Informal Risk Sharing and Demand for Index Insurance: Experimental Evidence from Rural Uganda*

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Abstract

Index insurance holds promise for smallholder farmers in developing countries, but its value is limited by basis risk: the imperfect correlation between the index and actual losses. If basis risk can be informally shared among farmers, the value of index insurance may increase, potentially raising demand. Conversely, the availability of formal insurance may reduce informal risk sharing; if farmers anticipate this, their demand for insurance may decline. The net effect is therefore ambiguous. We designed a lab experiment to study how informal risk sharing affects demand for index insurance and implemented it among farmers in Uganda. We find that demand for index insurance responds negatively to the presence of risk sharing, suggesting that informal arrangements crowd out formal insurance. We also find that absolute informal transfers are larger under index insurance than under indemnity insurance, but this reflects larger losses rather than a higher proportion of losses being shared. At the same time, the availability of risk sharing paradoxically reduces demand for index insurance, primarily by lowering high coverage choices. We discuss how strong local sharing norms and behavioral motives may help explain this finding.

Keywords: Index insurance; risk sharing; basis risk; Uganda

JEL classification: C93; D14; D81; G22; O12; O16; O17

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1. Introduction

Farming communities in the Global South face large uninsured weather and other risks, which have severe consequences for their livelihoods and welfare (Fafchamps, 2003; Dercon *et al.*, 2009; Carter *et al.*, 2014). Traditional agricultural insurance is plagued by well-known informational and enforcement problems that make it effectively out of reach for smallholder farmers (Morduch, 2006; Barnett and Mahul, 2007; Hazell *et al.*, 2010). Weather index insurance—with payouts based on an index of growing conditions such as rainfall—has been proposed as a solution but has seen limited uptake due to lack of trust and understanding, poor design and/or implementation, illiquidity and, most fundamentally, basis risk (Giné *et al.*, 2008; Clarke, 2011, 2016; Karlan and Morduch, 2010; Cole *et al.*, 2013; Karlan *et al.*, 2014; Jensen *et al.*, 2018).

Basis risk refers to the imperfect correlation between the index (and thus the indemnity payments it triggers) and the losses experienced by the farmer. Such discrepancies may arise either from uninsured risks—often referred to as design risk—or from the index failing to accurately capture insured risks at the farmer level—an occurrence known as idiosyncratic risk (Carter, 2011). An example of the latter occurs when rainfall at a farmer's plot differs from that recorded at the reference weather station. In line with much of the literature, we focus primarily on basis risk arising from this idiosyncratic component.

Basis risk reduces welfare because farmers may pay premiums yet still incur losses without receiving payouts, leaving them worse off than if they had remained uninsured (Clarke, 2011, 2016). This fundamental flaw exposes farmers to unexpected losses and increases uncertainty, effectively subjecting them to a kind of "double lottery": one associated with the underlying peril and, to a lesser extent, another related to the payout for a given outcome. As a result, both highly risk-averse individuals and those exhibiting ambiguity aversion are likely to avoid index insurance (Clarke, 2016; Bryan, 2019; Elabed and Carter, 2015). Furthermore, high basis risk can erode trust in the provider and hinder experiential learning, both of which have been shown to be important for fostering demand (Cai *et al.*, 2014, 2015; Cole *et al.*, 2013, 2014; Karlan *et al.*, 2014).

To improve the quality of index insurance and sustain demand, researchers and practitioners have proposed several innovations to mitigate basis risk. One approach focuses on technological enhancements that improve measurement accuracy, most commonly through advanced remote-sensing techniques that generate indices more closely correlated with actual losses (Carter *et al.*, 2017; Miranda and Farrin, 2012; Flatnes *et al.*, 2018). A second approach is to bundle index insurance with other agricultural inputs. Combining index insurance with improved agronomic technologies—such as stress-tolerant

seed varieties—is particularly promising, as it offers more comprehensive protection by exploiting complementarities that help mitigate risks neither technology can address on its own (Carter *et al.*, 2017; Boucher *et al.*, 2024).

A third approach to mitigating basis risk motivates the focus of this paper and involves targeting members of risk-sharing groups rather than individuals. If socially connected farmers are not uniformly exposed to basis risk, they may share it, thereby increasing the value of index insurance and potentially raising demand (Mobarak and Rosenzweig, 2012, 2013a,b, 2014; Dercon *et al.*, 2014). In that case, offering index insurance to members of existing risk-sharing groups or networks would be attractive. However, pre-existing risk-sharing arrangements could also hamper the uptake of formal insurance, either because such arrangements reduce the value of insurance (Arnott and Stiglitz, 1991; De Janvry *et al.*, 2014), or because the availability of formal protection crowds out informal support (Attanasio and Rıos-Rull, 2000; Lin *et al.*, 2014; Boucher and Delpierre, 2014). Moreover, the willingness of socially connected individuals to share losses may decline when insurance is available for risk protection (Cettolin and Tausch, 2015; Lenel and Steiner, 2020; Anderberg and Morsink, 2020), the more so, the more complete such insurance coverage is (Takahashi *et al.*, 2019).

Given these competing effects, we study the interaction between informal risk sharing and formal (index) insurance. We focus on two related aspects. The first is the link between insurance and the willingness of socially connected others to share losses, the second is the relation between anticipated loss sharing and the uptake of insurance. We research these two mechanisms both for indemnity insurance and for index insurance in order to assess the role of basis risk. Our approach is a lab experiment, which we consider appropriate appropriate because it allows us to ensure that both researchers and experimental subjects share a common understanding of the probability distribution of outcomes. When this understanding is not shared, the identification of causal effects becomes problematic (Clarke and Kalani, 2011).

In our experiment, conducted in rural Uganda, participating farmers are anonymously paired and fulfill two distinct roles. Person 1 faces probabilistic losses, and may insure themselves against these, in some treatments by purchasing index, in others indemnity insurance. Person 2 may in some treatments share Person 1's losses by agreeing to a transfer conditional on the size of the loss, but does not themselves face losses. Person 2 therefore in effect plays a dictator game in these treatments. In other treatments Person 2 is passive so that we may observe Person 1 behavior when loss sharing is ruled out. We vary the type of insurance on offer between subjects, with some allocated to the index insurance protocol of the experiment, and others to the indemnity protocol. Loss sharing is varied within subjects, with all subjects participating both in a treatment with and in

a treatment without it. All subjects participate too in a treatment in which loss sharing is permitted but no insurance is available.

By comparing Person 2's behavior in treatments with and without insurance, we identify the relationship between the availability of insurance and the willingness of socially connected others to share losses. By comparing Person 1's behavior in treatments with and without loss sharing, we assess how anticipated loss sharing affects insurance uptake. Comparisons of Person 2's behavior across indemnity and index insurance treatments allow us to examine the role of basis risk in shaping the willingness to share losses. Finally, by comparing Person 1's behavior across indemnity and index insurance treatments in the absence of risk sharing, we observe the effect of basis risk on insurance uptake. The resulting double difference captures how the effect of risk sharing on insurance demand differs when basis risk is present—that is, the effect of sharing basis risk.

We report two key findings. First, informal risk sharing is not affected by the availability of insurance. Conditional on insurance being available, the absolute amount of risk sharing is higher under index insurance than under indemnity insurance; however, this difference reflects the fact that net losses are, on average, larger under index insurance. When expressed as a proportion of losses, the extent of sharing is similar across the two insurance types.

This finding contributes to the literature on informal risk sharing in the presence of formal insurance. Prior work suggests that formal insurance may reduce informal transfers by lowering exposure to unavoidable risk and thus perceived deservingness (Cettolin and Tausch, 2015; Lenel and Steiner, 2020; Anderberg and Morsink, 2020). It has also been argued that responses may differ across insurance types, as indemnity insurance offers full protection while index insurance does not due to basis risk (Takahashi *et al.*, 2019). However, our findings do not support these predictions. We find no evidence that insurance availability reduces informal transfers, nor that the type of insurance affects the proportion of losses shared. We contribute to this literature by identifying these effects in a controlled environment, with particular attention to the role of basis risk.

Our second finding is that informal risk sharing reduces demand for index insurance, primarily by lowering high coverage choices, but has no effect on the demand for indemnity insurance. This suggests that risk sharing crowds out insurance demand only when residual risk remains—i.e. in the presence of basis risk. Consistent with this interpretation, the crowding-out effect is significantly stronger for index insurance, indicating that the ability to share basis risk reduces the demand for formal coverage.

This result contributes to the literature on index insurance and informal risk sharing. Our main contribution is to identify the causal effects of index insurance on informal risk

sharing and, in turn, on insurance demand. Our experimental design resembles that of Berg *et al.* (2022), but differs in a crucial respect: in our setting, subjects freely choose how much to transfer to others facing losses, whereas transfers in their design are imposed. This distinction matters because our focus is on two linked decisions: how the availability of insurance affects the willingness of socially connected others to share losses, and how anticipated sharing in turn affects insurance demand. When transfers are imposed, the effect on demand does not reflect what individuals expect others to do, but rather a fixed feature of the environment. By contrast, our design allows insurance demand to respond to endogenous, anticipated risk-sharing behaviour.

Related studies do not isolate these mechanisms in the same way. In Dercon *et al.* (2014), training on the benefits of risk sharing is exogenously varied among groups offered index insurance, which affects demand but does not capture the causal effect of risk sharing itself. Mobarak and Rosenzweig (2013a) report higher demand among more active risk-sharing groups, plausibly due to basis risk sharing, but this remains an inference. By contrast, our design allows us to directly observe both the risk-sharing response to index insurance and its effect on demand.

The paper proceeds as follows. Section 2 motivates and presents the experimental design. Section 3 presents details of the study site, sample and fieldwork implementation, and Section 4 the analysis. Section 5 discusses our findings in terms of the literature on risk sharing and the demand for index insurance.

2. Experimental Design and Fieldwork Implementation

2.1. Background and Motivation

What happens to informal risk-sharing arrangements when index insurance is introduced, and how does this in turn affect the uptake of index insurance? Informal risk-sharing arrangements (IRSAs) are widespread among smallholder farmers in the rural areas of developing countries (Fafchamps and Gubert, 2007). They are typically reciprocal arrangements that are in place to protect members against individual-specific (or "idiosyncratic") risk that can be diversified away across the parties to an IRSA. Risk that covaries across IRSAs' members is then left uninsured unless formal insurance is available. Given the high operational costs for assessing individual losses among smallholder farmers—related to well-known informational and enforcement problems—indemnity insurance is typically not available. In this context, if a reliable, objective index is available that is highly correlated with actual losses, index insurance becomes an attractive alternative (Morduch, 2006; Barnett and Mahul, 2007; Hazell *et al.*, 2010). When combined with an IRSA, index insurance may in principle take care of the covariate risk that informal

arrangements leave uninsured. Based on such complementarity, one would expect the uptake of index insurance to be higher when offered to members of IRSAs (Mobarak and Rosenzweig, 2012, 2013a,b, 2014; Dercon *et al.*, 2014).

However, index insurance may influence the IRSA in ways that in turn affect the uptake of index insurance. To see this, let us first briefly recall the nature of an index insurance policy. The policyholder pays a premium that entitles them to a payout determined by an index correlated with actual losses—for example, a rainfall index linked to crop-growing conditions. Basis risk arises from the mismatch between the insured farmer's realized losses and the payout triggered by the index. This mismatch is mainly due to spatial differences, temporal mismatches, and product design flaws, such as weak index-yield correlations or the use of inadequate weather variables. As a result, payouts may occur in the absence of losses, or losses may occur without triggering a payout (Giné *et al.*, 2008; Clarke, 2011, 2016; Karlan and Morduch, 2010; Cole *et al.*, 2013; Karlan *et al.*, 2014; Jensen *et al.*, 2018). In our experimental design, following the related experimental literature (Berg *et al.*, 2022), we capture basis risk as all those instances in which indemnity insurance would have paid out while index insurance does not, and vice versa.

How does the introduction of index insurance then affect IRSAs? We focus in this study on the willingness to share losses among socially connected individuals. For tractability, we abstract from mechanisms associated with the penalty for not adhering to reciprocal arrangements. Just like any formal insurance, index insurance may improve an individual's baseline security (autarky value), making the penalty for not engaging in informal help less severe, thus reducing the motivation to participate in private transfers (Boucher and Delpierre, 2014; Ligon *et al.*, 2002). Instead, we focus on willingness to share losses when a transfer will not be reciprocated. When reciprocity does not come into play, individual concern for the welfare of those impacted by stochastic shocks may originate from a sense of social responsibility toward the victims of bad luck (Weiner, 1993), giving rise to a willingness to share losses. It may also stem from altruism (D'Exelle and Verschoor, 2015), or from fairness (inequality aversion), leading to a willingness to redistribute (Cappelen *et al.*, 2013; Cettolin and Tausch, 2015; Cappelen *et al.*, 2020).[1]

The presence of formal insurance can alter feelings of obligation (or guilt associated with

[1] Recent work highlights that the functioning of informal risk-sharing arrangements may itself depend on the distribution of wealth within a community. Gallenstein (2024) shows that wealth inequality can undermine risk sharing by generating conflicting fairness norms: wealthier individuals tend to favor proportionate sharing, while poorer individuals prefer equal sharing. These differences reduce the likelihood that transfers are offered or accepted, weakening informal insurance. As a result, wealthier individuals may turn to formal insurance as a substitute, while poorer individuals may be left more exposed if formal and informal mechanisms are imperfect substitutes. Related evidence suggests that inequality aversion and social comparison can also distort insurance choices more broadly, contributing to underinsurance against large risks and overinsurance against smaller ones (Friedl *et al.*, 2014).

not helping), as people feel less personally responsible for partners' risks, especially if they chose to buy insurance voluntarily. A concern for fairness would operate in the same direction; whereas inequality arising from unavoidable risk may be deemed to be unfair, the opposite may be the case when such inequality results from risk that could have been avoided by purchasing insurance, and no redistribution may be felt to be necessary. We would thus expect the willingness to share losses to be lower when formal (indemnity) insurance is available, which we test in our experiment.

In the specific case of index insurance with basis risk, feelings of obligation and guilt—as well as a desire to address perceived unfair inequality—may become more salient, as individuals may feel responsible for compensating for the gaps left by this type of insurance. For instance, it may be considered unfair when an individual who has purchased index insurance suffers a loss but receives no payout. We would therefore expect a greater willingness to share losses when only index insurance is available than when only indemnity insurance is available, a prediction that we also test in our experiment.

How do the effects of introducing index insurance on the willingness of socially connected others to share losses, in turn, affect the uptake of index insurance? In our experiment, we focus on the role of anticipated loss sharing. Recall that actual loss sharing is expected to be more strongly reduced by the introduction of indemnity insurance than by index insurance. The value of an indemnity insurance contract is therefore more adversely affected by an anticipated reduction in loss sharing than the value of an index insurance contract. It follows that we expect demand for indemnity insurance to be more negatively affected than demand for index insurance—an implication we also examine experimentally.

2.2. Setting

Our experimental design focuses on losses that follow a binomial distribution, in which loss L occurs with probability v. Indemnity insurance provides coverage that is perfectly correlated with losses. By contrast, index insurance is tied to an index which is equal to I with probability q and 0 with a probability of *1-q*, where the index $\tilde{I}$ and losses are imperfectly correlated. Following Clarke (2011, 2016), basis risk refers to a situation in which a loss occurs but the index is not triggered, which corresponds to parameter γ in Table 1. Given γ, q and v, the remainder of the joint probabilities in the table follow immediately. For instance, the probability that a loss does not occur and the index is not triggered is equal to $1 - q - \gamma$, and so on. The expected payoffs for every state of the world and under every possible insurance status are shown in online Appendix A.

