Discussion
by
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of
The Effects of Internationalisation on Domestic Labour Demand by Skills: Firm-Level Evidence for Belgium
by
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1) Contents

- Does „globalization“ change the composition of labor demand in ICs?
- Recovering (short- and long-run) labor demand elasticities of production/non-production workers from wage cost share estimations in dependence of:
  - Export share
  - Import share
  - New FDI
  - Distinction by link-partner type: LDC/IC
1) Contents cont.

- Belgium manufacturing firms from 1997-2007
- Estimation method (bootstrapped s.e.)
  - Static wage cost share estimation
  - Dynamic panel wage cost share estimation
  - Difference-in-differences
- Large literature; few firm studies, few regards to type of link-partner, few long-run demand elasticities by labor types, some studies on Belgium data; new: FDI to LDCs.
## 2) Results

<table>
<thead>
<tr>
<th>Long run labor demand elasticity of ... in...</th>
<th><strong>Production workers</strong></th>
<th><strong>Non-production workers</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Export share</td>
<td>rises</td>
<td>falls</td>
</tr>
<tr>
<td>Share of exports from LDCs</td>
<td>falls</td>
<td>rises</td>
</tr>
<tr>
<td>Import share</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Import share from LDCs</td>
<td>falls</td>
<td>rises</td>
</tr>
<tr>
<td>New FDI</td>
<td>falls</td>
<td>rises</td>
</tr>
<tr>
<td>New FDI from LDCs</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>„In anticipation of new FDI“</td>
<td>-</td>
<td>rises</td>
</tr>
<tr>
<td>„In anticipation of new FDI from LDCs“</td>
<td>-</td>
<td>Falls</td>
</tr>
</tbody>
</table>
3) Comments

- 3.1) Microfoundation
- 3.2) Measures
- 3.3) Specification
- 3.4) Bootstrap
- 3.5) „Announcement-Effect“
- 3.6) References
3.1) Theoretical Microfoundation

• Simple offshoring model

\[ Y = M_1^\delta M_2^{1-\delta} \]

• Where production step 1 given by

\[ M_1 = \left( \alpha U_1^{\frac{1-\sigma}{\sigma}} + (1-\alpha) S_1^{\frac{1-\sigma}{\sigma}} \right)^{\frac{\sigma}{1-\sigma}} \]

• And production step 2 given by

\[ M_2 = \left( \beta U_2^{\frac{1-\sigma}{\sigma}} + (1-\beta) S_2^{\frac{1-\sigma}{\sigma}} \right)^{\frac{\sigma}{1-\sigma}} \]

• Step 1 intensive in low-skilled labor $U$: $\alpha > \beta$
3.1) Theoretical Microfoundation cont.

- **S-Wage cost share - both steps at home - (log-linearized)**

\[
\frac{w_{np}(S_1 + S_2)}{w_{np}(S_1 + S_2) + w_p(U_1 + U_2)} = a_{no \_ off} \ln \left( \frac{w_{np}}{w_p} \right) + \ldots
\]

where

\[
a_{no \_ off} = \delta \left[ \left( \frac{\alpha}{1-\alpha} \right)^{\sigma} \left( \frac{w_p}{w_{np}} \right)^{1-\sigma} \right]^2 + (1-\delta) \left[ \left( \frac{\beta}{1-\beta} \right)^{\sigma} \left( \frac{w_p}{w_{np}} \right)^{1-\sigma} + 1 \right]^2
\]
3.1) Theoretical Microfoundation cont.

