

—

Examining Productivity within Bangladeshi RMG Sector: Dispersion, Determinants, and Gender Advancements

Atonu Rabbani

Department of Economics, University of
Dhaka

7 December 2023

Version 1

A B C D

**ANNUAL
BIDS**

**CONFERENCE ON
DEVELOPMENT**

DEVELOPMENT, JUSTICE AND FREEDOM

**2
0
2
3**

7-9 December 2023

La Vita Hall, Lakeshore Hotel
Gulshan-2, Dhaka



Broad structure of this talk

- ~25 minutes (may be less)
- Topic 1: Measuring line-level productivity in RMG sector in Bangladesh
- Topic 2: Roles of supervisors and promoting gender advancement
- Thanks to my collaborators:
 - Chris Woodruff (Oxford)
 - Anik Ashraf (LMU)
 - Rocco Macchiavello (LSE)
 - Robbie Akerlof (Warwick)
 - Hannah Uckut (World Bank)
 - Mahreen Khan (Oxford)
 - Amal Chowdhury (BRAC JPGSPH)

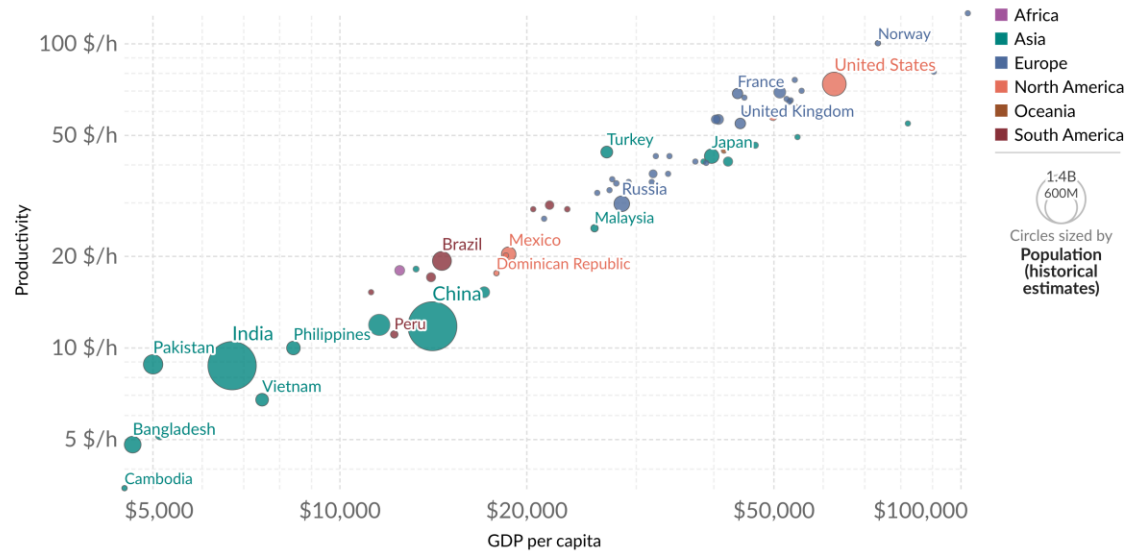


Why productivity?

Productivity vs. GDP per capita, 2019

Productivity is measured as gross domestic product (GDP) per hour of work. This data is adjusted for inflation and differences in the cost of living between countries.

Our World in Data



Data source: Data compiled from multiple sources by World Bank; Feenstra et al. (2015), Penn World Table (2021)

Note: This data is expressed in international-\$¹ at 2017 prices, using multiple benchmark years to adjust for differences in the cost of living between countries over time.

OurWorldInData.org/economic-growth | [CC BY](https://creativecommons.org/licenses/by/4.0/)

1. International dollars: International dollars are a hypothetical currency that is used to make meaningful comparisons of monetary indicators of living standards. Figures expressed in international dollars are adjusted for inflation within countries over time, and for differences in the cost of living between countries. The goal of such adjustments is to provide a unit whose purchasing power is held fixed over time and across countries, such that one international dollar can buy the same quantity and quality of goods and services no matter where or when it is spent. Read more in our article: [What are Purchasing Power Parity adjustments and why do we need them?](#)

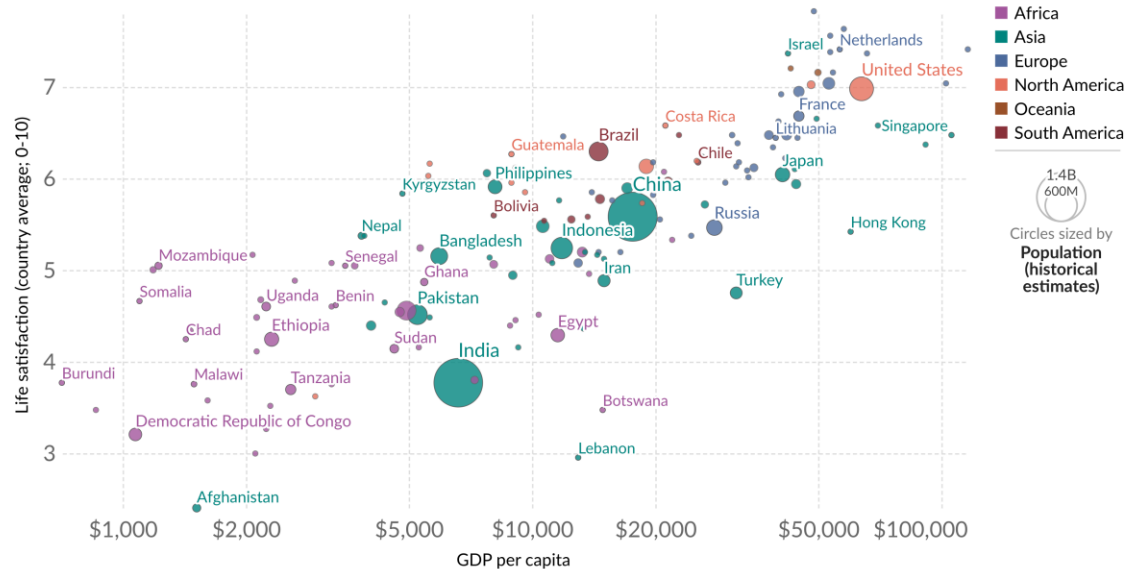


Productivity and Happiness!

