Labour demand and the distribution of wages in South African manufacturing exporters

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Introduction

• Exporting is associated with positive economic outcomes (Foster, 2006)
  – used as a policy tool to generate growth and employment
  – South Africa is no exception

• On a firm-level, what do we know about the linkages between exporting, labour demand and wages?
  – South African literature
    • Rankin and Schoër (2013)
    • Edwards et al. (2016) and Matthee et al. (2016)
Introduction

• This paper is part of the Labour Market Analysis project initiated by UNU-WIDER and National Treasury
  – Use SARS administrative records to investigate the following:
    • Labour demand and wages (exporters vs. non-exporters)
    • Employment growth by exporters
    • Within-firm wage distribution and inequality
Data

✓ Customs data
  • Export transactions of South African firms 2010-2014
  • Transaction: trader id, tariff code (HS6-digit level), country of destination (market), country of origin (SA), customs value of the transaction and the statistical value
  • Exporters trading > R10 000 per year (covers 99% of exports)

✓ Employee data (IRP5)
  • Completed IRP5 certificates by employers on behalf of their employee
  • Weighted number of employees per firm
  • Weighted wages per person
  • Weighted wages per firm

✓ Company income tax data (CIT)
  • IT14 form & ITR14 form (2010-2014)
  • Plant and equipment (to measure capital intensity)
  • Employee Expenses including Directors (to measure labour cost)
  • Gross Income (as a measure of sales)
  • Manufacturing sector (ISIC 4 classification: codes 1010 – 1033)

Merge = Conjunction table
Descriptive statistics

Number of manufacturing non-exporters and exporters

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-exporters</td>
<td>24,959</td>
<td>25,561</td>
<td>24,868</td>
<td>27,256</td>
<td>22,992</td>
</tr>
<tr>
<td>Exporters</td>
<td>4,957</td>
<td>6,868</td>
<td>7,145</td>
<td>8,117</td>
<td>7,257</td>
</tr>
<tr>
<td>Total manufacturing firms</td>
<td>29,916</td>
<td>32,429</td>
<td>32,013</td>
<td>35,373</td>
<td>30,249</td>
</tr>
</tbody>
</table>
Descriptive statistics

The number of the manufacturing exports per destination

- SACU: 41%
- Africa (excluding SACU): 24%
- International: 35%

The value of the manufacturing exports per destination

- SACU: 89%
- Africa (excluding SACU): 9%
- International: 2%
### Descriptive statistics

Number of employees, wages and wages per person (average for 2010-2014)

<table>
<thead>
<tr>
<th></th>
<th>Number of employees</th>
<th>Wages per person</th>
<th>Firm wages</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Non-export</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Mean</em></td>
<td>19</td>
<td>201 976</td>
<td>2 116 382</td>
</tr>
<tr>
<td><em>Median</em></td>
<td>7</td>
<td>96 468</td>
<td>667 673</td>
</tr>
<tr>
<td><strong>Exporters</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Mean</em></td>
<td>82</td>
<td>262 130</td>
<td>16 260 000</td>
</tr>
<tr>
<td><em>Median</em></td>
<td>20</td>
<td>144 725</td>
<td>2 771 373</td>
</tr>
<tr>
<td><strong>- International</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Mean</em></td>
<td>137</td>
<td>324 834</td>
<td>31 340 000</td>
</tr>
<tr>
<td><em>median</em></td>
<td>28</td>
<td>164 132</td>
<td>4 294 574</td>
</tr>
<tr>
<td><strong>- Africa_only</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><em>Mean</em></td>
<td>47</td>
<td>233 918</td>
<td>6 660 803</td>
</tr>
<tr>
<td><em>median</em></td>
<td>18</td>
<td>149 071</td>
<td>2 588 920</td>
</tr>
</tbody>
</table>

*Source: Authors’ own calculations*
**Brief literature overview**

- Exporters are, on average, larger than non-exporting firms in terms of number of employees (Brambilla et al., 2015)
- Exporters contribute to employment creation (Rankin, 2005)
- Exporters demand certain types of jobs (Bas, 2012)
  - Blue collar versus white collar jobs
- Exporters pay higher wages than non-exporters (Bernard and Jensen, 1997; Verhoogen, 2008)
\[ \ln(X)_i = \alpha + \beta_1 Exporter_i + \beta_2 No.\, dest_i + \beta_3 No.\, prod_i + \beta_4 \ln kl_i + \beta_5 Industry_i + \beta_6 year_i + u_i \]

Where:
- \(X_i\) – firm characteristics (number of employees, wages per person, wages)
- \(Exporter_i\) – dummy variable of export status (exporter=1 and non-exporter=0)
- \(No.\, dest_i\) – Number of destinations exported to by firm (this is 0 if the firm does not export)
- \(No.\, prod_i\) – Number of products exported by firm
- \(\ln kl_i\) – \(\ln\) capital per worker
- \(Industry_i\) – control dummy (4 digit ISIC classification) to account for heterogeneity
- \(year_i\) – control dummy for the years 2010 to 2014
- \(\beta_i\) – export premia
- \(\mu_{it}\) – Error term
Labour demand and wages: non-exporters versus exporters (within and outside Africa)

Note: Premium relative to non-exporters
Source: Authors’ own calculations
Employment growth

\[ \Delta E_i = \alpha + \beta_1 Exporter_i + \beta_2 \Delta lkl_i + \beta_3 No.\ dest_i + \beta_4 No.\ prod_i + \beta_5 Industry_i + u_i \]

