Notes for lecture on savings (Besley & Coate (Roscas) and Somville & Vandewalle (saving by default)

The costs and benefits of saving

- When households save they sacrifice current consumption for future consumption. At the macro level, savings allow the economy to produce production capital which, in turn, produces additional output that can be used for consumption in the future.

- Credit saving and insurance serve, to some extent, the same purposes they transfer resources across time and states: To cover unexpected big outlays today a household may take a loan, may draw on past savings or, if insured against the loss, may get expenses covered by the insurer.

- The availability of insurance, the scope for borrowing and the role of the extended family can influence choices about saving in the uncertain environment of developing countries.

- Given that it is difficult to write enforceable contracts (information constraints, literacy constraints and often a broken legal system) savings play an important role as a buffer if a household should experience a negative income shock or high expenses: Precautionary saving.

Saving to smooth consumption over time and states.

- At the individual level savings are used to smooth consumption in the presence a skewd income profile or in the presence of various uncertainties.

A simple model of saving: A household lives for T periods. It earns an income y_i and consumes c_i in period i. The budget constraint present value of what they consume should not be larger than the present value of their resouces: $\sum_{i=0}^{T-1} \frac{c_i}{(1+r)} \leq \sum_{i=0}^{T-1} \frac{y_i}{(1+r)}$. The household discounts the future; compared to the current period next period has a wheight $0 < \beta < 1$. The household allocates resources across time to maximize $V = \sum_{i=0}^{T-1} \delta^i u(c_i)$. In a two period model (easy to extend to many periods) the first order condition for maximal V is $\frac{u'(c_0)}{u'(c_1)} = \beta(1+r)$.

$\Longrightarrow$ saving is a residual of the difference between the income profile and the optimal consumption profile.

$\Longrightarrow$ concave utility –> smooth consumption over time

$\Longrightarrow$ concave utility may also give a motive for precautionary saving, save more if there is a mean preserving spread in future income. For this to be the case the household must have a utility function with a convex marginal utility ($u''' > 0$). The household is then said to be prudent.

Constraints to optimal saving decisions:

- Safe savings technology (how can you store away resources without risking to loose them)
- Behavioural constraints: impatience, under confidence. ...

The economics of rotating savings and credit associations (T Besley, S Coate, G Loury, AER (1993))

- Savings also play an important role in financing durable goods. That is what the paper by Besley et al is about. They show that a village based rotating saving and credit system can outperform individual savings. Better to save in a group
- The idea: Suppose a durable (a bike) costs B and that every household (there are n households) in the village wants one. Each household earns y each period (month) and decides to consume $c^a < y$ to finance the durable. This means that they will have to save for t^a periods (assuming no interest rates and no inflation) to obtain the good, where $t^a = \frac{B}{y-c}$.

- Where does t^a come from? Maximization. Let $v(0,c)$ be the utility a household obtains if it possess no durable and consumes c, $v(1,c)$ is the utility of it owns the durable and $\Delta v(c) \equiv v(1,c) - v(0,c)$. Assume that the utility function is concave in consumption and there is complementarity between the durable and nondurable; $\Delta v'(c) \geq 0$. Suppose households live for T periods and there is no discounting: if a household obtains the durable after t^a periods it gets utility $W(a) = t^a V(0,c^a) + (T - t^a) V(1,y)$, where $t^a(y - c^a) = B$.

- There is a trade-off: To have the durable good for a long time the family needs to cut down on consumption (save a more of the income y). The optimal saving time (rate) trades off these costs so that the loss in marginal utility of reducing c slightly below c^a is just equal to the marginal gain of getting the durable a little bit earlier; $t^a = \frac{B}{(y-c^a)}$ solves

$$max\, W(c) = \frac{B}{y-c} v(0,c) + \left(T - \frac{B}{y-c}\right) v(1,y)$$

- **Roscas.** One of the n villagers suggest village meetings. They agree to meet every $\left(\frac{t^a}{n}\right)$ month (so if $t^a = 10$ and $N = 20$ they will meet every half month, the 15th and 1st of every month). At a meeting each household brings an amount $\frac{t^a(y-c)}{n}$ in cash. Together they have, at each meeting, just enough to buy one durable. Suppose they put the money in a box and draw a winner. At each meeting they put $y - c^a$ in the box and another family gets the box, and buys a bike.

