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How do land rental markets affect household income? Evidence from rural Jiangsu, P.R. China

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ABSTRACT

The development of land rental markets in developing countries attracts much attention, but little is known about its impact on household income. This study empirically examines the effects of land rental decisions of farm households on their income and income components, i.e. farm, off-farm and transfer income, taking into account potential endogeneity of land rental decisions. Rural household survey data for 1080 households in 128 villages in Jiangsu Province, China are used to estimate these effects. Quantile regressions are used to examine to what extent effects differ between income groups. Results indicate that lessor households surprisingly obtain lower total income as compared to autarkic households. Among the lessee households, who gain on average from land rentals, the lower income groups obtain the largest total income gains. As to the sources of income, no significant differences in off-farm income between transacting households (i.e. lessee or lessor households) and autarkic households are found while differences in farm income between transacting households are as expected. Transfer income of lessor households is significantly lower than that of autarkic households. We explain these findings from some typical features of the rural land rental market in China and discuss the policy implications.

1. Introduction

Theoretically, well-functioning land rental markets can increase rural household income and reduce inequality of rural incomes by providing a sorting mechanism, through which households with higher agricultural abilities and less off-farm job opportunities can rent in additional land and expand farm operation, thus increasing farm income. Less efficient farm households that are more successful in off-farm employment can gradually opt out of agriculture by renting out their land, thus increasing off-farm income (Deininger and Jin, 2005; Zhang, 2008; Jin and Jayne, 2013).

In reality, in developing countries where labor, credit and other factor markets function imperfectly or may even be missing, land-poor but more efficient households cannot always enlarge their farm size and increase farm income, while labor-abundant but less efficient households cannot always access off-farm jobs and increase non-agricultural income. The effect of land rental markets on household income and equity is therefore context dependent and hence an empirical matter (Otsuka, 2007).

Available studies on the income and equity effects of rural land rental markets in South Asia, Latin America and Africa find that renting-in land has a significant positive effect on crop income and household total income, while the impact of renting-out land on crop and total income is mixed. Land rentals (i.e., land renting-in or renting-out) appear to have little effect on off-farm income (Sarap, 1998; Carter and Salgado, 2001; Jin and Jayne, 2013; Chamberlin and Ricker-Gilbert, 2016).

Understanding the income and equity effects of rural land rental markets is highly relevant for current policy-making in China. How to consolidate small plots into sufficiently large ones and how to increase rural household income, given the fragmented and small-scale landholdings that resulted from the egalitarian allocation of farmland since the late 1970s, are major problems in rural development policy in China. China has a special two-tier rural land system: ownership of most rural land rests with rural collectives, while land use rights are devolved from rural collectives to individual households (Zhang, 2008; Jin and Deininger, 2009). In this context, rural land rental markets are viewed by both researchers and policy-makers as an instrument to solve these problems, and have actively been promoted by the Chinese government in recent years. As a result, farmland transfers have increased at an accelerated speed. The share of transferred farmland in the total area of household-contracted farmland in rural China rose from 4.8% to 30.4% over the 2007–2014 period (MOA, 2015). Does this rapid development of land rental markets contribute to income growth and more equity of household incomes in rural China?

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Several studies have examined the effect of land rentals on rural household income and its distribution in China and provide mixed evidence (Benjamin and Brandt, 1997; Kung and Lee, 2001; Zhang, 2008; Xing et al., 2009; Yang, 2015). This is mainly because these studies focused on different regions of China, particularly in the middle-south or southeast of China, and different (mainly early) land rental market development stages in rural China. In addition, these studies did not take into account the endogeneity of land rental decisions, nor did they examine the possible differentiated income effects of land rental decisions.

This paper therefore aims to examine whether and to what extent the Chinese government's promotion of the development of rural land rental markets reaches its goal of increasing rural household income and reducing inequality of rural incomes. Specifically, using data collected in rural Jiangsu (one of the most developed regions in China), we firstly use an OLS regression to estimate the average impact of land rentals on rural household income for the entire sample, and then use a quantile regression (QR) approach to estimate income effects for households in different brackets within the income distribution. To deal with potential endogeneity of land rental variables in the income equation, predicted probabilities of land rental decisions are estimated from a bivariate probit model, and are used as instruments for land rental decisions in the income equation. The insights obtained from these results are used to discuss potential implications for policy making.

