

8. Risk Management for the Small Farmer

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Introduction

A majority of Indian farmers are smallholders and the situation facing them is very challenging and getting more so by the year. Some of the causal factors appear to be: fragmentation of land holdings; degradation of soil quality; inadequate level of investments; poor productivity; high exposure to rainfall risks; high exposure to commodity price risks; very low levels of "equity capital" with the small farmer to absorb these risks; high levels of leverage; poor quality of seeds; very poor access to information regarding sowing practices, choice of crops and market trends; and very poor access to credit.

The farmer is struggling to respond to these myriad challenges as best as she can by diversifying away from food grains to horticulture - which is particularly well suited to small landholdings and diversifying her sources of income - the proportion of rural GDP coming from non-farm sources is rising rapidly. And, the government has also sought to help the farmer respond by continuing to offer a Minimum Support Price (MSP) on several crops; implementing the National Rural Employment Guarantee Act (NREGA); heavily subsidising crop insurance; implementing a massive loan waiver scheme for farmers with over-due loans to banks and continuing with the priority sector requirement and (recently) making it even more important for the small farmer to be targeted and requiring the loans to be made at very low rates of interest.

It is our view that while many of the steps taken by the government when viewed discretely are very beneficial to the small farmer particularly in the short-run, taken together they do not represent a coherent policy response that is designed to have a long-term systemic impact on the life of the small farmer. For example low interest rates on priority sector may be encouraging higher levels of capital intensity in farming than is optimal given the relative availability of labour; subsidised crop insurance may encourage farmers to systematically underestimate rainfall risk in their cropping decisions and the massive loan waiver may make it harder for farmers to get access to credit in the future. An excessively high MSP which is provided for free to the farmer represents a Deep-In-The-Money Put Option that is being offered to the farmer as a conditional cash transfer only if she takes the "incorrect" decision of planting a crop for which there is inadequate demand! Unless the expectation is that she will not exercise the Put Option it would perhaps be better to offer her unconditional cash transfer instead and let her plant a different crop.

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In our view many of these interventions seek to subvert market forces in order to protect the small farmer but while they may indeed provide relief in the near-term, in the long-run they are not sustainable interventions² and may even end up exacerbating the problem.

Market Based Interventions

A key decision making point for the small-holder farmer is around the time of sowing her crop. She has to make a number of decisions at that point and take on a number of uncertainties without necessarily possessing the competency to assess them correctly or to protect herself against their impact. Before she makes the decision she needs to be aware, based directly on her experience as well as the nature of the risks that she faces, what a good set of choices for her might be. She would need good advice on cropping practices based on her soil type and crop choice and a firm estimate of what she would earn if she was able to plant a certain crop and fully hedge all the risks away. Once she has made the decision she needs to be able to actually hedge all these risks and be virtually guaranteed a good return on her investment - this will make it possible for her to access bank credit even with low levels of "equity" since the returns are now virtually certain.

Some of these interventions include:

1. Improving Spot Price discovery for the smallholder farmer³.
2. Addressing the Access to Credit and Warehousing challenges being faced by the large farmers and traders⁴. This would include Warehouse Receipt Finance (WRF) for the larger trader - the argument being that there is a great deal of underlying price risk⁵ even around the seasonal pattern and it would be difficult for the small farmer to "play" this market.

² Sethi (2006) presents the case study of the Vidarbha cotton farmers and how they suffered when the MSP for cotton was suddenly reduced.

³ Many steps are involved here - all of them eminently feasible. These include encouraging channels such as the CSCs and bank branches to act as links between the smallholder farmer and spot exchanges, development of transportation exchanges so that there is the possibility of remotely located buyers entering the spot market through the agency of the exchange and making all the Mandi infrastructure available for testing, grading and storage of commodities to the small farmer so that she is able to trade directly on an exchange with her warehouse receipt. Also see Fernandes and Mor (2009) for a case study of such an effort for the Castor crop in Mehsana District of Gujarat.

