

Prices or Knowledge?

What drives demand for financial services in emerging markets?

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Motivation

- Access to financial services recognized as critically important for growth and development (Levine, 2005)
- Financial services may be valuable: savings account
 - Store of value
 - Helps offset inflation
 - Prevents impulsive spending
 - Insurance against claims by relatives/friends
 - Payment services; gateway to credit, additional services

Barrier to Access: Lack of Financial Literacy and Understanding?

- Financial decisions can be difficult
 - Calculating interest rates (flat or declining; compounding)
 - Anticipating liquidity needs, inflation, etc.
 - Difficult to comparison shop on multi-dimensional products
- Financial services 'risky' for client
 - May contain undisclosed or hidden fee structures
 - Unlike, say, a meal, may be difficult to tell whether you got a good deal

Barrier to Access: Costs of Participation Outweigh Benefits?

- Access may be difficult
 - Identification cards
 - Forms
 - Attitudes
 - Distances to branch
- Financial services expensive to provide to poor
 - Bricks and mortar fixed cost
 - High salaries (efficiency wage?), low ticket sizes
 - Customer education
 - Regulation

This Paper

- Descriptive:
 - Measure financial literacy in two developing countries, India and Indonesia
 - Describe predictors of financial literacy
 - Describe relationship between financial literacy and financial decisions
- Test two competing view of low use of financial services
 - Low level of financial literacy
 - Value of product is less than cost

Contributions

- Large-scale nationally representative survey of financial literacy in an emerging market (the first?)
- Randomized evaluation of efficacy of financial literacy education (first?)

Two New Household Surveys

- Indonesia Access to Finance
 - Joint with World Bank Jakarta Office
 - July-December 2007
 - 3,360 households, randomly selected in 112 randomly selected villages
 - Representative at the national level
- Gujarat Household Financial Survey
 - Conducted March/April 2006
 - Baseline of Cole et. al (2009) Rainfall Insurance
 - 1,500 households in 100 villages in three districts in Gujarat
 - Not randomly selected
 - Members of local NGO oversampled
 - Poor, low levels of education
 - Similar circumstances to much of rural India

Measuring Financial Literacy

- Following Lusardi and Mitchell (2006)
- “Suppose you borrow Rupiah 100,000 from a money lender at an interest rate of 2 percent per month, with no repayment for three months. After three months, do you owe less than Rupiah 102,000, exactly Rupiah 102,000, or more than Rupiah 102,000?”
- “If you have Rupiah 100,000 in a savings account earning 1% interest per annum, and prices for goods and services rise 2% over a one-year period, can you buy more than, less than, or the same amount of goods in one year as you could today, with the money in the account?”
- “Is it riskier to plant multiple crops or one crop?”
- [New question] “Suppose you need to borrow Rupiah 500,000. Two people offer you a loan. One loan requires you to pay back Rupiah 600,000 in one month. The second loan requires you to pay back in one month Rupiah 500,000 plus 15% interest. Which loan represents a better deal for you?”

Other Survey Questions

- Consumption, household structure, education
- Financial decisions
- Cognitive ability (8 math and probability questions)
- Risk Aversion
 - For real money in India (Binswanger lotteries, 25-25 up to 100-0)
 - (Indonesia, \$0 or \$5, or \$2 with certainty)
- Fatalism / control
 - How much (1-10) do you agree with the following statements:
 - “I have little control over what will happen to me in my life.”
 - “Good things tend to happen to other people, not me”
 - “I have a hard time saving money, even though I know I want to”

Summary Statistics: Individuals

	India			Indonesia		
	Mean	Sd	N	Mean	Sd	N
Household Characteristics						
Household Size	5.9	2.5	1,500	2.9	1.3	3,360
Household Rural	100%		1,500	58%		3,360
Household has phone	14%		1,497	81%		3,360
Household has non-farm enterprise	6%		1,499	39%		3,360
Respondent Characteristics						
Female	54%		1,498	50%		3,360
Married	88%		1,499	83%		3,360
Muslim	9%		1,499	93%		3,360
Age	41.2	11.7	1,497	43.3	14.3	3,360
Attended school	58%		1,497	89%		3,360
Completed primary school	41%		1,493	80%		3,057

