

Insurance I

12/02/2008

Today's Agenda

1. Finish up interlinked transactions
2. Alternative Credit Policies (14.5)
3. Insurance (15.1-15.2)

So far--

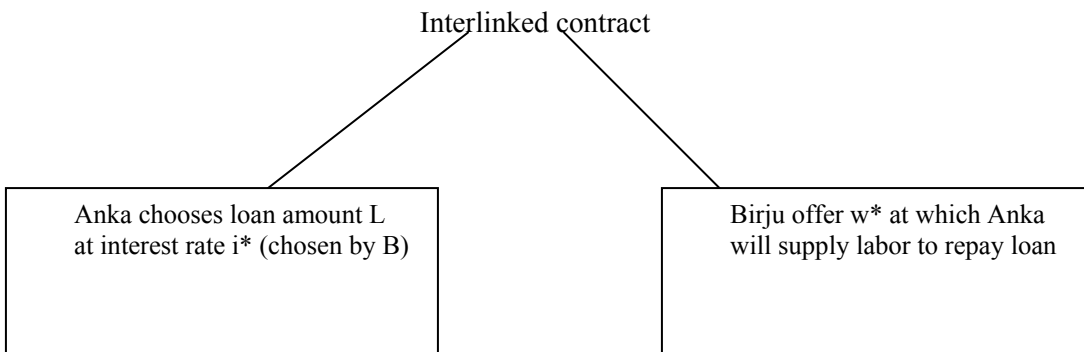
- We see a lot of interlinked transactions in data
- Modeling such interlinked credit contracts

E. Interlinkages & creation of an efficient surplus

- Interlinkages may lower “distortions” that cause loan amounts to be inefficient (there is a higher total surplus possible)
- Loan amount at going rate may be less than what the lender would actually like to provide—interlinkages prevent this
- Let's see some examples

1. *Credit-Labor interlinkages*

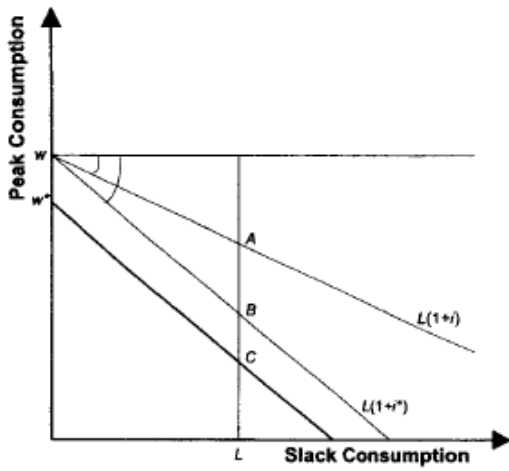
- Anka is rural laborer who must feed herself through slack and peak season
- She earns wage w in peak season, but zero in slack season
- She cannot save and must borrow in slack season
- Birju is a large landlord who hires labor in peak season
- He also has access to funds, he can get interest rate i in formal sector
- Birju and Anka can interlink labor-credit contract.



- What does it mean if $w^*=w$ and $i^*=i$?
- How will i^* and w^* be chosen?

- Following figure shows the total return to Birju from a contract of the form (w^*, i^*)

$w^* < w$ & $i^* > i$
 Loan is repaid with interest
 in both cash & labor



$w^* < w$ & $i^* < i$
 Loan subsidized in cash terms
 repaid in labor only

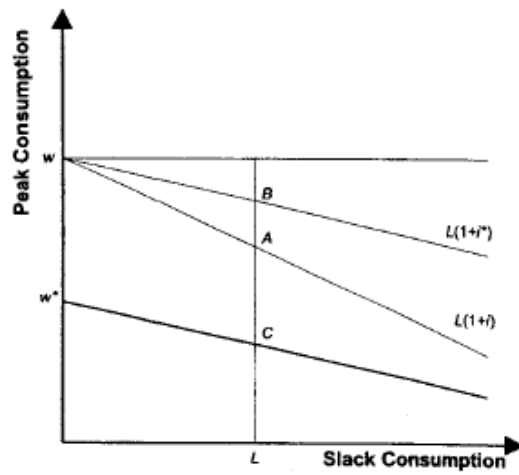


Figure 14.4. Birju's return from a contract (w^*, i^*) .

