

AGRARIAN INSTITUTIONS

BINSWANGER & ROSENZWEIG: “Behavioural and Material Determinants of Production Relations in Agriculture”

Motivation

Establish framework for analyzing major institutions governing production and exchange of output and primary factors of production in rural areas of LDCs.

Features

- **Risk**
- **Information** constraints
- Applicable to **land-scarce** environments

Focus

- Inter-temporal markets (or non-existence) – credit and insurance
- Family size and factor productivity
- Scarcity of animal rental markets and use of animals as collateral
- Land tenure/rental forms
- Existence of plantations for certain crops

Topics

- (1) Distribution of operational and ownership holdings
- (2) Tenancy
- (3) Factor rental and sales markets
- (4) Plantations
- (5) Farmsize-productivity relationships
- (6) Impact of different forms of tech change on factor markets
- (7) Absence of animal rental markets
- (8) Importance of land as collateral
- (9) Co-existence of plantations and small farms for some crops (but not others)
- (10) Interlinked contracts
- (11) Dominance of distress sales in land sales markets
- (12) Renting out of land by small landholders
- (13) Dominance of family farms

Individuals' Problem

- (1) Achieve high levels of income, consumption & leisure
- (2) Even out income and consumption over time (and avoid risk)

Typically it is assumed that (1) and (2) can be addressed separately – i.e. by assuming complete current and intertemporal markets. Binswanger and Rosenzweig do not make such an assumption.

ASSUMPTIONS ABOUT RISK AND INFORMATION COSTS

- A1** Risk is pervasive in production, the market and the environment
- A2** Information acquisition and transmission is costly (and is most cheaply acquired as a by-product of own production and consumption activities)
- A3** Individuals maximize utility, value consumption, dislike effort
- A4** Individuals value consumption
- A5** Individuals dislike effort
- A6** Individuals are generally risk averse

CONSEQUENCES OF RISK AND INFORMATION COSTS

- C1 Asymmetric information** (A2 & A3)
- C2 Incentive problems** (A2 & C1): moral hazard, adverse selection, screening problems
- C3 Imperfect enforcement of property rights** (C1) → legal and cultural institutions that reduce information costs (or increase penalties for theft) are adaptations to this problem
- C4 Insurance** is desirable (A1 & A6)
- C5 Collateral requirements**

$$E(L) = Li(1 - \pi) + (C - L) \pi,$$

where $E(L)$ = expected return on loan; π = probability of default; and C = size of collateral

- By raising C , expected rate of return on a loan – $E(L)/L$ – can be driven above i (i.e., can circumvent interest rate ceilings, e.g., pawnshops).
- Interest and collateral are substitutes
- Collateral shifts some risk from lender to borrower
- Loan terms will depend on personal characteristics such as reputation, mobility, and risk aversion (unlike goods transactions)

C6 Credit Markets

- Where collateral is essential, no credit market exists for groups of individuals who do not own assets acceptable as collateral
- Credit substitutes for insurance when insurance markets don't exist

C7 Forms of Collateral: collateral must:

- Be appropriable
- Not be at risk for losing value (e.g., land over animals)
- Accrue returns to the borrower over the term of the loan

C8 Collateral Substitutes

- Third party guarantee
- Loss of future borrowing opportunities (reputation)
- Tied contract

C9 “Collateral value” of an asset

- When insurance markets are poorly developed, an asset that can be used as collateral will have a value greater than the utility of its consumption or production stream
- This additional premium will be reflected in the good's sale price (but not rental price, since it's ownership that confers this premium)

ASSUMPTIONS ABOUT AGRICULTURE

- A7 Agriculture is spatially dispersed
- A8 Transport and travel costs are high
- A9 Agriculture is seasonal
- A10 Within regions, crop cycles & operations are synchronous
- A11 Information acquisition and transmission is costly
- A12 Four sources of risk
 - (1) Yield
 - (2) Market prices
 - (3) Timing (i.e., weather)
 - (4) Breakdowns (e.g., machines break, animals die)
- A13 Covariate yields

CONSEQUENCES FOR INTERTEMPORAL MARKETS

C10 Absence of crop insurance due to:

