Forced off Farm? Labor Allocation Response to Land Requisition in Rural China

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ABSTRACT

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Land requisition has been an important process by which Chinese local governments promote urbanization and generate revenue. This study investigates the impacts of land requisition on farmers' decisions of labor allocation between agricultural and non-agricultural sectors. We argue that, conditional on village fixed effects, land requisition can be explored as a quasi-natural experiment to identify the relationship between land rights and labor allocation of farmers. We find that young farmers (age 16-44) are not affected in their migration decisions by land loss through requisition, while some older farmers (age 45-55) are affected. In response to land loss through requisition, the probability that older farmers living beyond the mean distance from the county seat migrates to cities increases by 8.5 percentage points. An econometric test confirms that the finding is unlikely to be driven by unobserved variables associated with household experience of land loss. This finding raises concerns about the wellbeing of the farmers who may not be competitive in the urban labor market and therefore unlikely to leave farming unless they have to.

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1. Introduction

Some of the most fundamental functions of government involves their right to direct land-use practices in order to achieve certain development and social objectives. Legally termed as "eminent domain", the use of government power to take land is part of this right, and can be necessary for the orderly acquisition of sites needed for desired public purposes that may otherwise be blocked by property owners.[1] While in principle special consideration should always be given to the protection of the interests of both those whose land is taken, and of those taking the land, the exercise of such power can be very controversial in practice. Perhaps no other country experiences this contentious issue more than today's China. The amount of agricultural land requisitioned by Chinese local governments for urban and industrial purposes has increased substantially in recent years.[2] At the same time, associated problems — unauthorized land seizure, forced eviction, inadequate compensation, and corruption — have made "land issues" an important source of social discontent, topping the list of major agrarian matters that concern the public (Lin 2009; Kung, et al., 2013).

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[1] For a general discussion on the public direction of land use, see Chapter 18 in Barlowe (1985).

[2] During 2004-2007, 0.72 million hectares of cultivated land were requisitioned for construction purposes in China (Ministry of Land Resource 2004, 2005, 2006, 2007).

As the Chinese economy transitions out of agriculture, the migration of individuals or households from rural areas to cities is generally believed to be voluntary, because such a move allows people to seek higher wages, while enhancing their abilities to cope with shocks to farm income (Giles, 2006).[3] However, the movement out of rural areas often occurs incrementally at the household level, with only selected family members migrating while others stay behind. For farmers who stay behind in rural villages, farming remains an important production activity (de Brauw et al.,2008; Mu and van de Walle, 2011). Farming is also a major source of income for the rural elderly, who stop working only when they are physically incapacitated, due to their lack of social security (Cai, et al., 2012; Pang, et a., 2004; Benjamin, et al., 2003). For Chinese farmers, land is not only a major productive asset, but also an important safety net. Hence, the loss of land due to requisition means a reduction in livelihood for many rural households. When undercompensated for their land loss, farmers are forced to make costly adjustments. This paper examines how farmers use the labor market to cope with land loss, and analyzes the impact of land requisition on their migration decisions. To our knowledge, this is one of the first studies that provides empirical evidence on how land requisitions in China affect farmers.

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[3]As a form of off-farm employment, migrant work can also be an *ex post* labor response to income shocks in developing countries (Kochar, 1999; Rose, 2001).

The emerging body of literature on land taking in China focuses on institutional foundations and complex processes. There is evidence that, across most of China competition for land between agricultural and non-agricultural sectors is intensified by the accelerated urbanization process and rapid industrialization in recent years (Lin, 2009). As land sales contribute substantially to local revenue, local governments in China, as the constitutional owners of the land, have every incentive to engage in land requisitions and land development (Lin, 2009; Kung et al., 2013). Evidence shows that local officials who are eventually promoted maximized land revenue during their tenure, supporting the view that career incentives also fuel the increase of land requisitions (Kung and Chen, 2013). While all of these studies raise concerns about farmers' welfare in the land requisition process, there is a relative paucity of work analyzing how land requisitions affect farmers, and identifying their coping strategies. Our study contributes new evidence to these issues.

This paper also relates closely to the literature on land rights. Secure property rights in general, and land rights in particular, are among the most instrumental institutional arrangements conducive to economic development (e.g. North, 1990; Feder and Feeny, 1991).[4] One theoretical

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[4] Though the specific mechanisms through which property rights affect economic activity may be context specific, and depend on the existence of complementary conditions (Besley and Ghatak, 2009a; Katz and Owen, 2009), many empirical studies from different countries yield evidence supporting the view that secure land rights are investment enhancing (Besley 1995; Goldstein and Udry, 2008; Bandiera, 2007; Jacoby, et al., 2002; Sánchez, et al., 2010).

argument regarding how property rights improve efficiencies in resource allocation states that well-defined rights reduce the need for and the cost of property protection (Besley and Ghatak, 2009b). Evidence from multiple countries supports the argument that secure property rights encourage people to engage in labor market activities, including employment as migrants (Field, 2007; de Brauw and Mueller, 2012; Valsecchi, forthcoming). China is no exception — land tenure insecurity, reflected as administrative land reallocation in the 1990s and early 2000s, is associated with decreased participation in the labor market outside of the village (de la Rupelle et al., 2009; Mullan et al. 2011; Giles and Mu, 2014). Recently, land tenure security in rural China is threatened primarily by the increase of land requisitions without proper compensation. The impact of this land seizure on farmers may not be the same as other forms of land tenure insecurity, such as administrative land reallocation, because land requisition by the government is not a process individual households can effectively guard against. This study focuses on this specific form of land tenure insecurity and farmers' labor response to it.

In a simple conceptual framework in which households are assumed to allocate labor between agricultural and non-agricultural sectors to maximize utility, we show that farmers whose land holdings are reduced through government requisition, and who do not receive adequate compensation in the process, are more likely to seek non-farm job opportunities either in their local community or in cities. To guide the empirical analysis, we focus on the underlying

legal and administrative institutions in the land requisition process, which suggest that land

requisition decisions are made by county-level (sometimes township-level) governments or

above. Decisions are mostly driven by the urbanization and industry development plan of the

locality, but are sometimes also driven by fiscal motivations and/or the career incentives of local

officials. Our data further shows that, within a village, observed characteristics of households

that have experienced land loss are no different from those that have not, which is consistent

with the administrative stipulations of land requisition. Hence, we argue that land requisition can

be viewed as a quasi-natural experiment in which a household's loss of land via requisition is

exogenous to the labor allocation decisions of its members. In the empirical specification, using

data from the China Household Finance Survey (2011 and 2013), we explore intra-village

variations in households' probabilities of losing land through requisition to identify the impact

on their labor allocations. We find that that the labor allocation decisions of young farmers (age

16-44) are not affected by land loss through requisition, but the decisions of older farmers are

affected. In response to land loss, older farmers who live beyond the mean distance from the

county seat increase their propensity to migrate to cities. Following Altonji et. al (2005), we

show that our main results are unlikely to be driven by selection bias due to unobservables.

