Prices or Knowledge? What drives demand for financial services in emerging markets?

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Abstract

Why is demand for formal financial services low in emerging markets? One view argues that limited financial literacy stifles demand, while another view asserts that demand is rationally low because formal financial services are expensive. This paper uses original surveys and a field experiment to distinguish between these two views. Using original survey data from India and Indonesia, we first show that financial literacy is a powerful predictor of demand for financial services. To test the relative importance of literacy and price, we implement a field experiment, offering randomly selected unbanked households financial literacy education, crossed with small financial incentives to open bank savings accounts. We find that the financial literacy program has no effect on the likelihood of opening a bank savings account, except for uneducated and financially illiterate households. In contrast, small subsidy payments have a very large effect. Further, these payments are more than two times more cost-effective than the financial literacy training.

Financial development is widely recognized as an important determinant of economic growth (Levine (2005)). This belief has motivated substantial research on the determinants and constraints affecting the supply of banking and financial intermediation services, with substantial attention focusing on the role of institutions. Yet, the determinants of the demand for financial services are much less well understood, particularly in low-income countries.

Two plausible views could explain limited demand for financial services in emerging markets. First, because these services are expensive to provide, and often involve economies of scale, it may simply be that low income individuals do not demand formal financial services. Indeed, there is evidence that informal savings, credit, and insurance markets function reasonably well in emerging markets,[1] and the benefits of formal financial market participation may simply not exceed the relatively large fixed transactions costs associated with such products (Beck, Demirguc-Kunt, and Peria (2007)). An alternative view argues that limited financial literacy serves as an important barrier to demand for services: if individuals are not familiar or comfortable with products, they will not demand them.

These two views have significantly different implications for the development of financial markets around the world, and would suggest quite different policy decisions by governments and international organizations seeking to expand financial outreach.

This paper aims to distinguish these two theories. We first conduct novel surveys in India and Indonesia, measuring household financial literacy and demand for financial services. The survey in Indonesia represents the first nationally representative household survey on financial literacy in a developing country.

We supplement this survey data with a randomized field experiment among unbanked households in Indonesia to directly test the role and relative importance of fi-

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[1]See, for example, Besley, Coate, and Loury (1993), and Townsend (1994).

nancial literacy and prices in determining demand for banking services. An intervention offering a financial education program on bank accounts is randomly assigned to half of 564 unbanked households identified by our survey team. Orthogonal to this treatment, individuals are randomly offered small subsidies, ranging from \$3 to \$14, for opening a bank account. The design therefore allows us to directly compare the effect of financial literacy education to price subsidies.

We find that financial literacy education has no effect on the probability of opening a bank savings account for the full population, although it does have an impact among those with low initial levels of education and financial literacy. Modest financial subsidies, in contrast, have large effects, significantly increasing the share of households that open a bank savings account within the subsequent two months. Specifically, an increase in subsidy from \$3 to \$14 increases the share of households that open a bank savings account from 3.5% to 12.7%, an almost three-fold increase. Subsidies or price reductions may therefore represent a significantly more cost-effective way of drawing households into the financial system. In contrast, financial literacy efforts targeted at the general population may be relatively ineffective.

This paper proceeds as follows. The next section discusses the motivation for the study, and the context in which the field experiment takes place. The subsequent section describes how we measure financial literacy and details the levels of financial literacy in our samples. In section III we explore what factors predict financial literacy, and in section IV, we describe how financial literacy is related to use of, and demand for, financial services. Sections V and VI describe the design and results, respectively, of the experiment. We then conclude.

I Motivation and Context

The role of financial literacy has garnered increasing attention in both the developed and developing world. In January 2008, the United States government set up a President's Advisory Council on Financial Literacy, charged with promoting programs that improve financial education at all levels of the economy and helping increase access to financial services[2]. In the developing world, the Indonesian government declared 2008 "the year of financial education." with a stated goal of improving access to and use of financial services by increasing financial literacy[3]. Similarly, in India, the Reserve Bank of India launched an initiative in 2007 to establish Financial Literacy and Credit Counseling Centers throughout the country which would offer free financial education and counseling to urban and rural populations[4].

Much of this attention is motivated by a compelling body of evidence, based on household surveys in developed countries, that demonstrates a strong association between financial literacy and household well-being. Households with low levels of financial literacy tend not to plan for retirement (Lusardi and Mitchell (2007a)), borrow at higher interest rates (Lusardi and Tufano (2008), Stango and Zinman (2006)), acquire fewer assets (Lusardi and Mitchell (2007b)), and participate less in the formal financial system relative to their more financially-literate counterparts (Alessie, Lusardi and van Rooij (2007); Hogarth and O'Donnell (1999)). In response to this evidence, financial literacy programs have been advanced as a low-cost intervention with the potential to improve household financial decision making and ultimately increase savings and welfare.

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[2]See: http://www.treasury.gov/offices/domestic-finance/financial-institution/fin-education/council/index.shtml [accessed February 11, 2009]. As an indication of the United States government's resolve to improve financial literacy, it named April 2008 Financial Literacy Month.

[3]See: http://www.oecd.org/document/3/0,3343,en_2649_34853_40660803_1_1_1_1,00.html [accessed February 11, 2009].

[4]See: http://www.rbi.org.in/scripts/PublicationDraftReports.aspx?ID=526 [accessed February 11, 2009].

The first substantive contribution of this paper is to measure the level and predictors of financial literacy, and its relationship to demand for financial services, in two of the most populous countries of the world. We conduct two large household surveys in India and Indonesia, and find strong relationships between financial literacy and financial behavior.

Yet, as with any observational study, it is always possible that other factors explain some or all of the observed relationships. For example, individuals with lower levels of financial literacy may have lower levels of education, be less interested in financial matters, be poorer, or have different discount rates.

To measure causal relationships, we implement a field experiment in Indonesia. We study use of one of the most basic, but perhaps most valuable financial services, deposit accounts. We choose to study savings accounts for several reasons. For households, a bank savings account can be an efficient savings technology, secure from theft and often paying interest, as well as a means of sending and receiving payments. A savings account allows customers to build a relationship with the bank, potentially facilitating eventual access to credit and other financial services. This may in turn improve household welfare. Indeed, in the United States, the federal government and individual states have passed legislation intended to draw individuals into the banking system by establishing "lifeline" savings accounts, and by providing incentives to retail banks to operate in underserved areas (Washington (2006)). Transactions and savings accounts are the first and most obvious way in which household participation in the formal financial sector begins.

We conduct our study in a setting, Indonesia, in which financial literacy may be one of the most important barriers to access. This may in part be explained by low educational expenditures: measured as a share of GDP, education expenditures in Indonesia are the lowest in the world (UNESCO (2007)). However, and in contrast to many developing

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countries where access to banking infrastructure is difficult, the Indonesian banking system has a wide geographical reach. Moreover, Indonesian banks have traditionally offered savings accounts with low minimum deposits designed to serve the needs of low income customers. The minimum deposit to open a savings account is the nation's largest bank, Bank Rakyat Indonesia (BRI) is only 53 U.S. cents, and interest is paid on balances greater than U.S. $1.06[5]. This compares to a per-capita income of approximately $1,918. Yet, only 41% of the total population and 32% of rural Indonesia households have a bank savings account.

To evaluate the importance of financial literacy, we randomly select half of the unbanked households in our sample and offer them a two-hour financial literacy education session on how banks work and the benefits of opening a bank savings account. To understand cost sensitivity, we offer unbanked households subsidies ranging in value from US $3 to $14 if they open a bank savings account.

While financial literacy has received increasing attention worldwide, our paper is the first to systematically test the impact of a financial literacy training program in the developing world using randomized evaluation. In the developed world, the most convincing evidence on the role of financial education using a randomized evaluation comes from Duflo and Saez (2003), who conducted an experiment at a United States university. The authors sent letters (at random) to staff, encouraging the staff to attend an employee benefit fair. The authors find that enrollment in retirement plans increased significantly in the departments in which letters were received. The size of the effect, however, is quite small, an increase of approximately 1.25 percentage points. A related paper by Karlan and Valdivia (2008) studies the efficacy of offering a business training program to female microentrepreneur clients of a bank in Peru. While the content of the course falls outside

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[5]See: http://www.bri.co.id/english/layanan/simpanan.aspx?id=12 for terms of the savings product [accessed February 11, 2009].

the standard definitions of financial literacy, the spirit was similar: provide education for individuals making household decisions. They find that the treatment resulted in higher repayment and client retention rates but had no impact on business income or assets. Similarly, Bertrand and Morse (2009) look at the effect of financial literacy education intended to suppress demand for payday lending in the United State: they find that a treatment that emphasizes the dollar cost of repeated borrowing is effective in reducing the probability an individual renews a payday loan.