  This arrangement (Roscas) is better than autarky saving (each household save in isolation): In a Roscas it is possible for all (except the one who obtains the box at the last meeting) to get the bike earlier than if households saved in isolation.

- **Results:**
  - A random Roscas (at each meeting there is a random draw of the winner of the box and only those who did not win before can obtain the box) Pareto dominates autarky.
  - At a random Roscas if households decide to meet for t^a periods and have a meeting every $\frac{t^a}{n}$ period a family can expect to get the box after $\frac{1}{n}\left(\sum_{i=1}^{N}\frac{it^a}{n}\right) = \frac{t^a}{n^2}\sum_{i=1}^{N} i = \frac{t^a}{n^2}\frac{n(n+1)}{2} = \frac{t^a(n+1)}{2n}$ periods, which is less than t^a if $n > 1$.
  - But of course t^a will not be the optimal "end point" for a Roscas (it was the optimal periods to save for a household in isolation). Suppose the villagers chooses the savings rate (and "end point", i.e when the last family will obtain the box) to maximize the ex ante expected utility of a household. It is possible to show that the optimal Roscas length t^r stretches beyond the autarky solution $t^r > t^a$: In a Roscas they save less per period than in autarky. Try to explain why!
  - the alternative to a random Roscas is a bidding Roscas where households bid to obtain the box first, second, third,.... The rules of the game: A household bids by promising to contribute more to the box (in each round). Which means that those who get the box early obtain less consumption (of the non-durable) over the whole time time span. This explains why - with homogenous households - a random Roscas is better than a bidding Roscas from an ex ante perspective.
  - with heterogeneous individuals, some more impatient than others, for example, there is of course additional benefits to having bids for the box and now a biding Roscas can give a better expected outcome than a random Roscas.
- **Incentive problems in Roscas** A potential problem is that the family that got the box first will leave the Roscas; they got the

benefits (the bike) and have financial incentives to skip the costs (future contributions). The prospect of not being allowed to participate in future Roscas is one cost, shaming and ostracism is another. If it is not possible to sustain a optimal Roscas with saving c^r it is natural to ask how one can make the "no cheating" constraint less binding. Two alternatives: increase c^r (let the Roscas go over more periods) or reduce the number of individuals

Saving by default: Evidence from a Field Experiment in Rural India (Somville & Vandewalle, American Economic Journal: Applied Economics, forthcoming)

- A concern that poor save too little (why?)
- This paper proposes and tests the hypothesis that getting paid directly into a bank account leads to more saving than getting paid in cash and that the reason for this is that the money are saved by default if they go directly to the bank account.
- Two parts
    1. What: Getting paid on a bank account $\Longrightarrow$ increased saving (lower consumption)
    2. Why: Saving increases because it is the default option.
- 1 is interesting in itself (for policy we may care more about *what is the effect* than *why* (although it is always nicer to know why)). 2 is harder to test (can we rule out alternative explanations; getting money directly into the account creates more trust towards banks; transaction costs, habits)
- This is a randomized experiment.
    - Household participate in repeated interviews 7 - 13 weeks and were paid after each interview.

- The researchers make sure that everyone had a BCSA bank account (bank in shop) and they got information on how to use it.
- Selected 422 individuals from 26 villages and half, a random half, where paid on the account. The other half got cash.
- two phases; First 7 weeks those "treateed" where paid directly on account - last weeks both treatment and control where paid cash

Good balance (randomization worked)

