

**Impact of land tenure security on
rural-urban migration in Southern China:
*Evidence from Jiangxi Province***

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Abstract

This thesis examines the impact of the perceived land tenure security on the rural-urban migration of rural households, using data collected in three counties of Jiangxi Province in China. We find that in villages with a well-functioning land rental market tenure security derived from the expected absence of land reallocations has a positive impact on rural-urban migration, but that the impact is weaker in villages where the land rental market has developed most. The importance attached to land certificates in protecting land rights by households possessing land certificates, on the other hand, plays little or no role in migration decisions. These findings differ significantly from those obtained in earlier research for a region in China with less developed land markets but higher (actual and perceived) tenure security.

Keywords: land tenure security; land rental market; rural-urban migration; Jiangxi; China.

1. Introduction

Rural-urban migrants constitute an essential element of the labor market in cities, in China. Given the data set from the National Bureau of Statistics (NBS), Chinese rural labor power (nongmin gong) who left their hometowns and worked in other places accounted for 140.41 million people at the end of 2008, and rapidly boosted to 166.10 million people at end of 2013 (NBS 2014). More specifically, there were 387.40 million laborers in rural areas in 2013 (NBS 2014), which means that out-migration affects more than 42.9% of Chinese total laborers of rural areas.

By comparing to other developed and developing countries, two distinctive characteristics of Chinese rural-urban migration are not tailed by the classical Lewisian-Todarian structure. Temporality is the first noteworthy feature of internal migration flows in China. Specifically, Murphy (2002) pointed out that a large share of Chinese rural-urban migrants, after some years spent working on the often-informal urban manpower market, would eventually return to their native rural areas. Moreover, even during the migratory periods of life, rural migrants continue moving forth and back between their home villages and destination working areas. For example, since mid-1990s during every Chinese Spring Festival, China has a worldwide biggest inverse flow. Empirical evidence can find from the report of Chinese rural migrant workers survey conducted by State Council Research Bureau. Merely 8.13% of the interviewed migrants asserted that they intended a long duration stay in the destination of urban areas, whereas 39.07% of the interviewed migrants expected to return to their homeland once they have accrued abundant reserves for the future. The rest of 52.8% of the interviewed migrants thought that their decisions would depend on the conditions with development of future jobs. The second feature is that, migration by single persons forms the bulk proportion of migration rather than migration by entire families, which the latter one only accounted 20.6% of the total percent of migration. _(NBS 2013)

The factors impact the migration decisions can be divided by two parts. One is from origin areas and the other is from destination areas (De La Rupelle et al. 2010, Murphy 2002, Norman, et al. 2005, Tao, et al. 2007). Like in many other countries, the higher wage rate and better living environment in potential destinations contribute to migration incentives. While the household registration system (Hukou), social discrimination and low education level of migrants and so on, are the barriers in the potential destinations. These barriers restrict rural migrants in-flows and contribute to a surplus of workforce staying in rural areas and to a serious rural-urban income disparity. Among the barriers, the household registration system (Hukou) is an important one. As the Chinese economy has experienced a very rapid growth during the last 30 years, more urban employment opportunities are increasingly created. However, the hukou prevents equivalently to access employment, education, housing, social and health insurances for rural migrants as compared to residents with local hukou in destination areas. For example, in the survey of Lu et al. (2006), the percentage of rural migrants getting a formal instead of informal employment contract is 38.7% lower than the percentage of urban residents getting formal employment contracts. Chinese rural migrants in urban areas are a discriminated group and this can help to explain the temporality of Chinese migration and the migration by single persons too (Lu, et al. 2006, Murphy 2002, Whalley, et al. 2007).

As regards factors that impact rural-urban migration in the areas of origin, Mullan et al. (2011) point out that even if the household registration system (hukou) would be abolished, permanent migration is unlikely to fully replace temporal migration if obstacles on rural land tenure arrangements in origin areas remain. In the traditional and inherited thoughts of Chinese farmers, land considers as the most important property and future income guarantee. In addition, if farmer migrants have left their residence areas permanently, they will face a risk to lose their land, because the local authorities and village leaders may administratively expropriate their land. Therefore, it forms an additional cost and a barrier for Chinese farmers to take migration

decisions. (Rupelle et al. 2010;Mullan et al 2011;Yang 1997). However, once Chinese farmers hold the rights of land transferability, De Brauw et al. (2009) and De La Rupelle et al. (2010) argue that it will stimulate Chinese farmers to out-migration because the migration cost, in some extent, is attenuated. Meanwhile, owing to high-level of rural-urban migration in China, it has had the negative impacts on the health and support for the succeeding generations and elders. Especially, the left-behind children, who are far away from their migration parents during the education periods, have formed a serious social problem impacting migration decisions (Liang et al.2007; De Brauw et al 2011).

Further evidence on the importance of land tenure security for migration decisions comes from a survey conducted by the Chinese Ministry of Agriculture carried out in 4 provinces (Anhui, Henan, Jiangsu and Shanxi) during 1995-2002. It finds that the periodical land redistributions to correct for demographic changes within villages have a negative effect on rural-urban migration due to the land tenure insecurity that they cause. Similar evidence is provided by a survey conducted by Chinese Academy of Social Science that collected data during the Spring Festival of 2002 and included 22 representative provinces (De La Rupelle et al. 2010, Giles et al. 2012). Moreover, a study, based on data that were collected in Guizhou Province and Ningxia Province during 2004-2005, finds that the high level of land transferability, combined with a high level of land tenure security, can increase migration incentives, while it reduces migration incentives if land transferability is underdeveloped (Mullan et al 2011). These studies suggest that land tenure security and land transferability should be considered jointly in analyzing rural-urban migration, in China.