Table 1: Joint Probability Structure

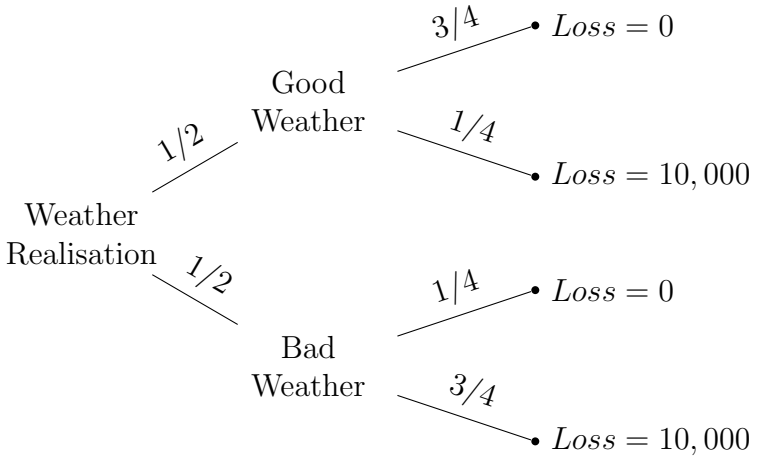
	Index = 0	**Index = *I***	
Loss = 0	$1-q-\gamma$	$q+\gamma-v$	**1-*v***
Loss = *L*	γ	$v-\gamma$	***v***
	1-*q*	***q***	

This experimental design allows us (1) to isolate the effect of basis risk sharing on demand, and (2) to investigate how risk sharing responds to the presence of insurance, both index and indemnity, which provides clues as to why we find the effects on demand that we do.

In the experiment, subjects were endowed with 16,000 Ugandan shillings, and paired with another individual.[2] One of the members of the pair, Person 1, was at risk of losing part of their endowment, 10,000 shillings, and was given the opportunity to purchase insurance against this prospect. By contrast, Person 2 was in some treatments given the opportunity to use their own endowment (which was not at risk) to compensate Person 1 for any losses experienced. In other treatments, Person 2 did not have an active role.

The probability structure that ruled whether Person 1 experienced a negative income shock was a composite one. First, a common shock— framed as 'bad' weather in the experiment—occurred with a probability of 50%. A second shock was idiosyncratic in nature and determined for each Person 1 separately whether they incurred a loss. Under bad weather, the probability of losing 10,000 shillings was equal to 75%, whereas under good weather it was 25%. This probability structure is shown in Figure 1 and was represented to subjects with red and green bags (bad and good weather) containing red and green tokens (losses and gains). In this structure, basis risk (γ in Table 1) is equal to 1/8 and $v = q = 1/2$.

Figure 1: Probability Structure Experiment



[2] At the time of the fieldwork, 16,000 shillings were equal to 4.73 US dollars, equivalent to between three and four days' wages of an agricultural labourer.

2.3. Treatments

Experimental treatments resulted from variation in two dimensions (see Table 2): insurance available to Person 1 (index, indemnity or no insurance) and whether Person 2 was permitted to share Person 1's losses. In *T1* and *T3*, Person 2 was allowed to share losses by making a transfer; these decisions were elicited using the strategy method described below. The losses reported to Person 2 corresponded to Person 1's realized negative income shock (i.e., 10,000 shillings) minus the net payout—that is, the difference between the insurance payout received and the cost of the insurance. When Person 1 experienced a negative income shock, Person 2 could transfer any portion of their endowment to Person 1, irrespective of the size of the loss that the latter incurred. Conversely, if Person 1 did not experience a negative income shock, informal transfers were ruled out in the experiment.

Table 2: Treatments

	Index	Indemnity	No Insurance
Risk Sharing	T1	T3	T5
No Risk Sharing	T2	T4	

In *T3* and *T4*, Person 1 had access to indemnity insurance, which provided direct coverage against losses, with payouts triggered by realized losses rather than an index. The only difference between these treatments was that, in *T3*, Person 2 could make an informal transfer to compensate Person 1, whereas in *T4* no such transfers were allowed. Comparing these treatments allows us to test whether risk sharing affects demand for indemnity insurance.

In *T1* and *T2*, Person 1 had access to index insurance, with payouts triggered by the realization of a 'bad weather' state. Because the index does not perfectly correlate with losses, insurance payments may fail to be disbursed when losses occur. This mismatch—basis risk—arises, for example, when the 'good weather' state is realized but a loss nonetheless occurs. As with indemnity insurance, the only difference between *T1* and *T2* is that risk sharing is allowed in *T1* but not in *T2*. The difference in demand between these treatments therefore identifies the effect of risk sharing on index insurance uptake.

The double difference in demand, $(T1 - T2) - (T3 - T4)$, captures the effect of basis risk sharing on insurance demand. Once the baseline effect of risk sharing is removed, the remaining difference across treatments reflects the presence of basis risk in index insurance and the possibility of sharing this residual risk.

Finally, in *T5* no insurance was available and informal transfers were the only means of mitigating losses. This treatment provides a benchmark to assess how risk sharing

behaviour responds to the presence of insurance in *T1* and *T3*. Participants were assigned either to the index treatments (*T1*, *T2*) or to the indemnity treatments (*T3*, *T4*), while all participants took part in *T5*. Comparisons across insurance types are therefore between subjects, whereas variation in risk sharing is within subjects.

2.4. Decisions

In all treatments with insurance, Person 1 chose the number of insurance units to purchase (from 0 to 4). Each unit cost 1,500 Shillings and yielded a payout of 2,250 Shillings (Table 3). Index and indemnity insurance were identical in all respects except for the payout rule: index insurance paid conditional on the weather realization, while indemnity insurance paid conditional on actual losses. Both products have the same expected payout, probability, and loading.[3,4]

Table 3: Insurance Characteristics

Premium (cost) per unit	1,500
Payout per unit	2,250
Unconditional Probability of Payout	1/2
Expected Payout (=actuarially fair premium)	1,125
Loading (mark-up over fair premium)	$33.\overline{3}\%$

The chosen coverage determined the extent of protection and the residual losses faced by Person 1. In *T1* and *T3*, these losses could be partially offset by informal transfers from Person 2, who could share any amount of their endowment. Sharing decisions were elicited only in states where Person 1 experienced a loss.

We elicited transfers using a strategy method. Person 2 specified how much they would transfer for each possible coverage level chosen by Person 1, based on the corresponding net losses (i.e. after premiums and payouts). The number of decisions varied across treatments: one in *T5*, five in *T3*, and ten in *T1*—that is, five for each weather state.

2.5. Implementation

To minimize the scope for post-experimental transfers, pairings were anonymous. At the same time, half of participants in each session were co-villagers and half were from a different village, maintaining a low level of social distance consistent with real-world settings. Participants were informed that they would be paired with others in the session, but no information was provided about whether their counterpart was a co-villager or

[3] The probability of payout is equal to $\frac{1}{2} \cdot \frac{1}{4} + \frac{1}{2} \cdot \frac{3}{4} = \frac{1}{2}$, v in Table 3.

[4] The expected payout per unit is the product of the payout times its probability, while the loading captures the proportional deviation of the premium from its actuarially fair value.

from a different village. Villages were selected to avoid very close proximity, although some cross-village familiarity cannot be ruled out.

Using a pre-randomized list, participants were assigned to either the index protocol (*T1*, *T2*) or the indemnity protocol (*T3*, *T4*), with all participants also taking part in *T5*. The experiment was conducted in three parts. In Part 1 (*T2* or *T4*), participants made insurance decisions as Person 1, while Person 2 played a passive role and transfers were not permitted. In Part 2 (*T1* or *T3*), transfers were introduced: participants first chose coverage as Person 1 and subsequently decided, in the role of Person 2, how much to transfer. In Part 3 (*T5*), only Person 2 was active and decided how much to transfer in the absence of insurance. In each part, instructions were provided publicly, followed by private comprehension checks and decision-making.

Participants assumed the roles of Person 1 and Person 2 in sequence. As Person 2 is passive in Part 1, all participants effectively began as Person 1 and only later made decisions as Person 2. This design ensures that insurance choices depend solely on anticipated transfers, rather than on the partner's insurance decisions, while allowing us to observe both types of behavior. Participants were paid for only one role, which was randomly selected after all decisions had been made.

The sequencing of roles could in principle influence behavior. For example, starting as Person 1 may shape expectations about transfers and thereby affect subsequent decisions as Person 2. However, as the sequence is identical across treatments, any such order effects apply uniformly and do not affect treatment comparisons. In addition, participants were not informed about others' behavior and all decisions were made under anonymity, limiting the scope for belief updating.

After all decisions had been made, one treatment was randomly selected for payment and publicly announced to participants within a given session. Once the treatment was determined, the weather realization and the type of pairing for which participants would be paid were selected through an additional random draw. Following the public resolution, the occurrence of losses was determined randomly in private. Payments were then calculated based on these outcomes and the decisions made by the participants. Full details about the experiment and its implementation are provided in online Appendix C.

2.6. Understanding and potential preconceptions

The experiment was conducted in small groups, with instructions delivered in the local language. Before making decisions, participants received individual guidance from enumerators and completed comprehension checks based on the decision cards. These checks focused on understanding the task rather than numeracy. Performance was high, with over 90% correct responses.

With respect to participants' perceptions and potential preconceptions about insurance, we did not directly elicit prior beliefs or preferences within the experiment. However, we control for insurance knowledge throughout the analysis, although this variable has limited predictive power. We proxy insurance knowledge using a short test formulated in the simplest possible terms, which less than a quarter of participants passed.[5]

3. Study Area and Sample

3.1. Study Area

We conducted the lab experiment in a rural region of eastern Uganda. This region, located in the Greater Mbale area, comprises the districts of Sironko and Lower Bulambuli, formerly known as Sironko District (see Appendix B for a map of the region). The vagaries of the weather are arguably the most important source of risk with 53% of communities affected by a drought in the last 12 years, and milder but prolonged dry spells taking place even more frequently. The area is estimated to be inhabited by around 300,000 people, with a large majority of the population having a Bagisu ethnic background and professing some form of Christianity (UBOS, 2014; Verschoor *et al.*, 2016).

3.2. Sample

In the selection of the sample for the study, we employed the sampling framework of Verschoor *et al.* (2016), which yielded a representative sample from the area. We selected purposively two sub-counties from the ten in their study.[6] Subsequently, a random draw gave us the names of the 20 villages which took part in the study. In each of these villages, a list of all adults (18+) by household was compiled and up to 20 adults were randomly selected from the list, subject to the condition that they belonged to different households and that farming was their primary activity.

Data collection took place in the lean season, between August and October. First, the enumerator team visited all participants to administer a household survey, then, the experiments were conducted in each sub-county. One of the authors supervised the entire data-collection process on site. In each sub-county, the experiments were held at a cen-

[5] See Table E1 in Appendix E Based on these data and our extensive fieldwork experience in the study area, we are confident that familiarity with formal insurance products—whether index-based or indemnity-based—was extremely limited among the population at the time the study was conducted. In fact, fewer than 3% of participants reported that anyone in their household had previously purchased insurance, suggesting that most individuals had little to no prior exposure to these products. As a result, participants were unlikely to have held well-formed preferences between them at baseline. Consistent with this, the experimental instructions included detailed, standardized explanations of both insurance products (Appendix C).

[6] A sub-county is a smaller administrative unit contained within a district.

trally located venue (typically, a school), conveniently located for participants. Each day, selected subjects from two different villages attended and took part in the experiment for approximately three hours. Participants from each of these villages were randomly divided into two groups, corresponding to the set of treatments in which they took part in: the 'index'—*T1*, *T2* and *T5*—and the 'indemnity' protocol—*T3*, *T4* and *T5*. On any given day, members from the two villages participated in one session of each protocol, which were run in parallel by two separate teams of enumerators. In total, we conducted 10 sessions for each protocol, with 20 participants per session, resulting in a total sample of 392 participants. Attrition was very low, with more than 95% of the selected participants taking part in the study.

While participants were randomly selected from among adult household members working on the farm, the sample shows a higher representation of women in one of the protocols. The remaining characteristics, however, are well balanced. Gender is controlled for throughout the analysis.[7]

Most of our participants were married, scarcely educated and lived in large households. Participating farmers were relatively poor, possessing only slightly more than an acre of land. Their knowledge of insurance was very limited, yet a large proportion had experienced severe shocks in the last two years, involving a fall in total and food consumption.[8]

4. Analysis

In this section, we present the main empirical results, first examining the effect of formal insurance on risk sharing and then analyzing how risk sharing influences insurance demand.

4.1. What is the Effect of Insurance on Informal Risk Sharing?

We begin by studying the decisions made by Person 2 to share any losses incurred by Person 1 through transfers, which we interpret as risk sharing behavior. The analysis of risk sharing is of intrinsic interest, given the extensive reliance on informal risk-sharing arrangements in asset-poor rural settings such as our study area. Moreover, the sharing data can shed light on patterns of insurance demand, since—consistent with our hypothesis—anticipated transfers from the partner influenced Person 1's insurance coverage decisions.

[7] Despite the imbalance detected, a joint test of orthogonality of selection into the index insurance protocol we performed was not significant, yielding a very small statistic. The significance level of the test is 39.2% when it is based on a linear regression (F-test) and 37.5% when it is based on a probit model (chi-squared test). See the full results of the test in Table E2 of Appendix E.

[8] Table E1 in Appendix E presents these descriptive statistics and balancing tests.

In this analysis, the dependent variables are constructed from the amounts transferred by Person 2 to Person 1. As previously described, Person 2 could transfer any portion of their endowment. Their transfer decisions were elicited using a strategy-method approach, which required Person 2 to specify how much of Person 1's losses they wished to share for each possible level of insurance coverage chosen by Person 1, with the understanding that these decisions would be binding. Consequently, the number of decisions recorded varied across treatments according to the set of coverage options available to Person 1.[9]

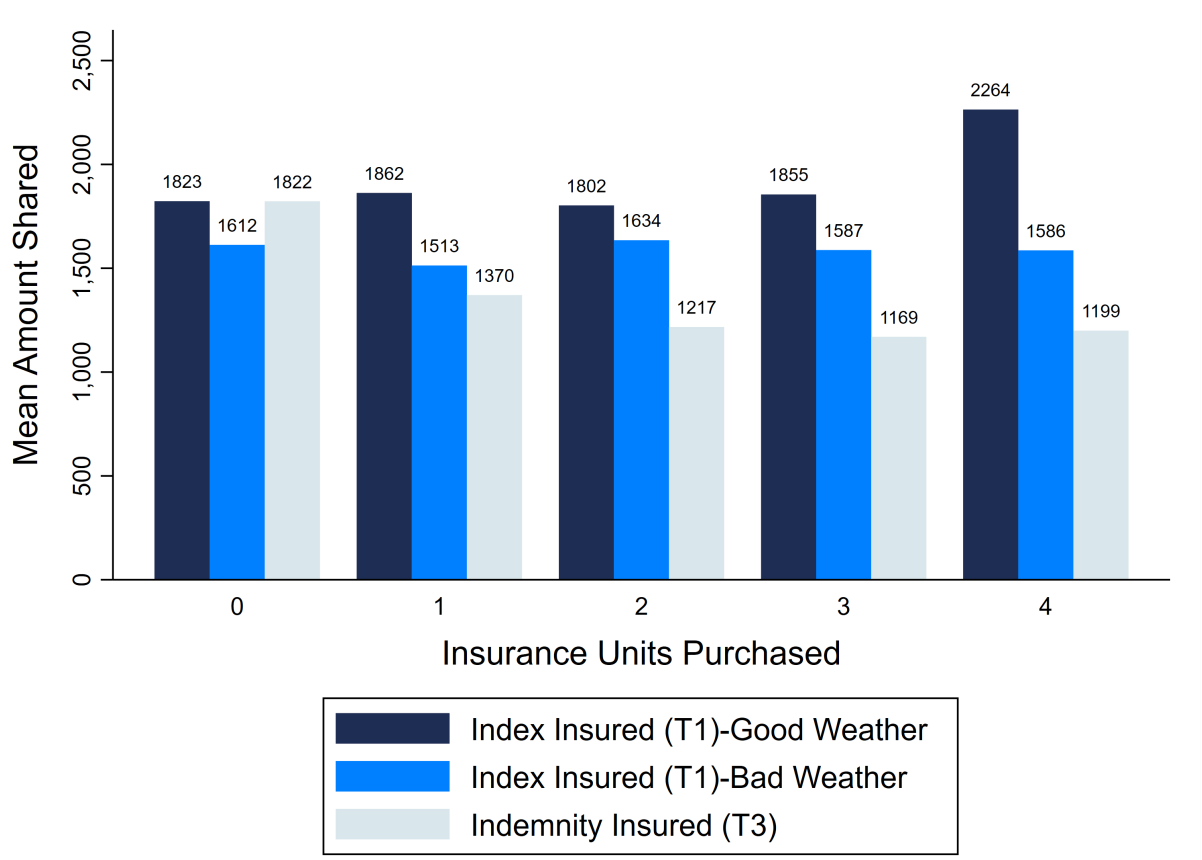
4.1.1. Comparative Analysis

Before proceeding with a more formal analysis, it is useful to visualize the sharing decisions made by Persons 2 in the experiment. Figure 2 compares the average amount Person 2 decided to transfer for each possible level of coverage in *T1* and *T3* (*i.e.* from zero to four insurance units). For *T1* transfers under good and bad weather are shown separately. The figure shows that transfers towards Persons 1 who experience losses are substantially lower under indemnity insurance than under index insurance, particularly when losses occur during good weather.