⁴ Even though the presumption is that these players would act entirely in a speculative and profit oriented manner, if they are required to interact with the smallholder farmer only through a formal exchange and not on a bilateral basis many of their monopsonistic rents would disappear but instead they would be able to deploy their skills and capital towards smoothing out the seasonal trends that are observed by aggressively purchasing and storing commodities around harvest time and selling them during the off-season to the point that the only difference between the in-season and the off-season prices would be the cost of storage and financing. They could also effectively become writers of the call and put options that would be necessary if indeed options are offered to smallholder farmers.

⁵ A typical agricultural commodity price series, whatever the frequency, exhibits considerable variability and positive autocorrelation (Tomek & Peterson, 2001). There are occasional spikes, i.e., prices jump abruptly to a high level relative to its long-run average. Thus the distribution of observed prices is skewed to the right and, in many cases, displays substantial kurtosis (e.g., Deaton & Laroque, 1992; Myers, 1994). Price changes are nonlinearly dependent; i.e., higher moments are correlated (e.g., Yang & Brorsen, 1992). Given the complexity of these time-series features, modelling commodity prices has been a daunting task. Economists have not reached a consensus about the best model for commodity prices. Besides the model itself could differ from commodity to commodity.

3. Providing the smallholder farmer with good weather forecasts, rainfall insurance contracts and good advice on cropping patterns⁶.
4. Developing and permitting a range of hedging and price risk management products and aggregation services for smallholder farmers including options on spot and futures prices.

The rest of the paper focuses on this last issue and seeks to discuss in some detail the rationale for this as well as the mechanisms that need to be put in place for this to happen.

Hedging and Insurance Instruments for Smallholder Farmers

There are broadly two types of instruments:

1. Hedging Instruments: Futures Contracts and Forward Contracts.
2. Insurance Instruments: Options Contracts, Insurance Policies, Price Guarantees.

Many would argue that farmers ought to restrict themselves to their core competence in farming and not indulge in speculation. However in the absence of a readily accessible hedging mechanism, the Indian farmer is a speculator in any case. From the point of time she sows the seed till the point of time she sells the crop in the market, she is *long* on the commodity; unless she hedges her *long spot* exposures by selling her produce in a forwards, futures or options market. Farmers have no access to this market in India. Most farmers, who sell their standing crop to traders and other local financiers before harvest, do so at sub-optimal rates under tremendous liquidity pressure and not from the point of view of hedging their exposure. Farmers who have no immediate liquidity concerns store their produce in their backyards in the hope of obtaining a better price in the future. So the argument that farmers must not engage in speculative activity because it is not their core competence is one that must be thought through in light of alternatives available.

Futures and Forward Contracts

Since their launch in 2002, trading volumes in agricultural futures (for the most part) have spurted. Table 8.1 gives the change in volumes over a three year period. NDCEX volumes increased from Rs. 1,519,165 million in 2004 to Rs. 3,553,113 million in 2009.

Table 8.1 Futures Contracts in Select Commodities

Commodity	Traded Quantity	
	2005 (MT)	2008 (MT)
Castor Seed	1,165,840	675,370
Maize	1,566,850	2,755,750
Pepper-Malabar	687,863	2,635,344
Soy Bean	11,351,610	35,877,550

⁶ A number of steps are underway here and several more need to be taken. A firm: www.weather-risk.com and a research centre: www.ifmr.ac.in/cirm are working on rainfall tracking and insurance design challenges and a new centre: the IFPRI-IKP Centre for Advancement in Agricultural Practice in Hyderabad will be working on providing high quality scientific inputs for smallholder farmers.

