Product and Labor Market Policies in a Model of Rent Creation and Division.

Alain Delacroix       Roberto Samaniego

UQÀM                  GWU

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Big interest in studying labor and product market regulations.
Introduction (1)

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- Yet, analysis of the two types of policies usually done separately.
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Yet, analysis of the two types of policies usually done separately.

Blanchard and Giavazzi (2003): analysis should be joint since

\[
\begin{align*}
PMR & \quad \rightarrow \quad \text{size of rents}, \\
LMR & \quad \rightarrow \quad \text{division of rents}.
\end{align*}
\]
Need occupational choice where agents can be *entrepreneurs*. 
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b/c *self-employment* avoids regs, theoretically important margin.

also *SE* (1) is a large share, (2) varies much across countries, and (3) is correlated with regulations.
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also *SE* (1) is a large share, (2) varies much across countries, and (3) is correlated with regulations.

We build model of monopolistic competition in goods market w/ matching frictions in labor market, based on Ebell & Haefke (2009).

- includes an occupational decision,
- includes various types of policies.
What do we do?

- We look at correlations (i) between policies and LM outcomes, and (ii) between different policies.
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- Quantitative analysis is useful b/c certain policies are highly correlated.
  - difficult to attribute particular LM outcome to particular policy.

We check how various policies affect the LM: unemployment / entrepreneurship / self-employment.

We find that SE is very responsive to policies.
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Tables and Figures

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<th>LMP</th>
<th>PMP</th>
<th>EC(O)</th>
<th>EC(S)</th>
<th>State</th>
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<td>PMP</td>
<td>EC(O)</td>
<td>EC(S)</td>
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<td>LMP (O)</td>
<td>0.542***</td>
<td>0.452**</td>
<td>0.520***</td>
<td>0.600***</td>
<td>0.542***</td>
<td>0.601***</td>
<td>0.160</td>
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<td>EPL(S)</td>
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<td>0.583***</td>
<td>0.701***</td>
<td>0.543***</td>
<td>0.670***</td>
<td>0.059</td>
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<td>Rep</td>
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<td>PMP (O)</td>
<td>0.781***</td>
<td>0.613***</td>
<td>0.809***</td>
<td>0.612***</td>
<td></td>
<td>-0.026</td>
<td>0.600***</td>
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<td>0.539***</td>
<td>0.315</td>
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<td>0.060</td>
<td>0.554***</td>
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<td>State</td>
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<td>0.417**</td>
<td>0.080</td>
<td>0.435**</td>
<td>0.555***</td>
<td></td>
</tr>
<tr>
<td>Trade</td>
<td>-0.057</td>
<td>0.329*</td>
<td></td>
<td></td>
<td>0.367**</td>
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Table 1 – Correlations between EPL, PMP and labor/product market outcomes. Standard errors are reported in parentheses. One, two and three asterisks represent significance at the 10, 5 and 1% levels respectively.
1. *SE* important activity in magnitude and responsive to policies.
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2. $corr(u\%, EC) > 0$, $corr(u\%, PMP) > 0$, $corr(u\%, EPL)$ weakly positive.
Data findings (3): conclusion

1. \( SE \) important activity in magnitude and responsive to policies.

2. \( corr(u\%, EC) > 0, corr(u\%, PMP) > 0, \)
   \( corr(u\%, EPL) \) weakly positive.

3. \( SE \): positively correlated with \( EPL, PMP \) and \( EC \).
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1. *SE* important activity in magnitude and responsive to policies.

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3. *SE*: positively correlated with *EPL*, *PMP* and *EC*.

4. *Entrepreneurship*:
   
   basically not correlated with either *EPL*, nor *EC*, nor *PMP*. 
Data findings (3): conclusion

1. \textit{SE} important activity in magnitude and responsive to policies.

2. \( \text{corr}(u\%, E\text{C}) > 0, \text{corr}(u\%, P\text{MP}) > 0, \text{corr}(u\%, E\text{PL}) \) weakly positive.

3. \textit{SE}: positively correlated with \textit{EPL}, \textit{PMP} and \textit{EC}.

4. \textit{Entrepreneurship}:

   basically not correlated with either \textit{EPL}, nor \textit{EC}, nor \textit{PMP}.

5. \textit{EPL} is positively correlated with \textit{EC} and \textit{PMP}. 
Model: *basic structure*.