To interpret these patterns, it is worth remembering that index insurance does not cover losses incurred under good weather. For that reason, net losses in *T1* under good weather are increasing with insurance units purchased, since losses consist of a fixed shock of 10,000 shillings plus the insurance premium, with no insurance payout received. By contrast, under bad weather in *T1*, net losses are decreasing with insurance coverage because the insurance payout more than compensates for the premium paid. Indemnity insurance, which covers losses regardless of weather conditions, implies that net losses following a shock always decrease with insurance units purchased in *T3*.

[9] In *T5*, Person 2 made only one sharing decision, either sharing the losses of Person 1 or not, because Person 1 could not buy insurance. Person 2 made five sharing decisions in *T3*, since Person 1 could choose any level of coverage between 0 and 4 units. Lastly, in *T1*, Person 2 chose ten times how much to share (five for bad weather plus five for good weather).

Figure 2: Comparison Amount Shared by Treatment (*T1* vs *T3*) and Insurance Units Purchased



4.1.2. Regression Analysis

To evaluate the observed patterns formally, we run a series of OLS regressions with the amount shared (specifications 1 and 4) and the ratio of the amount shared to net losses (specifications 5 to 8) as the dependent variables in Table 4. We examine the decisions made by Person 2 when Person 1 was in the no-insurance (*T5*), index (*T1*) or indemnity insurance (*T3*) treatment. In this analysis, we use the pooled dataset comprising all sharing decisions made by Persons 2 (specifications 1, 2, 5, and 6), as well as a subsample restricted to decisions made when the partner was in either the index (*T1*) or the indemnity insurance treatment (*T3*).

The empirical model estimated for the preferred specification (4) with the amount shared as the dependent variable is:

$$Y_{ijk} = \alpha + \beta T_j + \gamma I_{ijk} + \tau T_j \text{ x } I_{ijk} + \boldsymbol{X_i \delta} + \eta_v + u_{ijk} \quad (1)$$

Y_{ijk} is the amount shared by Person 2 i with Person 1 when the latter purchased k insurance units in treatment j. Each participant made such decisions multiple times,

depending on the features of the treatment. T_j denotes the state of the world in which Person 2 took a sharing decision, that is, the type of insurance Person 1 had access to and the weather conditions under which a loss occurred. It consists of a set of indicator variables that denote that Person 1 had access to none (*T5*), indemnity (*T3*) or index insurance (*T1*), split in the latter case by whether the loss occurred under good or bad weather conditions.

We add controls that we expect to correlate with sharing, in an attempt to increase statistical power: the number of insurance units purchased by Person 1 (I_{ijk}) and several other factors included in $\boldsymbol{X_i}$ (gender, education, age, wealth, risk preferences, knowledge of insurance and enumerator team dummy). An interaction term between the insurance units purchased and the treatment is added to test whether the effect of the treatment on sharing remains constant at every level of coverage. Lastly, η_v represents the village fixed effects and u_{ijk} is the error term.

We also adopted an alternative approach to analyzing the sharing decisions by constructing a dependent variable measuring the transfer from Person 2 to Person 1 as a fraction of the net loss in each state. The resulting empirical model can be specified as follows:

$$Y_{ijk} = \alpha + \beta Ins_j + \gamma Basis_j + \boldsymbol{X_i}\boldsymbol{\delta} + \eta_v + u_{ijk} \tag{2}$$

While the vector of controls, $\boldsymbol{X_i}$, and village fixed effects remain unchanged, the key explanatory variables are reduced to Ins_j and $Basis_j$. These are indicator variables denoting whether Person 1 had access to insurance and whether the insurance suffered from basis risk.

Throughout the analysis, we estimate standard errors with bootstrapping to deal with non-independencies within clusters, that is, within the different sessions in which the decisions were made. Here we follow Cameron *et al.* (2008), who show that bootstrapping is preferable to clustering if the number of clusters is low, as in our case.

The results from specifications (1) to (2) in Table 4 do not indicate a robust effect of insurance access on the magnitude of the transfers made. This can be seen by observing the coefficients of the first three regressors listed in these specifications, considering that the reference category for these indicator variables is the absence of insurance access by Person 1. If anything, the effect appears to be negative, at least for indemnity insurance, yet it is not robust to the inclusion of the amount of insurance purchased.

Nevertheless, specifications (3) and (4) indicate that the type of insurance matters when all individuals seeking assistance have access to insurance. In specification (4), the coefficient on insurance units purchased is (-143.7), implying that, under indemnity insurance, each additional unit of coverage is associated with approximately 144 shillings less in-

Table 4: Effect of Insurance on Informal Risk Sharing

Specification	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Variable	Amount Shared				Ratio amount shared to net losses			
Index Insurance (T1)-Good W.	253.5	252.1	112.1	38.91				
	(183.6)	(163.7)	(248.6)	(301.7)				
Index Insurance (T1)-Bad W.	-81.24	-82.68	-51.78	-125.0				
	(140.6)	(138.7)	(248.5)	(293.2)				
Indemnity Insurance (T3)	-321.1***	-249.5*						
	(114.5)	(126.0)						
Insurance Units Purchased		-17.58	-143.7***	-143.7***				
		(26.28)	(44.02)	(38.6)				
Index Insurance (T1)-Good W.			231.2***	231.2***				
x Insurance Units Purchased			(60.96)	(55.9)				
Index Insurance (T1)-Bad W.			145.8**	145.8**				
x Insurance Units Purchased			(63.46)	(58.61)				
Access to Insurance					-0.00868	-0.005		
					(0.014)	(0.016)		
Basis risk					0.012	0.005	0.012	0.005
					(0.022)	(0.026)	(0.022)	(0.032)
Constant	1668***	1193***	1634***	1202**	0.167***	0.131***	0.158***	0.128***
	(111.6)	(462.5)	(223)	(473.5)	(0.011)	(0.047)	(0.019)	(0.048)
Reference	No Insurance (*T5*)	No Ins. (*T5*)	Indem. Ins. (*T3*)	Indem. Ins. (*T3*)	No Ins. (*T5*)	No Ins. (*T5*)	Indem. Ins. (*T3*)	Indem. Ins. (*T3*)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
N	3319	3319	2929	2929	3319	3319	2929	2929
R^2	0.01	0.10	0.02	0.11	0.001	0.08	0.001	0.08
Clusters	20	20	20	20	20	20	20	20

Notes: OLS regressions with amount shared (specifications 1 to 4) and ratio of the amount shared to net losses (5 to 8) as dependent.
Bootstrap clustered standard errors at the session level in parentheses, $^{*}p < 0.1$, $^{**}p < 0.05$,$^{***}p < 0.01$.
Specifications (2), (4), (6) and (8) include village fixed effects and the following control variables: gender, age, wealth, education, risk preferences, knowledge of insurance, experience with shocks and an indicator variable for enumerator team 2.
Specifications (1), (2), (5) and (6) employ data from all sharing decisions (made in *T1*, *T3* and *T5*), while the remaing specifications used the sharing decions from the treatments where the partner had access to insurance (*T1* and *T3*).
Full results for the estimated specifications can be found in online Appendix. F. Further details of the variables are shown in Table D1 of online Appendix D.

formal support. This is intuitive: indemnity coverage reduces Person 1's net loss and therefore reduces the scope for compensation by Person 2.

The interaction terms show that this negative relationship between coverage and transfers is substantially attenuated under index insurance. Under good weather in *T1*, where index insurance does not pay out despite a loss, the interaction coefficient of (231.2) more than offsets the baseline effect of coverage, yielding an implied association of about 88 shillings more support per additional unit purchased (-143.7+231.2). Under bad weather,

the interaction coefficient of (145.8) almost exactly offsets the baseline effect, leaving the implied association close to zero (-143.7+145.8). Thus, while additional indemnity coverage reduces informal support, additional index coverage does not do so in the same way, especially when basis risk materializes.

However, these level effects do not by themselves show that index insurance changes the willingness to share a given loss. To distinguish between greater generosity and larger net losses, we estimate the model in equation 2, where the dependent variable is the amount shared expressed as a fraction of net losses (specifications (5) to (8)). The results show that neither access to insurance nor the presence of basis risk has a statistically significant effect on the share of losses transferred. The larger absolute transfers under index insurance therefore appear to be driven by the larger net losses generated by the coverage decision, rather than by a higher proportion of losses being shared. These findings can be summarized as follows.

Result 1. *Having access to insurance has no discernible effect on the proportion of losses shared. However, conditional on being insured, the absolute amount of informal support is higher when the partner is protected by an indexed cover. This reflects the fact that net losses are, on average, larger under index insurance.*

4.2. What is the Effect of Risk Sharing on Insurance Demand?

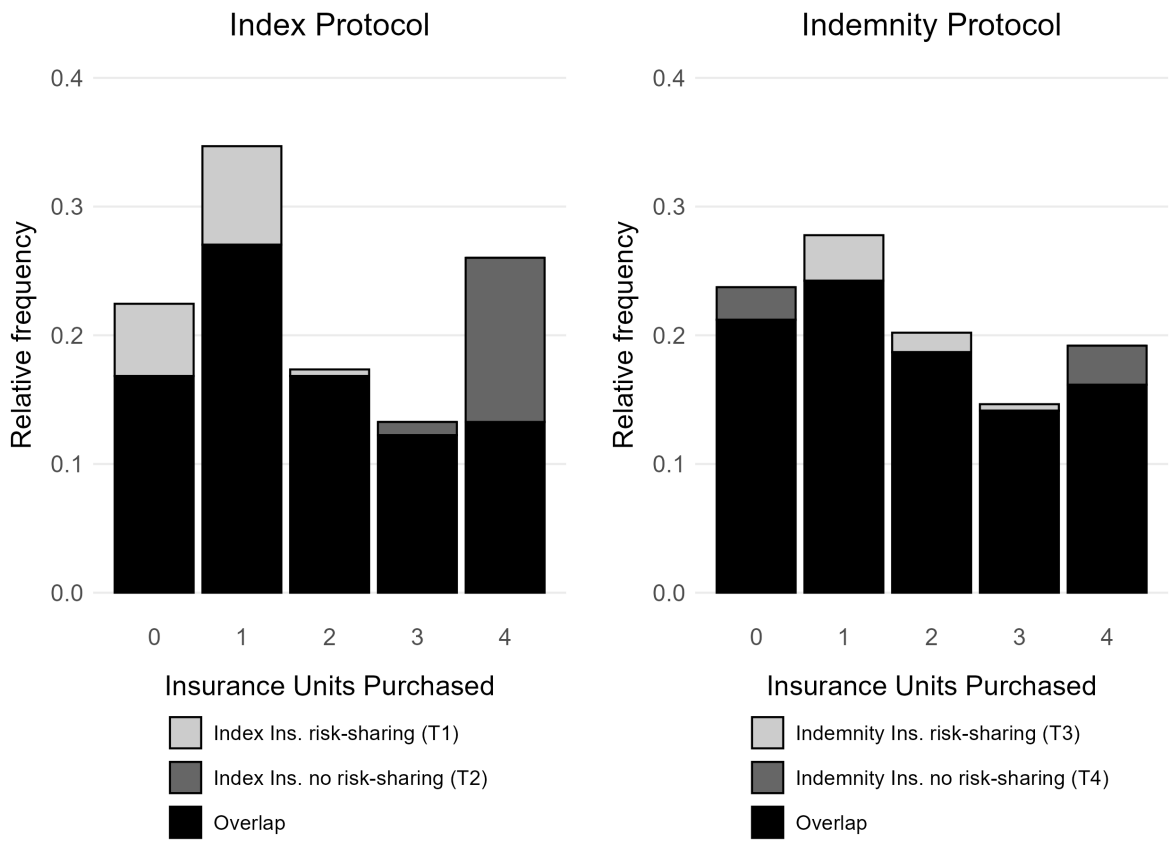
4.2.1. Comparative Analysis

We now turn to the investigation of the insurance decision, starting with the distribution of insurance purchased across treatments in Figure 3. For index insurance, demand increases markedly when risk sharing is not available, as reflected in the higher relative frequencies of four units purchased in *T2* compared with *T1*, and the lower incidence of 0 or 1 units purchased. By contrast, the distributions for the two indemnity-insurance treatments (*T3* and *T4*) are nearly identical.

We carry out pairwise comparisons of the means to test whether these differences are statistically significant (Table 5). The comparisons allow us to begin disentangling the components of the effect that risk sharing wields on insurance demand. We begin by comparing *T2* and *T4*, which isolates the role of basis risk in the absence of informal risk sharing. Demand for index insurance appears somewhat higher than for indemnity insurance, although the difference is not statistically significant, and we therefore refrain from drawing strong conclusions from this comparison.

We next examine the effect of informal risk sharing. Comparing *T1* and *T2* shows that the availability of risk sharing significantly reduces demand for index insurance. By contrast, the analogous comparison between *T3* and *T4* reveals no meaningful effect

Figure 3: Insurance Purchased by Treatment



for indemnity insurance. This pattern suggests that informal risk sharing crowds out insurance demand only when residual risk remains—i.e., in the presence of basis risk.[10]

The double difference reported in column (7) captures this mechanism more directly. It measures how much stronger the effect of risk sharing on insurance demand is under index insurance than under indemnity insurance. The negative and statistically significant estimate indicates that the crowding-out effect of risk sharing is substantially larger when insurance is subject to basis risk. In other words, basis risk sharing reduces the demand for index insurance.

The treatment differences in Figure 3 also suggest that the effect for index insurance operates mainly at the intensive margin. In particular, when risk sharing is available, participants appear less likely to choose high levels of index coverage, especially four units, rather than less likely to insure altogether. This helps explain why the purchase of one unit remains common in both sharing and no-sharing treatments. A small amount

[10] An equally significant difference is observed between *T1* and *T2* when the distributions of the two groups are compared employing a Wilcoxon matched-pairs signed-ranks test. Equivalent tests were carried out for the other comparisons in Table 5, leading to the same qualitative conclusions to the parametric tests.

of insurance still offers some protection at limited cost, whereas high index coverage is more exposed to basis risk because premiums increase even in states in which no payout is triggered. At the same time, informal transfers are voluntary and partial rather than a perfect substitute for insurance. Hence, anticipated sharing does not eliminate demand for index insurance, but appears instead to crowd out high coverage in particular.

Table 5: Two-sided t-tests Insurance Demand

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Index Insurance		Within Diff.	Indemnity Insurance		Within Diff.	Double Diff.
Treat.	*T1* (w/ Risk Sharing)	*T2* (w/o Risk Sharing)	(*T1*-*T2*)	*T3* (w/ Risk Sharing)	*T4* (w/o Risk Sharing)	(*T3*-*T4*)	(3) - (6)
Ins. Units	1.592 (0.094)	2.046 (0.104)	-0.454*** (0.097)	1.770 (0.098)	1.806 (0.103)	-0.036 (0.094)	-0.418*** (0.135)
N	196	196	196	196	196	196	392

Notes: Standard errors in parenthesis, *t-test* significance: $^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$. Paired t-tests were employed to test the differences within-subjects, and two-sample t-tests to test the differences between-subjects.

