



**Paving the Way Forward for Rural Finance
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Discussant Reaction Paper

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**“Risk Management Challenges in Rural Financial Markets:
Blending Risk Management Innovations with Rural Finance”
by Jerry Skees**

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Introduction

Prof. Skees brilliantly extends the Crop insurance discussion to the rural finance realm and blends crop index insurance methodology and tools with rural finance. The idea is how to improve depth and breadth of rural finance penetration through index insurance tools. Index insurance tools address systemic or covariate risk which abound in agricultural production and are major constraints to rural access to finance.

The bottom-line is that weather index and other index insurance work if the index is transparent, reliable and verifiable in the future and the correlation between the index and the insured party's exposure can be demonstrated in a sound manner. The nature of the index insurance, that is the inherent basis risk or potential mismatch between insured's losses and insurance payout need to be clarified to the insured party or borrower. In other words the crucial factors are the index and basis risk. Therefore I will a) focus on an Indian example of index insurance integration into crop loans and b) discuss the basis risk issue where I redefine the issue in terms of Farmers Value-at-Risk (VAR).

India: Monsoon indexed crop loans

One way to blend index insurance and rural finance is to integrate weather index insurance into the loan agreement. Indian banks seek to expand their crop lending to non-irrigated areas but are constrained by monsoon risk. The World Bank is undertaking a larger study on access to finance and is also currently exploring the feasibility of these weather index based crop loan insurance instruments for four commodities and districts in India.

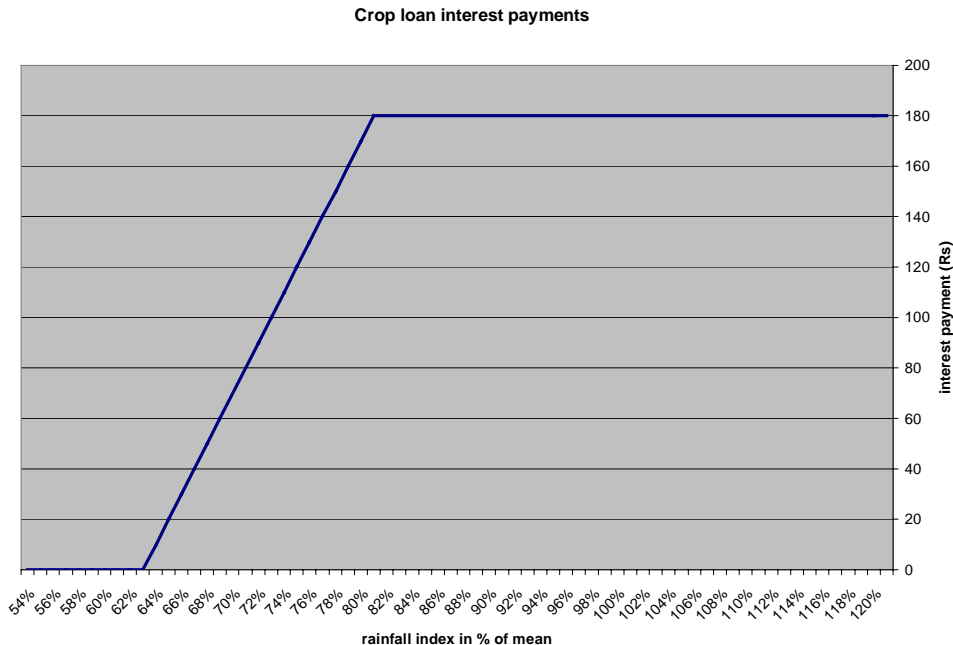
A large Indian bank, ICICI Bank provides crop loans through various agents in rural areas, one of them is Mahindra Shubhlabh (MSSL), an agricultural services and input provider, a one-stop shop for farmers. Part of the contract farming package deal that MSSL has with its farmers is a crop loan with ICICI Bank. MSSL effectively acts as an agent of ICICI Bank. Thanks to the close relationship between MSSL and the farmers that includes backward linkages to output buyers the default risk due to moral hazard is limited. Loan default rates are lower than those of comparable banks without these strong agency arrangements.

Covariate risk is still a major risk though for the existing loan portfolio as well as the expansion areas, loan defaults or NPLs are triggered mainly by monsoon failure or other calamities. Farmers find they are unable and to some extent unwilling to pay interest on their crop loans in a severe drought year and seek to reschedule principal repayments.

