Rural Labour Markets

Fall 2010
Example: Labour Markets in the ICRISAT Villages

- Mahbubnagar and Akola in Maharastra
  - hired labour constitutes 60–80% of total

- Casual labour:
  - hired on a day-to-day basis
  - high turnover rates
  - high rates of unemployment (esp. off season)
  - some paid on a piece rate basis (harvesting)
  - others with daily wages
Permanent Labour: “regular farm servant”

- contractual period: 3 to 12 months (often renewed)
- verbal contracts
- hired by wealthier landed households
- earn higher wages than casual labourers
- increasing contract violation since 1980s
The Neoclassical Labour Market

- No distinction between casual and long-term labour
- No distinction between numbers of workers and labour power (nutrition)
- Assumes away problems of asymmetric information
- No involuntary unemployment
- Ignores uncertainty
Energy Use

- Resting Metabolism
  - body temperature, heart, respiratory action
  - minimum energy for resting tissues and cell membranes
  - FAO estimate: 65 kg male requires 1700 kcal per day for this

- Energy required for work
  - depends on type and intensity of work
**Energy Balance**

- **Energy Input**
  - determined by food which is in turn determined by labour supply and non-labour income (e.g. land)

- **Storage and Borrowing**
  - in short run:
    
    \[
    \text{energy deficit} = \text{energy use} - \text{energy input}
    \]

- Met by running down stores in human body
  - sustained deficit leads to undernutrition, illness and, ultimately, death
The capacity curve

- at low incomes most nutrition used to maintaining resting metabolism
- little extra energy left over for work
- once critical nutrition level achieved, work capacity increases rapidly
- eventually diminishing returns to nutrition due to natural limits
Figure: Work Capacity Curve
Piece Rates

assume income received on the basis of tasks completed:

\[
\text{Piece Rate} = \frac{\text{Income}}{\text{Work Output}}
\]

Figure: Piece Rate
Labour Supply

→ how does capacity supplied vary with income?

→ assume worker maximizes her income

Figure: Determination of Labour Supply
Figure: Labour Supply Curve
Figure: Equilibrium
Implications

- **Involuntary unemployment**
  - Employers will not reduce piece rate below $v^*$ despite unemployment, because this will reduce work capacity.

- **Viscious cycle**
  - Lack of job opportunities
  - Low income
  - Low nutrition
  - Low capacity to work
  - Less access to labour markets
Dynamics of Nutritional Status

- low wages paid today
  ⇒ low nutritional status in the future
  ⇒ reduced productivity

- if probability of hiring same worker again is low
  ⇒ employers do not take full account of impact of wage on nutritional status
Example

- Worker’s “reservation” wage = $5
- Minimum wage to maintain nutritional status = $7
- Current value of work effort = $10
- If $w < $7 nutritional status deteriorates $\Rightarrow$ productivity falls to $7
- Two employers: E1 and E2
  - Random matching of workers with employers $\Rightarrow$ probability or re-hiring a worker = 1/2
Payoffs to $E_1$:

<table>
<thead>
<tr>
<th>Wage</th>
<th>Profit Today</th>
<th>Profit Tomorrow</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>$w = 7$</td>
<td>$10 - 7$</td>
<td>( \begin{cases} 10 - 5 &amp; \text{if } E_2 \text{ pays } $7 \ \frac{10}{2} + \frac{7}{2} - 5 &amp; \text{if } E_2 \text{ pays } $5 \end{cases} )</td>
<td>8</td>
</tr>
<tr>
<td>$w = 5$</td>
<td>$10 - 5$</td>
<td>( \begin{cases} \frac{10}{2} + \frac{7}{2} - 5 &amp; \text{if } E_2 \text{ pays } $7 \ 7 - 5 &amp; \text{if } E_2 \text{ pays } $5 \end{cases} )</td>
<td>8.5</td>
</tr>
</tbody>
</table>

Payoff matrix:

\[
\begin{array}{c|cc|cc}
\multirow{2}{*}{$E_1$} & \multicolumn{2}{c|}{$E_2$} & \multicolumn{2}{c}{\text{Total}} \\
& \text{w = 7} & \text{w = 5} & \text{w = 7} & \text{w = 5} \\
\hline
\text{w = 7} & 8, 8 & 6.5, 8.5 \\
\text{w = 5} & 8.5, 6.5 & 7, 7 \\
\end{array}
\]
Nash equilibrium: both employers pay $5

Superior outcome (both for wages and profits) is to pay $7

BUT each employer will deviate if he thinks the other is paying $7

“Prisoner’s dilemma”

if situation is repeated over time

continuous degradation of nutritional status
Permanent Labour Markets

- Also referred to as “tied” or “attached” labour

- Two main theories of why permanent labour markets arise:
  1. to provide incentives for workers performing specialized tasks that are difficult to monitor
  2. as a substitute for casual labour markets where there is risk and imperfect credit markets
To Induce Effort on Non–Contractible Tasks

- Employer induces effort by paying a high wage and threatening to end contract if the worker “shirks”

- **Example:**
  - \( w_c = \) wage in casual labour market
  - \( w_p = \) permanent wage
  - \( L_c = \) casual labour force
  - \( L_p = \) permanent labour force
  - \( e = \) work effort required of permanent labour
  - \( N = \) mental planning horizon
Payoff to not shirking:

\[ w_p - e + N(w_p - e) \]

Payoff to shirking:

\[ w_p + Nw_c \]

To induce effort employer must set the permanent wage so that

\[ (N + 1)(w_p - e) \geq w_p + Nw_c \]

which implies

\[ w_p = w_c + \left( \frac{N + 1}{N} \right) e. \]

last term is a “bribe” not to shirk

Relative wage

\[ \frac{w_p}{w_c} = 1 + \left( \frac{N + 1}{N} \right) \frac{e}{w_c}. \]
Demands for both types of worker rise, pushing up $w_p$ and $w_c$. 

$\frac{w_p}{w_c}$ falls 

$\frac{L_p}{L_c}$ increases 

Consistent with some empirical studies on agricultural booms 

But inconsistent with long term trend
Tied Labour and Seasonal Fluctuations

- If workers are more risk-averse than employers, they may accept a lower average wage in return for transferring the income fluctuations to the employer.

- Why do permanent labour contracts become less prominent as economy develops:
  - decline in seasonality
  - greater access to credit
  - greater opportunities (e.g. manufacturing) may reduce enforceability
Figure: Fluctuation aversion
Intermediate Societies

- General problem of “unbalanced” economic development:
  - increased mobility, wealth and change in some sectors
  - reduction in long-term, informal contracts based on trust and reciprocity.
  - once economy is sufficiently wealthy, can be replaced with formal contracts supported by more advanced information and legal systems

- BUT there may be a phase in which it becomes an intermediate society
  - growth in advanced sectors undermines traditional institutions