

# **Worker Absenteeism and Firm Outcomes: Evidence from the Indian Manufacturing Sector**

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# Motivation

- Developing countries face a wage employment challenge
  - low formal employment (Breza et al., 2021; Breza and Kaur, 2025)
  - high turnover and limited job security (Donovan et al., 2023)
- Dominant narrative: *too few “regular” jobs* (supply-side) (ILO, 2018; World Bank, 2017)
- **New angle: chronic “unscheduled” absenteeism** among wage workers undermines job quality, firm productivity, and sectoral competitiveness

## This paper:

**Q1:** How widespread is absenteeism, and how do firms adapt?

**Q2:** What are the quantitative impacts of absenteeism on firm dynamism/productivity?

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## Context: Indian labor markets

- A large number of studies document high rates of absenteeism in the public sector
  - E.g. education and healthcare (Chaudhury et al., 2006; Banerjee and Duflo, 2006; Callen et al., 2023)
  - often attributed to weak enforcement and limited disciplinary action.
- **Absenteeism in the private sector** has been noted (James, 1960), but **not studied systematically**
  - Reason: lack of comprehensive data.
  - private sector: absentee workers lose wages.
    - inferences drawn from public sector absenteeism literature are not that useful as incentive structure is different in private sector.

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# Preview of Micro findings

**Build a novel dataset** on monthly worker absenteeism—representative of Indian manufacturing sector across two decades. We only consider **unscheduled absences**.

## *Monthly patterns:*

1. absenteeism is high (8.6%) and pervasive across establishments.
2. **large unpredictable component** coexist with persistent differences.
  - Absences are driven by day-to-day interruptions to workers' labor supply: reasons are domestic/farm work (45%); social obligations (25%); sickness (18%) ▶ Worksite Survey
3. absenteeism is associated with **higher hiring & separation** (labor churning).

## *Yearly patterns:*

4. **productivity costs are sizable**; amplified in high **co-worker complementarity** sectors.
5. absenteeism **linked with high labor costs**: higher average wages; larger contract (temporary) worker shares.

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## Quantitative Model of Firm Dynamics + Frictional Labor Market + Absenteeism Risk (AR1)

- absenteeism shocks lead to production disruptions due to costly replacement.
- forward-looking firms **hire buffer workers** to hedge against future labor shortages due to  $\uparrow$  absenteeism.
- wage bargaining: high absenteeism states  $\implies \uparrow$  marginal product of labor  $\implies \uparrow$  per unit labor cost.

## Results

- **aggregate productivity declines** with absenteeism risk in the economy.
- more dispersion in the marginal revenue product of labor across firms.
- value of entry is lower  $\rightarrow$  **less job creation/business dynamism**

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# Contributions to the Literature

1. Micro-effects: seasonality (Zane, 2018; Krishnaswamy, 2019), managers (Adhvaryu et al., 2024).  
Developed economies: wages and absenteeism (Engström and Holmlund, 2007); assembly-line production (Weiss, 1985; Barmby, Sessions and Treble, 1994; Coles and Treble, 1993; Coles and Treble, 1996)

## This paper:

- Document broad patterns in absenteeism + coping strategies that firms undertake
- Assess long-run macro-consequences of absenteeism

2. Productivity measurement and distribution, Syverson (2011); Hsieh and Klenow (2009).

This paper: Worker absenteeism downward biases labor productivity measures. It also generates excess dispersion in revenues per unit of “labor input”.

3. High labor turnover (Donovan et al., 2023) and monopsony power in developing country labor markets (Amodio et al., 2022; Amodio and de Roux, 2024; Brooks et al., 2021; Cosar et al., 2016)

This paper: Worker absenteeism may be an important driver of labor turnover

## Data & Measurement

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## **Monthly ASI Part-II Survey (2000–2019)**

Nationally representative manufacturing panel;  
Worker-days scheduled, worker-days absent,  
hiring, separations, merged to annual accounts.

## **Establishment Survey (2023)**

206 firms across Odisha;  
Coping strategies (buffer labor, rotation,  
contractors, migrants), absences (timing,  
reasons).

## **Yearly ASI Part-I Survey (2000–2019)**

Balance sheet data: revenues, costs, labor  
costs, location, industry.

