



Risk, under-investment in agricultural assets and dynamic asset poverty in rural China



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ABSTRACT

This paper seeks new insight into the reasons for persistent hardship in some Chinese rural households from the perspective of assets, stressing the long-run implications of shocks and risk on households' agricultural asset holdings. Households show a tendency to hold onto substantial savings to cope with possible negative shocks, and are predisposed to specialize in low-risk low-return agriculture under ex ante credit constraints and the fear of low welfare outcomes if production plans should be unsuccessful. Overall, households' responses to uninsured shocks and risk cause inefficiencies and deficiencies of investment in agricultural asset accumulation. Multiple equilibria in the dynamics of household agricultural assets as well as under-investment as a response to risk make some households less able to earn income above the poverty line and keep them trapped in long-term low-equilibrium asset poverty.

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1. Introduction

According to official governmental figures, over the last three decades, 230 million people have escaped poverty in rural areas of China. This has been reflected in a sharp reduction in the poverty headcount ratio from 30.7% in 1978 to 2.3% in 2006. However, it is also worth noting that 80% of this poverty reduction happened before 1996.¹ Ravallion and Chen (2007) find that, since the late 1990s, poverty appears to have become more “concentrated” and “persistent” as the incomes of the rural poor have stagnated while others' incomes have risen, with actual increases in rural poverty in 1999, 2000 and 2001 relative to 1998.

But why has poverty persisted in rural China? Studies of rural China and from the rest of the world (sub-Saharan Africa in particular) might help answer this question. Studies of rural China have identified explanations for the persistence of rural poverty: a) inadequate endowments, such as those associated with living in remote or otherwise unfavorable geographical locations (Jalan & Ravallion, 2002), which reduce the productivity of farm households' investment (Jalan & Ravallion, 1999); b) poor education (Knight, Li, & Deng, 2009, 2010); c) lack of access to prosperous economic activities in addition to cropping (Glauben, Herzfeld, Rozelle, & Wang, 2012); d) social exclusion in an underclass associated with ethnicity and gender (Cao, Wang, & Wang, 2009; Hebel, 2003); and e) a range of institutional and market failures (Cai, 2010; Jacoby, Li, & Rozelle, 2002).

In addition to these studies of China, there is a growing body of evidence from African economies which suggests that risk and shocks can be a further cause of persistent poverty through their impact on households' investment in accumulation of key productive assets (Carter, Little, Mogues, & Negatu, 2007; Dercon, 2004, 2006, 2009; Dercon & Christiaensen, 2011; Elbers, Gunning, & Kinsey,

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¹ The figures in this and the previous two sentences are the author's calculations based on data from Poverty Monitoring Report of Rural China 2008.

2007; Foster & Rosenzweig, 2010; Lybbert, Barrett, Desta, & Coppock, 2004; Rosenzweig & Binswanger, 1993).² These studies find that exposure to uninsured risk and shocks tends to reduce farm households' incentives to invest in high-return but risky agriculture. This choice would then lead them to low-equilibrium asset holdings bringing lower long-term income (Adato, Carter, & May, 2006; Barrett et al., 2006; Carter et al., 2007), which means they would fall below the accepted poverty line and suffer from persistent poverty.³ Consequently, seemingly short-lived risk and shocks can generate persistent poverty in the long-term by undermining households' asset base. Going one step further, Carter and Lybbert (2012) use threshold estimation to locate a dynamic asset threshold around which households undergoing shocks would prefer to smooth assets rather than consumption.

