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THE DEMAND FOR MICROINSURANCE: A LITERATURE REVIEW

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1. INTRODUCTION

Microinsurance - or the insurance for the poor - has been considered as "the next revolution" in addressing risks and vulnerability in low-income countries (Morduch 2006). In particular, huge investments have been made in the last decade by several development agencies (among which USAID and the Gates foundation) in this revolutionary tool that promised to break the circle of poverty and ofer a reliable protection to the poor.

Its name echoes the well-known micro-credit phenomenon, on purpose. Both concepts have in common a specific attention to low-income households in the developing world. They, moreover, try to solve a market imperfection which is identified as perpetuating poverty. However, microinsurance is an even more complex concept than micro-credit. First, it implies paying a regular premium in return for an uncertain payout. Second, it is mostly conceived as individual contracts where some enrollees benefit from a compensation while others do not. Finally, microinsurance is far from being homogeneous. It namely concerns a wide variety of risks and takes a lot of diferent forms.

The focus of this review is on low-income countries, where adverse shocks are frequent, and risk-pooling mechanisms and self-insurance strategies are imperfect. As poor individuals also display a relatively high level of risk aversion, the demand for microinsurance products is thus expected to be high. However, the evidence is disappointing: subscription to the widely subsidized insurance schemes is low, rarely above 30%. Renewal rates are also exceptionally modest. Indeed, stylized facts are eloquent: Randomized control trials (RCT) ofering index insurances (without subsidies) reach a take up rate of 20% in Ethiopia (Hill and Robles (2011)), 17% in Malawi (Giné and Yang (2009)), 16% in India e (Cole et al. (2011a), Mobarak and Rosenzweig (2012)), between 6 and 36% in Ethiopia (Norton et al. (2011)), 6% in India (Gaurav et al. (2011)). Those RCTs ofering health insurance also reach low rates of take up with, for instance, 25% in Senegal (Bonan et al. (2011)) or 19% in India (Dercon et al. (2011a)). So, why is demand for microinsurance so poor? Understanding this puzzle, is the purpose of this review.

The present paper addresses this puzzle first from a theoretical point of view and then reviews the empirical evidence on the factors influencing demand for insurance. Given the numerous amount of studies published on microinsurance in the past 10 years, and the diverging results obtained, we believe this review is not only necessary, but also timely. Yet, the literature reviewed is not exhaustive. It rather tries to identify those papers that bring an additional insight on the reflection we pursue. It includes quantitative as well as qualitative studies that focus on demand. Nevertheless, we do not rely much on studies investigating the hypothetical willingness-to-pay (WTP) since the methodology used to elicit hypothetical demand presents great challenges. In particular, these studies systematically produce overly optimistic estimates of the demand for insurance.

Various types of insurances are considered, among which two main categories may be distinguished: contracts insuring the subscriber against the risk of incurring medical expenses and insurance contracts against the loss of the harvest. Among these crop insurances, the insurances based on an index have recently received considerable attention. The fundamental diference with classical insurance lies in the nature of the event that triggers the payment of compensation. The index namely insures against the occurrence of an easily identified event that correlates with an expected decrease in the revenue of the farmers in the area. In weather index insurances, for instance, it is the level of rainfall that will trigger the payout rather than the observed damage.

Although the evidence is far from decisive, there are several lessons to be drawn from this review. Admittedly, understanding the concept of insurance is not an easy task for individuals but there exists a wide range of alternative explanations to why demand for conventional insurance schemes is so low. A lack of trust in the institution delivering the insurance, or in the specifics of the product may significantly decrease uptake. Similarly, the frequency of payouts, the quality of the product and liquidity constraints are pointed to as important factors afecting the demand.

The remainder of the paper is structured as follows: In the theoretical section, we first expose the value of insurance and its determinants, followed by a discussion on the difculty of understanding insurance products. Then, we discuss how the demand for insurance is afected by the availability of credit, risk-sharing groups and other substitutes for formal insurance. Finally, we relax the assumption of expected

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utility maximization and see how other models of decision making under uncertainty provide insights in demand. The empirical part of the review follows exactly the same structure. Next, we also discuss the determinants of renewal of insurance. We then conclude and give scope for further research.

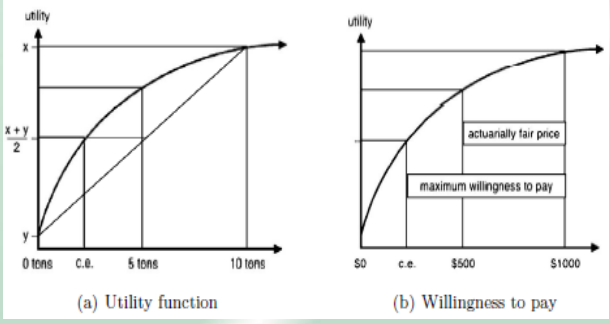
2. DEMAND FOR MICROINSURANCE

2.1. THE VALUE OF INSURANCE AND ITS DETERMINANTS

Before assessing which factors afect the demand for microinsurance, the scope of the present section is to understand how microinsurance afects individuals' wellbeing. This will then allow us to understand how diferent factors have an impact on demand.

To see why insurance can be valuable, one needs to take a closer look at the level of satisfaction or utility each individual derives from subscribing to the policy. Let us assume that people try to maximize their expected utility when deciding whether or not to purchase the insurance product. Then, if marginal utility is decreasing, that is, if greater consumption leads to more utility but that the increase in utility is smaller for each additional increase in consumption, the utility function of the agent will be concave. This specific feature of the utility function gives rise to risk aversion. Indeed, as can be seen in figure 1 (Patt et al. (2009)), a risk averse farmer will always prefer receiving a definite amount (the average of his harvests) over a risky outcome (the average of the two levels of utility that he will actually experience).

Figure 1: (a) The utility function of a risk-averse individual who obtains the same expected utility under the risky situation as when receiving a definite amount: his certainty equivalent (c.e.). (b) To remove the risk through an insurance he is willing to pay up to the diference between USD 1000 and this c.e., which is more than the actuarially fair price of the insurance.



(a) Utility function (b) Willingness to pay

Of course, the degree of risk aversion will vary from one individual to another, depending on the slope of his utility curve. Therefore, the guaranteed amount, or certainty equivalent, that each of them is ready to accept rather than taking a chance on a higher, but uncertain outcome will also depend on this slope. Patt et al. (2009), for instance, argue that poorer people are likely to accept a lower certainty equivalent since taking the risk of receiving no harvest at all would be much more detrimental to them.

The readiness to pay for receiving a definite amount allows an insurance market to emerge. Indeed, because of the aversion for uncertain outcomes, risk averse individuals will be willing to pay more than the actuarially fair price of the policy - the price which is equal to the expected amount the policy will payout - in order to receive a compensation in case the harvest fails. Figure 2, an example elaborated by Patt et al. (2009), depicts the case in which each ton of production is worth USD 100. Without any production shocks, the farmer may expect to harvest 10 tons of cereals. However, in case of a drought, the farmer might loose his entire production and earn USD 0. With a 50% probability of a drought, the average loss is USD 500. If an insurance pays USD 1000 in case of harvest failure, the figure shows that a risk averse individual will be willing to pay up to the diference between USD 1000 and his certainty equivalent for the insurance.

Thus, if price was the only determinant of the demand for an insurance product, setting the premium between the client's maximum willingness to pay and the actuarially fair price would sufce to sell it. Clearly, increasing the price will put it above certain individuals' maximum willingness to pay and thus reduce overall demand. In order to cover transaction costs, an insurer indeed needs to put the price substantially above the actuarially fair price in order to be profitable. In fact, Clarke (2011a) argues that the price of many unsubsidized index-based insurances is so high that many expected utility maximizers are better of not purchasing insurance. Moreover, also on the side of the insured there can be substantial transaction costs, which implicitly increase the price of the insurance, such as the difculty of purchasing or renewing the insurance, the opportunity cost of time and the complexity of filing a claim, and the ease with which premiums can be payed and payouts received.

Risk aversion is thus, under expected utility theory, the reason why insurance is valuable: a risk-neutral or risk-seeking individual should not purchase insurance, even when it is actuarially fair. As a consequence, in a classical model as outlined before, demand for insurance is higher for the more risk-averse individuals. This, however, is not necessarily the case when the insurance may fail to payout in case of a loss. This can happen if the insurer defaults (Doherty and Schlesinger 1990); if the client distrusts the insurer to payout when necessary

(Dercon et al. 2011a); or, in fact, in any insurance since the contracts never perfectly cover the client for every potential loss. The latter problem is especially important for index-based insurances (Clarke 2011b). Indeed, when insurance payouts are based on an index such as the weather, there is always the risk, called basis risk, that an individual sufers a loss even though the weather was good, and so no payout is given. In a situation where an insurance might fail to payout, the insurance becomes risky in itself and someone who purchases insurance can end up in a situation in which he payed the insurance premium, sufers a loss *and* does not receive a payout. This situation is worse than any attainable situation had he not purchased insurance and is thus particularly unattractive for very risk-averse people. For this reason, when risk-aversion increases demand for insurance might first increase but will eventually decrease (Clarke 2011b; Dercon et al. 2011a; Doherty and Schlesinger 1990). Therefore, we can not predict a general efect of risk-aversion on insurance demand.

The difculty in assessing whether to purchase an insurance or not is to accept disbursing a regular premium in return for an uncertain future payout. Therefore, the level of trust can be expected to have an influence on demand. In an environment where subjects are unfamiliar with formal insurance products, it may be difcult for potential clients to assess the benefits of such an investment. In this case, advice from trusted intermediaries may have a crucial influence on the take up decision. Moreover, because of the unpredictability of the return, some potential clients may fear to be cheated once the adverse event occurs. Therefore, in the absence of a good legal enforcement, it is in the interest of the insurance providers to build a strong reputation in order to restrict the uncertainty to the sole hazardous nature of the shock.

In an attempt to be more specific, let us distinguish, following Patt et al. (2009), three levels of trust: the trust in the product itself, the trust in the institution involved, and the degree of interpersonal trust of the individuals. The first component is closely related to the understanding of the product. In order to maintain trust in the product, a potential client must clearly see that by paying a premium, he will be able to make choices free from the fear of losing his investment in case of an adverse shock. At the same time, he must be aware that in the absence of a loss, he may pay more money into the insurance than he actually receives from the scheme. The second component concerns the trustworthiness of the institution delivering the product. When the insurance product is provided by the state or any external institution, it is crucial that potential clients are convinced that they will receive the promised payment when the adverse contingencies occur. If, in contrast, they question the trustworthiness of the insurance providers, households' participation in the insurance scheme may be negatively afected. Moreover, as several institutions may be involved in the provision of the insurance - the insurer, an MFI as intermediary, a health center - distrust in any of them can have this negative efect on demand. The last, interpersonal, dimension of trust may also strongly afect the demand for microinsurance. If an individual does not trust his circle of friends and neighbours, he may be, in general, less trusting in others. Therefore, he may be suspicious when requested to take part in a formal risk pooling organization. Patt et al. (2009) argue that trust in other people responds to various social factors and cultural backgrounds. Finally, according to those authors, a lack of trust in oneself reduces people's confidence in their own personal ability to make successful changes and may thus also discourage undertaking eforts to mitigate the efects of a shock, including insuring oneself against future hardship.

In addition to risk-aversion and trust, an individual's level of wealth also influences the purchase decision. Under expected utility theory, risk aversion may vary with wealth, which changes demand for insurance. Expected utility theory, however, does not ofer a clear prediction whether wealthier individuals should demand more or less insurance, even if we assume for simplicity that demand for insurance is increasing with risk-aversion. Indeed, in this case, utility functions may be conceived of as exhibiting decreasing absolute risk aversion (DARA). Then, when the individuals face the same risk, wealthier individuals are less risk averse and should therefore have a lower demand for insurance. If, however, we take into account that wealthier individuals typically face bigger risks, DARA utility does not ofer any prediction on purchase decisions. The equally reasonable assumptions of increasing, constant, and decreasing relative risk aversion predict that more wealthy individuals have more, the same, and less demand for insurance, respectively. From this perspective, the efect of wealth on demand is thus unclear. Nonetheless, when an increase in wealth relaxes liquidity constraints, its efect on the demand for microinsurance will mostly be positive, as will be discussed below.