Our World in Data

Self-reported life satisfaction vs. GDP per capita, 2022

Self-reported life satisfaction is measured on a scale ranging from 0-10, where 10 is the highest possible life satisfaction. GDP per capita is adjusted for inflation and differences in the cost of living between countries.



Data source: World Happiness Report (2023); Data compiled from multiple sources by World Bank

Note: GDP per capita is expressed in international-\$¹ at 2017 prices.

OurWorldInData.org/happiness-and-life-satisfaction | CC BY

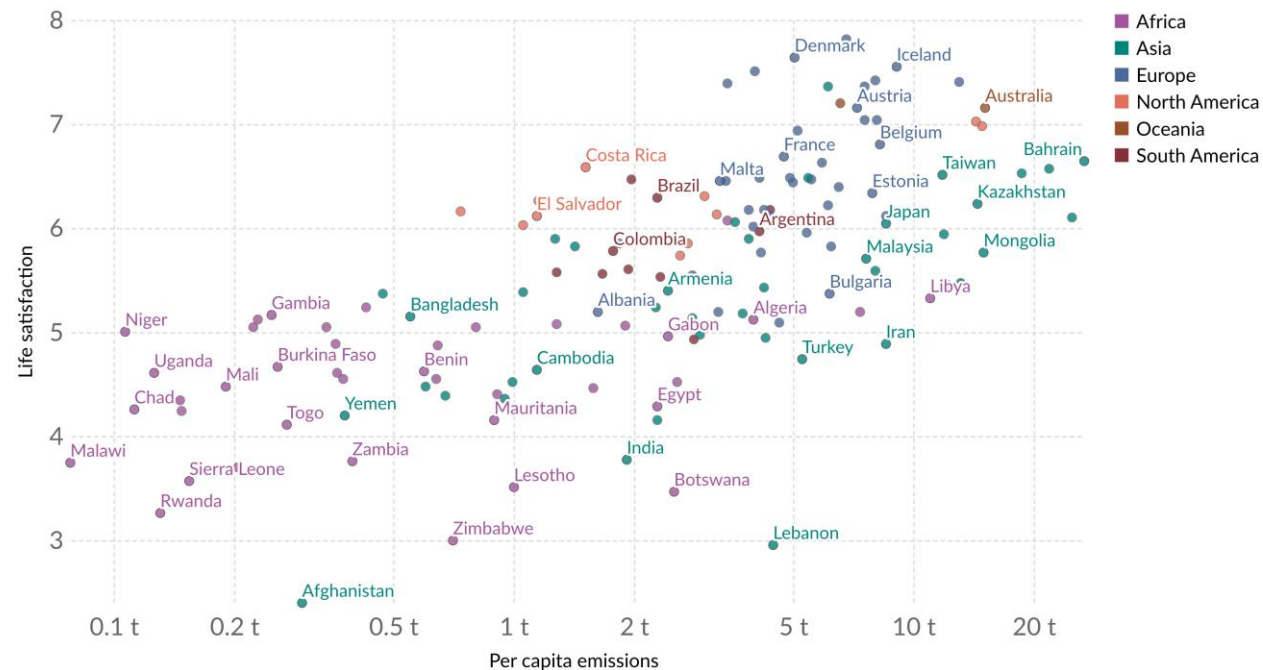
1. **International dollars:** International dollars are a hypothetical currency that is used to make meaningful comparisons of monetary indicators of living standards. Figures expressed in international dollars are adjusted for inflation within countries over time, and for differences in the cost of living between countries. The goal of such adjustments is to provide a unit whose purchasing power is held fixed over time and across countries, such that one international dollar can buy the same quantity and quality of goods and services no matter where or when it is spent. Read more in our article: [What are Purchasing Power Parity adjustments and why do we need them?](#)

Doesn't necessarily mean that's all we should care about!

Life satisfaction vs. CO₂ emissions per capita, 2021

Average of survey responses to the 'Cantril Ladder' question in the Gallup World Poll. The survey question asks respondents to think of a ladder, with the best possible life for them being a 10, and the worst possible life being a 0.

Our World in Data



Data source: World Happiness Report (2023); Global Carbon Budget (2022); Population based on various sources (2023)
OurWorldInData.org/happiness-and-life-satisfaction | CC BY



Productivity differentials

- Surprisingly, even for seemingly same products and processes, there is a wide variation in productivity
- Recent(?) important work: Syverson (2004)
 - Productivity ratio for 90th-10th plants within 4-digit SIC: 1.91
 - Also persistent with 0.6-0.8 autoregressive coefficients [Ábrahám and White (2007); Foster, Haltiwanger, and Syverson (2008)]
 - Larger for developing countries: 5:1 for China and India [Hsieh and Klenow (2009)]
 - Summarized in Syverson (JEL, 2011)
- Less explored: Productivity within firm, between lines (also workers)
- RMG sector may allow an appropriate lab for that



Cross-country (worker) productivity for RMG sector has been demonstrated already

Probably not wrong, and possibly quite useful

Just this is not what economists typically imply when they talk about productivity

