

# 14.771: Labor Markets

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# Poverty and the elasticity of labor supply

Jayachandran (2006): “Selling Labor Low: Wage Responses to Productivity Shocks in Developing Countries”

- Jayachandran’s idea:
  - The rural wage will be more inelastic if workers are unable to smooth shocks, because they really need the income to survive. In particular it will be more inelastic if there is:
    - Less access to credit
    - Lower ability to migrate
  - Inelastic wages imply larger impacts of productivity shocks on rural welfare.
  - They also imply a pecuniary externality – it is not just your own ability to smooth that affects your ability to cope with shocks, but the ability of everyone else around to smooth also affects your welfare.

## Empirical idea

- Empirical goal: estimate labor supply elasticity
- Therefore we need an instrument for labor demand
- Jayachandran uses rainfall shocks as instrument for labor demand:
  - *Rainshock* = 1 if above 80th percentile of rain, 0 if between 20th and 80th, and -1 if below 20th percentile
- Estimating equation:

$$w_{jt} = \beta_1 A_{jt} + \beta_2 S_{jt} + \beta_3 S_{jt} \times A_{jt} + \beta_4 X_{jt} + \beta_5 X_{jt} \times A_{jt} + \delta_t + \alpha_j + \varepsilon_{jt}$$

where key coefficients of interest are  $\beta_3$

- Instruments for  $A_{jt}$ ,  $S_{jt} \times A_{jt}$ ,  $X_{jt} \times A_{jt}$  with  $Rainshock_{jt}$ ,  $S_{jt} \times Rainshock_{jt}$ ,  $X_{jt} \times Rainshock_{jt}$
- Note: important to include *interactions*  $X_{jt} \times A_{jt}$ , not just  $X_{jt}$ , for controls  $X_{jt}$  (e.g. percent agricultural). Why?

# First stage

TABLE 2  
RELATIONSHIP BETWEEN AGRICULTURAL WAGE AND CROP YIELD, INSTRUMENTED WITH  
RAINFALL

	DEPENDENT VARIABLE		
	Log Crop Yield: OLS (1st Stage) (1)	Log Agricultural Wage: OLS (2)	Log Agricultural Wage: Instrumental Variables <sup>a</sup> (3)
RainShock	.070*** (.007)		
RainShock × %Agrarian	.003 (.005)		
Log crop yield		.035*** (.012)	.167** (.084)
Log crop yield × %Agrarian			-.009 (.039)
Observations	8,222	8,222	8,222
District and year fixed effects?	Yes	Yes	Yes

# Results

TABLE 3  
 BANKING AND THE ELASTICITY OF THE WAGE  
 Dependent Variable: Log Agricultural Wage, 1956–87

	MEASURE OF BANKING		
	Bank Deposits per Capita (1)	Bank Credit per Capita (2)	Bank Branches per Capita (3)
Log crop yield	.162** (.083)	.158* (.083)	.138* (.082)
Banking			-.049** (.021)
Log crop yield × Banking	-.091** (.036)	-.075* (.044)	-.033* (.019)
Observations	7,678	7,614	8,080
District and year fixed effects?	Yes	Yes	Yes

# Results

TABLE 4  
ACCESS TO NEIGHBORING AREAS AND THE ELASTICITY OF THE WAGE  
Dependent Variable: Log Agricultural Wage, 1956–87

	MEASURE OF ACCESS TO NEIGHBORING AREAS			
	Road Density (km/km <sup>2</sup> ) (1)	Bus Service (% of Villages) (2)	Railway (% of Villages) (3)	Closeness to City (km <sup>-1</sup> ) (4)
Log crop yield	.133*	.147*	.162**	.171**
Access	(.080)	(.076)	(.082)	(.084)
Log crop yield × Access	-.111 (.083)	-.095* (.046)	-.098* (.051)	-.050 (.039)
Observations	7,965	7,838	7,838	8,222
District and year fixed effects?	Yes	Yes	Yes	Yes

# Results

TABLE 7  
 POVERTY, LAND INEQUALITY, AND THE ELASTICITY OF THE WAGE  
 Dependent Variable: Log Agricultural Wage, 1956–87

	DISTRICT TRAIT			
	Poverty		Land Inequality	
	Average Expenditure (1)	Poverty Head Count (2)	%Landless (3)	Gini Coefficient (4)
Log crop yield	.183** (.090)	.181** (.091)	.121 (.084)	.186** (.091)
District trait			-.059** (.026)	
Log crop yield × District trait	-.034 (.028)	-.002 (.045)	-.157*** (.056)	-.005 (.048)
Observations	7,934	7,934	8,222	7,711
District and year fixed effects?	Yes	Yes	Yes	Yes

# Poverty and Productivity

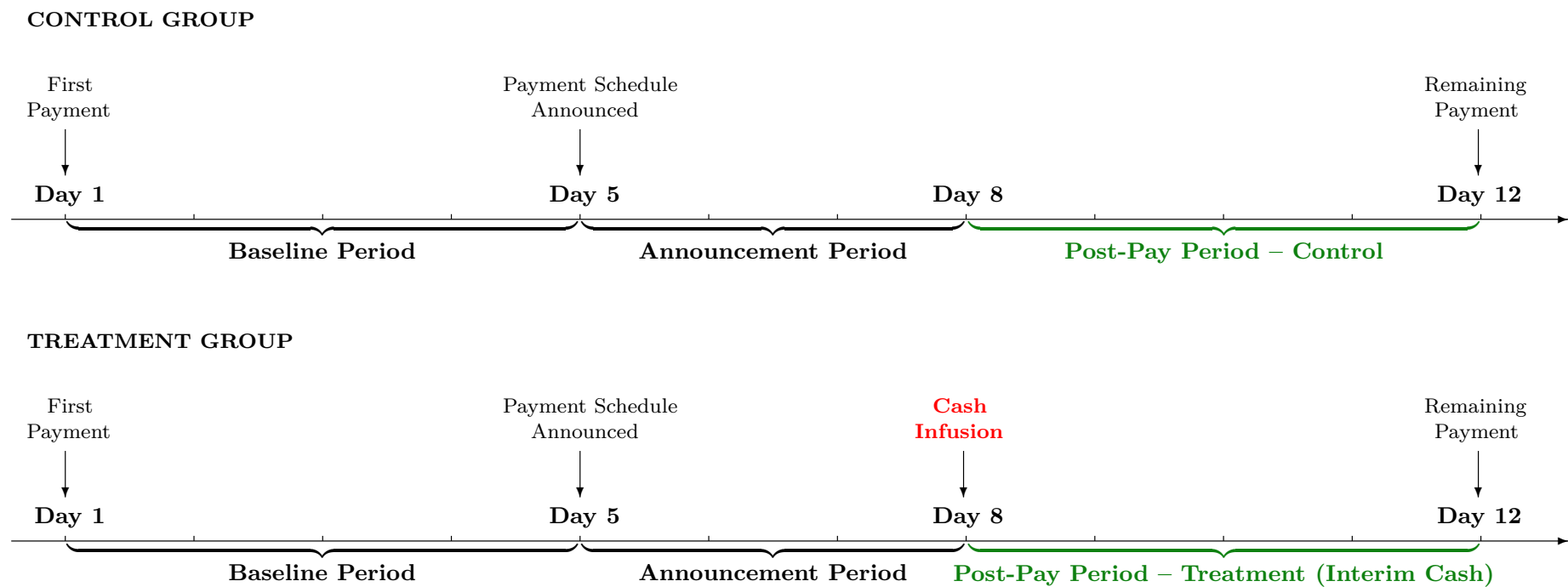
Kaur, Mullainathan, Oh, and Schilbach: “Do Financial Concerns Make Workers Less Productive?”