4.2.2. Regression Analysis

To account for other factors that may influence insurance uptake, as well as to address potential non-independencies within sessions, we turn to regression analysis. We deploy an Ordinary Least Squares (OLS) estimator, although we also implemented an ordered probit estimator which we do not report here.[11] The structure of the estimated models in their full form is the following:

$$Y_{ij} = \alpha + \boldsymbol{T_j}\boldsymbol{\beta} + \boldsymbol{X_i}\boldsymbol{\delta} + \eta_v + u_{ij} \tag{3}$$

where Y_{ij} are the units of insurance purchased by participant i (acting as Person 1) in a given treatment j. $\boldsymbol{T_j}$ are two indicator variables representing the characteristics of the treatment, namely, one dummy variable that takes the value 1 if the cover was of the index type and another that takes the value 1 if transfers between paired players were allowed. $\boldsymbol{X_i}$ includes all the control variables. Lastly, η_v are village fixed effects and u_{ij} is the error term.

The results in Table 6 show six different specifications, which are divided into three types according to the sample used for the estimation in the same manner as in Table 5. Specifications (1) and (2) were obtained from a sample where index insurance was the cover on offer (treatments *T1* and *T2*), whereas (3) and (4) used a sample where

[11] Since one could consider the insurance decision as a choice over a non-continuous outcome, we employed an ordered probit model to estimate the same specifications as in Table 6. There are no changes of note in these results (see online Appendix F).

only indemnity insurance was available (treatments *T3* and *T4*). All these specifications feature the possibility of sharing risk as the sole key variable. Lastly, specifications (5) and (6) make use of the full sample. They present as regressors of interest the availability of index insurance and risk sharing, and their interaction, i.e. their combined presence which occurs only in *T1*. This interaction yields the equivalent of the double difference in column 7 of Table 5 in regression form. Empirical models (1), (3) and (5) do not include the control variables $\boldsymbol{X_i}$, whereas (2), (4) and (6) do. We employ bootstrap-clustered standard errors at the session level.

Table 6: Effect of Risk Sharing on Insurance Demand

Sample	**Index Insurance**		**Indemnity Insurance**		**Pooled**	
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Risk Sharing	-0.454***	-0.454***	-0.036	-0.036	-0.036	-0.036
	(0.135)	(0.135)	(0.111)	(0.111)	(0.113)	(0.099)
Index Insurance					0.257	0.183
					(0.225)	(0.252)
Index Insurance x Risk Sharing					-0.418**	-0.418***
					(0.176)	(0.150)
Constant	2.046***	1.381***	1.789***	1.629***	1.789***	1.755***
	(0.152)	(0.377)	(0.154)	(0.382)	(0.159)	(0.410)
Controls	No	Yes	No	Yes	No	Yes
N	392	392	388	388	780	780
R^2	0.03	0.10	0.00	0.03	0.01	0.16
Clusters	10	10	10	10	20	20

Notes: OLS regression with insurance units purchased as dependent variable. Bootstrapped clustered standard errors at the session level in parentheses, $^{*}p < 0.1$, $^{**}p < 0.05$,$^{***}p < 0.01$.
Specifications (2), (4) and (6) include the following control variables: gender, education, age, wealth, risk preferences, knowledge of insurance, experience with shocks and an indicator variable for enumerator team 2. Specification (6) includes village fixed effects.
Full results for the estimated specifications can be found in online Appendix F. Further details of the variables are shown in Table D1 of online Appendix D.

In Table 6, specifications (1) and (2) show that the availability of risk sharing reduces index-insurance demand by almost half a unit (-0.454). Relative to the no-sharing index treatment, in which participants purchased 2.046 units on average, this corresponds to a reduction of approximately 22 percent. In contrast, specifications (3) and (4) show that the corresponding effect for indemnity insurance is only -0.036 units lower, which is both substantively small and statistically insignificant.

The pooled specifications (5) and (6) confirm that this difference is specific to index insurance. The interaction coefficient of -0.418 indicates that the effect of risk sharing on demand corresponds to a reduction of about 0.42 units when insurance is index-based rather than indemnity-based. When read alongside Figure 3, these estimates suggest that the effect for index insurance operates primarily at the intensive margin: it reflects

a reduction in high coverage choices rather than a shift from insuring to not insuring altogether. In other words, anticipated sharing appears to crowd out demand for high index-insurance coverage in particular. By contrast, neither the indexed nature of the cover nor the availability of risk sharing affects demand in isolation; what matters is their interaction.

Result 2. *Anticipated informal risk sharing crowds out demand for index insurance, primarily by reducing high coverage choices, but does not affect the uptake of indemnity insurance.*

5. Discussion and Conclusion

Our experiment was primarily designed to study the effect of anticipated risk sharing on index-insurance purchase decisions. To this end, we introduced exogenous variation along two dimensions: first, the possibility of receiving informal transfers (yes or no), and second, the type of insurance available—index or indemnity. We find that risk sharing has no effect on demand for indemnity insurance. By contrast, risk sharing reduces demand for index insurance, suggesting that the 'crowding-out' effect of informal support outweighs any potential 'crowding-in' effect. Moreover, this effect is concentrated primarily in high coverage choices. At the same time, we find that absolute transfers are higher under index insurance than under indemnity insurance, although this reflects larger residual losses rather than a higher proportion of losses being shared. These findings therefore pose a puzzle: why does anticipated risk sharing reduce demand for index insurance, especially high index coverage, when basis risk can, in principle, be mitigated through informal support? In this section, we situate this result in relation to the existing literature, discuss a plausible interpretation of the pattern, and reflect on its implications for development policy.

Our results speak to related experimental evidence on the interaction between formal insurance and informal support. In transfer games in rural Ethiopia and Cambodia, Anderberg and Morsink (2020) and Lenel and Steiner (2020) show that the availability of formal insurance reduces informal transfers: in Anderberg and Morsink (2020), average transfers fall from 15 ETB when no insurance is available to 10 ETB when insurance is rejected and 5 ETB when it is accepted, while Lenel and Steiner (2020) find that private transfers decline by about 28 percent when recipients have the option to insure. Our results differ in that we do not find a reduction in the proportion of losses shared when insurance is available. Rather, larger absolute transfers under index insurance reflect larger residual losses. With respect to insurance demand, our findings are closest to Berg *et al.* (2022), who also study indemnity and index insurance in a lab-in-the-field setting, but with imposed rather than freely chosen transfers. They find that risk sharing reduces

indemnity-insurance demand, including both take-up and full coverage, while increasing index-insurance take-up. By contrast, we find no effect on indemnity insurance and a negative effect on index insurance, concentrated primarily in high coverage choices. This contrast sharpens the puzzle: when transfers are freely chosen and anticipated, informal support appears not to make index insurance more attractive, but instead to reduce demand for high levels of index coverage.

A plausible explanation of this pattern relates to the degree of control over risk exposure that insurance provides. Control over risk exposure is known to shape individuals' willingness to support others who experience adverse outcomes: when misfortune results from exposure to risks that could have been avoided, support is less likely to be forthcoming (Cettolin and Tausch, 2015; Lenel and Steiner, 2020; Anderberg and Morsink, 2020). When formal insurance is introduced in settings previously characterized by informal arrangements alone, it allows individuals to reduce their exposure to risk and may thereby alter perceptions of who is deserving of assistance. However, the sensitivity of informal risk sharing to formal insurance may depend on the extent to which the insurance product actually provides control over risk exposure. Index insurance offers less such control than indemnity insurance because of basis risk. Drawing on insights from Cettolin and Tausch (2015), Lenel and Steiner (2020) and Anderberg and Morsink (2020), it is plausible to surmise that, in the context of our experiment, lower individual control over risk is associated with greater assistance from partners following a loss.

Our findings conform with this hypothesis to an extent. When comparing support received by those who are index rather than indemnity insured, we observe a significantly higher level of transfers in favor of the former, even when controlling for other factors correlated with sharing. The greater control over exposure to risk that indemnity compared to index insurance permits—because of the absence of basis risk—may thus help explain larger risk sharing with those who purchase index insurance, large enough in our sample to reduce the utility of insurance to such an extent that the demand for it falls.

However, contrary to expectation, those without access to insurance (and completely reliant on informal help to deal with losses) did not receive a higher degree of support on average; neither compared to those able to purchase index insurance nor to those who could buy the protection of an indemnity cover. One possible explanation lies in the nature of informal risk sharing arrangements in rural areas of developing countries. Such arrangements typically address idiosyncratic rather than covariate risks (Fafchamps, 2003, 2008). Thus, while support may be forthcoming when losses arise from individual shocks, such as illness, it is less likely when losses result from covariate events, such as droughts that affect entire communities. In the context of our experiment, agricultural insurance is likely to have been perceived as primarily addressing weather-related risk,

and therefore as pertaining to covariate risk. Because informal arrangements do not typically cover such risks, this may explain why the introduction of insurance does not reduce sharing. At the same time, because basis risk is inherently idiosyncratic, this line of reasoning also helps—complementing the discussion above—to explain why index insurance is associated with greater risk sharing than indemnity insurance.

What remains to be explained is the paradox that our findings pose, namely that when basis risk sharing is available, the demand for index insurance falls, contrary to what simple complementarity arguments would predict. One possible interpretation is that participants were reluctant to burden others with the consequences of their own risk-taking. In our experiment, purchasing high levels of index insurance increases exposure to large uncovered losses in states in which no payout is triggered. If participants anticipated that such losses would invite support from others, they may have regarded high index coverage as implicitly imposing a greater burden on their partner. On this interpretation, the availability of informal support need not encourage demand for index insurance; instead, it may discourage the purchase of high levels of coverage precisely because these generate the largest need for help.

This interpretation is necessarily indirect, since our design does not elicit beliefs about others' transfers or measure social norms directly. We therefore cannot determine whether the relevant mechanism is best characterized as social obligation, reluctance to impose on others, fairness concerns, or some combination of these. At the same time, the interpretation is consistent with two features of the evidence. First, the reduction in demand under index insurance operates primarily at the intensive margin, that is, through lower take-up of high coverage choices, which are precisely those associated with the largest potential uncovered losses. Second, earlier experimental evidence from the same study area shows that individuals take less risk when their losses may be shared by others, a pattern that can be interpreted as reluctance to expose others to the consequences of one's own choices (D'Exelle and Verschoor, 2015). Taken together, these considerations make a norm-based interpretation plausible, while also indicating that it remains an interpretation rather than a directly identified mechanism.

A natural limitation of our approach is that, as a lab experiment, it cannot fully capture the complexity of real-world insurance uptake decisions. In practice, such decisions are shaped by a range of additional factors—including liquidity constraints, trust in providers, marketing and salience, and repeated interactions with both insurers and social networks—that are only partially represented in our setting. We therefore do not interpret our results as predictive of insurance demand levels in the field. Rather, the strength of our design lies in its ability to isolate a specific mechanism—namely, the interaction between informal risk sharing and insurance demand under basis risk—under

conditions of controlled information and incentives. This trade-off between internal and external validity is well recognized in the experimental literature (e.g., Levitt and List, 2007; Falk and Heckman, 2009; Camerer, 2015).

At the same time, while experimental behavior may differ in level from field behavior, we believe that the mechanism identified here is relevant for policy when interpreted with appropriate caution. In many of the settings in which index insurance is promoted, informal risk-sharing arrangements remain an important component of households' risk management strategies. Our results suggest that such arrangements need not complement formal insurance, and may instead reduce demand—particularly for higher levels of index coverage—when basis risk leaves residual losses that can be shared. This implies that informal support networks may substitute for, rather than reinforce, demand for index insurance.

What are then the implications of our findings for development policy? In particular, should risk-sharing groups be targeted when marketing weather index insurance? One narrative in the literature emphasizes the complementarity between being index insured and receiving informal help, and suggests that targeting risk-sharing groups would be a good idea. Several studies frame their empirical contributions as providing evidence for it, but it is worth noting first that support for such complementarity is somewhat tentative. Dercon *et al.* (2014), as they themselves point out, lack full control over the exogenous variation employed to study this matter—training on the benefits of risk sharing when holding an indexed policy—which could lead to a selection effect in forming sharing groups. Mobarak and Rosenzweig's (2013a) findings are equally inconclusive; they report higher demand among the most active risk-sharing groups, but the difference is not sufficiently large to become statistically significant. Demand for index insurance in Berg *et al.*'s (2022) framed experiment surges with transfers, whereas uptake of indemnity coverage falls to a lesser extent. Nevertheless, their experiment is not a test of how freely decided risk sharing influences demand, given that the element randomized is a fixed and pre-determined transfer between partners in a pair. For identifying the effect of risk sharing on the demand for index insurance, risk sharing needs to be freely chosen rather than imposed.

A contrary narrative in the literature points out issues of incompatibility between informal and formal protection (Boucher and Delpierre, 2014; De Janvry *et al.*, 2014), especially that informal risk sharing may crowd out formal insurance. Our findings are consistent with this narrative as far as index insurance is concerned. Moreover, we add the insight that any complementarity between informal risk sharing and index insurance may be weakened if households are reluctant to rely on informal support when basis risk materialities. Our experiment does not identify the precise source of that reluctance,

but the evidence is consistent with mechanisms rooted in obligation, deservingness, or aversion to imposing losses on others.

In sum, we find that risk sharing can lower the demand for index insurance. This result may partly reflect the fact that informal support remains available when basis risk leaves losses uncovered. At the same time, the isolated effect of basis risk sharing on demand is paradoxically negative. One plausible interpretation is that participants were reluctant to rely on others when high index coverage exposed them to large uncovered losses. While our design does not permit a direct test of this mechanism, it is consistent with both the intensive-margin pattern in insurance demand and prior evidence from the same study area. Our findings therefore suggest caution in assuming that risk-sharing groups will necessarily amplify demand for index insurance when basis risk remains substantial.

