EC9C0 Topics in Development Economics

Week 2: Firms
Lecture 4

Stefano Caria

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Announcement

On Thursday next week, we will work together on writing a referee report for Vyborny et al. (2024) Why don't jobseekers search more?.

Plan

- Basic descriptives on firms in low and middle income countries (LMIC)
- Returns to capital
- Returns to labor

Roadmap

Returns to labor

The selection of talent

The allocation of talent within the firm

Conclusion

De Mel, McKenzie, Woodruff (2019)

An RCT to measure marginal returns to labor among small firms

- 1533 firms in urban Sri Lanka.
  - 81 percent do not have paid or unpaid workers at baseline.
- Offered a monthly wage subsidy, for 8 months, if firm hired an additional employee.
  - Subsidy is about $1/2$ average unskilled worker earnings.
  - 21 visit check-up visits per firm
- Wage subsidy cross-randomized with:
  - matched savings account
  - training.

A simple framework

In a simple, canonical model:

$$f'(L) = w \tag{1}$$

- In the absence of frictions, hiring should increase when wages subsidised, and shortly fall thereafter.
- If there is learning or binding one-off hiring costs, impact on hiring should be permanent.
- If hiring costs are persistent, impact on hiring should decline gradually over time.

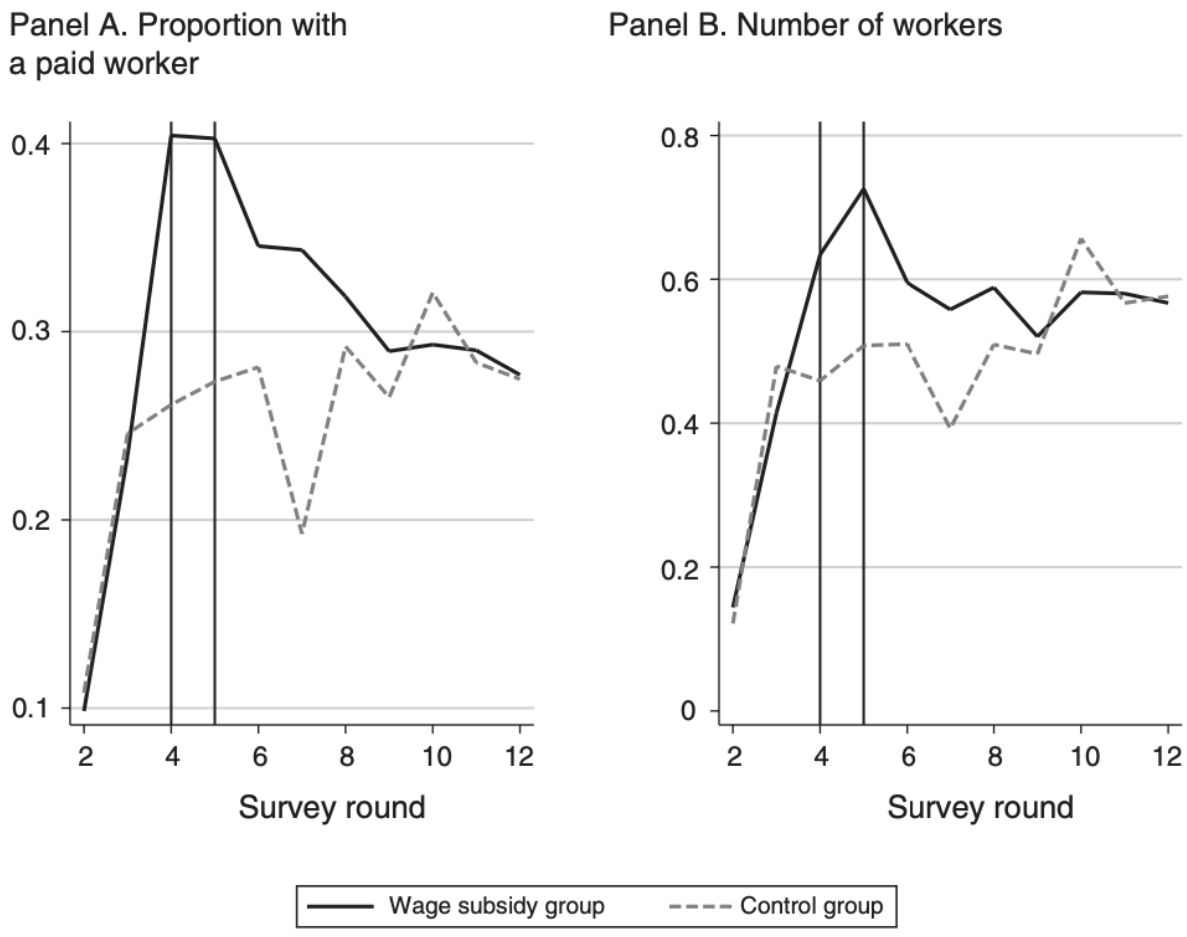

FIGURE 2. IMPACT ON EMPLOYMENT

TABLE 6—IMPACT ON PROFITS AND SALES

	Sample size	Before subsidy	During subsidy	After subsidy			*p*-value equality	*p*-value all zero
				Year 1	Year 2	Year 3+		
Panel A. Unconditional profits (truncated at ninety-ninth percentile)								
Assigned to treatment	4,692	873	6,786	1,906	2,110	1,431	0.727	0.478
		(1,479)	(1,235)	(1,150)	(1,445)	(1,175)		
Control mean		14,572	16,603	16,492	18,534	17,808		

