



Lecture 10: Learning by Exporting?

Williams College ECON 204:
Global Poverty and Economic Development
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Randomized Trial Questions

1. What is the main economic/development question that the paper is exploring?
2. What is the context? Where does the study take place?
3. What is the intervention being studied? Who or what is being intervened upon?
4. At what level is treatment assigned?
5. What types of data are collected, and from whom? What are the main outcome variables?
6. Is the main point of the paper to estimate the impact of the treatment, or the authors primarily interested in leveraging the experimental treatment to test a specific hypothesis?

The Industry and the Location*

Authors partnered with NGO Aid to Artisans (ATA) as they started project in Egypt

- Followed ATA protocol: Find viable Egyptian products, market products on Western markets, send orders through local intermediary

The authors and ATA identified handmade flat-weave rugs from Fowa as viable product

- Advantages: large sample of homogeneous firms using common technology
- Disadvantages: Small (1 employee) firms, handmade products, no mechanization

Many thanks to David Atkin, Amit Khandelwal, and Adam Osman for sharing their slides.

Experimental Design

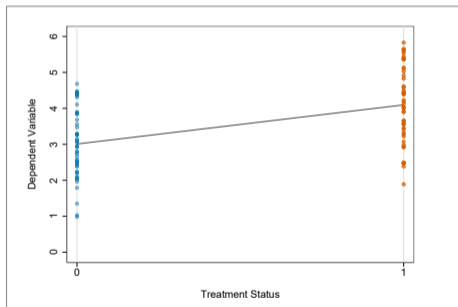
- Conducted recruitment drive for firms in Fowa in early 2011
- Found 303 firms who:
 - ▶ Worked on own account (e.g., bought own inputs)
 - ▶ Less than 5 employees
 - ▶ Never worked with intermediary Hamis Carpets
 - ▶ Made 4 different types of rugs
- Intervention:
 - ▶ Hamis Carpets offers an initial order to each treatment firm (\approx 11 weeks of work)
 - ▶ Hamis Carpets could optimally allocate future orders within treatment group
- Sample involves two rounds of recruitment, second round to \uparrow firms producing dub rugs

Main Outcomes

- Exports
- Profits
- Quantity and quality of inputs
- Productivity (rug production per hour)
- Skill

Estimating Treatment Effects

$$Y = \alpha + \beta D$$

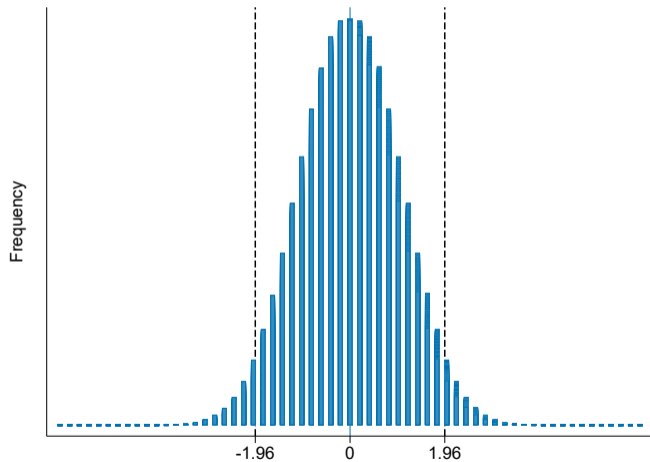


control	treatment
$D = 0$	$D = 1$
$\hat{\alpha}$	$\hat{\alpha} + \hat{\beta}$

$$\hat{\alpha} = \bar{Y}_C \text{ (control group mean)}$$

$$\hat{\beta} = \bar{Y}_T - \bar{Y}_C \text{ (difference in means)}$$

Estimated Treatment Effects “Under the Null”