- Information asymmetries cause difficulty in monitoring actual yields, measuring expected yields \Rightarrow **high program costs**
- **Incentive problems** (moral hazard, adverse selection) – this prevents distant agents from offering insurance
- High **covariance** of risks prevents local insurance

C11 Limitations on local financial intermediation

- If depositors and borrowers are both engaged in ag, both will want money at precisely the same time \Rightarrow boom and bust
- Covariance of yield risk \Rightarrow covariance of default risk

IMPLICATIONS FOR FACTORS OF PRODUCTION

I. Labor

Asymmetric info + disutility of work = **incentive problems whenever worker is not residual claimant**

Reducing this incentive problem is an important consideration

- **Piece rates** dominate, but only feasible when output is measurable (both qualitatively and quantitatively)
- **Family members** less of a risk than hired laborers (better incentives)
- Supervision difficulty increases with number of laborers \Rightarrow **labor costs per worker rise with farm scale**
- Optimal family (or permanent labor supply) lies between peak labor demand and minimum (slack season) labor demand

II. Animals

Animals (and machines) are fragile \Rightarrow **owner won't rent/lend animals unless he supervises and maintains them as well** (hence bullock+driver is the norm).

III. Management

Two elements to management: (1) Supervisory skill
(2) Allocative efficiency skill

- Returns to supervision fall with scale of operation (farm size)
- Returns to allocative efficiency rise with scale of operation (farm size)

IMPLICATIONS FOR LAND RENTAL MARKETS

Land holdings confer collateral value, but whether or not bigger is better depends on whether there are land rental markets.

Forces motivating rental market

- Landless person with animals and mgmt skills is better off renting in land than renting out those assets separately (because of maintenance, monitoring problems)
- Large landowner is better off renting out land than hiring laborers because of supervision problems
- Both of these tend to cause the distribution **operational holdings** to be **more equal** than the distribution of **ownership holdings**
- On the other hand, small owners without animals will tend to rent out their land. This will tend to make operational distribution less equal than ownership distribution

IMPLICATIONS FOR LAND SALES MARKETS

Land sales are unlikely during normal weather periods due to the spatial correlation of yields/incomes and collateral value of land

Supply side

- Landowners only better off selling if alternatives to ag (uses of sales proceeds) > stream of income from land (from self-cultivation or renting out) **plus** land's collateral value.
- This is unlikely if non-agricultural opportunities are limited
- Collateral value of land makes it even more unlikely
- Sales price unlikely to reflect seller's plot-specific knowledge

Demand side

- Bidders for land constrained by level of self-generated savings: it's **self-defeating to mortgage land to finance additional land purchases**
- Mortgaged land has no collateral value; rather it is used to finance **working capital**

Covariance issues

- When savings are high (in good years) there will be lots of potential buyers, but few sellers
- In bad years, savings would be low and hence there would be buyers, lots of sellers
- In very bad years, the only ones able to purchase land would be moneylenders
 - ⇒ distress sales (without resale, since land price is low)
 - ⇒ concentration of land holdings
- **Barring tenancy unlikely to alter pattern of land sales (if anything it would make it harder for landless to save)**

CONSUMPTION AND INCOME SMOOTHING

MOTIVATION:

Large risks in LDC agriculture + Poorly developed markets

- ➔ Fine line between bad growing season and malnutrition/starvation
- ➔ Need for HHs to find ways smooth consumption & income flows

Questions

1. What sorts of risk abating mechanisms are available?
2. Can they be improved?
3. What are the implications for economic inequality caused by differential access to risk mitigation?

TOWNSEND: THREE QUESTIONS

1. How covariate are risks?

- If shocks are idiosyncratic then local pooling or insurance is feasible
- If shocks are aggregate shocks common to the population, then insurance is not feasible

2. What markets/technologies are available for managing risk?

- Storage
- Land fragmentation (i.e., multiple, spatially diverse holdings)
- Real or financial assets
- Solidarity networks of family and friends

3. What financial institutions are available to supply insurance?

- Village level banks
- Credit unions
- Local money lenders
- National banks
- Rural credit programs

