

	$Baseline$	$1.1 \times m$		$Baseline$	$1.1 \times m$
ϕ	0.856	0.861	$e_{L,g}$	0.084	0.086
η	0.091	0.087	e_p	0.801	0.796
θ	0.750	0.724	e_g	0.124	0.124
α_p	0.741	0.732	v_g	0.008	0.008
α_g	0.125	0.119	$\bar{t}_H$	1.163	1.181
$x^*_{H,p}$	2.408	2.160	$\bar{t}_L$	2.074	2.248
$x^*_{H,g}$	1.369	1.229	$\overline{w}_{H,p}$	10.198	10.051
$\tilde{x}_{L,p}$	2.307	2.704	$\overline{w}_{H,g}$	9.820	9.658
$\tilde{x}_{L,g}$	2.224	2.612	$\overline{w}_{L,p}$	3.129	3.244
u	0.074	0.080	$\overline{w}_{L,g}$	3.273	3.295
u_H	0.007	0.007	$\overline{w}_{H,p}/\overline{w}_{H,g}$	1.038	1.041
$e_{H,p}$	0.112	0.113	$\overline{w}_{L,p}/\overline{w}_{L,g}$	0.956	0.984
$e_{H,g}$	0.039	0.038	$\Pr[w_{L,g} = m]$	0.131	0.281
u_L	0.068	0.073	$\Pr[w_{L,p} = m]$	0.181	0.245
$e_{L,p}$	0.690	0.683	$Surplus$	3.693	3.594

Policy Experiments

Effect of a 10% increase in the public sector employment

	Baseline	$1.1 \times e_g$		*Baseline*	$1.1 \times e_g$
ϕ	0.856	0.840	$e_{L,g}$	0.084	0.095
η	0.091	0.090	e_p	0.801	0.789
θ	0.750	0.747	e_g	0.124	0.137
α_p	0.741	0.726	v_g	0.008	0.009
α_g	0.125	0.138	$\bar{t}_H$	1.163	1.166
$x^*_{H,p}$	2.408	2.416	$\bar{t}_L$	2.074	2.101
$x^*_{H,g}$	1.369	1.374	$\overline{w}_{H,p}$	10.198	10.203
$\tilde{x}_{L,p}$	2.307	2.332	$\overline{w}_{H,g}$	9.820	9.825
$\tilde{x}_{L,g}$	2.224	2.248	$\overline{w}_{L,p}$	3.129	3.119
u	0.074	0.075	$\overline{w}_{L,g}$	3.273	3.262
u_H	0.007	0.007	$\overline{w}_{H,p}/\overline{w}_{H,g}$	1.038	1.038
$e_{H,p}$	0.112	0.108	$\overline{w}_{L,p}/\overline{w}_{L,g}$	0.956	0.956
$e_{H,g}$	0.039	0.043	$\Pr[w_{L,g} = m]$	0.131	0.141
u_L	0.068	0.068	$\Pr[w_{L,p} = m]$	0.181	0.189
$e_{L,p}$	0.690	0.680	*Surplus*	3.693	3.659

Policy Experiments

Effect of a reduction in the public sector hiring standards

	$Baseline$	$0 \times \overline{x}_L$		$Baseline$	$0 \times \overline{x}_L$
ϕ	0.856	0.954	$e_{L,g}$	0.084	0.110
η	0.091	0.112	e_p	0.801	0.812
θ	0.750	0.812	e_g	0.124	0.124
α_p	0.741	0.860	v_g	0.008	0.002
α_g	0.125	0.042	$\bar{t}_H$	1.163	1.123
$x^*_{H,p}$	2.408	2.648	$\bar{t}_L$	2.074	1.755
$x^*_{H,g}$	1.369	1.506	$\overline{w}_{H,p}$	10.198	10.345
$\tilde{x}_{L,p}$	2.307	2.068	$\overline{w}_{H,g}$	9.820	9.978
$\tilde{x}_{L,g}$	2.224	1.985	$\overline{w}_{L,p}$	3.129	3.231
u	0.074	0.064	$\overline{w}_{L,g}$	3.273	2.137
u_H	0.007	0.007	$\overline{w}_{H,p}/\overline{w}_{H,g}$	1.038	1.037
$e_{H,p}$	0.112	0.137	$\overline{w}_{L,p}/\overline{w}_{L,g}$	0.956	1.512
$e_{H,g}$	0.039	0.014	$\Pr[w_{L,g} = m]$	0.131	0.788
u_L	0.068	0.057	$\Pr[w_{L,p} = m]$	0.181	0.100
$e_{L,p}$	0.690	0.675	$Surplus$	3.693	3.913

Counterfactual

Equalizing productivities across sectors

	Baseline	$G_g = G_p$		*Baseline*	$G_g = G_p$
ϕ	0.856	0.928	$e_{L,g}$	0.084	0.103
η	0.091	0.106	e_p	0.801	0.808
θ	0.750	0.768	e_g	0.124	0.124
α_p	0.741	0.813	v_g	0.008	0.004
α_g	0.125	0.063	$\bar{t}_H$	1.163	1.158
$x^*_{H,p}$	2.408	2.819	$\bar{t}_L$	2.074	1.865
$x^*_{H,g}$	1.369	1.604	$\overline{w}_{H,p}$	10.198	10.455
$\tilde{x}_{L,p}$	2.307	2.055	$\overline{w}_{H,g}$	9.820	13.191
$\tilde{x}_{L,g}$	2.224	1.971	$\overline{w}_{L,p}$	3.129	3.238
u	0.074	0.068	$\overline{w}_{L,g}$	3.273	3.410
u_H	0.007	0.007	$\overline{w}_{H,p}/\overline{w}_{H,g}$	1.038	0.793
$e_{H,p}$	0.112	0.129	$\overline{w}_{L,p}/\overline{w}_{L,g}$	0.956	0.949
$e_{H,g}$	0.039	0.021	$\Pr[w_{L,g} = m]$	0.131	0.004
u_L	0.068	0.061	$\Pr[w_{L,p} = m]$	0.181	0.096
$e_{L,p}$	0.690	0.678	*Surplus*	3.693	4.118

A Note on the role of the Public Sector

Model Extension: Value of a public good financed with payroll taxes and debt.

- Flow income of an unemployed worker:

$$z_y + v(h) \quad y = H, L$$

- Flow income of an employee:

$$(1-\tau)w_{y,s}(x) + v(h) \quad y = H, L \quad s = p, g$$

- Production function:

$$h = \sum_{y=L,H} \int x \, dG_g^y(x) e_{y,g} \quad y = H, L$$

- Budget constraint:

$$\tau \left[\sum_{y=H,L} \int w_{y,p}(x) dG_p^y(x) e_{y,p} \right] = (D - \tau) \left[\sum_{y=H,L} \int w_{y,g}(x) dG_g^y(x) e_{y,g} \right]$$

Results do not change but identification is trickier.

Concluding Remarks

- There is a sizable productivity gap in favor of the private sector.
- An increase in the minimum wage has a large impact on the unemployment rate, with low skilled workers being the most affected, and pushes the composition of the public-sector employment towards low skilled workers.
- An increase in the target size of public employment introduces a crowding out effect due to search frictions, generating a substitution effect between private and public sector employment and leaving unemployment almost unaffected.
- A reduction in the public sector hiring standards dissipates in part the search friction in the market, generating a fall in the unemployment rate and better composition of the pool of low skilled workers available for the private sector.
- The large bite of the minimum wage in the Chilean labor market is explained by the large productivity differences between sectors.