This paper is also related to the literature on financial market development, surveyed in great detail by Demirguc-Kunt, Beck, and Honohan (2008). Most closely related to the present study, Beck, Demirguc-Kunt, and Peria (2007) study household and firm use of banking services around the world, finding GDP, institutional quality, and ownership structure as important predictors of the use of financial services.

II   Measuring Financial Literacy and Financial Decisions

In this section we describe the Indonesian and Indian household surveys from which we obtain our measures of financial literacy. We describe how we measure financial literacy and present summary statistics from the surveys. Both surveys focus on households' financial sector participation and were custom-designed by the authors in conjunction with partner organizations. To the best of our knowledge the Indonesian results are the first nationally representative measure of financial literacy in a developing country.

The Indonesian data were collected as part of the World Bank's Access to Finance survey. The Access to Finance survey is a nationally representative household survey designed to measure use of, and attitudes towards, financial services in Indonesia. Strat-

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ified sampling was used to select 112 villages and from each village 30 households were randomly selected to participate in the survey, giving a total sample size of 3,360 households. All Indonesian survey statistics reported in this paper are corrected for appropriate sampling weights. The survey took place between July and December 2007. Summary statistics are provided in Table I.

We complement the Indonesian survey results with data from India, using questions from a household survey administered in the state of Gujarat in 2006. Because we designed both survey instruments, the questions are comparable across countries. Despite the strikingly different context (India is far poorer than Indonesia), we find notable similarities, both in what predicts financial literacy, and in the relationship between financial literacy and demand for financial products.

The survey in India was undertaken as a baseline survey for a study on weather insurance, in March and April of 2006. The survey covers 15 households in each of 100 villages, located in three districts of India around Ahmedabad, the capital of Gujarat[6], and focused primarily on poor, subsistence agricultural laborers. While the sample was not representative of India or Gujarat, the selected households live in similar circumstances and have comparable educational backgrounds to households throughout much of rural India.

Both surveys measure financial literacy, in a manner consistent with methodology that has been used in the United States, by adapting three questions used by Lusardi and Mitchell (2006). We ask: (i) "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?" (ii) "If you have Rupiah 100,000 in a savings account earning 1%

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[6]The survey served as a baseline for Cole et al. (2008), which studies a weather insurance intervention. The survey was conducted prior to any intervention.

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?" (iii) "Is it riskier to plant multiple crops or one crop?" We also added one new question: (iv) "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?"[7]

Measured financial literacy is low, especially in India. The mean share of correct answers was 52% in Indonesia, and 34% in India. In the United States, the average share of the first three questions answered correctly was 65%. The corresponding shares for Indonesia and India were 55% and 38%, respectively.

In addition to financial literacy, the surveys also capture other household characteristics that may be important determinants of financial behavior. Cognitive ability was evaluated with a series of eight mathematics questions: the mean share answered correctly was 81% in Indonesia and 62% in India. Almost all respondents could answer the simplest question ("what is 4+3") while many more had difficulty with multiplication ("3 times 6") and division ("one-tenth of 400"). Since respondents were not allowed to ask their friends or neighbors for help, it is reasonable to think that in situations where collaboration is possible they will perform better when answering these questions.

Household discount rates were proxied by eliciting the minimum amount a household would be willing to accept in one month in lieu of a Rupiah 80,000 payment today.[8] Consistent with other evidence, respondents reported relatively high discount rates: the average elicited monthly discount rate was 36% in Indonesia, and 21% in India. We also

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[7]For the Indian survey the amounts used were Rs. 100 for questions (i) and (ii) and Rs. 500 for question (iv).

[8]Discount rates were calculated using answers to hypothetical questions of the form: "Would you prefer to receive Rupiah 80,000 today, or Rupiah X in one month." For India the ordering was reversed and respondents were asked to choose between Rs. X today and Rs. 10 in one month.

attempted to measure whether households were hyperbolic discounters by using questions of the same form, but with the choice being between payments six months or seven months from today. The variable ("commitment problem") measures the difference between the discount factor between six and seven months in the future and the discount factor between today and next month. It is statistically indistinguishable from zero for both countries.

To measure risk aversion we follow Binswanger (1980) and use actual lotteries, for real (and substantial) amounts of money. In Indonesia respondents were offered a choice between receiving Rupiah 2,000 for certain or playing a lottery that paid Rupiah 5,000 with probability $\frac{1}{2}$ and Rupiah 0 with probability $\frac{1}{2}$. Thirty-six percent of households chose the safe bet. We code these households as being risk averse.[9] In India respondents are coded as risk averse if they opt to receive Rs. 2 for certain, rather than playing a lottery that paid Rs. 5 with probability $\frac{1}{2}$ and Rs. 0 with probability $\frac{1}{2}$. 19% of Indian households met this definition of risk aversion.

The surveys also allow us to proxy the extent to which respondents view events as being outside of their control. In Indonesia, fatalism is measured as the proportion of the following statements with which the respondent either agrees or strongly agrees: (i) "I have little control over what will happen to me in my life." (ii) "Good things tend to happen to other people, not to me or my family." (iii) "I have a hard time saving money, even though I know I want to save money." The average value of fatalism is 60%. In India fatalism is measured using the extent to which respondents agreed with the first two of these statements. The average value is 53%.

Finally, the surveys collected standard data on household demographics and wealth. Table I demonstrates that Indian households are more rural, less educated and much

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[9]This test is also a test of a behavioral anomaly, "small-stakes risk aversion," described by Rabin and Thaler (2001).

poorer than the Indonesian sample. The average household size in the Indian sample is 5.9, twice as large as in Indonesia. In India the entire sample is rural, compared to 58% in Indonesia. Though low by developed country standards, the Indonesian sample exhibits substantially higher levels of education than the Indian sample. In Indonesia 80% of respondents completed primary school compared to 41% in India. In the Indian sample mean monthly per capita household expenditure (which includes consumption, but not investment spending) is less than $1/3^{rd}$ the Indonesian level, while average annual reported household income is US$674 in India and US$1,315 in Indonesia.

In Table II we present summary statistics on households' use of financial services. Bank accounts are uncommon in both locations. Only 12% of Indian, and 41% of Indonesian households report having a bank account. However, 29% of Indonesian households that do not currently have a bank account used to have an account at some point in the past. 51% of Indonesian households have savings with a non-bank institution, but only 13% have advanced savings instruments, such as Certificates of Deposit (CDs) or mutual funds. In total 68% of Indonesian households own a savings product of some form.

On the loan side, 25% of Indonesian households have a formal sector loan, while 13% of the Indian sample did. Informal credit was more common, with 64% of Indian households, and 52% of Indonesian households, having loans from microfinance institutions, money-lenders or other informal sources. The most common source of informal loans in Indonesia was family and friends.

One surprising result is the familiarity with, and use of, insurance in the Indian sample. Two-thirds of households have some form of insurance policy. This is likely attributable to the fact that SEWA, a local MFI in Gujarat oriented towards helping poor women, makes health insurance policies available to its members. In contrast, crop insurance, which must be separately obtained, is comparatively rare. Even in Indone-

sia, almost half of the households report having an insurance policy. One third of the population have health insurance, while 26% have asset or homeowner's insurance.

III   What Predicts Financial Literacy?

A breakdown of financial literacy performance by household expenditure and cognitive ability is given in Table III. It should be noted that all questions were multiple choice, two with two possible answers, and two with three possible answers. Thus, random guessing would yield an average score of 1.66, which is in fact higher than the average score in India, though not in Indonesia. (In India, many respondents answered 'Do not know' rather than guess).

Within samples, the share of the population answering each question correctly showed substantial variation by wealth and cognitive ability. Splitting the samples by household expenditure per capita we see that the richer halves of the samples did significantly better than the poorer halves on most questions. Similarly, dividing the samples by cognitive ability, we find that the upper half of the distribution did significantly better on all questions. In fact, the differences between the low and high cognitive ability sub-samples are on average more than twice as large as the differences between the wealthy and poor sub-samples, suggesting that cognitive ability may play an important role in determining financial literacy. This finding is consistent with Cole and Shastry (2009), which finds close relationships between cognitive ability and financial behavior in the United States.

While the connection between wealth and financial literacy has been long documented, the relationship between cognitive ability and financial literacy, though not surprising, is less well understood. Christelis et. al (2007) describe the relationship between cognitive ability and portfolio choice in European households, finding that higher

cognitive ability households are more likely to invest directly in stocks.

In Table IV we take a more systematic approach, regressing our measure of financial literacy on a variety of individual characteristics. This confirms that both greater wealth and higher human capital, as measured by either level of schooling or cognitive ability, are associated with significantly higher levels of financial literacy in Indonesia. We also find that rural households and households with a female head exhibit lower levels of financial literacy, while households that own a non-farm enterprise have higher financial literacy. With respect to age, financial literacy is quadratic and peaks at around 40 years old. Respondents that take a fatalistic world view have significantly lower financial literacy, but neither discount rates nor risk aversion predict financial literacy.