	India			Indonesia		
	Mean	Sd	N	Weighted		
	Mean	Sd	N	Mean	Sd	N
Discount factor	0.79	0.14	1,486	0.64	0.31	3,076
Risk averse	19%		1,493	36%		3,360
Fatalist	0.53	0.25	1,433	0.60	0.30	3,360
Interested in financial matters				74%		3,360
Saves enough (self-reported)				54%		3,360
Mean cognitive ability score (out of 8)	4.9	2.4	1,468	6.5	1.8	3,360

	India			Indonesia		
	Mean	Sd	N	Mean	Sd	N
Household Wealth and Income						
Monthly per capita Expenditure (USD, 2007)	\$ 30	\$ 39	1,499	\$ 90	\$ 106	3,360
Main income from agriculture	64%		1,500	36%		2,504
Main income from wage labor	23%		1,500	49%		2,504
Main income from own enterprise	4%		1,500			
Total Annual Household Income (USD, 2007)	\$ 674	\$ 698	1,499	\$ 1,315	\$ 3,798	3,359
Household owns land	48%		1,499	84%		3,360
Household has electricity	72%		1,491	98%		3,360
Household has tap water	47%		1,499	23%		3,360
Household has livestock, cattle, birds etc.	62%		1,497	42%		3,360

Measures and Predictors of Financial Literacy

		Indonesia				
		All	Per Capita Expenditure		Cognitive Ability	
			Below Median	Above Median	Below Median	Above Median
Compound Interest	% Correct	78%	69%	86% ***	56%	89% ***
Savings vs. inflation	% Correct	61%	51%	70% ***	37%	74% ***
Is one crop is safer than multiple crops?	% Correct	28%	24%	31% ***	23%	30% ***
Borrow 500, repay 600, or pay 15%	% Correct	44%	39%	49% ***	30%	52% ***
All questions Taken Together	Avg. Score	2.10	1.83	2.36 ***	1.46	2.45 ***

- Small differences by income; large differences by cognitive ability
- Similar results for India

Predictors of Financial Literacy: Regression

Dependent variable:	Financial Literacy Score			
	India		Indonesia	
	(1)	(4)	(5)	(8)
Per capita expenditure	.0725 *	.0507	.0736 *	.1 **
	(.0398)	(.0427)	(.0404)	(.0466)
Rural			-.152 ***	
			(.0506)	
Female	-.0767	-.0739	-.11 **	-.1352 ***
	(.0586)	(.0614)	(.0501)	(.0506)
Age	.0217 **	.0202 *	.0212 **	.0124
	(.0105)	(.0111)	(.0096)	(.0099)
Age squared	-2.4e-04 **	-2.1e-04 *	-2.4e-04 **	-1.8e-04 *
	(1.2e-04)	(1.3e-04)	(1.0e-04)	(1.1e-04)
HH has Non-farm enterprise	-.0653	-.0958	.1119 **	.1143 **
	(.1045)	(.1082)	(.0507)	(.0539)
	(.0101)	(.0107)	(.0175)	(.0194)
Completed primary school	-.0068	.1434 **	.1647 **	.0699
	(.0626)	(.0679)	(.0673)	(.0708)
Completed high school	.2009	.1478	.0219	-.072
	(.2284)	(.1964)	(.0664)	(.071)
Beyond high school education	-.2301	-.0588	.3524 ***	.2638 **
	(.2669)	(.2434)	(.1006)	(.1056)
Cognitive ability	.2225 ***	.1865 ***	.2339 ***	.1909 ***
	(.0126)	(.0143)	(.0168)	(.0189)
Fatalist		-.2319 **		-.3771 ***
		(.0992)		(.0844)
Interested in financial matters				.0504
				(.0622)
Saves enough (self-reported)				-.1005 *
				(.0518)
Village fixed effects	No	Yes	No	Yes
N	1450	1369	3057	2818

Predictors of Financial Literacy

- Wealth (+), Education (quadratic, peaking around 40), rural (-), non-farm enterprises (+), fatalism (-)
- Economic Magnitudes: A one standard deviation increase in consumption / cognitive ability predicts the following increase in financial literacy score:

	Consumption	Cognitive Ability
India	.05	.5
Indonesia	.05	.37

- Consistent with Mendell (2008) in U.S. high school students
 - 'Jumpstart' is a 40-question test of financial literacy administered to high school students
 - SAT/ACT score strongly predicts financial literacy