Apart from wealth and risk-aversion, other personal characteristics of an individual such as his age, gender or level of education could also influence insurance demand. In particular, education, by alleviating the problems of understanding of insurance discussed below, could have a substantial impact on insurance demand. With respect to gender, women face special health risks related to pregnancy and childbearing, greater vulnerability to

diseases such as HIV/AIDS, and are more subject to domestic violence (Banthia et al. (2009)). The authors also note that their informal sector activities are often the only income opportunities for low-income women and also makes this segment more likely to fall victim to risks such as theft of assets and harassment by authorities. Moreover, Banthia et al. (2009) stress the fact that women in low-income countries, being the family's primary caregiver and resource manager, often have to manage urgent household health or income shocks. Because of these specificities, one could expect the insurance purchase decision to be diferent across gender. Yet, apart from knowing whether men or women are more amenable to purchasing a certain kind of insurance, it is also important to know how the decision to purchase insurance is made in a household. The interpretation of this gender coefcient will be radically diferent in the presence of unitarian households rather than bargaining ones. In the latter case, each household member has a diferent weight in the decision-making process over every single type of insurance. Nonetheless, very little is known about intrahousehold decision making relative to the uptake of insurance products.

Another factor which obviously afect the value of insurance, but which is easily overlooked, is the quality of the product. The ILO's client value assessment tool, called PACE (Matul et al. 2011), provides a framework to compare the quality of various insurance products. It is structured around four dimensions: the product itself, the accessibility and simplicity, the cost and the experience. Diferent criteria are to be considered when assessing the quality of the product, namely identifying whether the product covers appropriate risks from a client perspective, whether it ofers simple cover without many exclusions, and whether it provides limited waiting period and adequate service quality, especially for health insurance. The higher the quality, the easier people will tend to trust the insurance and invest in it. For health insurance, high quality health services, such as a clean infrastructure of the health center and reliable and swift services, are crucial in attracting sufcient demand for the insurance product.

The quality of insurance is limited by another factor: basis risk. As already mentioned, insurance contracts rarely manage to fully compensate for the risks they cover. Uncertainty about the terms of the contract or about the ability of the insurer to payout when needed, indeed give rise to the possibility that a loss is not indemnified when it occurs. This weakness is especially marked for index insurances. Indeed, although an insurance product based on an index has the advantage of reducing informational asymmetries and transaction costs, it is inefcient since it is not able to cover every loss and it may pay out when it is not needed. On top of the reduced value of an insurance with high basis risk, clients may additionally perceive the insurance as especially low quality and not trustworthy when, frequently, losses are incurred without any indemnity payments from the index insurance. In order to minimize basis risk, it is thus important to ensure a high correlation between the index and the losses sufered (Molini et al. 2008). In this respect, it is important to note that diferent indices can give very diferent results (Leblois and Quirion 2011). For instance, De Bock et al. (2010) and Carter et al. (2007) argue that, for a given area, the use of area yields rather than weather data for agricultural index insurances can significantly reduce basis risk.

The design of the contract has to be carefully thought about, since some of its specificities may deter potential clients from purchasing the insurance product. A subtle mix has to be found between simplicity and flexibility. On the one hand, a complex contract may be badly understood and therefore reduce the take up or renewal rate. On the other hand, a simple but rigid contract may fail to meet the needs of the subscribers.

The threshold level is one of the crucial aspects to take into account since the frequency of payouts depends on it. If it is too low, a lack of payouts may jeopardize farmers' trust in the new insurance product. However, more frequent payouts imply a higher cost of the premiums which, in turn, may reduce demand for the insurance product. Therefore, one may decide to incorporate two critical levels instead of designing a contract with a unique threshold (De Bock et al. 2010). The higher threshold level, which occurs more often, would then result in a partial compensation whereas full compensation would be triggered by a second, more acute, critical level.

Besides the standard insurance products, tailoring a contract to the client's specific needs is also possible through a combination of shorter contracts. Although more complicated, these types of contracts are more efcient. For instance, Hill and Robles (2011) adopt a fully flexible approach by creating weather securities that pay out a fixed amount if a specified event comes true. In their case, the events in question are monthly rainfall totals. These derivatives ofer farmers the ability to choose the type and number of securities to buy, depending on their crop portfolio and production practices in a given year. By so doing, they personify each contract but, at the same time, increase the complexity of the product. Nonetheless, as take up in their study was quite reasonable, its complexity does not seem to be a substantial barrier to adoption.

At the other extreme, Gelade (2011) argues that a simple lumpsum contract, which always pays out the same fixed amount when the index falls below a given threshold, might be in higher demand. While it has the advantage of being easy to understand, it is less accurate in covering losses than a standard contract where payouts are proportional to the loss. Nonetheless, for insurances which pay out infrequently and only cover big losses, it is not necessarily much worse than a standard contract where payouts are proportional to the loss. Moreover, when distrust in the insurer is high, the calculation of the insurance payout based on an index which is difcult to understand and to measure for the farmers, might be particularly unattractive. In this case, a fixed lumpsum payout can be easier to trust.

From the viewpoint of the insurer, it is crucial to design the contract in order to minimize the recurrent problems of adverse selection and moral hazard. The former occurs when people presenting more risky profiles than the average subscribe to the insurance and, so-doing, increase the premium and thereby discourage the "good profiles" to purchase the insurance. Moral hazard, instead, occurs when insurance protection creates incentives for individuals to cause the insured event; or a behavior that increases the likelihood that the event will occur (Churchill et al. 2003). Index-insurances have been explicitly designed to avoid these risks. For other insurances, to limit those risks insurers may ofer partial insurance contracts. In particular, they often impose a co-payment (also called "deductible") in the contract, that is a part of the claimed amount to be paid out of the pocket of the client. So doing, the client is less tempted to behave in a risky manner. Interestingly, deciding whether to impose a co-payment or to ofer a rebate when no loss occurs for a certain period, may have a significant impact on take up. While contracts with deductibles and rebates are quite similar (compare a 20 dollar contract with a 5 dollar deductible with a 25 dollar contract with a 5 dollar rebate), people show a strong preference for rebates over deductibles (Harms (2011)). It is thus important to be aware of such preferences when elaborating the contracts.

Finally, the timing and modalities of premium payments are important. When requested to be paid in one installment, the insurance policy may not be immediately afordable for large families because of liquidity constraints. Similarly, collecting premiums during the lean period before the next harvest may restrict the ability for some farmers to subscribe.

2.2. UNDERSTANDING OF INSURANCE

A huge challenge for microinsurance schemes is to be understandable for potential and actual clients. The core concept of insurance - spending money in return for an uncertain payout covering a hypothetical event - can indeed be quite challenging. The best example is perhaps the demand of many newly insured to receive their premium back in case no payout occurs, well illustrated by a client of a community health insurance in Uganda: "I think that if one spends a year without falling sick, then one should not pay the coming year" (Basaza et al. (2008)). Platteau (1997) gives an interesting explanation for this phenomenon. He namely argues that in traditional risk-sharing arrangements members of traditional rural communities "are guided by a principle of balanced reciprocity (they expect a return from any contribution or payment they make) rather than by a true logic of mutual insurance. More precisely, they do not conceive insurance as a game where there are winners and losers and where income is redistributed between lucky and unlucky individuals." If also microinsurance is evaluated from such a logic of balanced reciprocity, the demand to be repayed when there is no payout, instead of absurd, seems fair.

However, even if people evaluate insurance in a framework of balanced reciprocity, this does not make it impossible for an insurance scheme to be successful. Most importantly, an insurance needs to pay out often enough to ensure a feeling of some reciprocity, which does not necessarily need to be perfectly balanced. By mixing diferent risks, and thus covering many of them, an insurance could achieve such frequent payouts. In another way, a life insurance, by guaranteeing a payout at some point, guarantees reciprocity. However, other types of insurance, such as agricultural insurance, often rely more fundamentally on the insurance mechanism by spreading (big) risks among many clients and redistributing money from lucky to unlucky individuals through infrequent payouts. For these, one needs to accept the logic of insurance to purchase it over extended periods of time.

Beyond the basic concept of insurance, other specificities of the insurance such as the pooling of contributions, the presence of a deductible, or the exact perils covered by the contract can also raise mixed understanding among the beneficiaries. From this perspective, index-based insurance poses most problems. First, one needs to understand the basic principles of insurance. Second, one can easily be deceived by the absence of a payout in case of a loss because of basis risk. Indeed, to fully understand basis risk one typically needs a grasp of concepts

such as average and have an idea of the amount of correlation between the index and individual outcomes, which is not evident. Finally, also the index itself when, for instance, expressed in millimeters or computed based on satellite imagery (Patankar (2011)) can pose serious problems.

Thus, the logic of insurance does not seem easy to internalize! Distinct levels of understanding are needed before observing a change in behaviour resulting in the actual purchase of the insurance policy. The theory of financial education behaviour change (Tower and McGuinness 2011) sheds light on the diferent phases setting the stage for a behaviour change over the long term. According to this framework, individuals first need to be aware of the risk management tools. Then, they have to acquire a better knowledge of the insurance terms and product. This, in turn, will enable them to increase their skills to better manage the risks faced by their household. Building on this, their attitude towards insurance will change, regarding it as an important and beneficial tool. The theory postulates that only then a change in behaviour can occur increasing the take up rate. There seem thus to be various aspects on which to focus in order to improve the understanding of the concept in the short run.

A first possibility to mitigate these problems of understanding is to implement the insurance along with a specific insurance literacy training on the product. Another is to exploit existing informational networks and use the influence from peers to increase demand for insurance (Cai et al. 2011). Indeed, peers can spread information about insurance to others. Especially in the context of (costly) financial literacy training this is a potentially valuable way to also reach untrained individuals. Moreover, when someone purchases insurance, others could imitate him. As insurance contracts are new products whose value is likely to be uncertain for most people, the signaling by a few people that they value the insurance by purchasing it, could indeed have a substantial influence on wavering participants.

To summarize, insurance is a new concept which can be difcult to understand. As a consequence, it can be considered as an innovation and the literature on the adoption of innovation (Rogers 1995) can provide useful insights. In particular, it shows that the early adopters are typically the more educated, wealthier, and less risk-averse individuals. Additionally, those who are more accustomed to similar technologies - in this case, perhaps, members of informal risk-sharing agreements - are also more likely to be early adopters. The adoption of insurance is thus not only influenced by factors directly related to the management of risk, and it is important to take this perspective into account when evaluating the demand for insurance.

2.3. EFECTIVENESS OF INSURANCE SUBSTITUTES

Microinsurance is not the only option to mitigate and cope with risks. Other tools such as credit, precautionary savings, informal risk-sharing agreements, and self-insurance strategies also ofer (partial) protection to risks. By providing a substitute for insurance, the availability of these tools can reduce the demand for microinsurance.

The aim of the present section is therefore to investigate how these alter native strategies perform in insuring poor people against adverse shocks. In particular, it will point at the benefits and limitations of these tools as risk-coping devices. Moreover, as providing a substitute for insurance is not the only way in which they afect demand, this section will also highlight the diferent interactions between these risk-coping tools and the demand for insurance,

2.3.1. CREDIT AND SAVINGS

Access to credit can afect insurance demand in several ways. First, imperfect credit markets may prevent those who face liquidity constraints from taking up insurance. When credit markets are perfect, a temporary shortage of liquidity should not impede the take up of insurance. Indeed, if someone is willing to purchase the insurance product although he can not directly aford it, having access to credit would give him the opportunity to buy it, nonetheless. On the contrary, when credit is not available, the efective demand for insurance may be reduced in case of liquidity constraints.

