Essays on Crop Insurance in India

Abstract of Thesis

Subhankar Mukherjee

This thesis studies the barriers to and impact of crop insurance adoption in India, in three separate but interrelated essays. The first essay critically examines the state of crop insurance in India from its inception, and points out the reasons for its low take-up rate. The second essay focuses on the means to improve coverage of crop insurance by analysing the factors that affects awareness about crop insurance, and also its take-up decisions. Finally, the third essay investigates the impact of crop insurance adoption on crop productivity.

Motivation

Agriculture in India faces substantial risk both in the production process as well as marketing process. Yet, adoption of formal insurance mechanism has not really taken off in the country. Most farmers still rely on informal risk-coping mechanisms rather than formal risk managing mechanisms for mitigating risk arising out of crop damage. The informal risk coping strategies are generally ex-post, i.e. they trigger after a crop loss. The extant literature has pointed out to the inadequacy of informal insurance in Indian villages (Townsend, 1994; Gaurav, 2015). This is especially true because of the covariate nature of agricultural risk; since almost all farmers in an area face crop loss at the same time, the risk cannot be mitigated through local asset markets.

On the other hand, formal agricultural insurance has several advantages over traditional and informal insurance practices described above. First, a formal market based mechanism has the potential of spreading risk spatially. Second, a market based insurance can spread risk temporally as well. This is especially important for smaller countries where weather variation may not be significant across regions. Third, crop insurance can help maintain farmers' credit

worthiness. Fourth, crop insurance can encourage farmers to shift investment on inputs away from low yield low volatility crops to riskier crops which give higher profitability. Evidence of such shift has been found among Indian farmers (Cole, Giné, & Vickery, 2017; Mobarak & Rosenzweig, 2012). Fifth, formal mechanisms to cope with risks can be better for economic growth and social mobility (Munshi & Rosenzweig, 2016). Finally, crop insurance may be an effective tool in managing production shocks related to climate change (Falco, Adinolfi, Bozzola, & Capitanio, 2014; Rao, 2010).

Given these advantages of formal insurance, agricultural insurance as a policy tool has gained particular attention among policy makers across the world, as well as in India. In 2016, the government of India launched a new crop insurance programme with the aim of covering half of the cultivated area under insurance within a short timeframe. The budgetary expenditure toward crop insurance was also increased by almost 300%, from 3000 crore rupees in 2015-16, to 11,000 crore rupees in 2016-17[1].

Essay 1: State of Crop Insurance in India

Against this backdrop, in the first essay we critically examine the state of crop insurance in India Specifically, we pursue the following set of questions. First, what is the performance of crop insurance programmes across the world? It is important for the crop insurance schemes to become financially self-sustaining in order to become viable in the long run. But what does the evidence show? Second, what is the state of crop insurance in India? Even if it is understood that crop insurance can be a good tool for mitigating farm households' risk, do farmers actually adopt it? And third, what are the impediments to its higher coverage? We analyse the design as well as implementation related constraints that might bind in achieving the intended goals of the schemes.

[1] See expenditure budget for Department of Agriculture, Cooperation and Farmers Welfare in the following website: https://www.indiabudget.gov.in. Last accessed on 2nd August, 2018.

On the status of crop insurance across the world, we find that most countries provide subsidies, either in the form of premium subsidy, or in the form of indemnity subsidy, or both. The situation in India is no different; the crop insurance schemes in the country are still far away from becoming self-sustaining. However, it must be noted that financial performance of the schemes have been improving over time. Second, coverage of crop insurance among farmers has remained low in India even with the existence of crop insurance schemes for over four decades. We find that presence of basis risk (difference between covariate risk and idiosyncratic risk that a farmer faces) associated with approximate loss calculation and linking credit with crop insurance are the main design flaws which impede take-up. On the other hand, delay in claim settlement after crop loss, and farm loan waivers announced by state governments appear to be the main barriers to successful implementation of the programmes.

Our study suggests that awareness about crop insurance programmes may be the biggest challenge for achieving high level of coverage. We find, using NSSO 70^{th} round data on Situation Assessment Survey of Farm Households, that close to 60 percent farmers are not aware about crop insurance schemes. This phenomenon motivates the research for the second essay of the thesis.