Since 1998, the Chinese government has implemented a series of land-related laws and market-oriented land reforms that are intended to improve tenure security and stimulate rural land transferability. Their main elements are: (1) granting farmers with perpetual and usufructuary rights; (2) issuing

land certificates to farmers; (3) significantly restricting the scope of administrative land redistributions; (4) forbidding that village leaders take rented out land back unless the landlords in question have migrated to the city and registered as urban citizens (Ma 2013). The increased land tenure security and land transferability provided by these laws may be expected to stimulate rural-urban migration. However, what matters for migration decisions is the land security perceived by households rather than the legal tenure security. In the implementation process of the laws and reforms, households may perceive land security differently than the legal land security that has been stipulated. For example, when households possess land certificates, but do not believe that certificates can protect their rights, these certificates are not expected to stimulate migration.

To my knowledge, there are only two studies that address the impact of perceived land tenure security on rural-urban migration. The first one is Mullan et al. (2011). Their study analyzes rural-urban migration by using village leaders' perceptions on future land redistribution and land transfer rights as explanatory variables. The second one is Ma et al. (2014). The following three paragraphs are the comparison the studies between Mullan et al. (2011) and Ma et al. (2014).

Firstly, the study of Mullan et al.(2011) uses perceptions on future land reallocation and on land rental market of village leaders instead of village residents. It may suffer a bias because village leaders are more likely to reflect the security specified in relative laws, rather than the real situation and perceptions within the village. For example, in a survey conducted by Nanjing Agriculture University in 11 villages in Jiangxi Province in calendar year 2010-2011 it is found that more than 90% of the interviewed village leaders expect that there will be no land redistribution in next five years, but only 26% of the interviewed village residents supported this opinion (see Table 2 below). The study of Ma et al. (2014) uses households' perceptions instead of village leaders' perceptions.

Secondly, besides perceptions about the likelihood of future land redistributions, perceptions about the importance of land certificates in protecting land rights may be another important aspect of tenure security. Land certificates are considered less important in securing land rights where the juridical system is unfair, where there is distrust in the laws and their enforcement system and where the enforcement repeatedly lacks (Pagiola 1999). The study by Mullan et al.(2011) ignores this important aspect of tenure security, but Ma et al. (2014) adds this part into his study to test the impact of land certificates on rural-urban migration.

Thirdly, with regard to land transferability, Mullan et al. (2011) focuses on the possession of land transfer rights. However, the actual level of land market development within the village is likely to play a more important role in migration decisions because it reflects the concrete opportunities to rent out land. The actual level of land market development not only depends on land transfer rights but also on other factors, such as trust among villagers, numbers of workers in the family, wage rate in the urban sector, and so on. Ma et al. (2014) therefore uses an indicator of the degree of land market development in a village to explain migration decisions.

The study by Ma et al. (2014) was carried out for a small region in northwest China (Gansu) where perceptions of land tenure security are relatively high. The results of that study may be less applicable to regions where households face much lower degrees of tenure security. The objective of this study is to analyze the impact of land tenure security as perceived by rural households on migration decision-making in Southern China (Jiangxi). This study uses the same approach as Ma et al (2014), but applies it to an area in Southern China (Jiangxi) where tenure security is much lower (Ma 2013:Chapter 2). Specifically, 70 percent of the interviewed households in the Jiangxi data set that is used for this study has experienced at least one land reallocation since 1998, as compared to 6 percent in the Gansu data set. The share of

interviewed households who expect a land redistribution within the next 5 years is 57 percent in the Jiangxi data set, but only 15% in the Gansu data set. Following Ma et al. (2014), household perceptions of probabilities of land reallocation in the next five years and household perceptions of the importance of land certificates in securing land rights serve as main land tenure security indicators. In order to examine the impact of different levels of the land transferability on the relation between tenure security and rural-urban migration in Jiangxi, a distinction will be made between villages with a relatively more developed and a relatively less developed land rental markets.

A cross-section data set, consisting of household-level data on migration, perceptions on tenure security, land rental market development, possession of a land certificate and other relevant factors, is used for empirically examining the effect of perceived land tenure security on migration. The data has been collected for 527 households from 11 villages in three counties in Jiangxi Province, southeast China, in 2011. The data refer to the calendar year 2010. Following Ma's (2013) study of a different region in China, a Logit model is used to estimate the determinants of migration decisions, and a Censored Tobit model to estimate the determinants of the ratio of migrants in the household and the migration duration.

The thesis is organized as follows. Section 2 depicts the definitions of land tenure and its (legal and perceived) security in rural China, discusses the reasons why land tenure security is assumed to affect rural-urban migration. Section 3 describes the data set used in this study, presents the definitions and descriptive statistics of the variables used in the empirical analysis, and discusses the expected signs of the relationships. Section 4 provides the model specification and estimation strategy that we used in estimating the three models to analyze migration participation decisions, shares of migrants in households and migration duration, respectively. Section 5 summarizes and discusses the estimation results for the three models and compares them with the results obtained by Ma et al. (2014) for a region in Gansu case, northwest

China. The thesis ends with conclusion in Section 6.

2. Land tenure security and migration decisions

Incongruous views on the definition of what constitutes land tenure security have arisen among the academic sides. Firstly, Bruce, et al. (1994) divides the concept of land tenure security into three detached portions: breadth of rights, duration of rights and assurance of rights. Subsequently, Sjaastad, et al. (2000) and Arnot et al. (2011) refute this distinction, because the breadth of rights and duration of rights indicate the content or substance of the right more than a security. Specifically, Fortmann, *et al.* (1997) explains that the breadth of rights is the composition of rights and the duration of rights is the rights of a length to legally permit, but the assurance of rights is the certainty with which the right is held. Finally, Van Gelder (2010) develops a tripartite view of land tenure security by distinguishing between legal land tenure security, actual land tenure security and perceived land tenure security respectively. Legal (or *de jure*) land tenure security is defined as securing tenure by land titling and the related laws and regulations. Actual (*or de facto*) land security is defined as the extent of factual control of owners to their property rights. Perceived tenure security derives from a psychological process by a fear of eviction, the perceived likelihood of expropriation and other factors triggering the threat and is a sense of security (Van Gelder 2007, Van Gelder 2010). Perceived tenure security is to a certain degree interdependent with legal tenure security, but the two are not equated. The extent to which the two are interrelated may fluctuate from situation to situation and becomes an empirical question eventually (Van Gelder 2009).