THE THEORY OF FULL INSURANCE

1. If households are risk averse and risks are entirely idiosyncratic, then households have incentive to group together to share (pool) all risks.
2. If risks are pooled, then household consumption variability (C^i) should exactly co-move with village consumption variability (C^G), and be unaffected by household-specific income (Y^i).

$$\rightarrow \ln C^i = \beta \ln C^G + \phi \ln Y^i$$

$$H_0: \beta = 1, \phi = 0$$

- Can also be expressed in terms of growth rates
- Can also substitute village averages for individual household consumption, regional/national averages for “Group” averages
- Can use levels instead of logs

ANSWERS TO TOWNSEND'S THREE QUESTIONS:

1. Income Covariance

- Evidence from India, Thailand, and Ivory Coast indicate that **individual household incomes vary more than village averages**
 - Limited household level diversification in ICRISAT data
 - Considerable variation in income growth rates across counties in a given region of Thailand; same for Ivory Coast
- ➔ **Covariate (village) income risks not as great as thought *a priori***
- ➔ **Considerable scope for insurance**

Empirical Evidence on Full Insurance

India: ϕ is very small (as low as .14) but significantly greater than zero
 β is significantly greater than zero, less than 1
➔ partial insurance
➔ Measurement error???

Thailand: Robust rejection of both full and non-insurance
More risk sharing for farmers than for entrepreneurs

Ivory Coast: Similar to India

Paxson (Thailand): Using savings as dep. var., found $\phi = 1$

2. Risk Management (Smoothing) Mechanisms

- Purchase/sale of **durables, livestock do not play much of a role**
- Crop inventories important in Shirapur
- Currency important in Kanzara
- Credit important in Aurepalle
- Spatial marriage contracts seem important in India (Rosenzweig)
- Land ownership related to relative importance of different mechanisms
 - Large landowners rely more on inventories
 - Small holders & landless rely more on currency
- Migration/remittances in Thailand
- Family networks in Ivory Coast
- Other indigenous networks, arrangements that may deteriorate with “modernization”

***Bottom Line:* Incredible heterogeneity in relative importance of different risk management mechanisms**

But this heterogeneity defies easy “programming”

MORDUCH: CONSUMPTION SMOOTHING VS. INCOME SMOOTHING

Motivation:

1. Many missing and/or imperfectly functioning markets
 2. Lots of behavioral and institutional responses to these mkt failures
 - Empirical evidence suggests that there are holes in effective insurance and credit markets, but these are smaller than previously thought (although disproportionately larger for poorer households).
 - To the extent that endogenous/indigenous mechanisms exist, public insurance/credit schemes may crowd out other mechanisms.
 3. Two types of risk-coping mechanisms:
 - a. **Income smoothing** via making **conservative choices in** production or employment strategies and via **diversifying** economic activities
 - b. **Consumption smoothing** via borrowing/saving, depleting/accumulating nonfinancial assets, formal/informal insurance
- **You can't just look at consumption variability/smoothness and know which mechanism is at work!!!**
 - **Income smoothing will take place when credit or insurance are unavailable.** Since this typically involves sacrificing profits for less variability, there are social and individual costs involved:
 - **There are health and education effects from income variability too**
 - Girl survival rates in India (Rose)
 - Anthropometric measures in Bangladesh (Foster)
 - Educational attainment in South India (Jacoby and Skoufias)
 - These provide additional reasons for income smoothing!

Separability/nonseparability issues

- If in fact consumption smoothing is perfectly feasible– i.e., if there are complete markets for insurance/credit – then income smoothing becomes a non-issue. Households will maximize expected profits and achieve consumption smoothing in alternative ways.
- But when consumption smoothing is not complete (as the empirical evidence seems to indicate) then income smoothing plays a role.
- **Some empirical evidence suggests that poorer farm households are more prone to borrowing/insurance constraints → income smoothing more important**

Of course, these are precisely the households most restricted in their ability to finesse risks.

FORMS OF INCOME SMOOTHING

1. Use Variability reducing inputs and techniques

- More family labor
- Less fertilizer
- Traditional varieties (?)