## **Co-worker Complementarities**

Composite industry-level index from O\*NET  
(teamwork, communication, contact, impact)

## Direct(permanent) workers

**Contract Type:** Firms hire directly (majority)

**Protections:** Full IDRA coverage

- Dispute resolution
- Hiring/firing regulations
- Closure rights

**Leave:** Must be pre-scheduled

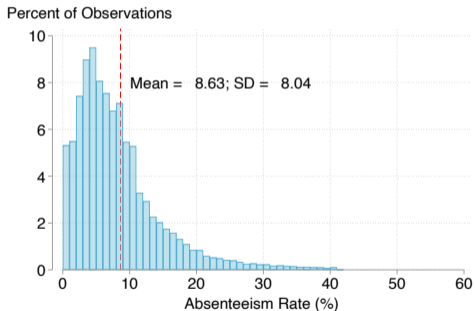
*Absence: "No work, no pay"*

## Stylized Facts

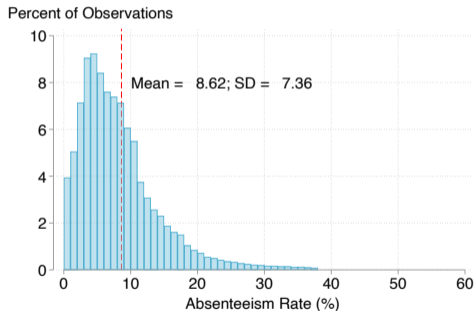
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## Fact 1a: Average absenteeism rate is 8.6%

$$\text{Absenteeism Rate} = \frac{\text{unscheduled absences}}{\text{worker-days scheduled}} \times 100$$

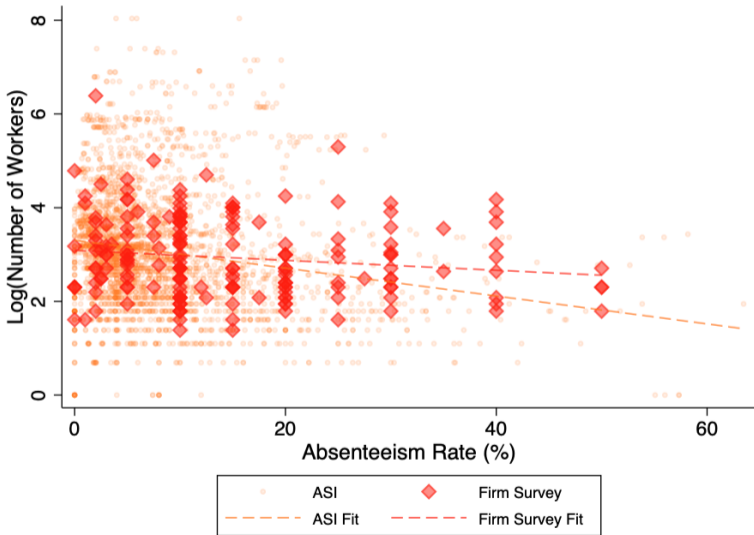


**(a)** Monthly

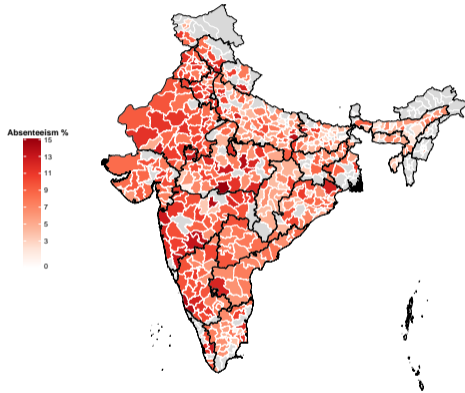


**(b)** Yearly

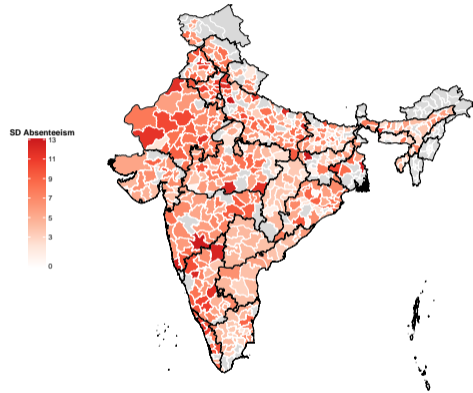
## Fact 1a: Primary survey data also documents high absenteeism