    The remainder of the paper is organized as follows: Section 2 provides a brief review of

institutions related to land rights and land requisition in China. Section 3 presents a conceptual

framework that links farmers' decisions of labor allocation to their land holdings. Section 4

includes a discussion of the data and a summary of statistics, followed by an outline of our

empirical approach. Section 5 reports the results, and Section 6 offers some concluding remarks.

2. Background

All land in China is the constitutional property of either the state or the collectives — the

State owns land in urban areas, and rural collectives own agricultural land and homesteads in the

suburban and rural areas[5].[6] Without actual land ownership, natural persons, legal persons, and

for-profit organizations in China instead have land *use* rights for a fixed period of time. For

example, under contractual arrangements with their village, rural individual households have 30-

year land use rights.[7] As individual land use rights are distinct from and independent of land

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[5] According to the Organic Law of Village Committees, administrative village committees have the authority to administer the affairs concerning the land and other property owned collectively by villagers. The Land Management Law (Article 10) stipulates that, based on ownership, rural land can be managed by the collective economic organizations of the village, the villagers' committees, or the collective economic organization of the township. This is consistent with a nation-wide survey that found that the administrative village, the small group, and the township government can all be regarded as rural collectives with land ownership rights (Cai 2003). The ambiguity concerning collective land ownership is believed to be "deliberate", allowing the government some leeway in reacting to social developments (Ho, 2001).

[6] Land ownership is stipulated in Article 8 of the Constitution of the People's Republic of China, amended in 1998, and in Article 10 of the Constitution, amended in 2004.

[7] Under the 1978 Household Responsibility System (HRS), rural households were granted 15-year land use rights. In the late 1990s, when the original 15-year leases expired, the national government extended the term of farmers' use rights for an additional 30 years, and codified 30-year land use rights under the 1998 Land Management Law (Chen and Davis 1998).

ownership by collectives and the State, this legal framework has been succinctly described as a "dual land tenure system" (Khantachavana et al., 2013).

2.1 Institutions of Land Requisition

Land in China is divided into three types of use: "agricultural land", "construction land", and "unutilized land". Any organizations or individuals needing land for construction purposes (including construction of buildings, mining, transportation and water-conservancy facilities, and buildings for tourist or military use) must apply for the usage rights of land owned by the State.[8][9] Rural collectives, though designated as owners of rural land, do not have the right to convert land for non-agricultural usage by selling or leasing land to non-State agencies. In this legal framework, land development in rural or suburban areas must proceed in two steps. First, local governments seize land from rural collectives. Second, a land lease transaction between the government and land developers occurs (Guo, 2001). In other words, land requisition by governmental seizure is a required step through which agricultural land is be converted to non-agricultural use.

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[8] One exception is that rural collectives can use land they own for community uses, such as township and village enterprises, public infrastructure, or resident houses for collective members. See the Land Management Law Articles 3 and 43.

[9] "Land owned by the State", according to the Land Management Law, includes both the land owned by the State and the land originally owned by rural collectives, but later expropriated by the State.

Following the establishment of the Ministry of Land Management in 1986, local land management bureaus were set up at county levels and given the authority to appropriate collective land and monitor the sales of land use rights. During the process of land acquisition, the bureaus are responsible for developing land requisition plans, establishing a compensation formula, and resolving any labor resettlement issues. Land requisition plans ought to be approved by the county government before being publicly displayed. During this period of public notice, the owners and users of the land being taken finalize the compensation procedure through the land management bureau.

According to Chinese land laws and the Constitution, the government may only use its power to seize land for public interests. This stipulation is consistent with eminent domain practices worldwide, however the definition of "public interest" is particularly vague in China. Many regulations on land requisition include a list of examples of public interests, but the list often ends with an ambiguous phrase such as "…and other public interests as stipulated by laws or administrative regulations".[10] The elastic scope of "public interest" can be stretched to include

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[10] For example, the Acquisition of Land for State Construction Regulation (1982) and the Regulation for the Expropriation and Compensation for Housing on State-owned Land (2011), both passed by the Standing Committee of the National People's Congress, explicitly enumerated land usages for "public interests".

many types of land resource developments, such as establishing development zones,[11] ecological

zones, tourist resorts, and industrial corridors or industrial cluster zones (Yew, 2012). More

recently, it includes the increase of land used for commercial and real estate purposes (Kung, et

al., 2013).

In addition to the legal framework that allows governments an almost unrestrained power

to take land, China's fiscal structure further incentivizes local governments to utilize that power.

During the Tax Sharing System reform in 1994, tax revenues were centralized, and the central

government's portion of shared tax revenue increased at the expense of local governments

(World Bank, 2007). However, as compensation to local governments for this loss of tax

revenue, revenue-sharing arrangements for land transactions moved in the opposite direction ―

municipal and county governments' share of revenue from land transactions increased from

60%, to an eventual 100% (Chan, 1997).[12] In 1998, a bill was passed granting local governments

de jure ownership over land within their geographical jurisdiction, and local governments

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[11] In 1998, The State Land Administrative Bureau revealed that, on average, each province had about 30
development zones. By 2005, China reportedly had a total of 6,866 development zones with a planned area of
38,600 square kilometers (Lin, 2009).

[12] The Land Management Law, amended in 1998, stipulates that 30% of land revenues generated from newly
acquired land must be submitted to the central government, and 70% can be retained by local governments. Hsing
(2006) documents that provincial and prefecture-level governments get 20% each and the remaining 30% is kept by
the county level governments. Township governments' share is 5-10%, though this is not fixed and is decided by
county-level governments.

became the legal residual claimant of revenue obtained from land sales (Lin and Ho, 2005; Kung

et al., 2013; Kung and Chen, 2013; Peterson, 2006). Land revenues subsequently grew from 10%

of counties' extra-budgetary revenue before 1998 to 79% in 2008, amounting to approximately

38% of the total annual revenue (Kung and Chen, 2013). With land revenue maximized, county

officials are able to spend on large-scale construction projects, which are often considered

representative of an official's achievement, and thus help advance their careers (Kung and Chen,

2013).

In 2001, the central government set a quota on the maximum quantity of land acquisitions

out of a desire to protect China's farmland for food security purposes. Despite of this effort, the

conversion of farmland into industrial and urban developments has showed no signs of slowing

down. The fees collected from land leases amounted to 901 billion *yuan*, or 90% of the entire

local revenue received between 2001 and 2003 (Kung et al., 2013).[13] Decisions regarding the

location and amount of land to be seized are made by county level (sometimes township level)

governments or above, and are driven by the aforementioned fiscal and career incentives of local

governments. Villages close to urban areas, where land has higher business potential, are more

likely to experience requisition. Due to the hierarchical relationship between the government and

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[13] In 2002, about 18,100 hectares of land were requisitioned illegally, often involving county and township
governments (Lin and Ho, 2005; Hsing, 2006).

the collectives, rural collectives, despite being *de jure* owners, actually have little choice about whether or not to sell the land rights (Lin and Ho, 2005). The jurisdiction of legal and administrative institutions governing land requisition suggests that these decisions are often imposed upon villages, and are made exogenous to households within a village.