TABLE 4—IMPACT ON FIRM SURVIVAL

	Sample size	Before subsidy	During subsidy	After subsidy			p-value equality	p-value all zero
				Year 1	Year 2	Year 3+		
Panel A. Self-employed in survey round								
Assigned to treatment	5,055	−0.006	−0.009	0.058	0.082	0.054	0.001	0.002
		(0.023)	(0.018)	(0.021)	(0.025)	(0.027)		
Control mean		0.927	0.958	0.885	0.850	0.831		

$$(6) \qquad \textit{Profits}_{i,t} = \alpha + \beta_1 \times L_{i,t} + \sum_{s=3}^{12} \delta_s 1\big(t = s\big) + \theta' X_i + \varepsilon_{i,t},$$

TABLE 7—RETURN ON LABOR

	Level of profits				log of profits		
	Associations in control group		Treatment IV estimates		Associations in control group		
	Cross section	Panel data	Unconditional profits	Conditional profits	Cross section	Panel data	IV treatment effect
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Number of paid workers	6,214	4,903	2,586	3,270	0.198	0.127	0.131
	(748)	(696)	(6,358)	(5,974)	(0.021)	(0.023)	(0.295)
Sample size	2,670	2,670	959	913	2,320	2,320	892

Notes: Robust standard errors are in parentheses, clustered at the firm level. Regressions control for time fixed effects, randomization strata, and controls used in re-randomization. Columns 1, 2, 5, and 6 use control group only. Columns 3, 4, and 7 use wage subsidy only and control groups. The IV estimates instrument the number of paid workers with assignment to the wage subsidy treatment.

Appendix Table 3.3: Treatment Effects on Having any Paid Worker by Treatment Arm

	(1a) Wage Subsidy Only Treatment Effect	(1b) Wage Subsidy + Savings Treatment Effect	(1c) Wage Subsidy + Training Treatment Effect	(1d) Savings Only Treatment Effect	(1e) Training Only Treatment Effect	(1f) Savings + Training Treatment Effect		(2) Any Wage Subsidy Effect
Before Subsidy	-0.020	0.027	0.035	0.025	0.023	-0.007		0.015
	(0.036)	(0.036)	(0.037)	(0.048)	(0.045)	(0.044)		(0.030)
During Subsidy	0.129***	0.184***	0.156***	0.018	0.039	0.040		0.158***
	(0.035)	(0.033)	(0.034)	(0.044)	(0.039)	(0.040)		(0.027)
Year 1 After	0.102***	0.152***	0.113***	0.070	0.073*	0.099**		0.124***
	(0.034)	(0.034)	(0.033)	(0.044)	(0.040)	(0.041)		(0.026)
Year 2 After	0.018	0.056	0.089***	0.015	-0.026	0.026		0.057**
	(0.035)	(0.035)	(0.034)	(0.045)	(0.038)	(0.040)		(0.028)
Year 3-4 After	-0.012	0.055*	0.050	-0.016	-0.003	0.003		0.034
	(0.032)	(0.033)	(0.032)	(0.043)	(0.037)	(0.039)		(0.026)
Pooled Impact After	0.029	0.083***	0.079***	0.017	0.012	0.037		0.066***
	(0.029)	(0.030)	(0.029)	(0.038)	(0.034)	(0.035)		(0.024)
Sample Size							13887	10,259
P-value: all three wage treatments equal during subsidy period							0.334	
P-value: wage only treatment = savings only treatment during subsidy period							0.018	
P-value: wage+savings=wage only + savings only, wage+training = wage only + training only, during subsidy							0.714	
P-value: all three wage treatments equal one another by round after intervention							0.050	
P-value: wage only treatment = savings only treatment by round after intervention							0.871	
P-value: wage+savings=wage only + savings only, wage+training = wage only + training only, by round after							0.003	
P-value: pooled impact after equal for all three wage treatments							0.152	
P-value: pooled impact after for wage only treatment = savings only treatment							0.760	
P-value: pooled impact after of wage+saving = wage only + savings only, wage+training=wage only + training only							0.637	

Notes:

Robust standard errors in parentheses, clustered at the firm level. *, **, and *** denote significance at the 10, 5, and 1 percent levels.

Columns 1a-1f are all from the same regression, which uses the full sample of 14,227 observations and estimates separate treatment impacts by treatment group and time period.

The Pooled impact after row shows the impact of pooling the 1 Year, 2 Years, and 3-4 Year after results.

Column 2 shows impacts from a separate regression which pools together the treatments in 1a, 1b, and 1c, and drops the other treatments.

All regressions control for randomization strata, variables used for re-randomization, and survey round dummies.

A simple framework

- Return to labor in the absence of complementary capital and training seems to be limited
  - See also Hensel, Tekleselassie, Witte 2023
- Results are more nuanced after boosting capital and training
- But why would hiring be so difficult?

Roadmap

Returns to labor

The selection of talent

The allocation of talent within the firm

Conclusion

Abebe, Caria, Ortiz-Ospina (2021)