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Online Appendix

A. Payoffs

Table A1: Expected Payoffs Person 1

	Payoff				Expected Payoff
State:	$L0$	LI	00	$0I$	
Weather:	Good	Bad	Good	Bad	
Loss:	L	L	0	0	
Prob:	γ	$v-\gamma$	$1-q-\gamma$	$q+\gamma-v$	
No Insurance	$w-L$	$w-L$	w	w	$v(w-L)+(1-v)w$
Indemnity Ins.	$w-L+\alpha L-P$	$w-L+\alpha L-P$	$w-P$	$w-P$	$v(w-L+\alpha L-P)+(1-v)(w-P)$
Index Ins.	$w-L-P$ [1]	$w-P+\alpha L-L$ [2]	$w-P$ [3]	$w-P+\alpha L$ [4]	$\gamma[1]+(v-\gamma)[2]$ $+(1-q-\gamma)[3]+(q-\gamma-v)[4]$

Table A2: Experimental Payoffs Person 1

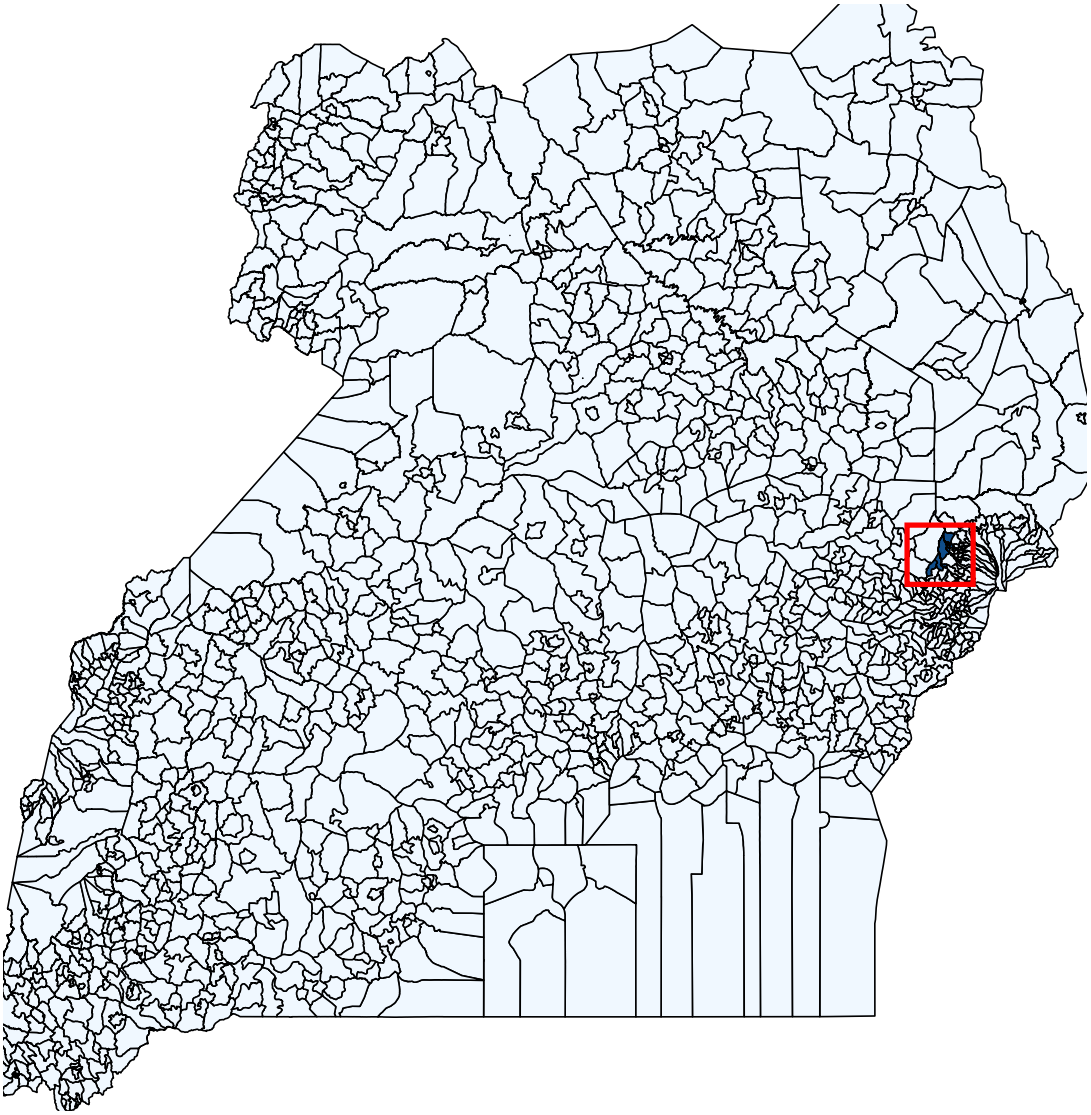
State:	$L0$	LI	00	$0I$	
Weather:	Good	Bad	Good	Bad	
Loss:	10,000	10,000	0	0	
Prob:$^{\psi}$	1/8	3/8	3/8	1/8	
Insurance Units	Payoff (UGX)				Expected Payoff
	No Insurance				
	16,000-10,000	16,000-10,000	16,000	16,000	
	6,000	6,000	16,000	16,000	11,000
	Indemnity Insurance				
0	16,000-10,000	16,000-10,000	16,000	16,000	
	6,000	6,000	16,000	16,000	11,000
1	16,000-10,000-1,500+2,250	16,000-10,000-1,500+2,250	16,000-1,500	16,000-1,500	
	6,750	6,750	14,500	14,500	10,625
2	16,000-10,000-1,500·2+2,250·2	16,000-10,000-1,500·2+2,250·2	16,000-1,500·2	16,000-1,500·2	
	7,500	7,500	13,000	13,000	10,250
3	16,000-10,000-1,500·3+2,250·3	16,000-10,000-1,500·3+2,250·3	16,000-1,500·3	16,000-1,500·3	
	8,250	8,250	11,500	11,500	9,875
4	16,000-10,000-1,500·3+2,250·4	16,000-10,000-1,500·3+2,250·4	16,000-1,500·4	16,000-1,500·4	
	9,000	9,000	10,000	10,000	9,500
	Index Insurance				
0	16,000-10,000	16,000-10,000	16,000	16,000	
	6,000	6,000	16,000	16,000	11,000
1	16,000-10,000-1,500	16,000-10,000-1,500+2,250	16,000-1,500	16,000-1,500+2,250	
	4,500	6,750	14,500	16,750	10,625
2	16,000-10,000-1,500·2	16,000-10,000-1,500+2,250·2	16,000-1,500·2	16,000-1,500·2+2,250·2	
	3,000	7,500	13,000	17,500	10,250
3	16,000-10,000-1,500·3	16,000-10,000-1,500+2,250·3	16,000-1,500·3	16,000-1,500·2+2,250·3	
	1,500	8,250	11,500	18,250	9,875
4	16,000-10,000-1,500·4	16,000-10,000-1,500+2,250·4	16,000-1,500·4	16,000-1,500·2+2,250·4	
	0	9,000	10,000	19,000	9,500

Notes: $^{\psi}$ γ is equal to $\frac{1}{8}$ and $v = q = \frac{1}{2}$.

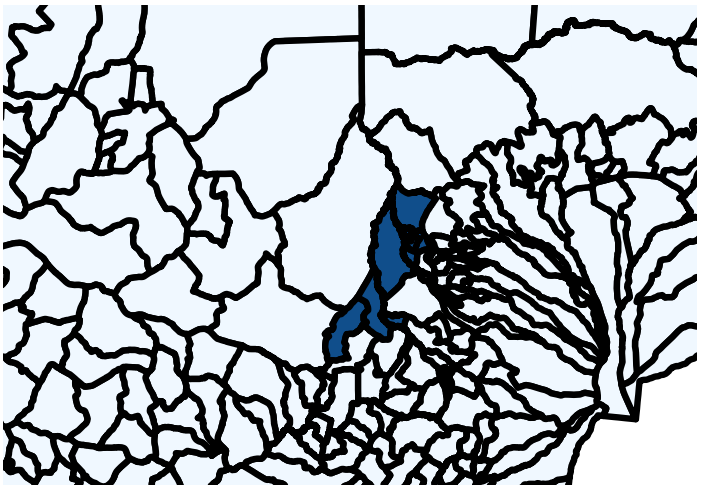
B. Maps Area of Study

Figure B1: Area of Study

(a) Map of Uganda



(b) Area of study



C. Instructions and Procedures[12]

C.1. Room Preparation

[When people enter the meeting room, they are asked for their name. We have a list of invited candidates. Their name is marked and they are given a sticker with an identity number, which we ask them to stick on their shirt. It is explained that this identity number is unique and allows us to identify them during the exercise while guaranteeing complete confidentiality. This is important, as they are able to earn real money in the exercise.]

[They are asked to take a seat in the experimental room. There are two rows of chairs/benches, placed perpendicular to the instruction table. Participants are seated randomly in each row. Both rows of participants are seated back-to-back. The benches/chairs should be arranged so that no subject can see what another subject is looking at.]

C.2. Running the Experiment

[The following instructions should be given to all subjects simultaneously while they are seated in the experimental room.]

C.2.1. Welcome Address

"Welcome. Thank you for taking the time to come today. [Introduce Experimenters and Assistants.] Later, you can ask any of us questions during today's programme. For this raise your hand so that we can come and answer your question in private."

"We have invited you here, today, because we want to learn about how people in this area take decisions. You are going to be asked to take decisions about money. The money that results from your decisions will be yours to keep. The decisions that you take here will not be told to anyone. We will never use your name."

"What you need to do will be explained fully in a few minutes. But first we want to make a couple of things clear."

"First of all, this is not our money. We belong to a university, and this money has been given to us for research."

"Participation is voluntary. You may still choose not to participate in the exercise."

"We also have to make clear that this is research about your decisions. Therefore, you cannot talk with others. This is very important. I'm afraid that if we find you talking with others, we

[12] Instructions in square brackets were not read aloud and were intended solely for the implementation team. Text in quotation marks indicates instructions that were orally conveyed to participants in their local language.

will have to send you home, and you will not be able to earn any money here today. Of course, if you have questions, you can ask one of us. We also ask you to switch off your mobile phones."

"Make sure that you listen carefully to us. You will be able to make a good amount of money here today, and it is important that you follow our instructions."

"During today's programme, you will be asked to make one or more choices, which will be explained to you very clearly. Only one of your choices will be selected to determine the money you will be paid. At the end of the exercise, we will randomly select one of your decisions to be paid out. Any money you earn will be paid out to you privately and confidentially after all parts of the exercise are complete."

"Now, before we explain what you need to do, it is really important to bear one more thing in mind. You will be asked to take decisions that are not a matter of getting it right or wrong; they are about what you prefer. However, it is important to think seriously about your choices because they will affect how much money you can take home."

"Please bear in mind when you take your decisions, no projects are going to come to this area because of the research that we do here today."

"There are three parts to today's programme. In all parts you will be asked to take decisions. Only one of the decisions will be selected. You will be told which decision that is at the end, and that decision determines how much money you take home. However, you will only find out which decision is selected at the end, so with every decision you take, remember: for all you know, this could be the one that determines how much money you take home."

C.2.2. Part 1 (Treatment 2)

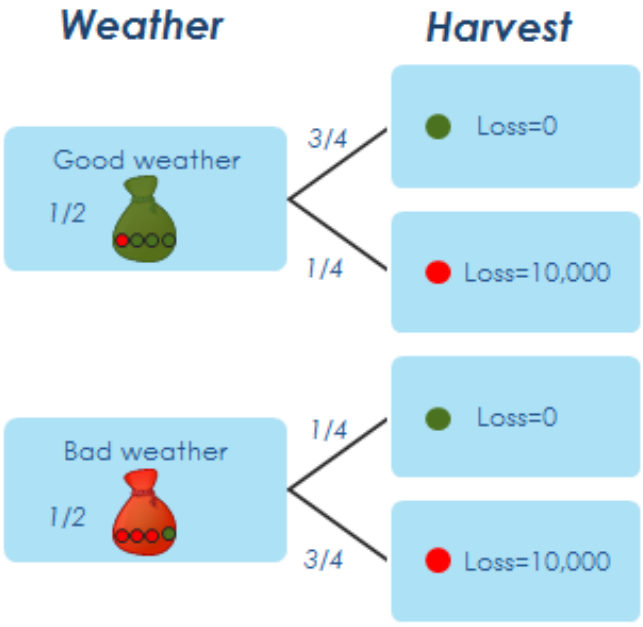
[The following instructions correspond to the implementation of the index insurance protocol, the instructions for indemnity insurance protocol are identical apart from those modifications required to implement the treatments featured in that protocol.]

Instructions

[Stick poster for the common event]

"In the first part of the task you will receive 16,000 Shillings and you will be presented with the situation you can see in the poster."

Figure C1: Probability Structure Experiment



"As you can see there is a chance that you lose part of your endowment, 10,000 Shillings. This is determined by two events: a common event, which affects everyone similarly, and an individual one, which affects everyone differently."

"You can think about the endowment as your harvest and the common event as the weather. If the weather is good, it is more likely that you get a good harvest and you don't make any losses. By contrast, in case of bad weather, there is a higher chance that you lose your harvest. However, the weather alone does not determine your losses. One can be lucky and not make a loss even when the weather is bad, but also be unlucky and lose the harvest with good weather."

"In this task, good weather is represented by a green bag and bad weather by a red bag. If the green bag is drawn everyone gets good weather, in this case there is only 1 in 4 chances that you lose the 10,000 Shillings, and 3 in 4 chances that you go home with the 16,000 Shillings. In contrast, if the red bag is selected the likelihood of losing 10,000 Shillings goes up to 3 out 4 times, while there is 1 in 4 chances that you keep all the endowment. There are equal chances that the green or the red bag are selected, we will put both bags into a larger bag and ask a volunteer to pick one without looking."

"Whether the losses are actually realised depends on the type of token that you draw individually from the green or red bag, if the token is red, you lose the 10,000 Shillings, if it is green, you do not lose that money and you get to keep 16,000 Shillings. There are 3 green tokens in the green bag for only 1 red token, so only 1 out 4 chances of losing the 10,000 Shillings in the green bag for 3 out of 4 chances of keeping the 16,000 Shillings. As opposed to this, in the red bag there are 3 red tokens and only 1 green token, so 3 out of 4 chances of losing 10,000 Shillings and 1 out 4 of keeping the 16,000 Shillings."

Decision

"The decision that we will ask you to make is one about insurance. Insurance is an arrangement that pays out some money when a specified bad event happens, like making a loss due to bad harvest, in return for a cost."

"The insurance that you will have access to protects you against bad weather, the more you buy of it, the more you get in case of bad weather. So if you make a loss with bad weather, you would lose less of the 10,000 Shillings the more insurance you buy. However, there is a chance that you lose 10,000 and the insurance does not pay anything in case of good weather." [Go back to the first poster and make this point clear.]

"Every insurance unit costs 1,500 Shillings and pays out 2,250 Shillings when there is bad weather."

Pairing

"Throughout this task you will be paired with somebody in this room. You don't know who this person is, but it is somebody who is also here now, participating in this workshop."

"One person in the pair is called Person 1, the other is called Person 2. Both persons have an endowment of 16,000 Shillings each. Person 1 will be at risk of losing her harvest and will need to decide whether she wants to buy insurance and, if so, how many units. By contrast, Person 2 will not be at risk of losing her harvest and won't need to buy insurance."

"Person 2 does not take any decisions in this exercise. They receive their endowment of 16,000 Shillings, but they don't need to decide what to do with it."

"You are paired with two different people in this part. In one pair you are Person 1 and in another pair you are Person 2."

"We will determine at random later on whether you are paid for your decision as Person 1 or as Person 2."

[Role play to explain pairing by asking two participants to come forward. One of them takes the role of Person 1 and the other that of Person 2. With the volunteers present we explain:

"Both Person 1 and Person 2 have an endowment of 16,000 Shillings each. Person 1 is again at risk of losing 10,000 Shillings due to a bad harvest and will need to decide whether to buy insurance, and if so, how many units. Person 2 is not at risk of losing her harvest, and will not take any decision."

Subsequently, the participant role-playing as Person 1 becomes Person 2 and another participant comes forward to fulfil the role of Person 1.]

"Because Person 2 cannot take any decision, in this part you will all make a choice as Person 1

only. Person 1 is at risk of losing 10,000 of her endowment and needs to decide whether to buy insurance and, if so, how many units."

Questions I

"Please raise your hand if you have any questions" [The experimenter administrator answers participants' questions in front of everybody as clearly and accurately as possible. If necessary, clarify the instructions. Refrain from giving any answers that may influence their decisions.]

Choices

[Stick the posters of the insurance decision card for part 1 to the wall, and use it to explain the possible outcomes. During the explanations emphasise that there are four different possible outcomes.]

"Person 1 is at risk of losing 10,000 Shilling due to a bad harvest and will need to decide how much insurance she wants to buy. In other words, you as Person 1 are asked to choose among the available insurance options."

"The choice is between the different options on the table on display here, it represents the decision card where you will record your choice after it is handed in to you. You can choose exactly one of these options."

Person 1		*ID: ____ Part: 1 Session: ____*	
		● - 10,000	● - 0
Insurance Units	***Insurance Price***	***Good Weather***	***Bad Weather***
0 ☐	- 0	+0 ● Earnings: 6,000 ● Earnings: 16,000	+0 ● Earnings: 6,000 ● Earnings: 16,000
1 ☐	- 1,500	+0 ● Earnings: 4,500 ● Earnings: 14,500	+2,250 ● Earnings: 6,750 ● Earnings: 16,750
2 ☐	- 3,000	+0 ● Earnings: 3,000 ● Earnings: 13,000	+4,500 ● Earnings: 7,500 ● Earnings: 17,500
3 ☐	- 4,500	+0 ● Earnings: 1,500 ● Earnings: 11,500	+6,750 ● Earnings: 8,250 ● Earnings: 18,250
4 ☐	- 6,000	+0 ● Earnings: 0 ● Earnings: 10,000	+9,000 ● Earnings: 9,000 ● Earnings: 19,000

"If you don't buy any insurance you will not pay anything, and if you draw the green token your earnings will be of 16,000, as you will get to keep your endowment. However, if you draw the red token, you will end up with losses of 10,000 Shillings and earnings of 6,000 Shillings."