Financial Literacy and Use of Financial Services

	India			Indonesia		
	Financial Literacy			Financial Literacy		
	Below Median	Above Median	Difference	Below Median	Above Median	Difference
Bank account	5%	15%	10% ***	24%	47%	23% **
Advanced savings instr.				5%	20%	15% **
Non-bank savings	51%	60%	9% ***	38%	62%	25% **
Formal loan	10%	15%	5% **	13%	29%	16% **
Informal loan	62%	66%	4%	45%	56%	11% **
Total debt	448	1303	855	310	1177	867 **
Any insurance	60%	69%	9% ***	37%	53%	16% **

Financial Literacy and Demand for Hypothetical Products

- Hypothetical question, would you be interested in the following product [Indonesia only]

	<u>Commitment Savings</u>	<u>Deposit Collector</u>	<u>Commitment Savings</u>	<u>Literacy Training</u>
Literacy	+	+	+	+
Education		-		
Expenditure	+	+	+	+
Cognitive		-		

Motivation

- Is the relationship between financial literacy and financial decision making causal?
- Is financial literacy a barrier to bank access?
- Is financial literacy a cost-effective way of affecting financial behavior?
- Increasing access to bank accounts often policy goal (Washington, 2006; Demirguc-Kunt et al, 2007)
- How price-sensitive is the demand for banking services?
- Ultimately, how does having a bank account affect financial behavior?

Why financial literacy?

- Compelling survey evidence demonstrates correlation between financial literacy and:
 - Financial planning (Lusardi and Mitchell, 2007)
 - Interest rates paid (Lusardi and Tufano, 2008; Stango and Zinman, 2006)
 - Asset acquisition (Lusardi and Mitchell, 2007b)
 - Financial market participation (Alessie et al.)
 - [Bernheim et al.]
- Substantial Policy Interest
 - ca. 40 U.S. states require financial education
 - Indonesia 2008, “Year of Financial Education”
 - India, RBI established financial education centers

Financial literacy is plausibly a barrier to access in Indonesia

- Physically accessible:
 - Dense population; BRI has a very wide branch network
- Cheap: SIMPEDES account
 - Minimum deposit Rp. 10,000 (USD 1.2)
 - No fees if fewer than 4 withdrawals/month

Financial literacy is plausibly a barrier to access in Indonesia

Reasons for not having bank account	No bank account (N=2153)
Not enough money	92%
Do not know how bank operates	32%
Do not have a job	20%
No advantage to having bank account	16%
Bank staff rude or unhelpful	15%

Financial Education Program

- 2-3 hour module focused on opening a bank account
- Included costs and benefits; how to fill out forms; paperwork required
- Developed by MICRA, Indonesia subsidiary of an international NGO
- Material from Microfinance Opportunities, Citigroup Foundation, and Freedom from Hunger
- Professional trainers
 - Trained by MICRA
 - Had experience in financial education or education
 - Likely higher quality than any national campaign
- Typical of targeted financial education intervention

Financial Incentive

- Offered payment of Rp. 25,000, Rp. 75,000, or Rp. 125,000 for opening bank account
- Fill out postage-paid card indicating account number and branch name
- Receive promised payment via remittance
- Done without explicit cooperation of banks

Experimental Design

- Geography and surveying problems reduced sample from 2,153 to 736
- Following household survey, unbanked households invited to participate

	N	Percent	N	Percent
Experiment Sample	1230			
No Bank Account	736	60%		
Participated in Experiment	564	77%	49	9%
Low Incentive (Rupiah 25,000 == \$3)	170	30%	6	4%
Medium Incentive (Rupiah 75,000 == \$8)	190	34%	17	9%
High Incentive (Rupiah 125,000 == \$14)	204	36%	26	13%
Invited to Financial Literacy Training	274	49%	21	8%
Not Invited to Financial Literacy Training	290	51%	28	10%

Randomization Balance

- Generally balanced (except initial financial literacy)

