



Offering rainfall insurance to informal insurance groups: Evidence from a field experiment in Ethiopia[☆]



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ABSTRACT

We show theoretically that the presence of basis risk in index insurance makes it a complement to informal risk sharing, implying that index insurance crowds-in risk sharing and leading to a prediction that demand will be higher among groups of individuals that can share risk. We report results from Ethiopia from a first attempt to market weather insurance to informal risk-sharing groups. The groups were offered training on risk management and insurance. We randomized the content of training provided to group leaders, with some sessions focusing on the benefits of informally sharing idiosyncratic basis risk. Consistent with learning informed by the theoretical results, we found that members of groups whose leaders had received training that emphasized risk-sharing had considerably higher uptake. We find that this effect can be explained either by a more careful selection of training participants by leaders or a direct impact of the treatment on insurance demand.

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1. Introduction

Rainfall risk remains a key problem for Ethiopian farmers. In a recent survey conducted in 2009, 44% of farmers reported serious losses in wealth and consumption due to drought in the last 4 years, and 22% report losses due to too much rain and floods. Rainfall risk also seems to affect the uptake of modern inputs in Ethiopia. Dercon and Christiaensen (2011) report a strong link between willingness to take up fertilizer and weather risk in Ethiopia. This would suggest that these farmers are likely to be interested in insurance.

Crop insurance based on offering indemnity against crop losses is fraught with problems, linked to incentives, costly verification and high transactions costs. More recently, index-based products are increasingly promoted as an alternative, as they offer payouts based on easily observable data, with lower verification and incentive problems, and reduced transactions costs (Barnett and Mahul, 2007; Skees et al., 1999). In this paper, we will study rainfall insurance products that offer a payout

when rainfall falls below a particular level, measured at a local rainfall station.

In practice, uptake of index insurance products appears to be low in agriculture in poor settings. For example, Giné et al. (2008) report about 5% uptake for a region in Andhra Pradesh in India; Cole et al. (2013) report uptakes of about 5–10% in Andhra Pradesh and Gujarat. Uptake patterns are also unusual for insurance products, with richer people buying more, and the more risk averse buying less.

Trust and poor understanding of insurance are general explanations often offered to explain why people are not taking up insurance in poor settings (e.g. Cai et al., 2009) in China or (Dercon et al., 2011 in Kenya). They may also hold true for index-insurance products (Cole et al., 2013). In addition Clarke (2011) shows that the basis risk inherent in these products, like any other form of contractual nonperformance (Doherty and Schlesinger, 1990), substantially suppresses rational demand, particularly for the very risk averse. Basis risk is the difference between the losses actually incurred and the losses insured. For example, a farmer may lose his or her entire crop due to disease or a very localized drought but not receive a claim payment from a weather indexed insurance policy because the weather at the contractual weather station was good. The effect on demand can be substantial if basis risk is non-trivial or farmers are very risk averse.

One possible way of overcoming some of these problems is to offer contracts to groups. Groups could internalize many problems of understanding the product and they could also be better placed to enforce insurance contracts, perhaps thereby addressing trust. Importantly, they could also be a means to manage basis risk, to the extent that not all basis risk is perfectly correlated among its members. Most index insurance products are designed to target aggregate shocks that affect a

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whole community, but leave individual farmers exposed to the threat of idiosyncratic agricultural shocks. If individuals within a group can commit to offer mutual protection to each other against such idiosyncratic shocks, then index products offer better value to farmers. In this paper we provide theoretical and empirical support for this idea.

We state and prove a theorem that shows that, under quite general conditions, within-group risk-sharing and index insurance are complements implying that index insurance crowds-in risk sharing and leading to a prediction that demand will be higher among groups of individuals that can share risk. This is the reverse of the result for indemnity insurance whereby risk-sharing and individual indemnity insurance are substitutes. This result provides the motivation for a randomized control trial in which index insurance products were offered to existing informal insurance groups and a random selection of group leaders were trained on the notion that idiosyncratic basis risk can be shared. We find that this training had a significant and positive impact on demand for index insurance, and on reported risk-sharing.

Mobarak and Rosenzweig (2012) also show, in a contemporaneous paper to this paper, that index insurance and risk-sharing are complements. They present results from rural India showing that risk-sharing becomes a more important determinant of demand for those for whom basis risk is higher. This paper takes a different approach by undertaking an intervention to exogenously vary the salience of risk-sharing in insurance training offered to group leaders, and assessing the impact of this variance on index insurance demand.

Consistent with the fact that index insurance is an unfamiliar and complex product, providing training to farmers about index insurance has been shown to be important in encouraging take-up (Gaurav et al., 2011; Gine et al., 2012). This is consistent with the documented role of financial literacy training in increasing awareness of, and changing attitudes towards, formal financial products (Carpena et al., 2011). In this paper we show that the content of training matters. Randomizing the content of training resulted in differences in take-up among treatment groups. Specifically we use differences in training content to test whether encouraging the sharing of idiosyncratic basis risk among group members increases demand for index insurance.