"If you buy 1 unit of insurance it will cost you 1,500 Shillings of your endowment, and if you draw the green token your earnings will be of 14,500 Shillings if the weather is good, and of

16,750 Shillings if the weather is bad, since then the insurance will pay you 2,250 Shillings. If instead you draw the red token, you will make a loss of 10,000 Shillings and the insurance will not pay you anything if the weather is good; you will then end up with earnings of 4,500 Shillings. However, if you draw the red token and the weather is bad, the insurance will pay you the 2,250 Shillings and you will get earnings of 6,750 Shillings."

"If you buy 2 units of insurance it will cost you 3,000 Shillings of your endowment, and if you draw the green token your earnings will be of 13,000 Shillings if the weather is good, and of 17,500 Shillings if the weather is bad, since then the insurance will pay you 4,500 Shillings. If instead you draw the red token, you will make a loss of 10,000 Shillings and the insurance will not pay you anything if the weather is good; you will then end up with earnings of 3,000 Shillings. However, if you draw the red token and the weather is bad, the insurance will pay you the 4,500 Shillings and you will get earnings of 7,500 Shillings."

"If you buy 3 units of insurance it will cost you 4,500 Shillings of your endowment, and if you draw the green token your earnings will be of 11,500 Shillings if the weather is good, and of 18,250 Shillings if the weather is bad, since then the insurance will pay you 6,750 Shillings. If instead you draw the red token, you will make a loss of 10,000 Shillings and the insurance will not pay you anything if the weather is good; you will then end up with earnings of 1,500 Shillings. However, if you draw the red token and the weather is bad, the insurance will pay you the 6,750 Shillings and you will get earnings of 8,250 Shillings."

"Finally, if you buy 4 units of insurance it will cost you 6,000 Shillings of your endowment, and if you draw the green token your earnings will be of 10,000 Shillings if the weather is good, and of 19,000 Shillings if the weather is bad, since then the insurance will pay you 9,000 Shillings. If instead you draw the red token, you will make a loss of 10,000 Shillings and the insurance will not pay you anything if the weather is good; you will then end up with nothing. However, if you draw the red token and the weather is bad, the insurance will pay you the 9,000 Shillings and you will get earnings of 9,000 Shillings."

"Bear in mind that it is more likely that the insurance pays you something when you make losses than you don't receive anything, because in the case of bad weather there are three chances out of four to make a loss, whereas in case of good weather there is only one chance of four to make a loss. Similarly, it is less likely that the insurance pays you when you don't lose your harvest."

"After you have made your choice about the insurance you want to buy, your payment will be calculated in the following way. We will ask one of you to come forth and pick one bag from this one [Show the bag], which contains a red and a green bag. Each of these bags contains the number of tokens described before. Whereas the red bag has 3 red tokens, signalling losses, and 1 green token, meaning no losses, the green bag contains only 1 red token and 3 green ones. Once one of the bags is selected, each one of you will pick one token during the resolution phase,

which together with your decision will determine how much money you go home with."

Decision Card

"Everyone will take her decision as Person 1."

"To make your decision we will use the following decision card. It shows the same 5 options as the ones presented on the table. Out of these 5 options we ask you to select one by ticking the appropriate box." [Show the decision card, and indicate where they can find the different options and how they correspond to the options presented on the table. Explain where they have to indicate their insurance decision.]

Questions II

"Please raise your hand if you have any questions." [The experimenter administrator answers participants' questions in front of everybody as clearly and accurately as possible. If necessary, clarify the instructions. Refrain from giving any answers that may influence their decisions.]

Control Questions

"We will now ask some questions individually to see whether you understood the instructions."

[Ask participants to turn and explain that they should place the decision card within the wooden structure.]

[The experimenter assistants call each participant one by one. They say the following:

"I am going to ask you some questions to see if you understood the instructions. Remember that in this part that you are Person 1, you are at risk of losing 10,000 Shillings due to a bad harvest and you can buy insurance to protect yourself against this event when the weather is bad. The insurance pays out when the weather is bad, both when you make losses and when you don't."

"You are paired with someone else in this room who is Person 2 and doesn't take any decision."

"You can buy no insurance, 1 unit, 2 units, 3 units or 4 units of insurance. Each option changes how much you take home when the weather is good or bad, and in case of good or bad harvest."

Finally, the experimenters ask the following four questions making reference to the decision cards that they carry with them.]

1. If you chose to buy one unit of insurance, how much would you go home with if a red token is drawn and the weather is bad? (6,750)
2. If you chose to buy three units of insurance, how much would you go home with if a green token is drawn and the weather is bad? (18,250)

3. If you chose to buy two units of insurance, how much would you go home with if a red token is drawn and the weather is good? (3,000)

4. How much of your endowment would you spend buying four units of insurance? (6,000)

[For each of the questions, record on the control question card whether they answered it correctly. If the participant gave a wrong answer for at least one of the questions, ask him/her what was not clear. Answer all the remaining questions participants as clearly and accurately as possible. If necessary, clarify the instructions; but not more than once.]

[At the bottom of the page the experimenter should answer the following question:

"Do you think the participant understood the instructions well?" Y=Yes/N=No]

Decision Card

[Before the participant goes back to her seat. The experimenter administering the control question explains how the decision card works by saying the following:]

"As Person 1 you will take the insurance decision using the following decision card. It shows the same 5 options as the ones presented on the table. Out of these 5 options we ask you to select one by ticking the appropriate box." [Show the decision card, and indicate where they can find the different options and how they correspond to the options presented on the table. Explain where they have to indicate their insurance decision.]

[Before the participant goes back to her seat give her the decision card with the ID are already filled in. Ask the participant not to write anything on it until we tell her. Remind them that if they need help or make a mistake they can ask us for help.]

Decisions

[Give each participant a pen.] "If you have no further questions, we will now begin. Please indicate the insurance option you choose. Remember, there are no wrong choices, so you should take up exactly as much insurance as you prefer."

"We emphasise that it is important that you make your choice in private. Do not show your decision card to the other participants and place it in the wooden structure in front of you. If you need assistance, please raise your hand so that one of us can come to you to assist you. Once you have made your choice, please fold the decision sheet and raise your hand so that we can come and collect your decision card."

"Take your time to make your decisions since they can affect how much money you take home."

[The participants remain seated. Any questions at this point should be addressed individually. After the participants have made their choice, they fold their decision card, and we collect them.

Verify whether participants filled in the decision cards correctly. The central administrator enters the insurance decisions in an Excel data sheet. When all participants have made their decision, Part 1 is completed.]

C.2.3. Part 2 (Treatment 1)

Instructions

[Remove poster for part 1.]

[Participants remain seated.] "Thank you, you have now all completed the first part of the task. We will now explain the second part."

"During this part you will be again paired with two other people in this room. Different people than before. You don't know who they are, but they are also here now, participating in this workshop."

"Same as before, in each pair there is again a Person 1 and a Person 2. Both persons have an endowment of 16,000 Shillings each. Person 1 will be again at risk of losing 10,000 Shillings due to a bad harvest and will need to decide again how much insurance she wants to buy. By contrast, Person 2 will not be at risk of losing her harvest and now will be given the opportunity of compensating Person 1 for her losses up to whatever amount she sees fit."

"You are paired with two different people in this part. In one pair you are Person 1 and in another pair you are Person 2."

"We will determine at random later on for whether you are paid for your decision as Person 1 or as Person 2."

[Role play to explain pairing by asking two participants to come forward. One of them takes the role of Person 1 and the other that of Person 2. With the volunteers present we explain:

"Both Person 1 and Person 2 have an endowment of 16,000 Shillings each. Person 1 is again at risk of losing 10,000 Shillings due to a bad harvest and will need to decide whether to buy insurance, and if so, how many units. Person 2 is not at risk of losing her harvest and now will be given the opportunity of compensating Person 1 for her losses up to whatever amount she sees fit."

Subsequently, the participant role-playing as Person 1 becomes Person 2 and another participant comes forward to fulfil the role of Person 1.]

"This part has two rounds and each of you will be asked to take a different decision in every round: an insurance decision as Person 1 and a sharing decision as Person 2."

"One of us will inform you personally if you are Person 1 or 2 in the round."

Questions I

"Please raise your hand if you have any questions." [The experimenter administrator answers participants' questions in front of everybody as clearly and accurately as possible. If necessary, clarify the instructions. Refrain from giving any answers that may influence their decisions.]

Round 1

Choices Person 1

[Stick the poster of the insurance decision card for part 2, and use it to explain the scenarios below.]

"As noted, those who are Person 1 will face the same situation every one of you faced before, in which there is a chance of losing 10,000 Shillings, and will have the chance to buy insurance against these losses. The only difference is that now Person 2 can compensate you when you make losses."

"Person 1 will be asked to choose how much insurance she wants to purchase. In other words, you as Person 1 are asked to choose again between the different insurance options. You may make the same decision that you made in the first part of the task, or you may decide to change your decision, and buy a different amount of insurance."

"The choice is between the different options on the table on display here, it represents the decision card where you will record your choice after it is handed in to you. You can choose exactly one of these options."

Person 1		*ID: ____ Part: 2 Session: ____*			
		● - 10,000		● - 0	
Insurance Units	***Insurance Price***	***Good Weather***	***Bad Weather***	***Losses Bad Harvest***	***Sharing Person 2***
0 ☐	- 0	+ 0 ● Earnings: 6,000 ● Earnings: 16,000	+ 0 ● Earnings: 6,000 ● Earnings: 16,000	- 10,000 - 10,000	+ ?
1 ☐	- 1,500	+ 0 ● Earnings: 4,500 ● Earnings: 14,500	+ 2,250 ● Earnings: 6,750 ● Earnings: 16,750	- 9,250 - 11,500	+ ?
2 ☐	- 3,000	+ 0 ● Earnings: 3,000 ● Earnings: 13,000	+ 4,500 ● Earnings: 7,500 ● Earnings: 17,500	- 8,500 - 13,000	+ ?
3 ☐	- 4,500	+ 0 ● Earnings: 1,500 ● Earnings: 11,500	+ 6,750 ● Earnings: 8,250 ● Earnings: 18,250	- 7,750 - 14,500	+ ?
4 ☐	- 6,000	+ 0 ● Earnings: 0 ● Earnings: 10,000	+ 9,000 ● Earnings: 9,000 ● Earnings: 19,000	- 7,000 - 16,000	+ ?

"If you as Person 1 don't buy any insurance you will not pay anything. Same as before, if you draw the green token you will not make any losses and you will get to keep your endowment of

16,000 Shillings. Person 2 cannot transfer any amount to you since you would not have suffered any losses due to a bad harvest."

"If, on the other hand, you draw the red token, you will end up with losses of 10,000 Shillings. In this case, Person 2 can choose to share any amount from 0 to 16,000 Shillings of her endowment to compensate you for your losses."

"If you buy 1 unit of insurance it will cost you 1,500 Shillings of your endowment. If you draw the red token, you will make a loss of 10,000 Shillings and the insurance will not pay you anything if the weather is good; you will therefore lose 11,500 Shillings of your endowment (your losses plus the cost of the insurance). Person 2 can choose to share any amount of her endowment to compensate you. If however you draw the red token and the weather is bad, the insurance will pay you 2,250 Shillings, you will lose 9,250 Shillings (your losses net of the insurance payout plus the cost of the insurance). Person 2 can choose to share any amount of her endowment to compensate you for the losses."

"If you buy 2 units of insurance it will cost you 3,000 Shillings of your endowment. If you draw the red token, you will make a loss of 10,000 Shillings and the insurance will not pay you anything if the weather is good; you will therefore lose 13,000 Shillings (your losses plus the cost of the insurance). If however you draw the red token and the weather is bad, the insurance will pay you the 4,500 Shillings, you will lose 8,500 Shillings (your losses net of the insurance payout plus the cost of the insurance). In both cases when you draw the red token and make losses, Person 2 can choose to share any amount of her endowment to compensate you for the losses."

"If you buy 3 units of insurance it will cost you 4,500 Shillings of your endowment. If you draw the red token, you will make a loss of 10,000 Shillings and the insurance will not pay you anything if the weather is good; you will therefore lose 14,500 Shillings (your losses plus the cost of the insurance). If however you draw the red token and the weather is bad, the insurance will pay you the 6,000 Shillings, you will lose 7,750 Shillings (your losses net of the insurance payout plus the cost of the insurance). In both cases when you draw the red token and make losses, Person 2 can choose to share any amount of her endowment to compensate you for the losses."

"Finally, if you buy 4 units of insurance it will cost you 6,000 Shillings of your endowment. If you draw the red token, you will make a loss of 10,000 Shillings and the insurance will not pay you anything if the weather is good; you will therefore lose 16,000 Shillings (your losses plus the cost of the insurance). If however you draw the red token and the weather is bad, the insurance will pay you the 8,000 Shillings, you will lose 7,000 Shillings (your losses net of the insurance payout plus the cost of the insurance). In both cases when you draw the red token and make losses, Person 2 can choose to share any amount of her endowment to compensate you for the

losses."

"Remember that if you draw a green token the possible outcomes are the same as in the first part. You will get higher earnings in case of bad weather than with good weather, because the insurance pays out an indemnity when the weather is bad, which is higher the more insurance you buy. Person 2 cannot transfer any amount to you when a green token is drawn, since then you as Person 1 would not have suffered any losses due to a bad harvest, even though you would still see your endowment reduced due to the cost of the insurance purchased if you buy any."

Decision Card Person 1

"As Person 1 you will take the insurance decision using the same card as before, with the only difference that this card has a column that reminds you of the amount you can lose and another reminding you that Person 2 can share some amount with you when you make losses. You need to mark your preferred option on the decision card." [Show the decision card, and indicate where they can find the different options. Explain where they have to indicate their insurance decision.]

Questions II

"Please raise your hand if you have any questions." [The experimenter administrator answers participants' questions in front of everybody as clearly and accurately as possible. If necessary, clarify the instructions. Refrain from giving any answers that may influence their decisions.]

Choices Person 2

"Person 2 is not at risk of losing any part of her endowment. She will not be able to buy insurance, however, this time she will be given the opportunity to compensate Person 1 for her losses up to whatever amount she sees fit using her endowment of 16,000 Shillings."

"So you as Person 2 need to decide how much, if any, of Person 1's losses you wish to compensate for every possible insurance decision taken by Person 1. The sharing decision you take for the actual insurance level chosen by Person 1 will determine how much you take home."

[Stick the posters of the losses-sharing cards and use them to explain the scenarios below.]

Person 2		ID: ____ Part: 2 Session: ____
		● - 10000
Insurance Units	***Losses Person 1***	***Sharing***
0	10,000	_____ Shillings
1	11,500	_____ Shillings
2	13,000	_____ Shillings
3	14,500	_____ Shillings
4	16,000	_____ Shillings

Person 2		ID: ____ Part: 2 Session: ____
		● - 10000
Insurance Units	***Losses Person 1***	***Sharing***
0	10,000	_____ Shillings
1	9,250	_____ Shillings
2	8,500	_____ Shillings
3	7,750	_____ Shillings
4	7,000	_____ Shillings

"If Person 1 draws a red token and has not bought any insurance, she will get a loss of 10,000 Shillings, regardless of the weather conditions. You as Person 2 can choose to share any amount of your endowment of 16,000 Shillings to compensate Person 1 for her losses, from 0 to 16,000 Shillings."

"If, on the other hand, Person 1 draws a green token she will not suffer any losses from a bad harvest, and you cannot transfer any amount to her."

"If Person 1 draws a red token and has bought 1 unit of insurance, she will lose 11,500 Shillings if the weather is good (10,000 of it are losses and 1,500 the cost of the insurance that has not paid out anything). You can choose to share any amount of your endowment to compensate person for her losses. If however Person 1 draws a red token and the weather is bad, she will lose 9,250 Shillings (10,000 of it are losses and 1,500 the cost of the insurance that has paid out 2,250). You can again choose to share any amount of your endowment to compensate Person 1

for her losses."