- Does poverty make you less productive?
  - One channel discussed earlier: nutrition-based poverty traps.
  - This paper: is there an *cognitive* relationship between financial concerns and productivity?
- Empirical approach:
  - Style of research: create their own workplace (making woven disposable plates) where they control everything. In between lab and field. Pros/Cons?
  - Key empirical test: vary the timing of when wages are paid out. Test how productivity responds to liquidity infusion, holding NPV earnings fixed. Views?
  - Compare this effect to changes in the piece rate paid. Find increases in *effort* associated with increased wages, but – unlike timing – no differences in *attentiveness*.
  - Concerns? A bunch of careful things done to rule out other hypotheses. Examples
    - To test gift-exchange, find no response to announcement of earlier payment. Only payments themselves matter.
    - To check nutrition, they directly measure workers' breakfast intake!



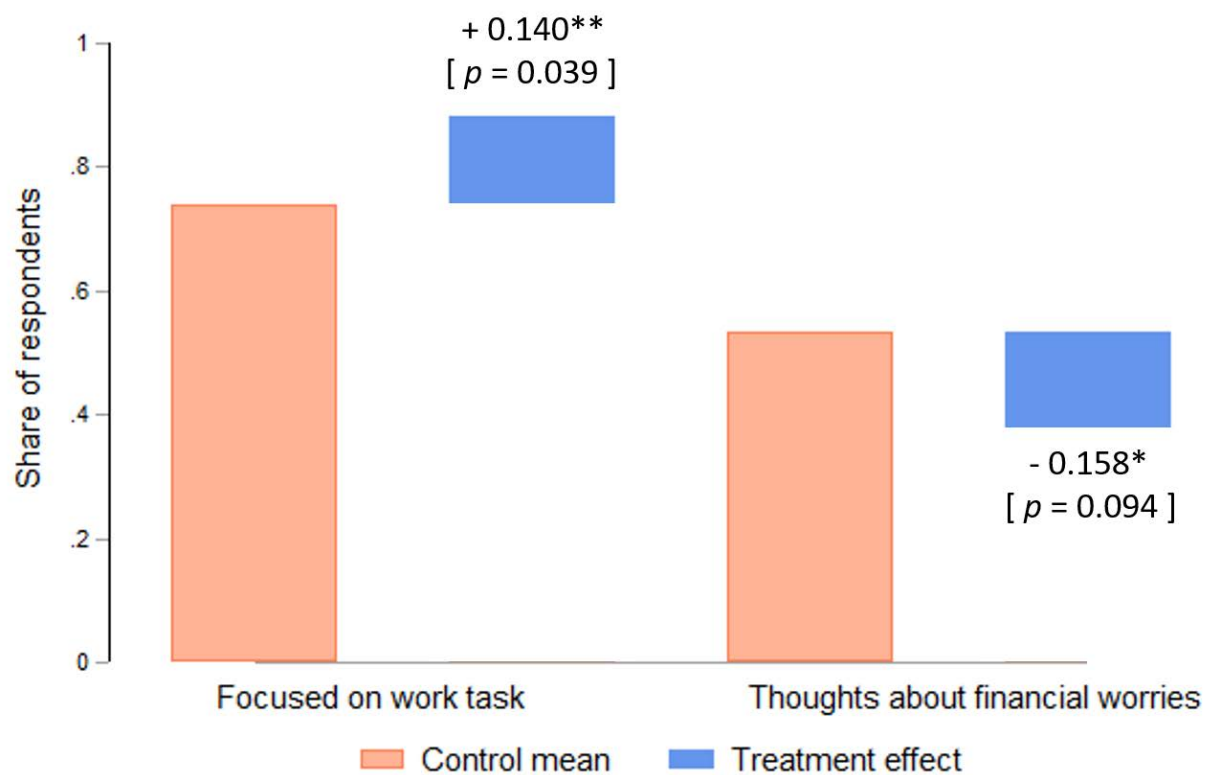
# Design

Figure II: Experimental Design



# Impacts on thoughts

Figure III: Thoughts while Working



# Impacts on productivity

Table III: Effects on Worker Productivity

	Hourly Production					
	(1)	(2)	(3)	(4)	(5)	(6)
Cash × Post-pay	0.102*** (0.037)	0.115** (0.058)	0.115** (0.058)	0.114** (0.058)	0.253*** (0.092)	0.215*** (0.079)
Cash × Post-pay × Higher wealth					-0.365** (0.175)	-0.211* (0.117)
Announcement controls	N	Y	Y	Y	Y	Y
Priming controls	N	N	Y	Y	Y	Y
Answered baseline questions	N	N	N	Y	Y	Y
Wealth index					Continuous	Binary
P-val: cash effect + interaction						0.965
N: worker-hours	22,849	22,849	22,849	22,789	22,789	22,789

# Impacts on attentiveness

Table IV: Effects on Attentiveness

	Attentiveness Index				High Attentiveness			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Cash × Post-pay	0.080** (0.037)	0.087 (0.061)	0.274** (0.107)	0.229*** (0.086)	0.077*** (0.025)	0.097** (0.038)	0.200*** (0.070)	0.186*** (0.055)
Cash × Post-pay × Higher wealth			-0.493** (0.226)	-0.287** (0.122)			-0.276** (0.139)	-0.185** (0.075)
Announcement controls	N	Y	Y	Y	N	Y	Y	Y
Wealth index			Continuous	Binary			Continuous	Binary
P-val: cash effect + interaction				0.513				0.985
N: worker-hours	15,265	15,265	15,227	15,227	15,265	15,265	15,227	15,227

- Attentiveness is mistakes: the average number of leaves, stitches, and double holes (each of which signifies that a stitch was removed in order to correct a mistake) per plate during the production hour slot.