To explore the complementarity between risk-sharing and index insurance, we collaborated with an Ethiopian insurance company to offer insurance to farmers in three districts (Meskan, Silte and Animelo), about 150 km west of Addis Ababa in 2010. Legal and reputational concerns led the insurance company to insist on contracts with individual farmers. However, the entire marketing was done towards members of an informal insurance group, the *iddir*, which are funeral societies. These groups are widespread in Ethiopia, with virtually every household a member. Against the payment of a premium, it offers funeral insurance, in the form of support in cash and kind in case someone linked to the member dies. In all communities, a large number of these groups exist, with several dozens of members in each group. *Iddirs* appear very suitable groups to roll out insurance, as they tend to understand insurance and its functioning, and are well respected by their members and in their communities. In addition to offering funeral insurance to all members these groups have increasingly offered other forms of insurance to some or all members (Dercon et al., 2006). Furthermore, Dercon et al. (2008) show that other informal risk-sharing ties between individual members are strong with households typically reporting a sub-set of members of the same *iddir* as the individuals upon which a household can rely for support in a time of need. As such we can also think of *iddirs* as comprising of a collection of individuals who are engaged in strong risk-sharing arrangements with some (but not all) other members.

As part of a marketing campaign we carried out training sessions for *iddir* leaders and members. Whilst all training sessions had a similar focus, introducing concepts of insurance and explaining in detail the insurance policies, we randomized the content of training received by the *iddir* leadership. Whilst one training focused on the insurance benefits for individual farmers, other training sessions focused on the

insurance benefits when complemented with risk-sharing between group members. Given that our experimental design always focused on groups, there should not have been any difference in uptake across treatment arms if information and understanding of these products were perfect. As these products and their links with informal insurance may not be that easily understood, it was expected that training group leaders on the interaction of risk-sharing and index insurance would increase awareness of the fact that some of the basis risk inherent in these policies could be shared, and change the perceived value of index insurance for those who would be able to commit to such basis risk-sharing strategies. Sharing of idiosyncratic basis risk could have been agreed to by all *iddir* members (as is the sharing of funeral costs), or it could also have been committed to by smaller subgroups of selected members (as has been the practice with livestock insurance, or reflecting the informal risk-sharing agreements between some members).

Because all other aspects of the marketing were held constant—the transactional and communication roles that *iddir* leaders played was identical across both training types—the design allows us to focus on the perceived benefits that result from emphasizing sharing policies or payouts to leaders, rather than marketing advantages that groups may have as a result of encouraging trust in the insurance product or reducing transaction costs. The nature of the experiment does not allow us to perfectly disentangle whether the risk-sharing message works primarily through a selection effect (group leader trained on sharing invited different types of people to the meeting who were more likely to purchase insurance), or whether those receiving the risk-sharing message were more likely to purchase insurance. Therefore, whilst we cannot identify from our design whether selling insurance to groups is superior to selling to individuals, we can identify a mechanism, consistent with theory, that may make index insurance more attractive to informal risk-sharing groups than to individuals.

We find that *iddirs* in which leaders were trained in the benefits of sharing insurance had substantially higher take-up rates than *iddirs* in which leaders were trained in the individual benefits of insurance. Demand was some nine percentage points higher among *iddirs* in which leaders were trained in sharing insurance, with this additional demand originating from both *iddir* leaders as well as trained regular members. We find these estimates to be robust to controlling for community fixed effects, as well as a broad set of farmer characteristics.

Our analysis also shows that these effects are not due to (coincidental) pre-intervention differences across randomized *iddirs*, nor due to differences in how effective training was in increasing understanding of the policies and the basis risk they held. Rather, training the *iddir* leadership in sharing policies and payouts encouraged leaders to involve more people in the training exercises. We can also show that in these groups, the selected members are engaged in informal risk-sharing beyond funeral insurance.

The results of our experiment show that the type of training provided to leaders of indigenous groups has important implications for demand for insurance. Our analysis shows either that demand for index insurance is higher among those inclined to share risk, or that insurance marketing that provides messages on risk-sharing increases demand. As such our evidence is consistent with the hypothesis that the benefits of encouraging groups to combine these products with increased risk sharing among members might be large, resulting in substantially larger take-up rates.

If this is the case, the results also suggest that strengthening mechanisms to manage basis risk makes index insurance more attractive to small-holder farmers. The presence of basis risk in index-based insurance means that even actuarially fairly priced insurance products may not be attractive to risk-averse farmers. Understanding mechanisms to manage this basis risk deserve further attention, and the combination of index insurance for aggregate shocks with local risk sharing for idiosyncratic shocks could be one such mechanism.

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