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**Research Report**

## Basis Risk and Trust in Index Insurance Provision: can groups provide an alternative?

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# Basis Risk and Trust in Index Insurance Provision: can groups provide an alternative?

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Based on work by Stefan Dercon, Daniel Clarke and Ruth Vargas Hill, presented at FERDI Workshop, June 2011



While risks remain high in many poor developing countries, attempts to sell insurance products to the poor have proved difficult. Relatively recent index-based insurance products, which provide payouts based on easily measurable indexes such as the level of rainfall, are no exception. When offered, few appear to be buying the products and careful studies have also noted that purchases are highly sensitive to prices, with uptake at premium prices which would just cover expected payouts relatively low (see Gine and Yang, 2009 for Malawi; Cole et al. (2008) for India, and Karlan et al (2010) for Ghana). These and other studies also find the rather surprising result that those who are more risk averse, and therefore should be expected to buy more insurance, are actually buying less.

A common explanation for these problems of uptake is related to the uncertainty about the nature of the insurance products (Karlan and Morduch, 2009): as people don't quite know or understand these products, they are cautious in taking them up. As a result, training in financial literacy is offered as solution (Cole et al. 2008). However, it is possible to offer at least partial alternative explanations that suggest uptake may be low as part of rational decision making in the view of the specific characteristics of these insurance products.

A first possible explanation is related to basis risk, inherent in index based insurance products. Classic indemnity based insurance makes a payout on the basis of an actual loss; an index-based insurance products makes a payout on the basis of an index correlated with a loss. For a good index insurance product, this correlation is hopefully high; but as long as the correlation is not perfect, basis risk is present. In particular, basis risk reflects the difference between the actual loss and the insured loss. It may therefore be the case that a loss is experienced by a farmer when the index does not show a loss, while a

payout could occur because the index shows a loss, while the farmer is not facing a loss.

The implication is that when a farmer has acquired an index based product, the downside risk (the worst case outcomes) may actually worsen, while the best case outcomes may actually improve. Clarke (2011) has shown that this would imply that highly risk averse farmers would not buy this product (as they are afraid of the increased downside risk), while some risk loving farmers may well acquire it (as the best case outcome improves as well). How important basis risk is as an explanation of some of the observed correlation between risk aversion and uptake of index-based products is an empirical question, and depends on the extent of basis risk in relation to the premiums, but it offers a rational explanation for lower uptake than one may have expected, even under full information.

A second plausible explanation relates to trust. Insurance products are very different from standard financial products offered to the poor, most notably microcredit. In the case of credit, cash is offered to clients by a financial institution, and the problem is for the financial institution to get it back. In the case of insurance, a financial institution first tries to get cash from clients, and the problem is then for the clients to get some payout in case of a loss. The result is that clients must have a high degree of trust in the financial institution before they will part with their premiums. One simple way of modelling trust is as if it is a form of the downside of basis risk: with some probability, a payout may not occur even if a loss is faced, as the insurance company defaults on its obligation with non-zero probability. Using the same reasoning as above, lack of trust would then imply that risk averse clients would not be keen to buy this products, as the downside risk may have increased after spending on a premium. Again, the extent to which this is true will depend on the nature of trust,

the premium size, risk aversion and the resulting downside risk. As many have already observed that trust is a serious problem in insurance uptake (Cai et al. 2009 for China; Cole et al. 2008 for India), then this offers a simple model to understand how it operates.

How can uptake then be improved? Two obvious solutions present themselves: improve the products by reducing basis risk and increase trust in these products. One can for example increase the spread of rainfall stations (so that smaller geographical areas depend on them, reducing basis risk) or have a repeated or permanent presence in the community to increase trust in the institution. In practice, this would increase the transactions costs of these products, making them more expensive or less sustainable. One option that may be more cost-effective is to use groups as a means of contracting and distributing insurance products. Using pre-

existing groups would offer a more institutionalised partner, that may feel stronger in enforcing contracts and therefore overcome some of the trust problems inherent in contracting many individual poor farmers. Furthermore, provided that basis risk is not perfectly correlated among all members of communities or groups (for example, crop losses are not perfectly correlated with rainfall at the village level), then contracting a group will allow these members to insure some of the basis risk via a group policy. Payouts could flow to the group, but they can then use their own superior private information to ensure those with higher losses are compensated more than those with lower losses, for a given payout based on the index. Whether this will be possible and whether it will make any difference is currently investigated in a large field-study in Ethiopia and subsequently in Bangladesh; results from these studies will begin to become available during 2012-13.



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