## Fact 1b: Substantial regional variation – 3.7% to 14.3% – across states

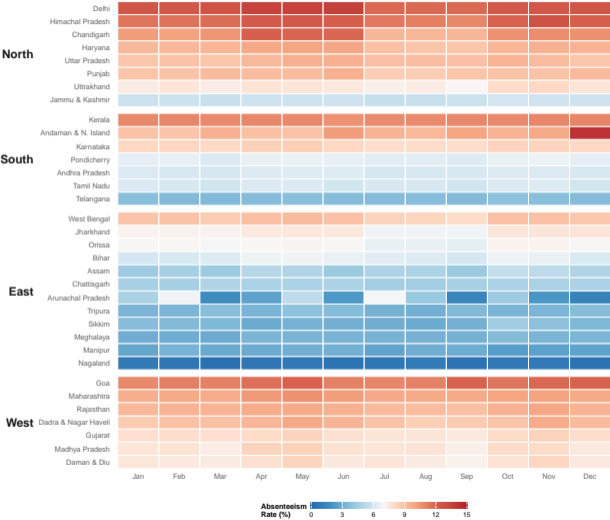


(a) Mean absenteeism



(b) Standard deviation of absenteeism

# Fact 1c: Agricultural seasons do affect absenteeism, but marginally

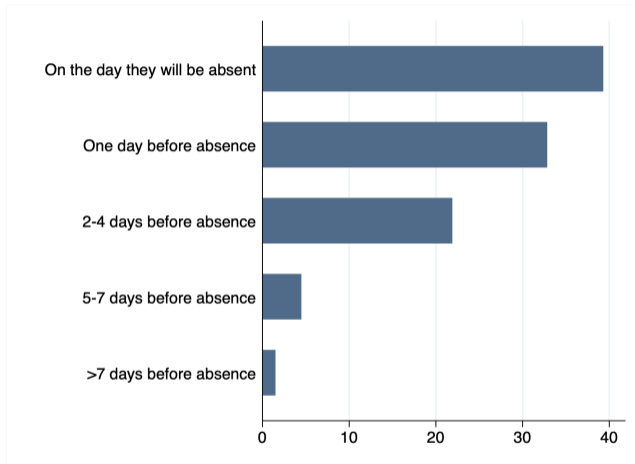


## Fact 2a: High variability in absenteeism *within* establishments

	$\sigma_e$	$ e  > 1$	$ e  > 2$	$ e  > 3$	$ e  > 5$	$ e  > 8.62$
	(1)	(2)	(3)	(4)	(5)	(6)
No FE	8.035	0.866	0.743	0.631	0.394	0.123
Establishment FE	5.664	0.709	0.512	0.374	0.206	0.082
Establishment FE + Year FE	5.650	0.707	0.509	0.369	0.204	0.081
Establishment FE + Year×State FE	5.618	0.706	0.506	0.367	0.202	0.080
Establishment FE + Year×Sector FE	5.643	0.707	0.509	0.370	0.203	0.081

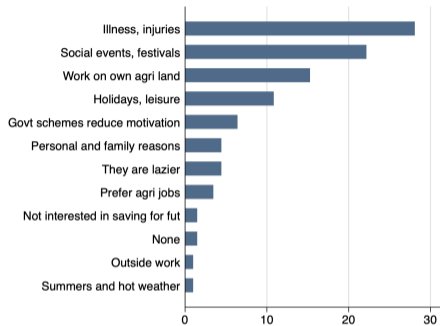
- For each row  $e$  is **residualized absenteeism rate** after taking out fixed-effects.  $\sigma_e =$  S.D.(residual).
- Establishment fixed effects explain **30% of variation in absenteeism**
- Establishments face unpredictable, time-varying shocks to absenteeism
  - $\sim 8\%$  of establishments experience **shocks as large as the sample mean**

## Fact 2b: What drives unpredictability in absenteeism?

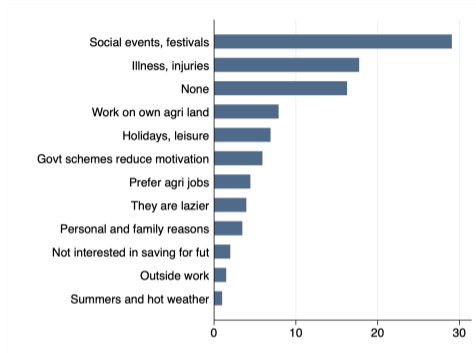


- **Workers** do not inform in advance regarding future absences.

## Fact 2c: What are the reasons for absenteeism?



(a) Primary Reason



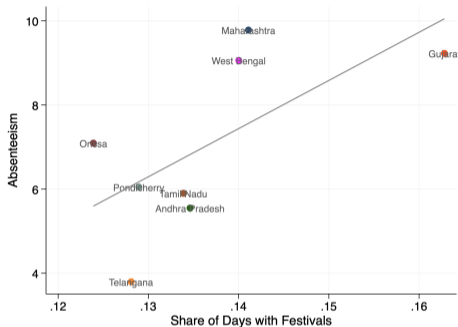
(b) Secondary Reason

- **Social events and illness** are the two most important reasons behind absenteeism
- [Goraya et al. \(2025\)](#) explore the role of social obligations — weddings, funerals, helping neighbors and visiting relatives — in influencing labor supply