This paper aims to investigate whether prolonged hardship for some Chinese rural households can be attributed to this risk-induced dynamic asset poverty. Risk has been found to affect Chinese rural households' decisions on agricultural production and investment plans. Huang, Lin, and Rozelle (2003) find that Chinese farm households do not use hybrid or high-yielding varieties that might provide them with higher incomes. During field work, the directors of China Health and Nutrition Surveys (CHNS) also observed that many rural households did not invest at all for three to four years after a relatively large-scale investment in agriculture had failed.⁴ These observations suggest that households' exposure to uninsured risk and shocks would force them to renounce profitable investment in productive assets in favor of low-return but less risky agricultural production, and in that case, such behavioral responses bring them low income forcing them to continue in low-return production. A way of breaking this vicious circle is needed if policy makers are to help improve the conditions of the poor and promote self-reinforcing growth out of poverty through that steady investment in profitable agricultural asset accumulation which in the past helped rural China reduce poverty (Montalvo & Ravallion, 2010). However, there is a paucity of studies examining the impact of risk and shocks on Chinese rural households' long-term well-being in relation to their asset holdings. There are some studies of the extent of precautionary savings following negative shocks in the context of rural China (e.g., Giles & Yoo, 2007; Jin, Chen, Yu, & Huang, 2011) but, as we will elaborate in the next section, this is only the first part of the story where risk-induced dynamic poverty is concerned and they pay little attention to the consequences of risk and shocks for household asset holdings which can form the foundation for long-term income generation.

This paper seeks to contribute to the literature in three ways. First, using a representative household panel (CHNS, 1989–2006), it provides the first comprehensive econometric investigation of the existence of risk-induced dynamic asset poverty in rural China. By focusing on the impact of risk on a household's asset base, it may give new insight into the root causes of persistently low income in poor rural households. Second, it is a methodological improvement for studying household asset dynamics. Insufficient capture of higher order nonlinearity and households' underlying livelihood strategies has hampered fully parametric and non-parametric methods employed in the existing literature. This paper uses a semi-parametric approach to describe asset dynamics which is less susceptible to the above problems.⁵ Third, it draws upon counterfactual simulations to distinguish potential downside risks from realized shocks as Dercon and Christiaensen (2011) and gauges household-specific marginal effects of risk and other explanatory variables of interest. We do this because, in latent variable regressions in many existing studies cited above, interpretation is based on estimates of household responses to risk, while the magnitude of the effects is still unclear and there might be significant heterogeneity across households caused by either their observed or unobserved characteristics. The calculations of marginal effects will show the role of various risk-enhancing and risk-mitigating factors in asset dynamics and thus permit household heterogeneity to be addressed. We should then be able to offer more informative interpretations.

The analysis finds multiple equilibria in household asset dynamics. Households' behavioral responses to uninsured shocks and risk cause deficiencies and inefficiencies of investment in profitable agricultural asset accumulation. This is likely to lead some households into low-equilibrium asset traps resulting in low income in the long-term, instead of converging to the high-equilibrium asset level and finally escaping from poverty. In other words, there may be risk-induced and asset-based persistent poverty.

The remainder of this paper is organized as follows. The next section spells out two behavioral mechanisms underpinning risk-induced dynamic asset poverty. Section 3 describes the dataset and explores the shape of asset dynamics. Section 4 presents the econometric specifications for two mechanisms and their empirical results are discussed in Section 5. Section 6 concludes.

2. The role of risk vis-à-vis household dynamic welfare status

Risk has two kinds of effect on household welfare and poverty status (Clarke & Dercon, 2009). Risk in the form of possible negative shocks may knock households into poverty, but they can, in principle, adjust and regain the pre-shock living standards as the shocks dissipate. However, the risk of some negative shocks (e.g., insecure asset and investment portfolios) may cause changes in household behavior and/or preferences which make outcomes worse than they might otherwise be. Such behavioral responses to risk have a cumulative impact on a household's welfare.

² McKay and Perge (2013) examine countries in Asia and Latin America as well but the asset-based poverty traps appear to exist in only a few African and Latin American countries. There are mixed empirical studies on this topic which will be discussed in Section 3.2.

³ Lipton (1968) and recently Baulch (2011) have reached similar conclusions using other non-asset based methods.

⁴ This can be found at: <http://www.cpc.unc.edu/projects/china/data/datasets/Household%20Income%20Variable%20Construction.pdf> [accessed 21 July 2012].

⁵ Naschold (2012) also uses a semi-parametric approach to model asset dynamics – he uses penalized spline estimators based on a chosen total number of knots. The methodology in this paper is more general than that as we will draw upon non-parametric estimators (LOESS and kernel) to model lagged assets. This, together with a fully parametric part controlling for other attributes to asset accumulation, forms our semi-parametric regression for asset dynamics.

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