Participants on the exchange include grain producers, grain millers, oilseed processors, feed manufacturers, food companies, grain merchandisers, importers, exporters and speculators. However basis risk still exists. Table 8.2 below gives the correlation of the spot (CMIE polled) and futures prices (one-month futures contracts on NCDEX) for some commodities traded in India. As can be seen, basis risk does exist and using these contracts would not result in the most efficient hedging. However empirical evidence across other markets in the world shows that as markets mature, these numbers improve making the contracts more attractive for hedging.

Table 8.2 Correlation of Spot and Futures Prices

Commodity	Correlation
Castor Seed	0.54
Maize	0.26
Pepper-Malabar	0.50
Soy-Bean	0.54

But these markets are only accessible to large traders and producers. The small farmer is still left with no choice but to take the exposure on her commodity and rely on the MSP provided by the government. A recent survey done by the National Sample Survey Organisation (NSSO) shows that 71 per cent of farmers in the country are either unaware or do not understand the concept of minimum support price.

Also futures market offer only standardised contracts of fairly large sizes and are much more suitable for the aggregators, traders and large farmers and not at all appropriate for the small farmer - forward contracts offered by risk aggregators such as banks would, for example, be much more appropriate for their hedging needs.

Options Contracts and Price Guarantees

As far as options are concerned, trading in options on agricultural commodities within the country is prohibited. The Reserve Bank of India recently relaxed its regulations on hedging in overseas markets and has provided companies with a wider range of options relating to price risk management. The RBI has also permitted hedging on international exchanges in the case of commodities procured or sold locally.

Trading in options contracts on agricultural commodity futures began in the US in 1984. These contracts though not existent in the Indian market, are useful to study because of their interesting payoffs. Options on futures require the delivery of an underlying futures contract when exercised. From a buyer's point of view, the risks are limited. However these positions involve an immediate cash outflow towards the premium. From a sellers point of view, short position in options on futures are easier to delta hedge because it involves trading in the underlying futures contracts which are often more liquid than the spot and can be traded at almost one-tenth the transactions costs of trading in the spot. Basis risk does exist; however, options on futures contracts offer an attractive alternative risk-management mechanism.

Agricultural options on spot prices can enable farmers to obtain a similar price protection as that available through government run agricultural support programs such as MSP. Ever since the early days of options, economists have argued that price support programs and target price programs available to farmers in many countries are actually options markets

[Gartner(1981), Belongia (1983) and Petzel (1984)]. In economies where traded options markets exist, the farmer pays for the protection. In the absence of these markets, the protection is paid for by taxpayers. The MSP program is actually a put option whereby if the farmer meets all the requirements, she is guaranteed a price by the government and an undertaking that all her production will be bought at the predetermined price. The farmer is thus the buyer of the put option while the government is the seller of the put. In short, both the MSP as well as the traded option gives the farmer a limited downside (the government determined price in an MSP environment and the exercise price of the option in an options markets environment) and an unlimited upside (if prices are higher than the MSP or the strike price of the option, she can chose to sell to the government or exercise her option and sell in the open market instead). In addition, options also give the farmer a say in the amount of insurance she would like to avail of by choosing the strike price of the puts she would like to purchase. The economic rationale for using options to achieve the same means is that trading in options would lead to price movements and price equilibrium. MSP on the other hand restricts price movement and does not result in equilibrium. Thus using options market would give price signals and in turn lead to effective allocation of resources.

Conclusions

It is our belief that systematic steps that are taken to harness market forces in support of the small farmer would not only provide relief to the small farmer in the near term but more importantly work in consonance with market forces and therefore feed into more sustainable longer term solutions for the farmer. These steps could include improvements in the spot price discovery process, providing access to credit, development of reliable storage infrastructure, providing weather and crop related information and advice, and developing access to hedging and price risk management.

While there may still be a need for the government to provide subsidy, it should support the orderly development of a market that the small farmer any way faces, and ensure that she does so on terms that are more equitable. The key challenge in our view is to protect the farmer from short-term shocks and provide her with the best possible returns on her farm related investments while making her fully cognizant of longer term market dynamics so that she can gradually adapt to them.

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