Willingness-to-pay for microinsurance and flexibility: Evidence from an agricultural investment lab-in-the-field experiment in Senegal

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Extended abstract

Poor households depending on agro-pastoral livelihoods have seasonal income and are therefore particularly vulnerable to idiosyncratic income shocks. Additionally, weather-related aggregate shocks such as droughts or floods pose huge threats to vulnerable households who have little means of diversifying their income sources or investing in risk-reduction technologies.

Both researchers and practitioners increasingly recognize the importance of interacting savings, credit and insurance as risk coping tools for agricultural smallholders in developing countries. In part, it is an answer to the failure of independent risk transfer mechanisms reflected in the low offer of insurance products for aggregate risks in developing countries as well as the low take-up of these insurance products when they are available in form of index-based contracts.

Very recent research suggests that the interaction between credit, savings and insurance is important for household behavior (Karlan and Morduch (2009)). Also the interaction between informal risk sharing groups and formal insurance seems to play an essential role in households’ demand for and use of insurance (De Janvry et al. (2013); Janssens and Kramer (2012); Mobarak and Rosenzweig (2012)). However, little is known on both questions and empirical evidence

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remains limited.

One important characteristic in interlinking credit, savings and insurance is commitment. The more the household is committed to credit reimbursement or savings plans, the less flexibility it has on its financial or investment decisions.

Flexibility in agricultural investment decisions refers to the ability to take decisions once relevant information is available, such as the ability to decide how much to invest in cattle once the revenue from harvest is precisely known. These investments in different income generating activities financed from a fluctuating main income stream from agriculture illustrate the interconnection between flexibility in decision making and commitment to financial products, and their interaction with investment decisions. In this regard, flexibility can be considered as a proxy for non-commitment and vice versa.

Insurance for agricultural production can reduce fluctuations in the underlying agricultural income stream and consequently loosen constraints caused by commitment and inflexibility. Therefore it is important to understand the interactions between commitment or flexibility and insurance.

To analyze the effect of insurance in flexible and non-flexible decision making environments and to assess the valuation of insurance in both these environments, we conduct lab-in-the-field experiments with agricultural decision makers in rural Senegal that will be offered an agricultural drought insurance in the near future. The drought insurance will be accompanied by activities regarding savings promotion and the facilitation of access to credit. We randomly selected 400 agricultural households in rural Senegal in the program region for participation in the experimental sessions that consisted of 20 participants each.

In our setting, the interactions between financial products are particularly important. While commitment to credit reimbursement or savings plans is typically a dynamic concept that is difficult to capture in a one-stage framework, it is easy to introduce different levels of flexibility in a one-period game. Therefore, we use inflexibility in decision making as a proxy for commitment in various financial products and circumvent problems related to identification of effects in dynamic experimental setups, such as undesirable learning or path-dependency.
**Experimental investment decision**

The experimental design is built around a basic investment decision. Participants face an investment opportunity with risky prospects. From their initial endowment $y$, they can invest an amount $x$ in a risky asset. This amount is lost with probability one-half or multiplied by three with probability one-half. In addition to the return on investment, there is a second stochastic element in the experimental setting. The participants’ initial wealth can be high ($\overline{y}$) or low ($\underline{y}$) with equal probability. This reflects the fact that investment decisions depend on income, consequently on the annual harvest of agricultural production which can be good or bad depending on the weather conditions. This investment decision is made in various treatments incorporating flexible and inflexible as well as insured and non-insured decision environments.

A second phase of the experiment consists of eliciting the participants’ willingness-to-pay using a standard Becker-deGroot–Marschak procedure (Becker et al. 1964). First, we elicit how much participants are willing to pay for insurance which we denote as the WTP for insurance. Second, we elicit the willingness-to-pay for flexibility which we denote this as WTP for flexibility.

**Preliminary results**

We find that participants invest 45.96 percent of their initial wealth in the risky asset. Within one decision making scenario, the share of wealth invested does not change significantly across the three treatments. While insurance increases investment in the low income state proportionally to the income increase by insurance in this state, it also decreases investment in the high income state proportionally to the income decrease in this state. This implies that the provision of insurance as modeled by the reduction in variability of the initial wealth has no significant over proportional impact on investment decisions.

The average willingness-to-pay for flexibility in the standard treatment is 1.8 on a discrete scale from zero to five. There is no significant difference in the WTP for flexibility for neither insurance treatment. The willingness-to-pay for insurance is around 1.2 on average on a discrete scale from zero to five. There is no significant difference between the willingness-to-pay for the moderate-coverage insurance level and the high-coverage insurance level, neither in the flexible decision scenario nor in the non-flexible commitment scenario.

We isolate the effect of commitment on the willingness-to-pay for insurance and we find a
marginally significant increase of 0.121 translating to an increase of around ten percent in the willingness-to-pay due to inflexibility. This implies that for potential insurance clients the value of insurance is higher when combined with other financial products that involve some form of commitment.

Concluding remarks

While in our lab-in-the-field experiments insurance has been successful in increasing investment in the low income state, no over-proportional impact on investment aside from the effect induced by the reduced variability in income has been found. This may indicate the limited suitability of insurance as an investment promotion tool and may lead to further research on the two different roles of insurance of investment promotion and safety net provision. Willingness-to-pay for insurance in general seems not to depend much on insurance coverage, although the value of insurance is higher in inflexible investment decisions. As a next step, we will look in more detail at heterogeneous effects across individuals in terms of risk preferences and household characteristics to better understand the determinants of the value of insurance.

References


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