Wealth and cognitive ability are also positively correlated with financial literacy in India, but, surprisingly, there is no systematic relationship between education and financial literacy. As in Indonesia, age is quadratic and peaks at around 45 years old. Those with fatalistic views have lower levels of financial literacy, but other household preference variables are insignificant predictors of financial literacy.

The regressions also allow us to quantify effects, and in particular compare the effects of wealth and cognitive ability, two of the most important predictors of financial literacy. The estimates from column (2) indicate that in our Indian sample a one standard deviation increase in household per capita expenditure predicts a 0.05 standard deviation increase in the financial literacy score. In contrast, a one standard deviation increase in cognitive ability is associated with a 0.50 standard deviation increase in the financial literacy score. In Indonesia, the corresponding magnitudes, based on the estimates in column (6), are 0.05 and 0.37 standard deviations, respectively. In both samples, cognitive ability has a substantially stronger association with financial literacy than does household expenditure.

IV   What Does Financial Literacy Predict?

A compelling body of evidence demonstrates a strong association between financial literacy and household well-being in developed countries. Table V shows how use of financial services varies with household characteristics in our Indian and Indonesian samples. Higher household expenditure predicts greater use of bank accounts and formal credit in both countries, but predicts increased use of informal credit and insurance in Indonesia only. The results for human capital are mixed. Education is positively associated with use of bank accounts and formal credit in both countries and with insurance in Indonesia, but is negatively associated with informal credit use in both countries. Higher cognitive ability predicts greater insurance use in both countries and greater use of formal credit in Indonesia, but is otherwise insignificant.

In both countries none of the household preference indicators consistently predicts use of financial services. In Indonesia a high discount factor is associated with lower use of both formal and informal credit, while risk averse households are more likely to have a bank account or a formal loan. Fatalism is associated with lower use of bank accounts in Indonesia, but higher use of insurance in India.

Higher financial literacy is significantly associated with greater use of bank accounts in Indonesia and insurance in India. The coefficients on the loan-side regressions are positive but insignificant. Although financial literacy is a significant predictor of use of bank accounts in Indonesia, the magnitude of the estimates suggest it is a less important predictor than wealth. The estimates from column (2) indicate that a one standard deviation increase in financial literacy is associated with a 2.2 percentage point increase in the probability of having a bank account, while a one standard deviation increase in household expenditure is associated with a 14.9 percentage point increase.

IV.A Demand for Financial Products

In Table VI, we explore demand for financial products. Data for this section and the remainder of the paper is available for the Indonesian sample only. Respondents were asked if they were interested in three financial products that have been identified as potentially beneficial in increasing household savings. First, we asked about a commitment savings product, similar to the one described in Ashraf, Karlan, and Yin (2006a). This product allows clients to deposit money at any time, but to withdraw only after a certain savings target has been met, or a specified time period has passed. Christmas savings clubs in the United States are one example of this product. Approximately 43% of households expressed interest in such a product.

Second, we asked about whether the household would be interested in deposit collection services. Deposit collection services have been shown to increase savings in the Philippines (Ashraf, Karlan, and Yin (2006b)). Interest in this product was lower, at 25%. Finally, we asked if households were interested in retirement savings accounts: 50% of households said yes.

To better understand barriers to use of bank accounts, respondents were asked whether they would open a bank account if account fees were reduced. Of the unbanked, 37% reported that they would open a bank account if fees were halved; that figure rose to 58% if fees were eliminated.

Panel B of Table VI explores which household characteristics predict interest in the three financial products. Interest in all three products is increasing in financial literacy and household expenditure, thus financial literacy does indeed strongly predict demand for financial services. There is no evidence of a robust effect of human capital on interest levels for any of the products. Households that have a bank account are less interested in deposit collection services and more interested in retirement savings, but their interest in the

commitment savings product is not significantly different. Demand for the commitment savings and deposit collector products are higher among households that are more patient and are not risk averse. Demand for all three products is higher from households that have a fatalistic outlook, are interested in financial matters and report saving enough for the future.

Table VII examines self-reported attitudes towards use of financial services. The most common reasons cited for having a bank account are: security (53%); for predicted future needs (42%); to transfer money (37%), and; for emergency needs (31%). Only 17% of respondents see having a transactions account as a step towards borrowing from the bank.

When asked their reasons for not having a bank account 92% of unbanked households report that they do not have enough money. The second most common answer, not knowing how a bank operates, was only cited by 32% of households. Interestingly, 29% of currently unbanked households did have an account at some point in the past. Among these households 71% report that they stopped using the account because they did not have enough money.

Just over half of households (54%) reported they were saving enough for the future. Of those who answered "no," lack of money was the most frequently cited reason for insufficient savings (76%), with irregular income (31%) and failure to control spending (23%) the second and third most common reasons.

We also asked about household demand for insurance. Among those without insurance, not enough money was again the most frequent reason given (59%), followed by not knowing about any insurance products (38%). Only 6% of households said that they did not have insurance because premiums were too expensive.

Finally, households were asked to describe the three most important financial risks

they faced. Illness was the most common risk (79%) followed by loss of employment (56%), and loss of dwelling (33%). Conditional on owning a non-farm enterprise 52% of households reported concern about business risk. Interestingly, many of the risks (health, property loss, death, and vehicle damage) were insurable, though most households chose not to insure them.

The data in Tables VI and VII provides support for the notion that a financial literacy training intervention could increase the share of households possessing a bank account. Lack of knowledge of how a bank works is the second most common reason for not having a bank account and is cited by approximately one-third of households. The fact that only 31% of the population reports knowing the requirements to open a bank account suggests that knowledge may be a barrier to opening an account. Finally, 74% of households without a bank account expressed interest in attending a free financial literacy training session.

V   Experiment Design

This section describes the intervention we conducted in Indonesia to test whether financial literacy acts as a barrier to opening a bank account. The results of the experiment are analyzed in Section VI.

V.A   Financial Literacy Intervention

To study whether financial literacy training could stimulate demand for financial services, we worked with an international non-profit organization in Jakarta, Microfinance Innovation Center for Resources and Alternatives (MICRA). MICRA provides consulting and training programs to banks and microfinance organizations in Indonesia.

MICRA developed a customized training session on bank accounts, using material

adapted from a curriculum developed by a consortium of Microfinance Opportunities, Citigroup Foundation and Freedom from Hunger. The curriculum was designed for unbanked individuals, with the specific goal of teaching households about bank accounts.

Working with MICRA, we identified individuals to serve as trainers who had previous experience in financial sector work or education. The trainers were given two days of specialized training relating to the curriculum prior to the start of the experiment. MICRA provided the training of the trainers. The salary offered for the trainers was relatively high (200,000 INR/hour); thus, the quality of delivery of this intervention is likely to be as good or better than any other large-scale intervention.

The financial literacy experiment took place in the 64 Access to Finance survey villages that were on the island of Java. Thirty households were sampled in each village making a total of 64x30=1,920 households. Of these, 1,173 households did not have a bank account at the time of the survey. After completing the Access to Finance survey each of these unbanked households was offered the opportunity to participate in the experiment. Once a respondent agreed to participate, he or she was subsequently randomly assigned a financial incentive level, and a financial literacy training invitation status. The financial incentives offered were Rupiah 25,000, 75,000 and 125,000, with equal probability, for opening a bank account within two months of the intervention. To receive the incentive, the household was required to fill out a postage-paid mail-in form, indicating the participant's name and bank account number. Upon receipt of this card, the survey firm transferred the appropriate incentive amount to the respondent's account.

At the time of the study, the Bank Rakyat Indonesia, the country's largest bank, offered a "SIMPEDES" account which required a minimum deposit of Rp. 10,000, and charged no fees, as long as an individual deposited or withdrew money no more than 4 times per month). This account paid no interest for deposit levels below Rp. 100,000,

and increasing interest rates for balances higher than this amount.

Independent of the incentive level, households were assigned to either treatment or control for the financial literacy training program. Treatment households received from the surveyor a written invitation to attend a two hour financial literacy training session, to be held in the village on a weekend. Households that did not agree to participate in the experiment were eligible to receive invitations to the financial literacy training, but since we do not know if these households decided to open a bank account they do not form part of our experimental sample. Half of the households (again randomly assigned) receiving a financial literacy invitation were allowed to invite a friend to accompany them to the session.[10]

In each of the 64 villages a financial literacy training session was held within one month of the date the survey was conducted. Invited households were reminded about the training the day before it occurred.

Unfortunately, 23 villages had to be dropped from the sample because of evidence that the surveyors were collaborating with households to ensure households received high incentives.[11] This left a sample of 1,230 households, of which 736 did not have bank accounts.

The outcome of interest is whether a household opened a bank account. We measure this based on financial incentive claims. After verifying the identity of the claimant and the existence of a bank account we were left with 49 claims that came from eligible households that had indeed opened a bank account.