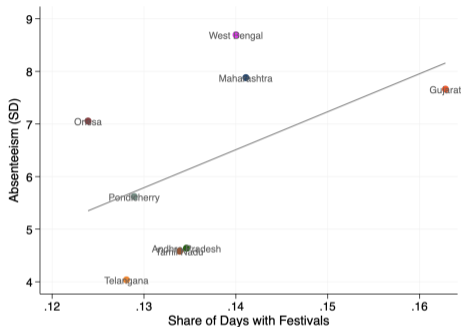
▶ Experiment

▶ Shares Workey Survey

## Fact 2c: Regional festivals and absenteeism



(a) Mean Absenteeism Rate



(b) Dispersion in Absenteeism Rate

- We can examine relationship between absenteeism and aggregate shocks (e.g. festivals)
- $\implies$  absenteeism (mean/variance) is higher in months with higher-than-usual festival days

## Fact 3: Output and Absenteeism

	log(VA) (1)	log(VA) (2)	log(VA) (3)	log(VA) (4)
log(Absenteeism Rate)	-0.153 (0.007) [0.000]	-0.016 (0.003) [0.000]	-0.152 (0.010) [0.000]	-0.008 (0.004) [0.023]
log(Absenteeism Rate) × High Co-worker Complementarity			-0.002 (0.014) [0.885]	-0.015 (0.005) [0.003]
Year FE	Yes	Yes	Yes	Yes
Sector FE	Yes	No	Yes	No
State FE	Yes	No	Yes	No
Establishment FE	No	Yes	No	Yes
Dep Var Mean	16.914	17.211	16.914	17.211
N:establishment-year	338,824	278,841	338,824	278,841

- Absenteeism rate is associated with **smaller size (with Establishment FE)**.
- Losses larger in industries where **co-worker complementarities are higher**.
- Similar losses emerge while using festivals as a shock to absenteeism.

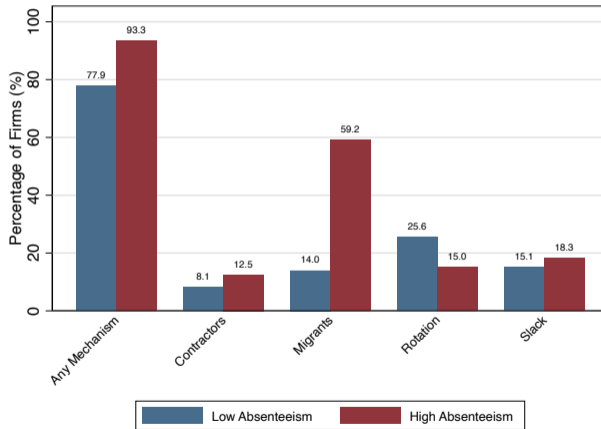
## Fact 4: Cost of absenteeism and coping strategies

	log(Average Direct Employee Yearly Wage) (1)	Contract Employee Share (2)	log(Average Contract Employee Yearly Wage) (3)
log(Absenteeism Rate)	0.022 (0.001) [0.000]	0.375 (0.055) [0.000]	0.000 (0.002) [0.870]
Year FE	Yes	Yes	Yes
Establishment FE	Yes	Yes	Yes
Dep Var Mean	11.158	13.588	11.140
N:establishment-year	278,569	278,841	82,893

- **Interpretation:** Per unit labor cost is positively associated with absenteeism.
- Establishments exposed to higher absenteeism are associated with a higher share of contract employees, while their per unit cost is unaffected.

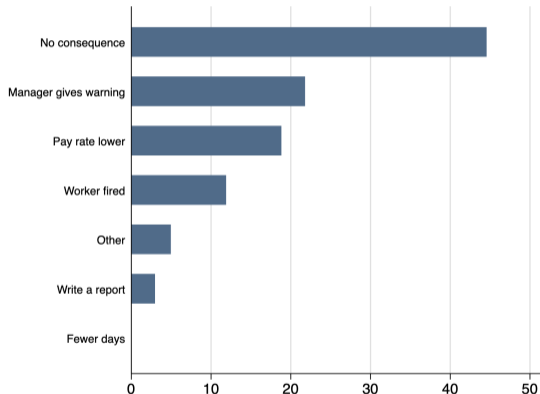
## Fact 4a: Dealing with worker absences, survey evidence I

### Coping Mechanism Usage by District



## Fact 4b: Dealing with worker absences, survey evidence I

What happens if workers take more time off than what is permitted?



- **Limited** consequences for absent worker beyond unpaid wages. Firing is limited.