2.1 Land tenure security in China

By implementing a series of official land tenure reforms, legal land tenure security in rural China has been gradually improved. Two periods can be distinguished; one is the establishment of individual land use rights supported by egalitarian principle under the household responsibility system (HRS) since 1979, the other is the period of market-oriented land right reforms that intended to boost tenure security since 1998.

The household responsibility system (HRS) assigned farmland use rights to rural households for a period of 15 years and was implemented nationally between 1979 and 1984. The rural land allocation was based on households' size and/or the household number of laborers, so that all households would have similar resources for making a livelihood. The village leaders had rights to redistribute land administratively, either full-scale or partially, when the demographic situation changes within the village in order to maintain egalitarian principles. It caused frequent land redistribution in response to demographic changes (Tan, et al. 2006, Wang, et al. 2011, Yao 2001). The land ownership belongs to the collective, so rural households after land reallocation do not obtain any compensation for their land even if they would have invested in it. Therefore, the HRS is typically considered to be contributing to land tenure insecurity.

Since 1998, the Chinese central government has issued four guiding consecutive land laws in order to initiate market mechanisms and increase rural households' land tenure security.

Firstly, the 1998 revision of the Land Administration Law (LAL) stipulated that the duration of land use rights would be extended to another 30 years, that land use rights of farmers would be protected by laws officially, that land certificates would be issued to farmers aiming at securing their land use rights, that land transferability is approved by the Chinese central government officially by law, and that land redistributions within villages are prohibited

unless they are accepted by two-thirds of village households and approved by higher-level local authority.

Secondly, the Rural Land Contract Law (RLCL) in 2002 guaranteed to rural farmers that, even if land use rights after 30 years has expired since starting at 1998, their land use rights would be automatically extend to another 30 years, that partial-scale land reallocations are allowed only if it accepted by two-thirds of households within the village and approved by higher-level local authority. Exceptions to this rule include natural disasters, land expropriations for infrastructure construction or other purposes, and other special conditions. Full-scale land distributions are completely prohibited by RLCL. In addition, without appropriate compensation, the collective cannot deprive land rights of individuals. The definitions and explanations of land transferability were the milestone element included in RLCL. It stimulated the emerging of land transfer markets and was an important way to increase legal land tenure security (Zhu et al. 2012, Ma 2013).

Thirdly, the Property Law (PL) of 2007, stipulated that land use rights are as property rights or rights *in rem* (Zhu, et al. 2012). Based on property rights' definition from Chen (2008), Chinese farmers officially possess perpetual right and usufruct rights after PL stipulated. The PL further enhanced land tenure security. Specifically, perpetual rights guarantee that even if the 30 years of land use rights have expired, farmers can remain and inherit their land rights under relevant rules, and usufruct rights guarantees that the benefits of farmers gotten from lands will not be compulsively expropriated by the collective or governments without appropriate compensation.

Fourthly, the Law of Mediation and Arbitration of Rural Land Contract Disputes, adopted in 2009, specifies relevant principles to mediate related land disputes in order to secure farmers' interests by legal support (Ma 2013).

Although legal tenure security has been enhanced considerably since 1998, actual and perceived tenure securities still lag behind in many regions of China. Evidence from a rural study covering 119 villages in 6 representative provinces, shows that the average frequencies of land redistribution within villages have dropped to 1.0 during 1998-2008, while it equaled 2.6 before 1998 (Wang et al. 2011).

Similar results are found in a survey covering 527 rural households in 11 villages of 3 counties in Jiangxi province, in 2010 (Ma 2013:Ch 2). It discovered that 70% of the interviewed households have experienced on average 3.4 land reallocations since 1998, that only 18% of the interviewed persons think that there will be no land reallocation in the next five years and that only 35% of the interviewers believe that the land certificates play an important role in securing their land tenure.

These results reveal that perceived land tenure security greatly differs from legal land tenure security in many regions of China. It may be assumed that what matters for households to take migration decisions is perceived tenure security rather than legal tenure security. In the remaining of this study, we will focus on perceived land tenure security in analyzing household rural-urban migration decision-making.

2.2 Theories of land tenure security and rural-urban migration

The theory of new economics of labor migration (NELM) considers migration decisions as family decisions, rather than individual decisions. The hypothesis of the NELM is that migration is a response to market imperfections: migrant remittances help to overcome capital constraints while income diversification obtained through migrant family members helps to overcome insurance constraints (De Haas 2010, Mendola 2012, Taylor et al. 2001, Taylor et al. 2003). Empirical studies have provided support for the hypothesis that the off-

farm employment decisions are part of family strategies (Kimhi 2004). Supportive evidence of the NELM in the case of rural China can be found, for example, in Huang et al. (2012) and Taylor et al. (2003).

The degree of land tenure security may play an important role in such migration decisions. Ma et al. (2014) distinguish three different effects of tenure security on household migration decision-making, namely the asset enhancing effect, the income effect and the risk reduction effect respectively. In our study, the same version of these effects will be used in a different research area (Jiangxi).

Firstly, a high level of tenure security would enhance the confidence of rural farmers and lower the perceived risks of the land expropriation so that they will make more investment into the land and spend more time on cultivating their land (Ma et al 2014). It is termed the asset enhancing effect (De La Rupelle et al. 2010, Mullan et al. 2011), and has a negative impact on migration.

Secondly, the income effect has an indeterminate effect on rural-urban migration. Deininger (2011) and Holden (2011), argue that a high level of land tenure security reduces risks of land expropriation and thereby stimulates land rental market development and productivity-enhancing investments. The income obtained from leasing land and productivity-enhancing investments can alleviate constraints on capital and can be used to cover the initial costs of migration for landholders, such as traffic costs, accommodation costs, costs of job seeking. So the income effect can stimulate migration. Meanwhile, based on NELM, the additional income obtained from land rented-out and productivity-enhancing investments alleviate the need to overcome capital constraints through migrants' remittances. Hence, income effect also depresses the migration incentives.