In addition, credit fulfills a role of consumption smoothing and thus allows to cope partially with the consequences of an adverse shock. Nonetheless, credit is a highly imperfect insurance instrument for several reasons. First, although credit allows to spread the efects of a shock over time, a big shock will still leave one worse of than in the case the shock had not occurred. As a risk-averse individual prefers to perfectly smooth consumption, both over time *and* over states of nature, this is suboptimal. Second, the likelihood to be granted a loan for insurance purposes could actually be lower than normal, precisely because it is requested when the individual is most vulnerable and thus least likely to be able to repay. Finally, the strong consequences in case of default increase the risk faced by those resourceless individuals.

A more hybrid transaction, halfway between credit

and insurance, has been identified by Platteau and Abraham (1987) as "quasicredit". Incidentally, by letting repayment depend on the situation of both borrower and lender - transactions are personalized with the possibility to renegotiate reimbursement following shocks and loans are often made without interests - quasicredit sufers less from the aforementioned limitations. It is even debatable whether it is best described as credit or as risk-sharing agreement (Platteau and Abraham 1987; Udry 1990). In any case, there is evidence that also access to others forms of credit reduces vulnerability (Morduch 1998) and credit could thus potentially crowd out demand for insurance.

Savings, in cash or in the form of marketable assets, allow to cope with the consequences of risk in a way very similar to credit. As a (self)insurance device, savings also face the limitation that shocks are spread over time rather than over states of nature. In addition, the size of the shock which savings can help to overcome is bounded by the amount of the available savings. This is a major limitation, especially when several shocks occur in a short period of time. Another drawback of precautionary savings is that it has a cost, namely the potentially forgone investments.

Besides the potential of credit and savings to substitute for insurance in coping with risks, there may also exist complementarities, for example by interlinking credit and insurance. Indeed, the possibility of default on a loan creates risk for both the bank, who might lose part of the money, and the customer, who might lose his collateral. In this case, ofering the credit together with an insurance has several advantages (Carter et al. (2011)): the bank, facing less defaults, can charge a lower interest rate and the customer, facing less risk and a lower interest rate, has two reasons to demand more credit. Moreover, as the credit is linked to insurance, a higher demand for credit will automatically increase insurance take up. However, this may be dangerous if clients are not aware of what they actually buy and are, somehow, forced to take the insurance along with the loan. Indeed, this would go against all eforts to make the product understandable. Nonetheless, when a farmer faces a profitable but risky investment opportunity - such as the purchase of high-yielding seeds - an interlinked credit and insurance contract could be the only tool to make the investment attractive, and would thus be especially valuable (Carter et al. (2011)).

As for credit, also between savings and insurances there can be complementarities. Indeed, when an insurance comes with much basis risk - as is the case for many index insurances - its value decreases significantly. In this situation, savings are especially useful to cope with the outcomes in which a shock occurs but the insurance fails to payout. For this reason, savings limit the negative efects of insurance and improved access to savings can efectively increase de- mand for insurance with much basis risk (Clarke et al. 2012).

2.3.2. INFORMAL RISK-SHARING NETWORKS

Besides those individual risk-coping strategies, people can also engage in informal insurance mechanisms in which they mutually provide help to each other in times of need. Such informal arrangements allow to cope with unexpected health or schooling expenses, necessary disbursements for funerals or other important ceremonies, among other things. These arrangements can take the form of actual risk-sharing groups, such as funeral societies, or of flexible transfers between family and friends (Fafchamps and Lund (2003)). When efcient, such informal risk-pooling agreements can crowd out insurance (Arnott and Stiglitz 1991). As compared to microinsurance, these agreements, indeed, present informational advantages since members can monitor each other more efciently, but they have the drawback to represent only a limited pool of risks. This not only weakens their ability to deal with large covariate shocks, but also threatens their stability if multiple idiosyncratic shocks occur in a short period of time.

When some members of an explicit risk-sharing group purchase insurance, this can also have an efect on the dynamics in the group, which in turn can afect demand. Indeed, an insured individual is better protected against shocks and could be able to help more often, and could thus be more interesting for the group. In this sense insurance participation could be encouraged by group members. On the other hand, if people start leaving the group because they substitute it with microinsurance, this reduces the risk pool of the risk-sharing group and makes it less efective in coping with risk (Fafchamps 1992). For this reason, insurance participation might be discouraged by group members.

Additionally, even when one is willing to substitute such a risk-sharing agreement for microinsurance, membership of a risk-sharing group could delay the adoption of insurance when the group can not be left immediately. When one, for instance, has received or given more than the others to a funeral society, it might not be permitted or desirable to leave right away. Finally, risk-sharing groups can also be an especially efcient way of spreading information about insurance, thereby promoting its uptake.
Informal risk-sharing agreements can thus influence

demand for insurance in diferent ways, many of which rely on the idea that insurance and informal risk-sharing are substitutes. There can, however, also be complementarities in much the same way as savings and insurance can be complements. Indeed, when an insurance comes with much basis risk and a risk-sharing agreements succeeds in providing coverage when the insurance fails to pay out, improved risk-sharing attenuates the negative efect of the basis risk and can thereby increase demand for insurance (Mobarak and Rosenzweig 2012; Clarke 2011a).

One way to exploit such complementarities is proposed by Clarke and Dercon (2009) and Clarke (2011a). Instead of ofering insurance to individuals, they propose to ofer insurance to groups, in particular to pre-existing risk-sharing groups. These groups have many advantages over formal insurance, such as lower transaction costs and less asymmetric information. However, their stability is also continuously threatened by a big covariate shock, or multiple idiosyncratic ones. By for instance providing an index-based insurance to a pre-existing risk-pooling group or by re-insuring those informal groups when multiple adverse shocks occur over a short period, an insurance can significantly strengthen such groups. Conversely, the group has the necessary information to spread the benefits of the insurance payouts to the members who are most in need, and so doing increase the value of the insurance. In this way, informal risk-sharing groups and microinsurance, instead of competing, could strengthen each other.

2.3.3. OTHER SUBSTITUTES FOR INSURANCE

In order to reduce the risk they face, and, for instance, protect themselves against a harvest failure, individuals may prefer to opt for a low return, low risk production strategy instead of a a high return, high risk one. When comparing such self-insurance strategies to formal insurance, it is important to realize that, as argued by Carter et al. (2011), these strategies are "neither actuarially fair, nor free of basis risk". Indeed, the reduction in average productivity makes self-insurance strategies costly while their failure to remove all risk amounts to the presence of basis risk. Thus, when insurance allows to relax certain self-insurance strategies, the question is not whether the insurance is too costly or carries too much basis risk, the question is whether it is more efcient in dealing with risk than the self-insurance strategies it replaces (Carter et al. (2011)). Finally, depending on the context, several other risk-coping instruments are available. Family members informally share risk through flexible transfers (Fafchamps and Lund (2003)). But even when family members have emigrated, remittances can be an important source of relief in times of need. Such transfers have been proved to increase after disasters. But their impact on the decision to purchase the insurance is ambiguous. On the one hand, remittances provide self-insurance, and thereby, substitute for formal insurance. On the other hand, remittances increase income, which relaxes the liquidity constraint of poor households and should, holding other things equal, increase the use of insurance for low-income individuals and decrease it for high-income individuals (Crayen et al. (2010)). Governments can also ofer formal social security or programs to cover major shocks but these are largely absent in many low income countries. This is due to problems of enforcement, moral hazard issues and the presence of perverse incentives.

To sum up, microinsurance is developed in an environment where people have access to a variety of tools to cope with risk. When developing an insurance it is thus critical to understand which risks are least covered by existing arrangements as insurance is likely to be most valuable, and in highest demand, when it complements rather than substitutes for existing arrangements. Generally speaking, the diferent existing risk-coping strategies are least efective for large shocks, and even more so when covariant risks are at stake. These risks thus form the comparative advantage of microinsurance (Clarke and Dercon 2009). For smaller, idiosyncratic risks, formal insurances are not necessarily the best instrument since their efectiveness may be hampered by informational problems and high transaction costs. Nonetheless, as even those specific risks are only incompletely covered by existing methods, microinsurance could potentially ofer some additional protection even for those risks.

2.4. A DEPARTURE FROM CONVENTIONAL RATIONALITY

The arguments given above all explicitly or implicitly rely on the assumption that people are risk-averse and maximize their expected utility. Yet, there are many ways in which people appear to systematically violate the rules prescribed by expected utility theory. We next describe some of the alternative models of choice under uncertainty which can bring additional insights in the demand for insurance. Many of these behaviourial models, and the way in which they can afect demand for insurance, are described by Dalal et al. (2010).

First, many people appear to be ambiguity averse, that is, dislike being uncertain about the likelihood with which events will occur (Ellsberg (1961)).[2] In

2 Ambiguity aversion is still best explained by the original

particular, when a certain choice leads to uncertainty about the probabilities with which events will realize, they seem to be pessimistic and evaluate this choice assuming that the worst conceivable probability distribution this choice can lead to is the true one. Bryan (2010) argues that ambiguity aversion might limit take up of insurance. While people know what to expect when *not* buying insurance, the choice to purchase insurance comes with plenty of ambiguity, for example about the exact trustworthiness of the insurer or the exact coverage of the contract. An ambiguity averse individual would then evaluate the insurance contract by assuming the least conceivable trustworthiness and coverage, and conclude that insurance is not very valuable. In addition to giving an extra reason why demand for insurance is low, ambiguity aversion also gives a more rigorous explanation as to why the simplicity of the contract and a good understanding of the insurance are important: they reduce ambiguity about the benefits of insurance, and, by so doing, limit the pessimism with which ambiguity averse individuals evaluate the insurance.

Second, every potential client has an intrinsic discount rate, that is a degree of preference for present consumption. Paying a premium today and only receiving a payout in the future thus implies an opportunity cost of not having used the money during the period in between. Thus, a risk-neutral agent with a positive discount rate has no incentive to take up an actuarially fair insurance. When people exhibit hyperbolic discounting, or time-inconsistent preferences, this efect is even stronger. On top of preferring consumption sooner rather than later, hyperbolic discounting implies a preference to consume today, simply because it is today. That is, one might systematically prefer to receive 2 dollars in a week and one day instead of 1 dollar in a week but also prefer to receive 1 dollar today over 2 dollars tomorrow. Hyperbolic discounting can lead to a low demand for insurance because the premium needs to be paid today, but the potential benefits are experienced only in the future. When present consumption is valued highly, paying the subscription appears as particularly unattractive. It could thus be seen as a lack of self-control. Indeed, even when an individual with time-inconsistent preferences is willing to purchase insurance - and would commit, if possible, to do so in the future - he might well decide not to do so at the moment the payment needs to be made.

Kahneman and Tversky (1979) argue that people exhibit loss-aversion, that is, they experience more disutility for a loss, than they experience utility for a gain of the same amount. Thus, unlike in expected utility theory, the framing of a change in wealth matters: feeling that a loss of a certain amount has been avoided gives more utility than simply gaining the same amount.

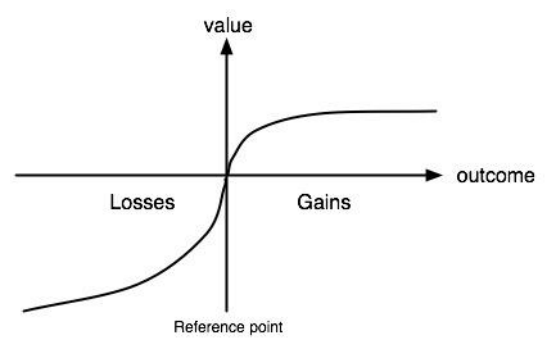
Such loss-aversion can influence insurance behaviour in several ways. First, marketing insurance as preventing a loss ("don't lose your property, buy insurance to be covered in case of emergencies"), rather than allowing a gain ("increase your peace of mind, buy insurance to be covered in case of emergencies"), could increase people's perception of the value of insurance (Ganzach and Karsahi 1995; Dalal et al. 2010). Second, Stein (2011) observes that individuals who obtain an insurance payout are more likely to renew their contract. One explanation is that, expecting balanced reciprocity (Platteau 1997), people do not renew when the insurer has failed to reciprocate. Stein (2011), however, argues that this pattern of renewal can be ascribed to loss-aversion: without payout, the payment of the premium is seen as a loss, while with a payout, the premium payment is seen as reducing the payout, and thus reducing a gain. As the loss is felt more strongly than the reduced gain, a payout thus makes the payment of the premium less painful and increases the probability of renewing the contract. Finally, the preference of rebates over deductibles mentioned earlier (Harms (2011)) can also be explained by loss-aversion: having to pay a deductible is perceived as a loss and gives a lot of disutility, while missing out on a rebate is felt like missing a gain and causes less disutility (Johnson et al. (1993)).