- **S-Wage cost share – 1st step offshored** - (log-linearized)

\[
\frac{w_{np} S_2}{w_{np} S_2 + w_P U_2} = a_{off} \ln \left( \frac{w_{np}}{w_p} \right) + \ldots
\]

where

\[
a_{off} = \frac{(\sigma - 1) \left( \frac{\beta}{1 - \beta} \right)^{\sigma} \left( \frac{w_p}{w_{np}} \right)^{1-\sigma}}{\left[ \left( \frac{\beta}{1 - \beta} \right)^{\sigma} \left( \frac{w_p}{w_{np}} \right)^{1-\sigma} + 1 \right]^2}
\]

- **thus** \( a_{off} < a_{no\_off} \)
3.2) Measures

- Import share

\[
\text{Import share} = \frac{\text{Imported Inputs}}{\text{Intermediate goods}} \rightarrow \text{But input type substitution!} \\
\text{(Moser, Urban, Weder, CEPR DP 7455)}
\]

**Factor intensities before substitution:**
- Production workers
- Non-prod. workers
- Capital
- Foreign inputs
- Domestic inputs

**Factor intensities after substitution:**
- Production workers
- Non-prod. workers
- Capital
- Foreign inputs
- Domestic inputs
3.2) Measures cont.

- Production/non-production workers: ➔ dividing line finer?


- FDI from LDCs: nice!
  - But most FDI to China is horizontal FDI, which is not expected to change factor intensities much (except in KCM); remains noisy measure of vertical FDI

- Explanatory variable: relative wage ➔ meaning?

  \[
  \frac{\text{avg.} \cdot \text{wage}_{np} \cdot \text{labor}_{np}}{\text{total} \cdot \text{wage} \cdot \text{bill}}
  \]

  - What is source of variation in \( \text{avg.} \cdot \text{wage}_{np} \) across firms?
    Collective bargaining = same wage for the same worker type ➔ variation through differences in intra-group skills? Still labor demand elasticity estimates?
  - Endogeneity?
3.3) Specification

• Control for all types of global activities at the same time!
  (Otherwise omitted variable bias!)

• You can have dynamic specification for FDI, even if FDI does not vary much over time
  (Wage share is dynamic, not FDI!)

• Interact „relative wage“ control var. with industry?
  (Factor intensities vary by industries if not by plants)
3.3) Specification cont.

- Control for high-skilled labor augmenting technical progress?
  (e.g. export-expanders are in industries with large technological change? Split sample by low vs. high tech industries; control for R&D expenditure, random linear firm time trend, etc.)

- Endogeneity of export share/import share/FDI?
  Firms invent new patent $\Rightarrow$ change technology $\Rightarrow$ become exporters or expand export product range = control for technology level? Exogenous trade shock? E.g. entry of Eastern European countries into EU? Or introduction of Euro? Compare GB, DK, SE with Euroland
3.4) Bootstrap

• Useful, because l.r. demand elasticities are non-linear functions of estimated parameters

• Clustered? (Bertrand, et al. QJE, 2004)
  – stack estimated error term $e_{it}$ in vectors $e_i$
  – Randomize $e_i$ rather than $e_{it}$ ➔ preserves correlation structure of error term of observations belonging to same firm

• Do not eliminate bootstrap steps, when Hansen or AR2-test fail! Type I error!

• Alternative to bootstrap is delta-method (e.g. Woodridge, 2002)
3.5) „Announcement-Effect“
a negative effect on clerical employment in $t-1$. For blue-collar workers, we find no significant anticipation effects of OFDI, while we find a weakly significant anticipated impact on value added.