The remainder of this paper is organized as follows. In Section 2 we outline a conceptual framework. In Section 3 we introduce the research site and the dataset used. In Section 4 we present the model specification, descriptive statistics and estimation strategy. Empirical results are presented in Section 5, whereas Section 6 concludes with a summary of our main findings and a discussion of policy implications.

2. Impact mechanisms of participation in land rental markets on household income

In our analysis we classify rural household income into three categories: farm income, off-farm income and transfer income. Farm income refers to income obtained by farm households as units of production and operation on-farm. Rental income on leased-out land and dividend income gained from shareholding in farmer cooperatives are counted as farm income as well. Off-farm income includes wage income from work on other farms and non-farm employment, retirement pensions, and family operation income from business activities. Transfer income refers to agricultural subsidies provided by state and local governments, including direct payment to grain producers, general agricultural input subsidies for grain producers, improved strains of seed subsidies, and machinery-purchase subsidies. We distinguish four types of farm households: those who rent-out land (lessor households), those who neither rent-in nor rent-out land (autarkic households), those who rent-in land (lessee households), and those who rent-out and rent-in land at the same time (lessor-cum-lessee households).

Farm households' participation in land rental markets has direct and indirect impacts on household income. Specifically, when renting in or renting out farmland, rural households' resource endowments and allocations are likely to change. With those changes in resource endowment, the total income level of rural households and its structure will change accordingly.

2.1. Effects of renting-in land on household income

The most likely impacts of renting-in land on lessee households' income are:

(1) *Direct and indirect effects on farm income*. After renting in farmland, it is anticipated that the size of lessee households' operational land holdings increases, requiring a higher use of labor and other inputs in farming activities. As a result, net farm revenue from crop production (after deducting production costs) generally increases. In some situations in which land rental transactions are made between relatives, neighbours or friends, the land rental rate is zero or even negative (i.e., lessee households may be compensated to look after lessor households' land) (Tian et al., 2012). However, in many cases lessee households can access additional land only if they make rental payments to the landowner. Consequently, farm income of lessee households should be expected to rise if the actual growth of net farm revenue is higher than the payment for renting-in land.

(2) *Indirect effects on off-farm income*. Theoretically, with a farm size increase more labor and capital of lessee households will be allocated to agricultural production. Hence, an absolute or relative decline in off-farm income may occur because of decreasing labor availability for off-farm work. In reality, however, the volume of land that most lessee households rent-in may be small, given the small size of landholdings and the predominance of household-to-household transactions within the same community. Also, with the rise of the secondary and tertiary sector in urban areas and township and village enterprises and private enterprises in rural areas, both migration and local off-farm employment may have become widespread. Taken together, if lessee households are able to combine local off-farm employment with on-farm work (due to the small operational farm size and the seasonality of agricultural production), participation in land rental markets may have little effect on their off-farm income.

(3) *Indirect effects on transfer income*. Whether renting-in land affects transfer income of lessee households depends on the way agricultural subsidies are allocated to farm households by local officials. Although policy guidelines from the Ministry of Finance suggest that the amount of subsidy received by each household should depend on the actual area planted with particular grain crops, the policy also states that local governments can decide how best to allocate agricultural subsidies to households based on the locality's actual situation (Huang et al., 2013). In practice, grain subsidies(including the direct subsidy payment, the general-input subsidy, and the improved-seed subsidy) are mostly being directly given to the land contractor rather than the cultivator (Gale, 2013; Huang et al., 2011). In some cases, grain subsidies are capitalized into land rent and implicitly go to the contractor (Yi et al., 2015). Compared with grain subsidies which are paid to most grain-producing rural households, machinery-purchase subsidies are received by only a small fraction of farm households since few buy medium- or large-size machines. In conclusion, renting-in land may have no or a positive (though probably small) effect on lessee households' transfer income depending on whether the land contractor or the lessee household receives grain subsidies.

The total income effect, i.e. the aggregate of the direct and indirect effects of land renting-in on the three sources of income, is expected to be positive if there is an increase in lessee households' farm income or transfer income; otherwise, renting-in land will have little effect on total income of lessee households.

2.2. Effects of renting-out land on household income

The most likely effects of renting-out land on lessor households' income are:

(1.) *Direct and indirect effects on farm income*. The effect of lessor households' participation in land rental markets on farm income is ambiguous. Renting-out farmland results in a decline of land, and usually also labor and other inputs, allocated to on-farm production activities. The result is a decrease in gross farm revenue, provided the land rented-out was not left fallow. If the loss of farm revenue exceeds the saved production costs plus the rental