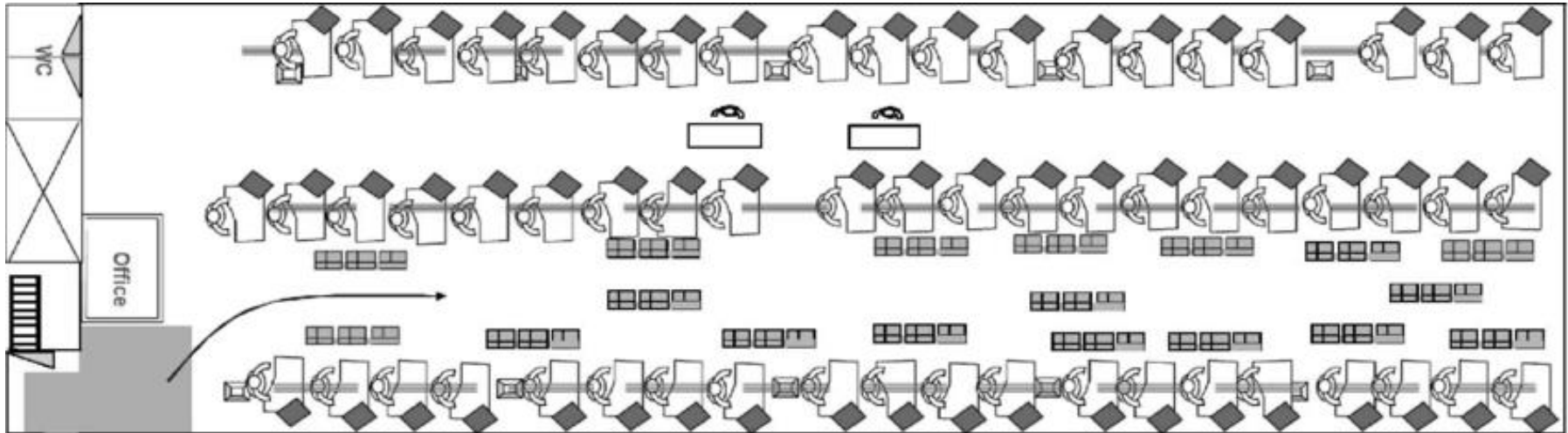
RMG worker productivity in Asian countries

Name of the country	Per hour productivity in value
Sri Lanka	\$15.9
Indonesia	\$12.3
China	\$11.1
Philippines	\$8.7
India	\$7.5
Vietnam	\$4.7
Myanmar	\$4.1
Bangladesh	\$3.4

Source: Asian Productivity Organization (APO) Data

<https://www.tbsnews.net/economy/rmg/rmg-labour-productivity-yet-behind-rivals-140554>

Production process within RMG factories



- “Simple” products, t-shirt, trousers, dress shirt etc.
- Each item is a sum of simple operations
- Operators perform them on material inputs in a linear fashion (no pun intended)
- The finished products go for quality checking, finishing and packaging for shipment

What is line level productivity?

Each operation is assigned a Standard Minute Value (SMV, also known as Standard Allowed Minutes (SAM))

Let's say, a line produces n_{lst} which has a SMV of v_s with x_{lt} working for h_{lt} minutes on date t

So,

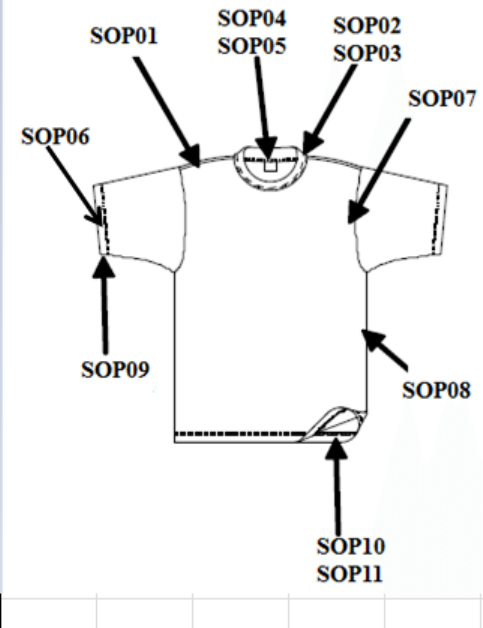
$$\text{Output}_{lt} = n_{lst} \times v_s$$

$$\text{Input}_{lt} = x_{lt} \times h_{lt}$$

Hence,

$$e_{lt} = \frac{n_{lst} \times v_s}{x_{lt} \times h_{lt}}$$

OPE. NO.	DESCRIPTION OF OPERATION	OPE. TIME(Min)
SOP01	Sew shoulder	0.33
SOP02	Join neck rib & attach neck rib to body	0.5
SOP03	Covering neck seam	0.38
SOP04	Baste brand label to neck	0.13
SOP05	Attach tape to shoulder & neck line	0.42
SOP06	Hem sleeve mouth	0.42
SOP07	Attach sleeve	0.58
SOP08	Sew side & under sleeve	0.56
SOP09	Tack sleeve mouth	0.21
SOP10	Hem bottom	0.42
SOP11	Sew laundry label to bottom	0.13
SOP12	Turn body	0.17
Total Sewing Operation Time		4.25