# Mechanism: People use the cash immediately

Table II: Effects on Expenditures

	Loans and Credits		Household Expenditures					Total Expenditures	
	Amount (1)	Any payment (2)	Total (3)	Food (4)	Clothes (5)	HH essentials (6)	Medical (7)	Tobacco/ alcohol (8)	Amount (9)
<b>PANEL A: Overall Impacts</b>									
Cash	275.81*** (53.01)	0.40*** (0.04)	156.86*** (38.53)	70.51*** (23.97)	35.15** (16.57)	13.38*** (4.97)	15.93 (12.26)	0.66 (4.57)	383.01*** (67.09)
Control group mean	94.20	0.18	372.37	270.36	14.31	7.92	31.55	34.01	568.08
N: workers	402	402	402	402	402	402	402	402	402
<b>PANEL B: Daily Impacts</b>									
Cash × Day of payment	171.13*** (44.96)	0.17*** (0.04)	71.92*** (16.80)	50.12*** (13.66)	0.96 (4.18)	6.88** (3.01)	4.64 (5.22)	3.07 (1.94)	209.08*** (34.47)
Cash × 1 day post-pay	68.27*** (26.18)	0.13*** (0.03)	41.58* (21.35)	18.64 (15.04)	9.62 (7.01)	3.76** (1.77)	0.30 (7.31)	0.09 (1.84)	113.37*** (36.81)
Cash × 2 days post-pay	40.94* (20.94)	0.16*** (0.04)	48.76* (25.22)	1.97 (12.29)	27.63* (16.41)	3.09 (3.81)	12.36 (10.02)	-2.81 (2.22)	68.11 (44.16)
Control group mean	32.55	0.07	128.65	93.40	4.94	2.74	10.90	11.75	196.26
Control group mean, day of payment	22.72	0.07	102.43	79.20	3.86	1.47	5.53	10.24	146.06
N: worker-days	1,160	1,160	1,160	1,160	1,160	1,160	1,160	1,160	1,160

## Comparison to piece rates

Table V: Piece Rate Variation

	Hourly Production		Attentiveness Index	
	(1)	(2)	(3)	(4)
Piece rate	0.018** (0.008)		-0.008 (0.009)	
Piece rate = Rs. 3		0.021 (0.015)		0.002 (0.023)
Piece rate = Rs. 4		0.036** (0.016)		-0.015 (0.019)
P-val: equality of coefficients				
Piece rate in (1) and (3)	0.004			
Piece rate = Rs. 3 in (2) and (4)		0.345		
Piece rate = Rs. 4 in (2) and (4)		0.004		
N: worker-hours	4,374	4,374	4,373	4,373

# Identity and Labor Supply

Oh 2020: “Does Identity Affect Labor Supply?”

- Study in India, where particular castes are historically associated with different types of jobs.
- Question: how much are workers willing to give up to avoid tasks associated with other castes? And does it matter if it's public or private.
- What do you expect? Is this about India per se, or do you think it's more general?
- Experimental design:
  - Similar to Kaur et al, she runs the task, in her case, making paper bags for a fixed daily wage.
  - Adds an extra task, either associated with higher or lower castes. Vary the task and the amount of time associated with it (10 min, 30 min, 1 hr, 1.5 hr). Why also vary amount of time? Also vary whether tasks done are made public in a meeting or not (workers know this.) Why?
  - Measures WTA for job using Becker-DeGroot-Marschak. What is this?

# Tasks

Table 1: Caste ranking and associations with tasks

Caste (1)	Rank score (2)	Identity tasks (Caste-associated tasks) (3)	Share associating task w. caste (4)	Paired control tasks (5)	Share associating task w. any SC (6)
Kaibarta	1.48	-	-	-	-
Sundhi	2.07	-	-	-	-
Dhoba	3.71	Washing clothes	0.72	Washing farming tools	0
Kela	4.14	-	-	-	-
Mochi	4.59	Mending leather shoes	0.97	Mending grass mats	0.15
Pana	5.19	-	-	-	-
Hadi	6.60	Sweeping latrines	0.84	Sweeping animal sheds	0