- Total return to Birju $AC = AB$ (interest return) + BC (employment return)
- The next figure shows Anka's preference over loans represented by indifference curves

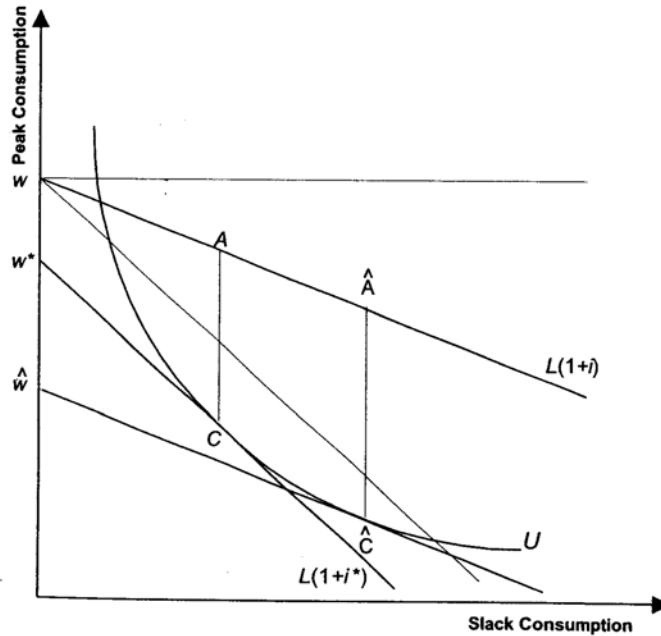


Figure 14.5. Anka's return from a contract (w^*, i^*) .

- Given some contract (w^*, i^*) , what is Anka's budget line?
 - We see that her utility-maximizing bundle is C, Birju's profit is AC
 - Can we make Birju better off without lowering Anka's utility i.e. make a Pareto-improvement?
 - A-hat, C-hat achieves this—Birju should lower wage and interest rate
 - Thus, the interlinked contract dominates—no extra interest charged on loan, all payments made in "labor unit"
 - Intuition—the contract that maximizes surplus is the one that taxes her labor but does not distort her loan incentives. Similar to the argument between lump-sum vs. on-the-margin tax
2. *Credit-Output interlinkages*
- Another possible distortion in credit contracts—from production loans
 - Rahul is a small rice farmer
 - Ayesha is a rice trader
 - Rahul sells crop to Ayesha who markets it, he also needs working capital loan as an input to production
 - Ayesha can get loans from formal sector at rate i
 - Figure below denotes production function

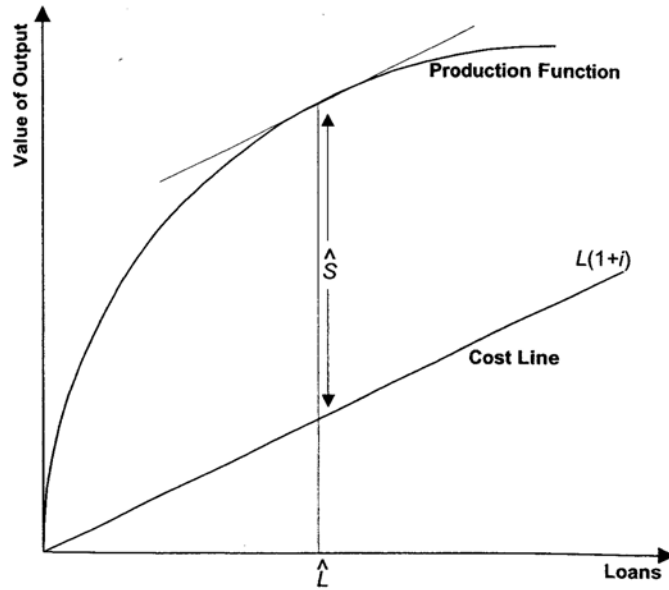


Figure 14.6. Working capital, output, and interest.

- Total cost of getting loan is cost line
- Say Rahul could get loans at rate i as well, then what loan size would he choose— S -hat
- So S -hat is the maximum **total** profit that can be generated
- But Rahul cannot get loans at this rate because of imperfect credit markets and thus, he approaches Ayesha for a loan (his outside option is some A)
- Thus S -hat- A is the maximum amount Ayesha can expect to get out of Rahul
- She offers a contract of the form (p^*, i^*) where p is the price she buys rice from Rahul—an interlinked contract
- What is the pure credit contract (that is, when $p=p$)?



Figure 14.7. A pure credit contract.