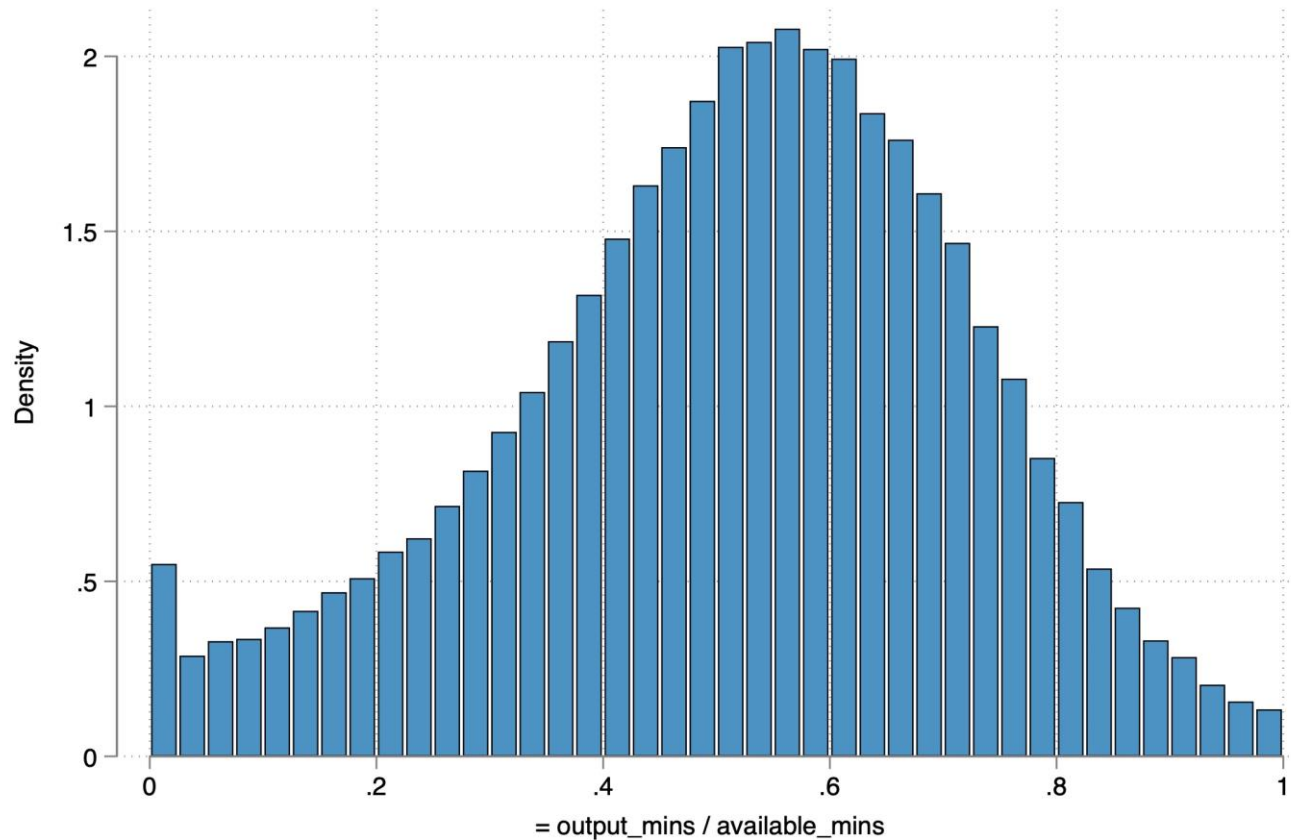




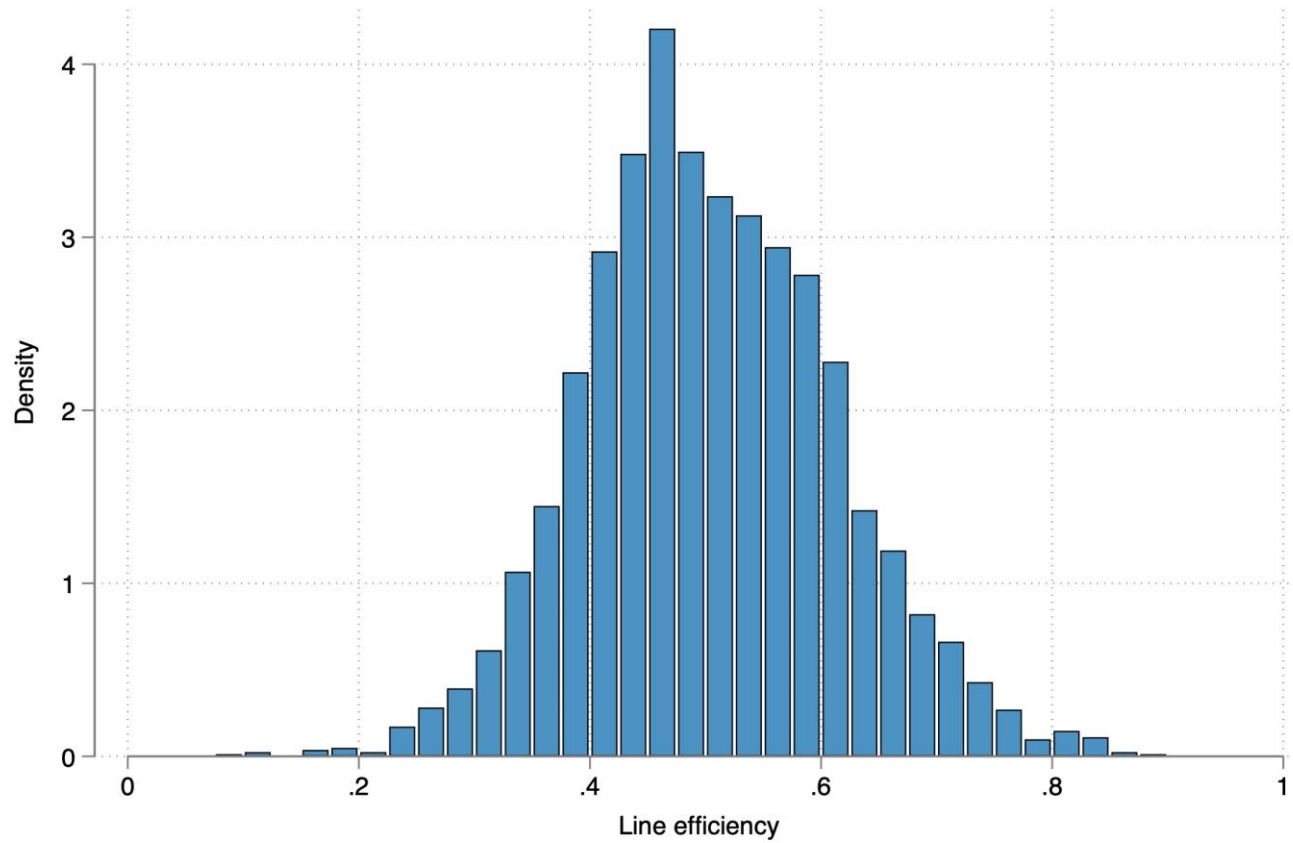
Data

- Number of factories: 142
- Number of lines: 4,057 (28.6 lines/factory; these are large factories)
- Missing values: 621,427 (37.1%, ☹)
- Weird outliers (= efficiency > 1): 10,213 (0.6%)
- Dropped another 385 observations for too few overservations per line (< 30 days)
- Final data set: 1,045,417 line-days
 - Number of factories: 102
 - Number of lines: 3,262 (32 lines/factory, even larger)