An RCT to study the selection of talent

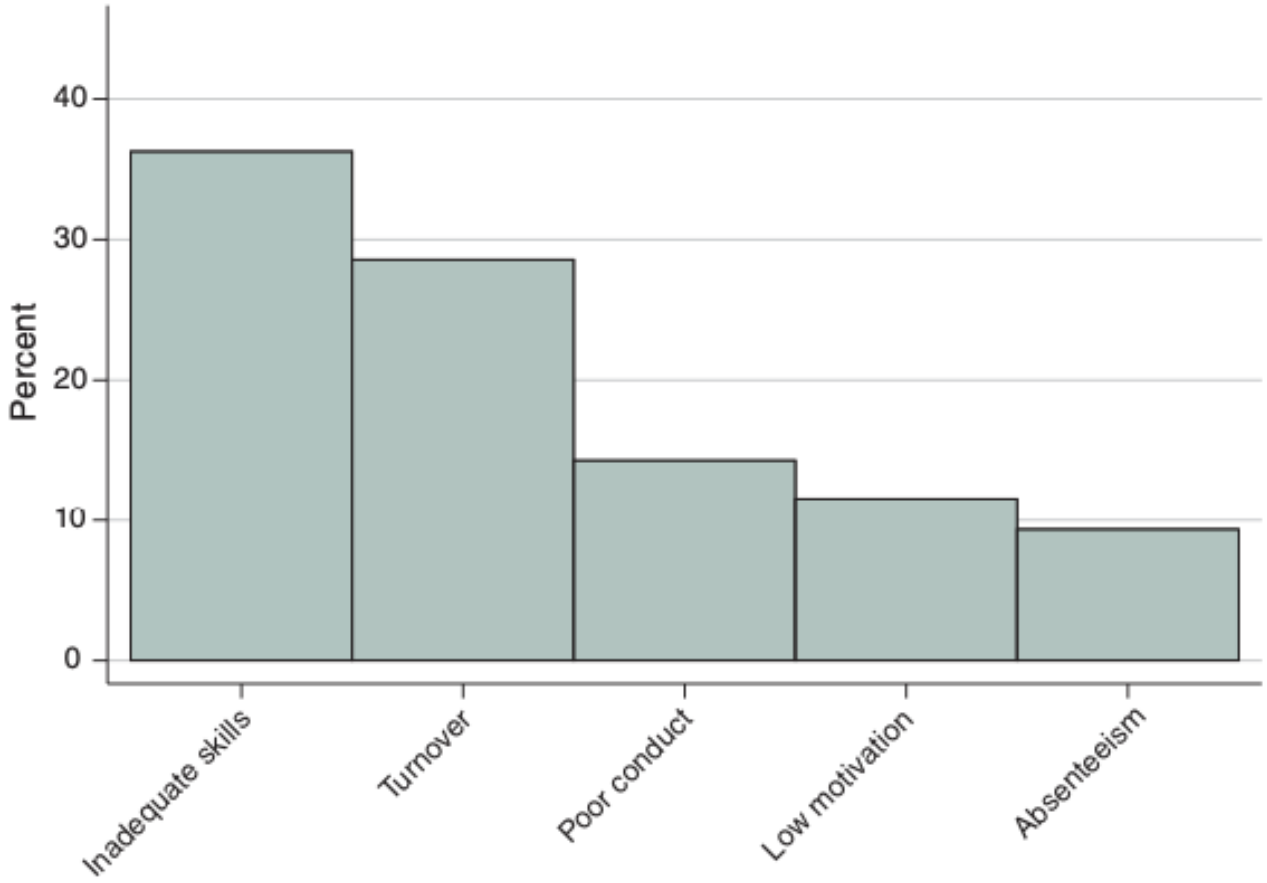

FIGURE 1. MOST IMPORTANT HR PROBLEM

Notes: This figure reports data from our survey of firms hiring clerical workers. We report the distribution of managers' responses to the question "What is the most important HR problem faced by your firm?" Sample used: all managers.

A simple model of selection

- Jobseekers differ in terms of:
  - ability t,
  - application costs c,
  - value of the job b.
- Job is offered if $t > a$.
- Jobseeker is either uncertain about a (noisy selection: $a \sim N(\mu_a, \sigma_a)$) or t (noisy ability).
- Assume b is discrete, and for each value of b, t and c are jointly normally distributed, with correlation ρ

- Noisy selection: for each b type, jobseeker applies to the job whenever $\Phi\left((t - \mu_a)/\sigma_a\right) > c/b$

