Is deregulation of forest land use rights transactions associated with economic well-being and labor allocation of farm households? Empirical evidence in China

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\textbf{A B S T R A C T}

Economic development literature has documented the importance of property rights of farmland for household economic well-being. Despite this well-supported consensus, limited empirical evidence has been provided for forestland. This study fills the gap in existing literature by identifying the determinants of forestland use rights transaction decision (FTD)—that is, the decision of households to rent in or rent out the forestland. This paper also empirically assesses the association between the FTD and the economic well-being and labor allocation of households in China. Using unique survey data of 2228 households in 7 provinces of China, a multiple-choice treatment effect model was estimated to cope with potential endogeneity bias. Results indicate that forestland size, forestland fragmentation, and age and education of the household head, as well as region heterogeneity, are associated with the decision to participate in FTD. Households renting forestland from others have higher household consumption and savings than those households without forestland transaction, and households renting out forestland also have a higher level of savings. The improvement in household economic well-being due to FTD is possibly because of an efficient reallocation of family and hired labor as well as a higher likelihood to receive policy financial loans on forest production.

1. Introduction

More than 25% of the world’s population relies on forest resources for their livelihood (FAO, 2015). Among others, a well-defined and enforceable property right on forestland has been recognized as the cornerstone of efficient forest management (e.g., Goldstein and Christopher, 2008; De Janvry et al., 2014; Takahashi and Otsuka, 2016). In some countries, such as Vietnam, Mexico, and China, land rights are established through the contingent use of the land rather than land titles (Linde-Bahr, 2008; De Janvry et al., 2015). In China, income from forest products contributes to 17% of the average total annual household income (State Forestry Administration, hereinafter SFA, 2015). Moreover, 60% of forestland was titled to collective ownership, and their use right was collectively owned and not allowed to be circulated among farmers until the recent round of Collective Forest Tenure Reform (CFTR) in 2003. Since 2003, with a focus on increasing the efficiency of forestland use, forestland circulation programs that allow forestland use rights transactions (FURT) have been widely sponsored by the government for two reasons. First, during the CFTR, forestland is distributed to households according to the principle of equity, with the result that each household holds a small size of the fragmented forestland. It has been documented that land productivity is negatively associated with land size, so the fragmentation of forestland might reduce productivity of forestry production (Hatcher et al., 2013; Qin and Xu, 2013; Sklenicka, 2016).

Second, as many farmers are becoming migrant workers, reallocating the idle forestland is necessary for specialized management of these resources. Copious empirical evidence has documented the positive effects of land transactions on farm production and household welfare. For instance, Deininger et al. (2009) used a large panel dataset for 20 years from India, together with a climatic shock (rainfall) indicator, to assess the productivity and equity-impact of market-mediated land sale and purchase as compared to non-market ones (inheritance). The authors found that frequent disaster shocks increased land market activity. In addition, poor households have a chance to voluntarily sell their land to improve household welfare. Therefore, they concluded that sales markets improved productivity and helped purchasers accumulate non-land assets and significantly enhance their
welfare. Keswell and Carter (2014) examined South Africa’s land transfer program and showed that beneficiary households (i.e., purchasers who meet the application requirements of the program) on average experienced a 25% increase in per capita consumption, and households that received transfers increased medium-term household living standards by 50%. Chen and Zhai (2015) presented evidence concerning China’s farmland transfer program and revealed that renting in and renting out land were conducive to enhancing farmers’ income and reducing poverty incidence. Based on economic theory, the study proposed three possible incentive effects associated with land transfers: labor allocation, investment incentive, and scale effect. Studies have presented evidence that land liquidity had a sizable effect on migration, which increased the marginal return on labor (Chernina et al., 2014; Valsecchi, 2014; De Janvry et al., 2015). Moreover, land rental markets help improve productivity and equity by transferring land to households with limited land resource. The land rental markets also provide an incentive to the households to invest in land, especially when the credit market is imperfect (e.g., Deininger et al., 2009; Leight, 2016). Many empirical studies also found that allowing land consolidation could enhance economies of scale most prominently through use of modern agricultural technologies, mechanization, or improved rural infrastructure (e.g., Ali and Deininger, 2015; Chen and Zhai, 2015; De Janvry et al., 2015).

