The Impact of Land Property Rights on Rural-Urban Migration in China with Income Considerations

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Abstract: In the wake of the People's Republic of China's (PRC) land reforms over the years granting greater operational autonomy for land use, scholars have had renewed interests in the relationship between such land policies and rural-urban migration patterns. Using empirical methods, this paper explores the relationship between rural land transfer and rural-urban migration in China's population. It defines rural land transfer through a quantitative means by expressing it as the percentage of land rented out by a household to account for regional variations in land availability. Using data from the 2013 China Longitudinal Health and Retirement Survey (CHARLS), this study runs a probit regression to study the impact of rural land transfer on the likelihood to migrate. Robustness checks confirm the statistical reliability and significance of these results. The study then strengthens this relationship by confirming a causal relationship between the two variables through using the ownership of fixed capital assets as an instrument variable (IV). Finally, it concludes that these findings have significant policymaking implications that necessitate the continued strengthening and reforms of China's rural land rights and contracting laws.

1. Introduction

1.1 China's land system: Rural-Urban Differences and the HRS

Land property rights in rural China have been a field of study in law and economics ever since the Chinese Communist Parties fully implemented the Household Responsibility System (HRS) in 1982[1-2]. Unlike many Western societies, China's land system is a hybrid system of control between state, households, and rural collectives. In *Household Contract System: Three Perspectives Analysis*[3], Chen highlights how these shared responsibilities over rural land intersected in three dimensions: the political, the economic, and the socioinstitutional. Under this system, households have gained newfound operational autonomy, while rural collectives have maintained oversight and the Chinese government shifted its role of total control to final regulatory powers. Following the passage of China's 2002 Rural Land Contracting Law, more formalized rural contracts reinforced perceptions of land tenure and dismantled previous collectivist norms (Rural Land Contracting Law, 2002; Chen, 2024)[4].

In spite of these reforms, one constancy of China's land system has been the *hukou* system. In essence, *hukou* is an internal passport system that identifies each person's location-based status and type-based status—agricultural or non-agricultural. Despite certain changes to the system, *hukou* remains a way for the government to control the flow of population across different regions in China. Urban *hukou* does not confer rights to land; instead, it grants access to welfare services and education opportunities in cities (Wang, 2005)[5]. Conversely, rural *hukou* holders—even those who may choose to migrate to cities—do not gain access to these services, though they instead obtain access to rural land that is owned by a collective (Wang, 2005; Chen, 2024)[4-5]. The *hukou* system, then, is one of the many points in China's land use and residency policies that remain intertwined with current migration trends, providing an interesting topic of study on the connection between land rights and migration developments.

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1.2 Migration Significance and Trends

Before studying relationships between land property rights and rural-urban migration, the significance of changes in migration patterns is worthy of exploration. The topic of rural-urban migration in China bears particular importance due to its rising prominence and empirical evidence supporting its economic benefits. Following the HRS reforms, production and incomes increased, initially prompting farmers to pursue non-agricultural work in local areas before eventually migrating to cities (Lin, 1992; Bao et al., 2009)[2] [6]. Most notably, though, Giles and Du (2025) [7] observe that the median age of migrant workers has increased in recent years. Specifically in the demographic of those aged 45 or older, migration has risen in the decade following the 2002 land contract reforms: 16.8 to 19% for males, and 4.5% to 7% for females (Giles and Du, 2025)[7].

Empirical studies have generally demonstrated a net positive impact on migration. Fundamentally, as Giles and Du (2025) [7] point out, determining the effect of migration becomes a task of weighing positive remittances (payments sent back to families) versus the negative labor costs, with the former generally having a greater effect. Additionally, (Du, et al. 2005)[8] finds that households with migrants have on average a per capita income 8.5-13.1% than those without migrants. More recent literature has also suggested that hat migration increases household consumption and investment (De Brauw and Giles, 2018)[9], indicating an overall economic benefit both from a macroeconomic perspective and from the workers' view.

2. Literature Review

2.1 The mechanisms of land property rights impacting migration

2.1.1 Market Mechanism

Since the aftermath of the HRS and subsequent changes to land policies, various literature has emerged studying the varied impacts of reforms that have shifted increasingly towards market-based approaches. One increasingly has been rural land transfer, the process by which an individual rents out rural land management rights to other individuals while the same rural collective still maintains official ownership (Wang et al., 2017)[10]. Within rural regions themselves, economists have found significant positive effects. With regards to entrepreneurial effects, farmers' entrepreneurial enthusiasm has generally increased following the increased development of land rental markets (Zhao and Guo, 2022)[11]. However, the outcomes for labor productivity are more mixed: while renting out land decreased productivity overall, rural households renting in farmland increased in labor productivity by 55% in the farming sector (Zhang et al., 2023)[12].