Raw distribution, N = 1,045,417 line-days

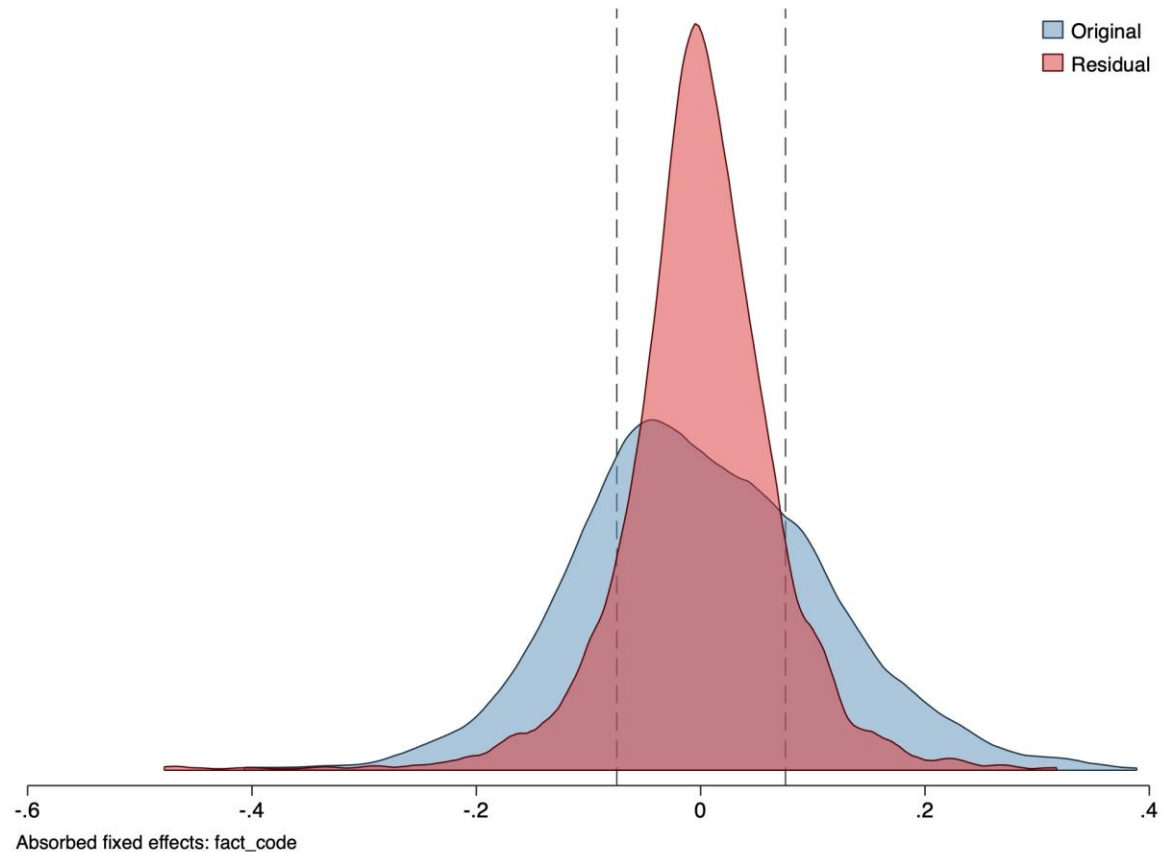


Line efficiency, $N = 3,262$



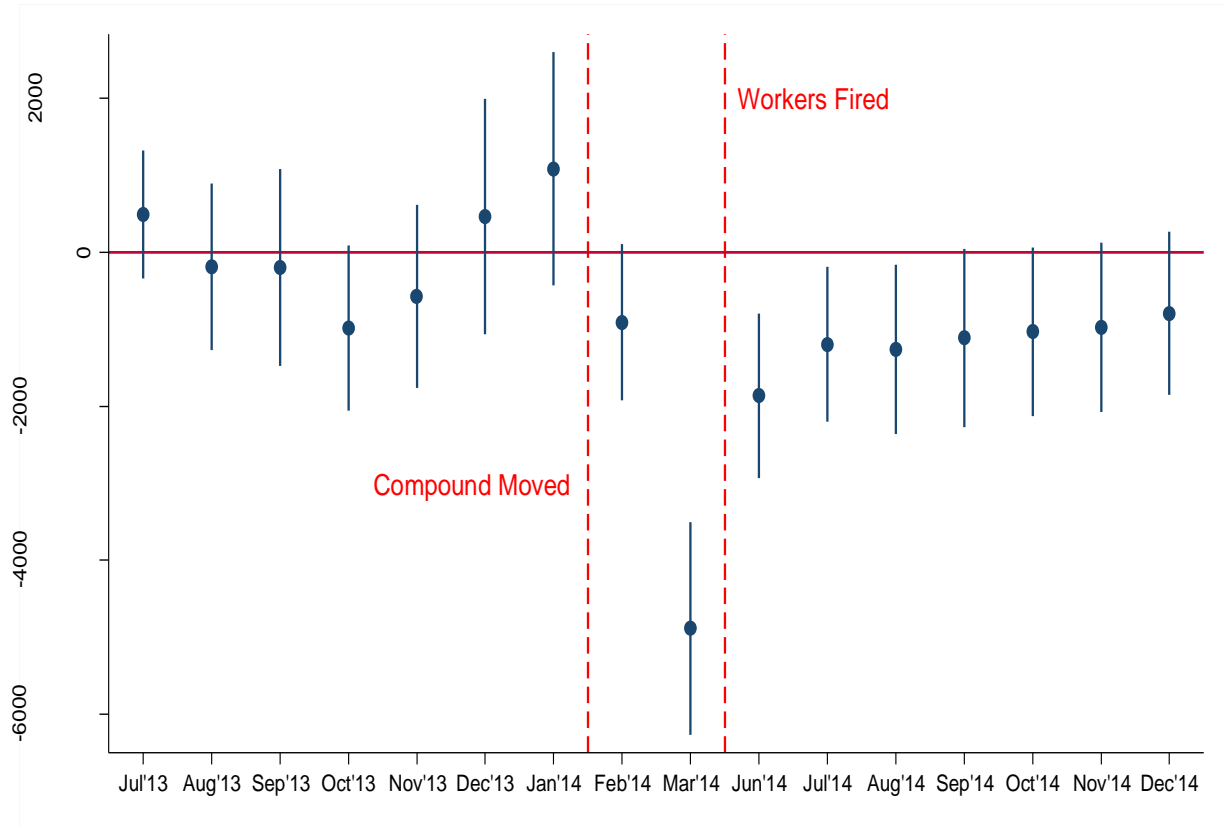
Extent of productivity differential

- Average line efficiency = 50.3%
- Without factory effects 90-10 ratio is 1.73
- With factory fixed effects 90-10 ratio is 1.35
- Suggesting an average 90th percentile line is 35% more productive than the 10th percentile line



So what? Answer #1

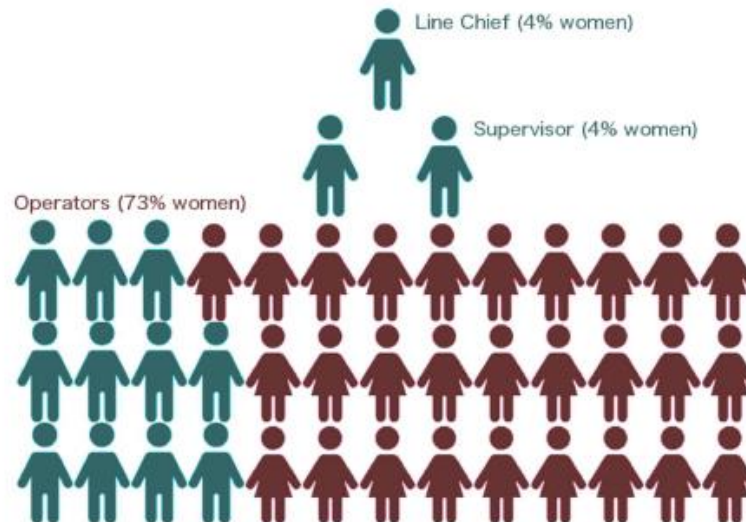
- How bad are disruptions for productivity?
- Or, do workplace “friends” matter?
- Yes and yes
- They are persistent even after six months
- The more connection a worker loses, the larger is the productivity loss



So what? Answer #2

So why so few female SVs?

- Perhaps, the marginal female supervisor is worse than the male supervisors
- OR, NOT, suggesting managerial talent is misallocated at least in the long run
- Worse or not, women are perceived as being worse in supervisory roles
- Not trying them as supervisors can contribute to persistence in such perceptions



Around 75 percent of supervisors are hired from outside the factory.

Factories are taking risks by hiring from outside and are encouraging ambitious workers to leave.