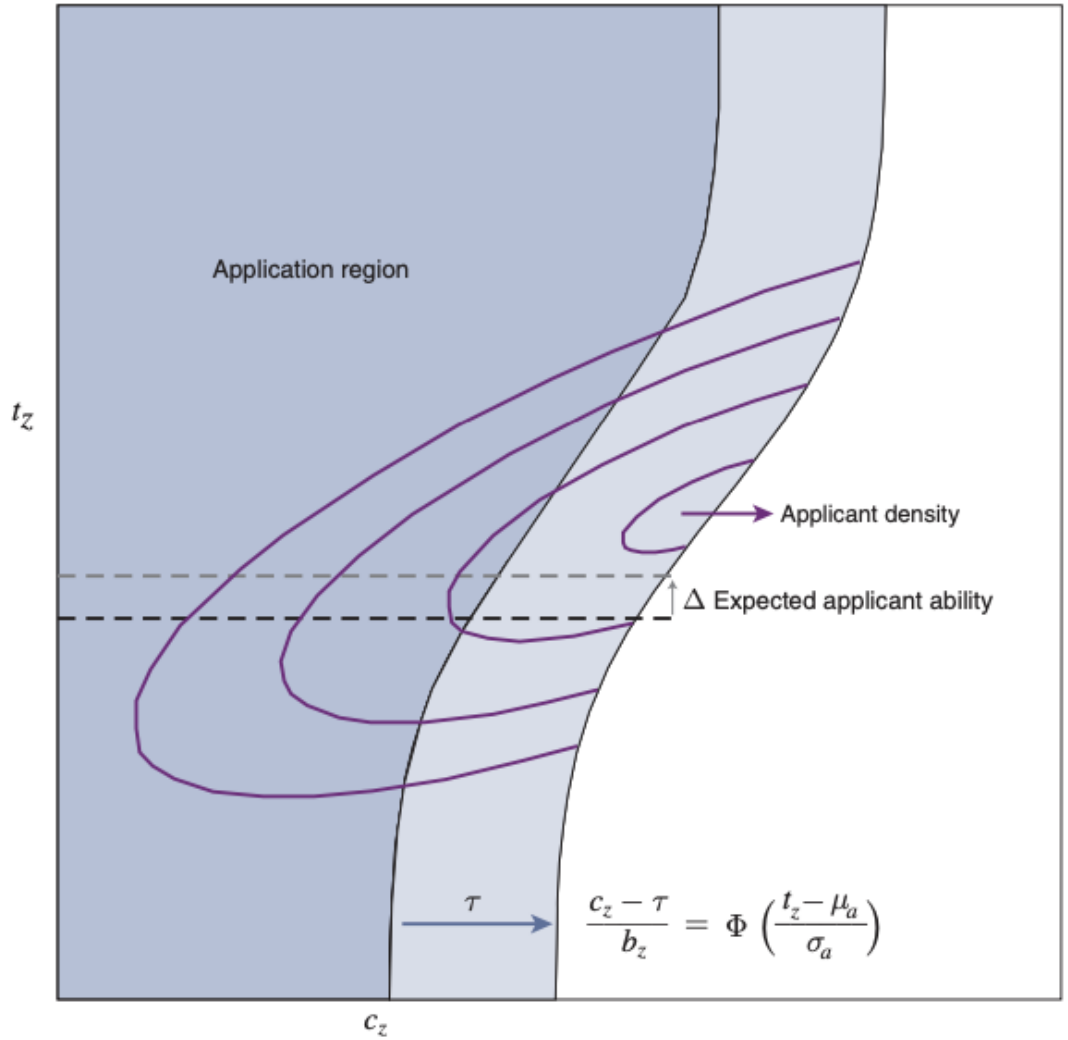

FIGURE 4. ILLUSTRATION OF THE EFFECT OF AN APPLICATION INCENTIVE (NOISY-SELECTION CASE, $\rho_z > 0$)

Why would $\rho > 0$

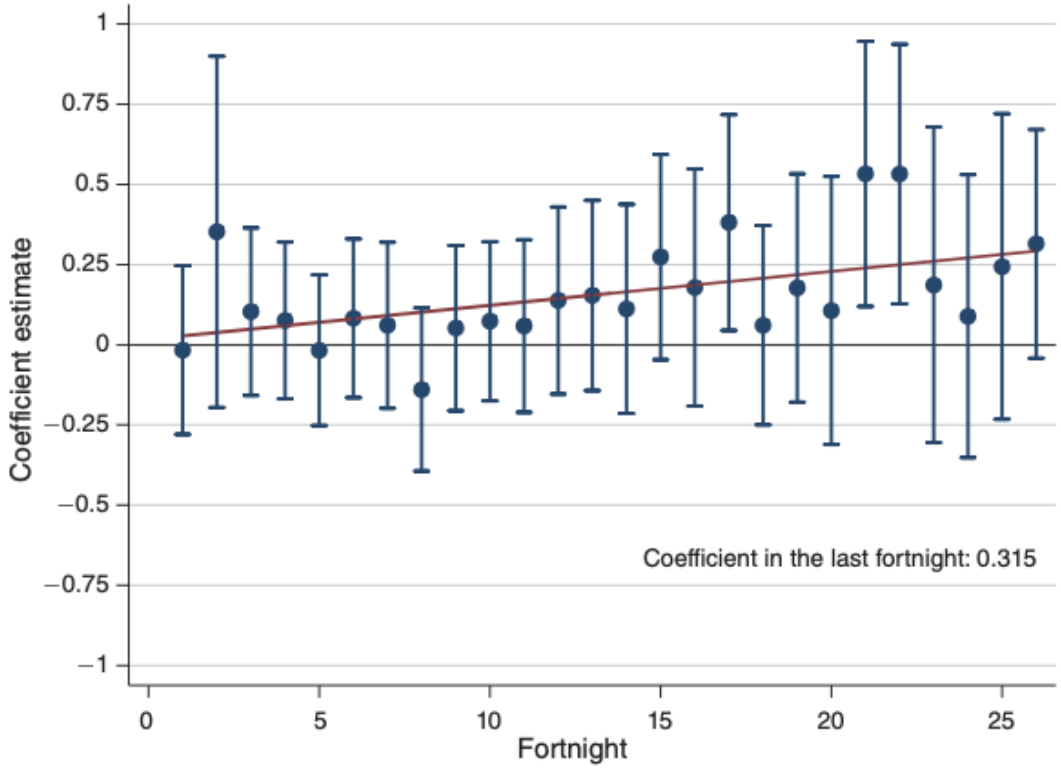

FIGURE 2. LOW SAVINGS AND RAVEN TEST SCORE AMONG JOBSEEKERS BY FORTNIGHT

Empirical evidence from an RCT

- A real employer posts vacancy ads for clerical jobs.
- When potential applicants call to inquire about the position, we randomize:
  - Application subsidy
  - Higher wage offer

Impacts on applications

TABLE 2—APPLICATION RATES

Incentive	0.115
	(0.018)
High wage	0.186
	(0.017)
Control mean	0.412
Incentive = wage (p)	0.000
Observations	4,689

Notes: OLS regression. The dependent variable is a dummy capturing whether the respondent has applied to the experiment's job. The second to last row reports the p-value of a test of the null hypothesis that the two treatments have the same effect. Robust standard errors reported in parentheses. Sample used: baseline sample.