Empirical studies have generally supported the idea of a positive relationship between land transfer and lease rights and urban migration. Ze (2022)[13] finds a positive correlation between land lease rights and urban migration, while Xie, et al. (2022) [14] concludes, using a differences-in-differences (DID) technique that there exists a strong causal relationship between the two. Additional research has also suggested that the two developments are bidirectionally related, suggesting an interdependence between the two (Wen et al., 2023)[15]. However, no existing research has explicitly used the Charls (2013) dataset to examine correlation and causal relationship between rural land transfer and rural-urban migration. The use of this different dataset and the unique methodology of quantifying rural land transfer as a percentage of land rented out in this paper aims to address research gaps and see if results confirm or modify existing findings.

2.1.2 Government Mechanism and Land Expropriation

Another area of literature has studied the impacts of government intervention on rural land. Specifically, these researchers study the effects of land expropriation—that is, the seizure (often compulsory) of land for public purposes. Ma et al. (2023) [16] note that land expropriation is common in urban areas, development zones, and areas in which the government is carrying out urbanization initiatives. Using the China Migrants Dynamic Survey from 2018, Su et al. (2023)[17] has examined the impact of government programs that gave increased compensation to rural residents in land

expropriation processes. The researchers conclude a causal relationship between these programs and increased urban migration, suggesting social integration and reduced attachment to rural homes as plausible mechanisms to explain this effect (Su et al., 2023)[17]. However, other studies have yielded opposite results on the relationship of government mechanisms with migration. According to an empirical analysis conducted using the China Health and Retirement Longitudinal Survey (CHARLS) dataset, Ze (2022) [13] finds an inverse correlation between land appropriation and migration. However, a key distinction between these two government mechanisms exists: expropriation involves generally government compensation for land seizure, while appropriation is often the informal seizure of land without a legal process and compensation (Deininger and Xia, 2016)[18].

Due to the relatively new data collected on expropriation and appropriation, there has been no definitive consensus on the effects of such policies. Moreover, the differences in the scope of the effect along demographic lines like income, gender, and age remain relatively unexplored[19]. Therefore, this study aims to bridge these existing gaps in the literature by analyzing the differences—if any—in the relationships between government land appropriation and urban migration behavior along demographic lines.

2.1.3 Land Tenure Security as a Proposed Explanation

One last emerging body of literature has focused on the concept of 'land tenure security'---that is, how secure a rural resident's land rights are and their associated perceptions of that security. In one recent study, Chen et al. (2025)[4] have examined the role of land tenure security in the relationship between land endowment and urban migration. Using latent modeling, the researchers identified two implied groups within their study: a group with secure tenure and a group with unsecure tenure. Ultimately, they concluded that land insecurity posed a hindrance to urban-rural migration, while migration under secured land reduced the risk of land loss and incentivized migrant workers to stay in cities. These findings provide empirical support for China's recent land policies on secure land tenure, such as the second-round contract renewal policy and rural revitalization (Chen et al, 2025)[4]. Another study, meanwhile, examined this similar issue from a perception-based perspective, analyzing how households' feelings on land tenure security influenced migration decisions, though restricted to data from Minle County in Northwest China. The researchers concluded that perception had only a significant effect in villages without well-functioning land rental markets: families who did not expect land reallocation were less likely to migrate, while families who value land certificates are more likely to migrate (Ma et al., 2016)[16].

However, widespread problems persist in the methodologies of literature on land tenure security and perception. First, Arnot et al. (2011)[1], in a review of existing literature on the topic, note that academia has often inconsistently defined such terminology, partially explaining for discrepancies in the results of empirical analysis in this field. Moreover, a larger issue persists: these studies often rely on self-reported measures of land security and perception-based measures often suffer from bias (Arnot et al., 2011)[1]. For this reason, this study makes a clear distinction of the market mechanism affecting rural-urban migration as limited to renting out land. Furthermore, this study does not engage in self-reported measures of perception, thus bypassing the issues of bias and design problems that Arnot et al(2011)[1] note.

3. Methodology

3.1 Dataset Description

The China Health and Retirement Longitudinal Study (CHARLS), conducted by a group of Peking University researchers, collects a nationally representative sample of Chinese residents aged 45 and up to serve the research on China's elderly population. The initial survey (2011) comprises of 10,000 homes and 17,500 individuals in 150 counties and 450 towns/ resident communities. The experimenters will follow up with the surveyed individuals after two years. All data will be made public one year following the completion of data collection.

