

The Impact of Insurance Provision on Households' Production and Financial Decisions

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Abstract

Taking advantage of a natural experiment and a rich household-level panel dataset, this paper tests the impact of an agricultural insurance program on household level production, borrowing, and saving. The empirical strategy includes both difference-in-differences and triple differences estimations. I find that first, introducing insurance increases the production area of insured crops by around 15%; second, provision of insurance raises credit demand by 25% but has no impact on credit supply; third, while the policy does not affect either the rate or the level of household saving, farmers tend to hold more flexible-term savings after the insurance provision; fourth, the effects of insurance policy on production and savings persist in the long-run, while that on borrowing diminishes and becomes less significant over time; fifth, the impact of insurance is bigger on smaller farmers and on households with lower migration remittances.

Poor households in rural areas are exposed to substantial weather shocks. To protect themselves from these risks, rural households undertake costly risk management and coping strategies such as avoiding high-risk high-return agricultural activities, holding precautionary savings, and reducing investment in production, etc., this together with negative shocks can lead to highly variable household income and persistent poverty. As a result, in recent years, many developing countries have started to develop formal insurance markets. However, insurance take-up is usually surprisingly low even with heavy government subsidies. While there is a growing literature studying ways to improve insurance demand (Cole et al. (2011), Cai et al (2013), Cai and Song (2012)), rigorous evaluations of the impacts of insurance provision are quite rare. In this study, I analyze the impact of formal insurance provision on households' production and financial behavior using data from a natural experiment in rural China, where insurance was provided to selected farmers in selected industries.

The program I am studying is a weather insurance policy for tobacco farmers offered by the People's Insurance Company of China (PICC) starting from 2003 in one county of Jiangxi province. It was expanded to more areas afterwards and was implemented province-wide at the beginning of 2010. Purchase of insurance was made compulsory for tobacco farmers in treatment regions. I take advantage of the variation in insurance provision across both regions and household types (tobacco households vs. other households) to estimate the effect of insurance provision on household behavior, focusing on the initial stage of the policy in 2003. The main data used in this analysis is a household level panel dataset (2000-2008) provided by the Rural Credit Cooperatives (RCC, the main rural bank in China).

I use both difference-in-differences (DD) and triple differences (DDD) to identify the in-

surance impacts. I use tobacco households outside the treatment region to control for industry-specific trend in outcomes, and use non-tobacco households both within and outside the treatment region to control for region-specific trends in absence of the policy intervention. Then the extra changes in household behavior for tobacco households in treatment regions can be attributed to the insurance policy implementation.

According to Table 1, I find that first, insurance provision has a statistically significant positive effect on production of the insured crop: it raises tobacco production by around 15% (Column (1)). Second, insured households tend to borrow more from the rural bank for investment in tobacco production, and the magnitude of the effect is about 25% (Column (2)); however, the impact on credit supply is not significant (Column (3)). Turning to results on saving, I find that although the sign of impact is negative, the effect is not precisely estimated (Column (4)). But there is evidence that households tend to hold more flexible-term rather than fixed-term saving once their productions is insured (Column (5)). Estimation of dynamic effects shows that while the impact of insurance policy on production, borrowing, and saving became significant shortly after the policy was implemented, the impact on production and saving was persistent through the end of the sample period, while the effect on borrowing decreased and became insignificant towards the end of the sample period. Heterogeneity tests suggest that insurance provision has a larger impact on smaller farmers.

The policy implication of the results from this study is that offering formal insurance to farmers has important impacts on households' production, borrowing, and saving behavior. Farmers tend to invest more in the production of a more profitable cash crop once it is insured. More favorable credit supply policies (such as a

lower interest rate) to insured farmers will help further increase the magnitude of insurance impacts. Given the large and persistent impacts of the insurance policy, it is important to find cost-effective ways of improving voluntary insurance demand.

▶ Reference

- **Cai, J., A. de Janvry, and E. Sadoulet** (2013), "Social Networks and the Decision to Insure". Working paper, University of Michigan and UC Berkeley.
- **Cai, J. and Changcheng Song** (2013), "Insurance Take-up in Rural China: Learning from Hypothetical Experience," Working paper, University of Michigan and National University of Singapore.
- **Cole, Shawn, Petia Topalova, Xavier Gene, Jeremy Tobacman, Robert Townsend, and James Vickery** (2011), "Barriers to Household Risk Management: Evidence from India". Working Papers id:4293, eSocialSciences.

Table 1. Effect of Insurance Provision on Production, Borrowing, and Saving

VARIABLES	Production	Borrowing		Saving	
	Area of Tobacco Production (mu) (1)	Loan Size (10,000 RMB) (2)	Monthly Interest Rate (%) (3)	Saving Rate (4)	Flexible-term Saving (5)
After (= 0 if 2000-2002, = 1 if 2003-2008)	1.663*** (0.473)	0.049 (0.061)	-0.573*** (0.103)	0.007 (0.02)	-0.028 (0.025)
Insurance (= 0 if control region, = 1 if treatment region)	1.039** (0.425)	-0.093*** (0.012)	0.373*** (0.059)	0.014* (0.008)	-0.155* (0.087)
Tobacco Household (= 0 if No, = 1 if Yes)		-0.164*** (0.026)	-0.109 (0.087)	0.013 (0.01)	-0.164 (0.1)
After* Insurance	0.84** (0.352)	0.084 (0.056)	-0.452*** (0.091)	0.02 (0.018)	0.039 (0.03)
After* Tobacco Household		0.098** (0.041)	0.326* (0.171)	-0.022 (0.023)	-0.007 (0.033)
Tobacco Household* Insurance		0.023 (0.015)	-0.383*** (0.071)	-0.014 (0.01)	0.053 (0.099)
After* Insurance* Tobacco Household		0.088* (0.048)	-0.132 (0.19)	-0.011 (0.023)	0.084*** (0.033)
Pre-policy Mean of Outcome Variables	5.37	0.343	7.621	0.069	0.328
No. of Observation	31183	9263	8219	33808	32365
Household Characteristics	Yes	Yes	Yes	Yes	Yes
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes
R-squared	0.0967	0.0199	0.131	0.0405	0.0681

Notes: Bootstrap clustered standard errors in parentheses. Saving rate is defined as annual net saving divided by income. Flexible-term saving is calculated by the ratio between net saving in checking account and the total net saving. *** p<0.01, ** p<0.05, * p<0.1



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