Short- and Longer-Run Impacts of Management Training: An Experiment in Tanzania

Yuki Higuchi (Nagoya City University, Japan)
https://sites.google.com/site/yukihibuchipage

(with Edwin Paul Mhede and Tetsushi Sonobe)

ABCDE
20th June, 2016
Acknowledgement

• This research was supported by the World Bank Japan PHRD Trust Fund Number TF096317 and JSPS KAKENHI Grant Numbers 25101002 and 15H06540

• The opinions expressed and arguments employed are the sole responsibility of the authors
Background

- Entrepreneurs play key role in industrial development and job creation [WDR 2013 “Jobs”]
- Their managerial capacity is limited in developing world [Bloom and van Reenen (2010 JEP); Bruhn et al (2010 AER)]
- A number of RCT of management training [Pioneered by Karlan and Valdivia (2011 REStat)]
- Stylized facts: significant training impact on adopted management practices but not on business performance [Survey by McKenzie and Woodruff (2014 WBRO)]
- Training impact evaluated too soon?
What we do

• RCT of management training for small garment manufacturers in Tanzania
• Panel data in the span of 4 years with negligible incidence of attrition

Findings
• Treated enterprises adopted a number of management practices soon after training
• They stopped using some practices later and instead assimilated other practices
• Significant training impacts on business performance 3 years later
Presentation outline

• Experimental design
• Externality
• Results
• Remarks
Study Site

• Small garment manufacturers in an *industrial cluster* in Dar es Salaam

• Manufacturers of similar or related products tend to locate in geographical proximity [Sonobe and Otsuka, 2011]

• Heterogeneity to be controlled is relatively small

• Garment cluster formed in 1990s by housewives participated in UNIDO training

• Samples randomly selected from associations
Timeline

• Baseline survey (2010 Apr.)
• Classroom training program (2010 May.)
• Interim survey (2010 Sep.)
• On-site training program (2010 Nov.)
• 1st follow-up survey (2011 Apr.)
• 2nd follow-up survey (2012 Sep.)
• 3rd follow-up survey (2014 Jan.)
Training

Classroom training
• Lectures and workshop: 50 hours
• Production management, entrepreneurship, marketing and record keeping
• 47 / 52 participated

On-site training
• Instructors visited each enterprise: half day * several rounds
• Mostly production management
• 54 / 54 enterprises received the consultation
Training

• Japanese expert of production management (*Kaizen*)

• *Kaizen*: a common-sense and low-cost approach to production management by reducing wasted work and materials and improving coordination among workers [Imai 2012]

• Local consultants with ILO’s qualification (standard entrepreneurship, marketing, and record keeping)
Sample Size

- 111 (baseline) -> 105 (3rd follow-up survey)
- Negligible incidence of attrition (not systematic)
- Observable characteristics balanced

<table>
<thead>
<tr>
<th>Group</th>
<th>Classroom</th>
<th>On-site</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>TT</td>
<td>Invited</td>
<td>Invited</td>
<td>26</td>
</tr>
<tr>
<td>TC</td>
<td>Invited</td>
<td>Not</td>
<td>24</td>
</tr>
<tr>
<td>CT</td>
<td>Not</td>
<td>Invited</td>
<td>29</td>
</tr>
<tr>
<td>CC</td>
<td>Not</td>
<td>Not</td>
<td>32</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td></td>
<td>111</td>
</tr>
</tbody>
</table>
Externality

• SUTVA (control group is unaffected by treatment) is likely to be violated
• Frequent communication among sample entrepreneurs
• Knowledge spillover from participants to non-participants
  -> Estimated coefficients show conservative training impact
• Limited general equilibrium effect: 60 percent of sample enterprises export to neighboring countries and beyond
## Externality