Impacts on applicant ability

TABLE 3—COGNITIVE ABILITY

		Percentile				
	Mean	90th	75th	50th	25th	10th
	(1)	(2)	(3)	(4)	(5)	(6)
Incentive	0.248	0.229	0.229	0.170	0.412	0.079
	(0.112)	(0.110)	(0.117)	(0.133)	(0.173)	(0.250)
	[0.081]	[0.115]	[0.148]	[0.607]	[0.053]	[1.000]
High wage	0.194	0.202	0.227	0.075	0.280	0.155
	(0.110)	(0.108)	(0.112)	(0.131)	(0.165)	(0.227)
	[0.225]	[0.182]	[0.130]	[0.852]	[0.271]	[0.743]
Control value	−0.0000	2.312	1.477	0.356	−1.238	−2.697
Incentive = wage (p)	0.574	0.795	0.983	0.448	0.371	0.741
Observations	2,386	2,386	2,386	2,386	2,386	2,386

Notes: Estimates from OLS (column 1) and quantile (columns 2–6) regressions. The dependent variable is the index of cognitive ability. The second-to-last row reports the p-value of a test of the null hypothesis that the treatments have the same effect. Robust standard errors are reported in parentheses. Sharpened q-values (Benjamini, Krieger, and Yekutieli 2006) are reported in brackets. q-values control the false discovery rate for the multiple tests of the same hypothesis for different indices of ability. A Wilcoxon rank-sum test rejects the equality of the distribution of cognitive ability in the control and incentive groups ($p = 0.038$) and marginally fails to reject the equality of the distribution of cognitive ability in the control and wage groups ($p = 0.107$). Sample used: all applicants.

- Results show that jobseeker search frictions change the selection problem of the firm.
- When search frictions are high, there may be a case for employers to subsidise applications.
- Suppose we could remove all hiring frictions.
- Would this be sufficient for firms to grow?

- Results show that jobseeker search frictions change the selection problem of the firm.
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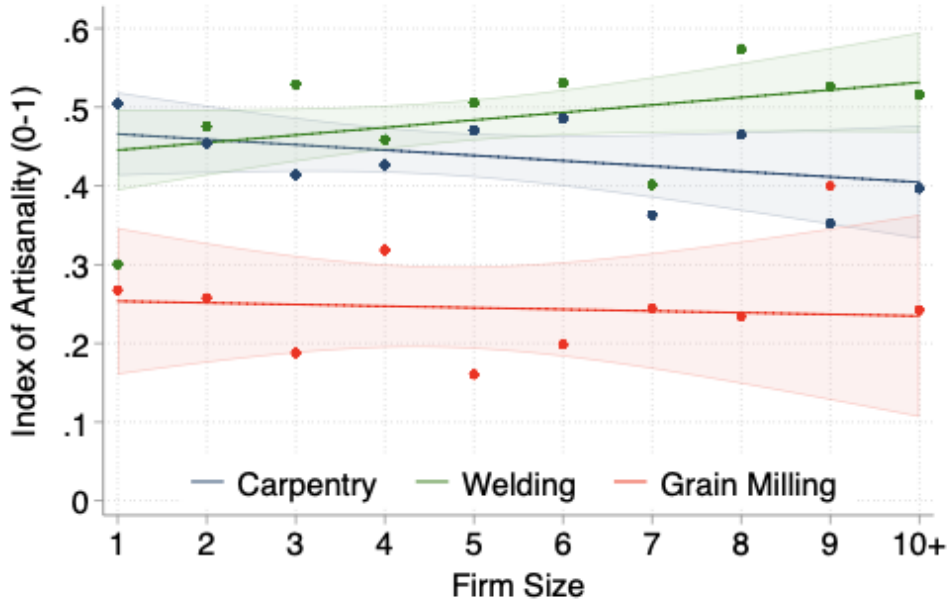
Bassi et al. (2023)

An observational study of firms in Uganda

- 1,000 firms sampled across Uganda, in 3 sectors: carpentry, welding, grain milling.
- Median firm size is about 5-6 workers.
- Collect detailed data on artesanality and time use.

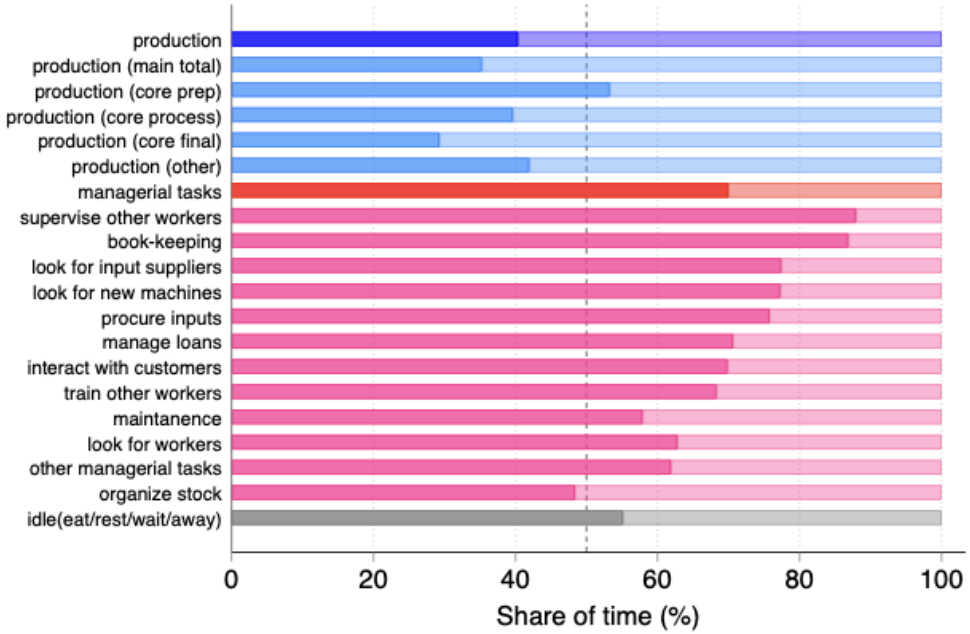
Artesanality is widespread in carpentry and wielding