The third is the risk reduction effect of tenure security. Specifically, the following three risks of losing land restrict the migration decisions in China: (1) if a land redistribution is intended to correct for demographic changes that have taken place, a household with migrant members runs the risk of losing some of its land; (2) without adequate compensation local governments may expropriate farmers' land for reasons of urban expansion or rural infrastructure development; (3) tenants who refuse to return rented-out land is another potential risk for migrants. As a result, if the tenure security could be increased by a certain degree, which meant that the perceived secure risks have been alleviated; it would have a positive impact on rural-urban migration.

The risk reduction effect has a positive effect on migration. The income effect has either a positive or a negative impact, whereas the asset enhancing effect has a negative impact on migration. How do the three effects interact with land rental market? In villages with a developed land rental market, the income effect may be stronger or weaker, because land rented-out can bring additional incomes. The positive risk reduction effect becomes stronger. One source of risk that tenants not returning their land is stronger when there exists a well-developed land rental market. But when land tenure security improves, this constraint on migration becomes less important. The negative asset enhancing effect is expected weaker, because the option to rent out land instead of investing in the land for households becomes more attractive. Consequently, land tenure security may have different impacts on migration in villages with a relatively more developed land rental market and a relatively less developed land rental market. But whether the net impact is weaker or stronger in villages with a well-developed land rental market is an empirical matter.

As discussed above, legal land tenure security has been increased through relevant land laws and reforms since 1998. However, the household land redistributions are still observed frequently in parts of China. The shortage of rural farmland, the traditional egalitarianism thoughts among villagers and the

incompetent administration at grassroots level of governments, are the main reasons (Wang et al. 2011, Yao 2001). As a result, if landowners do not believe that the land certificate can protect the land rights completely, they will perceive the risks of the land expropriation as large. Land redistributions by village leaders, government expropriations and tenants who refuse to return rented-out land are three main sources of perceived insecurity of land rights. Rural landlords in China possess only weak bargaining power in these three cases (Ma et al. 2013). So, whether Chinese villagers participate in migration or not depends on whether they perceive land tenure to be safe or not. The perception on risks of land expropriation in the near future and the perception on the importance of land certificate in protecting their land tenure security are likely to play important roles in migration decisions.

3. Data set

3.1 Data collection

Table 1

The data used for this study were collected through a rural household survey carried out by students from Nanjing Agriculture University in July and August of 2010. The survey covered 527 households living in 11 villages and 3 counties in Jiangxi Province. The survey aimed to collect information regarding agricultural production, land tenure situation, off-farm employment, land and water uses, income and expenditures, assets and other relevant factors.

In our data set, 3 of 11 investigated villages were selected pre-determinately, followed by Feng and Heerink (2008). Among them, 23 percent of households are interviewed. A stratified random sample was used for selecting the

households, with the hamlets within each village forming the strata. The other 8 of 11 investigated villages were selected randomly for a study on biogas adoption. The interviewed households are chosen randomly as well.

3.2 Descriptive statistics, definitions and expected effects

Table 2 presents the definitions of the variables used in the regression analysis, the expected signs of effects of the independent variables and the descriptive statistics. I categorize the variables into migration variables, land tenure security variables and other independent variables.

Table 2

(1) Migration

There is no universally accepted standard to define migration in China. Available research and statistics have used many different definitions. NBS (2013) defines a migrant worker as an individual who has left his registered place of residence in order to work for a least six months in a given year. Rozelle (1999) uses a similar definition, but with three months as the minimum duration of work outside the registered place of residence. Other studies define a migrant worker as an individual who works outside the home county (De La Rupelle, *et al.* 2010), or who works outside his living village, whatever the duration of out-migration.

The duration of migration is an essential factor in defining a migrant and may be correlated with land tenure security (Ma et al 2014). For the purpose of this study, a migrant is defined as a person who has lived outside the home county for employment purposes during the calendar year 2010, whatever the duration of out-migration. This definition debars those members who lived outside the home village but within the home county. Household members

who work and live elsewhere within the same county can more regularly travel between the home village and the place of work, and may continue to contribute to on-farm production. For that reason, they are excluded from the analysis.

There are three different indicators to measure migration in the analysis. The first indicator is a binary variable that holds the value 1 for households with at least one migrant, and 0 for other households. This variable measures whether a household is involved in migration or not. The second indicator is the share of migrants to total workers (persons aged between 16 and 65) in a household. It measures a household's degree of involvement in migration. The third indicator is the share of working time allocated to migration in a household. It measures the time employed working outside the county, divided by the whole time employed working by total workers (aged between 16 and 65) of a household. This indicator measures the migration duration of the household.

In the selected research area, 68% of the interviewed households participated in migration in 2010 (see Table 2). It is slightly higher than the share of migrant households found in a study by Shi, *et al.* (2007) for three villages in Jiangxi Province in the year 2000, which found that 65% of the households participated in the migration. Households in the same three villages (Gangyan, Banqiao and Shangzhu) were also interviewed in the recent survey. The share of households participating in migration in 2010 had increased to 69%, in 2010. Furthermore, an average of 33% of the workers in migrant households (i.e. 1.1 household members) were migrants in 2010, while migrants were working an average duration of 15.12 months (i.e. 46% of the total working time) outside the county in 2010.

(2) Perceived land tenure security

The perceived land tenure security is measured by two variables, which are expectations of other sampled households within the same village who think no land redistribution will take place in the next five years and perceptions on importance of the land certificate by other sampled households within the same village who possess land certificates, respectively. The expectation about land redistribution equals 1 if a household does not expect land redistribution within 5 years, and 0 if the household expects that a land redistribution will happen within 5 years or does not have an idea. The perception of the significance of land certificates for protecting land rights is defined on a scale from 1 (= not important) to 5 (= very important) and 0 (= household who does not possess the land certificate). Reverse causality may play a role in estimating the impact of tenure security on migration, because migration may increase the perceived risk of expropriation for individual households (Mullan et al. 2011). To minimize the potential endogeneity bias, the average village-level land perceived tenure security perceptions of the other sampled households within the same village is used as an approximation, as suggested by Ma et al. (2014).