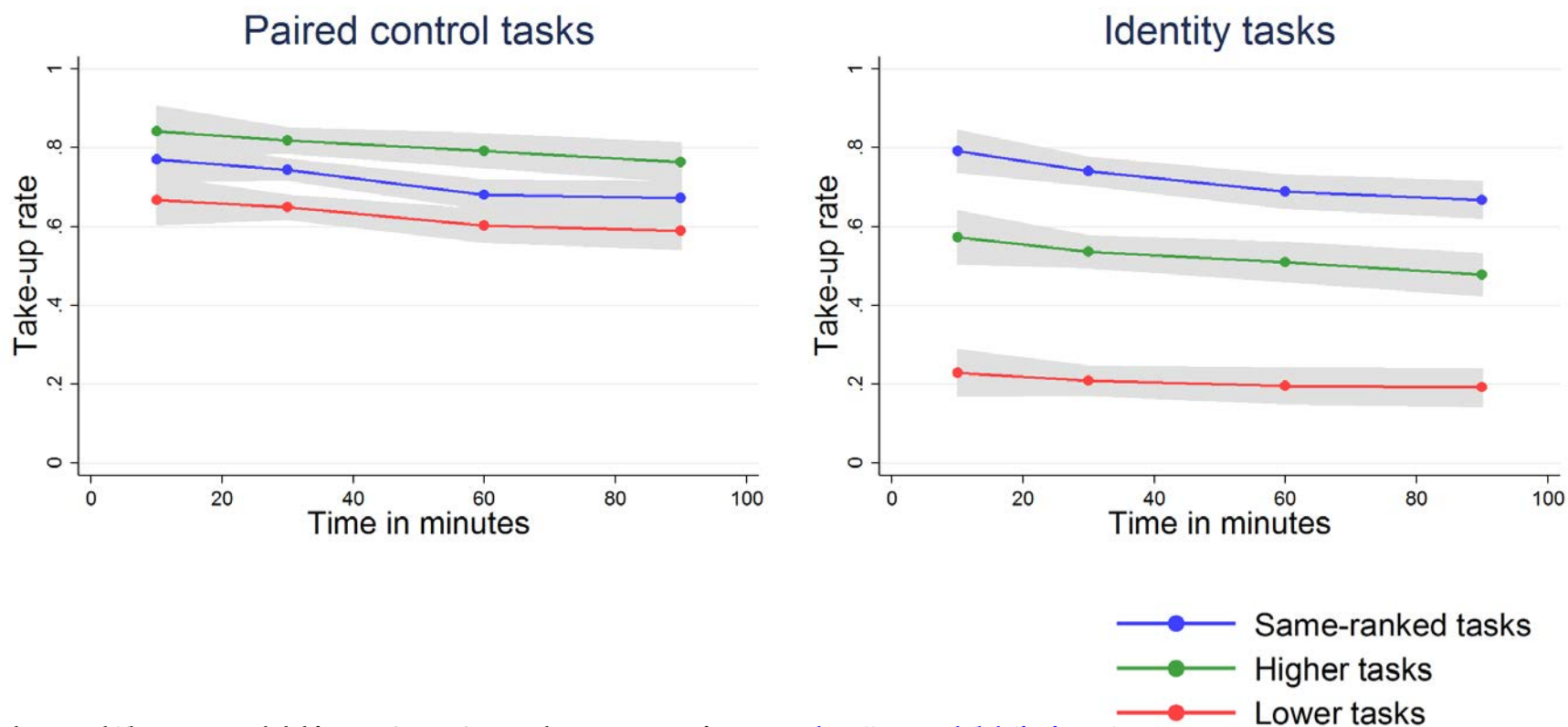
# Tasks



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# Results

Figure 1: Raw take-up rates



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# Results

Table 3: Predicted identity violations and job take-up

Dependent var. = Willingness to take up job offer						
	(1)	(2)	(3)	(4)	(5)	(6)
Different task	0.059* (0.031)	-0.053 (0.033)	-0.053** (0.025)	0.054 (0.044)	-0.058 (0.045)	-0.053 (0.034)
Different × Identity	-0.251*** (0.046)	-0.233*** (0.046)	-0.233*** (0.037)	-0.242*** (0.064)	-0.223*** (0.065)	-0.223*** (0.051)
Lower task	-0.124*** (0.022)	0.065** (0.028)	0.065*** (0.022)	-0.094*** (0.029)	0.096*** (0.034)	0.086*** (0.028)
Lower × Identity	-0.205*** (0.033)	-0.238*** (0.035)	-0.238*** (0.026)	-0.221*** (0.045)	-0.253*** (0.046)	-0.253*** (0.035)
Identity task	0.000 (0.038)			-0.012 (0.053)		
Public × Different				0.010 (0.062)	0.010 (0.060)	0.000 (0.048)
Public × Different × Identity				-0.018 (0.091)	-0.019 (0.091)	-0.019 (0.072)
Public × Lower				-0.059 (0.041)	-0.060 (0.041)	-0.040 (0.035)
Public × Lower × Identity				0.032 (0.062)	0.030 (0.061)	0.030 (0.046)
Public × Identity				0.023 (0.075)	0.026 (0.075)	0.026 (0.061)
Mean: same-ranked						
control tasks	0.717	0.717	0.717	0.717	0.717	0.717
identity tasks	0.722	0.722	0.722	0.722	0.722	0.722
Time controls	Yes	Yes	Yes	Yes	Yes	Yes
Task FE	No	Yes	Yes	No	Yes	Yes
Caste FE	No	Yes	No	No	Yes	No
Worker FE	No	No	Yes	No	No	Yes
R-squared	0.200	0.223	0.498	0.202	0.225	0.498
Observations	20,160	20,160	20,160	20,160	20,160	20,160

# Is there a positive benefit to work per se?

Hussam et al 2021: "The Psychosocial Value of Employment"

- Typical model has something like  $U(C, L)$  where  $\frac{\partial U}{\partial L} < 0$ , i.e. disutility of labor
- This paper asks: is that right? Or maybe  $\frac{\partial U}{\partial L} > 0$ ? And if so why?
- Experimental design: Randomize people into
  - Jobs (doing surveys in the camps or 3 days per week, for 2 months)
  - Control (small fee to fill out surveys)
  - Cash (large fee to fill out surveys, equal to the job arm)
- Views? Is the survey a good / bad job? How does this affect interpretation?
- Why is cash important? Challenges in implementing this?
- Paper works in an extreme setting: Rohingya refugee camps in Bangladesh. Do you think this matters?
- Pre-specify heterogeneity (e.g. past exposure to violence, baseline sociability, baseline depression). Why pre-specify heterogeneity in particular?

# Results

Table 2: Impacts on psychosocial wellbeing (SD)

	(1) PHQ	(2) Stress	(3) Life Sat.	(4) Social	(5) Self Worth	(6) Control	(7) Stability	(8) MH Index
Work	-0.185*** (0.060)	-0.258*** (0.096)	0.301*** (0.075)	0.167** (0.082)	0.143* (0.080)	0.310*** (0.116)	0.249*** (0.081)	0.214*** (0.039)
Cash	0.001 (0.071)	-0.060 (0.108)	0.237*** (0.087)	0.083 (0.100)	-0.075 (0.087)	0.047 (0.144)	0.055 (0.102)	0.045 (0.049)
Adj. p-val Work	0.006	0.007	0.001	0.015	0.023	0.007	0.006	
Test Work=Cash	0.006	0.022	0.350	0.324	0.002	0.031	0.033	0.000
Adj. p Work=Cash	0.018	0.035	0.112	0.112	0.015	0.035	0.035	
Observations	726	726	726	726	726	726	726	726

# Results

Table 3: Impacts on physical health, cognitive health, and preferences

	(1) Days Sick	(2) Days Sick >7	(3) Cognitive Index	(4) Risk Av.	(5) Time Pref.
Work	-0.780* (0.411)	-0.044 (0.049)	0.182*** (0.068)	-0.656** (0.291)	-0.119 (0.323)
Cash	-0.054 (0.479)	0.007 (0.055)	0.057 (0.077)	0.028 (0.342)	-0.074 (0.336)
Adj. p-val Work	0.070	0.229	0.045	0.055	0.399
Test Work=Cash	0.064	0.204	0.030	0.016	0.850
Adj. p Work=Cash	0.081	0.119	0.081	0.081	0.343
Observations	726	726	726	726	726