Figure 2: Relationship between Artisanal Production and Firm Size



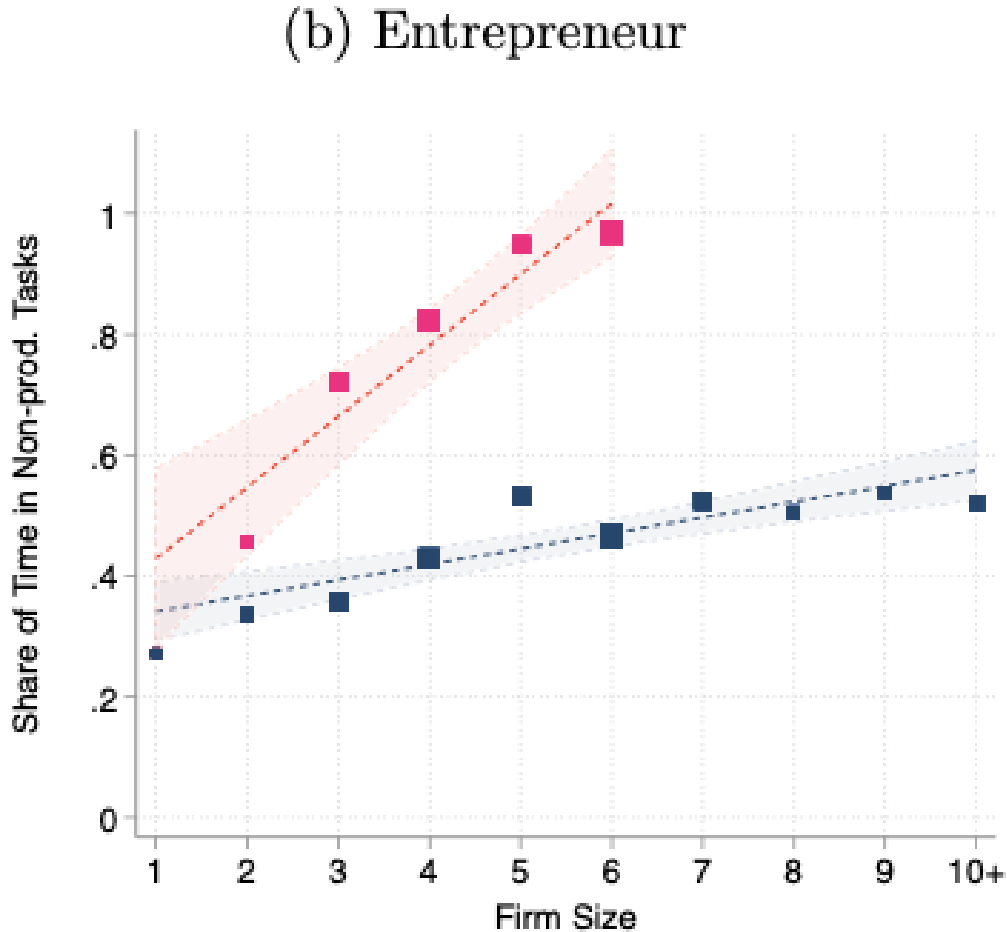
Specialization is limited...

Figure 4: Time Allocation Between Production and Non-production Tasks



Notes: The figure compares the time spent on each task by the entrepreneur (dark bars) and the average employee (light bars). Blue bars: production tasks. Red bars: Non-production tasks. Grey bars: Idle time. "Production (core prep)", "Production (core process)" an "Production (core final)" refer to the following production stages of the core product: "Preparation", "Processing" and "Finalizing". See Figure 2 for more details on which production steps map to these production stages. Sample: all surveyed firms in carpentry and welding sectors. Time use reported by interviewed entrepreneurs and employees. All figures are weighted by sampling weights within each sector and the relative number of surveyed firms per sector.

... even as firms grow larger



Model

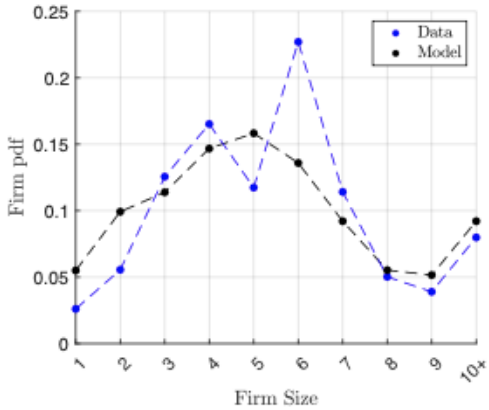
- Individuals get an ability draw.
- and choose whether to be entrepreneurs or workers.
- Each worker is assigned to a production line, with a share D of complex tasks.
- Task can be traded at a cost (the cost of specialization κ_0).
- Productivity driven by (i) entrepreneur ability, and (ii) ability of complex task performers.
- Convex hiring costs (χ_0).

- Entrepreneur chooses firm size and task assignment.