The estimated coefficients for the two tenure security variables will reflect the net effect of the asset enhancing effect, the income effect and the risk reduction effect on migration. The net effect can be positive, negative or zero since it depends on the magnitude of these three countervailing effects.

Based on NELM, land rented-out can alleviate capital constraints to migrate, but also can reduce the need to overcome capital constraints by migrants' remittance. Therefore, the land rental market should have indeterminate effect on migration. Ma et al. (2014) measure land rental market development by a binary variable, which equals 1 if more than 10% of households in the village rent out land in 2009, and equals 0 otherwise. There are only 23% of interviewed villages with a developed land rental market (Ma et al. 2014). If the same standard is applied to our data set for Jiangxi, 91% of the villages are classified as villages with a developed land rental market. Hence, the land

rental market in the research area in Jiangxi is more developed than in the research area in Gansu that was examined by Ma et al. (2014). In this study we therefore do not distinguish between an underdeveloped and developed land rental market but between a relatively more developed land rental market and a relatively less developed land rental market. The binary variable to measure the land rental market development in this study equals 1 if more than 20% of the households in the village rent out land in 2010 and equals 0 otherwise.

(3) Other independent variables

Village characteristics, household characteristics, land characteristics and regional characteristics are four added subcategories. They are expected to affect household migration decisions and are chosen on the foundation of earlier studies on the determinants of migration in China, such as Giles et al. (2012), Huang et al. (2012), Mendola (2012), Rozelle (1999), Shi et al. (2007), Taylor et al. (2001), and Yao (2001).

Village characteristics include two variables: distance to the nearest county seat and village migration prevalence. Distance from the village to the nearest county is applied as an indicator of market access. The longer the distance from the village to the county seat, the higher the transportation costs spent in the migration will reasonably be. On the other hand, the shorter the distance between the village and the nearest county seat, the more local off-farm job opportunities for which workers do not need to migrate, are likely to be available. Hence, the impact of this variable is indeterminate. Village migration prevalence is measured as the average number of migrants per household of other sampled households within the village. Village migration prevalence is anticipated to have a positive effect on migration, because transaction costs involved in migration, such as the costs of getting a job and finding accommodation, are lower when many villagers have migrated. The average value of this variable is 1.40 for our research area in Jiangxi. It is considerably

larger than the average value of 0.80 migrants that was found by Ma et al. (2014) for their research area in Gansu

There are seven household features distinguished in the analysis. The first two features are the proportion of children and old people, respectively, to workers in the household. The impact of dependents on migration is unclear. On the one hand, some workers should live at their villages to look after dependents and cannot migrate. On the other hand, households with more dependents generally spend more on health care, education, food and other items, and consequently have a greater demand to migrate to earn additional income. The female members of a household may have fewer possibilities to migrate because traditionally females in China take more responsibilities in the household. So the proportion of female workers to all workers is anticipated to have a negative effect on migration. The average age of the workers in the household is also expected to have a negative impact on migration. Younger household members have more opportunities to migrate than older members. The education level of the head of the household has an ambiguous effect on migration. People who have more education hold better possibilities to be employed in off-farm work, both locally and outside the own county. If there are many local off-farm opportunities, it will have a negative effect on migration. If not, its impact will be positive. The average village-level duration of migration for migrants belonging to other sampled households is used as a proxy for past migration experience of the household. It is anticipated to have a positive impact on migration, because transaction costs will be lower for households with more migration experience. Household wealth is applied as an indicator of the economic and social power of a household within the village. The available empirical evidence suggests a nonlinear impact of wealth on migration (McKenzie et al. 2007). When migration costs are large and cannot be afforded by some households, subsistence and liquidity constraints will bind and migration will initially increase and then decreases with wealth. The square of household wealth is introduced in order to examine this potential nonlinearity.

Land characteristics include contracted land area (i.e. the land allocated to the household by the village leader) per worker and the ratio of paddy land area to the total land area for the household. These are indicators of land quantity and land quality, respectively. Both are anticipated to have a negative impact on migration. Households who have higher land quantity and quality have more resources for agricultural production.

Finally, two dummy variables are included for two of the three counties. These dummies are intended to control for significant unobserved differences between counties in factors such as different infrastructure and agro-ecological conditions which may affect household migration decisions.

4. Model specification and estimation strategy

The regression model is specified as:

$$M_i = a_0 + a_1 LR_i + a_2 LRM_i + a_3 LR_i * LRM_i + a_4 LC_i + a_5 LC_i * LRM_i + \sum a_{6j} X_{ji} + u_{1i}$$

M_i = Values of migration variables (participation decision, share of migrants and migration duration) for household i.

LR_i = Perception on land redistribution in next 5 years for household i.

LRM_i = Dummy variable indicating the development of land rental market within the village for household i (equals 1 for a relatively more developed land rental market; equals 0 for a relatively less developed land rental market)

LC_i = Importance attached to land certificates in protecting land tenure security for household i if the household possesses a land certificate

X_{ji} = A set of control variables for household i.

u_{1i} = Error term with standard properties.

In order to test the hypothesis that the net impact of increased tenure security on migration is stronger or weaker in villages with a relatively more developed land rental market or villages with a relatively less developed land rental market, two interaction terms of the tenure security variables and the land rental market development variable are introduced in the regression model as suggested by Ma et al. (2014). The objective of adding interaction terms of the tenure security variables and the land rental market variable is to examine if the impact of tenure security differs between villages with a relatively more developed land rental market and villages with a relatively less developed land rental market. Specifically, the coefficients of the tenure security variables indicate the impact for villages with a relatively less developed land rental market (LRM equals zero), while the coefficients of the interaction terms indicate the difference in impact between two groups of villages, and the sum of the coefficients of the tenure security variables and the interaction terms indicates the impact for villages with a relatively more developed land rental market.