Loss aversion is, in fact, only one part of a more elaborate theory of decision making under uncertainty, known as prospect theory (Kahneman and Tversky (1979); Tversky and Kahneman (1992)). On top of the assumption of loss aversion, prospect theory is based on two additional assumptions. First, that the utility function for losses is convex, implying risk-seeking, while the one for gains is concave (see Figure 2.). Second, the probability distribution with which expected utility is evaluated is not the true one but is weighted such that the worst (low probability) outcomes are overweighted and other outcomes are underweighted. Together, these assumptions imply that in the domain of losses - which is the relevant

experiment of Ellsberg (1961): An individual faces two urns. The first contains 10 balls, 5 red and 5 blue; the second also contains 10 red or blue balls, but in unknown proportions. The individual can choose a color and an urn to draw a ball from, and wins if he draws the chosen color. An individual following subjective expected utility theory should believe that in the second urn, either for red or for blue, he has at least 50 percent probability of drawing this color. Nonetheless, most individuals strictly prefer drawing from the first urn because the odds are not ambiguous; they are thus ambiguity averse.

domain in the context of insurance - individuals are riskaverse for the worst outcomes and risk-seeking otherwise. It is this risk-aversion for the worst events which makes insurance valuable under prospect theory. The reason for this is thus quite diferent than the reason under expected utility theory. Instead of the concavity of the utility function, it is the overweighting of the worst events which makes insurance valuable (Wakker et al. (1997)).

Figure 2: The utility function in prospect theory



If overweighting of the worst outcomes is indeed an important reason for purchasing insurance, this could explain why certain insurances are in low demand. Perceptions of what is covered by the insurance thus play a decisive role in the take up. In particular, when an insurance can not guarantee full coverage, some of the worst events are not covered. As these events are overweighted most, this lack of coverage gives a disproportional amount of disutility and the insurance is perceived as less valuable. By simply asking people in the USA, Wakker et al. (1997) actually argue that people demand more than a 20% reduction in price when an insurance has a 1% probability of non-payout. The implication is that insurance is valued more if, instead of reducing the risk, it gives the impression of removing the risk completely.

This probability distribution with which individuals evaluate the value of insurance depends on the perceptions they have about the risk. In this sense, the frequency and intensity of past shocks, be they real or hypothetical, may have a strong influence on the perceptions of risks, and hence, afect the demand for insurance products. In the case of independent series of events, this is a judgment bias which has been called the "hothand efect"[3]. Moreover, this bias can go in diferent directions: the experience of a shock can make the risk more salient and cause an overestimate of the true probability of a new shock; but, if one believes that it is unlikely that several (independent) shocks will occur in a short period, the true probability of a new shock could also be underestimated. Clearly, diferent biases will afect demand diferently.

Another well-known behavioural trait is mental accounting (Thaler 1985) which asserts that people mentally keep diferent accounts for diferent purposes. As a consequence, they can abstain from making a purchase for a particular purpose, even though they would like to make the purchase and money is available - but the money has mentally been assigned to another purpose. Recognizing this, demand for insurance could be higher when a pre-existing mental account is addressed at the moment it is liquid, for instance by marketing index-insurance as part of a harvest strategy and selling it right after the harvest.

Finally, McCord et al. (2012) mention several additional beavioural explanations which could limit demand. One is status quo bias which is "our tendency, when faced with a decision, to do nothing or maintain our current decision". As most people currently do not have insurance, the current status quo is, of course, *not* buying insurance. While this seems difcult to change, Cai et al. (2011) do note that when people are told that what needs to be stated is not the decision to buy the insurance but the decision not to buy it, take up increases by 12%. This increase of demand could be due to a subtle change in the status quo and, when possible, setting the default to "buying insurance" could increase demand. Additionally, the presence of small upfront hurdles in the form of small transaction costs to enroll in insurance can disproportionally decrease demand for insurance, and removing them could thus greatly increase demand.

3. EVIDENCE

The theoretical discussion has detailed the mechanisms through which several factors may afect the demand for microinsurance products. The present section aims at confronting this theoretical approach with the existing evidence and follows the same structure as the previous section.

3.1 THE VALUE OF INSURANCE AND ITS DETERMINANTS

3.1.1. PRICE

While it is to be expected that lower prices lead to higher demand, it is important to know the extent to which demand responds to changes in prices. By

3 This "hothand efect" was first identified by Gilovich et al. (1985) who observed that bas- ketball fans judged that a player's chances of hitting a shot was greater following a successful shot than a miss.

randomly ofering diferent discounts for index-based insurances, Cole et al. (2011a) and Cole et al. (2011b) estimate a price elasticity of demand of about 0.7-1.1, suggesting that a 10% increase in price would lead to a 7 to 11% decrease in demand. Hence, the price has a sizable impact on demand. Mobarak and Rosenzweig (2012) find, by randomly ofering discounts of 10%, 50% or 75% with respect to the actuarially fair price, a price elasticity of only 0.44. Dercon et al. (2011a) observe a reasonably high elasticity to price increases: a 10% increase in prices causes a 7.6 percentage points reduction in demand. When only looking at the low-trust individuals, this efect becomes bigger (17 percentage points reduction).

When ofering insurance for free, Karlan et al. (2011) observe an increase from 40% to 100% take up for their rainfall insurance in Ghana. Similarly, Gaurav et al. (2011), in their work in India, ofered a total refund of the rainfall insurance premiums if clients did not receive any payout at the end of the contract. This money-back guarantee was thus expected to have a huge impact on the take up rate. Results show that this treatment indeed increases the demand for insurance but, in contrast with Karlan et al. (2011), only by 6.9 percentage points, which means that the overall uptake remains low despite this strong treatment. As this money-back guarantee could also be seen as a very generous rebate, this result does not support the idea of rebates as a good way to enhance demand.

Although changes in prices generally do have a strong impact on the demand for insurance, this does not necessarily imply that demand at low prices will be high. When demand is very low, a discount can have a big relative impact on take up, but still lead to a low absolute take up. Indeed, even when prices are significantly below actuarially fair prices, Cole et al. (2011a) still observe less than 50% take up. Likewise, although Bonan et al. (2011) and Thornton et al. (2010) ofer health insurance for free for an initial period, they only reach around 30% take up. Cai et al. (2009), however, observe 90% take up when insurance is heavily subsidized by the government, and strong incentives are given for those selling it.

Thus, while the price seems to have a great impact on the willingness to buy insurance, a low price is, in itself, not enough to obtain a high demand. Other factors, to which we turn next, are also important in limiting demand.

3.1.2. TRANSACTION COSTS

McGuinness (2011) in her case study of health microinsurance in India describes accurately the various costs implied by the insurance policy in response to a serious case of malaria. As expected, the direct out-of-pocket expenses for the insured patients were much lower than for the uninsured. However, she finds that, on average, the amount of transaction costs, including the cash costs related to subscription, payment of the annual premium, filling claims, and obtaining reimbursement is higher for the insured patients. Interestingly, the financing cost of the policyholders turned out to be more favourable since they were able to get credits at lower interest rates. Note however that the sample size is very small, including only 15 insured and 10 uninsured patients. The comparison of diferences in outcome is thus difcult to generalize.

Using a much larger sample, Thornton et al. (2010) provide direct evidence about the importance of transaction costs, and they conclude that those costs matter. The enrollment procedure for the health insurance they ofer in Nicaragua normally requires about a day of work to complete. When, instead, they allow market vendors to sign up directly at their market stall, uptake is about 30 percentage points higher.

3.1.3. RISK AVERSION

As we have seen, it is not easy to predict the impact of risk-aversion on demand for insurance. Since risk-aversion should be the main reason for buying insurance, we would expect that more risk-averse individuals are more likely to buy insurance. However, we also argued that, as insurance is a new product which moreover may not ofer full coverage, it could be considered risky in itself. In the latter case, risk-aversion could have a negative influence on demand.

To study the impact of risk-aversion, it needs to be measured properly. It is, however, not easy to measure the true risk aversion of respondents. Indeed, one can not be sure that people would make the same decision in reality, as they do when answering hypothetical questions. Therefore, (quasi) experimental designs are often used to reveal risk preferences of the individuals. Diferent variants exist (Binswanger 1981; Holt and Laury 2002), but the rationale is the same: subjects have the choice between a safe alternative and some "risky" lotteries, which difer both in expected outcome and variance. The more risky the lottery they choose, the less risk averse the subjects are considered to be. That such measures need to be implemented with caution in order not to confuse what is actually measured, is well illustrated by Kouame and Komenan (2011). Past risk experience influence the results of their gamble choice games. Indeed, previous luck seems to interfere in the choices of the agents: those who

had bad luck in previous lotteries tend to stick to the safer choice in the next round. This suggest the existence of path dependence and may be caused by the hothand efect discussed before.

The evidence suggests that risk aversion, measured in this way, often has a negative, and sizable, efect on demand for insurance (Cole et al. 2011a; Giné et al. 2008; Giné and Yang 2009; Dercon et al. 2011a). For instance, in their estudy on index insurance in India, Cole et al. (2011a) find that those who took the safest lotteries in a pre-survey are about 10 percentage points less likely to purchase insurance. Similarly, Giné et al. (2008) ascertain that risk-aversion decreases the probability to purchase the Indian rainfall index insurance by 1.1 percentage point, from a baseline take up of about 5 percent. Galarza and Carter (2010), in a field experiment where subjects can choose between safe projects, uninsured loans and insured loans, find a non-monotonic relationship between risk aversion and insurance demand. In particular, they find that highly risk averse individuals have a higher demand for safer projects (including either an insured loan or no loan at all) but that this relation is decreasing, that is, those individuals with the highest risk aversion would prefer the risky project or not to purchase the insurance.

Several studies ofer more insight in the reasons why risk-aversion can decrease demand for insurance, which remains rather counterintuitive. First, ambiguity about the insurance, and aversion to this ambiguity, can make the most risk-averse dislike insurance. Bryan (2010), revisiting the data of Giné and Yang (2009), finds that the negative efect of risk-aversion on demand is driven by the ambiguity averse individuals; demand for non-ambiguity averse individuals is increasing with risk-aversion, as the standard theory would suggest. Likewise, Cole et al. (2011b), ofering a rainfall index-based insurance in India, find a neg- ative relation between risk aversion and demand for insurance in the first years of the program. This trend is, however, reversed over time and after 5 years risk-aversion has a positive efect on demand. They argue that a new product arouses a feeling of ambiguity but that this decreases over time when people gain better knowledge or trust of the product.

One specific source of ambiguity is doubt about the trustworthiness of the insurer. Dercon et al. (2011a) outline a model in which limited trust can reduce demand for insurance for the most risk-averse. Indeed, "a reduction in credibility increases the likelihood of the 'worst case' outcome, in which an insurance premium is paid and a loss is sufered, but no claim is paid; this outcome is particularly threatening to the risk averse". Empirically, they find that, controlling for trust, slightly increasing risk-aversion for risk-lovers individuals seems to have a positive efect on demand, but this efect becomes negative as agents become more and more risk averse, that is extreme risk-aversion seems to decrease the likelihood to purchase the insurance. Moreover, the efect of (random) price variations is strongest on the less trusting individuals. These results are consistent with the model and thus strengthen its validity. In line with these findings, Giné et al. (2008) find that the negative efect of risk-aversion on demand is emostly concentrated among people not knowing the micro-finance institution selling the insurance, and these are exactly the individuals which could be expected to trust the insurer the least. Finally, also Kouame and Komenan (2011) argue that the negative correlation between risk aversion among Ivorian cocoa farmers and the purchase of insurance is a consequence of limited trust in the credibility of the insurance policy.