ICICI Bank in conjunction with ICICI Lombard, the ICICI Groups insurance company now proposes in a few pilot cases to index interest payments to rainfall measures. The borrower pays a higher interest rate in normal years that comprises the weather index insurance premium, but in case of a severe rainfall deficit and in one case

excessive rainfall in critical periods the borrower pays no or only partial interest on the loan. The desired effect is to keep the farmer bankable even throughout drought years.

For example in Ujjain, Madhrar Pradesh, crop loans of 2000 Rs with embedded weather insurance to soya farmers would attract an interest rate of 20.5% instead of 17.5%. While the overall rate goes up due to the weather insurance premium, the actual



interest rate will be lowered with the weather risk stripped out. The insurance kicks in when cumulative weighted rainfall during the critical growing periods falls below 80% of the mean. The farmer receives interest payment relief of 10Rs per mm of rainfall index deficit. In the case of a 75% of the mean rainfall year, the interest payment would be 130 Rs instead of 180 Rs. This interest payment relief is an important break for the farmers strained budget after a failed harvest.

Basis Risk and Farmers Value-at-Risk

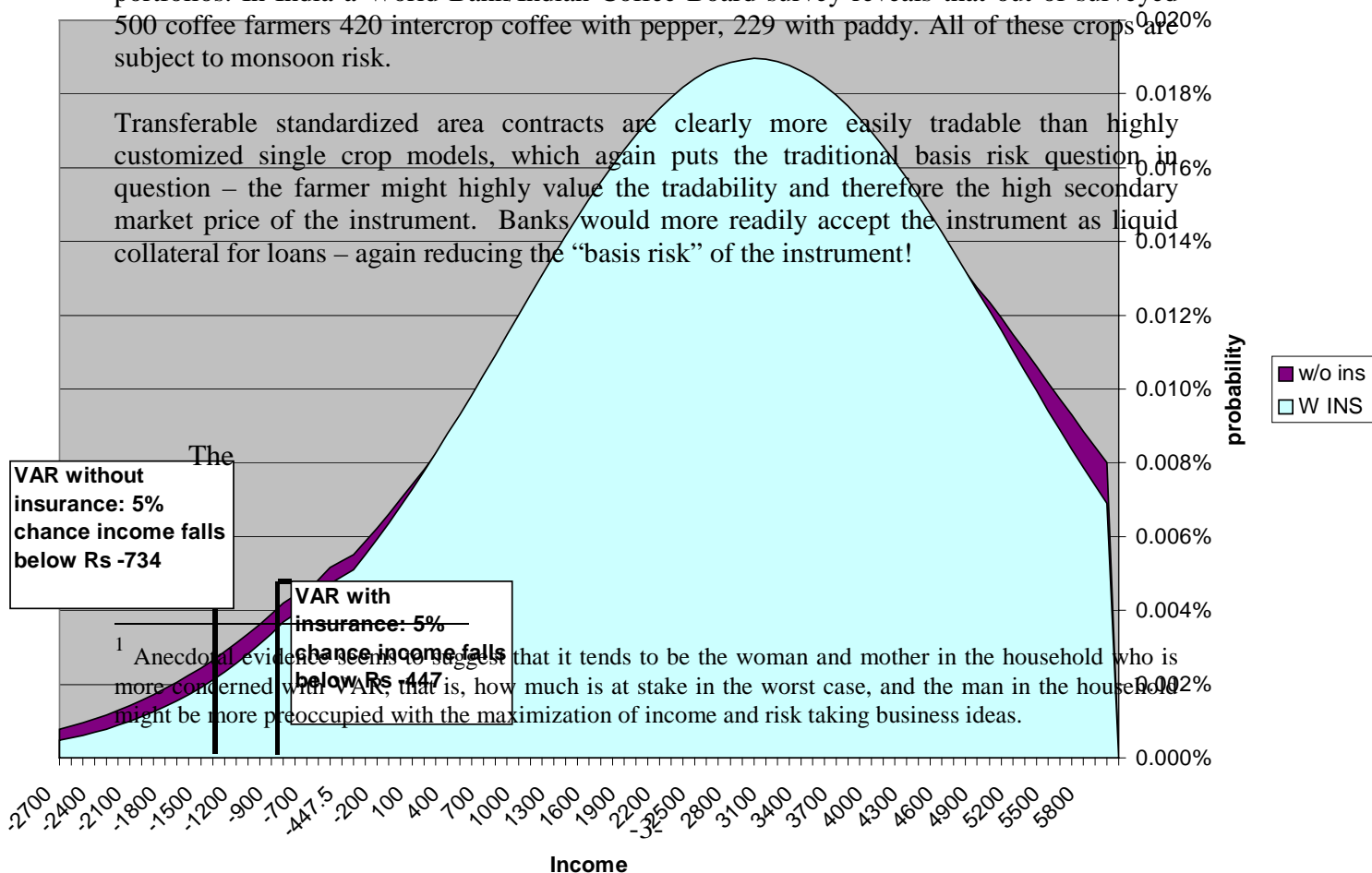
A major concern with weather index and other index-based insurance is basis risk, that is the potential mismatch between insurance payouts and the farmers losses. Jerry Skees writes that *“The effectiveness of index insurance as a risk management tool depends on how positively correlated farm-yield losses are with the underlying area yield or weather index.”* This concern relates to the question whether weather index insurance can substitute for traditional crop insurance and “indemnify” the farmer for his losses. The answer given is usually along the following lines: basis risk can be managed if 1) the correlation between index and yields is high and the index is well measured and 2) efficiency gains with index insurance allow for lower deductibles which partially compensates for the basis risk.