Intent-to-Treat vs. Treatment-on-the-Treated

- Potential outcomes with and without treatment
 - ▶ For every observation in the **control** group, we observe Y_0
 - ▶ For every observation in the **treatment** group, we observe $Y_0 + \text{impact of treatment}$
- Not every firm (or person, etc.) assigned to treatment chooses to participate: some rug producers decide not to accept the first order for to-be-exported rugs
 - ▶ The impact of treatment on those who don't participate is (often) zero
 - ▶ Average outcome in the treatment group:

$$\bar{Y}_T = \lambda \underbrace{\bar{Y}_{\text{choose to participate}}}_{\text{average } Y_0 + \text{impact}} + (1 - \lambda) \underbrace{\bar{Y}_{\text{choose not to participate}}}_{\text{average } Y_0}$$

- ▶ Estimated (ITT) treatment effect = proportion who participate \times impact of program

Does the Intervention Increase Exports?

Outcome: Firm Knowingly Exported		
	ITT	TOT
Treatment	0.55*** (0.06)	0.76*** (0.07)
Control group mean	0.20	0.20
Observations	191	191

source: Atkin, Khandelwal, and Osman (2017)

Does the Intervention Increase Profits?

	Monthly Profits		Profits per Hour	
	ITT	TOT	ITT	TOT
Treatment	0.26*** (0.05)	0.42*** (0.08)	0.20*** (0.05)	0.32*** (0.08)
Control group mean	6.8	6.8	1.26	1.26

source: Atkin, Khandelwal, and Osman (2017)

Components of Profits

- Firm's profit function:

$$px(l, k) - wl - rk - F$$

- Change in profit could come from:
 - ▶ ↑ p per rug produced
 - ▶ ↑ the number of rugs produced, which could come from...
 - ▶ ↑ in inputs used in production
 - ▶ ↑ efficiency with which inputs are transformed into rugs

Why Does the Intervention Increase Profits?

SOURCES OF CHANGES TO FIRM PROFITS: COMPONENTS OF PROFITS

	Log output price ($\frac{LE}{m^2}$)		Log output (m^2)		Log hours worked		Number of employees		Log number of looms		Log warp thread ball (kg)	
	(1) ITT	(2) TOT	(3) ITT	(4) TOT	(5) ITT	(6) TOT	(7) ITT	(8) TOT	(9) ITT	(10) TOT	(11) ITT	(12) TOT
Treatment	0.43*** (0.10)	0.78*** (0.19)	-0.26*** (0.09)	-0.47*** (0.17)	0.05** (0.02)	0.08** (0.04)	0.01 (0.01)	0.01 (0.01)	-0.02 (0.04)	-0.04 (0.06)	0.15*** (0.05)	0.25*** (0.08)
R-squared	0.16	0.15	0.24	0.22	0.12	0.13	0.02	0.02	0.13	0.13	0.24	0.24
Control mean (in levels)	28.2	28.2	64.1	64.1	269.0	269.0	1.0	1.0	1.1	1.1	6.0	6.0
Observations	691	691	676	676	678	678	695	695	694	694	600	600

Notes. Table reports treatment effects on output prices and quantities, hours, number of employees (inclusive of owner), looms, and the size of the warp thread ball (which is a proxy for the length of the production run), all measured in logs except number of employees. The TOT regressions instrument takeup with treatment. Hours worked are calculated using average daily hours and number of days worked last month. Control group means are reported in levels. The regressions control for baseline values of the dependent variable, and include round and strata fixed effects. Standard errors are clustered by firm. Significance: *.10; **.05; ***.01.

source: Atkin, Khandelwal, and Osman (2017)

Why Does the Intervention Increase Profits?