In conclusion, there is evidence that risk-aversion can limit demand for insurance, which is a source of concern. When insurance is considered risky in itself, its usefulness as a risk-coping instrument is limited, and the most risk-averse who should benefit most from insurance do not even purchase it. Nonetheless, by reducing ambiguity about the product and increasing trust in the insurer, it seems possible to recover the basic result that insurance is valued, and pur- chased, most by more risk-averse individuals.

3.1.4. TRUST

A wide range of empirical evidence highlights the importance of trust in the take up decision. Not only do qualitative surveys point to the lack of trust in the management of the scheme as a reason to drop out or not to participate in the scheme (Dong et al. 2009; Basaza et al. 2008) but both quantitative and experimental research bring evidence that trust enhances the take up of an insurance product (Cole et al. 2011a; Cai et al. 2009; Giné et al. 2008; Dercon eet al. 2011a; De Allegri et al. 2006). Note, however, that "trust" may have diferent meanings, and that this unobservable trust component is measured in diferent ways across the empirical literature. Using distinct methodologies, diferent studies thus capture quite diferent aspects of trust. Let us therefore distinguish, following Patt et al. (2009), three levels of trust: trust in the product itself, trust in the institution, and the degree of interpersonal trust among agents.

With respect to the first dimension of trust, Patt et al. (2009) discuss the ability of experimental research to build trust in the product. They assemble considerable evidence from case studies to show that, through participatory methods, farmers were

able to learn how the insurance contract works, and how to explain it accurately to others. On top of building understanding about the insurance, they argue that such games are also valuable in building trust in the product.

Trust in the institution is the dimension of trust most discussed in the literature. Several factors which influence trust in the institution can be identified: experience with the institution, the involvement of known and trusted individuals, trust in the management of the institution, and other external factors.

The potential trust-building role of experience with the institution that delivers the insurance is highlighted by Cai et al. (2009), who study a government sponsored livestock insurance program. They argue that willingness to participate in the program increases with trust in the authorities. First, they reveal that households who participate in another government sponsored insurance program or received government subsidies are substantially more likely to purchase the insurance. Second, they show that payouts following a snowfall led to higher take up and argue that this was caused by gains in trust for the subsidized product. Stein (2011), in contrast, argues that increased trust following efective payouts is not driving higher renewal rates of insurance. This claim is nevertheless to be taken with caution since, though the impact is insignificant, his data do not allow to reject the trust-building hypothesis. Additionally, it is important to note that a general distrust in financial institutions, or a bad experience with other institutions, can also decrease trust in new insurers. Basaza et al. (2008), for instance, claim that it took two years to overcome such distrust, caused by previous bad experience, through positive experiences with the new insurance. Finally, Patt et al. (2009) report that farmers say that they put their greatest trust in organizations that they themselves are members of and that, in general, trust increases with experience with the organization.

The involvement of known and trusted individuals is shown to have a substantial influence on the demand for insurance. Giné et al. (2008) find that emembers of borewell user associations in India, who are more likely to know the insurance vendor personally, are 37 percentage points more likely to buy the insurance contract, or 7 percentage points when they restrict the sample to existing customers of the MFI. Those figures are however to be considered with caution since the authors could not control for the marketing intensity of the insurance product to village opinion leaders and existing customers which may partly account for this efect. Similarly, Cole et al. (2011a) find a strong and significant efect of introducing an insurance educator into the visited households by a local trusted agent from BASIX. The interpretation that such an agent enhances trust is strengthened by the fact that, although there is a 10 percentage point increase amongst households familiar with the BASIX microfinance institution, there is no significant efect for those who are not. Indeed, for the latter, an unknown agent would not be expected to enhance trust. Although related to the trust issue, a distinct section will present the influence from peers on take up rates.

Dong et al. (2009) identify trust in the management of the community health scheme as an important factor influencing households' probability of enrolling. The involvement of known and trusted individuals in such a scheme could thus have a positive efect on demand. De Allegri et al. (2006), however, note that although people like to have representatives of the community-health scheme at the local level, they prefer the money to be managed outside of the community. When there is a lack of trust in the community management, their involvement can thus also have a negative efect on take up.

Finally, also external factors can have an influence on the trust placed in the insurer. Schneider and Diop (2004) and Patankar (2011) point at the potential trust-building role of legal and institutional support. Moreover, Patankar (2011), studying an index-insurance, indicates that people would place more trust in the measurement of the index if it was certified by the government.

The last aspect of trust which can have an influence on uptake is interpersonal trust. This aspect of trust is often measured through variants of the trust game initiated by Berg et al. (1995). Here again, one should be well aware of what is captured by the trust measure. Some games try not to confuse the trust efect with altruistic motivations, by first playing a dictator game[4]. It is also possible to distinguish trust from fairness considerations. When comparing empirical studies that probe into the issue of trust, we therefore need to be precise about the content of the trust measure. The trust game is, for instance, used in the study of Dercon et al. (2011a) on a composite health insurance product in Kenya, where it is shown that low interpersonal trust levels have a significant negative efect on uptake. Widening the scope of implications which this lack of interpersonal trust can generate, the study of Hill et al. (2011) suggests that taking insurance through pre-existing

4 In this game (Kahneman et al. 1986), players receive a monetary endowment and are asked to send all, part or nothing of it to another player, whose identity is not revealed. The higher the amount sent, the more altruistic the agent is considered

groups may not be advisable.

3.1.5. PERSONAL CHARACTERISTICS

We next discuss how personal characteristics - age, gender, wealth and education - correlate with insurance take up. It is important, however, to not interpret these results causally. Omitted variables may well explain such correlations as, for instance, a person more willing to experiment could be both more wealthy and more likely to purchase insurance.

Age does not seem to have a clear relation with customers' propensity to purchase health or index insurance. In diferent settings, older people have been observed to be more likely (Gaurav et al. 2011; Cole et al. 2011a), as likely (Dercon2011a), and less likely (Cole et al. 2011a) to purchase insurance as younger people. There is no clear trend when looking only at index insurance nor health insurance. In contrast, age seems to matter with respect to life insurance purchases. Indeed, Arun et al. (2012) argue that, with increasing age, households heads request less life insurance policies, as they have a lower understanding and less experience with insurance than the younger household heads. However, they observe that above a certain age, older household heads request more life insurance, likely due to a higher incentive to protect their family in case of death. They indeed find that subscription is positively associated with a higher number of young dependents in the household. This suggest that participation may be motivated by the desire to leave bequests to their family.

The evidence is mixed when it comes to attest whether one's gender afects the likelihood to purchase insurance. While Jehu-Appiah et al. (2011) find women to be more likely to buy the product, Bonan et al. (2011), Schneider and Diop (2004) and De Allegri et al. (2006) observe a higher take up rate among men. However, they all interview only household-heads. De Allegri et al. (2006) justify this by saying that household heads generally declared making the decision on their own, without consulting their spouse. Yet, female headed households are likely to be very different than "normal" households. In their work in Malawi, Giné and Yang (2009) control for female headed households e when assessing the impact of gender on take up, but the gender coefficient is not estimated precisely enough to draw meaningful conclusions. As mentioned in the theory, Banthia et al. (2009) pinpoint the risks to which women are especially vulnerable and so doing, highlight the scope for microinsurance to address those gender specific risks. They make recommendations as to how microinsurance could be designed and delivered to help women manage those risks. On the one hand, they suggest the formal insurance should address longer term risks and rights of access and recourse. Offering a formal insurance to women would enable them to shift resources from inefficient forms of savings into income generating opportunities. On the other hand, they emphasize the characteristics that make women more attractive risks to formal insurers: Their reduced mobility and reliability in making regular payments.

As for education, various empirical studies advocate that the more years of schooling respondents have completed, the more likely they are to enroll in the insurance scheme (Akter et al. 2008; Giesbert et al. 2011; Giné and Yang e 2009; Jehu-Appiah et al. 2011; Jowett 2003; Schneider and Diop 2004). This is consistent with the idea that better educated people may have a better understanding of the insurance product and are therefore more likely to purchase it. More specifically, Giesbert et al. (2011) notes that education might stimulate demand by increasing financial literacy, and that the effect of education on demand may thus vanish once financial literacy is controlled for. For this reason, neither Bonan et al. (2011) nor Giné et al. (2008) find a significant e impact of years of school attendance on take up. Gaurav et al. (2011) find a counter intuitive relation between education and financial literacy, measured by responses to precise questions about interest rates, inflation, and risk diversification. According to their results, education does not have any significance in predicting financial literacy. They moreover bring evidence that low financial awareness of the respondents lowers the probability of adopting the rainfall insurance. Interestingly Cole et al. (2011a) isolate the understanding of probabilities when testing the respondents' financial awareness. The authors then observe that financial literacy per say has no effect on insurance demand whereas facility with probabilities seems to be strongly correlated with the decision to purchase insurance.

Generally, more wealthy households seem more likely to purchase insurance. Measuring wealth in different ways, several studies find that the more wealthy are more likely to purchase insurance (Cole et al. 2011a; Gaurav et al. 2011; Giné and Yang 2009), although for instance Dercon et al. (2011b) do not.

3.1.6. CONTRACT SPECIFICS

As has been shown in the theory, many dimensions are to be considered when designing the contract. Coverage, waiting periods, eligibility criteria, premium payment method, simplicity, claim processing procedures, are only some examples among others. Although the empirical literature is not

equally detailed on each of those components, they all contribute to the client's value of the insurance policy. Let us focus here on some key aspects. In designing most insurances, a choice has to be made as to how to decide the benefit level. Does the insurance pay out regularly, or only when disastrous events occur? Keeping the price of the contract constant, the trade off is then between many small payouts or few bigger payouts. Nonetheless, one should bear in mind that since comprehensive covers (more frequent payouts) are more expensive, the increase in take up might be counter balanced by an increase in price. For an index-based weather insurance in Ethiopia, farmers seemed to strongly prefer many small payouts. When asked to choose between a payout, on average, every 3 years or every 5 years, 90% preferred every 3 years and, subsequently, actual take up of the products reflected this preference with 93% opting for comprehensive covers (Norton et al. 2011). As discussed below, individuals receiving a payout also tend to be more likely to renew their contract, which gives an additional reason for preferring contracts with frequent payouts. Nonetheless, offering an insurance with very frequent small payouts is not necessarily a good idea: Stein (2011) notes that the microinsurance provider BASIX, noticing the dissatisfaction of Indian customers with small payouts, stopped offering very small contracts; and he additionally finds that receiving a payout which is smaller than the premium, might *decrease* the likelihood of renewal.

Next to properties of the payout structure, the modalities of premium payments can also be important. This is especially an issue for health insurances where, in an effort to limit adverse selection, the entire family is often required to enroll at once. In such cases, the total premium can be high. People therefore seem to prefer paying the premium in different installments or paying higher amounts when more money is available, for instance after the harvest (De Allegri et al. 2006). In Basaza et al. (2008)'s Ugandan health insurance analysis, a minimum number of clients were required to sign up in each village prior to selling the insurance product. Potential clients did not feel comfortable with this condition and advocated instead for a family subscription scheme.

3.1.7. QUALITY OF THE PRODUCT

The quality of the insurance is determined by several aspects for different kinds of insurance. As depicted in the theory, the PACE assessment tool (Matul et al. 2011) considers various quality criteria. We will focus, here, only on a few specific issues.