2.2 The Status of Farmers in the Process of Land Requisition

Requisition of land by local governments has substantially shaped the state-farmer relationship and has been the primary instigation of the proliferation of rural conflicts in the past decade (Guo, 2001). Many conflicts and disputes stem from the low and often delayed compensation to farmers. According to the current Land Management Law, the farmers affected by the land requisition process are entitled to three types of compensation — compensation for loss of land, a resettlement subsidy, and compensation for structures and standing crops. However, under no circumstances shall the combined land compensation fees and resettlement subsidies exceed 30 times the value of the average annual yield of the land, as calculated over the three-year period preceding the requisition.[14] Compensation for non-land rural assets is also highly discretionary. While the compensation is legally bound by an upper limit and based on the agricultural value of the land, the sale price of the converted land is determined by its

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[14] See Article 47 in the Land Management Law of the People's Republic of China (2004 Revision).

commercial value, and is not capped. This asymmetry allows the government to profit

considerably from land requisition (Kung, et al., 2013). Undercompensating farmers becomes a

norm in the process of land requisition. Guo (2001) documents that 60-70% of income from land

sales goes to county township governments, 25-30% goes to village collectives, and only 5-10%

is ever delivered to farmers.

The procedure for land requisition compensation does not work in farmers' favor either.

As land lease transactions between local governments and developers are seldom transparent,

farmers often do not know the sale price land rights. In the period from 1995 to 2002, 86% of

government land requisition transactions were carried out via closed-door negotiations, with only

the remaining 14% executed through public tender and auction (Lin and Ho, 2005). Moreover,

farmers are not directly compensated by the local government. Instead, rural village collectives,

as the *de jure* owners of land, receive compensation directly from the government. Even though

a village is not a formal government body, but rather a "self-governing" agency, village leaders

are effectively agents of the state, entitled to salaries, and obligated to implement government

policies and carry out central mandates (Rozelle and Boisvert, 1994). As such, village leaders

may not have the power or the *incentive* to negotiate with the local government for fair

compensation. There are even reports that corrupt village cadres embezzle compensation money

designated for farmers (Cai, 2003). Undercompensated farmers sometimes resort to violence in

their resistance to land requisition (Lin and Ho, 2005). More often, however, they cope with land

loss via nonviolent strategies, though these remain largely poorly understood

3. A Simple Model of Farmers' Labor Allocation

The simple model developed in this section relates a representative household's decision

of labor allocation between agricultural and industrial work, to their land endowment. With some

standard assumptions about agricultural production functions, the model shows that an

exogenous reduction of land without adequate compensation leads the household to allocate

more labor to non-agricultural activities. This is a central hypothesis we test empirically in later

sections.

We assume that the household maximizes the utility function, which is composed of

leisure (l) and consumption (c), by allocating labor between farming (L_f) and work in the urban

sector (L_u). The household faces a time constraint and a budget constraint as specified below:

$$Max\ U(l, c) \tag{1}$$

$$s.t.\ l + L_f + L_u = T_0 \tag{2}$$

$$c \leq wL_u + pf\left(L_f, \bar{L} - R\right) + \tau R \tag{3}$$

where T_0 is a constant number denoting the total time available to the household. The price of

consumption goods is normalized as 1, and the price of agricultural output is p. Initial land

endowment is given by $\bar{L}$. The amount of land taken through requisition is denoted as R, and $0 \leq$

$R \leq \bar{L}$. Farm labor L_f and remaining land $\bar{L} - R$ are the two inputs of the agricultural production

function $f(\cdot)$. Compensation to the household for land requisition is specified as τR, where $\tau \geq$

0. We further assume that the production function f has the following commonly assumed

features: $f_1 > 0$, $f_2 > 0$, $f_{11} < 0$, $f_{22} < 0$, and $f_{12} > 0$, where the subscripts 1 and 2 indicate the

derivative of the function with respect to its first and second argument, respectively. The

assumption $f_{12} > 0$ ensures that labor and land are complements in agricultural production, and

that more of one factor increases the marginal utility of the other.

By allocating labor between farming (L_f) and migrant work (L_u), the household

maximizes the utility subject to the two constraints specified in (2) and (3). It follows that the

first order condition for an interior solution is:

$$p \frac{\partial f}{\partial L_f} = w \qquad (4)$$

This equation dictates that the optimal amount of labor allocated to farming is such that

the value of marginal product of labor on the farm is equal to the forgone wage rate in the urban

sector. To assess how land requisition influences the household's labor allocation decision, we apply the implicit function theorem to derive the following relationship from equation (4):

$$\frac{dL_f}{dR} = \frac{pf_{12}}{f_{11}} < 0 \tag{5}$$

Given that $f_{11} < 0$ and $f_{12} > 0$, the above formula shows unambiguously that the household's labor devoted to farming decreases with the increase in land requisitioned by the government.

Given the budget constraint specified in (3), we can obtain the following relationship between the amount of land taken and the household labor allocated to the urban sector:

$$\frac{dL_u}{dR} = \frac{p(f_2 - f_1\frac{dL_f}{dR}) - \tau}{w} \tag{6}$$

There are two cases that distinctly define the above relationship:

Case I. The compensation for the unit land loss is no lower than the value of marginal productivity of land and labor in agricultural production. That is,

$$\tau \geq p(f_2 - f_1\frac{dL_f}{dR}) \tag{7}$$

then $\frac{dL_u}{dR} \leq 0$. This is the case when compensation is high enough to generate an income effect leading to either no change or a reduction in labor allocation to non-agricultural sectors, and consequently more consumption of leisure.

Case II. The compensation for the unit land loss cannot replace the value of

marginal productivity of land and labor in agricultural production: $\tau < p(f_2 - f_1 \frac{dL_f}{dR})$. In

this scenario, households will allocate more labor to the urban sector in response to land

requisition $(\frac{dL_u}{dR} > 0)$.

This model highlights that a household's labor allocation response to land

requisition depends on the level of compensation received by the household. *Case I* may

apply when the commercial value of land is greater than the agricultural value (e.g. land

close to urban centers), and when farmers are adequately compensated. However, given the

more common compensation practices in land requisition as described in Section 2, it may

be reasonable to infer that *Case II* is more widely applicable. In our empirical analysis, we

will use the distance to the county center as a proxy measure for the level of compensation.

4. Data and Empirical Framework

4.1 Data

The data used in this paper is based on the second wave of the China Household Finance

Survey (CHFS), which was carried out by Southwestern University of Finance and Economics

from July to August 2013. The sample size is 28,241 households and 98,045 individuals,

covering 29 provinces,[15] and including 1,046 communities. The sample was drawn with

stratified, three-stage and PPS sampling methods. All data was collected by interviewers using a

computer-assisted interviewing (CAPI) system. The data set covers detailed household

information including demographic characteristics, financial and non-financial assets, liabilities

and credit constraints, household expenditures, income, social security, and insurance. The 2013

CHFS data is not only nationally representative, but also provincially representative.[16] The

interviewee and his or her spouse are asked whether their household registration (*hukou*) is with

the village committee where they live. The interviewees with rural *hukou* and who were residents

in their *hukou* registration place, together with their household members, are included in our

analysis sample. Households with missing information on land requisition are excluded from the

sample. The final sample contains 8,432 households.[17]

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[15] The survey does not cover five areas: Tibet, Xinjiang, Hong Kong, Macao, and Taiwan.