# Not about consumption

Table 5: Impacts on consumption

Panel A			
	(1) Luxury	(2) Necessary	(3) Total Cons.
Work	17.762 (31.484)	228.285 (155.611)	285.395 (176.621)
Cash	-18.144 (36.522)	194.457 (164.093)	208.658 (191.747)
Adj. p-val Work	0.277	0.277	0.277
Test Work=Cash	0.244	0.821	0.659
Adj. p Work=Cash	1.000	1.000	1.000
Mean in Control	347.47	1777.38	2132.99
Observations	726	726	726

Panel B			
	(1) Savings	(2) Borrowing	(3) Lending
Work	196.441*** (52.220)	-685.075*** (187.721)	50.277*** (16.266)
Cash	128.096** (61.683)	-761.448*** (220.438)	34.053* (18.562)
Adj. p-val Work	0.001	0.001	0.001
Test Work=Cash	0.283	0.676	0.424
Adj. p Work=Cash	1.000	1.000	1.000
Mean in Control	98.64	1986.30	8.15
Observations	726	726	726

# Labor Demand

- Note that one thing I haven't really mention is labor demand
- Frankly I'm not sure what the interesting questions are here. Ideas? But, I'll leave this as an exercise for future thought.



# Urban labor markets

- We'll examine four questions:
- Do people want urban manufacturing jobs?
- Informal sector
  - A big theme that differentiates labor markets in development is the large informal sector.
  - Do formal labor market regulations (e.g., min. wage, unions) have bite given the large, unregulated informal sector? Do they lead to more informality?
- Search, signaling, and frictions.
  - Do informational problems mean that people have trouble getting hired?
- Labor conditions
  - What can / should be done about working conditions?
  - What is the role of multinationals?
  - Note: would like to see more here!

# Jobs

- First question about labor markets: do people want to be employees, vs. being self-employed?
- Blattman and Dercon (2018) study this by conducting an experiment:
  - Take 1,000 applicants to entry level jobs in 5 industrial firms in Ethiopia. Most were unemployed but educated young adults, mostly women.
  - Randomly assign 1/3 to get a job with approx. \$1 hourly wage, 1/3 to an entrepreneurship program with \$300 grant, and 1/3 to control group
  - Follow outcomes
- Questions to think about:
  - How does the selection of *workers* into this project affect how you think about this experiment?
  - How does the selection of *firms* into this project affect how you think about results?

# Results

## Takeup

TABLE 3—TAKE-UP OF TREATMENTS AND TURNOVER

Dependent variable	Proportion who take up by treatment assignment				Take-up differences (OLS)			
	Job (1)	Entrepreneur (2)	Control (3)	Obs. (4)	Job— Control		Entrepreneur— Control	
					Coeff. (5)	SE (6)	Coeff. (7)	SE (8)
<i>Employment in a study firm:</i>								
Was directly informed of a job offer <sup>†</sup>	0.99	0.00	0.04	947	0.964	[0.020]	−0.027	[0.017]
Worked at least a day <sup>†</sup>	0.89	0.07	0.14	947	0.753	[0.039]	−0.081	[0.041]
Worked at least a month <sup>†</sup>	0.69	0.07	0.13	947	0.569	[0.044]	−0.071	[0.032]
Was working in study firm at endline	0.21	0.01	0.03	1,841	0.172	[0.017]	−0.016	[0.012]
<i>Employment in formal or industrial sectors:</i>								
Worked at least a month in formal sector	0.91	0.53	0.69	1,628	0.225	[0.032]	−0.158	[0.041]
Worked at least a month in any industrial firm	0.83	0.26	0.43	835	0.408	[0.057]	−0.153	[0.020]
Number of months worked in any industrial firm	5.98	1.43	3.16	835	2.943	[0.387]	−1.496	[0.267]
Was working in any industrial firm at endline	0.32	0.09	0.20	1,587	0.107	[0.023]	−0.118	[0.016]
<i>Entrepreneur and training intervention:</i>								
Offered grant and training <sup>†</sup>	0.00	0.97	0.00	947			0.970	[0.019]
Received grant and training <sup>†</sup>	0.00	0.94	0.00	947			0.938	[0.029]

# Results

## Impacts

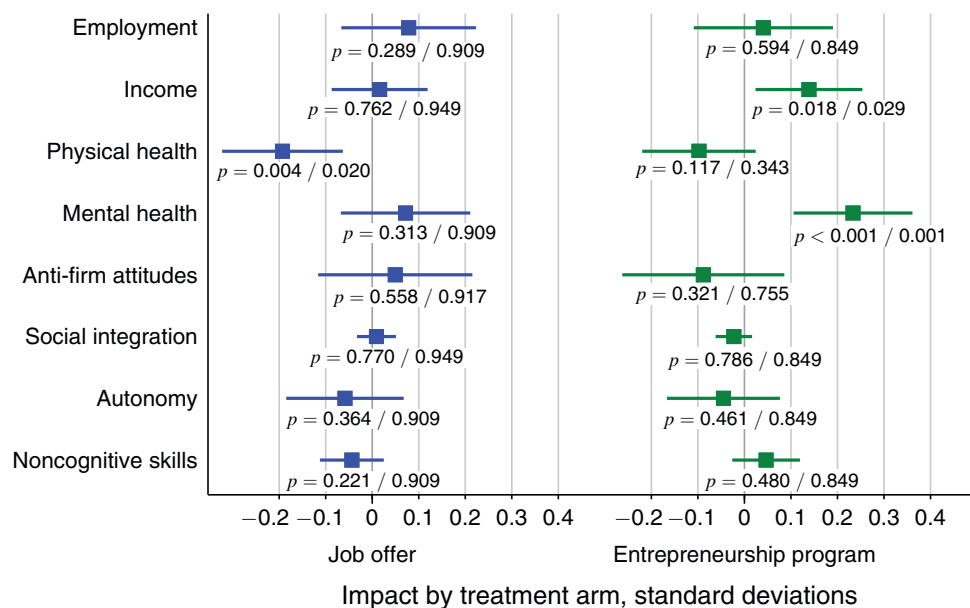


FIGURE 1. PROGRAM IMPACTS ON STANDARDIZED FAMILY INDEXES, WITH 95 PERCENT CONFIDENCE INTERVALS AND UNADJUSTED/ADJUSTED *p*-VALUES

- Note: these are standardized indexes of variables. What's this?
- How should we think about comparing these?

