

The third in our new series of impact notes highlights an example of where randomized experiments have been used to help understand the impact of a new insurance product first developed by CRMG at the World Bank and various public and private partners in several client countries.

The Promise of Index Insurance

Xavier Gine

Index-based insurance is an innovative financial product, which has been introduced in recent years in countries as diverse as India, Mongolia, Malawi and Thailand. It allows individual smallholder farmers to hedge against agricultural production risk, such as drought or flood. The product pays out in events that are triggered by a publicly observable index, such as rainfall recorded on a local rain gauge. Advocates argue that index insurance is transparent and inexpensive to administer, enables quick payouts, and minimizes moral hazard and adverse selection problems associated with other risk-coping mechanisms and traditional insurance programs.

This financial innovation holds significant promise for rural households. Weather shocks to agricultural income generate fluctuations in household consumption that are not perfectly insured; at the extreme they may lead to famine or death. This suggests that households in developing countries are only partially insured and as a result, may pass on more profitable but riskier investments.

An important set of interrelated questions about these micro-insurance products are (i) what types of households buy index insurance, (ii) what are the factors which prevent the remaining households from participating and (iii) does purchase of index insurance result in more efficient risk taking.

Randomizing access to insurance

Recent randomized experiments in Malawi and India were used to try and answer these questions.

In Malawi, smallholders were offered credit to purchase high-yielding seed varieties. To understand whether adoption was discouraged by its inherent riskiness, farmers in some localities were randomly selected to be just offered credit, while those in other localities were offered a bundle of credit and insurance.

In India, smallholders were offered a stand alone insurance product whose price elasticity was estimated by randomly varying the price of the policy. To understand the role of credit constraints, certain households were given a positive liquidity shock. To measure the importance of trust, some households received a product endorsement by a trusted local agent. To understand whether limited financial education about the product limits adoption, additional information was provided to a subset of households relating the unfamiliar concept of rainfall in millimeters to the familiar concept of soil moisture. Finally, to understand the effect of product framing, information was presented in subtle different ways.

Low uptake of insurance

In Malawi, take-up of the credit was 33 percent for farmers offered the loan without insurance, and only 17.6 percent for farmers

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who were offered a loan bundled together with rainfall insurance. This suggests that smallholders did not value insurance, perhaps because the limited liability clause in the loan contract was already providing implicit insurance.

In India, demand was sensitive to the price and to the endorsement from a third trusted party. But uptake remained low, even when the purchase of insurance had positive net present value given the high subsidy. These results are consistent with the view that in addition to price and liquidity, trust and financial literacy influence take-up to a significant degree.

Besides the wealthier, the more educated and financially literate were also more likely to purchase insurance, suggesting that these products are complex.

Policy Implications

1. Implementation and Marketing of index insurance should be carefully designed.

The findings on trust and financial literacy suggest scope for modifying implementation and marketing in a way which will boost demand. To the extent that poor farmers are unable to understand complicated insurance products, a trade-off arises since the product has to be simple and yet has to pay out in the events the smallholder cares about, which

can be a complicated function of the event being insured against.

2. Mistrust can be overcome by designing a product that initially pays fairly often.

It is easier to sell insurance in villages where a positive past insurance payout has occurred. Therefore, it would be useful to modify the contracts, at least in the beginning to ensure that they payout a positive return with sufficient frequency as to engender trust in the population. Current contracts resemble catastrophic insurance, paying large sums only in rare events.

3. Because liquidity constraints matter, lenders could offer a loan to pay for the premia.

In this case, lenders would have to be explicit about the events that trigger a payout, so that the culture of repayment is not undermined.

4. The focus of research has been on the farmer or borrower as beneficiaries of insurance. When considering agro-businesses or lenders the demand for insurance should be a no-brainer.

From the agro-business or the lender's standpoint, weather insurance is an attractive way to mitigate default risk and thus, it can become an effective risk management tool with the potential of increasing access to credit in agriculture at lower prices.

For further reading see:

Gine, Xavier, Robert M. Townsend, and James Vickery. 2007. "Statistical Analysis of Rainfall Insurance Payouts in Southern India." *American Journal of Agricultural Economics* 89(5): 1248-54.

Gine, Xavier, Robert Townsend, and James Vickery. 2007. "Patterns of Rainfall Insurance Participation in Rural India." *World Bank Economic Review* 22(3) (2008):539-566.

Gine, Xavier, and Dean Yang. 2007. "Insurance, Credit, and Technology Adoption: Field Experimental Evidence from Malawi." *Journal of Development Economics* 89(1) (2009): 1-11.

Cole, Shawn, Xavier Gine, Jeremy Tobacman, Petia Topalova, Robert Townsend and James Vickery "Barriers to Household Risk Management: Evidence from India". Working Paper, World Bank, Washington, DC.

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