[16] The first wave of CHFS was conducted in 2011. At that time, the valid sample size was 8,438 households and 29,500 individuals in 25 provinces, including 320 counties with 1,046 communities. In the 2011 survey, however, questions regarding land requisition were only directed to households who still owned land (rights) at the time of the interview. As a consequence, households whose entire land holdings had been seized by the time of the interview cannot be identified. Therefore, we only use the 2013 data in this study.

[17] For individuals with rural *hukou* but not residing in their *hukou* registration place, we can identify only the county in which their *hukou* was registered, but not the village. In the regression analysis, which is based on village fixed effects, we have to exclude such individuals. Due to this data limitation, individuals from households that migrated as a whole are effectively excluded from our sample. According to Lu (2014), of the 260 million rural-urban migrants, 37 million (14.2%) are from such households. Without including individuals from these households, we are likely to underestimate the positive impact of land requisition, if any, on migration.

The subject of land requisition was asked in two questions: "whether household land has been requisitioned" and "when did each requisition happen". One additional concern about coding land requisition experience based on these variables is whether survey respondents interpret "land requisition" correctly. Officially, land requisition specifically refers to rural land converted to non-agricultural use by local governments, and does not include land taking by rural collectives for housing and/or non-agricultural production purposes. It is possible for respondents to consider land taken by their own village collective as governmental land requisition. Accordingly, if such collective land acquisitions are misidentified in the data as land requisition by governments, then some estimates may be biased. That's because land appropriated by village collectives is less likely to be exogenous to an individual household if village cadres can select households based on unobserved factors that are related to migration decisions, such as agricultural productivity. To address this concern, it's important to note that in the 1980s, most agricultural land conversions were for rural housing construction purposes.[18] Since then, the loss of farmland to rural housing has declined, partly due to better land management by the central government. In 1993, the amount of farmland lost to rural settlement accounts for less than 10% of total farmland loss (Lin 2009). Therefore, to minimize the chance that land taken by

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[18] Lin and Ho (2005) documents that during 1985-1988, the loss of farmland to rural housing construction averages 68,700 hectares, accounting for 33% of the total farmland loss during the period.

collectives for rural housing purposes is mistaken as land requisitioned by governments, we

exclude from the analysis sample those households whose land was "requisitioned" before 1993.

The remaining sample contains 7,706 households and 10,963 individuals aged between 16 and 55.

4.2 Summary Statistics

In the analysis sample, 7.02% of rural households experienced land requisitions by the

end of August 2013.[19] Figure 1 depicts the share of households who lost land in villages where

land requisitions occurred. The figure shows that in such villages, it is rare for more than half of

the households to be affected by land requisitions. In fact, in most of these villages, fewer than

20% of households had land taken by governments. Figure 2 is the density distribution of the

timing of the latest land requisition, reported by households that experienced land requisition.

The distribution shows that most land requisitions happened in the most recent decade (2003-

2013), with approximately 78% of land requisitions occurring after 2005, and 50.6% during

2010-2013. Most households affected have their land requisitioned in part, and not entirely

(Figure 3).

To study the non-farm employment decisions, we focus on individuals aged 16-55. A

person is defined as a migrant if he or she has rural *hukou* but does not reside in rural areas at the

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[19] In the eastern, central, and western regions of China, the share of households that experienced land requisition is 8.69%, 4.91%, and 7.66% respectively.

time of survey. Table 1 reports the non-farm employment status by age, gender, and education. In the total sample, 22% of the individuals migrated. Young people make up a large part of the migrant group — 42% of individuals aged 16-29 migrate, compared to 7% for individuals aged 45-49, and just 4% for individuals aged 50-55. Migration rates correlate positively with individual education level — 7% of individuals without formal education migrate, compared to 32% for high school or technical school-educated individuals, and 48% for the college-educated. The age distribution in local non-farm employment is not as distinct as that in migration. The young are only slightly more likely to be employed in local off-farm activities than the old. However, participation in local non-farm employment certainly increases with education. The level of self-employment in the local non-farm sector is low, at only 4.5% of the total sample.

When comparing the characteristics of household heads and family structures between households with land requisition experience and those without (Table 2), we find most differences are not statistically significant. This point is further strengthened by intra-village comparisons reported in Column (4). For example, the political connections, approximately measured by two variables: whether or not the household head is a Communist Party member, and whether or not the household head is a village cadre, do not differ between households with land requisition experience and those without it. Neither do household income nor the majority of pre-determined demographic characteristics differ between the two groups. The results

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indicate that both types of households essentially share the same observable characteristics. For labor allocation outcomes, the data show that households with land requisition experience have fewer members that migrate to cities than households without it, but this difference vanishes once village fixed effects have been controlled for. The comparisons - with or without village fixed effects - consistently show that individuals in households that experienced land requisition are more likely to work in the local non-farm sector. Geographically, households with land requisition experience are located closer to the county seat, implying that land requisition occurs more often in villages closer to urban centers.

4.3 Empirical Framework

The explained variables of focus are dummy variables that reflect individuals' off-farm labor decisions: migrating to cities, employment in the local non-farm sector, and self-employment in the local non-farm sector. This paper primarily uses the linear probability model specified as the following:

$$OffFarm_{ij} = \alpha + \beta LandRequistioned_{ij} + X_{ij}\gamma' + D_j + \varepsilon_{ij} \tag{8}$$

where *OffFarm* denotes whether an individual i in village j is engaged in the aforementioned off-farm activities. The key explanatory variable $LandRequisitioned_{ij}$ is a binary variable indicating whether one's land was requisitioned after 1993. The vector *X* contains variables of individual

and household characteristics. Individual characteristics include gender, age, and the level of education, while household variables include the age and gender of the head of household, household size, as well as demographic compositions (the number of children 0-6 years old, the number of children 7-15 years old, and the number of household members older than 60, all designated by gender). We also control for whether the head of household is a village cadre and whether they are a Communist Party member as proxies for connections the household may have with the village's decision-making body. The vector D_j contains village fixed effects. There are 484 total villages in the sample. The error term in the regression is denoted by u_{ij}. To account for heteroskedasticity caused by a binary dependent variable and the serial correlation within a village, we report the robust standard errors clustered at the village level (White, 1980).

We are interested in the coefficient β, which captures the extent to which land requisition is related to an individual's probability of accepting off-farm jobs. It is identified by the intra-village differences between individuals in households whose land has been taken and those in households who do not have such experience. This identification strategy is justified by the legal and administrative institutions governing land requisition, as discussed in Section 2, which suggest that land requisition decisions are made independent of individual households. In the next section, we provide empirical evidence for this argument before we present regression results.