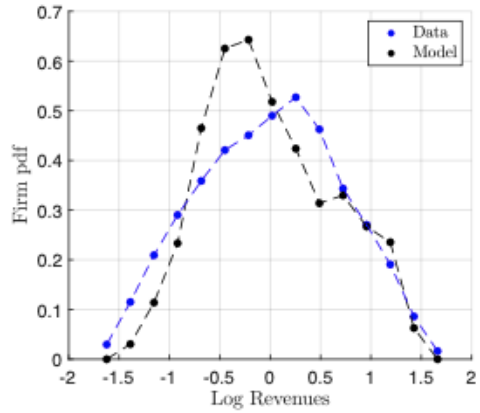
Model estimation

Figure 8: Model Fit for Firm Heterogeneity and Time Allocation

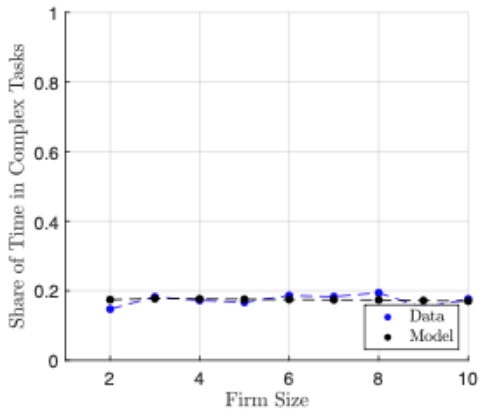
(a) Firm Sizes



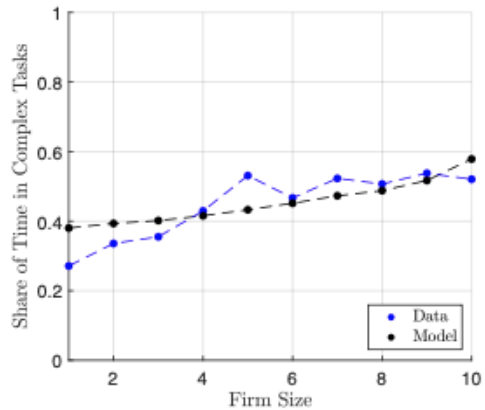
(b) Firm Revenues



(c) Employees' Complex Tasks



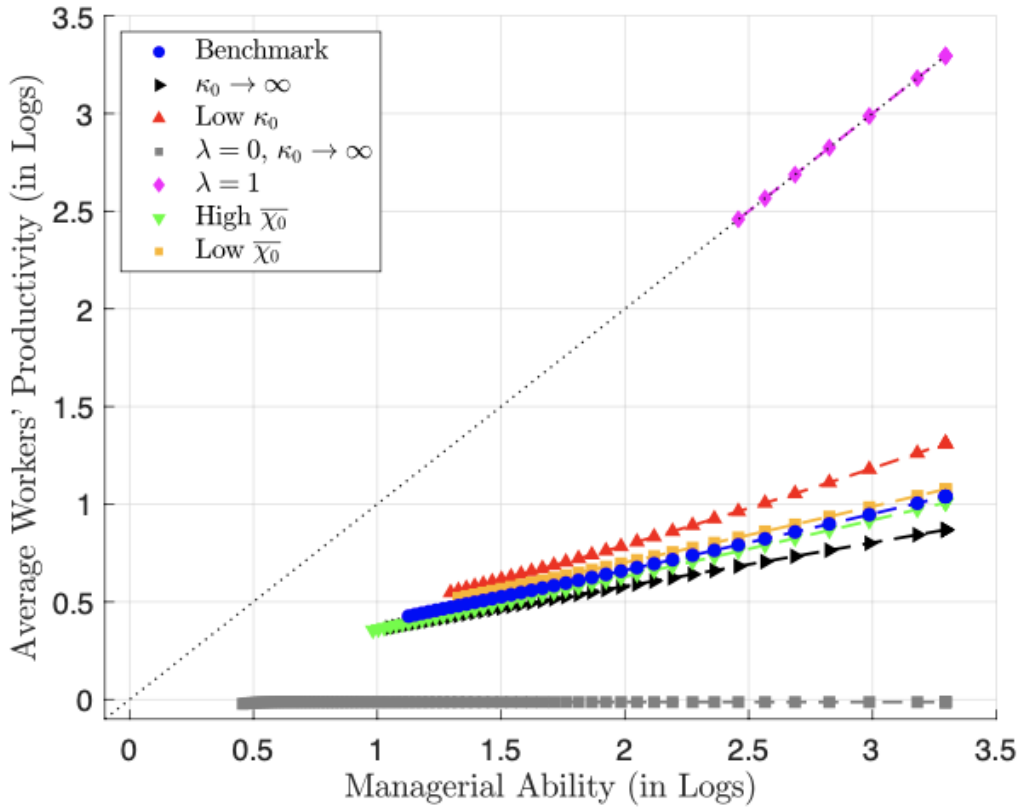
(d) Entrepreneurs' Complex Tasks



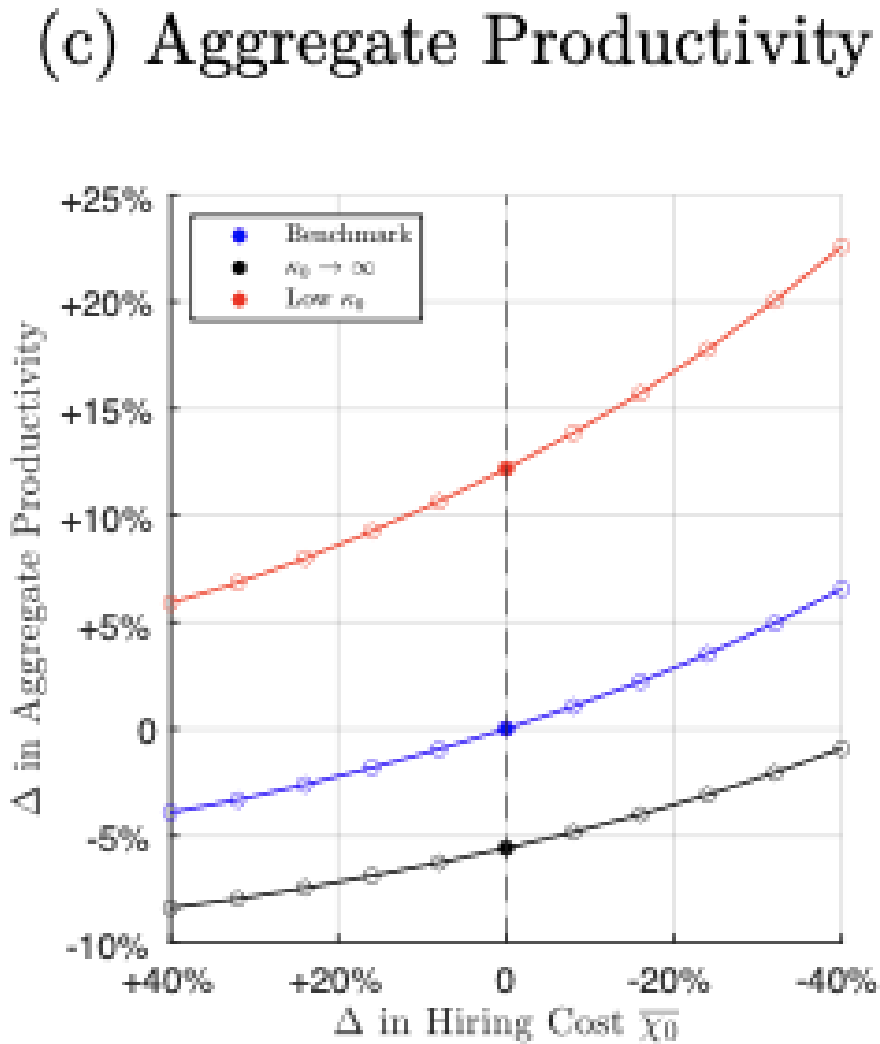
Notes: The figure compares empirical moments, in blue, with their model-generated counterparts.