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# Results 5 years later

Table 3: Impacts on income and employment

Outcome	1-year Endline				5-year Endline			
	Control	N	ITT Estimate		Control	N	ITT Estimate	
	mean		Job offer	Start-up	mean		Job offer	Start-up
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Income and consumption, z-score	-0.005	1,587	0.016	0.139**	0.002	1,390	-0.042	-0.038
			[0.053]	[0.059]			[0.066]	[0.068]
Weekly earnings, 2010 Birr	34.227	1,586	3.036	12.156**	34.405	1,390	-3.308	-0.470
			[4.476]	[5.466]			[5.484]	[5.940]
Earnings per hour, 2010 Birr	1.562	1,019	0.073	0.126	1.451	763	-0.109	0.266
			[0.267]	[0.266]			[0.375]	[0.342]
SD of weekly earnings	58.150	1,587	6.472	4.653	56.412	1,390	1.131	3.876
			[7.673]	[8.139]			[8.950]	[9.986]
Household nondurable consumption, 2010 birr	665.049	1,584	20.363	59.320*	1,737.076	1,390	-33.448	-66.041
			[35.300]	[35.845]			[93.031]	[88.097]
Employment and occupational choice, z-score	-0.038	1,587	0.078	0.041	0.084	1,390	-0.080	-0.083
			[0.074]	[0.076]			[0.079]	[0.079]
Hours work/week, past 2 weeks	26.394	1,585	0.995	3.535*	26.773	1,390	-1.797	-1.960
			[1.894]	[1.892]			[2.048]	[2.042]
Factory labor	7.463	1,581	3.017**	-4.114***	6.132	1,390	0.560	-3.534***
			[1.380]	[1.168]			[1.423]	[1.220]
Farm wage labor	3.074	1,584	1.816**	-1.469**	0.440	1,390	1.037**	0.129
			[0.914]	[0.744]			[0.452]	[0.356]
Smallholder farming	0.821	1,584	-0.258	1.480***	0.219	1,390	-0.001	0.130
			[0.323]	[0.398]			[0.116]	[0.143]
Petty business	4.037	1,586	-0.877	5.378***	5.969	1,390	-1.705	-0.563
			[0.977]	[1.378]			[1.318]	[1.297]
Skilled trades	1.592	1,583	-0.737	-0.570	3.134	1,390	-1.483**	-1.403*
			[0.449]	[0.483]			[0.633]	[0.779]
Casual nonfarm labor	2.180	1,586	-0.952*	0.726	0.812	1,390	0.626	0.872
			[0.568]	[0.770]			[0.467]	[0.546]
Low-skill salaried labor	4.187	1,586	0.064	-0.410	3.761	1,390	-0.395	-0.164
			[1.095]	[0.955]			[0.932]	[0.945]
Hrs Medium-skill salaried labor	1.209	1,586	-0.415	1.610***	3.253	1,390	0.972	3.331***
			[0.419]	[0.590]			[0.863]	[0.980]
Other work	2.268	1,439	-0.094	0.493	2.257	1,390	-0.886	-0.784
			[0.693]	[0.737]			[0.577]	[0.593]
No work in past two weeks	0.343	1,586	-0.013	-0.082**	0.405	1,390	0.001	-0.033
			[0.033]	[0.032]			[0.040]	[0.039]
SD of hours/week	16.444	1,586	-1.307	3.956***	11.841	1,390	1.378	2.517
			[1.342]	[1.476]			[1.515]	[1.594]

# Results 5 years later

Table 5: Impacts on health

Outcome	1-year Endline				5-year Endline			
	Control	N	ITT Estimate		Control	N	ITT Estimate	
	mean		Job offer	Start-up	mean		Job offer	Start-up
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Physical health, z-score	0.058	1,587	-0.193*** [0.066]	-0.098 [0.062]	0.011	1,390	-0.023 [0.069]	0.103 [0.075]
Ability to do 5 core activities of daily life (0-15)	14.072	1,587	-0.274** [0.125]	-0.240* [0.128]	13.485	1,390	-0.201 [0.196]	-0.036 [0.198]
Ability to do 15 activities of daily life (0-45)					39.212	1,390	-0.424 [0.501]	0.299 [0.548]
Disability	0.040	1,587	0.033** [0.015]	0.017 [0.014]	0.020	1,390	0.009 [0.011]	0.010 [0.014]
Subjective health assessment (0-10)	8.909	1,586	-0.233** [0.104]	0.001 [0.104]	8.774	1,387	0.089 [0.106]	0.136 [0.102]
Subjective health assessment, 5 years from now (-10 to 10)	0.760	1,586	0.055 [0.093]	-0.001 [0.091]	0.096	1,387	-0.066 [0.084]	0.134 [0.082]
General health (0-60)					56.809	1,390	0.186 [0.407]	0.464 [0.359]
Physical symptom count (1-5)					0.204	1,390	-0.029 [0.033]	-0.009 [0.033]
Abnormal Spirometry Reading (colour system)					0.025	532	0.019 [0.021]	-0.004 [0.020]
Mental health and subjective well-being, z-score	-0.110	1,587	0.072 [0.071]	0.233*** [0.065]	0.016	1,390	-0.088 [0.077]	0.029 [0.066]
Depression symptoms (0-27)	2.545	1,587	-0.088 [0.219]	-0.281 [0.211]	2.283	1,390	0.261 [0.283]	-0.191 [0.248]
Generalized Anxiety index (0-27)	2.028	1,587	0.054 [0.197]	-0.284 [0.183]	1.933	1,390	0.313 [0.251]	-0.013 [0.218]