5. Results

To examine the nature of land requisition relative to household characteristics, we begin

our regression analysis by investigating if household characteristics are related to the probability

that households lose land through requisition. Then, we examine whether land loss changes the

labor participation decisions of farmers, both in the total sample and in the stratified subsample.

5.1. Which households are likely to lose land through requisition?

As a "first stage" analysis, we examine the characteristics of households that have lost

land in government requisitions. As current household demographics might be shaped by land

requisitions that occurred many years ago, we focus only on the determinants of land requisitions

that occurred in the most recent three years (2011-2013). Table 3 reports the regression results on

whether a household experienced any land requisitions during this period.

Results in Column 1, based on a model without village fixed effects, show that the

coefficient of the distance between village and county seat is negative and statistically

significant, suggesting that households located closer to the county seat (where land has higher

commercial value) are more likely to experience land requisition. None of the household

characteristics are shown to be a significant determining factor in land requisition. This point is

further confirmed by the small F-statistic for the joint significance test of all household

characteristics (1.34 with a p-value of 0.16). Column 2 shows the results with village fixed

effects as additional control variables. Again, each coefficient of the household level variables is

small in magnitude and statistically insignificant, and the joint significance test of household

characteristics renders a small F-statistic of 1.02. In contrast, the F-statistic for the village fixed

effects reaches 2294, strongly suggesting that village characteristics are important determining

factors of how likely land requisition is for a household.

The empirical evidence presented in Table 3, consistent with that in Table 2, supports the

implication that land requisition decisions made by legal and administrative institutions are done

independently of the observed individual household characteristics.

5.2. Does land loss through requisition affect farmers' off-farm labor allocation decisions?

The estimation results of individual migration probabilities are reported in Table 4. The

model without village fixed effects (Column 1) suggests that migration probability is negatively

associated with land loss experience of a given household. Individuals residing in villages far

away from the county seat are more likely to migrate. The estimate of land loss is likely to reflect

the fact that certain unobserved characteristics of villages that experienced land requisition also

reduce the likelihood of villagers migrating. Once we control for village fixed effects (Column

2), the coefficient of land loss is no longer significant. The village fixed effect model also shows

that individual and household characteristics are important determinants of migration probability.

In particular, young male individuals, individuals with more education, individuals from the

ethnic majority group, and individuals from households with more total members or fewer

children are more likely to migrate than their counterparts. Individuals from households headed

by a village cadre or a Communist Party member are less likely to migrate.

In summary, conditional on these individual and household characteristics, the village

fixed effect estimation shows that, in the total sample, land loss via requisition does not affect an

individual's migration decision.

Using the same empirical specification, we also examine if land loss affects farmers'

labor participation in local off-farm activities, including employment and self-employment in

non-agricultural sectors. The results from the village fixed effect model are reported in Table 5.

For the total sample, the estimations show that land loss through requisition does not affect the

individual's labor participation in local non-farm activities, either as a wageworker or as a self-

employed individual. Regarding individual and household characteristics as determinants of

labor participation in local non-farm activities, the results show that education is positively

associated with the likelihood of working in local non-farm activities. Men are more likely to

engage in non-farm work than women. Individuals in households headed by a village cadre have

a higher probability of being locally employed in the non-agricultural sector. Individuals from

households headed by a Communist Party member are more likely to be self-employed locally.

These estimations of local non-farm labor participation also show that household demographic composition factors are *not* significant determinants, which differs from the estimation results of migration decisions.

The above estimations are based on the assumption that land requisition equally affects the labor allocation decisions of all individuals. However, as local non-farm opportunities differ across villages, and the prospect of finding jobs in cities differs among individuals, it is reasonable to allow the impact to vary. In particular, we stratify the sample into four groups, based on the household's distance to the county seat and the age of the individual, and then estimate the labor participation equations separately for each group. The village fixed effect regressions of the three outcomes for each group are reported in Table 7.

Among the four subsamples, the results in Table 6 show that older farmers (aged 45-55), regardless of distance to the county seat, are significantly affected by land requisition in their labor allocation decisions. When compared to those not affected by land requisition, older farmers that experience land loss and who live far away from the county seat face an increased probability of migration of 8.5%. As migrants, their labor supply seems to come partially at the expense of the local non-farm sector, where they are 6.8% less likely to be employed. At the same time, among older farmers living close to the county seat, those who experience land

requisition are more likely to work as wage laborers in the local non-farm sector, compared to those who do not have such experience. In contrast, young farmers (age 16-44), regardless of village location, are not affected by land requisition when making labor allocation decisions.

Young individuals have higher labor force participation rates in non-agricultural sectors, both in cities and locally (as shown in Table 1). Changes in land rights have limited impact on their labor allocation decisions. The livelihood and labor supply decisions of the older farmers, however, are more attached to land, and thus loss of land through requisition has a more pronounced effect on older farmers. We observe different patterns in labor response to land requisition between the two groups of older farmers, which may reflect that local non-farm opportunities affect how land requisition impacts the labor allocation of farmers. Villages far away from a county seat may have only limited access to non-agricultural activities. The labor of older farmers who lost land may not be completely absorbed locally. In contrast, in villages closer to a county seat, there may be more vibrant opportunities in nonagricultural sectors, allowing those who lost land to find employment.

5.3 Can the results be driven by unobservables?

The above analysis is based on the assumption that land requisition is exogenous to individual labor allocation decisions. This assumption is supported by our prior knowledge that land requisition decisions are made at the county level or above, exogenous to households within

a village, as explained in Section 2. In addition, empirical evidence in Tables 2 and 3 confirms

that land requisitions are uncorrelated with observed household characteristics, once the village

location is controlled for. The results presented in Tables 4-6 are conditioned on a powerful set

of controls, including village fixed effects. All of this evidence suggests that at least part of the

estimated migration effect, when significant, is real. However, it is not possible to completely

rule out the existence of unobservables that may bias the estimation. For the unobservables to

have a significant impact on labor supply decisions, they would have to have a very weak

correlation with the observables. If there were a strong correlation, the significant impact of the

unobservables would have been captured by the observables, which would be reflected through

significant coefficients on the observables.

To assess the likelihood that the estimations are biased due to omitted variables, we

implement a test proposed by Altonji et al. (2005). In our context, the test is to assume under the

null hypothesis that land requisition has no impact on labor allocation decisions, the difference in

the means of the distribution of the index of unobservables between individuals with and without

land requisition experience is equal to the difference in the means of the distribution of the index

of observables, after adjusting for the variances of these distributions.[20] Thus, we can use the

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[20] This assumption is no stricter than the OLS assumption that the selection on the unobservables is zero. (Altonji et al., 2005).

selection on the observables to calculate the bias caused by unobservables.[21] Based on this

calculated bias, we can measure a ratio of how large the selection of unobservables would need

to be in order to attribute the entire effect of land requisition to unobservables. This ratio,

measuring the size of selection on the unobservables relative to selection on the observables, is

likely to be less than one as clearly stated in Altonji et al. (2005).