Unbundling costs κ_0 dampen productivity

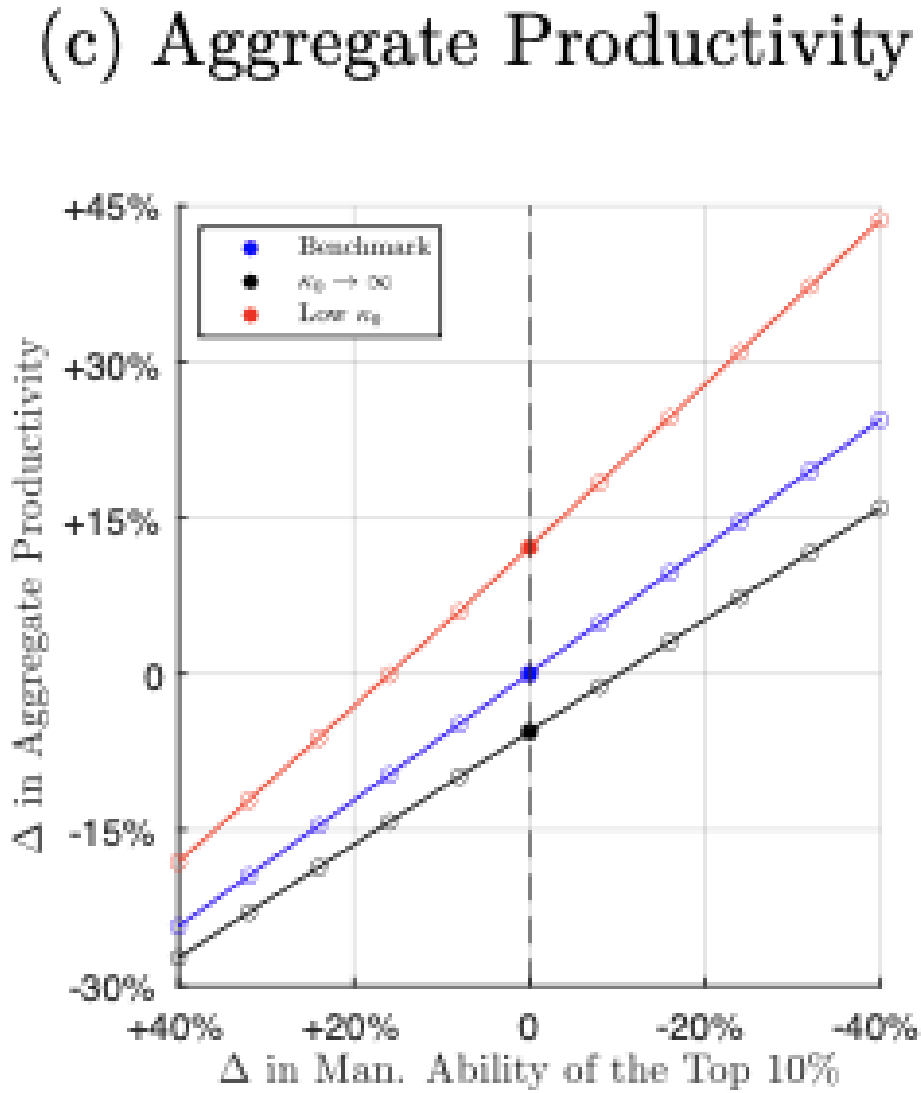
(a) Workers' Productivity



κ_0 dampens impact of lowering hiring costs χ_0



κ_0 dampens impact of boosting managerial ability



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Conclusion

- Features of capital, insurance, labor, and product markets may hinder the performance of firms in LIMCs.

$\rightarrow$ We need to find effective ways to address these frictions and unlock the full potential of firms in LIMCs!