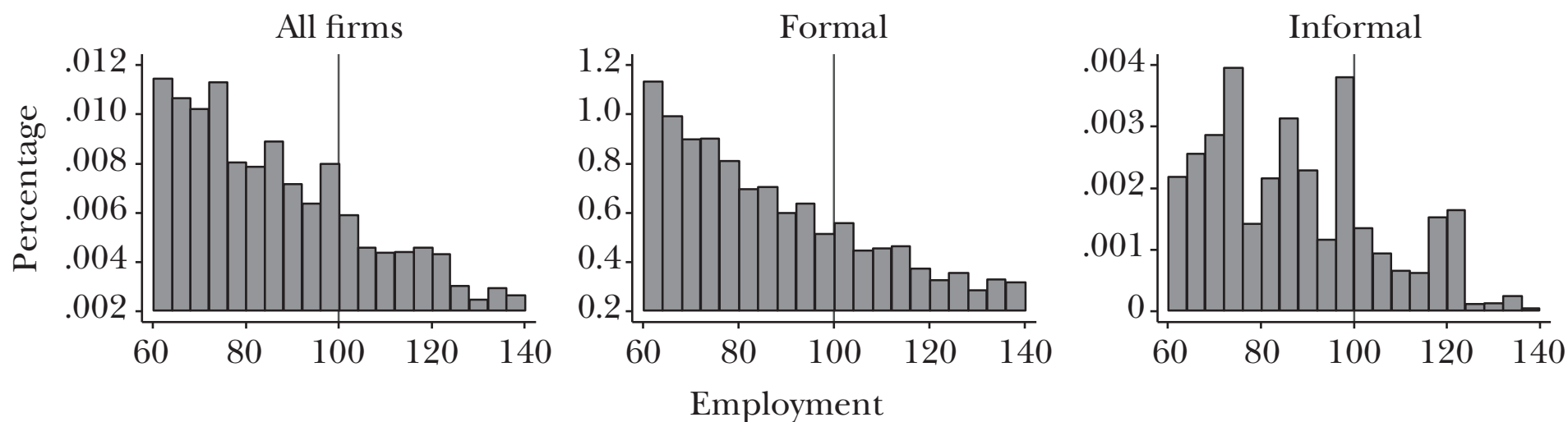
## Informal sector

- Besley and Burgess (2004): examine overall industrial labor regulation in India, using state-year diff-in-diff. Find that more 'pro-worker' policies lower output and formal employment and increase poverty. Suggests they matter, but this is very coarse.
- Hsieh and Olken (2016): many firm regulations kick in at discrete thresholds, esp 100 firms in India. Do we see firms avoiding these regulations?

## Indian firm size

### Distribution of Indian Firm Size and Labor Regulations

(size as measured by employment)



- Nothing for formal firms
- Slight bunching for informal firms, but excess mass is at most 400 firms in all of India



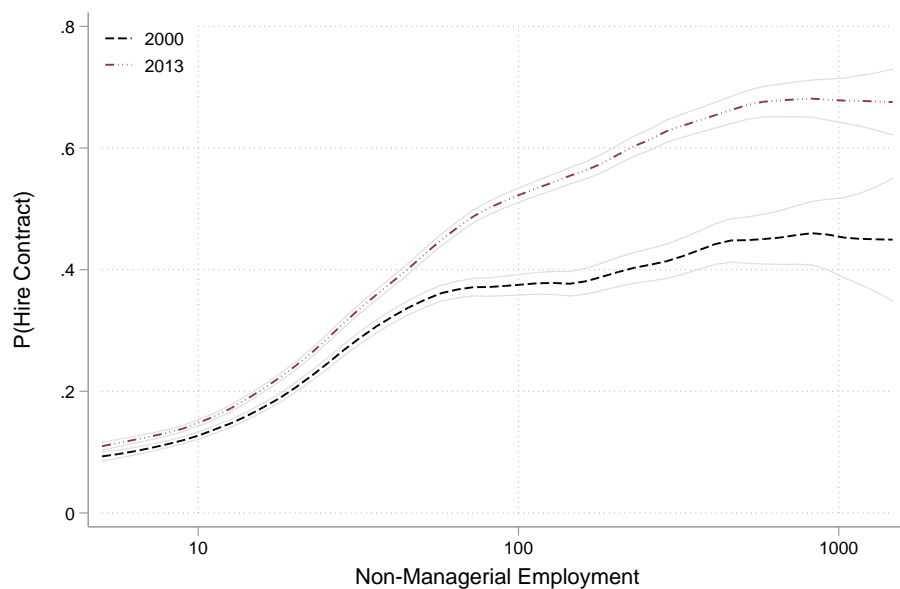
## Labor regulation

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- Bertrand et al (2017): Why not? Bertrand et al find that firms can get around these constraints by using contract labor, particularly after this was sanctioned by Supreme Court in 2001. Potentially led to more efficiency.

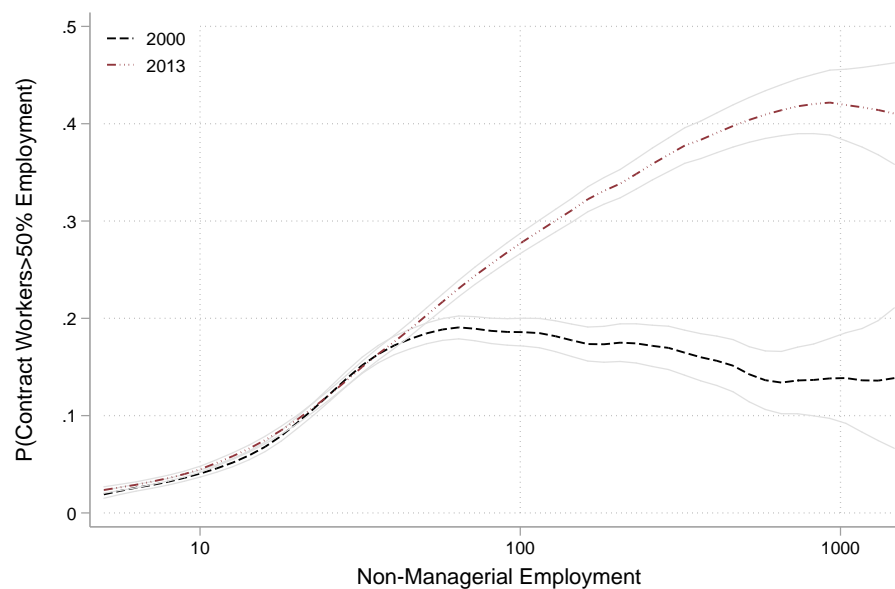
# Larger firms rely on contract labor, esp recently...