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[10]The experimental plan initially called for a range of invitations designed to elicit the importance of peer effects. Operational limitations precluded any peer invitations in the first 14 villages surveyed. In the subsequent villages, half of the treatment sample was offered an invitation for a friend.

[11]The survey was conducted in two waves. During wave one, which covered 48 villages, the size of the incentive for participating households was chosen by the surveyor drawing one of three colored balls from a bag. For four surveyors a Pearson Chi-squared test rejected the hypothesis that the allocation of incentives was random. The 23 villages visited by these surveyors have been dropped from the sample. During wave two incentive amounts were pre-assigned to households. There is no evidence that the incentive amount affected households' participation decisions (Table VIII).

V.B Summary Statistics and Checks of Randomization

Summary statistics for the experimental group are presented in Appendix Table I. Column (1) gives the mean value for all unbanked households who agreed to participate in our experiment; column (2) present summary statistics for unbanked households who declined to participate. We of course could not compel participation. Fortunately, the take-up rate was relatively high: 564 out of 736 households without bank accounts chose to participate in the experiment (77%): households made this decision prior to learning the precise details of the survey, including the size of the incentive and whether they would receive a literacy invitation. We find that rural households, older and unmarried household heads are less likely to participate in the experiment, whereas more educated, more financially literate household heads and those more interested in financial matters are more likely to participate.

Turning to summary statistics, slightly more than half of our experiment sample households are rural, half are female headed, household heads are on average in their early 40s, are overwhelmingly married, are Muslim and have attended some school. About 70% are employed and 70% own their homes. The average financial literacy score, as measured by questions asked in the Access to Finance Survey, is 50% though 70% of the sample claim they are interested in financial matters.

Panel B of Table VIII provides a test of the randomization. We first present mean differences between those invited to financial literacy training (274 out of 564) and those who were not (290 out of 564), and then for those who were offered the low (170), middle (190), or high (204) incentive. Column (3) tests the hypothesis of equality of means between the invited and non-invited group, while column (7) tests for equality of means across the assigned incentives. By and large, the randomization appears successful, as baseline characteristics do not vary systematically by treatment status.

VI Experimental Results

The main experimental results are presented in Table IX. Since the assignment of incentives and invitations to financial literacy training were randomly determined, unbiased estimates of the causal impact of each can be obtained by estimating the following simple equations[12]:

$$Open_i = \alpha + \beta * LitInvite_i + \varepsilon_i, \tag{1}$$

where $Open_i$ is a dummy variable indicating whether a household has opened a bank account, and $LitInvite_i$ a dummy variable for whether the household was invited to attend the training session. We focus initially on the reduced-form relationship because it is difficult to compel people to attend a training session; thus, the intention-to-treat estimate may be of greatest interest. Equation (1) is therefore the reduced form.

The point estimate on $LitTraining_i$ in Equation (1) is -0.02, with a standard error of .027. Thus, the financial literacy program we offered appears to have no effect on the likelihood a client opens a bank account. Column (2) presents the same results, but includes a set of household controls available from our survey[13].

Similarly, to determine the effect of incentives on opening an account, we estimate:

$$Open_i = \alpha + \gamma_M * MidPay_i + \gamma_H * HiPay_i + \varepsilon_i, \tag{2}$$

where $MidPay_i$ indicates whether the household received an incentive of Rp. 75,000, and $HiPay_i$ indicating whether the household received an incentive of Rp. 125,000. The

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[12]We chose a linear probability model because the coefficients are simple to interpret. We obtain very similar results from a marginal effects probit model.

[13]The controls include household/household head location, gender, age, marital status, religion, family size, schooling, consumption, employment status, financial literacy score, cognitive ability and expressed interest in financial matters.

omitted category is the small incentive, of Rp. 25,000. Standard errors in all specifications are clustered at the village level.

The point estimates on $MidPay_i$ and $HiPay_i$ in Equation (2) are large and statistically significant. These estimates suggest that incentives have a large effect on households opening a bank account. A household receiving the middle incentive is 5.4 percentage points more likely to open a bank account than a household receiving a low incentive. This represents a 150% increase over the group offered the low incentive, of whom 3.5 percent opened accounts. The effect of $HiPay$ is even greater: the point estimate of 9.2 percentage points represents a 260% increase in probability of opening a bank account compared to the group receiving Rp. 25,000.

This effect is large. For example, we saw in Table V that a one standard deviation increase in log household expenditure is associated with a 14.9 percentage point increase in the likelihood of having a bank account. Moving from the low to the high incentive has an effect equivalent to increasing household expenditure by two-thirds of a standard deviation.

Finally, we explore the possibility that there is an interaction between financial literacy training and financial incentives, with the following regression:

$$
\begin{aligned}
Open_i \;=\;& \alpha + \beta * LitInvite_i + \gamma_M * MidPay_i + \gamma_H * HiPay_i + \\
& + \theta_M * (MidPay_i * LitInvite_i) + \theta_H * (HiPay_i * LitInvite_i) + \varepsilon_i,
\end{aligned}
\tag{3}
$$

Columns (5) and (6) of Table IX report results. We find no interaction effect: the interaction point estimates are relatively imprecisely estimated, but statistically indistinguishable from zero. The main effect of incentives is unchanged.

VI.A Heterogeneous Treatment Effects

While there is no effect on the general population, it is possible that financial literacy training is effective for particular subsets of the population. Because the experiment was conducted in conjunction with the survey, we did not stratify by education or levels of financial literacy when assigning treatment levels. There is, however, strong reason to believe effects of financial education may vary based on individuals' characteristics. Limited financial literacy is likely a larger constraint for household heads with low levels of formal or financial education, as information acquisition may be costlier or more difficult for those who cannot read. Indeed, the results from the household survey presented in Table V (and from survey data in the United States and other developed countries) suggest education is an important predictor of financial literacy. Similarly, because the program was designed for individuals with low levels of financial literacy, it may have been most effective among this group.

In Table X, we therefore split the sample, exploring the possibility of heterogenous treatment effects. In columns (1) and (2), we interact $LitInvite_i$, $MidPay_i$, and $HiPay_i$ with a dummy variable indicating whether the respondent is reports having no formal schooling:

$$
\begin{aligned}
Open_i \quad = \quad & \alpha + \delta * NoSchool_i + \beta * LitInvite_i + \theta * (NoSchool_i * LitInvite_i) + \quad (4) \\
& \gamma_M * MidPay_i + \gamma_H * HiPay_i + \\
& \kappa_M * (NoSchool * MidPay_i) + \kappa_H * (NoSchool_i * HiPay_i) + \varepsilon_i
\end{aligned}
$$

We find, as before, that for literate households, the invitation has no effect: the point estimate of γ is -.032, indistinguishable from zero. However, for households that report

having received no schooling, we find that the financial literacy training program has a substantial effect: the sum $(\beta + \theta)$ is equal to 12.3 percentage points (column 1); an F-test for the joint significance of $(\beta + \theta)$ yields a p-value of 0.07. Approximately one tenth of the sample is illiterate. The coefficients κ_M and κ_H are negative, with κ_M weakly statistically significant. Testing the hypotheses $(\gamma_M + \kappa_M) = 0$ and $(\gamma_H + \kappa_H) = 0$ cannot be rejected at standard levels of significance, suggesting that for this subgroup, the financial incentives were not important determinants of behavior.

As a second way of cutting the data, we test whether the effect varies with initial levels of financial literacy. Columns (3) and (4) estimate equation 4, with a main effect and interactions for whether or not an individual obtained a score below the median score in the baseline financial literacy test replacing the schooling schooling terms. The point estimate of the effect of an invitation on those with above average financial literacy is negative but statistically indistinguishable from zero, at -4.9 percentage points. The estimate of the effect of the program on low financial literacy households $(\beta + \theta)$ is 5.1%. The hypothesis that this sum is zero can only be rejected at the 15% significance level. The incentives have an effect for both subgroups: the point estimate of the sum $\gamma_H + \kappa_H$ is 7.6 percentage points, significant at the 10% level.

These results suggest that the intervention delivered to the general population will not produce significant effects. However, a training program targeted at individuals with low levels of education and financial literacy can increase demand for financial services.

VI.B   Treatment on Treated

Approximately 69% of respondents invited to attend the program in fact attended the training. An alternative method of estimating Equation (1) is to use the invitation for the program as an instrument for the endogenous indicator of whether the individual

attended[14]. Under reasonable assumptions, this provides the effect of treatment on the treated, also known as the local average treatment effect (Imbens and Angrist (1994)). These results are reported in Table XI.