For health insurance, the package mostly covers services in a designated health center, and the (perceived) lack of quality of this center is often identified as one of the most important impediments to the take up of health insurance (Criel and Waelkens 2003; Basaza et al. 2008; De Allegri et al. 2006). For this, both the quality of the services provided as well as the way patients are treated matter. For this reason, it seems of great importance to put the right incentives such that health workers carefully treat the insured patients, even when they do not directly pay the consultation. Additionally, the distance to the health facility can also influence the quality of the offered package (Schneider and Diop 2004). De Allegri et al. (2006) warns, however, that people have different preferences over health centers and do not necessarily prefer to be assigned to the closest one.

For index-insurances, we pointed out in the theoretical section that the quality of the product may be limited by the amount of basis risk it carries. Several studies provide evidence about the importance of basis risk. Giné et al. (2008), estudying demand for an index-insurance, argue that those farmers who produce the crops for which the policy is designed suffer from less basis risk. As these farmers are more likely to adopt the insurance, they thus interpret this as a negative effect of basis risk on demand. An arguably cleaner test is given by Cole et al. (2011a). They measure basis risk as the distance between the farmer's village and the rainfall station, and do not find a significant correlation between basis risk and demand.

The most robust evidence, however, is given by Mobarak and Rosenzweig (2012) who obtain random variation in the amount of basis risk by constructing new weather stations. They find that, in the absence of coverage by informal risk-sharing, for every additional kilometer of perceived distance from the weather station demand reduces by 6.4%. The interaction between basis risk and informal coverage will be discussed in the section on informal risk-sharing.

3.2. UNDERSTANDING OF INSURANCE

As exposed in the theory of financial education behavior change (Tower and McGuinness 2011), successive phases of understanding are needed prior to effectively influence the agent's purchase decision. Empirical evidence exists on the different aspects of overcoming the issue of understanding of insurance: raising awareness and the influence peers can have in this respect; improving the knowledge of the insurance terms and product through specific financial literacy training sessions; and developing skills and ability to manage risk. One should note that, following this progressive framework, educational modules may have a real impact on

some phases of understanding in the short run without achieving a direct increase in take up rate. Note that a last step is needed before observing a change in behavior: namely sparking of positive attitudes towards the insurance. This point will be discussed in a later section when addressing the departures from conventional rationality.

3.2.1. AWARENESS AND THE INFLUENCE FROM PEERS

Detecting whether the individual has already been exposed to the concept of insurance and its products is a first step to improve understanding. Ackah and Owusu (2012) computed an insurance awareness index in Ghana, regardless of the type of product offered, ranging from 0 - or not at all aware of the existence of insurance - to 1. The mean insurance awareness score is 0.65. Yet, although many people have heard of the word insurance, they seem not to take up insurance as a way of preparing towards future unforeseen misfortunes.

In their work in Kenya, Tower and McGuinness (2011) use a radio campaign to difuse information about insurance and other risk management tools. Constructing treatment and comparison group based on listener versus non listeners entails a selection bias, since those who choose not to listen to the radio business' program may difer from the treated group. However, they try to avoid this problem by using a propensity score matching technique. Their results suggest a 19% increase in listeners' awareness of insurance terms and products.

Peers can also influence an individual's awareness of insurance in several ways: by spreading information about the insurance as well as by actually purchasing the insurance for themselves.

Several pieces of evidence show that the influence of peers indeed matters in the purchase of insurance. First, insurance purchases by people close to each other are correlated (Patankar 2011; Giné et al. 2008). Such correlations should however be interpreted cautiously as it can perhaps be expected that friends, who can be "similar" in some unobserved ways, exhibit similar purchasing behaviour.

Two randomized control trials provide stronger evidence. Above, we already mentioned that, in a study of Cai et al. (2011), people attending a village meeting about insurance were substantially (12 percentage points) more likely to take up insurance than those receiving door-to-door visit. Interestingly, the door-to-door visits were much more effective (7 percentage points) in villages where a meeting took place, even though the visited individuals did not attend the meeting themselves. Moreover, each additional friend attending the meeting also substantially increased individuals' probability to take up insurance. This indicates that peers do have an influence on take up decisions, but does not allow to disentangle the mechanisms by which it does so.

To shed more light on the way peers influence uptake decisions, they conduct a second experiment in which people are assigned to an intensive or simple training session. Moreover, this is done in two phases, a few days apart, with different individuals in each phase. While in the first phase there were substantial diferences in understanding and take up among the participants of the two types of training, there were no big differences in understanding or take up among the individuals receiving the different trainings in the second phase. This suggests that the individuals trained in the first phase had spread the information to the others, which induced similar take up in the second phase as training did not add much new information. Additionally, they find that a higher take up in the first phase in the village causes a higher take up in the second, but only when the participants were explicitly told about the take up in the first round. This suggests that purchases by others can stimulate demand, but that people are not necessarily aware of their purchase decisions.

Giné et al. (2011), in another randomized control trial, get results broadly consistent with the previous ones. The comics they distribute for financial literacy training only have a substantial effect when many in the village receive them. This could be a consequence of increased information dissemination through the villages which received more comics. On the other hand, being in a village where many discount vouchers have been distributed and take up is thus higher, seems to have only a modest effect on individual uptake. While this could suggest that people were not strongly influenced by the take up decisions of their peers, it could also be that, as in the study of Cai et al. (2011), they were not fully aware of the decisions of other people in the village.

Understanding the importance of this channel, insurance providers may also pay attention to the agents put in charge of the distribution of the product.

In this respect, Giné et al. (2008) used the village networks to disseminate the information about the product. They performed a more intensive marketing of the insurance product in the direction of selected village opinion leaders and asked them to help publicize the insurance product. They later came back to sell the policy. Participation is 8 percentage points higher among members of the local council

(Gram Panchayat) and somewhat superior for those who are connected to other village networks. Thus, a network effect seems to be at play. The authors, however, acknowledge that, since marketing intensity is omitted in their regression estimates, the strength of the results is dampened. Networks have also been exploited by Dercon et al. (2011a). They set up a peer referral treatment which gave a 10% incentive to every subscriber who convinced another potential client to sign up for the health insurance policy. Curiously, this proved to be counterproductive in the sense that the tea centers in which this intervention was implemented were less likely to purchase the insurance policy. Indeed, take up dropped from 13% to 6%, allegedly out of a fear of a pyramid scheme that would break trust.

Relying on social networks for the transmission of information may sometimes be at the insurers' disadvantage. Olapade and Frolich (2012) bring evidence from a randomized control trial distributing comics to raise understanding about health insurance in the Philippines. While the campaign did not improve the knowledge of brochure recipients, the authors find a significant negative spillover effect on the non-recipients. They attribute this fact to a distortion of information.

To sum up, the evidence suggests that there is some degree of awareness about insurance among the population, and that this can easily be improved through information campaigns or exploiting peers networks. Peers do indeed have an important influence on the decision to purchase insurance. By spreading information about the insurance, they can increase the likelihood that insurance is purchased. Moreover, their actual decision to purchase insurance might also influence the decision of others, although, at least in the short run, information about purchasing decisions might not spread as easily as information about the insurance itself.

3.2.2. IMPROVING KNOWLEDGE THROUGH LITERACY TRAINING

Once people are aware of the existence of an insurance product, efforts can be directed to improving the knowledge of the insurance terms and product as well as the skills and ability to evaluate such risk management tools through specific financial literacy training sessions. Among the existing work, two main approaches can be distinguished: the participatory one, through games, and the traditional one, through a detailed explanation of the product, using a variety of media.

As regards the traditional method, Cole et al. (2011a) randomly assign households to a visit from an insurance educator at home and find that receiving a visit induces a significant increase in the take up rate by 20-25 pecentage points as compared to those households who only received flyers about the rainfall insurance product. Yet, their framework does not allow to distinguish whether this increase is driven by a genuine increase in knowledge or a Hawthorne effect. The results of Cai et al. (2011) indicate that the intensity and the quality of the training need to be carefully thought about. They compare the impact of a basic information session with an intensive, 45 minutes long, training session, in a randomized experiment in China. The improvement in training quality translates in an increase in the insurance purchase from 35% to 50%. Also a village meeting about the insurance is shown to be more effective than a short door-to-door visit in stimulating demand. Giné et al. (2011) find that distributing comics as financial literacy training can have a positive effect on take up, although this effect is only substantial when enough people in the village received the comics. Using another type of media, Tower and McGuinness (2011) find that broadcasting a radio campaign leads to an 8% increase in knowledge of insurance terms and products. In the context of health insurance, Bonan et al. (2011) and IPA (2012) come to less optimistic conclusions about the efficacy of literacy training. Both a three-hour training session about the insurance and general financial management (Bonan et al. (2011)), as well as several educational modules varying in intensity (IPA (2012)) are shown to have almost no impact on the demand for insurance.

Gaurav et al. (2011) find an heterogeneous effect of training. Indeed, the training program increases take up by 5.3 percentage points in their Indian data base, but this effect varies depending on personal characteristics of the household head such as the cognitive ability, schooling attainment and land holdings. They namely find that the training is only effective for those with low initial levels of financial literacy, which points to an interesting trade off while financial literacy training may indeed be expected to have the biggest impact on individuals with low initial financial literacy, training individuals with low financial, and actual, literacy is also most challenging. Finally, they carried out a demonstration of how the millimeter threshold triggers a payout, on the one hand, and, on the other hand, provided a weather forecast for the next ten days. Neither treatment significantly influenced the take up rate of the rainfall insurance.
The second approach, participatory training activities, have also been thoroughly developed. It aims at stimulating skills that will bring households to successfully adopt the insurance product. Here again, it is not clear whether financial education triggers a positive effect on demand. Cai and Song

(2011) played a repeated insurance game in China, in which farmers had to decide whether to buy the weather insurance and then gambled to see if a disaster occurred during the time of their contract. Then, the enumerators helped them to compute their income from that year, including the calculation of the premiums and the payout when needed. Following this exercise, they noted an increase in the actual insurance take up by 9.6 percentage points. Their work allows to compare the traditional training approach with the participatory one. Learning the objective benefits of insurance through a simple calculation guidance does not reach a significant impact on purchase decisions. Additionally, they demonstrate that games might be more efficient in raising awareness of the risky environment than real experience with adverse events. Indeed, the amount of hypothetical disasters (or bad luck) encountered in their game induces an update in the probability distribution, which, in turn, significantly influences the take up decisions in real life. One could, however, wonder if this willingness to subscribe will translate in a concrete subscription and if this effect will be long lasting since subjects were actually proposed to subscribe some days later, but they did not have to pay directly. Patt et al. (2010), on the other hand, find hardly any differences in understanding after a traditional training session by explanation and one by playing games. They nevertheless find that those who played the game perceived the insurance as fairer.

Dercon et al. (2011a) randomly assign people to so called "'study circles"' which consist in regular meetings of a study group in which written materials about insurance are discussed. This kind of participative training session does, however, not prove to have any impact on uptake of health insurance in the sample.

Thus, while insurance literacy training does definitely seem to increase the knowledge on the product specificities, its impact on the purchase of insurance is unclear. Interestingly, most studies which find an effect on the take up rate deal with complex index-based insurances; the ones on health insurance find no effect. As the major difference between the two is the technical difficulty of the index insurance, this suggests that these trainings do succeed in improving the understanding of these technicalities.

Yet, several reasons may explain the mixed evidence of training on the take up rate. First, according to the theory of financial education behaviour change, knowledge is not sufficient to translate into an effective purchase of the insurance product, individuals should also acquire the appropriate skills and attitudes towards insurance. A lack of trust in the institution or cultural beliefs may thus interfere with the benefits of the financial training. Second, the aforementioned studies measure the short run effects on demand. Nonetheless, as we will see below that understanding is also a crucial factor in renewing, financial literacy trainings, possibly coupled with a good follow up, can also have substantial effects in the longer run. Third, a deeper understanding about the logic and concept of insurance is necessary, current training methods do not seem to succeed in raising this kind of understanding. While it is unclear whether financial literacy training can achieve this, there is definitely scope for current training methods to focus less on the technicalities of the insurance product and more on a broader understanding of its concepts. Finally, it may also be that people perfectly understood the concept of insurance but prefer not to buy it for other reasons.