Figure 4: Contract Labor Use and Firm Size: 2000 vs 2013

(a) Any Contract



(b) Contract > 50% Employment



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## Labor regulation

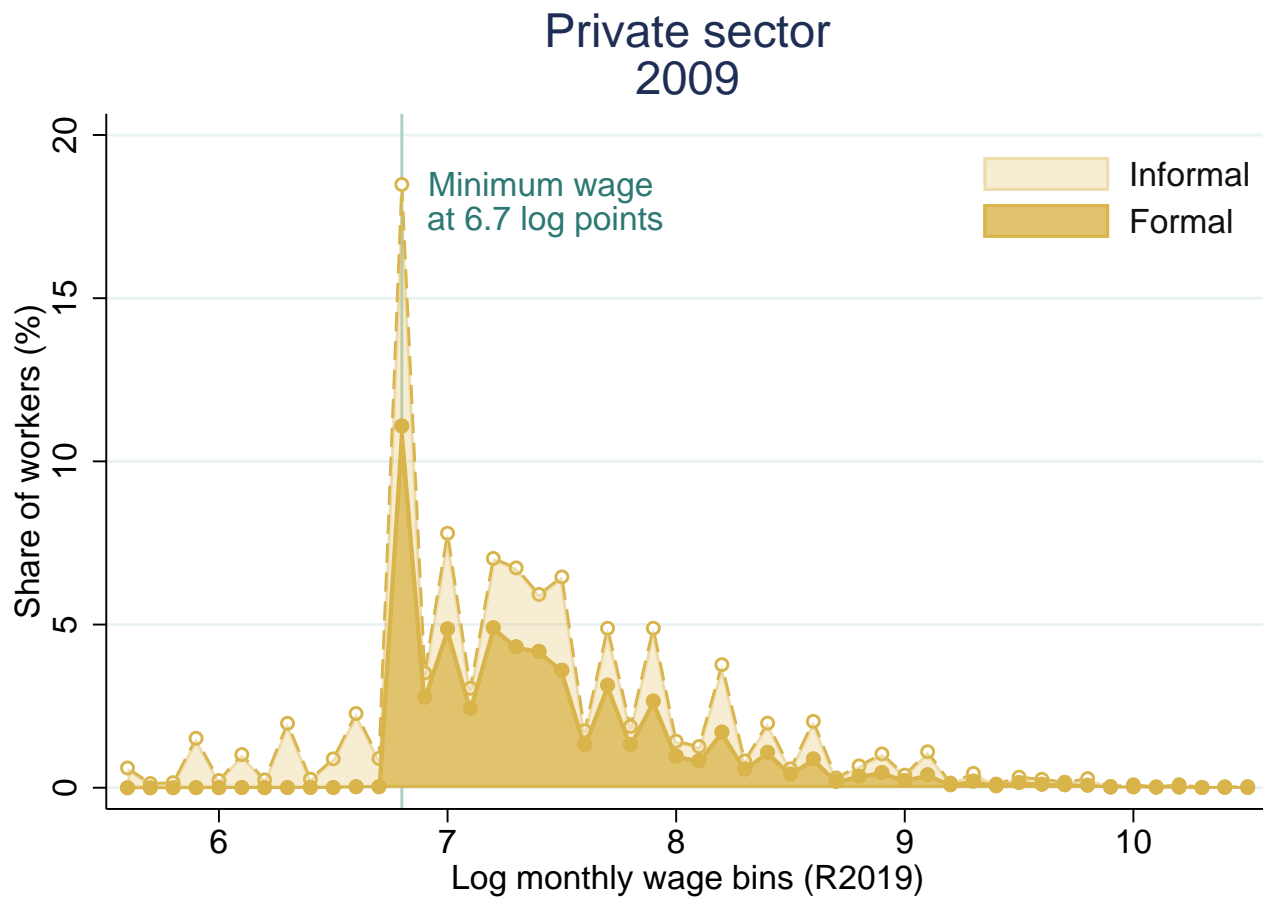
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- Felix and Wong (2021) studying impacts of outsourcing on workers in Brazil... stay tuned

# Do formal regulations affect informal market?

Derenoncourt et al (2021): “Racial Inequality, Minimum Wage Spillovers, and the Informal Sector”

- How does minimum wage affect wages in a context with a large informal sector? And does this affect racial disparities in earnings?
- Setting: Brazil. Large increase in minimum wage from 1999-2009 – min-to-median rose from 30 percent in 1999 to 50 percent in 2009
- National policy, so study it’s impacts by looking at percentiles of income distribution over time. Views?
- Examine changes on formal vs. informal sector by looking at heterogeneity in states pre-period income levels

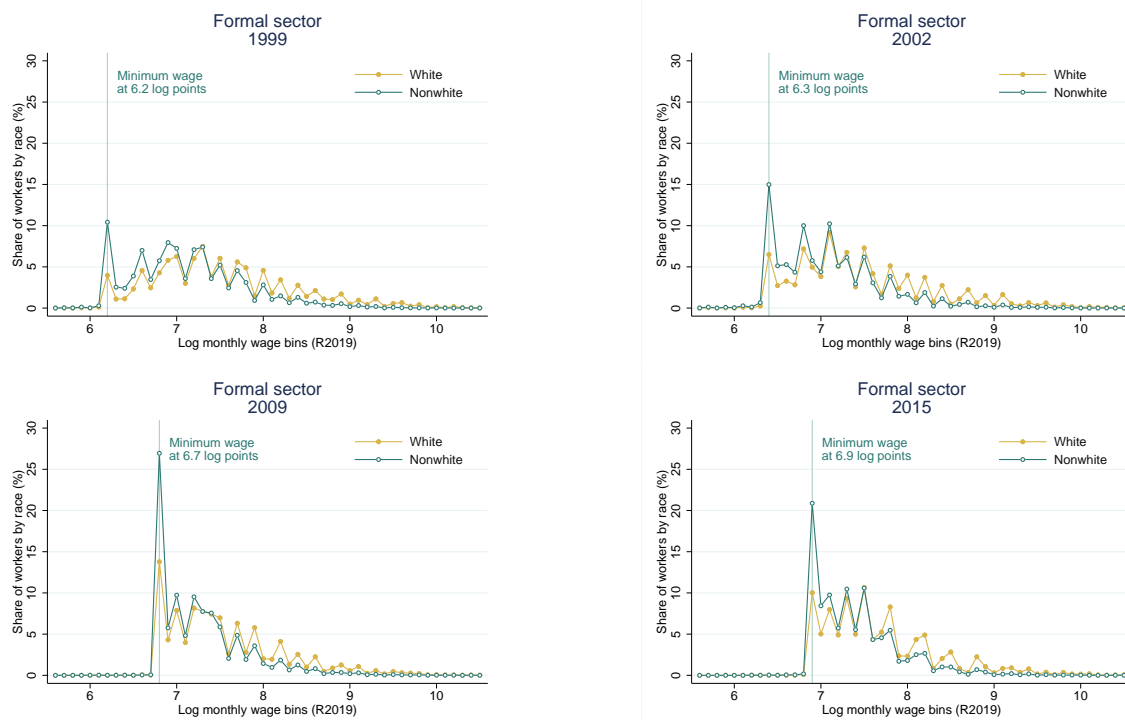
# Spikes at min wage in *informal* sector



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# Changes in formal wages

Figure 3: Monthly earnings distributions for white and nonwhite workers, Brazil



- I would like to see impacts on *informal* wages

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