Table 1: Summary Statistics and Balance Check of Baseline Characteristics

	Mean (Std. dev.) (1)	Coefficient on *Paid on account* (Std. errors) (2)
Paid on account (%)	50.00	
	(50.06)	
New account (%)	46.15	-0.00
	(49.91)	(0.05)
Woman (%)	49.77	0.00
	(50.06)	(0.05)
Caste category: ST (%)	12.90	0.00
	(33.55)	(0.03)
Caste category: SC (%)	11.76	-0.01
	(32.26)	(0.03)
Caste category: OBC (%)	74.66	0.00
	(43.54)	(0.04)
Caste category: FC (%)	0.68	0.00
	(8.22)	(0.01)
Literate (%)	48.19	0.00
	(50.02)	(0.05)
Married (%)	88.24	0.01
	(32.26)	(0.03)
Age	43.00	0.43
	(12.61)	(1.20)
Wage labor in agriculture (%)	29.19	0.00
	(45.51)	(0.04)
Wage labor outside agriculture (%)	13.80	0.01
	(34.53)	(0.03)
Self-employed in agriculture (%)	45.48	-0.01
	(49.85)	(0.05)
Self-employed outside agriculture (%)	4.07	-0.01
	(19.79)	(0.02)
Land (acres)	1.17	-0.05
	(1.74)	(0.17)
Dwelling type: katcha (%)	52.49	0.01
	(49.99)	(0.05)
Accounts held (#)	1.17	0.00
	(0.60)	(0.06)
Savings groups (#)	0.16	0.00
	(0.38)	(0.04)
Takes savings decision at home (%)	84.84	0.02
	(35.90)	(0.03)
Trusts the BCSA and banks (%)	73.30	0.03
	(44.29)	(0.04)
Impatient (%)	42.08	0.04
	(49.42)	(0.05)
Distance to the BCSA (km)	0.29	-0.03
	(0.22)	(0.02)
Balance on BCSA account before start weekly surveys (Rs)	116.56	14.77
	(712.63)	(67.87)
Weeks interviewed (#)	9.73	-0.44
	(3.05)	(0.29)
Observations	442	442

The first column reports means (and standard deviations), and the

Results: After 13 weeks they measure bank balance (and savings more generally). They find strong effects; much more savings for those who got money into the bank account. The effect is long lasting (23 weeks). Those receiving cash consume more of their earnings.

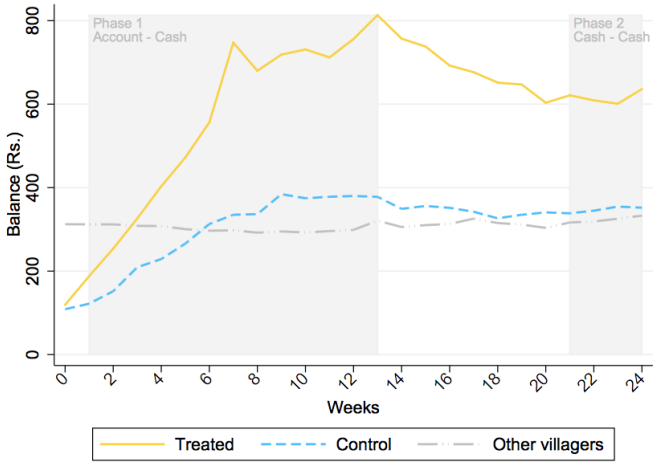

Figure 2: Evolution of the account savings of the Treated and Control

Numbers

Table 2: Impact of Being Paid on the Account on Savings and Expenditures (Phase 1)

	BCSA balance					Total assets	
	Final	Average	Frequent consumption	Temptation goods	Cash at home	without BCSA	including BCSA
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Impact on the conditional mean							
Paid on account	420.4***	254.9***	-386.8*	22.9	-161.1	479.0	919.6**
	(78.6)	(45.5)	(210.5)	(46.5)	(447.7)	(444.8)	(447.1)
R^2	0.10	0.08	0.15	0.11	0.13	0.13	0.12
Mean dependent (control)	378	299	3328	663	1614	2436	2821
Panel B: Impact on the conditional median							
Paid on account	401.7***	250.9***	-318.2*	-27.4	-67.3	-61.8	455.9***
	(51.5)	(25.7)	(169.7)	(56.1)	(56.1)	(128.9)	(150.7)
Median dependent (control)	50	40	2661	470	300	990	1156
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	442	442	430	430	430	430	430

Panel A presents the impact on the conditional mean using ordinary least squares, and panel B on the conditional median using quantile regressions. In the columns (1) and (2) the dependent variables are different measures of the savings on the respondent's BCSA account; in column (3) and (4) it is the household's total expenditures on frequent consumption and temptation goods respectively; and in the columns (5)-(7), the respondent's financial assets, measured during the last weekly interview. All columns include village fixed effects and the following baseline characteristics: the respondent's caste category, literacy, marital status, age, occupation, land owned, dwelling type, accounts held, membership of savings groups, and distance to the BCSA. It also includes dummies indicating whether the respondent takes savings decisions in the household, trusts both the BCSA and banks, and is impatient. All columns include village fixed effects. *** significant at 1 percent, ** significant at 5 percent, * significant at 10 percent.