### Table 1

<table>
<thead>
<tr>
<th></th>
<th>(1) Group TT</th>
<th>(2) Group TC</th>
<th>(3) Group CT</th>
<th>(4) Group CC</th>
</tr>
</thead>
<tbody>
<tr>
<td># of acquaintances invited to training talked about <em>Kaizen</em> with</td>
<td>27.0</td>
<td>28.6</td>
<td>19.6</td>
<td>15.8</td>
</tr>
<tr>
<td>Willingness to pay (yes = 1)</td>
<td>11.0</td>
<td>9.9</td>
<td>5.5</td>
<td>3.4</td>
</tr>
<tr>
<td>before the training programs</td>
<td>0.65</td>
<td>0.75</td>
<td>0.64</td>
<td>0.68</td>
</tr>
<tr>
<td>soon after training programs</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>
Results

Management score [Bloom and van Reenen (2007 QJE)
-> McKenzie and Woodruff (2015 NBER WP) for SMEs in developing countries]

• Information on adopted management practices
• Enumerators’ visual inspection and/or entrepreneurs’ response
• Enumerators’ fixed effect controlled in regressions (noise control)
• Based on 27 yes/no diagnostic criteria
### Table 2

<table>
<thead>
<tr>
<th>Sales promotion</th>
<th>Baseline adoption rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>The enterprise had any expenditure for advertisement in the last 3 mo.</td>
<td>10</td>
</tr>
<tr>
<td>The enterprise has any signboards in front of the workshop.</td>
<td>39</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Record keeping</th>
</tr>
</thead>
<tbody>
<tr>
<td>The enterprise separates business and household expenses.</td>
</tr>
<tr>
<td>The enterprise keeps record of sales.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Marketing</th>
</tr>
</thead>
<tbody>
<tr>
<td>The entrepreneur can clearly describe the characteristics of their customers.</td>
</tr>
<tr>
<td>The entrepreneur has clear sales target or profit target in this year.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Production management</th>
</tr>
</thead>
<tbody>
<tr>
<td>The enterprise assigns any workers to inspect the quality of the products before sales.</td>
</tr>
<tr>
<td>The enterprise keeps records of quality defects.</td>
</tr>
<tr>
<td>The enterprise a flowchart indicating each production activity</td>
</tr>
<tr>
<td>The enterprise has no scrap cloths around the floor.</td>
</tr>
</tbody>
</table>
Results (management score [0-27])

Figure 1
Results (value added [international $])

Figure 2

(a) Baseline (2009)

(b) 3rd follow-up survey (2013)
Specification

• \( y_{it} = \alpha + \beta_{Bt}Z_{Bi} + \beta_{Et}Z_{Ei} + \gamma y_{i0} + \sum_{n=1}^{N-1} \delta_n m_{nit} + \eta_t + \varepsilon_{it} \)

  • \( Z_{B(E)i} = 1 \) if invited to both (either) training program
  • \( y_{i0} \) = (average) baseline value
  • \( m_{nit} \) = enumerator dummies, \( \eta_t \) = time dummies
  • \( \varepsilon_{it} \) = errors clustered at enterprise level

• ITT and TOT

• ANCOVA [McKenzie (2012 JDE)]

Add the mean of baseline value of an outcome variable as an additional control variable in the right-hand-side

• Fixed effect model for robustness check
Econometric results

Table 3

<table>
<thead>
<tr>
<th></th>
<th>(1) Both training</th>
<th>(2) Either training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Management score</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Soon after</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>1.5 years later</td>
<td>**</td>
<td>***</td>
</tr>
<tr>
<td>3 years later</td>
<td>***</td>
<td>***</td>
</tr>
<tr>
<td>Value added and sales revenue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2012</td>
<td>**</td>
<td>-</td>
</tr>
<tr>
<td>2013</td>
<td>***</td>
<td>*</td>
</tr>
<tr>
<td>Investment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2011 Jan. – 2012 Sep.</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>2012 Jan. – 2013 Dec.</td>
<td>*</td>
<td>-</td>
</tr>
</tbody>
</table>
Remarks

• Higuchi et al. (2015 JEBO) find sustained impacts of similar Kaizen management training in Vietnam
• Presence of knowledge spillover suggests greater social impacts
-> Government intervention warranted
• This research highlights the importance of collecting panel data in a longer span after RCT
Reference

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• McKenzie, D., Woodruff, C., 2014. What are we learning from business training and entrepreneurship evaluations around the developing world. WBRO 29(1), 48-82.