**Table 6: Anticipated, contemporaneous and long-run impacts of new FDI projects**

### a. on employment

<table>
<thead>
<tr>
<th></th>
<th>Non-production labour</th>
<th></th>
<th>Production labour</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Eq. (10)</td>
<td>Eq. (11)</td>
<td>Eq. (12)</td>
<td>Eq. (13)</td>
</tr>
<tr>
<td>$NFDI$</td>
<td>0.025**</td>
<td>0.014*</td>
<td>0.014</td>
<td>0.021</td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.008)</td>
<td>(0.011)</td>
<td>(0.013)</td>
</tr>
<tr>
<td>$NFDI_{low}$</td>
<td>-0.046**</td>
<td>-0.004</td>
<td>-0.025</td>
<td>-0.065**</td>
</tr>
<tr>
<td></td>
<td>(0.023)</td>
<td>(0.012)</td>
<td>(0.019)</td>
<td>(0.027)</td>
</tr>
<tr>
<td>$y$</td>
<td>0.271**</td>
<td>0.258**</td>
<td>0.341**</td>
<td>0.394**</td>
</tr>
<tr>
<td></td>
<td>(0.021)</td>
<td>(0.019)</td>
<td>(0.016)</td>
<td>(0.014)</td>
</tr>
<tr>
<td>$w_{rel}$</td>
<td>-0.027</td>
<td>-0.025</td>
<td>-0.078**</td>
<td>-0.062**</td>
</tr>
<tr>
<td></td>
<td>(0.023)</td>
<td>(0.020)</td>
<td>(0.024)</td>
<td>(0.027)</td>
</tr>
<tr>
<td>$k$</td>
<td>0.052**</td>
<td>0.047**</td>
<td>0.058**</td>
<td>0.064**</td>
</tr>
<tr>
<td></td>
<td>(0.008)</td>
<td>(0.006)</td>
<td>(0.005)</td>
<td>(0.005)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.118</td>
<td>0.111</td>
<td>0.188</td>
<td>0.232</td>
</tr>
<tr>
<td># obs.</td>
<td>8869</td>
<td>11140</td>
<td>11140</td>
<td>11140</td>
</tr>
</tbody>
</table>

Notes: ** indicates significance at the 5% level; * indicates significance at the 10% level.

Standard errors in brackets

Estimated equations include sector specific time dummies

### b. on value added

<table>
<thead>
<tr>
<th></th>
<th>Eq. (10)</th>
<th>Eq. (11)</th>
<th>Eq. (12)</th>
<th>Eq. (13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$NFDI$</td>
<td>0.018*</td>
<td>0.006</td>
<td>0.019</td>
<td>0.015</td>
</tr>
<tr>
<td></td>
<td>(0.010)</td>
<td>(0.009)</td>
<td>(0.014)</td>
<td>(0.020)</td>
</tr>
<tr>
<td>$NFDI_{low}$</td>
<td>-0.004</td>
<td>-0.008</td>
<td>-0.031</td>
<td>-0.038</td>
</tr>
<tr>
<td></td>
<td>(0.025)</td>
<td>(0.016)</td>
<td>(0.024)</td>
<td>(0.034)</td>
</tr>
<tr>
<td>$R^2$</td>
<td>0.158</td>
<td>0.153</td>
<td>0.136</td>
<td>0.138</td>
</tr>
<tr>
<td># obs.</td>
<td>8869</td>
<td>11140</td>
<td>11140</td>
<td>11140</td>
</tr>
</tbody>
</table>

Notes: ** indicates significance at the 5% level; * indicates significance at the 10% level.

Standard errors in brackets

Estimated equations include sector specific time dummies

On impact, effects are still relatively moderate. The setting up of the new foreign facility still increases demand for non-production workers (though the positive effect is only weak). Production workers are now negatively affected, but only when the investment takes place in a low-income country. A new investment abroad reduces demand for blue-collar workers by 0.03% on impact. No effects are found for value added. OFDI therefore has no indirect effects on employment through output.

The negative impact of investment in low-income countries on demand for non-production workers increases after one period (in $t+1$, the decrease in employment compared to its pre-investment level is of 0.06%) while we cannot find any effect on non-production labour.
3.6) References

• HO-Theory with firm data (Bernard, Redding, Schott, RevStud, 2007)
• Static labor demand & globalization (Hijzen, Görg, and Hine, 2005; Epifani and Gancia, 2008; Crino, RevStud 2010)
• Dynamic labor demand & globalization (Bruno and Falzoni, 2005)
• Offshoring theory (e.g. Sanyal and Jones, 1982, and Venables, 1999)
• Intermediate goods trade between ICs Ethier (1982)