The sensitivity test results are reported in Table 7. The estimated coefficients reported in

Table 6 are listed in Column (1) of Table 7. Column (2) reports the predicted selection due to

observables. The predicted bias due to selection on unobservables is presented in Column (3).

The last column presents the ratio of the estimated coefficient of land requisition to the estimated

bias due to unobservables. This tells us how large the normalized shift in the distribution of the

unobservables would have to be, relative to the shift in the observables, in order to entirely

explain the requisition effect. For example, among the sample of older farmers living far from

the county seat, the selection due to observables is 0.082. In other words, the variance adjusted

index of the observables that determine migration is 0.082 lower for those who experience land

requisition than those who do not. For this group, there is a bias ratio of 9.5 for the migration

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[21] More specifically, the bias is calculated in two steps. The first step is to multiply the variance adjusted selection on observables by the variance of the regression error term to obtain an estimate of the selection on unobservables. The second step involves multiplying the estimate from the first step with the ratio of the variance of dependent variable to the variance of the regression error term to calculate the bias due to unobservables.

estimation, indicating the selection on the unobservables would have to be 9.5 times as strong as the selection on the observables if it were to explain the entire land loss effect in migration. As this seems highly unlikely, the estimation of the migration probabilities of the older farmers is validated by the test. The test also shows that, for this group of farmers, the significant result on employment in the local non-farm sector can be completely eliminated by a possible effect of unobservables, as the ratio is -0.78. Thus, we conclude that land requisition probably has little effect on local non-farm employment for this group, but it significantly increases the group's probability of migration.

6. Conclusions

Land requisition has proven to be an important activity for Chinese local governments to promote revenue and urbanization. This paper develops a simple model to show that an exogenous reduction of land without adequate compensation leads a household to allocate more labor to non-agricultural activities. In the empirical analysis, this paper builds upon the fact that land requisition decisions are made independent of individual households, as suggested by the administrative and legal institutions governing land requisition, and supported by data. We find that land requisition has little impact on the labor allocation decisions of young farmers. However, in response to land loss through requisition, older farmers in remote villages become more likely to migrate to cities. This finding raises concerns about the long-term wellbeing of

those older farmers, as they are not always competitive in the urban migrant labor market.

Efforts should be made to adequately support older farmers who are vulnerable to land loss, particularly in areas with limited non-farm opportunities locally. Such support mechanisms should include adequate compensation and job training which facilitates the migration of these farmers.

Figure 1. Share of households with land requisition experience in villages where land requisition occurred
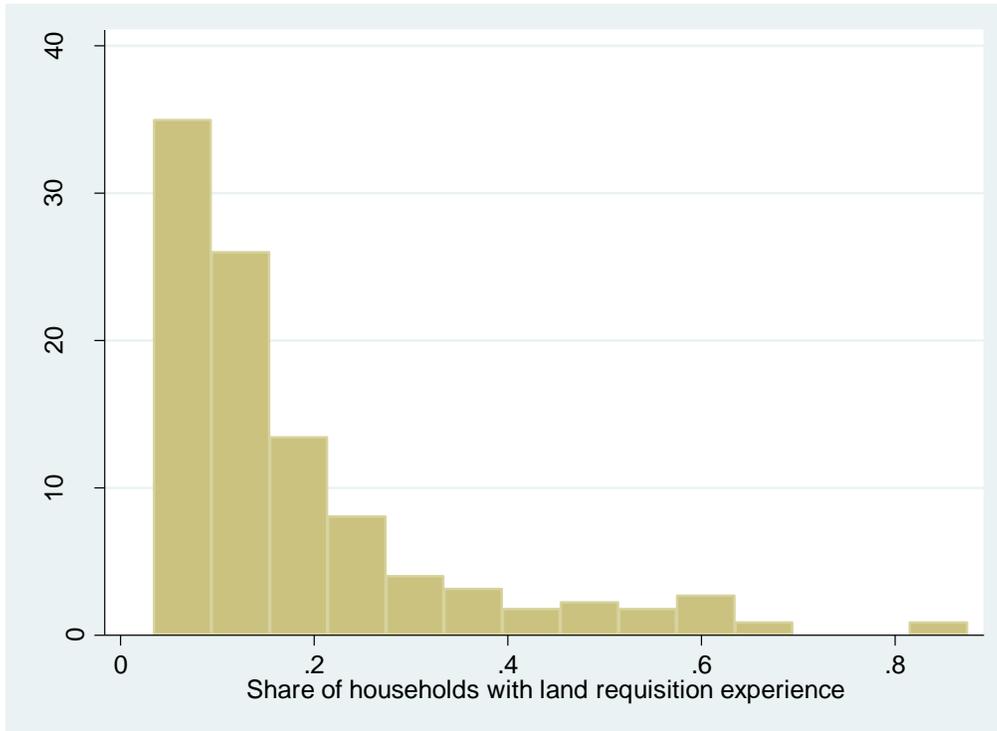
Figure 2. Timing of Land Requisitions
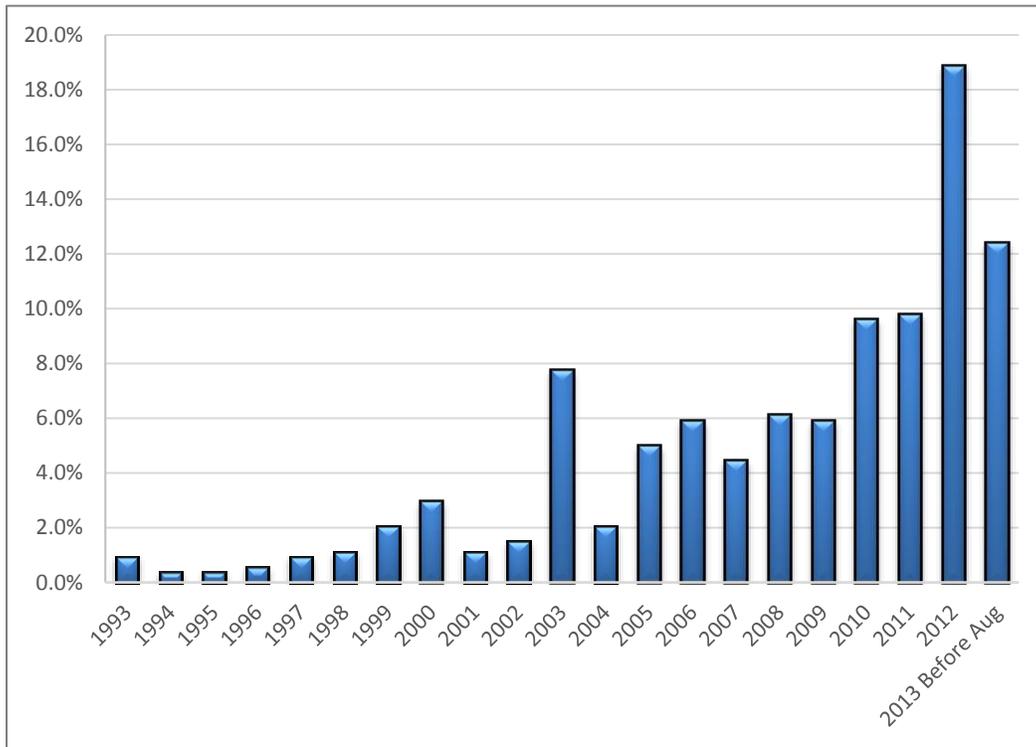
Figure 3. Distribution of the share of land lost through requisition