- Frictions in the labor market.
- Monopolistic competition in the goods market.
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- $M$ sectors, each producing a differentiated good;
  within each sector, firms are Cournot oligopolists.
Model: *basic structure.*

- Frictions in the labor market.
- Monopolistic competition in the goods market.
- \( M \) sectors, each producing a differentiated good; within each sector, firms are Cournot oligopolists.
- Occupational choice: worker / entrepreneur / self-employed.
  - Choice based on individual characteristics: cost of running firm \((h)\), ability to operate as self-employed \((\omega)\).
Model: consumer problem.

- Household $n$’s problem is to

$$\max_{\{c_{j,n}\}} \left( \int_0^M \alpha_j^{1/\sigma} c_{j,n}^{\sigma/\sigma} dj \right)^{\sigma/\sigma-1},$$

s.t. $\int_0^M p_j c_{j,n} dj = P.l_n$.

- Solving generates aggregate demand for good $j$,

$$Y_j^d = \frac{1}{M} \left( \frac{p_j}{P} \right)^{-\sigma} l.$$
Workers transit between unemployment and employment:

\[
\begin{align*}
    rV_u &= bP + p_w(\theta)[V_w - V_u], \\
    rV_w &= w + \delta[V_u - V_w].
\end{align*}
\]

(Workers will be paid the same, regardless of entrepreneur type.)
Model: entrepreneurs (1).

The entrepreneur’s maximization problem is

\[ V_e(l; h) = \max_{v, l'} \frac{1}{1+r} \left\{ hP + zl.p(l) - w(l)l - Pcl - \kappa P\nu 
+ (1 - \delta_e) V_e(l'; h) + \delta_e [S_e(h) - Pc_e], \right\} \]

s.t. \( \frac{p(l)}{P} = \left( M \frac{zl + \hat{Y}_{-k}}{l} \right)^{-\frac{1}{\sigma}} \) and \( l' = p_f(\theta).v + (1 - \delta_s)l \).
Model: *bargaining*.

- Multi-employee firms → as if firms bargain w/ marginal worker.

- Thus,

\[ \phi \cdot V'_e(l; h) = (1 - \phi) \cdot (V_w - V_u), \]

where \( \phi \) is workers’ bargaining power.

*(Implies w independent of entrepreneur’s characteristics.)*
Model: *entrepreneurs* (2).

- Combining FOC $[\nu]$ and envelope condition, we get

$$
\frac{p(l)}{P} = \frac{1}{z\varepsilon - 1} \left\{ \frac{r + \delta}{1 - \delta e} p_f(\theta) + \frac{d}{dl} [w(l).l/P] + c \right\},
$$

where $\varepsilon$ is the firm-level elasticity of demand.

$(\varepsilon = \sigma/s$, where $s$ is the individual firm's share of sector output.)

- Markup condition over *overall* marginal costs inclusive of vacancy posting costs.
Model: *entrepreneurs* (3).

- The bargaining rule implies

\[
\phi \left( z \frac{\varepsilon - 1}{\varepsilon} p(l) - \frac{d}{dl} [w(l)l] - Pc \right) = (1 - \phi) \cdot (w(l) - rV_u),
\]

or

\[
\phi l \cdot \frac{dw(l)}{dl} + w(l) - \phi z \frac{\varepsilon - 1}{\varepsilon} p(l) - (1 - \phi) rV_u + \phi Pc = 0.
\]
Model: entrepreneurs (4).

- Solving the differential equation, we get

\[
\begin{align*}
\frac{w}{P} &= b + \frac{\phi}{1-\phi} \frac{1}{1-\delta_e} \frac{\kappa}{p_f(\theta)} (r + \delta + p_w(\theta)), \\
\frac{p}{P} &= \frac{\epsilon - \phi}{\epsilon - 1} \frac{1}{z} \left\{ b + \frac{1}{1-\phi} \frac{1}{1-\delta_e} \frac{\kappa}{p_f(\theta)} (r + \delta + \phi p_w(\theta)) + c \right\}.
\end{align*}
\]

- Competition across sectors equalizes sectorial prices, so that

\[
\frac{p}{P} = 1.
\]
Model: *self-employed*.

- By being self-employed, agents avoid the \( LMR \) and \( PMR \).