Where:
\( \Delta E_i \) – Growth in employment (number of employees, above and below age 30, above and below R6500pm)
\( Exporter_i \) – dummy variable of export status (Africa, International, Continue, Enter, Exit)
\( \Delta lkl \) – growth in capital
\( No.\ dest_i \) – control dummy (number of destinations exported to by firm)
\( No.\ prod_i \) – control dummy (number of products exported by firm)
\( Industry_i \) – control dummy (4 digit ISIC classification)
\( \mu_{it} \) – Error term
\( -i \) – the sample period of 2010 to 2013
## Employment growth: Exporters within and outside Africa

<table>
<thead>
<tr>
<th></th>
<th>Δ No of employees (1)</th>
<th>Δ below age of 30 (2)</th>
<th>Δ above age of 30 (3)</th>
<th>Δ below R6500 pm (4)</th>
<th>Δ above R6500 pm (5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Export dummy</td>
<td>0.212***</td>
<td>0.157***</td>
<td>0.251***</td>
<td>0.0583*</td>
<td>0.408***</td>
</tr>
<tr>
<td>(0.0301)</td>
<td>(0.0288)</td>
<td>(0.0297)</td>
<td>(0.0322)</td>
<td>(0.0265)</td>
<td></td>
</tr>
<tr>
<td>Africa only</td>
<td>0.069***</td>
<td>0.041***</td>
<td>0.086***</td>
<td>0.0143</td>
<td>0.212***</td>
</tr>
<tr>
<td>(0.0312)</td>
<td>(0.0298)</td>
<td>(0.0308)</td>
<td>(0.0334)</td>
<td>(0.0275)</td>
<td></td>
</tr>
<tr>
<td>Δ Lkl</td>
<td>0.150***</td>
<td>0.102***</td>
<td>0.143***</td>
<td>0.136***</td>
<td>0.0958***</td>
</tr>
<tr>
<td>(0.00111)</td>
<td>(0.00106)</td>
<td>(0.00109)</td>
<td>(0.00119)</td>
<td>(0.000974)</td>
<td></td>
</tr>
<tr>
<td>No. dest &amp; prod control</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Industry controls</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Observations</td>
<td>31 961</td>
<td>31 961</td>
<td>31 961</td>
<td>31 961</td>
<td>31 961</td>
</tr>
</tbody>
</table>

**Source:** Authors’ own calculations

**Notes:** ***p<0.01  **p<0.05   *p<0.1

(Is significant at the 1% level, 5% level and 10% level respectively)
Wage distribution and inequality

• International literature
  – Frías, Kaplan and Verhoogen (2012) – Mexico
    • exporters versus non-exporters
    • Between the top and bottom quartile the wage effects of exporting increase with earnings
  – Bernini, Guillou and Treibich (2015) – France
    • wage premium throughout the distribution and that the magnitude of the distribution increases towards the top end of the wage distribution
Wage distribution: non-exporters versus exporters (within and outside Africa)

Source: Authors' own calculations
Wage distribution: Exporters within and outside Africa and SACU, with different controls

Note: Premium relative to non-exporters
Source: Authors’ own calculation
Wage distribution: Exporter dynamics within and outside Africa

Premium relative to non-exporters - The lower end of each bar is the premium controlling for firm characteristics, the upper end is the additional premium without controlling.

Source: Authors’ own calculations
Wage inequality in terms of exporter status

Note: Premium relative to non-exporters
Source: Authors’ own calculations
Wage inequality: exporter behaviour

\[
\ln(X)_i = \alpha + \beta_1 \text{Exporter}_i + \beta_2 \text{No. dest}_i + \beta_3 \text{No. prod}_i + \beta_4 \text{Industry}_i + \beta_5 \text{firm}_i + \beta_6 \text{year}_i + \beta_7 \text{control}_i + u_i
\]

Where:
- \(X_i\) – within firm wage distribution (5th percentile, 25th percentile, 75th percentile, 95th percentile)
- \(\text{Exporter}_i\) – dummy variable of export status (SACU, Africa, International)
- \(\text{No. dest}_i\) – control dummy (number of destinations exported to by firm)
- \(\text{No. prod}_i\) – control dummy (number of products exported by firm)
- \(\text{Industry}_i\) – control dummy (4 digit ISIC classification) to account for heterogeneity
- \(\text{firm}_i\) – control for firm characteristics (ln capital per worker, ln number of employees, ln output per worker)
- \(\text{year}_i\) – control dummy for the years 2010 to 2014
- \(\text{control}_i\) – control for HS6 product price/ GDP per capita/ adding product fixed effects
- \(\beta_i\) – export premia
- \(\mu_{it}\) – Error term
Wage distribution (inequality): Within and outside Africa

Note: Relative to International firms - The dotted lines are the premium controlling for firm characteristics, the solid lines are without controlling.
Source: Authors’ own calculations
Conclusion

• South African manufacturing exporters employ more workers and pay higher wages than non-exporters.
• Moreover, exporters tend to grow employment of more experienced (older), better paid workers.
• Within firm distribution of wages
  – An export premium exists across the wage distribution,
    • wide dispersion of wages within exporters (particularly international exporters)
  – Source of inequality?
    • inequality within exporters is not driven by exporting but rather by characteristics associated with the types of firms which participate in the export market.