Share of land requisitioned in household total land
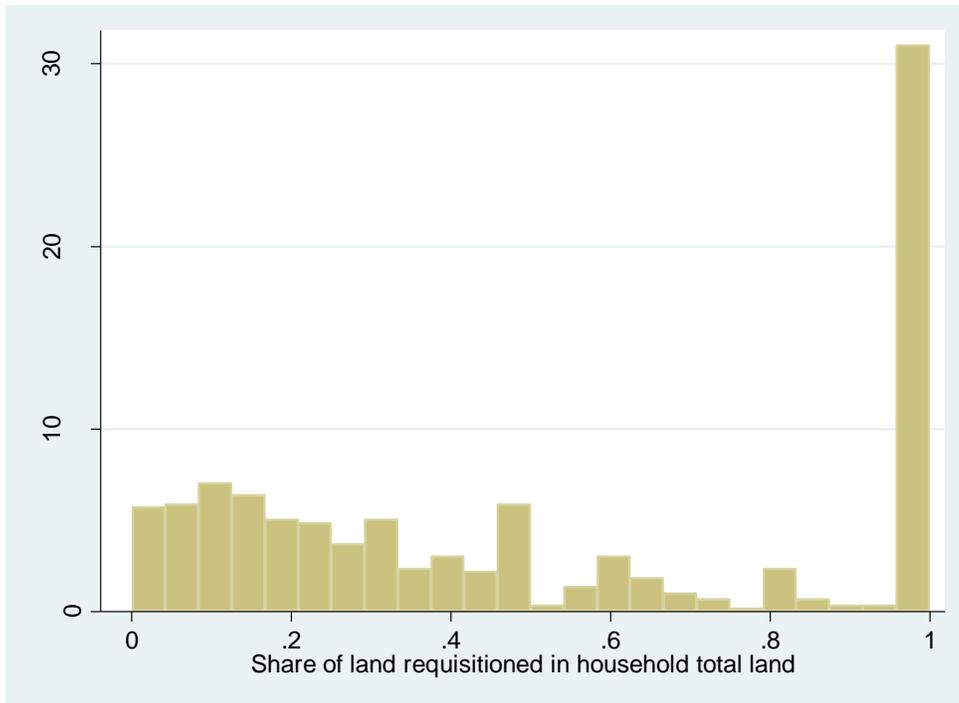
Table 1: Rates of Non-farm Employment in the Sample

	Migration	Employed in Local Non-farm Sector	Self-Employed in Local Non-Farm Sector	Number of Observations
Total Sample	0.22	0.14	0.045	15134
Male	0.26	0.17	0.054	7788
Female	0.18	0.10	0.034	7346
16-30 Years Old	0. 42	0.18	0.033	4791
31-40 Years Old	0.25	0.15	0.061	3491
41-45 Years Old	0.11	0.13	0.058	2373
46-50 Years Old	0.06	0.10	0.038	2653
51-55 Years Old	0.04	0.07	0.037	1826
No Schooling	0.07	0.05	0.015	1365
Primary School Education	0 .15	0.11	0.033	4537
Junior High School Education	0.26	0.15	0.052	7064
High School or Technical School Education	0.32	0.18	0.064	1824
College or Higher Education	0.48	0.27	0.064	344

Table 2. Households with and without land requisition experience

	Households with land requisitioned	Households without land requisitioned	Diff	Diff within village
	（1）	(2)	（3）	(4)
Age of household head	53.56	53.99	-0.43	-0.41
Education of household head				
- Primary school	0.34	0.39	-0.05**	-0.03
- Middle school	0.40	0.35	0.05**	0.04*
- High school	0.12	0.10	0.02*	0.00
- College	0.01	0.01	0.00	0.00
Gender of household head (male)	0.83	0.84	-0.02	0.00
Household head is an ethnic minority	0.10	0.09	0.00	-0.01
Household head is a Communist Party member	0.11	0.098	0.013	-0.00
Household head is a village cadre	0.0073	0.0059	.0015	-0.00
Household size	3.94	3.99	-0.05	0.12
Number of boys aged 0-6	0.15	0.17	-0.02	0.00
Number of girls aged 0-6	0.13	0.13	0.00	0.02
Number of boys aged 7-15	0.20	0.22	-0.02	0.01
Number of girls aged 7-15	0.18	0.18	0.00	0.01
Number of men aged 60 and above	0.39	0.39	0.01	0.02
Number of women aged 60 and above	0.41	0.37	0.04*	0.05*
Household income per capita	11082	15892	-4810	-3851
Any member migrated to cities	0 .20	0 .27	-0.07***	-0.01
Any member employed in local non-farm sector	0 .39	0 .28	0 .11***	0.04**
Any member self-employed in local non-farm sector	0.09	0.06	0.03***	0 .01
Distance from village to county seat (kilometers）	28.4	38.3	-9.96***	---
Number of observations	541	7166		

Note: ***statistically significant at the 1% level; ** statistically significant at the 5% level; * statistically significant at 10% level.

Table 3: Estimation of Land Requisition by Government

	(1)	(2)
Age of household head	-0.000024	-0.00016
	(0.00024)	(0.00021)
Education of household head:		
- Primary school	0.0064	-0.00044
	(0.0061)	(0.0058)
- Middle school	0.010	0.0030
	(0.0079)	(0.0061)
- High school	0.016	0.0096
	(0.011)	(0.0092)
- College	0.060	0.043
	(0.040)	(0.039)
Gender of household head (male)	-0.0073	-0.0025
	(0.0067)	(0.0054)
Household head is an ethnic minority	0.0012	-0.0030
	(0.0090)	(0.011)
Household head is a village cadre	-0.013	-0.021
	(0.022)	(0.023)
Household head is a Communist Party member	0.00019	-0.0046
	(0.0069)	(0.0070)
Household size	-0.00026	0.000067
	(0.0017)	(0.0017)
Number of boys aged 0-6	0.00019	0.0040
	(0.0048)	(0.0044)
Number of girls aged 0-6	0.00028	0.0037
	(0.0061)	(0.0065)
Number of boys aged 7-15	-0.0064	-0.0031
	(0.0044)	(0.0045)
Number of girls aged 7-15	0.0022	0.0053
	(0.0041)	(0.0042)
Number of men aged 60 and above	0.00085	0.0048
	(0.0054)	(0.0052)
Number of women aged 60 and above	-0.00090	-0.0031
	(0.0050)	(0.0048)
Distance from village to county seat (log)	-0.025***	---
	(0.0072)	---
Constant	0.12***	0.29***
	(0.029)	(0.014)

(*continued*)

(*Table 2 continued*)

	no	yes
Village fixed effect	no	yes
F statistic for joint significance test of household characteristics (p-value)	1.34 (0.16)	1.02 (0.43)
F statistic for joint significance test of village fixed effect (p-value)		2294 (0.00)
Observations	7,706	7,706

Note: Robust standard errors reported in parentheses, clustered at the village level; ***statistically significant at the 1% level; ** statistically significant at the 5% level; * statistically significant at the 10% level.