- Self-employed do not suffer breakdowns. Thus,

\[
rV_{se}(\omega) = pz - P\omega.
\]
Model: *occupational choice (1).*

- We have

\[(1 + r) V_e(h, \omega) = hP + \pi + (1 - \delta_e) V_e(h, \omega) + \delta_e \max \{S_e(h, \omega) - Pc_e, V_u, V_{se}(h, \omega)\}\]

- Occupational decision based on choice in the max operator:

\[
\begin{align*}
\text{Ent.} & \implies \text{W,} \quad \text{if} \; S_e(h, \omega) - Pc_e > V_u, \\
\text{Ent.} & \implies \text{SE,} \quad \text{if} \; S_e(h, \omega) - Pc_e > V_{se}(h, \omega), \\
\text{SE} & \implies \text{W,} \quad \text{if} \; V_{se}(h, \omega) > V_u.
\end{align*}
\]
Model: *occupational choice* (2).

- Clearly: $S_e$ does not depend on $\omega$; $V_{se}$ does not depend on $h$.

- Define $\hat{h}$ and $\hat{\omega}$ so that

\[
\begin{align*}
S_e(\hat{h}) - P_{ce} &= V_u, & \implies \text{Ent.} & \implies W & \text{if } h > \hat{h}, \\
V_{se}(\hat{\omega}) &= V_u, & \implies \text{SE} & \implies W & \text{if } \omega < \hat{\omega}.
\end{align*}
\]

- What governs the choice of SE vs. entrepreneurship?
  - Agents choose entrepreneurship if $S_e(h) - P_{ce} > V_{se}(\omega)$,
    \[\text{i.e. if } h + \omega > \hat{h} + \hat{\omega}.\]
The diagram illustrates the relationship between wage rate (ω) and hours (h) for different types of employment.

- **Worker**: Located at the top of the diagram, indicating high wages at lower hours.
- **Entrepreneur**: Found at the intersection of the lower boundary, showing a lower wage at increased hours.
- **Self-employment**: Positioned within the triangle, depicting a middle ground where wages and hours balance.

The diagram suggests that as wages increase, hours tend to decrease, and vice versa, with distinct zones for worker, entrepreneur, and self-employment.
Model: closing the model.

- Proportions $\mu_e$, $\mu_{se}$ and $\mu_w$ can be computed from $(\hat{h}, \hat{\omega})$ and the distributions $F_h(.)$ and $F_\omega(.)$.
  - We know that $\varepsilon = \sigma / s$. By definition of $s$,
    \[ \varepsilon = \bar{\sigma} \left[ \mu_e + \mu_{se} / l \right], \]
    where $\bar{\sigma} = \sigma \bar{L} / M$.

- In steady state,
  \[ \frac{\mu_e}{\# \text{ of entrepreneurs}} \cdot \frac{|l|}{\# \text{ of employment}} = \frac{\mu_w}{\# \text{ of workers}} \cdot \frac{\rho_w(\theta)}{(\delta + \rho_w(\theta))} \cdot \frac{\text{employment rate}}{\text{employment rate}}. \]
Model: *extension with firing taxes.*

- **Firing taxes:** cost $t$ per employee upon separation.
  
equivalent to replacing operating costs $c$ with
  
  $$c' = c + (\delta_e + \delta_s).t.$$

- **Bargaining:** by staying, firm avoids payment of $t$:
  
  $$\phi.[V'_e(l) + t] = (1 - \phi).(V_w - V_u).$$
Normalization: $z = 1$ / Standard: $r = 0.04/12$.

$\delta_e$ & $\delta_s$ to target firm and job expected durations:

- 7-year firm survival probability of 45%,
- median job tenure of 4.2 years.

Targeting $\theta = 0.45$ as in Hall (2005).

$\kappa = 1$ (average recruitment costs $\approx 1.5$ m. of earnings).

$\eta = 0.5$ (Pissarides and Petrongolo).

Matching intercept to match avg. unemployment duration.

Policy parameters:

- $b = 0.3$ (Shimer) [also tried $b = 0.6$ for robustness].
- $c_e = 20\%$ of monthly per capita income (Djankov et al.).
- $t = 0$. 
U.S. calibration (2)


- $\phi = 0.433$ chosen to match wage / output ratio.

- “Markup condition” pins down operating cost $c = 0.230$.