3.3. EFFECTIVENESS OF INSURANCE SUBSTITUTES

3.3.1. CREDIT

Access to credit can affect demand for insurance in different ways. We next discuss the evidence of the effect of credit on demand through liquidity constraints, interlinking credit and insurance, and credit as a substitute for insurance.

3.3.2. LIQUIDITY CONSTRAINTS

Testing directly whether liquidity constraints are preventing people from taking up insurance is not easy. Nonetheless, several studies provide indirect evidence about the importance of liquidity constraints.

First, Chen et al. (2012) propose to sell an insurance policy on credit for pig raising activities in China. They namely ofer credit vouchers which allow farmers to enter an insurance contract while delaying payment of the premium until the end of the insured period. Their results show that the voucher's system increases the purchase of the insurance by 11 percentage points. One possible explanation is that this increase was caused by removing liquidity constraints at the moment of sign up.

Second, handing out money right before the purchase decision, which relaxes potential liquidity constraints, significantly increases take up. Cole et al. (2011a) randomly give 25 Rs. or 100 Rs. to households and observe that the ones with the high endowment are about 40 percentage points more likely to take up the insurance which costs between 80 and 125 rupees. Likewise, Norton et al. (2011) play games in which an endowment can be distributed among index insurance, savings, a community fund, and simply keeping the money. They

find that 99% buy some (potentially very small amount of) index-insurance and that, together with keeping the money, index insurance is the most popular option. A year later, take up of these index insurances in the absence of any endowment varied between 6 and 36%.

These high take up rates following the disbursement of an endowment can arise because liquidity constraints are relaxed, but also simply because money is given and people reciprocate by doing the perceived right thing: buying insurance. Cole et al. (2011a), however, argue that liquidity constraints do matter because they observe that the big endowment has a larger effect on poorer individuals, for whom liquidity constraints are more likely to be binding. Additionally, when asked about the main reason for not buying insurance, "not enough funds to buy insurance" is the most common response.

Other suggestive evidence for the importance of liquidity constraints is offered by the actual take up in the study of Norton et al. (2011). A take up of 6 to 36% is, in fact, quite high for index insurance products, and one reason for this might be that individuals had the possibility to obtain insurance as part of the remuneration of a work program. Since this program's wage is only half the market wage, the authors argue that, rather than providing a subsidy, the program helped alleviating liquidity constraints, thereby increasing take up.

Moreover, we saw in the theory that the effect of remittances on take up was not clear. Crayen et al. (2010)'s empirical analysis of remittances in South Africa shows that remittances, after controlling for income, act as a substitute with respect to formal insurance in a context where the budget constraint is binding. Indeed, their results suggest that if the respondent receives remittances, he is seven per cent less likely to have a formal funeral cover.

Finally, wealthier individuals are usually more likely to purchase insurance. One explanation could be that liquidity constraints matter, and wealthier individuals face them less.

Thus, while it is difficult to judge whether liquidity constraints are important, and while it is impossible to say to what extent they matter, most evidence is at least consistent with the fact that liquidity constraints are a significant barrier to the take up of insurance.

3.3.3. INTERLINKING CREDIT AND INSURANCE

Beyond the question of whether access to credit has an impact on adoption of microinsurance, two studies investigate the effect of jointly offering credit and insurance. Giné and Yang (2009), when e offering credit to finance investment for new seeds, randomly oblige one group of customers to jointly take up an index-based insurance to mitigate the risk inherent in taking a credit for the adoption of a new technology. Although it could be expected that the insurance makes the adoption of credit less risky and thus more attractive, they find the opposite: those who are required to take insurance are 13 percentage points less likely to take the credit. While this can be taken as evidence against the interlinking of credit and insurance, such a conclusion is not necessarily warranted. First, the authors argue that limited liability can restrict demand for the credit with insurance: it seriously reduces the usefulness of the insurance while still increasing the price of credit. Second, interlinking of credit and insurance might be especially useful because an insured loan can carry a lower interest rate, precisely because of the limited liability and higher default rates for uninsured loans. As the interest rates in the experiment are the same for the insured and uninsured loans, the insured loan was less attractive than it could have been.

Using a lab experiment, which allows to control more carefully for limited liability and the consequences of default, Galarza and Carter (2010) arrive at a more optimistic conclusion about the interlinking of credit and insurance. In a baseline game, people have the possibility to choose between a safe low-return production and taking an uninsured loan leading to a risky high-return outcome. In the next game, they add the possibility to take the loan with an additional index insurance, mitigating the risk of the loan. The probabilities and outcomes are computed based on actual data[5], and the risk in the multiround experiment is the loss of collateral and the incapacity to invest in risky projects during following rounds. In this setting, they find that 57 percent of people choose the insured loan in the second game, and that 60 percent of those who chose the safe option in the first game switch to the insured loan in the second. This indicates that demand for insurance in such a setting can be high, and that interlinking of credit and insurance can increase demand for credit and motivate the purchase of insurance. This study therefore goes against the conclusions reached by Giné and Yang (2009).

3.3.4. SAVING

In an experiment to assess whether linking savings and insurance could increase uptake, Stein and

5 The price of the index insurance is 40 percent above the actuarially fair price

Tobacman (2011) find that people prefer a pure insurance or pure savings product over a mixture of the two. In another experiment, Clarke et al. (2012) ofer people the opportunity to allocate money to different index and health insurances. When a "group savings" is added to the possibilities, demand for index-insurance could increase due to the complementarities between savings and insurance with basis risk. They however find that the introduction of savings does not significantly change demand for index-insurances, suggesting that these complementarities are not very important. Nonetheless, people do indicate that savings are an important part of their risk-management strategy by allocating a good part of their money to the group savings.

3.3.5. INFORMAL RISK-SHARING

As we have discussed, depending on the type of risks existing informal risk-sharing agreements cover, they can both have a positive and negative effect on the demand for insurance. Mobarak and Rosenzweig (2012) find evidence that such substitution effects and complementarities do matter in the demand for insurance. They study an index-based weather insurance in India, which covers covariate risks. They use sub-caste as risk-sharing networks and, based on historical data, they assess how well such sub-castes manage to cover both idiosyncratic and covariate risks.

They find, first, that members of those sub-castes that better cover covariate risks are less likely to buy insurance. This suggests that, when they cover similar risks, informal risk-sharing is indeed a substitute for microinsurance. Such substitution effects should not be at play when the informal insurance covers other risks, and indeed they do not find an effect of the extent of informal coverage of idiosyncratic risk on the demand for insurance when there is little basis risk. However, when basis risk is high, more informal coverage of idiosyncratic risk has a positive effect on demand, confirming the idea that informal coverage can attenuate the negative effects of basis risk present in formal insurance contracts. These results thus confirm that, by exploiting complementarities with existing risk-coping strategies in the design of insurance, both the value of, and demand for, insurance can increase.

In a study by Dercon et al. (2011c), a first attempt is made in understanding whether such complementarities can be exploited by offering insurance to preexisting risk-sharing groups. In particular, the product sold is still anl individual index-based insurance, but a group-focused training is provided to some group leaders which emphasizes the benefits of the insurance to the group and explains how basis risk can be attenuated through side payments in the group. As the group-focused trainings lead to a 12 percentage points higher take up than the normal trainings, this shows that people are at least receptive to the idea of combining informal and formal risk-sharing, which is promising with respect to its potential to increase demand.

3.3.6. OTHER INSURANCE SUBSTITUTES

Several studies show how access to potential risk-coping possibilities, other than credit, correlate with insurance take up. Jowett (2003) finds that where private transfers among people are strong, people are less likely to purchase health insurance. Giesbert et al. (2011) show that those who have received remittances in the past, and could thus potentially receive remittances in the future to cope with a shock, are less likely to take up insurance. Likewise, Akter et al. (2008) find that demand for disaster insurance is lower among communities who previously received government assistance when a disaster occurred, and thus might consider themselves as already partially insured.

Although these results should be interpreted with caution, they are at least consistent with the following explanation: the availability of other risk-coping possibilities does reduce the need and demand for insurance. Although the same substitution argument can be applied to credit, the effect of credit availability on demand for insurable is not well established. A plausible reason is that credit availability simultaneously increases demand for insurance, by relaxing liquidity constraints.

3.4. A DEPARTURE FROM CONVENTIONAL RATIONALITY

3.4.1. ALTERNATIVE MODELS OF CHOICE UNDER UNCERTAINTY

Attitudes towards insurance may be influenced by a wide range of fears and beliefs that do not necessarily have a rational explanation. In the theoretical section we already explained how the alternative behavioural models give plausible explanations of observed insurance behaviour (Bryan 2010; Stein 2011; Harms 2011; Cai et al. 2011). These papers thus provide indirect evidence for the validity of such models in the context of insurance. More direct evidence as to whether these models provide a good framework to understand demand for microinsurance is however limited.

The empirical literature seems to agree on the fact that cultural beliefs do not always support the need

to acquire insurance. For instance, Ackah and Owusu (2012) observe among some Ghanaians, the perception that planning ahead for a possible misfortune is like inviting evil, which advocates against purchasing the insurance product. The authors also notice a tendency to rely on God's protection, believing he will prevent catastrophe from befalling them. As for prospect theory, Ito and Kono (2010) assess the attitudes of individuals vis-a-vis risk and find that a large number of them are risk-loving in the domain of losses. These loss risk-lovers also seem to be somewhat less likely to purchase insurance. On the other hand, Dercon et al. (2011a) find that people are risk-averse in the domain of losses, and actually even more than in the domain of gains. As prospect theory assumes that people are risk-averse for big losses and risk-seeking for smaller ones, it is however debatable whether these results support or contradict prospect theory. Concerning the weighting of probabilities under prospect theory, Clarke and Kalani (2011) actually find that insurance take up decisions in a game are better explained by the underweighting of extreme events, instead of the overweighting prescribed by prospect theory.

Ito and Kono (2010) also estimate the demand for insurance for a small group of people exhibiting hyperbolic preferences and find that they are more likely to purchase health insurance. They argue that these people use the insurance as a commitment device: having time inconsistent preferences, they will have difficulties to save for uncertain health expenditures. A prepayment of health expenditures is thus especially valuable.

Finally, Cole et al. (2011a) find that marketing an insurance by using a negative framing of the product significantly increases the take up. This lends support to loss-aversion driving insurance decisions.

3.4.2. EFFECTS OF PAST SHOCK

Several papers provide some insight into how past shocks, by changing people's perceptions of risk, could have an effect on their demand for insurance.

Arun and Bendig (2010) strongly support this idea. First, they confirm the intuition that as one's perception of risk increases, demand for microinsurance increases. Moreover, they show that the experience of specific hazards in the past, in particular the death or a severe illness of a household member or the inability to sell agricultural products in the past five years, increases the probability to use financial services in Sri Lanka. In contrast, Cole et al. (2011a) and Stein (2011) do not find any clear evidence that having experienced a weather shock increases the uptake of insurance services.

It is often difficult to disentangle the exact reasons why the experience of a shock changes demand for insurance. Both a change in the perception of risk as well as the consequences of the shock could have an influence on demand. Cai and Song (2011) provide a cleaner, and perhaps surprising result: the experience of hypothetical shocks in a repeated insurance game has a strong positive effect on the demand for real insurance. In fact, this effect is even stronger than that of the experience of real adverse events. On the other hand, Galarza and Carter (2010) suspect a judgment bias leading to the opposite effect in the project choices made by farmers in their Indian sample. When one of them suffers a loss several times in a row, he is tempted to believe that chance will turn and that bad luck will not happen once again in the next cropping season. He would thus underestimate the autocorrelation in the series of bad covariate shocks. A "hothand effect" is thus at play in their sample which leads farmers who experienced many shocks to opt for riskier projects.