Table 4: Estimation of Individual Migration Probabilities

	(1)	(2)
Losing land through requisition	-0.051***	-0.020
	(0.018)	(0.019)
Age	-0.010***	-0.010***
	(0.00054)	(0.00052)
Individual education		
- Primary school	0.047***	0.044***
	(0.017)	(0.015)
- Middle school	0.10***	0.11***
	(0.019)	(0.017)
- High school	0.14***	0.17***
	(0.023)	(0.020)
- College	0.21***	0.25***
	(0.036)	(0.035)
Gender (male)	0.100***	0.089***
	(0.0081)	(0.0079)
Household head is an ethnic minority	-0.11***	-0.096**
	(0.025)	(0.037)
Household head is a village cadre	-0.064	-0.11*
	(0.067)	(0.064)
Household head is a Communist Party member	-0.028	-0.037*
	(0.020)	(0.019)
Household size	0.036***	0.029***
	(0.0056)	(0.0055)
Number of boys aged 0-6	-0.057***	-0.054***
	(0.015)	(0.015)
Number of girls aged 0-6	-0.075***	-0.072***
	(0.015)	(0.015)
Number of boys aged 7-15	-0.027**	-0.039***
	(0.012)	(0.011)
Number of girls aged 7-15	-0.047***	-0.041***
	(0.013)	(0.013)
Number of men aged 60 and above	0.100***	0.078***
	(0.015)	(0.014)
Number of women aged 60 and above	-0.011	-0.012
	(0.015)	(0.014)
Log of distance between village to county seat	0.049***	——
	(0.015)	——

(*continued*)

(*Table 3 continued*)

Constant	0.21***	0.27***
	(0.062)	(0.041)
Village fixed effect	No	Yes
Observations	10,963	10,963

Note: Robust standard errors reported in parentheses, clustered at the village level; ***statistically significant at the 1% level; ** statistically significant at the 5% level; * statistically significant at the 10% level.

Table 5：Estimation of Individual Local Non-Agricultural Work

	Employed in Local Non-Ag Sector	Self-Employed in Local Non-Ag Sector
Losing land through requisition	0.022	0.0020
	(0.019)	(0.011)
Age	-0.0026***	0.00075***
	(0.00036)	(0.00019)
Individual education		
- Primary school	0.029**	0.023***
	(0.011)	(0.0056)
- Middle school	0.031**	0.037***
	(0.012)	(0.0060)
- High school	0.042***	0.037***
	(0.016)	(0.0080)
- College	0.093***	0.043***
	(0.028)	(0.015)
Gender (male)	0.073***	0.014***
	(0.0073)	(0.0041)
Household head is an ethnic minority	-0.011	-0.0051
	(0.032)	(0.015)
Household head is a village cadre	0.099*	0.048
	(0.058)	(0.041)
Household head is a Communist Party member	-0.0039	0.018*
	(0.013)	(0.010)
Household size	-0.0035	-0.00055
	(0.0035)	(0.0027)
Number of boys aged 0-6	0.0050	-0.0069
	(0.011)	(0.0060)
Number of girls aged 0-6	0.0055	0.0032
	(0.010)	(0.0058)
Number of boys aged 7-15	0.032***	0.0086
	(0.0086)	(0.0052)
Number of girls aged 7-15	0.015	0.0097*
	(0.010)	(0.0053)
Number of men aged 60 and above	-0.012	0.0013
	(0.010)	(0.0056)
Number of women aged 60 and above	0.0039	-0.0024
	(0.011)	(0.0051)
Village fixed effect	Yes	Yes
Observations	10,963	10,963

Note: Robust standard errors reported in parentheses, clustered at the village level; ***statistically significant at the 1% level; ** statistically significant at the 5% level; * statistically significant at the 10% level.

Table 6 Estimated impacts of land requisition by location and age

	Distance to county seat	
	< 50th percentile	≥ 50th percentile
Panel A: Age 45-55		
Migration probabilities	-0.033	0.085**
	(0 .026)	(0 .040)
Employed in local non-ag. sector	0 .085**	-0.068**
	(0 .033)	(0 .033)
Self-employed in local non-ag. sector	-0.018	0.0028
	(0.022)	(0.020)
Observations	1332	1344
Panel B: Age 16-44		
Migration probabilities	-0.039	-0.0079
	(0.026)	(0.032)
Employed in local non-ag. sector	0.031	0 .014
	(0.023)	(0 .025)
Self-employed in local non-ag. sector	0.014	-0.0041
	(0.013)	(0.012)
Observations	3970	4317

Note: Coefficients on "losing land in requisition" are reported in the table. All the other variables in Table 4 are included but not reported. Robust standard errors are reported in parentheses, clustered at the village level; ***statistically significant at the 1% level; ** statistically significant at the 5% level; * statistically significant at the 10%level.

Table 7 Testing Potential Bias due to Selection on Unobservables based on Altonji et al. (2005)

Regression model and samples	Estimated effect (1)	Selection on Observables: (2)	Predicted bias due to selection on Unobservables (3)	Implied Ratio (4)
Panel A: Migration Probabilities				
Full sample	-0.020	-0.807	-0.175	0.114
Age 45-55, far away from county seat	0.085**	0.082	0.0089	9.5
Age 45-55, closer to county seat	-0.033	-0.378	-0.031	1.05
Age 16-44, far away from county seat	-0.0079	-0.941	-0.210	0.038
Age 16-44, closer to county seat	-0.039	-0.815	-0.207	0.193
Panel B: Employed in Non-Ag Sector				
Full sample	0.022	1.493	0.234	0.094
Age 45-55, far away from county seat	-0.068**	1.204	0.087	-0.78
Age 45-55, closer to county seat	0.085**	0.898	0.118	0.72
Age 16-44, far away from county seat	0.014	1.171	0.154	0.093
Age 16-44, closer to county seat	0.031	1.428	0.295	0.105
C: Self-employed in Non-Ag Sector				
Full sample	0.002	4.380	0.215	0.009
Age 45-55, far away from county seat	-0.0028	2.837	0.076	0.037
Age 45-55, closer to county seat	-0.018	0.415	0.025	-0.727
Age 16-44, far away from county seat	-0.004	2.936	0.098	-0.042
Age 16-44, closer to county seat	0.014	2.608	0.175	0.078

Notes: ***statistically significant at the 1% level; ** statistically significant at the 5% level; * statistically significant at the 10% level.

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