- Now, Ayesha's is CD , Rahul's profit is BC

- Total is $BC+CD < S\text{-hat}$
- Is there a better contract around?
- Such a contract would make Rahul choose $L\text{-hat}$, but give Ayesha more surplus
How can we find this?

$$S\text{-hat} = pQ\text{-hat} - (1+i)L\text{-hat}$$

Imagine the contract being such that Ayesha is imposing a “tax” of t per dollar on the combined operation

$$tS\text{-hat} = ptQ\text{-hat} - (1+i)tL\text{-hat}$$

Define $p\text{-hat}$, $i\text{-hat}$ such that $p\text{-hat} = pt$ and $i\text{-hat} = (1+i)t$

By construction, this new contract is doing is implicitly allowing Rahul to borrow at Ayesha’s available rate and then taxed at rate t

So since his interest rate isn’t too high, his choice of loan isn’t distorted

Rahul makes A

Ayesha makes $S\text{-hat} - A$

- Note the interlinked contract involves lower price and an interest rate that is below the formal sector!

2. Alternative Credit Policies

- Large financial institutions cannot adequately serve rural credit needs due to lack of “microinformation”
- Two kinds of policy responses: expand loans to informal lenders & design credit organizations to harness information

A. Formal-informal linkages

- Formal sector lends to large landowners/traders who then cash in on their informational advantage in informal markets
- Expansion of credit to informal lenders increases competition among them, thus improving borrowing terms faced by individuals
- But does this work? Theoretically, answer is mixed.
 - Costs of monitoring:* Expansion of formal credit increases number of active moneylenders, thus increasing alternatives available to borrowers. Now there is a higher probability of default which raises monitoring costs for lenders.
 - Collusion:* Lenders agree not to invade each other’s clients thereby giving them local monopolies. “If you stay away, we will each maintain our monopolies and command higher rates of interest than we would under competition. But if you break agreement, competition resumes.” What factors will this agreement depend on?
 - Differential information:* If one lender has better information about riskiness of borrowers and siphons of good ones, then other lender may decide to exit market.
Example.

- **Conclusion:** Expansion of credit to rural sector does not guarantee lower interest rates for borrowers.

B. Microfinance

- Institutional/formal lending may incorporate some features of informal lending
- Grameen Bank is a formal institution but it exploits the information base of a community like an informal lender might
- Grameen Bank

Type of Organization: *Regulated Bank*

Founder: *Muhammad Yunus*

Year of First Loan: *1976*

Current Borrowers: *3.7 million*

Total Borrowers (1976-2005): *5 million*

% of Women Borrowers: *96%*

% Served as Poorest of the Poor: *100%*

Total Funds Loaned (1976-2005): *\$5.01 billion*

Loan Portfolio (2003): *\$369,320,000*

Recovery Rate: *99.02%*

Average Loan Size: *\$334*

Annual Operating Budget: *\$1,671,892,639*

Number of Employees: *14,536*

<http://www.kbyutv.org/smallfortunes/organizations/?org=grameen>)

- Typical group consists of 5 borrowers, borrowers get loan in sequence
- Central feature: in the event of a default, no group member is allowed to borrow again → borrowers have incentive to use information to include members who will not jeopardize creditworthiness of everyone else
- More of the costs of risky behavior borne by members of group, thus there will be pressure to reduce level of riskiness.
- Drawbacks: Genuine inability to repay may create incentive for everyone to default, excessive pressure to choose overly safe outcomes, lack of flexibility
- Viability: small loan sizes/fixed loan costs per borrower lead to large operating costs. GB subsidized by foreign donors and government, about 22 cents per dollar lent.
- Performance: In the absence of the program how much worse off would borrowers have been? Can you just look at incomes of borrowers vs. non-borrowers?
- After applying econometric techniques: effect of GB is seventeen cents per dollar lent.
- But subsidy is more—so then is GB not worth it?

3. Insurance

- How can individuals smooth their consumption—credit, self-insurance, mutual insurance
- Example of mutual insurance

A. The perfect insurance model—Theory

Each (identical) farmer's income:

$$Y = A + \varepsilon + \theta$$

A = each farmer's average income

ε = random shock to each farmer (independent of each other)

θ = common/aggregate uncertainty in village

- A is average income, so the random terms have mean value zero
- Think about all idiosyncratic variation in ε being insured away like we discussed before

So each farmer's insured income is given by:

$$Y\text{-bar} = A + \theta$$

- Can aggregate shock θ be insured away as well?

B. The perfect insurance model— Empirical Evidence

- Generally, perfect insurance model does not fit empirical facts³
- Some evidence from India suggests that there substantial smoothing accomplished by households, but we don't know if it is mutual insurance for sure. Other studies reject hypothesis of risk-sharing
- Better off farmers smooth better
- Maybe households smooth their income stream in the first place

Next time: Finish Chapter 15