## Summary of Stylized Facts on the Establishment Side

- 1 absenteeism is high and pervasive across establishments.
- 2 **large *unpredictable* component** coexist with persistent differences.
- 3 absenteeism is associated with **higher hiring & separation** (labor churning).
- 4 **productivity costs are sizable**; amplified in high **co-worker-complementarity sectors**.
- 5 absenteeism **linked with high labor costs**: higher average wages.

# Theoretical Framework

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# Model components

- Heterogeneous (multi-worker) firms a la Hopenhayn (1992) + homogeneous workers

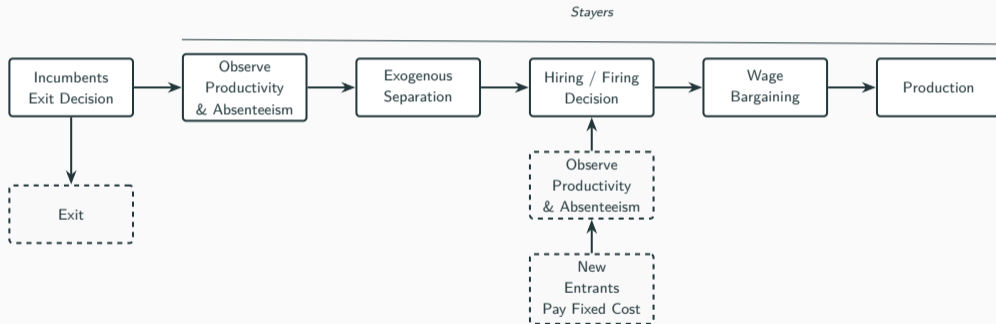
- firms are heterogeneous in two dimensions: productivity + absenteeism

$$z' = \rho_z z + \varepsilon_z, \varepsilon_z \sim N(0, \sigma_z)$$

$$\xi' = \rho_a \xi + \varepsilon_a, \varepsilon_a \sim N(0, \sigma_a)$$

- frictional hiring & firing
    - hiring costs: vacancy posting costs
    - firing costs: severance pay
  - wage bargaining: links firm-level absenteeism shocks to labor costs.
  - endogenous entry and exit: free entry pins down the labor market tightness ( $\theta$ ).

# Timeline of events within a period



- Firms that are hiring:

$$\begin{aligned}
 V^H(n, \xi, z) = \max_{h > 0} & \left\{ \exp(z) \underbrace{(\exp(\xi)(1 - \rho)n + h\mathbb{1}_+)}_{\text{Effective workers}}^\alpha - W - cv - cf \right. \\
 & \left. + \beta \max \left( \int V(n', \xi', z') dF(\xi', z' | \xi, z), -g(0, n') \right) \right\}, \quad (1)
 \end{aligned}$$

subject to  $h\mathbb{1}_+ = (n' - (1 - \rho)n)\mathbb{1}_+ = vq(\theta)$ .

- Firms that are firing:

$$\begin{aligned}
 V^S(n, \xi, z) = \max_{h < 0} & \left\{ \exp(z) (\exp(\xi)(1 - \rho)n + h\mathbb{1}_-)^{\alpha} - W - g(n', n) - cf \right. \\
 & \left. + \beta \max \left( \int V(n', \xi', z') dF(\xi', z' | \xi, z), -g(0, n') \right) \right\}. \quad (2)
 \end{aligned}$$

- **Current Hiring and Separation Margins.**

- Define the current marginal surplus with respect to effective worker  $\ell$  as  $J_\ell(n, z, \xi)$ .

Hiring boundary ( $\Delta n > 0$ ) :

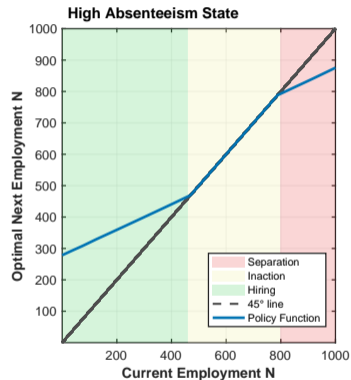
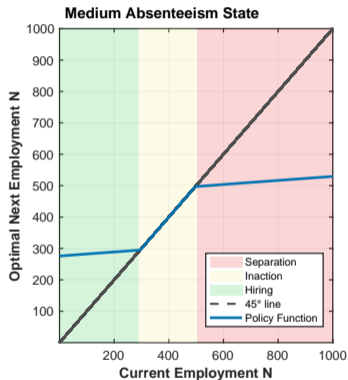
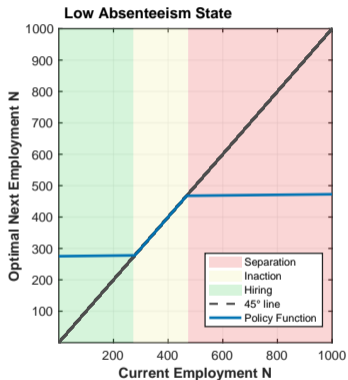
$$J_\ell(n, z, \xi) = \frac{c}{q(\theta)}. \quad (3)$$

Separation boundary ( $\Delta n < 0$ , with firing cost) :

$$J_\ell(n, z, \xi) = -S. \quad (4)$$

# How does absenteeism generate misallocation?

## Optimal Employment for different absenteeism states



- **overhiring**: firm hiring more
- **high inaction** due to increased labor input risk.