Essay 2: Determinants of Awareness about Crop Insurance and Take-up of Crop Insurance in India

The latest Economic Survey, as well as several other government reports have emphasized the importance of building awareness for improving crop insurance coverage in India (Economic Survey, 2018; Ministry of Agriculture, 2011; Ministry of Agriculture, 2014). Awareness building for crop insurance is especially important since insurance is a sophisticated financial product, and in a developing country like India, where penetration of any kind of insurance is low (Reserve Bank of India, 2017), farmer households may not have adequate understanding of the operational intricacies of a formal risk management instrument like crop

insurance. In this essay, therefore, we investigate this issue. The essay is divided into two sub-parts. In the first part, we investigate the factors that could determine farmers' awareness about crop insurance. And in the second part, we look into the factors that could determine farmers' take-up decisions, conditional on farmers being aware.

We find that the farmers who attended agricultural training and/or received technical advice from public sources (such as Krishi Vigyan Kendra, TV/Radio campaign etc.) or even from private sources (such as progressive farmers) are considerably more likely to be aware about crop insurance, as well as more likely to insure their crops. On the other hand, higher financial inclusion in the area of residence of the farmers may not affect either awareness or take-up. These results are robust after controlling for several individual level and household level characteristics, as well as district level fixed effects. In India, providing relevant technical knowledge to farmers is undertaken through agricultural extension services. We therefore argue that utilizing the existing agricultural extension services infrastructure can go a long way in improving awareness about crop insurance, and in turn its coverage.

Essay 3: Assessing the Impact of Crop Insurance on Crop Productivity

In the third and final essay of the thesis, we try to investigate the impact of crop insurance on farmers' welfare. We have not noticed enough literature focusing on the impact of crop insurance, but we think this is an important line of enquiry, because it helps us assess whether crop insurance schemes are beneficial to farmers or not. In our study, we considered a sample of paddy growing farmers from all agro-climatic regions in India to analyze if crop insurance can improve productivity of the crop. The sample comes from the latest Situation Assessment Survey of farm households conducted by the NSSO. We found that there is a positive impact of crop insurance adoption on crop productivity – farmers who insured their paddy crop experienced approximately 8 percent higher productivity compared to those who did not. This result qualitatively holds after controlling for several plausible confounders, at

individual level, household level, and district level fixed effects, and also after addressing possible endogeneity issue. We also tried to identify the channel through which the improvement in crop productivity might be taking place. We found that farmers who insure their crops spend higher amount per unit area on input expenditure. It is often discussed that hidden actions by farmers – moral hazard and adverse selection – are major deterrents toward development of crop insurance market, especially in developing countries. The results in this essay contributes toward understanding whether such behaviour is noticed among Indian farmers when they insure their crops.

References

Cole, S., Giné, X., & Vickery, J. (2017). How Does Risk Management Influence Production Decisions? Evidence from a Field Experiment. *The Review of Financial Studies*, *30*(6), 1935-1970.

Economic Survey. (2018). Economic Survey 2017-18, Chapter 06. Ministry of Finance, Government of India.

Falco, S. D., Adinolfi, F., Bozzola, M., & Capitanio, F. (2014). Crop Insurance as a Strategy for Adapting to Climate Change. Journal of Agricultural Economics, 65(2), 485-504.

Gaurav, S. (2015). Are Rainfed Agricultural Households Insured? Evidence from Five Villages in Vidarbha, India. *World Development*, *66*, 719–736.

Ministry of Agriculture. (2011). Report on Impact Evaluation of Pilot Weather Based Crop Insurance Study (WBCIS). Department of Agriculture & Cooperation, Government of India, New Delhi.

Ministry of Agriculture. (2014). Report of the Committee to Review the Implementation of Crop Insurance Schemes in India. Department of Agriculture & Cooperation, Government of India, New Delhi.

Mobarak, A. M., & Rosenzweig, M. (2012). Selling Formal Insurance to the Informally Insured. Economic Growth Center Discussion Paper, No. 1007, Yale University, New Haven, CT.

Munshi, K., & Rosenzweig, M. (2016). Networks and Misallocation: Insurance, Migration, and the Rural-urban Wage Gap. American Economic Review, 106(1), 46-98.

Rao, K. N. (2010). Index based crop insurance. *Agriculture and agricultural science procedia*, 1, 193-203.

Reserve Bank of India. (2017). Report of the Household Finance Committee. Mumbai: Reserve bank of India.

Townsend, R. M. (1994). Risk and Insurance in Village India. *Econometrica*, *62*(3), 539–591.