A Logit model is used to estimate the equation for the migration participation decision. Migration takes place only if the anticipated net utility from a migrating member, as compared to all household members staying in the village, is positive. Otherwise, migration is not expected to occur.

Two censored Tobit models are applied to estimate the equations for the share of migrants in a household and for migration duration. The two migration variables both have values between 0 and 1. In the data set used for this study, 32% of the households are left censored and less than 1% of the households are right censored for both the share of migrants and the migration duration. A censored Tobit model is a suitable estimation technique for dealing with corner solutions.

It should be noted that unobserved factors that affect the probability to migrate may also affect household decisions on the share of migrants and on

migration duration. The Heckman selection model is applied to examine for possible selection bias. Regression results of two-step estimates in Stata report an inverse Mill ratio of -0.14 (P-value = 0.56) for share of migrants and an inverse Mill ratio of -0.50 (P-value = 0.39) for migration duration. The null hypothesis that there is no selection bias therefore cannot be rejected. The censored Tobit model rather than the Heckman selection model is therefore chosen to estimate the equations for the share of migrants in a household and for migration duration.

5. Estimation results

Table 3

Table 3 summarizes the regression results. Tenure security derived from the expected absence of land reallocations within the next 5 years has a significant positive impact on all of the three migration variables. It is opposite to the results in the study of Ma et al. (2014) who find that village perceptions on land redistribution in the next 5 years have a significant negative impact on all of the three migration variables. Therefore, the (positive) risk reduction effect, the (indeterminate) income effect and the (negative) asset enhancing effect discussed in section 2.2, on balance, have a positive net impact on migration tenure security derived from the expected absence of land reallocations within the next five years.

Land rental market development has a positive impact on migration participation decision, but does not significantly affect the other two migration variables. The interaction terms of expected absence of land reallocations and land rental market variable have significant negative coefficients for migration participation decision and share of migrants, but no statistically significant coefficient for migration duration. The sum of estimated coefficients for perceptions on land reallocations and its interaction with the land rental market variable is not significantly different from zero in the equations for

migration participation decision and share of migrants, but positive and significantly different from zero in migration duration. Therefore, it may be concluded that households expecting no land reallocations in the next 5 years are more likely to migrate and have a larger share of household members who migrate in villages with a relatively less developed land rental market but not in villages with a relatively more developed land rental market. In addition, the duration of the migration is longer as compared to households expecting that land reallocations may take place, or who have no idea. The degree of land rental market development does not affect this finding.

The importance attached to land certificates in protecting land rights by households possessing a certificate has no statistically significant impact on all three migration variables. The possible reason is that the Land Administration Law (1998) officially stipulates that land certificates should be issued to every rural household, but for research area in Jiangxi nearly 70% of the interviewed households do not possess land certificates. It indicates that the enforcement by local governments is lagging and therefore may not contribute much to raising households' trust in land certificates. Besides, the village-level mean value for the other sampled households within the same village who possess land certificates is 1.04 in JInagxi case, which is much lower than 4.14 in Gansu case presented by Ma et al. (2014). As a consequence, the importance attached to land certificates plays no role in migration decisions.

The interaction terms of the land certificate perceptions and land rental market development have significant negative impacts on migration participation decisions and share of migrants, but no statistically significant impact on migration duration. The sum of estimated coefficients for the land certificate perception variable and its interaction with the land rental market variable is negative and differs significantly from zero for migration participation and migration duration. In other words, households in villages with a relatively more developed land rental market that possess a land certificate and attach

a high importance to land certificates in protecting their land rights tend to participate less in migration and the duration of migration tends to be shorter.

Table 4

We can further summarize three conclusions obtained from marginal effects of land tenure security variables in all three models (see table 4). Firstly, migration participation decisions are more sensitive to changes in land reallocation perceptions than the share of migrants and the duration of migration. Secondly, in villages with a relatively less developed land rental market, the land reallocation perceptions have a significant positive impact on migration incentives for all three models while the land certificate perceptions have no impact in such villages. Thirdly, in villages with a relatively more developed land rental market, land certificate perceptions have a small but significant negative impact on migration participation and duration of migration decisions while land reallocation perceptions only have a (small) significant negative impact on the duration of migration. .

Therefore, this study finds that land tenure security derived from the expectation that no land reallocations will take place in the next five years has a positive net impact on migration for households living in villages with relatively less developed land rental markets; land tenure security derived from land certificates, on the other hand, does not significantly affect migration in such villages. In villages with relatively more developed land rental markets, perceptions about land reallocations affect only the duration of migration (with a negative sign) while land certificate perceptions affect both the participation in migration and the duration (with a negative sign).

With regard to the other explanatory variables, we do not find that village migration prevalence and past migration experience have a significant impact on all three-migration variables, which is contrary with the findings presented by Ma et al (2014) for Gansu. It may be that Jiangxi is more near to the

economically prosperous regions of China than Gansu, so households find jobs easily than Gansu. Transaction costs, as a consequence, involved in migration for other sampled households within the same village in Jiangxi are much low and then the potentially positive effects of village migration prevalence and past migration experience have been cancelled out.

Regarding dependents, children ratio has a negative impact on all three-migration variables. Elder ratio has a negative impact on the migration participation decisions and share of migrants, but does not affects significantly the migration duration. We also find that female ratio and education years of family head have a negative impact on migration duration, but not significant on the other two migration variables. The wealth of a household also does not significantly affect migration variables in our research area in Jiangxi. It is contrary to the findings in Gansu (Ma et al. 2014).

Finally, with respect to land characteristics, we find that land quantity negatively affects all three-migration variables (at a one percent testing level). Land quality, on the other hand, negatively affects migration duration only.

6. Conclusion

Land reallocated by village leaders without adequate compensation, land expropriated by local governments for purposes of urban developments and infrastructure constructions, and tenants who refuse to return rented land are three factors contributing to perceived land tenure insecurity (Ma et al. 2014). Therefore, although legal land tenure security in rural China has been gradually improved since 1998 after implementing a series of official land tenure reforms, perceived land tenure security is still lagged behind. As a result, rural-urban migration may be depressed. China has the world's largest migration flows and the rural migrants affect more than 40% of total Chinese rural laborers in 2013. So rural-urban migration linked with perceived land

tenure security should be received more attention. To my knowledge, there are only two studies that address the impact of perceived land tenure security on rural-urban migration, which are Mullan et al. (2011) and Ma et al. (2014).