- The unemployed worker's Bellman equation is

$$Y = b + \beta \left( (1 - f(\theta))Y' + f(\theta) \mathbb{E}[W \mid \text{find job next period}] \right), \quad (5)$$

- **Employed Worker's Value When Present This Period.** Let  $\tilde{s}$  be the separation probability between firm and a worker.

$$W^P(n, \xi, z) = w(n, \xi, z) + \beta \mathbb{E} \left[ \rho Y' + (1 - \rho) (\tilde{s} Y' + (1 - \tilde{s}) W(n', \xi', z')) \right] \quad (6)$$

- **Absent Worker's Value** We assume that absenteeism affects the current period payoff while keeping the continuation value the same for workers.

$$\begin{aligned} W^A(n, z, \xi) &= \beta Y' + \beta(1 - \rho) \mathbb{E} \left[ (1 - \tilde{s})(W(n', \xi', z') - Y') \right] \\ W(n, z, \xi) &= \exp(\xi) W^P(\xi n, z, \xi) + (1 - \exp(\xi)) W^A(n, z, \xi) \end{aligned} \quad (7)$$

## Wage determination

- **Determination of contracts.** for  $w$ , solve the following Nash problem

$$\max_w \left( W(n, z, \xi) - Y \right)^\eta \left( J_\ell(n, \xi, z) \right)^{1-\eta} \quad (8)$$

- The sharing rule at the hire boundary,

$$W(n, z, \xi) - Y = \frac{\eta}{1-\eta} J_\ell(n, z, \xi), \quad J_\ell(n, z, \xi) = \frac{c}{q(\theta)}, \quad (9)$$

- **The wage equation is**

$$\tilde{\eta} w(n, \xi, z) = \eta \left[ F_\ell(n, \xi, z) - w_\ell(\ell, z, \xi) \ell + \beta f(\theta) \frac{c}{q(\theta)} \right] + (1-\eta)b. \quad (10)$$

## Quantitative Implications

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# Calibration Table

Parameter	Value	Description	Moment	Model	Data
<i>Panel A. Internal Calibration</i>					
Firm Dynamics					
$c_f$	3.1	Fixed cost	Employee share: Bottom 50%	15.2%	5.4%
$c_e$	13.4	Entry cost	Entry Rate	8.8%	8.8%
$n_e$	5	Entrant size	Relative entrant size	0.50	0.43
$c$	0.5	Hiring costs	Hiring Rate	30%	24%
$S$	0.015	Separation cost	Separation Rate	20%	20%
Absenteeism					
$\rho_a$	0.45	Persistence in Absenteeism	Mean Absenteeism	8.5%	8.5%
$\sigma_a$	0.56	Dispersion in Absenteeism	S.D. Absenteeism	6.8%	7.3%
Productivity					
$\rho_z$	0.85	Persistence in Productivity	Employee share: Top 5%	52%	65%
$\sigma_z$	0.29	Dispersion in Productivity	Employee share: Top 10%	42%	78%
<i>Panel B. External Calibration</i>					
$\alpha$	0.85	Returns to scale			
$\beta$	0.92	Discount rate			
$\eta$	0.44	Worker bargaining power			
$w_o$	1	Worker outside option			
$b_{sick}$	$0 \times w_o$	Wage for absent workers			
$\omega$	0.50	Matching function elasticity			
$m$	0.48	Matching function efficiency			

## Aggregate Implications: output and misallocation

$exp(\mu_a)$	36.8	100	182
	(1)	(2)	(3)
<b>Panel A. Implied Absenteeism Rate</b>			
Mean	3.1%	8.6%	15.3%
S.D.	2.7%	7.5%	13.7%
<b>Panel B. Aggregate Outcomes</b>			
Real Consumption	106.1	100.0	92.0
Total Non-absent Workers	104.3	100.0	94.4
Aggregate Productivity	101.7	100.0	97.4
Hiring cost (% of Output)	93.0	100.0	110.0
<b>Panel C. Misallocation Measures</b>			
Variance (Employment Growth)	102.0	100.0	99.3
Variance (Wages)	91.3	100.0	115.8
Variance (Marginal Product of Labor)	98.8	100.0	101.6

- Aggregate productivity goes down with high absenteeism risk.