2. More conservative, less profitable production activities

- Delayed planting
- Different crop mixes (drought staples), more different crops
- Intercropping

3. Income source diversification

- Off-farm agricultural labor
- Off-farm non-agricultural labor
- Migration

4. Tied-labor contracting

- Accounts for 1/3 of ag labor relationships in India (according to surveys)
- Permanent labor contracts mitigate slack season consumption risk for workers, peak season bottlenecks for employers

FAFCHAMPS: SOLIDARITY NETWORKS

Definition: Solidarity networks are mutual insurance mechanisms that have evolved in pre-industrial communities.

Features: (1) Highly informal

(2) More common in “primitive societies” with weak central authorities

Examples:

- Grain transfers
- Credit (consumption, production loans)
- Labor sharing in hard times (esp. for sick, old)
- Gifts (food, money) in bad times
- Remittances
- Child adoption (temporary or permanent)

I. EXPLANATIONS: NOBLE PEASANTS VS. OPPORTUNISTIC SAVAGES

Scott: Reciprocal solidarity mechanisms to insure minimum subsistence

Popkin: Documented opportunistic behavior (shirking, free-riding). But why the persistence of solidarity networks.

Posner reconciled these opposing views: Mutual solidarity system can be sustained in the **long run** by the existence of a lasting **relationship between self-interested members.**

Evans-Pritchard: “It is scarcity not sufficiency that makes people generous”

➔ **Solidarity networks as endogenous institutional responses to uncertain survival**

II. LESSONS FROM THE THEORY OF REPEATED GAMES

1. **Prisoner's dilemma:** All can benefit from cooperation, but opportunistic behavior (e.g., shirking) is advantageous in the short run

2. **Punishment/reward:** Theory of repeated games indicates that cooperation can be sustained if it can be rewarded and opportunistic behavior today can be punished in the future

- Participation is voluntary
- Punishment will be accepted if $U(\text{punishment}) > U(\text{non-participation})$
- The more likely people are to starve if they're on their own, the harsher the feasible penalties for breach of promise
 - ➔ The greater incidence of solidarity networks in harsh environments
 - ➔ Economic prosperity undermines solidarity

3. **Multiple equilibria:** This accounts for the variety of different solidarity systems that arise in similar conditions (cross-sectional variation)

4. **Finite Lives:** People don't live forever, but...

- At any point in time there is a $\text{Prob}(\text{death}) \neq 1$.
- Bequest motives
- Young people more likely to want to abandon older people
 - ➔ Possibly this explains clash between young and old in many places in Africa

III. IMPERFECT MONITORING

1. Income & Wealth

- *Signals* – some more informative/observable than others (crops vs. wages, remittances, livestock income)

- *Self-revelation*

- ➔ Some misrepresentation possible, but often observable after the fact (can trigger penalties)

- ➔ Weddings, funerals, births particularly observable

- *Secrecy*

- ➔ In consumption (e.g., Bram's villages)

- ➔ In storage (but note Indian anti-stockpiling laws)

- ➔ Livestock

2. Effort

- Moral hazards have effects identical to those of sharecropping

- ➔ Less than optimal effort because individuals capture only a fraction of the marginal product of their labor

- An alternative is guaranteed subsistence financed by lump sum “fees”

3. Ex ante Solidarity

Reduces incentive problems by preventing a shortfall, thereby (a) reducing moral hazards; and (b) reducing social waste.

Examples:

1. **Labor assistance/sharing** during cropping season – better to salvage crops than to wait for crops to fail and provide ex post insurance
2. **Land borrowing (W. Africa)** – Better to lend out excess land than cultivate it with hired labor, since households that are short of land will be short of food at harvest time.
3. **Food loans during cropping season** – keep workers productive

IV. INDIVIDUAL WEALTH ACCUMULATION

- Protects against collective (non-idiosyncratic) risks
- Increases the likelihood of (wealthy) individuals defecting

****MAY LIE AT THE HEART OF “PATRON-CLIENT” RELATIONSHIPS****

- ➔ Patrons gain social stature, ability to “exploit” clients
- ➔ Clients secure some insurance

V. BREAKDOWN OF THE SYSTEM

Entitlement literature: Some groups thrive during famines.

Possible explanation: Poorest members accept possibility of being “shut out” in the worst times in order to be insured during “normal” times

- ➔ **“When you ain’t got nothin’ ya got nothin’ to lose”**