Compared with a sizable body of literature that examined the effects of transaction on non-forestation, fewer studies have focused on the forestland market. Some studies documented the low willingness toward FURT (Linde-Rahr, 2008; Zhu et al., 2014), indicating that Chinese farmers were more willing to rent in forestland than rent out (Siikamäki et al., 2015). Some other studies argued that the participation decisions of farmers were significantly correlated with their income structure, education, forest endowments, and property right awareness (Zhu et al., 2014; Si et al., 2016). However, these studies commonly use binary choice models without considering the multiple choices in forestland transfers that households encounter. Moreover, limited attention has been paid to the link between forestland use rights transactions decision (FTD) and economic well-being. Considering that forest activities require a long management period, forestland is leased for the entire contracted duration, which may engender insecure expectations of property rights (Yin and Newman, 1997; Xu et al., 2013). By contrast, secured access to the forestland will greatly improve the investment confidence of households (De Janvry et al., 2014). Meanwhile, most forestry investments should be concentrated in the early and the harvest stages, which may yield different effects on labor migration. In light of the different land types and resource attributes, the program effects regarding farmland markets cannot be simply extended to forestland, which raises the question of whether the vast forestland transfers can be a factor that leads to a more efficient allocation of resources and improve household welfare.

This study has twofold objectives. We first identify the determinants of the participation in FTD of forestry farm households in China. With a better understanding of the determinants of forestry farm households’ participation in the FTD, we then assess the relationship between FTD and economic well-being. In line with the specification in literature of farm household well-being, consumption and saving are defined as the indicators for measuring economic well-being (Deininger et al., 2009; Lovo, 2014; Keswell and Carter, 2014). To further examine the potential pathways between the association between FTD and the economic well-being of farm households, we test whether FTD is significantly associated with the labor allocation in and the likelihood to receive policy support for the forestry farms. The results indicate a positive relationship between forestland rent-in decision and household consumption and saving. A positive correlation between forestland rent-out decisions and household saving is also evident. Furthermore, the positive correlation between FTDs and the economic well-being of households may be caused by the reallocation of the family and hired labor and the inflow of policy financial loans for forestry farm production.

This study contributes to the existing literature on deregulation of land transaction on several aspects. First, this article adds to the few existing studies on forestland markets (e.g., Xu et al., 2013; Siikamäki et al., 2015; Linde-Rahr, 2008) using a unique dataset of forestry producers in seven provinces of China. Compared with most previous studies relying on a small scale of random sample in a specific region, our data contain a large sample of households. Second, to the best of our knowledge, empirical studies that discussed the potential pathways of the association between FTD and economic well-being are minimal. Discussing the potential pathways behind the association can enhance the understanding of the FTD behaviors of producers and provide valuable empirical evidence to policy making on forestry production efficiency and livelihood in China as well as other developing countries. Third, this work considers FTD of households as a selection process and applies a recently developed multiple-choice treatment effect model proposed by Cattaneo et al. (2013) to cope with the endogeneity bias. To our best knowledge, this method has not been applied to land market issues so far.

2. Deregulation of forestland use rights transaction in China

China has 253 million hectares of forestland, which are mainly distributed in the northeastern and southern regions; approximately 60% of the forestland is under collective ownership whereas the rest is owned by the state (Ministry of Land and Resources of the People’s Republic of China, 2016; SFA, 2015). The collectively owned forests are concentrated in southeast, central, south, and southwest China; most of these forests are artificial ones that are important in maintaining the livelihoods of rural people. Collective ownership of forestland in China commenced in the 1950s, and these forests were collectively managed until the end of the 1970s (Xie et al., 2013). After acknowledging the inefficiency of this management method, the first round of forest reforms began in 1981. It aimed to clarify and confirm the ownership of forests and barren hills, allocated hills to members of the collectives through two kinds of arrangements (i.e., household-held hills and common hills), and established a forest management accountability system. Household-held hills (Ziliu-shan) were distributed based on household size from the collective forestland to those households likely to lease the hills in a specific time period. Households can usually enjoy a full stream of benefits from the land during the duration. Common responsibility hills (Zeren-shan) were assigned by village authorities to each member-household, which shall manage the assigned forestland with a benefit-sharing arrangement (Xu et al., 2013).

The first round of forest reforms was stalled because of excessive timber harvesting and extensive destruction of forests in certain provinces. In 1987, the government suspended the allocation of forestland to households, strengthened the regulations of forestland that had been already allotted to individuals, and launched a harvest quota system (Xie et al., 2014). In certain regions, village collectives reverted their forests to collective management. FURT was not permitted until the 1990s, when the government enabled interested households to obtain long-term usage rights. However, village leaders could be corrupt and abuse their power by selling forestland at low prices (Xu et al., 2013; Siikamäki et al., 2015).

Due to the poor performance of the collective forests, a second round of CFTR began in 2003, initially in Fujian Province, followed by Jiangxi and Liaoning. In 2008, the Central Committee of the Communist Party of China and the State Council officially announced the new national policy, called the Guidelines on Fully Promoting CFTR. The recent round of reforms primarily aims to encourage forest investment and management in addition to improving forest efficiency as well as rural growth by reallocating forestland from the village collectives to forestry households. Forestland was allocated equitably to member-households.

Despite the potential advantages of the policy, a low rate of transaction in user rights among forestland has been observed. By the end of
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