Given that there was no reduced-form relationship between the training invitation and opening a bank account (Table IX), it is not surprising that the IV estimate of the effect of training is also zero (Columns 1 and 2). The size of the standard error increases somewhat, but we can still comfortably rule out an effect size equivalent to the large incentive. Columns (3)-(4) examine heterogenous treatment effects, using invited as an instrument for attending, and invited*unschooled as an instrument for attended*unschooled. The treatment effect for unschooled is still positive, though no longer statistically significant. In column (5)-(6) we repeat this exercise for respondents above and below the median level of financial literacy. Here, we continue to find large marginal effects of attending the financial literacy education program: an individual is twenty percentage points more likely to open a bank account within six months if she or he is invited to a financial literacy session.

VII   Conclusion

Using two new surveys from two of the most populous countries in the world, this paper presents compelling new evidence that financial literacy is an important predictor of financial behavior in the developing world. These correlations, which have been well-documented in developed countries, have spurred governments, non-profits, and firms to promote financial literacy as a means of expanding the depth and breadth of the financial system.

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[14]There is no need to instrument the incentives offered, as there was no endogenous take-up of the incentives.

The benefits of better financial literacy may be great. On a personal level, individuals may save more, and better manage risk, by purchasing insurance contracts. There may even be general equilibrium effects: increased demand by households for financial services may improve risk-sharing, reduce economic volatility, improve intermediation, and speed overall financial development. This in turn could facilitate competition in the financial services sector, and ultimately more efficient allocation of capital within society.

Yet, we find evidence that a carefully-designed and delivered financial literacy training program in Indonesia did not stimulate demand for bank accounts among the general population. This was not because bank accounts are very difficult to open, as small financial incentives caused a large number of people to open bank accounts. We did find modest effects of both the financial literacy training program and the incentives among households with low levels of initial financial literacy.

We caution that these results do not necessarily constitute support for financial literacy education even among the low-literacy subpopulation. Even if financial literacy programs are carefully targeted, they may still not be cost-effective. For our experiment, the literacy training cost approximately US $17 per head to deliver. Among those with low levels of initial financial literacy (i.e. below median score on baseline financial literacy assessment), the training program increased the share opening a bank savings account by approximately 5 percentage points. Thus, causing one person to open a bank savings account through a literacy intervention, even if targeted at a population with low levels of literacy, would cost $17/0.05=$340. In contrast, for this same sub-sample, increasing the subsidy from US $3 to $14 led to an increase in probability of opening a bank savings account of 7.6 percentage points, suggesting a cost per bank savings account opened of $11/0.076=$145. Thus, subsidies are almost two-and-one-half times more cost effective than financial literacy education. Of course, this calculation ignores any ancillary value of

the financial literacy education course, which also informed participants about the power of compound interest, and other advantages and costs of savings. Nevertheless, it does suggest that financial literacy education is a relatively expensive way to increase financial access.

Where does this study leave us? On the one hand, the survey data from Indonesia and India demonstrate that financial literacy is an important correlate of household financial behavior, and household well-being. This provides further suggestive evidence that financial literacy is important, and that educated consumers will make better decisions.

Yet, our experimental results show that, a financial literacy training program does not affect financial decision making among the general population. It may be that financial literacy is a secondary, or even tertiary, determinant of demand for financial services. In contrast, we demonstrate that demand for bank accounts is highly sensitive to small financial incentives. This finding is consistent with the observation that banks in the United States offer cash gifts or presents to those opening a new account, and suggests that efforts to reduce the price of financial services, for example through encouraging competition, may be effective in facilitating financial development.

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This table reports summary statistics on demographics and wealth for participants in two household surveys conducted by the authors, one in India, one in Indonesia. The Indonesian sample is nationally representative, while the Indian survey consists of a study of rural farmers in the state of Gujarat.

	India			Indonesia				
				Unweighted			Weighted	
	Mean	Sd	N	Mean	Sd	N	Mean	Sd
Household Characteristics								
Household Size	5.9	2.5	1,500	3.0	1.4	3,360	2.9	1.3
Household Rural	100%		1,500	59%		3,360	58%	
Household head years of schooling	3.7	4.0	1,492					
Household has phone	14%		1,497	70%		3,360	81%	
Household has non-farm enterprise	6%		1,499	39%		3,360	39%	
Respondent Characteristics								
Bahasa speaker				79%		3,360	74%	
Female	54%		1,498	51%		3,360	50%	
Married	88%		1,499	83%		3,360	83%	
Muslim	9%		1,499	87%		3,360	93%	
Age	41.2	11.7	1,497	42.2	14.3	3,360	43.3	14.3
Attended school	58%		1,497	91%		3,360	89%	
Completed primary school	41%		1,493	79%		3,057	80%	
Completed high school	3%		1,493	33%		3,057	33%	
Beyond high school education	2%		1,493	9%		3,057	10%	
Employed	61%		1,498	75%		3,360	73%	
Discount factor	0.79	0.14	1,486	0.64	0.32	3,076	0.64	0.31
Commitment problem	0.00	0.12	1,481	0.02	0.26	3,005	0.03	0.27
Risk averse	19%		1,493	35%		3,360	36%	
Fatalist	0.53	0.25	1,433	0.62	0.29	3,360	0.60	0.30
Interested in financial matters				78%		3,360	74%	
Saves enough (self-reported)				53%		3,360	54%	
Mean cognitive ability score (out of 8)	4.9	2.4	1,468	6.3	1.8	3,360	6.5	1.8
Household Wealth and Income								
Monthly per capita Expenditure (USD, 2007)	$ 30	$ 39	1,499	$ 89	$ 103	3,360	$ 90	$ 106
Main income from agriculture	64%		1,500	40%		2,504	36%	
Main income from wage labor	23%		1,500	43%		2,504	49%	
Main income from own enterprise	4%		1,500					
Total Annual Household Income (USD, 2007)	$ 674	$ 698	1,499	$ 1,282	$ 3,700	3,359	$ 1,315	$ 3,798
Household owns land	48%		1,499	84%		3,360	84%	
Household has electricity	72%		1,491	94%		3,360	98%	
Household has tap water	47%		1,499	19%		3,360	23%	
Household has livestock, cattle, birds etc.	62%		1,497	94%		3,360	42%	

Table II: Household Financial Situation

This table reports data on use of financial services and household assets and liabilities for households surveys respondents in India and Indonesia. The Indonesian sample is nationally representative. For each country, the table gives the mean response to each question, as well as the mean for households who exhibit below median financial literacy, and the mean of households who exhibit above the median level of financial literacy. Figures in parentheses indicate standard deviation. The final column gives the difference between the two groups. *** indicates that the difference is statistically significant at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

	India				Indonesia			
	All	Financial Literacy			All	Financial Literacy		
		Below Median	Above Median	Difference		Below Median	Above Median	Difference
Household has a bank account	12%	5%	15%	10% ***	41%	24%	47%	23% ***
Household has advanced savings instruments (e.g. CDs, mutual fund)					13%	5%	20%	***
Household has savings with non-bank institution	55%	51%	60%	9% ***	51%	38%	62%	25% ***
Total household savings (USD, 2007)	31	15	41	26 **				
	(151)	(40)	(213)					
Household has a formal sector loan	13%	10%	15%	5% **	25%	13%	29%	16% ***
Household has an informal loan	64%	62%	66%	4%	52%	45%	56%	11% ***
Total household indebtedness (USD, 2007)	906	448	1303	855	875	310	1177	867 ***
	(8,899)	(818)	(13,154)		(5,761)	(2,599)	(6,328)	
Mean Household Indebtedness/Annual Income	1.7	1.3	2.1	0.9	4.0	1.9	3.7	1.8
	(10.2)	(2.7)	(14.8)		(90.9)	(48.0)	(58.0)	
Household has any insurance program	64%	60%	69%	9% ***	49%	37%	53%	16% ***
Household has health insurance	61%	59%	65%	7% **	34%	26%	37%	11% ***
Household has crop insurance	3%	1%	5%	4% ***				0%
Household has asset/homeowner's insurance	57%	56%	59%	3%	26%	14%	31%	17% ***
N	1,496	384	1,112		3,360	1,104	2,256	

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Table III: Financial Literacy, Cognitive Ability, and Discount Rates

This table reports levels of financial literacy among households surveys respondents in India and Indonesia. The Indonesian sample is nationally representative. The means are given for households above and below mean per capita expenditure, and for households above and below measured cognitive ability. The column to the right of the comparison columns indicates whether the difference in means is statistically significant. *** indicates that the difference is statistically significant at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