Our experience shows that the relevant question is whether the weather index insurance payout effectively reduces the insured's Value at Risk, his VAR, rather than compensating for a single crop loss only. Value at Risk is a measure of potential dollar loss from an adverse change in prices occurring in a normal market environment. The farmer's value at risk is an effective measure of his overall vulnerability, his exposure to shocks, such as a wedding, a disease or a big drought. The farmer is interested in the maximization of his overall income while minimizing his VAR. Overall income comes from multiple sources, such as off-farm labour, livestock as well as field and perennial crops. The diversification of income sources is clearly a way of managing risks and minimizing VAR by sacrificing some upside that could come with specialization and economies of scale effects.

Once we understand the farmer's value at risk and his objective function which allocates investments among VAR minimization and income maximization according to the farmer's risk aversion, we can redefine the basis risk issue and the weather index insurance discussion. The message is that certain systemic shocks, in particular weather, affect ALL farmer activities, not only one crop. In a severe drought all rural economic portfolios suffer, the herder who has some land, the dentist who is also a wheat farmer. The farmer cares about the insurance effect on his income over VAR¹.

Anecdotal evidence also supports the hypothesis that rural entrepreneurs understand the portfolio coverage effect of weather index insurance. In Morocco a dentist expressed his willingness to pay for weather insurance, mainly because in a drought both the amount of patient visits and the yields of his secondary farming activity diminish. The sunflower association asked for a simplification of a highly customized weather insurance contract, presumably because that makes the contracts a better insurance for the overall farmer portfolios. In India a World Bank/Indian Coffee Board survey reveals that out of surveyed 500 coffee farmers 420 intercrop coffee with pepper, 229 with paddy. All of these crops are subject to monsoon risk.

Transferable standardized area contracts are clearly more easily tradable than highly customized single crop models, which again puts the traditional basis risk question in question – the farmer might highly value the tradability and therefore the high secondary market price of the instrument. Banks would more readily accept the instrument as liquid collateral for loans – again reducing the “basis risk” of the instrument!



Value at Risk Model at the heart of the insurance discussion allows for a better choice of instruments and indexes. The combination of price and weather indexes into a revenue index might be the right choice for coffee farming areas, where the lack of cash income from coffee affects the areas economies. Clearly weather index insurance seems to be a powerful hedge for a farmer that intercroops coffee with pepper and also farms paddy – as it significantly reduces his overall VAR. In weather exposed staple food growing areas with highly diversified and specialized activities the right insurance trigger might be a basket of weather stations.

	Single crop VAR without Insurance	Single crop VAR with Insurance
stdev	2344.369	2104.7
Mean	3,122	3,010
VAR	- 734	- 447.5
MEAN/VAR	4.25	6.73

Conclusion

Jerry Skees paper brilliantly shows the relevance of index insurance instruments for rural finance. This discussion paper adds one possible application of his ideas and an addition to his risk measuring and basis risk model, the Value at Risk Model. This is a hypothesis whose real value has to be tested further.