	Invited	Not Invited	Low	Medium	High	p-value
	(1)	(2)	(4)	(5)	(6)	(7)
Rural Household	0.58	0.53 *	0.57	0.53	0.55	0.591
Female	0.55	0.50	0.54	0.50	0.53	0.681
Age	41.84	40.55	40.76	40.72	41.95	0.554
Married	0.87	0.85	0.88	0.86	0.85	0.710
Muslim	0.97	0.99	0.99	0.98	0.98	0.662
Family Size	2.73	2.82	2.73	2.76	2.82	0.756
Attended School	0.90	0.90	0.89	0.93	0.88	0.134
Log of Consumption Expenditure	17.26	17.32	17.18	17.33	17.35	0.213
Employed	0.68	0.69	0.65	0.67	0.72	0.367
Financial Literacy Score	0.46	0.51 **	0.49	0.49	0.48	0.821
Cognitive / Math Skills Score	0.79	0.80	0.78	0.80	0.79	0.727
Believe Household Saves Enough	0.43	0.49	0.45	0.47	0.47	0.846
Interested in Financial Matters	0.72	0.72	0.69	0.73	0.73	0.626

Experimental Results

<i>Dependent Variable : Opened Bank Account?</i>	(1)	(3)	(5)
Financial Literacy Invitation?	-0.020 (0.027)		0.022 (0.028)
Incentive==75000		0.054 ** (0.024)	0.065 * (0.036)
Incentive==125000		0.092 *** (0.026)	0.136 *** (0.036)
(Incentive==75000) * Financial Literacy Invitation			-0.021 (0.047)
(incentive==125000) * Financial Literacy Invitation			-0.090 (0.057)

Experimental Results:

- Incentives matter
 - Mean take-up for individuals offered Rp. 25,000 was 3.5%
 - Increasing incentive to Rp. 125,000 increases take-up by 9 percentage points, to about 13%
- Financial literacy education does not affect take-up
 - Point estimates range from -2.2% to 2.9%, with a confidence interval of approximately $(-6\%, 6\%)$

Experimental Results: Heterogenous Treatment Effects

	No Schooling		Schooling	
Invite	0.12 ** (0.06)	0.11 (0.10)	-0.03 (0.03)	0.01 (0.05)
Medium	-0.07 (0.08)	0.00 (0.12)	0.06 * (0.03)	0.07 (0.04)
High	0.04 (0.07)	0.00 (0.09)	0.10 *** (0.03)	0.16 *** (0.04)
Invite*Med		-0.11 (0.10)		0.00 (0.05)
Invite*High		0.09 (0.14)		-0.12 * (0.06)

Experimental Results: Heterogenous Treatment Effects

	<u>Below Med Financial Lit.</u>		<u>Above Median Financial Lit</u>	
Invite	0.05 (0.06)	0.03 (0.10)	-0.05 (0.03)	0.02 (0.05)
Medium	0.04 (0.06)	0.03 (0.10)	0.06 (0.03)	0.08 (0.05)
High	0.08 (0.06)	0.06 (0.10)	0.10 (0.03)	0.17 (0.05)
Invite*Med		0.02 (0.09)		-0.04 (0.08)
Invite*High		0.02 (0.09)		-0.14 (0.07)

Experimental Results: Heterogenous Treatment Effects

- Randomization not stratified initially on education or financial literacy
- (Theoretical reasons to believe these matter)
- No heterogeneity (e.g., no effect of literacy) by income, sex

Cost Effectiveness of Financial Literacy

- Point estimates in entire sample indistinguishable from zero
- Best case: top of confidence interval, increases bank account usage by 6 percentage points
- Literacy training costs \$17/person. Marginal cost of inducing bank accounts is \$283
- Compared to marginal cost of 'high' incentive (\$11), which has 50% larger effect
- Subsidies are much more cost effective

Conclusions

- Financial literacy strongly correlated with cognitive ability
- Financial literacy predicts use of and demand for financial services
- Is the relationship between financial literacy and financial decision making causal? (For some groups)
- Is financial literacy a barrier to bank access?
 - Training on how to open a bank account does not have an overall effect
 - For a small financial incentive, individuals open bank accounts
- Is financial literacy a cost-effective way of affecting financial behavior? (No)
- (Ultimately, how does having a bank account affect financial behavior?)

Financial Literacy Research Agenda

- Larger-scale intervention
 - Gujarat: Eight hours of individual videos and decision-making problems
 - South Africa: Large scale, long-term financial literacy campaign among mine workers
- Alternative approaches
 - Gujarat: Decision-making labs, debiasing
 - U.S.: Evaluation of financial literacy education and video games