- $\mu_e = 3.9\%$ and $\mu_{se} = 7.4\%$

- $l = 21.5$, and $\epsilon = \bar{\sigma}.[\mu_e + \mu_{se}/l]$ gives $\bar{\sigma}$.

- $(z, V_u(\theta)) \implies \hat{\omega}$ and entry condition $\implies \hat{h}$.

- $F_h(.)$ and $F_\omega(.)$ uniform dsn, with robustness analysis on range.
Changes in firing costs:

(fc affects firm surplus.)

<table>
<thead>
<tr>
<th></th>
<th>% Ent.</th>
<th>% SE</th>
<th>U%</th>
<th>Unemp. Dur.</th>
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<td>4,6</td>
<td>2,4</td>
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Corr. in data: 0 + weak +
Model: - + + +

% entrepreneurship less sensitive than %SE.
Changes in firing costs:

(fc does not affect firm surplus.)

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<th>fc</th>
<th>% Ent.</th>
<th>% SE</th>
<th>U%</th>
<th>Unemp. Dur.</th>
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<td>0</td>
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<td>15,3</td>
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<td>2,6</td>
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Corr. in data: 0 + weak +
Model: - + weak + +

% entrepreneurship less sensitive than %SE.
Changes in entry costs:

(months of individual GDP)

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<td>ce = .2 months</td>
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<td>7.5</td>
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<td>ce = 6 months</td>
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Corr. in data: 0 + +

Model: $\sim 0$ $\sim 0$ 0 0
Changes in ongoing regulatory costs:

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<th>Flow reg cost</th>
<th>% Ent.</th>
<th>% SE</th>
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<td>Flow reg cost = 0</td>
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<td>Flow reg cost = .05</td>
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<td>Flow reg cost = .1 (oper. costs = .2298)</td>
<td>3.4</td>
<td>20.5</td>
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Corr. in data: 0 + +
Model: - + + +

% Entrepreneurship less sensitive than %SE.
Changes in unemployment income:

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<td>$b = .3$</td>
<td>3.9</td>
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<tr>
<td>$b = .4$</td>
<td>4.0</td>
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<td>5.3</td>
<td>2.8</td>
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<tr>
<td>$b = .5$</td>
<td>4.0</td>
<td>5.6</td>
<td>6.6</td>
<td>3.5</td>
</tr>
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</table>

Corr. in data: weak - weak - 0
Model: 0 - + +
1. *SE* reacts to policies as in data (but correlation with $c_e$ is weak).
   → *SE* as a way to escape LMR and PMR.
Simulations: conclusion.

1. $SE$ reacts to policies as in data (but correlation with $c_e$ is weak).
   → $SE$ as a way to escape LMR and PMR.

2. Limited (negative) reaction of entrepreneurship to policies considered, even for large policy changes.
Simulations: conclusion.

1. \(SE\) reacts to policies as in data (but correlation with \(c_e\) is weak).
   \(\rightarrow \) \(SE\) as a way to escape LMR and PMR.

2. Limited (negative) reaction of entrepreneurship to policies considered, even for large policy changes.

3. \(SE\) more responsive to policies than entrepreneurship.
Simulations: conclusion.

1. $SE$ reacts to policies as in data (but correlation with $c_e$ is weak). → $SE$ as a way to escape LMR and PMR.

2. Limited (negative) reaction of entrepreneurship to policies considered, even for large policy changes.

3. $SE$ more responsive to policies than entrepreneurship.

4. Unemployment reacts as in data (correlation w/ $c_e$ is weak).
Conclusion / future research (1):

- Looking at data,
  - we showed that SE is an important margin to model when looking at regulations,
  - we established correlations of different policies with unemployment and occupational choices,
  - we established correlation between labor and product market regulations.

- We built a model with frictions in the labor market and monopolistic competition in the goods market to look at effect of policies on $u\%$ and occupational choice.
Conclusion / future research (2):

- We want to consider different types of heterogeneities (productivity \(\rightarrow\) size distribution).

- Endogenous separations might be an important margin, especially when looking at firing costs.

- No positive effects of regs. Focus on rent creation / division.

- Political economy / constituencies. Need to consider:
  - transitions.
  - partial (industry-level) reform, structure of reform.
  - exogenous variations across countries: Industry composition / historical differences / political systems?