"If Person 1 draws a red token and has bought 2 units of insurance, she will lose 13,000 Shillings if the weather is good (10,000 of it are losses and 3,000 the cost of the insurance that has not paid out anything). If however Person 1 draws a red token and the weather is bad, she will lose 8,500 Shillings (10,000 of it are losses and 3,000 the cost of the insurance that has paid out 4,500). In both cases when Person 1 draws a red token and makes losses, you as Person 2 can choose to share any amount of your endowment to compensate Person 1 for her losses."

"If Person 1 draws a red token and has bought 3 units of insurance, she will lose 14,500 Shillings if the weather is good (10,000 of it are losses and 4,500 the cost of the insurance that has not paid out anything). If however Person 1 draws a red token and the weather is bad, she will lose 7,750 Shillings (10,000 of it are losses and 4,500 the cost of the insurance that has paid out 6,750). In both cases when Person 1 draws a red token and makes losses, you can choose to share any amount of your endowment to compensate Person 1 for her losses."

"Finally, if Person 1 draws a red token and has bought 4 units of insurance, she will lose 16,000 Shillings if the weather is good (10,000 of it are losses and 6,000 the cost of the insurance that has not paid out anything). If however Person 1 draws a red token and the weather is bad, she will lose 7,000 Shillings (10,000 of it are losses and 6,000 the cost of the insurance that has paid out 9,000). In both cases when Person 1 draws a red token and makes losses, you can choose to share any amount of your endowment to compensate Person 1 for her losses."

[Ask two volunteers to come forward and role-play with them using the examples below. Use actual money to simulate the transactions.]

"For instance, if Person 1 does not buy any insurance and you, as Person 2, decide to compensate Person 1 with 5,000 Shillings because she has drawn a red token and made losses, she will end up with earnings of 11,000 Shillings and you will also take 11,000 Shillings home."

[Tell participants that this is just an example to help them understand the decision they need to make and that they should not guide their decisions based on it.]

"If Person 1 buys 3 units of insurance and you decide to compensate Person 1 with nothing, she will end up with earnings of 1,500 Shillings if the weather is good, and with 8,250 Shillings if the weather is bad. In either case you will take the full endowment of 16,000 Shillings home."

"If Person 1 buys 2 units of insurance and you decide to compensate Person 1 with 2,000 Shillings, she will end up with earnings of 5,000 Shillings if the weather is good, and with 9,500 Shillings if the weather is bad. In either case you will take 14,000 Shillings home."

[Remind participants that these are just examples to help them understand the decision they need to make and that they should not guide their decisions based on them.]

"Remember that if Person 1 draws a green token, you cannot transfer any amount to her, since Person 1 would not have suffered any losses due to a bad harvest, even though she may still have to pay the cost of insurance if she purchased any."

Decisions Cards Person 2

[Use loss-sharing posters in the explanation.]

"We will use these cards to record the amount that you, as Person 2, wish to share with Person 1. [Show the cards and use it in the explanations.] These cards allow you to express how much of your endowment you wish to share with Person 1 to compensate her for the losses in the event of a bad harvest. You can share any amount from your endowment of 16,000 Shillings, from 0 to 16,000."

"For both the case of good and bad weather, the cards show the insurance that Person 1 has bought and the amount she has lost. [Point at the card while you explain this.] As Person 2, you will need to decide how much, if any, of your endowment you want to share with Person 1 when she draws a red token for every possible level of insurance coverage Person 1 could have chosen, both in the event of good and bad weather."

"In other words, you will need to decide, both in the case of good and bad weather, how much you want to share if she buys no insurance, if she buys one unit of insurance, if she buys two units, if she buys three and if she buys the maximum units of insurance, which are four units." [Indicate the spaces where the amounts they wish to share in every case should be filled.]

"Remember that only the sharing decision you take for the insurance decision actually made by Person 1 will have actual consequences. However, you are asked to decide about all possible decision of Person 1 because we don't know yet what Person 1 would choose."

"For example, if Person 1 buys 2 units of insurance, we will look at how much you decided to share in this case and deduct it from your endowment." [Use the posters to illustrate this point.]

Questions III

"Please raise your hand if you have any questions." [The experimenter administrator answers participants' questions in front of everybody as clearly and accurately as possible. If necessary, clarify the instructions. Refrain from giving any answers that may influence their decisions.]

Control Questions

"We will now ask some questions to see whether you understood the instructions and inform you about the decision we ask you to make."

[Ask participants to turn.]

[The experimenter assistants call each participant one by one. They say the following:

"I am going to ask you some questions to see if you understood the instructions. In this round you are Person 1, you are at risk of losing 10,000 Shillings due to a bad harvest and you can buy insurance to protect yourself against this event when the weather is bad, that is, the insurance pays out when you make losses and the weather is bad."

"You are paired with someone else in this room who is Person 2 who may help you with your losses."

"You can buy no insurance, 1 unit, 2 units, 3 units or 4 units of insurance. Each option changes how much you take home when the weather is good or bad, and in case of good or bad harvest."

Finally, the experimenters ask the following question making reference to the decision cards that they carry with them.]

1. As Person 1, if you chose to buy one unit of insurance and you draw a red token with good weather, how much would you home? (4,500) How much would you take home if Person 2 decides to help you with 2,000 Shillings? (6,500)

[Record on the control question card whether they answered the question correctly. If the participant gave a wrong answer for at least one of the questions, ask her what was not clear. Answer all the remaining questions participants as clearly and accurately as possible. If necessary, clarify the instructions; but not more than once.]

[At the bottom of the page the experimenter should answer the following question: "Do you think the participant understood the instructions well?" Y=Yes/N=No]

Decision Card Person 1

[Before the participant goes back to her seat. The experimenter explains how the decision card works by saying the following:]

"As Person 1 you will take the insurance decision using the same card as before, with the only difference that this card has a column that reminds you of the amount you can lose and another reminding you that Person 2 can share some amount with you when you make loses [Show columns in the card]. You need to mark your preferred option on the decision card. [Show the decision card, and indicate where they can find the different options. Explain where they have to indicate their insurance decision.]"

[Before the participant goes back to her seat give her the decision card with the ID are already filled in. Ask the participant not to write anything on it until we tell her. Remind them that if they need help or make a mistake they can ask us for help.]

Decisions

"If you have no further questions, we will now begin. Please indicate clearly your choice.

Remember, there are no wrong choices."

"We emphasise that it is important that you make your choice in private. Do not show your decision card to the other participants and place it in the wooden structure in front of you. If you need assistance, please raise your hand so that one of us can come to you to assist you. Once you have made your choice, please fold the decision sheet and raise your hand so that we can come and collect your decision card."

"Take your time to make your decisions since they can affect how much money you take home."

[The participants remain seated. Any questions at this point should be addressed individually. After the participants have made their choice, they fold their decision card, and we collect them. Verify whether participants filled in the decision cards correctly. When all participants have made their decision, Round 1 is completed.]

Round 2

Instructions

"After you have taken your decisions in the first round, you will take your decisions in the second round. A different decision than before."

Control Questions

"We will now ask some questions to see whether you understood the instructions and inform you about the decision we ask you to make."

[Ask participants to turn.]

[The experimenter assistants call each participant one by one. They say the following:

"I am going to ask you some questions to see if you understood the instructions. In this round you are Person 2, you are not at risk of losing your endowment. You are paired with someone in this room, Person 1, who is at risk of losing 10,000 Shillings due to a bad harvest and can buy insurance against this event when the weather is bad. The insurance pays out when the weather is bad, both when Person 1 makes losses and when she doesn't."

"As Person 2, you have the chance of compensating Person 1 for her losses for every possible decision she can take. In other words, you will need to decide, both in the case of good and bad weather, how much you want to share if she buys no insurance, if she buys one unit of insurance, if she buys two units, if she buys three and if she buys the maximum units of insurance, which are four units."

"However, only one of your sharing decisions will have actual consequences. We will only take from you the money you decide to share for the actual insurance decision taken by Person 1." [Use an example to make this point employing the decision cards.]

Finally, the experimenters ask the following question making reference to the decision cards that they carry with them.]

1. As Person 2, if Person 1 buy 2 units of insurance and she draws a red token with bad weather, how mush would she take home? (7,500) and you how much would she take home if you decide to share 4,000 Shillings with her? (11,500) And how much would you take home? (12,000)

[Record on the control question card whether the participant answered the question correctly. If the participant gave a wrong answer, ask him/her what was not clear. Answer all the remaining questions participants as clearly and accurately as possible. If necessary, clarify the instructions; but not more than once.]

[At the bottom of the page the experimenter should answer the following question: "Do you think the participant understood the instructions well?" Y=Yes/N=No]

Decisions Cards Person 2

[Before the participant goes back to her seat. The experimenter explains how the decision card works by saying the following:]

"We will use these cards to record the amount that you, as Person 2, wish to share with Person 1. [Show the cards and use it in the explanations.] These cards allow you to express how much of your endowment you wish to share with Person 1 to compensate her for the losses in the event of a bad harvest. You can share any amount from your endowment of 16,000 Shillings, from 0 to 16,000."

"For both the case of good and bad weather, the cards show the insurance that Person 1 has bought and the amount she has lost. [Point at the card while you explain this.] As Person 2, you will need to decide how much, if any, of your endowment you want to share with Person 1 when she draws a red token for every possible level of insurance coverage Person 1 could have chosen, both in the event of good and bad weather."

"In other words, you will need to decide, both in the case of good and bad weather, how much you want to share if she buys no insurance, if she buys one unit of insurance, if she buys two units, if she buys three and if she buys the maximum units of insurance, which are four units." [Indicate the spaces where the amounts they wish to share in every case should be filled.]

"Remember that only the sharing decision you take for the insurance decision actually made by Person 1 will have actual consequences. However, you are asked to decide about all possible decision of Person 1 because we don't know yet what Person 1 would choose."

"For example, if Person 1 buys 2 units of insurance, we will look at how much you decided to share in this case and deduct it from your endowment." [Use the posters to illustrate this point.]

[Ask the participant to think about their decision. Tell them that if they change their minds or make a mistake they can ask us for help.]

Decisions

"If you have no further questions, we will now begin. Please indicate clearly your choice. Remember, there are no wrong choices."

"We emphasise that it is important that you make your choice in private. Do not show your decision card to the other participants and place it in the wooden structure in front of you. If you need assistance, please raise your hand so that one of us can come to you to assist you. Once you have made your choice, please fold the decision sheet and raise your hand so that we can come and collect your decision card."

"Take your time to make your decisions since they can affect how much money you take home."

[The participants remain seated. After the participants have made their choices, they fold their decision card, and we collect them. Verify whether participants filled in the decision cards correctly. When all participants have made their decision, Part 2 is completed.]

C.2.4. Part 3 (Treatment 5)

Instructions

[Remove posters for part 2.]

[Participants remain seated.] "Thank you, you have now all completed the second part of the task. We will now explain the final part."

"During this part you will be again paired with two other people in this room. Different people than before. You don't know who they are, but they are also here now, participating in this workshop."

"Same as before, in each pair there is again a Person 1 and a Person 2. Both persons have an endowment of 16,000 Shillings each. Person 1 will be again at risk of losing 10,000 Shillings due to a bad harvest, but this time she will not have access to insurance. Person 2, will not be at risk of losing her harvest and will again be given the opportunity of compensating Person 1 for her losses up to whatever amount she sees fit."

"You are paired with two different people in this part. In one pair you are Person 1 and in another pair you are Person 2."

"We will determine at random later on for whether you are paid for your decision as Person 1 or as Person 2."

[Role play to explain pairing. Person 1 remains the same as in the previous role-playing, whereas

Person 2 changes from the first. With the volunteers present we explain:

"Both Person 1 and Person 2 have an endowment of 16,000 Shillings each. Person 1 is again at risk of losing 10,000 Shillings due to a bad harvest but this time will not have access to insurance. Person 2 is not at risk of losing her harvest and will again be given the opportunity of compensating Person 1 for her losses up to whatever amount she sees fit."

Subsequently, the participant role-playing as Person 1 becomes Person 2 and another participant comes forward to fulfil the role of Person 1.]

"Because Person 1 cannot take any decision, in this part you will all make a choice as Person 2 only. Person 2 needs to decide how much, if any, of Person 1's losses she wishes to compensate in a situation where Person 1 cannot buy any insurance to protect herself against those losses."

Choices

[Stick the loss-sharing card for Part 3 to the wall.]

"If Person 1 draws a green token she will keep her whole endowment, and you as Person 2 cannot transfer any amount to Person 1, since she would not have suffered any losses. If, on the other hand, Person 1 draws a red token, she will get a loss of 10,000 Shillings. In this case, you can then choose to share any amount of your endowment of 16,000 Shillings to compensate Person 1 for her losses, from 0 to 16,000 Shillings."

Person 2		*ID: ____ Part: 3 Session: ____*
● - 10000		
No Insurance	***Losses Person 1***	***Sharing***
	10,000	_____ Shillings

[Ask two volunteers to come forward and role-play with them using the examples below.]

"For instance, if you decide to share 4,000 Shillings with Person 1 because she has drawn a red token and made losses, she will end up with earnings of 10,000 Shillings and you will take 12,000 Shillings home."

[Tell participants that this is just an example to help them understand the decision they need to make and that they should not guide their decisions based on them.]

"If you decide not to share anything with Person 1, she will end up with earnings of 6,000 Shillings and you will take the full endowment of 16,000 Shillings home."

"If you decide to share 2,000 with Person 1, she will end up with earnings of 8,000 Shillings and you will take the 14,000 Shillings home."

[Remind participants that these are just examples to help them understand the decision they need to make and that they should not guide their decisions based on them.]

Decision Card

[Use loss-sharing posters in the explanation.]

"Everyone will take her decision as Person 2 in this part."

"We will use this card to record the amount that you, as Person 2, wish to share with Person 1." [Show card in the poster and use it in the explanations.]

"This card allows you to express how much of your endowment you wish to share with Person 1 to compensate for her losses in case of a bad harvest. You can share any amount from your endowment of 16,000 Shillings, from 0 to 16,000 Shillings."

"The card shows the 10,000 Shillings Person 1 has lost. As Person 2, you will need to decide how much, if any, of your endowment you wish to share with Person 1, who doesn't have insurance, to compensate for her losses when she draws a red token."

Questions

"Please raise your hand if you have any questions." [The experimenter administrator answers participants' questions in front of everybody as clearly and accurately as possible. If necessary, clarify the instructions. Refrain from giving any answers that may influence their decisions.]

Control Questions

[The experimenter assistants call each participant one by one. They say the following:

"I am going to ask you some questions to see if you understood the instructions. Remember that in this round you are Person 2, you are not at risk of losing your endowment. You are paired with someone else in this room who is Person 1 and is at risk of losing 10,000 Shillings due to a bad harvest and cannot buy insurance to protect herself against this event."

"As Person 2, you can share any amount with Person 1 to compensate her for the losses, this is the decision you need to make."

Finally, the experimenters ask the following question making reference to the decision cards that they carry with them.]

1. If Person 1 draws a red token how much would she lose? (10,000)
2. As Person 2, if you help Person 1 with 2,000 how much would she take home? (8,000) How much would you take home? (14,000)

[Record on the control question card whether the participant answered the question correctly. If the participant gave a wrong answer, ask him/her what was not clear. Answer all the remaining questions participants as clearly and accurately as possible. If necessary, clarify the instructions; but not more than once.]

[At the bottom of the page the experimenter should answer the following question:

"Do you think the participant understood the instructions well?" Y=Yes/N=No]

Decision Card

[Before the participant goes back to her seat. The experimenter explains how the decision card works by saying the following:]

"We will use this card to record the amount that you, as Person 2, wish to share with Person 1." [Show card in the poster and use it in the explanations.]

"This card allows you to express how much of your endowment you wish to share with Person 1 to compensate for her losses in case of a bad harvest. You can share any amount from your endowment of 16,000 Shillings, from 0 to 16,000 Shillings."

"The card shows the 10,000 Shillings Person 1 has lost. As Person 2, you will need to decide how much, if any, of your endowment you wish to share with Person 1, who doesn't have insurance, to compensate for her losses when she draws a red token."

[Ask the participant to think about their decision. Tell them that if they change their minds or make a mistake they can ask us for help.]

Decisions

"If you have no further questions, we will now begin. Please indicate the insurance option you choose. Remember, there are no wrong choices, so you should take up exactly as much insurance as you prefer."