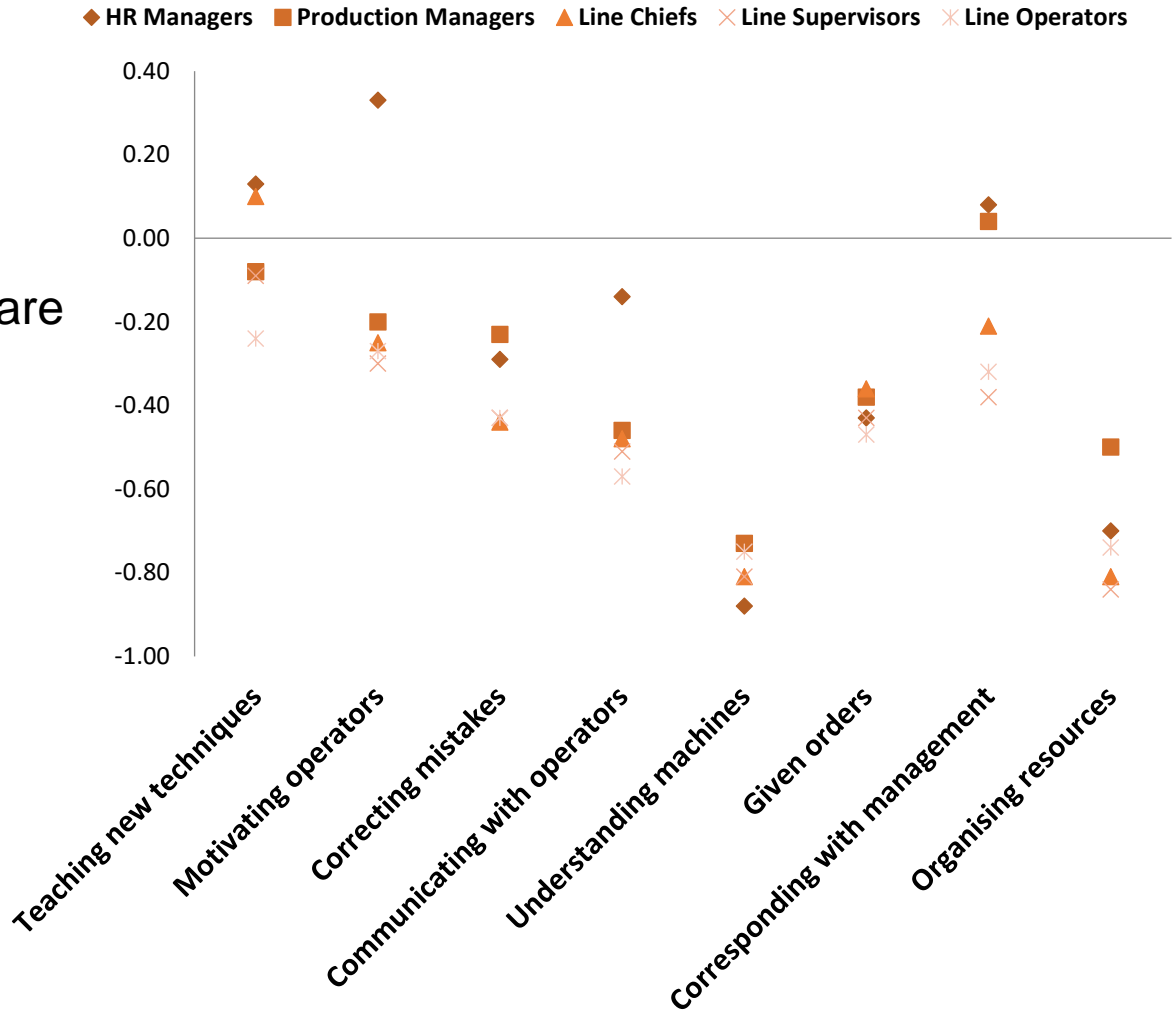


Perceived Ability by Gender in Supervisory Roles

Negative means men are perceived as better supervisors

Most people think so.

And across almost all tasks.