This study uses the same approach as Ma et al. (2014), but applies it to an area in southern China (northeastern part of Jiangxi) where perceptions of tenure security are much lower and the development of land rental market is much higher, compared with the area in Gansu examined by Ma et al. (2014). We use household perceptions of probabilities of land reallocation in the next five years and household perceptions of the importance of land certificates in securing land rights as main land tenure security indicators. Empirical estimates are obtained of the impact of tenure security on probabilities of migration decisions, share of migrants and migration duration for a household, using data collected from 527 households in 3 counties in Jiangxi for the year 2010.

Empirical findings show that land tenure security derived from the expectation that no land reallocations will take place in the next five years has a positive net impact on migration for households living in villages with relatively less developed land rental markets; land tenure security derived from land certificates, on the other hand, does not significantly affect migration in such villages. In villages with relatively more developed land rental markets, perceptions about land reallocations affect only the duration of migration (with a negative sign) while land certificate perceptions affect both the participation in migration and the duration (with a negative sign). The results contrast with the findings presented by Ma et al. (2014) that land reallocation perceptions have a negative impact and that land certificate perceptions have a positive impact in villages with a underdeveloped land rental market, while land tenure perceptions do not matter in villages with well-functioning land rental markets.

The different results can be explained from two factors. Mullan et al. (2011) in their study concluded that “increasing the security of land tenure, in the

absence of complete rental rights, reduces the likelihood of migration. [...] However, rental rights in combination with increased tenure security raise the probability of migration. As the ability to freely transfer the land weakens the link between household labor supply and returns to land, it is unsurprising that we no longer observe that households facing a lower risk of losing land are less likely to migrate" (Mullan et al 2011:p.129). Compared with the Gansu research area, our research area in Jiangxi has a more developed land rental market as defined by Ma et al. (2014). Hence, tenure security derived from the expected absence of land reallocations perceptions has a positive impact on rural-urban migration, although we also find that the impact is weaker in villages where the land rental market has developed most. Relatively few households in our research area in Jiangxi possess land certificates. This may explain why the importance attached to land certificates plays little or no role in migration decisions.

The results of our study have important policy implications. The results for Gansu presented by Ma et al. (2014) show that land certificates can have a significant positive impact on rural-urban migration. In our research area in Jiangxi, only 30 percent of the households possess a land certificate and the importance attached to land certificates in protecting land rights is lower than in the Gansu research area. Land certificates provide legal protection against land expropriation and thereby usually increase perceived land tenure security. Hence, if local governments in Jiangxi would issue land certificates to all households and improve their enforcement systems to raise households' trust that land certificates protect their land rights, rural-urban migration is likely to be stimulated. If the land belonging to migrant households is rented out to more efficient farmers, as economic theory suggests, this will stimulate the total level of agricultural production in the region.

Our study is limited to a relatively small area in southeast China, Jiangxi, but differ significantly from those obtained by a case study by Ma et al. (2014) in Gansu province. More research is needed, for example in coastal areas

where land value is much higher and initial costs for migrants are much lower than in Jiangxi or Gansu, to gain more insights into the impact of tenure security of migration and to explain the different results obtained so far.

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Table 1

| Investigated county | Investigated township | Investigated villages | Sample numbers | Total |
|---------------------|-----------------------|-----------------------|----------------|-------|
| Yanshan | Wanger | Gangyan | 167 | 222 |
| | | Henglin | 55 | |
| | Xintan | Qingliu | 29 | 51 |
| | | Zhancun | 22 | |
| | Yongping | Hebei | 7 | 55 |
| | | Xiaban | 21 | |
| | | Yongping | 27 | |
| | Zixi | Huoxing | 23 | 47 |
| | | Wenshan | 24 | |
| Yujiang | Honghu | Banqiao | 53 | 53 |
| Guixi | Tangzhen | Shangzhu | 99 | 99 |

Table 2. Descriptive statistics and definition variables used in the analysis (n=527)

| Variable | Definition | Mean | S.D. | Exp. signs |
|---|---|-------------------|-------|------------|
| Migration variables | | | | |
| Migration dummy | 1= households with at least one member living outside the county for employment purposes during the year before the survey, whatever the duration, and 0= other households | 0.68 | 0.47 | n.a |
| Share of migrants | Share of migrants to all workers (aged between 16 and 65) in a household | 0.33 ^a | 0.15 | n.a |
| Migration duration | Share of the time spent working outside the county to the total time spent working by all workers (aged between 16 and 65) of a household | 0.46 ^a | 0.19 | n.a. |
| Perceived land tenure security variables | | | | |
| Village perception on land redistributions | Share of the other sampled households that live in the same village as the surveyed households expecting no land redistributions within the next five years | 0.26 | 0.43 | +/- |
| Village perception on land certifications | Mean importance attached to land certificates in protecting land security by the other sampled households that live in the same village as the surveyed household and possess land certificates | 3.41 ^b | 1.38 | +/- |
| Village characteristics | | | | |
| Village migration prevalence | Average number of migrants per household of other sampled households within the village in 2010 | 1.40 | 0.26 | + |
| Distance to county | Average distance from the village to the nearest county seat (km) | 23.25 | 10.84 | +/- |
| Household characteristics | | | | |
| Children ratio | Ratio of children (aged < 16) to all workers in the household | 0.30 | 0.32 | +/- |