		India					Indonesia				
		All	Per Capita Expenditure		Cognitive Ability		All	Per Capita Expenditure		Cognitive Ability	
			Below Median	Above Median	Below Median	Above Median		Below Median	Above Median	Below Median	Above Median
Compound Interest	% Correct	59%	55%	63% ***	33%	80% ***	78%	69%	86% ***	56%	89% ***
If savings earns 1% and inflation is 2%, after one year is buying power greater, less, or the same?	% Correct	25%	21%	28% ***	14%	33% ***	61%	51%	70% ***	37%	74% ***
Is one crop is safer than multiple crops?	% Correct	31%	30%	32%	26%	34% ***	28%	24%	31% ***	23%	30% ***
Borrowing 500,000, repaying 600,000 versus paying 15 percent	% Correct	24%	24%	23%	11%	34% ***	44%	39%	49% ***	30%	52% ***
All questions Taken Together	% Correct	34%	33%	36%	21%	45% ***	52%	46%	59%	37%	61% ***
All questions Taken Together	Avg. Score (out of 4)	1.38	1.31	1.45 ***	0.83	1.80 ***	2.10	1.83	2.36 ***	1.46	2.45 ***
N		1,497	749	747	622	843	3,360	1,680	1,680	1,412	1,948

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Table IV: Predictors of Financial Literacy

This table reports the results from regressions predicting measured financial literacy among households surveys respondents in India and Indonesia. Financial literacy is measured by a series of questions about compounding, interest rates, and risk diversification. The Indonesian sample is nationally representative, and weighted by sampling weights. The Indian regressions are unweighted. Standard errors, clustered at the village level, are given in parentheses beneath each point estimate. *** indicates statistically significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Dependent variable:	Financial Literacy Score							
	India				Indonesia			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Per capita expenditure	.0725 *	.0788 *	.0799 *	.0507	.0736 *	.0865 **	.0711 *	.1 **
	(.0398)	(.0411)	(.0409)	(.0427)	(.0404)	(.0419)	(.0416)	(.0466)
Bahasa					.0727	.0748	.0796	.033
					(.0547)	(.0567)	(.0568)	(.0671)
Rural					-.152 ***	-.1949 ***	-.1955 ***	
					(.0506)	(.0528)	(.0528)	
Female	-.0767	-.0897	-.0957	-.0739	-.11 **	-.1234 **	-.1302 **	-.1352 ***
	(.0586)	(.0609)	(.061)	(.0614)	(.0501)	(.0517)	(.0506)	(.0506)
Age	.0217 **	.0269 **	.0269 **	.0202 *	.0212 **	.0203 **	.022 **	.0124
	(.0105)	(.011)	(.011)	(.0111)	(.0096)	(.0098)	(.0098)	(.0099)
Age squared	-2.4e-04 **	-3.0e-04 **	-3.0e-04 **	-2.1e-04 *	-2.4e-04 **	-2.4e-04 **	-2.5e-04 **	-1.8e-04 *
	(1.2e-04)	(1.2e-04)	(1.2e-04)	(1.3e-04)	(1.0e-04)	(1.1e-04)	(1.1e-04)	(1.1e-04)
HH has Non-farm enterprise	-.0653	-.0396	-.0411	-.0958	.1119 **	.1291 **	.136 ***	.1143 **
	(.1045)	(.1083)	(.1074)	(.1082)	(.0507)	(.0519)	(.0504)	(.0539)
Married	-.03	-.0396	-.0456	-.032	-.0788	-.1113	-.0944	-.0748
	(.0796)	(.0824)	(.0825)	(.0803)	(.0761)	(.0787)	(.0762)	(.0773)
Muslim	.0483	.0757	.0742	.1869 *	-.0728	.0097	.0098	-.1035
	(.0943)	(.0964)	(.0966)	(.1042)	(.1022)	(.109)	(.1064)	(.1549)
Household size	.0133	.0143	.0126	.0133	-.0164	-.0204	-.0243	-8.8e-04
	(.0101)	(.0107)	(.0106)	(.0107)	(.0175)	(.0183)	(.0177)	(.0194)
Completed primary school	-.0068	-.0335	-.0353	.1434 **	.1647 **	.1273 *	.1281 *	.0699
	(.0626)	(.0642)	(.0644)	(.0679)	(.0673)	(.0683)	(.0682)	(.0708)
Completed high school	.2009	.2543	.2531	.1478	.0219	-.0194	-.0199	-.072
	(.2284)	(.2429)	(.2387)	(.1964)	(.0664)	(.0706)	(.0689)	(.071)
Beyond high school education	-.2301	-.2906	-.3007	-.0588	.3524 ***	.3698 ***	.3293 ***	.2638 **
	(.2669)	(.2827)	(.2753)	(.2434)	(.1006)	(.1059)	(.1028)	(.1056)
Cognitive ability	.2225 ***	.226 ***	.2245 ***	.1865 ***	.2339 ***	.2331 ***	.2238 ***	.1909 ***
	(.0126)	(.0131)	(.0132)	(.0143)	(.0168)	(.0175)	(.0176)	(.0189)
Discount factor			-.1455	-.0337			.0019	.0115
			(.1849)	(.184)			(.0762)	(.0773)
Risk averse			-.037	.0264			-.0752	-.062
			(.0675)	(.0646)			(.0551)	(.0558)
Fatalist			-.2681 ***	-.2319 **			-.398 ***	-.3771 ***
			(.0997)	(.0992)			(.084)	(.0844)
Interested in financial matters							.0217	.0504
							(.0624)	(.0622)
Saves enough (self-reported)							-.0569	-.1005 *
							(.0499)	(.0518)
Village fixed effects	No	No	No	Yes	No	No	No	Yes
N	1450	1369	1369	1369	3057	2818	2818	2818

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Table V: Predictors of Financial Participation

This table reports the results from estimating which household characteristics predict use of financial services by households surveys respondents in India and Indonesia. The Indonesian sample is nationally representative. Standard errors, clustered at the village level, are given in parentheses beneath each point estimate. *** indicates statistically significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Household has:	Bank account		Formal Loan		Informal Loan		Insurance	
	India	Indonesia	India	Indonesia	India	Indonesia	India	Indonesia
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Financial literacy score	0.000	0.020 **	0.019	0.002	0.012	0.014	0.032 **	0.000
	(.011)	(.008)	(.012)	(.006)	(.016)	(.009)	(.016)	(.009)
Per capita expenditure	0.027 *	0.187 ***	0.066 ***	0.096 ***	0.018	0.064 ***	0.031	0.093 ***
	(.015)	(.018)	(.017)	(.012)	(.025)	(.016)	(.024)	(.015)
Bahasa		0.049 **		0.017		0.009		0.028
		(.023)		(.021)		(.031)		(.03)
Female	0.014	0.047 ***	0.032	0.025 *	-0.008	-0.016	0.031	0.005
	(.021)	(.017)	(.025)	(.014)	(.034)	(.022)	(.032)	(.021)
Age	0.002	0.001	0.014 ***	0.002	0.006	-0.006 *	0.005	-0.006
	(.004)	(.003)	(.005)	(.002)	(.006)	(.003)	(.007)	(.004)
Age squared	-3.0E-06	1.4E-05	-1.5E-04 **	2.8E-06	-6.7E-05	3.0E-05	-4.7E-05	7.3E-05 *
	(4.8E-05)	(3.1E-05)	(5.9E-05)	(2.7E-05)	(7.2E-05)	(3.7E-05)	(8.4E-05)	(4.1E-05)
Non-farm enterprise	0.006	0.050 ***	0.019	0.042 ***	-0.045	0.022	0.058	0.018
	(.035)	(.019)	(.046)	(.015)	(.06)	(.022)	(.058)	(.02)
Married	0.055 **	-0.001	0.014	0.027	-0.045	0.071 **	-0.009	0.005
	(.022)	(.022)	(.034)	(.018)	(.045)	(.029)	(.048)	(.026)
Muslim	-0.055 *	0.053	0.084	0.068 *	-0.156 ***	0.028	-0.052	0.030
	(.031)	(.05)	(.053)	(.04)	(.06)	(.052)	(.064)	(.06)
Household size	0.007	0.060 ***	0.022 ***	0.033 ***	0.007	0.019 **	0.000	0.054 ***
	(.005)	(.007)	(.005)	(.006)	(.006)	(.008)	(.007)	(.007)
Completed primary school	0.070 ***	0.038 **	0.043 *	0.026 *	-0.065 *	-0.044	0.018	0.031
	(.026)	(.019)	(.023)	(.015)	(.037)	(.027)	(.038)	(.026)
Completed high school	0.063	0.161 ***	0.173	0.049 ***	-0.289 ***	-0.025	0.276 ***	0.107 ***
	(.102)	(.024)	(.108)	(.017)	(.106)	(.024)	(.08)	(.021)
Beyond high school education	0.093	0.145 ***	-0.032	0.161 ***	0.050	-0.064 *	-0.156 *	0.151 ***
	(.137)	(.032)	(.129)	(.033)	(.14)	(.035)	(.094)	(.037)
Cognitive ability	0.005	0.006	0.004	0.011 ***	0.000	-0.004	0.016 *	0.011 *
	(.006)	(.005)	(.005)	(.004)	(.008)	(.007)	(.008)	(.006)
Discount factor	-0.048	0.011	-0.044	-0.046 **	-0.064	-0.055 *	0.081	0.025
	(.064)	(.026)	(.07)	(.022)	(.104)	(.029)	(.104)	(.024)
Risk averse	0.011	0.032 *	-0.013	0.028 *	0.031	0.007	0.007	0.021
	(.023)	(.016)	(.021)	(.015)	(.034)	(.02)	(.037)	(.017)
Fatalist	0.035	-0.083 ***	0.029	-0.010	0.014	0.051	0.093 *	-0.041
	(.044)	(.029)	(.042)	(.022)	(.059)	(.034)	(.052)	(.032)
Interested in financial matters		0.015		0.012		0.092 ***		0.010
		(.019)		(.016)		(.027)		(.022)
Village fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1365	2818	1369	2818	1369	2818	1363	2818