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## Conclusion

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## What we document

- Absenteeism is widespread, unpredictable, and often announced at very short notice.
- It is associated with smaller firm size, higher labor costs  $\rightarrow$   $\uparrow$  strong co-worker complementarities.
- Firms cope by hiring buffer workers.

## What the model implies

- Absenteeism  $\downarrow$  aggregate productivity by  $\uparrow$  dispersion in the MPL across firms.
- It dampens firm dynamism: firms carry buffer labor;  $\Delta$  employment dispersion falls; entry falls

## Development & policy takeaways

- Absenteeism is a structural barrier to formal employment.
- Causes are multifaceted: agriculture/health plus social commitment shocks.
- Promising direction: flexible/shift schedules that manage absence risk while supporting skill formation and stable employment.

**Thank you for attending!**

Please send comments and questions to [sampreet.goraya@hhs.se](mailto:sampreet.goraya@hhs.se)

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# Appendix

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# Social Events and Worker Absenteeism

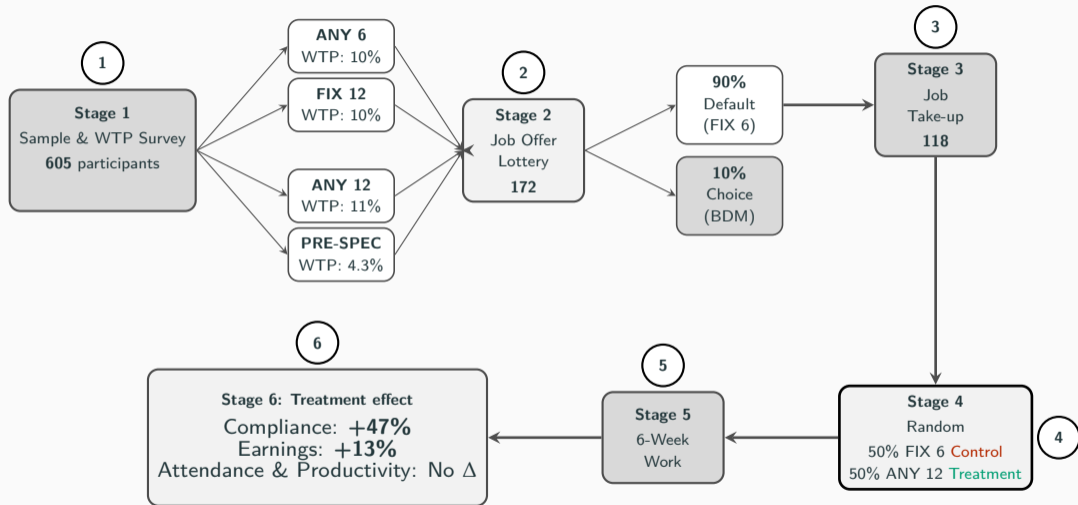
Dependent Variable: Absenteeism Rate					
	(1)	(2)	(3)	(4)	(5)
Share of Days with Festivals	3.386 (0.052) [0.000]	0.835 (0.033) [0.000]	0.810 (0.033) [0.000]	0.284 (0.052) [0.000]	1.193 (0.129) [0.000]
State FE	No	Yes	Yes	Yes	Yes
Sector FE	No	No	Yes	Yes	Yes
Month FE	No	No	No	Yes	No
Year FE	No	No	No	Yes	No
Month*Year FE	No	No	No	No	Yes
Dep Var Mean	7.695	7.695	7.695	7.695	7.695
N	2,278,916	2,278,916	2,278,916	2,278,916	2,278,916

► Main

## Social Events and Worker Absenteeism

	Dependent Variable: Log Value Added		
	(1)	(2)	(3)
Share Days Any	-2.894 (3.180) [0.363]	-0.197 (3.300) [0.953]	-2.883 (3.884) [0.458]
Share Days Any × High Complementarity		-5.817 (2.561) [0.023]	-5.896 (2.704) [0.029]
State FE	Yes	Yes	Yes
Year FE	Yes	Yes	Yes
Sector FE	Yes	Yes	Yes
Log GDPC Control	No	No	Yes
Dep Var Mean	16.916	16.916	17.233
Observations	227,530	227,530	164,682