| | | | | |
|---------------------------------------|--|----------|----------|-----|
| Elderly people ratio | Ratio of elderly people (aged > 65) to all workers in the household | 0.13 | 0.25 | +/- |
| Female ratio | Ratio of female workers to all workers in the household | 0.46 | 0.17 | - |
| Education of household head | Years of formal education of the head of household (years) | 3.47 | 3.23 | +/- |
| Average age | Average age of all workers in the household (years) | 39.46 | 8.59 | - |
| Past migration experience | Village-level of average duration of migration for migrants of other sampled households (years) | 9.58 | 2.19 | + |
| Wealth | Value of agricultural devices, livestock, electronic instruments, house, furniture and transportation vehicles (1,000 RMB) | 83896.05 | 399662.8 | +/- |
| Land characteristics | | | | |
| Contracted land-worker ratio | Ratio of contracted (=allocated) land area to all workers in the household (mu) | 1.65 | 1.36 | - |
| Paddy land-total land ratio | Ratio of paddy land area to the total land area cultivated by the household | 0.96 | 0.14 | - |
| Land rental market development | 1= more than 20% of the households in the village rent out land, 0 = otherwise | 0.56 | 0.49 | +/- |
| Regional characteristics | | | | |
| Yanshan | 1 = farmer resides in Yanshan county 0= otherwise | 0.19 | 0.39 | +/- |
| Guixi | 1 = farmer resides in Guixi county 0= otherwise | 0.71 | 0.45 | +/- |

Source: Household Survey

^a Calculated based on the sub-sample of 357 households involved in migration

^b Calculated based on the sub-sample of 161 households involved in possessing land certificates.

n.a = Not applicable

Table 3 Regression results for perception on land security variables

| Variable | Participation decision | | Share of migrants | | Migration duration | |
|--|------------------------|---------|-------------------|---------|--------------------|---------|
| Model Variable | Logit Coefficient | z-value | Tobit Coefficient | t-value | Tobit Coefficient | t-value |
| Perceived land tenure security variables | | | | | | |
| Village perception on land redistribution | 0.67*** | 2.99 | 0.05*** | 2.64 | 0.10*** | 3.53 |
| Land rental market | 0.50** | 2.36 | 0.02 | 0.94 | 0.03 | 1.21 |
| Village perception on land certificates | 0.07 | 0.96 | 0.008 | 1.46 | 0.003 | 0.29 |
| Village perception on land redistribution land × rental market | -0.55*** | -2.66 | -0.04*** | -2.53 | -0.02 | -0.76 |
| Village perception on land certificates × Land rental market | -0.16** | -2.00 | -0.013* | -1.81 | -0.013 | -1.06 |
| Village characteristics | | | | | | |
| Distance to nearest county | 0.00 | 0.18 | -0.00 | -1.79 | 0.00 | 0.44 |
| Village migration prevalence | 1.34 | 1.37 | -0.07 | -0.79 | 0.18 | 1.50 |
| Household characteristics | | | | | | |
| Children Ratio | -1.12*** | -4.56 | -0.11*** | -3.73 | -0.10* | -1.89 |
| Elder Ratio | -1.40*** | -3.13 | -0.21*** | -2.70 | -1.11 | -1.02 |
| Women Ratio | 0.46 | 0.62 | 0.06 | 0.62 | 0.18* | 1.65 |
| Average age | -0.00 | -0.93 | -0.00 | -1.26 | -0.00 | -0.42 |
| Education of household head | -0.08 | -1.40 | -0.01 | -1.12 | -0.01* | -1.72 |
| Migration experience | -0.05 | -0.07 | 0.01 | 1.25 | -0.00 | -0.13 |
| Ln (Wealth) | 0.01 | 0.10 | 0.06 | 0.87 | 0.00 | 0.02 |
| Square_In (Wealth) | 0.01 | 0.21 | -0.00 | -0.74 | 0.00 | 0.17 |
| Land characteristics | | | | | | |
| Contracted land-workers ratio | -0.29*** | -2.40 | -0.04*** | -2.76 | -0.06*** | -2.86 |
| Paddy-total land ratio | -0.63 | -0.83 | -0.13 | -1.21 | -0.17*** | -1.82 |
| Observations | 527 | | 527 | | 527 | |
| Mean VIF | 1.60 | | 1.60 | | 1.60 | |
| Lincom test (Z-value)^b | 0.12(1.26) | | 0.01(1.26) | | 0.07***(5.51) | |
| Lincom test (Z-value)^c | -0.10***(-3.24) | | -0.00(-1.11) | | -0.010*(-1.79) | |

Note: *, **, *** indicate statistical significance at the 10%, 5% and 1% level respectively. Standard errors are adjusted 11 clusters (villages).

^a Mean VIF tests the degree of multicollinearity among the independent variables.

^b For sum of coefficients of village perception on land redistribution and village perception on land redistribution land × rental market

^c For sum of coefficients of village perception on land certificates and village perception on land certificates × Land rental market

Table 4 Marginal impacts for land security perception variables

Perception on land redistribution

| Variable | Participation decision | | Share of migrants | | Migration duration | |
|--|------------------------|---------|-------------------|---------|--------------------|---------|
| Perception on land redistribution | | | | | | |
| Land rental market | Coefficient | Z-value | Coefficient | Z-value | Coefficient | Z-value |
| 0 | 0.13*** | 3.23 | 0.04*** | 2.54 | 0.07*** | 3.34 |
| 1 | 0.02 | 1.20 | 0.01 | 1.24 | -0.01* | -1.82 |

Note: *, **, *** indicate statistical significance at the 10%, 5% and 1% level respectively

0 defines as a relatively more developed land rental market

1 defines as a relatively less developed land rental market

Perceptions on land certificates

| Variable | Participation decision | | Share of migrants | | Migration duration | |
|---|------------------------|---------|-------------------|---------|--------------------|---------|
| Perceptions on land certificates | | | | | | |
| Land rental market | Coefficient | Z-value | Coefficient | Z-value | Coefficient | Z-value |
| 0 | 0.01 | 0.95 | 0.01 | 1.46 | 0.00 | 0.29 |
| 1 | -0.02*** | -2.86 | -0.00 | -1.12 | -0.01* | 1.82 |

Note: *, **, *** indicate statistical significance at the 10%, 5% and 1% level respectively

0 defines as a relatively more developed land rental market

1 defines as a relatively less developed land rental market