SOURCES OF CHANGES TO FIRM PROFITS: INPUTS								
	Log weft thread price ($\frac{LE}{m^2}$)		Log warp thread price ($\frac{LE}{m^2}$)		Log weft thread quantity (g)		Log warp thread quantity (g)	
	(1) ITT	(2) TOT	(3) ITT	(4) TOT	(5) ITT	(6) TOT	(7) ITT	(8) TOT
Treatment	0.20*** (0.06)	0.33*** (0.10)	-0.04 (0.03)	-0.07 (0.06)	-0.19** (0.10)	-0.34** (0.17)	0.04 (0.11)	0.06 (0.20)
R-squared	0.22	0.24	0.27	0.27	0.23	0.22	0.10	0.11
Control mean (in levels)	12.8	12.8	18.1	18.1	110.0	110.0	17.8	17.8
Observations	564	564	685	685	677	677	686	686

Notes. Table analyzes input prices and quantities, all measured in logs. The TOT regressions instrument takeup with treatment. Control group means are reported in levels. The regressions control for baseline values of the dependent variable, and include round and strata fixed effects. Standard errors are clustered by firm. Significance: *.10; **.05; ***.01.

source: Atkin, Khandelwal, and Osman (2017)

Why Does the Intervention Increase Productivity?

IMPACT OF EXPORTING ON UNADJUSTED PRODUCTIVITY				
	Log unadjusted output per hour		Log unadjusted TFP	
	(1) ITT	(2) TOT	(3) ITT	(4) TOT
Treatment	-0.24*** (0.09)	-0.42*** (0.16)	-0.28*** (0.09)	-0.50*** (0.16)
R-squared	0.18	0.16	0.26	0.24
Control mean (in levels)	0.26	0.26	0.49	0.49
Observations	687	687	674	674

Notes. Table reports treatment effects for the two productivity measures: log unadjusted output per labor hour (in $\frac{\text{m}^2}{\text{hour}}$) and log unadjusted TFP. See text and [Appendix](#) for the methodology used to obtain unadjusted TFP. The TOT specifications instrument takeup with treatment. Control group means are reported in levels. Regressions control for baseline values of the variable, round and strata fixed effects. Standard errors are clustered by firm. Significance: * .10; ** .05; *** .01.

source: Atkin, Khandelwal, and Osman (2017)

Measuring Skill: Production of Identical Domestic Rugs

Researchers brought rug makers from both the treatment and control groups to rented workshop (“quality lab”) to produce a rug using researcher-supplied inputs on a common loom

- Standardized domestic-market rug design familiar to all the rug producers
- Researchers provided producers with precise specifications and all inputs
- Rugs scored along 9 quality metrics (e.g. corners, design accuracy), by master artisan (with anonymized firm IDs) and a Professor of Handicraft Science at Domietta University
- Rug producers in treatment group scored significantly higher on all 9 quality metrics plus size accuracy, but produced the rug in slightly less (though not significantly less) time

Buyer → Intermediary Communication About Quality

From: [REDACTED]
Sent: Tuesday, June 11, 2013
To: <hamis_carpets [REDACTED]>
Subject: next complain order 1590

Dear Mr. Magdy,

Wrapping the kelims tightly and strongly leaves waving marks on them, so please roll kelims and wrap them softly to avoid waviness.

Mit freundlichem Gruß / With best regards
Anton Sulzberger



source: Atkin, Khandelwal, and Osman (2017)

Buyer → Intermediary Communication About Quality

From: [REDACTED]
Sent: Wednesday, August 14, 2013
To: <hamis_carpets [REDACTED]>
Subject: complain to order 1418

Dear Mr. Magdy,
we have a problem with our client [REDACTED]. As you remember, this client asked for two carpets with fringes in the colour uni 2 and 3.

Now after one and a half year using the carpets, the **fringes crumble away**, as you see on the pictures.
They will have two new pieces and give the whole problem to an lawyer.
What to do?



source: Atkin, Khandelwal, and Osman (2017)

Learning by Exporting: Takeaways

- Export opportunities increase exports, firm profits, rug quality
- Unadjusted productivity declines: treated firms produce fewer higher quality rugs
 - ▶ Higher quality rugs command higher prices (in foreign markets)
- Exporters receive feedback on low-quality aspects of rugs delivered
- The learn (?) to produce higher quality rugs without taking more time to do so
 - ▶ Indicates improvements in efficiency / total factor productivity