Table VI: Demand for Financial Products, Indonesia

This table reports demand for financial products by households surveys respondents in Indonesia. The sample is nationally representative. Panel A gives average reported demand for each service, while Panel B reports OLS regressions relating individual characteristics to product demand. Standard errors, clustered at the village level, are given in parentheses beneath each point estimate. *** indicates statistically significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Panel A: Summary Statistics

	Indonesia		
	Sample	**Mean**	**N**
Demand for savings products			
Interested in commitment savings product	All	43%	3360
Interested in using deposit collector	All	25%	3359
Interested in retirement savings product	All	50%	3360
Open account if fees cut 50%	No bank account	37%	2153
Open account if fees cut 100%	No bank account	58%	2153
Would attend financial literacy training	No bank account	74%	2153

Panel B: Determinants of Demand for Financial Products

Demand for:	Commitment savings		Deposit Collector		Retirement savings		Literacy training	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Financial literacy score	0.028 ***	0.025 **	0.024 ***	0.026 ***	0.037 ***	0.033 ***	0.019 *	0.014
	(.01)	(.01)	(.009)	(.01)	(.01)	(.011)	(.01)	(.011)
Has bank account	-0.012	-0.018	-0.051 **	-0.065 ***	0.087 ***	0.074 **		
	(.026)	(.026)	(.02)	(.021)	(.025)	(.029)		
Per capita expenditure	0.058 ***	0.043 ***	0.030 **	0.025	0.073 ***	0.067 ***	0.061 ***	0.051 **
	(.015)	(.016)	(.014)	(.015)	(.017)	(.019)	(.021)	(.021)
Bahasa	0.072 **	0.078 **	0.001	0.000	0.027	0.012	0.040	0.017
	(.034)	(.037)	(.03)	(.03)	(.036)	(.04)	(.036)	(.038)
Female	0.007	0.009	-0.021	-0.013	0.031	0.030	-0.022	-0.025
	(.019)	(.021)	(.018)	(.017)	(.02)	(.019)	(.019)	(.02)
Age	0.005	0.005	0.003	0.004	0.003	0.002	0.010 **	0.007 *
	(.004)	(.004)	(.003)	(.003)	(.004)	(.004)	(.004)	(.004)
Age squared	-1.0E-04 **	-1.0E-04 ***	-5.2E-05	-5.8E-05	-6.4E-05 *	-5.1E-05	-1.6E-04 ***	-1.3E-04 ***
	(4.0E-05)	(3.9E-05)	(3.8E-05)	(3.8E-05)	(3.8E-05)	(3.8E-05)	(4.0E-05)	(4.2E-05)
HH has non-farm enterprise	0.012	0.010	0.025	0.021	-0.044 **	-0.048 **	-0.022	-0.025
	(.02)	(.02)	(.018)	(.019)	(.018)	(.02)	(.022)	(.021)
Married	0.091 ***	0.085 ***	-0.014	-0.034	0.005	-0.008	0.029	0.021
	(.024)	(.024)	(.026)	(.028)	(.025)	(.024)	(.034)	(.035)
Muslim	0.025	0.021	-0.020	-0.008	0.038	0.049	-0.042	-0.050
	(.049)	(.047)	(.036)	(.036)	(.046)	(.046)	(.059)	(.052)
Household size	0.017 **	0.017 ***	0.011	0.012	0.013 *	0.013 *	0.015	0.015
	(.007)	(.007)	(.007)	(.007)	(.007)	(.007)	(.01)	(.01)
Completed primary school	0.027	0.029	0.015	0.011	0.021	0.022	0.024	0.017
	(.025)	(.025)	(.024)	(.025)	(.028)	(.027)	(.025)	(.025)
Completed high school	-0.017	-0.023	-0.057 **	-0.066 **	0.008	-0.006	0.028	0.015
	(.024)	(.025)	(.026)	(.026)	(.026)	(.026)	(.03)	(.032)
Beyond high school education	0.026	0.030	-0.01557	-0.010	0.053 *	0.048	0.036	0.030
	(.032)	(.034)	(.031)	(.034)	(.032)	(.033)	(.075)	(.082)
Cognitive ability	0.007	0.002	-0.007	-0.010	-0.006	-0.012 *	0.005	0.003
	(.006)	(.007)	(.007)	(.008)	(.007)	(.007)	(.007)	(.007)
Discount factor		0.076 **		0.076 ***		0.030		0.054 *
		(.03)		(.026)		(.033)		(.032)
Risk averse		-0.037 *		-0.027 *		-0.030		-0.038
		(.02)		(.016)		(.023)		(.024)
Fatalist		0.082 **		0.113 ***		0.065 *		0.095 **
		(.038)		(.033)		(.04)		(.037)
Interested in financial matters		0.121 ***		0.096 ***		0.154 ***		0.070 **
		(.026)		(.023)		(.024)		(.033)
Saves enough (self-reported)		0.097 ***		0.102 ***		0.108 ***		0.092 ***
		(.022)		(.02)		(.024)		(.021)
Village fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3057	2818	3057	2818	3057	2818	1876	1737

Table VII: Attitudes towards Bank Accounts and Use of Financial Services, Indonesia

This table reports attitudes towards use of financial services, and how these attitudes are correlated with financial literacy levels, among households surveys respondents in Indonesia. The sample is nationally representative. Standard errors, clustered at the village level, are given in parentheses beneath each point estimate. *** indicates statistically significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

	Sample	Mean	Correlation with Financial Literacy
Reasons for having bank account	Has bank account (N=1207)		
Security		53%	0.06 **
For predicted future needs		42%	0.02
Transfer money		37%	0.02
For emergency needs		31%	0
Access other financial services		26%	0.15 ***
To be able to borrow money		17%	-0.05 *
Reasons for not having bank account	No bank account (N=2153)		
Not enough money		92%	0
Do not know how bank operates		32%	-0.07 ***
Do not have a job		20%	-0.04 *
No advantage to having bank account		16%	0.1 ***
Bank staff rude or unhelpful		15%	0.1 ***
Household used to have bank account	No bank account (N=2153)	29%	0.23 ***
Reason stopped using bank account	Used to have account (N=544)		
Not enough money		71%	0.05
Became unemployed		10%	-0.13 ***
No advantage to having bank account		4%	0.03
Know location of nearest bank branch	No bank account (N=2152)	76%	0.31 ***
Know requirements to open bank account	No bank account (N=2153)	31%	0.24 ***
Does household save enough for the future?	All (N=3360)	54%	0.15 ***
Limits on household's ability to save	Not save enough (N=1574)		
Claims of relatives		0%	0.01
Failure to control spending		23%	0.14 ***
Debts to pay		10%	0.07 ***
No money to save		76%	-0.1 ***
Prefer to purchase assets		2%	0.05 *
Irregular income		31%	0.02 *
Reasons for not having any insurance	No insurance (N=1460)		
Insurance term too long		1%	0.06 **
Premium too expensive		6%	0.08 ***
Do not know about any insurance product		38%	-0.09 ***
Do not think need it		23%	0.02
Not enough money		59%	-0.04 *
Most important risks to financial well being	All (N=3360)		
Illness		79%	-0.07 ***
Loss of formal/informal employment		56%	0.06 ***
Loss of/damage to dwelling		33%	-0.01
Business perform poorly		30%	0.08 ***
Death		28%	0.01
Harvest fails		26%	-0.17 ***
Natural disaster		24%	0.11 ***
Loss of/damage to vehicle		12%	0.05 ***
Loss of/damage to cattle		6%	-0.11 ***

Table VIII: Experimental Sample, Indonesia

This table reports sample summary statistics and tests of random treatment assignment for an experiment testing the effect of offering financial literacy training and financial incentives on respondents' decision to open a bank account. Panel A gives sample size and the mean of the outcome group by treatment status. Panel B provides tests of random assignment. The p-values column reports the statistical significance of a test for difference between the mean of invited and non-invited individuals; the p-values for incentive level corresponds to a joint test of significant differences between medium and low, and high and low, categories. Standard errors are adjusted for clustering at the village level. *** indicates statistically significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Panel A: Summary Statistics

