# **Development Economics**

Slides 15

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### A substitute for land markets:

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### Sometimes complementary with land markets

- E.g., both follow the bullock distribution when that market collapses
- Or both can follow the wealth distribution
- In these cases, employers can rent in land and hire in labor.

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- Sometimes even placed into competition with each other ...
- ...though this could backfire

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- May serve in a supervisory capacity.
- Perform tasks that require special care and are harder to monitor:

e.g., application of fertilizer, pesticides or water.

In addition, they might perform "standard" tasks along with casual hires

e.g., participating in the harvesting process.

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#### The effects of base wage and piece rates on work incentives:



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Jayaraman et al 2018

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### Plucking:

- Several hundred fields, 2000 workers.
- Tea grows in rows pruned to resemble 1m tall hedges.
- Plucked by hand or shears, leaves collected in individual bags.
- 70% female (so are the supervisors)
- 65% permanent (median tenure 21 years)

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- Each gang has one supervisor.
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#### Contracts:

- Fixed baseline wages + piece rates
- Bags weighed daily: wages calculated on this basis.
- Wages paid monthly.



- A twist: Government-mandated increase in base wage.
- Over 30% increase in base wage: from Rs 77 to over Rs 100.
- Planter petitions sought a stay on the increase.
- Dismissed by the State High Court on August 27, 2008.
- In response, planters flattened the piece rate structure.
- Lack of deep pockets

### **Old Contract**

	SubStandard		Standard		Threshold 2		Threshold 3	
	Hands	Shears	Hands	Shears	Hands	Shears	Hands	Shears
Yield Class 2	0	0	23	28	34	39	50	55
Yield Class 3	0	0	28	33	44	49	59	64
Piece Rate (Rs.)	0.40 →		0.40 $ ightarrow$		0.55 $ ightarrow$		0.85 $ ightarrow$	

#### **New Contract**

	SubStandard		Standard		Threshold 2		Threshold 3	
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Yield Class 2	0	0	22	28	36	43	52	59
Yield Class 3	0	0	27	33	46	53	61	68
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## Idea:

- Estimate a "standard" model off the pre-contract data.
- Apply it "out of sample" to the post-contract data.
- Model
- Observe a shock  $\mu$ , then choose y to maximize

$$w(y) - \frac{\mu}{\theta} \left[ e^{\theta y} - 1 \right]$$



- minus a supervisory penalty for not meeting absolute output minimum.
- $\theta$  measures curvature of effort disutility.

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- minus a supervisory penalty for not meeting absolute output minimum.
- $\theta$  measures curvature of effort disutility.
- **Exercise.** Given w(y), estimate  $\theta$  and parameters of  $\mu$ .

# Estimation Procedure using 2007 Treatment Plantation

[simplified]

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**Step 3.** Choose best fit. Repeat Steps 1–2 for 200 possible values of  $\theta$  on a grid.

- Match simulated data to actual 2007 data.
- Obtain  $\theta = 0.9$ , select as estimate.

# Actual Vs Simulated, 2007



Data	Mean	Median	SD	Skewness	Kurtosis	Interquartile Range
Actual	32.39	32.00	6.61	0.35	3.89	8.43
Simulated	32.65	32.36	7.54	0.03	3.27	10.39

# Predicting the 2008 Post-Contract Outcome



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# **Prediction Minus Actual**



Weekly average

Two-day moving averages

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- And yet: a subsequent reversal:
- Initial increase is comprehensively eroded (4th month, last 2 weeks).
- Standard model estimated off pre-change data works well.
- **Classical incentives** appear to ultimately dominate
- despite a possibly "behavioral" response in the shorter term.

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- Immediate payoff to worker:
- $w_p x$  if he works.
- $\mathbf{w}_p$  if he shirks, so x is also the gain made from shirking.
- Punishment for shirking:
- Can only get access to casual labor contracts thereafter.
- Can get access to permanent contracts with some probability (more complex)

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- But that argument leads to a question.
- In what way is the longer-term employee held accountable?
- Repay past wages? Very unlikely.
- Fire the employee? More likely.
- ⇒ Long-run contracts → **payments that strictly exceed outside options**.

#### Self-enforcement constraint:

$$\frac{w_p - x}{1 - \delta} \ge w_p + \delta \frac{w_c}{1 - \delta}$$

which on rearrangement yields:

$$x \leq rac{\delta}{1-\delta}[(w_p-x)-w_c]$$
 or equivalently,  $x \leq \delta(w_p-w_c).$ 

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#### Variation:

- Possible re-employment in permanent labor contract with probability q.
- First calculate the value after he is fired:

$$V = q\frac{w_p - x}{1 - \delta} + (1 - q)[w_c + \delta V]$$

Post-firing value:

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$$V = q \frac{w_p - x}{(1 - \delta)[1 - \delta(1 - q)]} + \frac{(1 - q)w_c}{1 - \delta(1 - q)}.$$
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Combining (1) and (2) and after some elementary algebra:

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Combining (1) and (2) and after some elementary algebra:

$$x \le \delta(1-q)(w_p - w_c).$$

- For any  $w_c$ , employer will offer  $w_p$  just enough for this to hold with "=".
- Again, note endogenous wage differential:  $w_p x > w_c$ .

#### Endogenous wage differentials:

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- Everyone would like to work as a permanent laborer
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- Notice how the same person gets paid differently in different sectors:
- Everyone would like to work as a permanent laborer
- But they cannot credibly undercut the wage.
- The larger the effort cost *x*, the higher the wage **net** of effort cost!
- Can apply this observation over a cross-section of industries.
- Think about large firms, or more complex tasks, or group-based tasks
- Will typically command higher wages

#### How to solve it:

- Recall  $x = \delta(1-q)(w_p w_c)$ , so  $w_p$  moves in tandem with  $w_c$ .
- $\Rightarrow$  a downward-sloping labor demand curve for all labor combined.

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Casualization? Recall 
$$x = \delta(1-q)(w_p - w_c)$$
, so that:  

$$\frac{x}{w_c} = \delta(1-q)\left(\frac{w_p}{w_c} - 1\right).$$

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#### Market tightening can lead to an increase in permanent labor.

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So q rises, and using:

$$\frac{x}{w_c} = \delta(1-q) \left(\frac{w_p}{w_c} - 1\right),$$

we see that  $w_p/w_c$  could now rise.

#### $\Rightarrow$ incidence of permanent labor could fall.

We return to a combination of these effects in the next topic.

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- q may or may not depend on the overall employment rate: q(e).
   Why might it? And what form would this dependence take?
- New version of equilibrium equation:

$$\frac{x}{s} = \delta(1 - q(e)) \left(\frac{w}{s} - 1\right).$$

where q increases with e.

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- Allows us to draw "supply-demand diagrams" in a different space:
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#### Changes in labor demand and supply:



Increase in labor demand

Decrease in labor supply

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   See also:
- insurance contracts with reciprocity
- land contracts with eviction

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- Moral hazard plays a central role
- Subtle interplay between employment and the outside option
- Involuntary unemployment and wage differentials are "natural" outcomes.
   See also:
- insurance contracts with reciprocity
- land contracts with eviction
- Most importantly, what looks like a fractured market may well be a second-best response to deep problems of adverse selection and moral hazard.