In short, the experience of past hazards does not always have a clear impact on peoples perception of risk, which remains a highly quite subjective matter.

3.4.3. MARKETING

Various marketing strategies have been implemented and evaluated on the field in order to test whether there exists an optimal way to deliver the insurance product. Of course, the impact of such marketing treatments are context specific. Nonetheless, some recurrent features arise which may stimulate participation.

In an effort to sell their index insurance in India, Cole et al. (2011a) tried different marketing strategies. Either flyers were distributed or video messages were shown to the selected households. In the latter case, the authors used several variations in the broadcasted messages and randomly assigned the households to one of the following treatments: mentioning a wellknown branch when advertising the product; delivering the product by a local farmer or a teacher; emphasizing the probability to payout or the opposite; describing the benefits of the insurance product or, conversely, warning households against the difficulties they may face in case of hardships if they choose not to subscribe. Remarkably, the last treatment, which uses a negative framing of the product, significantly increases the take up rate whereas none of the other messages had a significant impact. The effect of the flyers is ambiguous. They lead to more or less

similar proportions of insurance purchase (26% take up) compared to video messages (29% take up). A comparison is however difficult since those who received flyers had already been exposed to weather insurance the year before and, at the time, the policy did not pay out. Note also that, given the low overall take up rate, marketing remains relatively expensive.

Properly designed incentives may lead to a higher take up rate, as illustrated by the interesting work of Cai et al. (2009). In the context of a sow insurance in China, they tested whether linking good performance with attractive rewards for the vendor of the product had an impact on demand. Their results strongly support this marketing strategy since the participation rate increases from 53% to 90% in the high incentives group.

4. RENEWAL

While the puzzle of low take up rate for microinsurance products has been widely discussed in the literature, very little is known about the renewal of such products. Yet, the figures are alarming with renewal rates only ranging from 10 to 70% (Dong et al. 2009; Fitzpatrick et al. 2011; Stein 2011). Moreover, these low renewal rates are a serious impediment to the expansion of microinsurance. Indeed, convincing people to buy insurance in a sustained way is more difficult, and more important, than to simply convince them to buy and try it once.

For this reason, we discuss the available evidence about why people (do not) renew their insurance. Unfortunately, not much is known about this crucial subject. Obviously, the factors leading to a higher take up also influence the renewal rate, such as afordability, quality of care and households characteristics (Dong et al. (2009)). Some of these factors, such as understanding of the insurance and assessment the quality of the product, should be more obvious when a client has actually experienced the product, and are therefore expected to influence more strongly renewal than initial demand. Finally, some factors, such as having received a payout from the insurance, only affect renewal. We next discuss these different determinants of renewal in turn.

Experiencing a payout seems to be an important factor in the decision to renew. For instance, Stein (2011) estimates that receiving a payout leads to a 9 to 22 percentage points increase in likelihood to renew the insurance. Other authors (Cole et al. 2011a; Fitzpatrick et al. 2011; Dong et al. 2009; Ugarte 2012) also find evidence that more payouts lead to a higher retention. Yet, while Stein (2011) estimates that payouts generally have a positive effect on retention, he estimates that payouts which are smaller than the premium actually make people less likely to renew their contract than if they had no payout at all. A difficulty in assessing whether payouts lead to higher renewal rates, is that they might correlate with other factors influencing renewal. The shock that triggers the payout, most of the time omitted, may have such consequences, or simply the fact that sicker individuals receive more payouts from a health insurance now and allegedly also in the future and therefore value insurance more. In which case, insurers would face a problem of adverse selection. However, Ugarte (2012), finds that, even when controlling for individuals' current health status, the effective use of a health insurance in case of illness increases the likelihood of renewal. Similarly, Stein (2011) provides evidence that weather shocks do not drive take up decisions, and it is therefore the actual occurrence of payouts which increases retention.

The true value of insurance, especially for health insurance, is a factor which people can better evaluate after having experienced the insurance. Such evaluation should exert an important influence on the decision to renew the insurance. Dong et al. (2009) indeed find that perception about the quality of the health center is an important factor underlying the decision to renew. The authors report that disliking the behaviour of the medical staff is the second most cited reason for not renewing the insurance, only preceded by an afordability concern.

A lack of understanding of the insurance is another important factor in not renewing the insurance. To study this, Ugarte (2012) measures understanding by verifying whether clients think they should be reimbursed in the absence of payout and whether they know the modalities of their contract, among other things. They find that people with a lower level of this kind of understanding are much less likely to renew; in fact, below a certain level of understanding, virtually nobody renewed the contract. Selling insurance which is not understood properly thus seems a self-defeating strategy: When people lack a basic understanding of the product, they will probably not use it properly, feel deceived, and fail to renew. Taking this into account, insurance literacy trainings could have bigger long term impacts on demand for insurance than the immediate impact on take up which is usually measured.

A more basic lack of information about the necessary procedures and the administrative burden is another reason for clients not to renew their subscription. Giesbert (2008), for instance, observes that in his sample, only one person out of 87 enrollees filed a

claim while many more should have been eligible. Even though the people in this study seem to understand the general features of the contract, several barriers, such as the wrong perception that no claim could be made, still prevented people from actually using the insurance. Moreover, both Fitzpatrick et al. (2011) and Ugarte (2012) observe that many individuals who dropped out of a health insurance scheme reported not knowing where to make payments. While these examples may only point at ill-managed schemes, they do indicate that the effective transmission of information should not be overlooked in implementing an insurance. Therefore, putting renewal as a default option may partially alleviate these procedures and could ease renewal, as attested by the study of Cai et al. (2011) where take up is higher when people have to sign out, rather than sign up, for insurance. Such a default option needs, however, to be clearly communicated to clients as an undesired renewal can easily lead to overall distrust in the scheme. Overall, the fact that these practical problems limit renewal of insurance, suggests that a good follow up is crucial in building a sustainable insurance scheme. Ugarte (2012), for instance, finds that people are more likely to renew when they met a representative of the NGO in charge over the last year.

Overall, the low rates of renewal call into question the idea that people should simply be convinced to buy insurance and that, once they have insurance and gain experience using it, expansion of insurance is ensured. An approach which logically follows from this idea consists of subsidizing insurance for an initial period and hope for a sustained demand after the removal of the subsidy. Fitzpatrick et al. (2011) test this intuition with a health insurance product in Nicaragua. They find that, while a strong subsidy significantly increases take up at first, many of the clients drop out after its expiration. This confirms the intuition that those who purchase the insurance just because it is subsidized are least enthusiastic about the product. Even though overall take up is somewhat higher among those who initially received the subsidies than among those who did not once all subsidies are ended, the results do not support the idea of using initial subsidies as a costeffective way of increasing coverage. This finding is consistent with the work of Thornton et al. (2010), also conducted in Nicaragua, where less than 10% of the enrolled clients decide to renew their subscription after one year and after the expiration of the subsidies. One of the explanations they give is that, for low income households, "insurance is often perceived as a net gain only for those with healthcare costs above the price of insurance". Their results also indicate that those clients who received the highest subsidies were least likely to renew their contracts. who dropped out of a health insurance scheme reported not knowing where to make payments. While these examples may only point at ill-managed schemes, they do indicate that the effective transmission of information should not be overlooked in implementing an insurance. Therefore, putting renewal as a default option may partially alleviate these procedures and could ease renewal, as attested by the study of Cai et al. (2011) where take up is higher when people have to sign out, rather than sign up, for insurance. Such a default option needs, however, to be clearly communicated to clients as an undesired renewal can easily lead to overall distrust in the scheme. Overall, the fact that these practical problems limit renewal of insurance, suggests that a good follow up is crucial in building a sustainable insurance scheme. Ugarte (2012), for instance, finds that people are more likely to renew when they met a representative of the NGO in charge over the last year.

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5. CONCLUSION

Perhaps the most puzzling question regarding the impact of micro insurance is the following: why demand, and renewal rates, are so low when it may significantly increase the protection of the poor against adverse shocks.

Paradoxally, demand seems to be negatively correlated with risk aversion whereas it should be valued as a risk-coping instrument. This observation emphasizes the current limits of microinsurance. Various theories ofer possible explanations for the paradox; yet, evidence is far from decisive. In particular, lack of knowledge about the nature and technical characteristics of microinsurance products is not sufficient to account for low demand. Indeed, although literacy training appears to significantly enhance knowledge by shedding light on the specificities of complex insurance products, it is less efficient when it comes to enhancing demand. Several reasons may explain this result: first, according to the theory of financial education behaviour change, in order that knowledge can be translated into an effective purchase of the insurance product, individuals should also acquire the appropriate skills and attitudes towards insurance. Second, there is a lack of evidence regarding long run effects. Third, a deeper understanding of the logic and concept of insurance is necessary that is not actually provided by the current training methods.

Moreover, several other factors also influence the purchase decisions of individuals. Of course, demand responds to changes in the price of the product, with a higher take up when the premium becomes more afordable. This is especially true in a context where liquidity constraints are binding. However, a low price is not enough to obtain a high demand. A wide range of evidence illustrates how a lack of trust, either in the institution delivering the microinsurance product or in the product itself, may also constrain demand. Poor quality of the product is unanimously regarded as another factor lowering demand in the empirical literature. The evidence is, however, much more divided when it comes to the availability of credit. It is not clear whether individuals who have easy access to loans are more likely to subscribe.

In the light of these considerations, what can be done to enhance demand? In which field is further research needed? In the current context, two options are conceivable. The first is to rethink the insurance contracts in order to mitigate the various problems highlighted above. One could, for instance, imagine a double-trigger contract for index insurance, which would ofer frequent payouts, and, at the same time, cover big shocks. Further research in this direction is desirable. Different types of contracts could be randomized in order to observe how take up responds to such changes. Adapting the modalities by spreading the premium payments over several months, in order to relax liquidity constraints, is another possibility. We also discussed the potential of interlinking insurance with credit or savings. However, this may also imply negative consequences if, for instance, people are not aware or do not understand the product they buy. Moreover, we need to think about reliable ways to reduce the basis risk inherent to an insurance contract. To overcome the many other factors limiting demand innovations in microinsurance are necessary and should be imagined. Many of the conceivable ideas, however, give rise to trade offs between the necessary simplicity of the contract and the flexibility it offers to the client. For these reasons, they are unlikely to dramatically increase demand.

Therefore, we explored the potential of informal risk-sharing arrangements as an alternative way of increasing the attractiveness of microinsurance. We believe that more research is needed to exploit complementarities between formal and informal practices, for instance by offering insurance via the vehicle of a pre-existing, informal group.

In addition, trust in the insurance can be built in several ways: involving trusted organizations or individuals; ensuring sufficient payouts to create a positive experience; or adding government certification and regulation to avoid that defaulting insurers break trust in others. These are some promising ideas but more work is required to identify the most effective ways to enhance trust in the product itself and in the institution delivering the insurance.

Finally, more attention ought to be given to the problem low renewal rates which has been largely disregarded so far. One useful direction for research would be to look at the long term impact of literacy training on renewal rates. Are those who attended a training session less prone to be disappointed in the absence of payout and, therefore, more likely to renew? What is the scope and is there value added in a potential followup of the clients?

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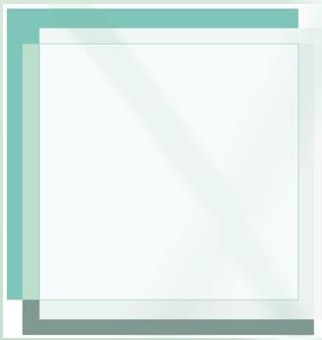

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Housed at the International Labour Organization's Social Finance Programme, the Microinsurance Innovation Facility seeks to increase the availability of quality insurance for the developing world's low income families to help them guard against risk and overcome poverty. The Facility was launched in 2008 with generous support from the Bill & Melinda Gates Foundation to learn and promote how to extend better insurance to the working poor. Additional funding has gratefully been received from several donors, including the Z Zurich Foundation and AusAID.