# Workers experiment in a nutshell



Default FIX 6: can take off one fixed day a week as chosen by the worker

# Persistence in absenteeism

	(1)	(2)
	Log Absenteeism Rate	
	Monthly	Yearly
L.log(Absenteeism Rate)	0.876 (0.001) [0.000]	0.448 (0.003) [0.000]
Month-Year/ Year FE	Yes	Yes
Sector FE	Yes	Yes
State FE	Yes	Yes
Dep Var Mean	1.866	1.823
N:establishment-month/year	4,260,365	170,690

▶ Main

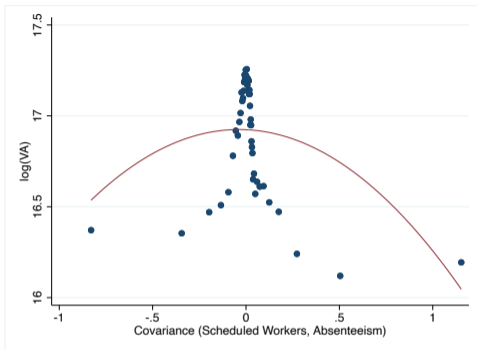
# Establishments unable to mitigate absenteeism through intertemporal reallocation of production.

- Decomposition:

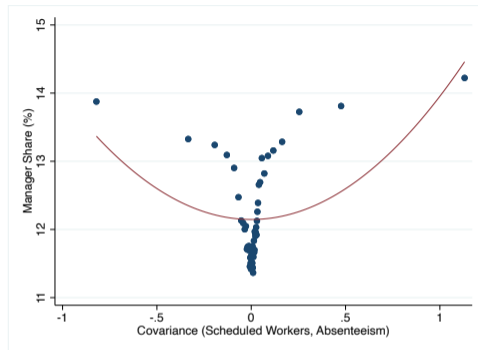
$$\underbrace{A_{ft}}_{\text{yearly absenteeism}} = \underbrace{\bar{A}_{ft}}_{\text{mean monthly absenteeism}} + \sum_m \left( \underbrace{S_{mft}}_{\text{share of workerdays scheduled}} - \bar{s}_{ft} \right) \left( \underbrace{A_{mft}}_{\text{monthly absenteeism}} - \bar{A}_{ft} \right).$$

- **Near-zero covariance** on average  $\Rightarrow$  firms do not shift worker-days toward low-absence months.
- Heterogeneity in reallocation:
  - larger firms are less agile (agility is lost with scale)
  - higher managerial capacity + correlate with more agility.

# Reallocation and Establishment Characteristics



(a) Establishment Size



(b) Managerial Share

**Figure 5:** Relationship between Covariance and Firm Characteristics

- **Large** behemoths are less agile
- Managerial ability can help reduce absenteeism risk.

## Fact 4: Worker absenteeism is linked to higher churning

	Hiring rate		Separation rate	
	(1)	(2)	(3)	(4)
Absenteeism Rate	0.016 (0.001) [0.000]	0.009 (0.001) [0.000]	0.024 (0.001) [0.000]	0.012 (0.001) [0.000]
Year-Month FE	Yes	Yes	Yes	Yes
Sector FE	Yes	No	Yes	No
State FE	Yes	No	Yes	No
Establishment FE	No	Yes	No	Yes
Dep Var Mean	1.263	1.259	1.183	1.180
N:establishment-month	2,849,868	2,846,333	2,849,868	2,846,333

- **Interpretation:** firms replace missing workers and adjust buffers in response to attendance risk.
- Highlights personnel/coordination costs beyond lost output.

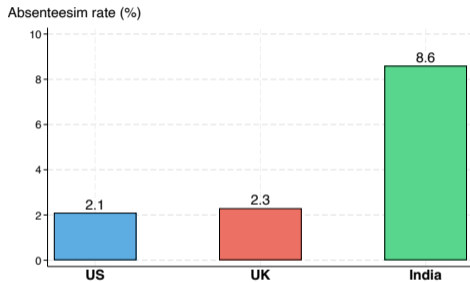
# Reasons for Absenteeism: Worker Survey

## Reasons for Absenteeism Among Workers

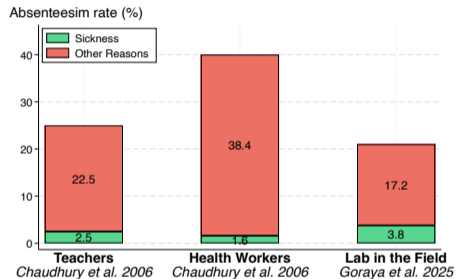
	Baseline worker survey Self-reported	Worksite survey Lab in the field
Domestic / farm work	45%	43%
Social commitments	25%	16%
Illness	19%	18%

▶ Main

# Absenteeism Comparison Across Countries and Sectors



(a) Across Country Comparison



(b) Indian Absenteeism Rate

▶ Main