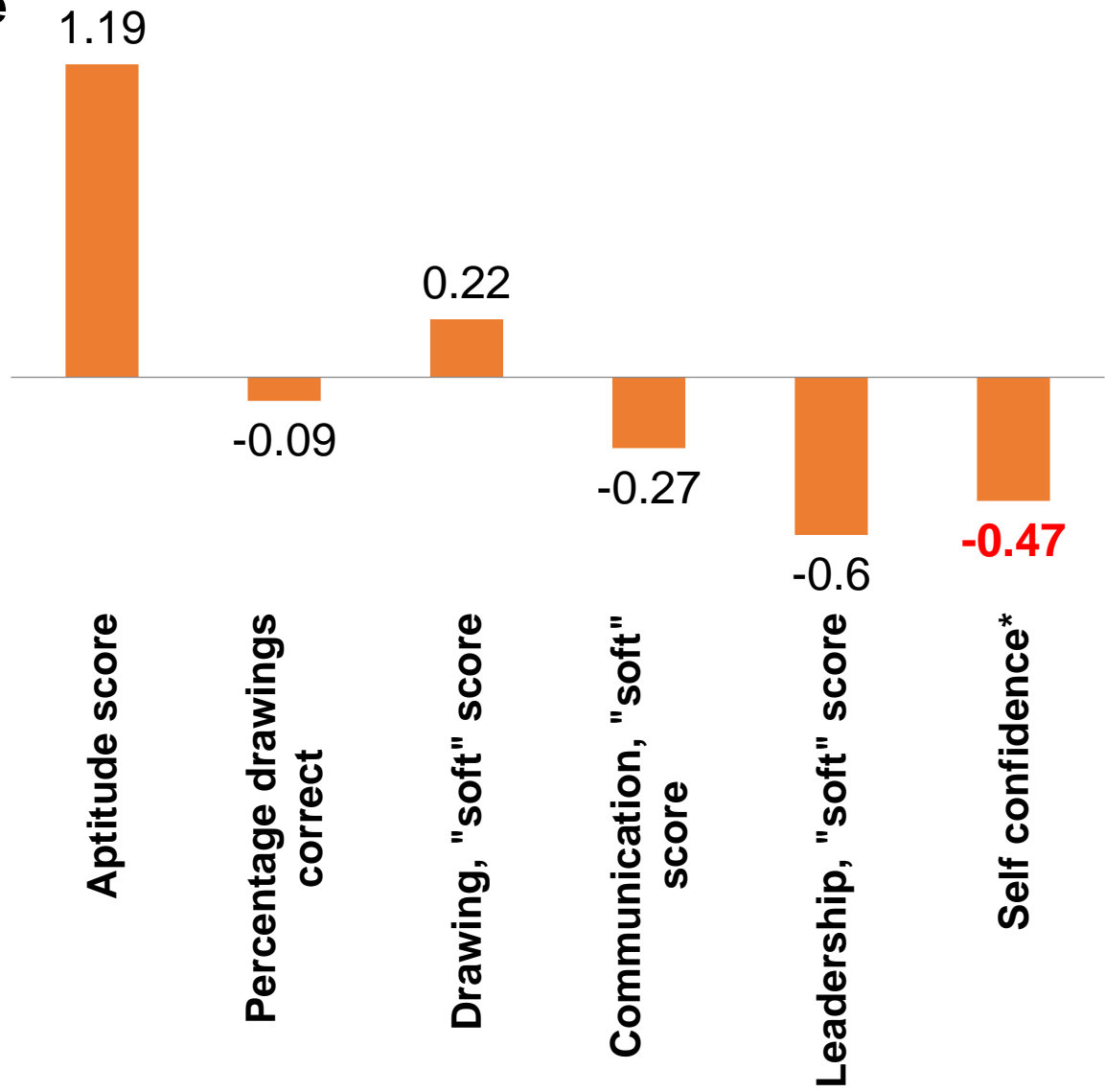




Based on extensive skill assessments

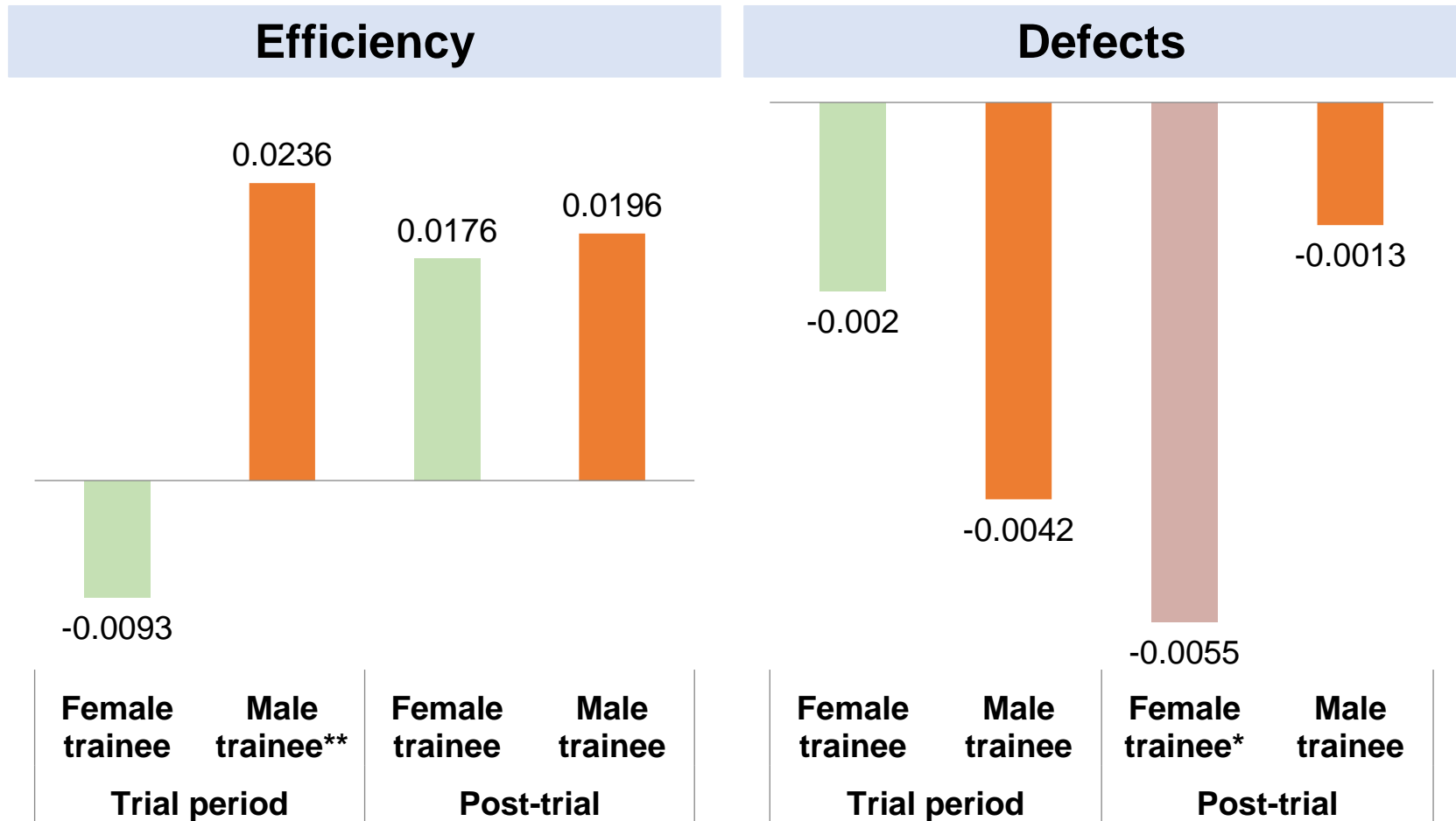
Not much statistical differences

Female trainees lack confidence (which disappears after the training)



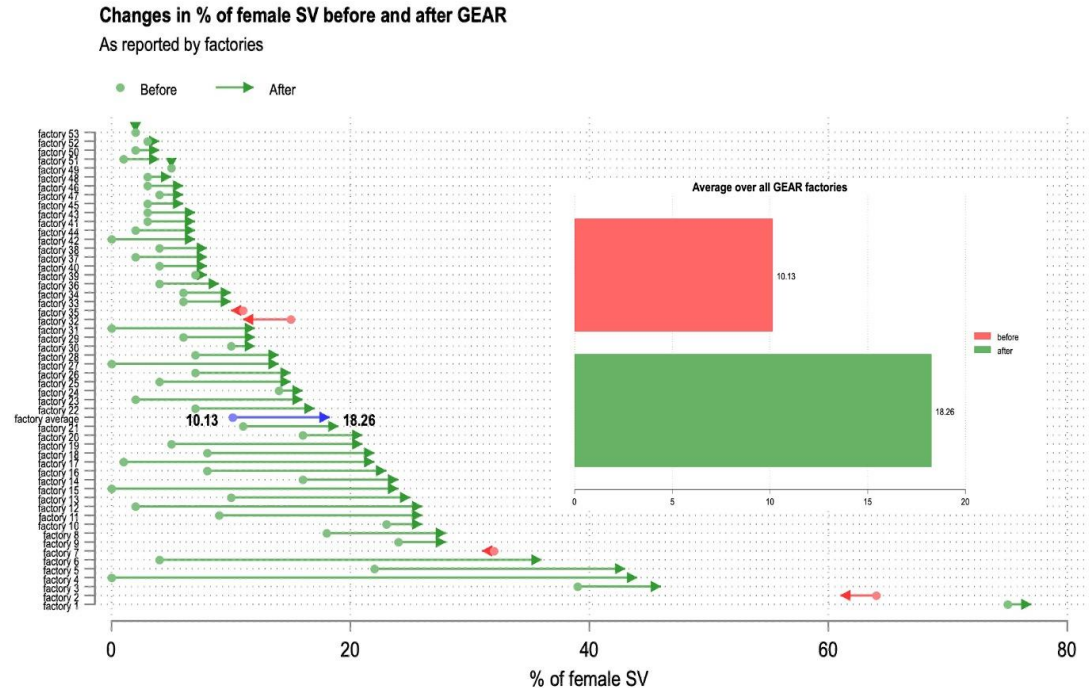


Initial gaps disappear after trial period



Research Impact?

- We shared our findings with the participant factories: a couple of them established all female lines (not unprecedented)
- IFC and ILO followed up with similar training interventions → increased female SVs from ~10% to ~18% in the participating factories
- Also, such interventions are effective for more experienced SV candidates





Takeaways and Future work

- Organization and management practices matter
- “Insider econometrics” can be very useful to understand the determinants of (within firm) productivity [Ichniowski and Shaw (2003)]
- Correcting misperceptions and beliefs can promote gender equality in leadership positions [Bursztyn, González and Yanagizawa-Drott (2020)]
- Currently, working on renewable energy technology adoption within the garment sector
 - Perhaps I can share some findings in the next ABCD!
- Thank you.