"We emphasise that it is important that you make your choice in private. Do not show your decision card to the other participants and place it in the wooden structure in front of you. If you need assistance, please raise your hand so that one of us can come to you to assist you. Once you have made your choice, please fold the decision sheet and raise your hand so that we can come and collect your decision card."

"Take your time to make your decisions since they can affect how much money you take home."

[The participants remain seated. After the participants have made their choices, they fold their decision card, and we collect them. Verify whether participants filled in the decision cards correctly. The central administrator enters the sharing decisions in the Excel data sheet. When all participants have made their decision, the session ends and we proceed to the resolution.]

C.3. Resolution

"Thank you, you have now completed all parts of the task. Your earnings from your decisions will now be determined."

"In order to do so, we first need to select which of the three parts of the task will be used to determine your earnings, part 1, part 2 or part 3. For this, we put three cards with numbers 1 to 3 on them in a bag, and pick out one card without looking. The number on the card that is picked out determines the decision which will be used to calculate your earnings. [Ask one volunteer to pick out a card.]"

[Whichever number is drawn say:] "In this part you played both as Person 1 and Person 2, so we need to decide which decision will determine your earnings. We will do as follows, we will put two cards with the numbers 1 and 2 on this bag. If number 1 is selected those with IDs 1 to 10 will be paid for their decision as Person 1 and IDs 11 to 20 for their decision as Person 2. In contrast, if number 2 is drawn, those with IDs 11 to 20 will be paid for their decision as Person 1 and IDs 1 to 10 for their decision as Person 2. [Ask one volunteer to pick out a card.]"

[For everyone] "Before we proceed to determine the individual earnings, we need to know what the common weather conditions are, that is, the chances of getting a red or a green token. Remember that a green bag contains 3 green tokens for 1 red one, so if this bag is picked, there is a 1 in 4 chances that Person 1 makes a loss of 10,000 Shillings. If however the red bag, containing 3 red and 1 green tokens, is selected there is a 3 in 4 chances that Person 1 makes a loss of 10,000 Shillings."[Ask one volunteer to pick out the bag.]

"We now invite you to come forward, one by one, to determine your earnings."

[If type 1 pairs were selected, IDs 1 to 10 are called first in one by one to pick out a counter from the bag selected. We show them their decision card and explain them what their decision was in that pair as well as the decision of the person they were paired with if relevant, so that they understand how their earnings were calculated.]

[After IDs 1 to 10 have received their payment, IDs 11 to 20 are called in one by one. We explain them what their decision was in the selected pair as well as the decision of the person they were paired with if relevant, so that they understand how their earnings were calculated.]

[If type 2 pairs are selected, we follow the opposite order; with IDs 11 to 20 coming forward first to pick out the counter, followed by IDs 1 to 10.]

[After the session, put all decision cards in one big envelope, and write on it date, time and code of session. Close and seal the envelope.]

Table D1: Study Variables

Variable	Description
Insurance Units Purchased	Insurance units purchased by the Person 1 in the experiment
Amount Shared	Amount transferred by Person 2 to assist Person 1 with her losses in a treatment at a particular level of insurance coverage
Ratio amount shared to net losses	Amount shared expressed as a fraction of net losses
Index Insurance (T1)-Good W.	Whether partner (Person 1) had access to index insurance while facing losses under good weather conditions when the sharing decision was made by Person 2 [indicator variable; 1=Yes]
Index Insurance (T1)-Bad W.	Whether partner (Person 1) had access to index insurance while facing losses under bad weather conditions when the sharing decision was made by Person 2 [indicator variable; 1=Yes]
Indemnity Insurance (T3)	Whether partner (Person 1) had access to indemnity insurance while facing losses when the sharing decision was made by Person 2 [indicator variable; 1=Yes]
Access to Insurance	Whether partner (Person 1) had access to any form of insurance while facing losses when the sharing decision was made by Person 2 [indicator variable; 1=Yes]
Index Insurance/ Basis risk	Whether Person 1 was offered index rather than indemnity insurance in the treatment in which they made the insurance purchase decision; index insurance suffers from basis risk [indicator variable; 1=Yes]
Risk Sharing	Whether risk sharing by Person 2 was permitted in the treatment in which Person 1 made the insurance purchase decision [indicator variable; 1=Yes]
Gender	Whether the participant is male [indicator variable; 1=Yes]
Age	Participant's age
Married	Whether the participant was married [indicator variable; 1=Yes]
Household size	Number of members in the participant's household
Years of Education	Participant's years of formal education
Bagisu Tribe	Whether participant's belongs to the Bagisu tribe [indicator variable; 1=Yes]
Protestant	Whether the participant professes some form of Protestantism [indicator variable; 1=Yes]
Land Holdings	Number of acres owned by the participant's household
Wealth Index	First principal component in a PCA of the participant HH's assets $^{\psi}$
Risk Preferences	Participant's hypothetical willingness to invest (1 least risk averse to 6 most risk averse)
Knowledge of Insurance	Participant answered more than half of the answers correctly in a test about insurance [indicator variable; 1=Yes]
Experience with Shocks	Whether participant HH's suffered a serious income shock which led to a reduction in total and food consumption [indicator variable; 1=Yes]
Enumerator Team 2	Participant made decisions in a session led by second team of enumerators [indicator variable; 1=Yes]

Notes: $^{\psi}$ Our overall measure of wealth is calculated through principal components analysis (PCA) of a comprehensive list of household assets reported by the participants in the study. Details can be found in Pérez-Viana (2019), who employs the same methodology to construct the measure of wealth.

E. Descriptive Statistics & Orthogonality Test

E.1. Descriptive Statistics

Table E1: Summary Statistics and Balancing Tests

	Total (N=392)	Index (N=196)	Indem. (N=196)	t-stat	p-value
Gender (1=Male)	0.463	0.531	0.395	2.71	0.007
	(0.5)	(0.5)	(0.49)		
Age	38.57	39.08	38.06	0.752	0.452
	(13.42)	(13.59)	(13.26)		
Married	0.788	0.765	0.811	-1.112	0.267
	(0.409)	(0.425)	(0.395)		
Household Size	5.559	5.582	5.536	0.172	0.863
	(2.628)	(2.573)	(2.688)		
Years of Education	5.703	5.842	5.536	0.841	0.401
	(3.246)	(3.307)	(3.185)		
Bagisu Tribe	0.9693	0.9642	0.974	-0.585	0.559
	(0.172)	(0.186)	(0.158)		
Protestant	0.610	0.622	0.597	0.517	0.606
	(0.488)	(0.486)	(0.492)		
Land Holdings	1.262	1.274	1.251	0.199	0.842
	(1.156)	(1.186)	(1.129)		
Wealth Index	-0.110	-0.188	-0.032	-0.716	0.475
	(2.163)	(2.122)	(2.207)		
Risk Preferences	2.217	2.189	2.245	-0.38	0.704
	(1.461)	(1.443)	(1.482)		
Knowledge of Insurance	0.235	0.25	0.219	0.714	0.476
	(0.424)	(0.434)	(0.415)		
Experience with Shocks	0.367	0.357	0.378	-0.418	0.676
	(0.483)	(0.48)	(0.486)		

Notes: Mean reported, standard deviation in parentheses. Details of the variables can be found in Table D1 of online Appendix D.

E.2. Orthogonality Test

Table E2: Orthogonality Tests

Variable	(1)	(2)
Gender (1=Male)	0.140**	0.358**
	(0.055)	(0.140)
Age	0.001	0.004
	(0.002)	(0.005)
Married	-0.090	-0.232
	(0.066)	(0.167)
Household Size	0.008	0.021
	(0.011)	(0.027)
Years of Education	0.008	0.020
	(0.009)	(0.024)
Bagisu Tribe	-0.134	-0.355
	(0.148)	(0.384)
Protestant	0.0197	0.0504
	(0.053)	(0.133)
Land Holdings	0.012	0.031
	(0.029)	(0.074)
Wealth Index	-0.018	-0.047
	(0.016)	(0.041)
Participant's Risk Preferences	-0.000	-0.001
	(0.018)	(0.045)
Knowledge of Insurance	0.005	0.0128
	(0.066)	(0.166)
Experience with Shocks	-0.028	-0.072
	(0.053)	(0.134)
Constant	0.475**	-0.049
	(0.199)	(0.510)
N	390	390
$\mathbf{R}^2$	0.03	0.02
Prob. F-test/χ^2-test	0.39	0.38

Notes: Specification (1) is a linear regression and (2) is a probit regression. The dependent variable is selection into the index insurance protocol. Standard errors in parentheses, * $p < 0.1$, $^{**}p < 0.05$,*** $p < 0.01$. Probabilities of the F-test (1) and χ^2-test (2) of joint significance are reported in the last row of the table.

Further details of the variables are shown in Table D1 of online Appendix D.

F. Further Analysis

F.1. Full Analysis

F.1.1. What is the Effect of Risk Sharing on Insurance Demand?

Table E1: Effect of Risk Sharing on Insurance Demand

Sample	**Index Insurance**		**Indemnity Insurance**		**Pooled**	
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Risk Sharing	-0.454***	-0.454***	-0.036	-0.036	-0.036	-0.036
	(0.135)	(0.135)	(0.111)	(0.111)	(0.113)	(0.099)
Index Insurance					0.257	0.183
					(0.225)	(0.252)
Index Insurance x Risk Sharing					-0.418**	-0.418***
					(0.176)	(0.150)
Gender (1=Male)		0.152		0.219		0.353***
		(0.131)		(0.241)		(0.114)
Age		0.023***		-0.002		0.012***
		(0.005)		(0.006)		(0.004)
Years of Education		-0.011		-0.006		-0.005
		(0.028)		(0.038)		(0.014)
Wealth Index		0.000		0.008		0.042
		(0.046)		(0.061)		(0.034)
Risk Preferences		-0.029		-0.005		-0.040
		(0.047)		(0.058)		(0.035)
Knowledge of Insurance		0.023		0.410*		0.090
		(0.201)		(0.238)		(0.142)
Experience with Shocks		-0.177		-0.031		-0.102
		(0.143)		(0.183)		(0.107)
Enumerator Team 2		-0.280		0.245		-0.026
		(0.180)		(0.345)		(0.218)
Constant	2.046***	1.381***	1.789***	1.629***	1.789***	1.755***
	(0.152)	(0.377)	(0.154)	(0.382)	(0.159)	(0.410)
N	392	392	388	388	780	780
R^2	0.03	0.10	0.00	0.03	0.01	0.16
Clusters	10	10	10	10	20	20

Notes: OLS regression with insurance units purchased as dependent variable. Bootstrapped clustered standard errors at the session level in parentheses, $^{*}\ p < 0.1$, $^{**}p < 0.05$,$^{***}\ p < 0.01$.
Specification (6) includes village fixed effects.
Further details of the variables are shown in Table D1 of online Appendix D.

F.1.2. What is the Effect of Insurance on Informal Risk Sharing?

Table E2: Effect of Insurance on Informal Risk Sharing

Specification	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Variable	Amount Shared				Ratio amount shared to net losses			
Index Insurance (T1)-Good W.	253.5	252.1	112.1	38.91				
	(183.6)	(163.7)	(248.6)	(301.7)				
Index Insurance (T1)-Bad W.	-81.24	-82.68	-51.78	-125.0				
	(140.6)	(138.7)	(248.5)	(293.2)				
Indemnity Insurance (T3)	-321.1***	-249.5*						
	(114.5)	(126.0)						
Insurance Units Purchased		-17.58	-143.7***	-143.7***				
		(26.28)	(44.02)	(38.6)				
Index Insurance (T1)-Good W.			231.2***	231.2***				
x Insurance Units Purchased			(60.96)	(55.9)				
Index Insurance (T1)-Bad W.			145.8**	145.8**				
x Insurance Units Purchased			(63.46)	(58.61)				
Access to Insurance					-0.009	-0.005		
					(0.014)	(0.016)		
Basis risk					0.012	0.005	0.012	0.005
					(0.022)	(0.026)	(0.022)	(0.032)
Gender (1=Male)		444.1***		447.1***		0.0442***		0.0445***
		-151.3		-153.8		-0.015		-0.016
Age		1.551		1.34		0.0001		0.0001
		-6.185		-6.407		-0.0006		-0.0006
Wealth Index		-50.72*		-54.17**		-0.005*		-0.005*
		-26.99		-26.84		-0.003		-0.003
Years of Education		15.39		17.24		0.002		0.002
		-15.32		-15.38		-0.002		-0.002
Risk Preferences		5.827		-6.048		0.001		-0.0003
		-61.84		-62.19		-0.006		-0.006
Knowledge of Insurance		-71.65		-100.5		-0.009		-0.012
		-172.7		-181.1		-0.0175		-0.0182
Experience with Shocks		-189.7		-206.1*		-0.022*		-0.024*
		-122.0		-121.1		-0.013		-0.013
Enumerator Team 2		526.1*		495.8		0.0549*		0.053
		-269.6		-301.8		-0.029		-0.033
Constant	1668***	1193***	1634***	1202**	0.167***	0.131***	0.158***	0.128***
	(111.6)	(462.5)	(223)	(473.5)	(0.011)	(0.047)	(0.019)	(0.048)
Reference	No Insurance (*T5*)	No Ins. (*T5*)	Indem. Ins. (*T3*)	Indem. Ins. (*T3*)	No Ins. (*T5*)	No Ins. (*T5*)	Indem. Ins. (*T3*)	Indem. Ins. (*T3*)
Controls	No	Yes	No	Yes	No	Yes	No	Yes
N	3319	3319	2929	2929	3319	3319	2929	2929
R^2	0.01	0.10	0.02	0.11	0.001	0.08	0.001	0.08
Clusters	20	20	20	20	20	20	20	20

Notes: OLS regressions with amount shared (Specifications (1) to (4)) and ratio of the amount shared to net losses ((5) to (8)) as dependent.
Bootstrap clustered standard errors at the session level in parentheses, * $p < 0.1$, $^{**}p < 0.05$,*** $p < 0.01$.
Specifications (2), (4), (6) and (8) include village fixed effects.
Specifications (1), (2), (5) and (6) employ data from all sharing decisions (made in *T1*, *T3* and *T5*), while the remaing specifications used the sharing decions from the treatments where the partner had access to insurance (*T1* and *T3*).
Further details of the variables are shown in Table D1 of online Appendix D.

F.2. Ordered Probit

F.2.1. What is the Effect of Risk Sharing on Insurance Demand?

Table E3: Effect of Risk Sharing on Insurance Demand (ordered probit estimator)

Sample	**Index Insurance**		**Indemnity Insurance**		**Pooled**	
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Risk Sharing	-0.333***	-0.346***	-0.016	-0.018	-0.014	-0.008
	(0.095)	(0.101)	(0.082)	(0.085)	(0.084)	(0.084)
Index Insurance					0.209	0.179
					(0.173)	(0.213)
Index Insurance x Risk Sharing					-0.318**	-0.356***
					(0.131)	(0.123)
Gender (1=Male)		0.075		0.147		0.268**
		(0.100)		(0.207)		(0.110)
Age		0.019***		-0.001		0.011***
		(0.005)		(0.005)		(0.003)
Years of Education		-0.006		-0.009		-0.005
		(0.023)		(0.032)		(0.013)
Wealth Index		-0.006		0.007		0.032
		(0.036)		(0.050)		(0.030)
Risk Preferences		-0.025		0.002		-0.035
		(0.037)		(0.048)		(0.029)
Knowledge of Insurance		0.0361		0.320*		0.079
		(0.165)		(0.191)		(0.119)
Experience with Shocks		-0.182		-0.016		-0.101
		(0.120)		(0.141)		(0.090)
Enumerator Team 2		-0.179		0.162		-0.017
		(0.142)		(0.284)		(0.184)
N	392	392	388	388	780	780

Notes: Ordered probit regressions with insurance units purchased as dependent variable. Bootstrapped clustered standard errors at the session level in parentheses, * $p < 0.1$, $^{**}p < 0.05$,*** $p < 0.01$.
Specification (6) includes village fixed effects.
Further details of the variables are shown in Table D1 of online Appendix D.