	N	Percent	Opened Bank Account N	Opened Bank Account Percent
	(1)	(2)	(3)	(4)
Surveyed Individuals	1230			
Of whom, No Bank Account	736	60%		
Of whom, participated in experiment	564	77%	49	9%
Incentive Treatment				
Low Incentive ($3)	170	30%	6	4%
Medium Incentive ($8)	190	34%	17	9%
High Incentive ($14)	204	36%	26	13%
Literacy Treatment				
Invited to Financial Literacy Training	274	49%	21	8%
Not Invited to Financial Literacy Training	290	51%	28	10%

Panel B: Test of Random Assignment

	Invited	Not Invited	p-value	Low	Medium	High	p-value
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Rural Household	0.58	0.53	0.053 *	0.57	0.53	0.55	0.591
Female	0.55	0.50	0.287	0.54	0.50	0.53	0.681
Age	41.84	40.55	0.302	40.76	40.72	41.95	0.554
Married	0.87	0.85	0.529	0.88	0.86	0.85	0.710
Muslim	0.97	0.99	0.102	0.99	0.98	0.98	0.662
Family Size	2.73	2.82	0.446	2.73	2.76	2.82	0.756
Attended School	0.90	0.90	0.916	0.89	0.93	0.88	0.134
Log of Consumption Expenditure	17.26	17.32	0.332	17.18	17.33	17.35	0.213
Employed	0.68	0.69	0.792	0.65	0.67	0.72	0.367
Financial Literacy Score	0.46	0.51	0.039 **	0.49	0.49	0.48	0.821
Cognitive / Math Skills Score	0.79	0.80	0.408	0.78	0.80	0.79	0.727
Believe Household Saves Enough	0.43	0.49	0.101	0.45	0.47	0.47	0.846
Interested in Financial Matters	0.72	0.72	0.867	0.69	0.73	0.73	0.626

Table IX: Experimental Results: The Effect of Financial Literacy Education and Incentives on Opening of Bank Accounts

This table reports the results from a randomized experiment measuring the effect of offering financial literacy training and financial incentives on respondents' decision to open a bank account. The dependent variable is an indicator for whether the respondent opened a bank account. A linear probability model is used. Standard errors, clustered at the village level, are given in parentheses beneath each point estimate. *** indicates statistically significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

Dependent Variable : Opened Bank Account?	(1)	(2)	(3)	(4)	(5)	(6)
Financial Literacy Invitation?	-0.020	-0.022			0.022	0.029
	(0.027)	(0.028)			(0.028)	(0.034)
Incentive==75000			0.054 **	0.048 *	0.065 *	0.066 *
			(0.024)	(0.026)	(0.036)	(0.037)
Incentive==125000			0.092 ***	0.088 ***	0.136 ***	0.137 ***
			(0.026)	(0.029)	(0.036)	(0.033)
(Incentive==75000) * Financial Literacy Invitation					-0.021	-0.036
					(0.047)	(0.052)
(incentive==125000) * Financial Literacy Invitation					-0.090	-0.101
					(0.057)	(0.062)
Constant	0.097 ***	-0.444	0.035 **	-0.447	0.024	-0.455
	(0.017)	(0.306)	(0.014)	(0.308)	(0.017)	(0.303)
Household Controls		YES		YES		YES
Observations	564	564	564	564	564	564
R-squared	0.001	0.068	0.018	0.082	0.023	0.089

Table X: Experimental Results: Heterogeneous Effects of Financial Literacy Education and Incentives on Opening of Bank Accounts

This table reports the results from a randomized experiment measuring the effect of offering financial literacy training and financial incentives on respondents' decision to open a bank account. The dependent variable is an indicator for whether the respondent opened a bank account. Columns (1) and (2) include main effects and interaction terms for households who were illiterate; columns (3) and (4) include main effects and interaction terms for households who initially scored below the median level of financial literacy. A linear probability model is used. Standard errors, clustered at the village level, are given in parentheses beneath each point estimate. *** indicates statistically significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

	(1)	(2)	(3)	(4)
Financial Literacy Invitation	-0.032	-0.031	-0.049	-0.048
	(0.029)	(0.030)	(0.034)	(0.036)
Incentive==75000	0.061 **	0.057 **	0.060	0.051
	(0.028)	(0.029)	(0.039)	(0.040)
Incentive==125000	0.099 ***	0.091 ***	0.100 ***	0.098 ***
	(0.027)	(0.030)	(0.030)	(0.034)
Unschooled	-0.055	-0.067		
	(0.050)	(0.068)		
Unschooled * Financial Literacy Invitation	0.155 **	0.139 *		
	(0.068)	(0.071)		
Unschooled * Incentive==75000	-0.135 *	-0.131 *		
	(0.071)	(0.072)		
Unschooled * Incentive==125000	-0.062	-0.036		
	(0.084)	(0.093)		
Below Median Financial Literacy			-0.076 **	-0.056
			(0.037)	(0.050)
Below Median Financial Literacy * Financial Literacy Invitation			0.100 **	0.087 **
			(0.044)	(0.043)
Below Median Financial Literacy * Incentive==75000			-0.016	-0.008
			(0.060)	(0.058)
Below Median Financial Literacy * Incentive==125000			-0.024	-0.031
			(0.049)	(0.055)
Constant	0.050 **	-0.377	0.067 **	-0.377
	(0.020)	(0.325)	(0.027)	(0.331)
Household Controls		Yes		Yes
Observations	564	564	564	564
R-squared	0.03	0.09	0.03	0.09

Table XI: Instrumental Variable Estimates of Experiment and Heterogeneous Treatment Effects

This table reports instrumental variable estimates of the effect of offering financial literacy training and financial incentives on respondents' decision to open a bank account. The dependent variable is an indicator for whether the respondent opened a bank account. Financial Literacy Attendance is instrumented for with assignment of a financial literacy invitation. Columns (1) and (2) include main effects and interaction terms for households who were illiterate; columns (3) and (4) include main effects and interaction terms for households who initially scored below the median level of financial literacy. Standard errors, clustered at the village level, are given in parentheses beneath each point estimate. *** indicates statistically significance at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

	(1)	(2)	(3)	(4)	(5)	(6)
Attended Financial Literacy Program	-0.033	-0.036	-0.056	-0.059	-0.081	-0.078
	(0.049)	(0.051)	(0.050)	(0.053)	(0.056)	(0.057)
Incentive==75000	0.053 **	0.047 *	0.060 **	0.051 *	0.057	0.049
	(0.024)	(0.025)	(0.027)	(0.029)	(0.039)	(0.038)
Incentive==125000	0.092 ***	0.088 ***	0.099 ***	0.089 ***	0.103 ***	0.101 ***
	(0.026)	(0.027)	(0.026)	(0.029)	(0.030)	(0.034)
Unschooled			-0.159	-0.166		
			(0.154)	(0.153)		
Unschooled * Attended Financial Literacy Program			0.544	0.489		
			(0.468)	(0.403)		
Unschooled * Incentive==75000			-0.168	-0.149		
			(0.113)	(0.103)		
Unschooled * Incentive==125000			-0.199	-0.149		
			(0.125)	(0.107)		
Below Median Financial Literacy					-0.115 **	-0.084
					(0.058)	(0.060)
Below Median Financial Literacy * Attended Financial Literacy Program					0.206 **	0.172 *
					(0.104)	(0.094)
Below Median Financial Literacy * Incentive==75000					-0.013	-0.006
					(0.059)	(0.056)
Below Median Financial Literacy * Incentive==125000					-0.027	-0.032
					(0.053)	(0.056)
Constant	0.050 **	-0.404	0.058 **	-0.426	0.077 **	-0.391
	(0.024)	(0.312)	(0.026)	(0.331)	(0.032)	(0.317)
Household Controls		Yes		Yes		Yes
Observations	564	564	564	564	564	564

Appendix Table I: Determinants of Participation in Field Experiment

This table reports household characteristics of households who elected to participate in the randomized experiment, and those who chose not to participate. Household characteristics are from the household survey that was offered prior to the invitation to participate in the study. *** indicates that the difference is statistically significant at the 1 percent level, ** at the 5 percent level, and * at the 10 percent level.

	Participants	Non-Participants	Difference
Rural Household	0.55	0.73	0.17 **
Female	0.52	0.53	0.01
Age	41.19	44.85	3.66 **
Married	0.86	0.76	-0.10 ***
Household Size	2.77	2.82	0.05
Attended School	0.90	0.78	-0.12 ***
Log of Consumption Expenditure	17.29	17.15	-0.14
Employed	0.68	0.70	0.02
Own House	0.72	0.77	0.05
Financial Literacy Score	0.48	0.39	-0.09 ***
Cognitive / Math Skills Score	0.79	0.67	-0.12 ***
Consistent Preferences	0.73	0.71	-0.02
Believe Household Saves Enough	0.47	0.35	-0.11 **
Interested in Financial Matters	0.72	0.62	-0.09 **