3.2 Regression Model and Variables

This study aims to examine the relationship between rural land transfer and rural-urban migration through a probit regression model, since migration is modeled as a dummy variable signifying a binary yes/no decision of whether a household migrated. The hypothesis is that rural land transfer rights–the agency or ability of an owner of rural land management rights to transfer that right to others—positively impacts rural-urban migration. This study defines a migrant as anyone who has "lived outside [their] permanent city/country/district for more than 6 months" (Questionnaire Item BB009) and indicates agricultural (rural) hukou as their current hukou status (Questionnaire Item BC001).

One challenge arises when defining rural land transfer rights through a rigorous, quantitative means that is consistent across regional variations. For example, a farmer may have more land to begin with that is available for a potential land transfer simply because of circumstances of climate and landscape that are region-specific. To account for these regional differences, we calculate the *proportion of land rented out* (called rent_per) through the following definition, with all measurements of land in mu (1 acre = 6.07 mu):

Rent_per = total land (of all types) rented out/amount of land (available)

We employ a probit regression that includes control variables to account for the effects of other factors, including demographics, in this relationship. The model is as follows:

$$y^*_i = \beta_0 + \beta_1 \times \text{rent\_per}_i + \beta_2 \times \text{age}_i + \beta_3 \times \text{gender}_i + \beta_4 \times \log(\text{income}_i) + \varepsilon_i$$

Where $\varepsilon_i \sim N(0,1)$

To a better understand each variable in the regression, we also provide statistical descriptions of each of them below, as shown in Table 1.

Table 1 Variable Statistical Description

Variable	Obs	Mean	Std. dev.	Min	Max
age	19,903	57.8971	9.879897	19	80
migration	6,906	0.58051	0.493511	0	1
health	7,818	3.01957	0.966498	1	5
gender	19,903	0.475456	0.49941	0	1
edu	19,779	1.590121	0.841466	1	5
party	15,588	0.100205	0.300283	0	1
han	15,549	0.920702	0.270212	0	1
hukou	15,578	1.222301	0.444317	1	4
appropriation	10,345	0.136201	0.343019	0	1
prov	19,903	13.27312	7.164256	1	28
logincome	10,628	6.182338	1.293527	-1.20397	12.20607
rent_per	5,759	0.093755	0.269701	0	1
private_busi	8,740	1.905378	0.29271	1	2
marital	15,606	1.497821	1.270104	1	7
parents	8,939	1.857031	0.350061	1	2
income	10,628	1143.132	3339.076	0.3	200000

Note: each variable has varying sample sizes, with some variables having lower sample sizes even after certain attempts at imputation of values. In the process of running the regression, only data entries with all the available variables of study were considered valid. Accordingly, in the final regression results, the sample size was significantly reduced.

3.3 Choice of Instrument Variable (IV) for Causation Analysis

To study for a causal relationship, we choose an instrument variable (IV) as a controlled

experiment is not possible at the moment for this topic of study. This IV causation analysis is primarily conducted due to issues of endogeneity, confounding variables, or even pure coincidences. Generally, as accepted in statistics and econometrics, IVs require two conditions: they must be relevant to the independent variable and be exogenous (Woolridge, 2010)[19]. In the case of our study, a binary variable indicating whether a household owns fixed capital assets (Questionnaire Item HA060) meets these two conditions and will serve as the IV. Specifically, fixed capital assets are logically inversely related to the rural land transfer variables; households with more assets are less likely to transfer land. Fixed capital assets also do not hold a direct relationship with migration. This variable, labeled as IV, is defined as having a value 1 whenever a household owns at least one type of the fixed capital assets described in the CHARLS survey.

4. Results

4.1 Regression Results

Table 2 Regression model analysis results

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
migration							
rent_per	0.283*	0.284*	0.352*	0.358*	0.362*	0.377*	0.396*
	(0.151)	(0.151)	(0.207)	(0.208)	(0.208)	(0.209)	(0.210)
logincome	0.045	0.045	0.087*	0.087*	0.088*	0.086*	0.100**
	(0.033)	(0.033)	(0.045)	(0.045)	(0.045)	(0.045)	(0.045)
age	-0.036***	-0.037***	-0.038***	-0.042***	-0.042***	-0.041***	-0.042***
	(0.005)	(0.005)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
gender	0.974***	0.980***	1.139***	1.182***	1.180***	1.171***	1.306***
	(0.089)	(0.092)	(0.133)	(0.136)	(0.137)	(0.137)	(0.143)
edu		-0.021	-0.178*	-0.167	-0.174*	-0.176*	-0.15
		(0.070)	(0.103)	(0.103)	(0.103)	(0.104)	(0.105)
Self Assessed Health Status (Very Good)			0.022	0.025	0.029	0.029	0.002
			(0.065)	(0.065)	(0.065)	(0.065)	(0.066)
Marital Status				0.066	0.062		0.067
				(0.045)	(0.046)	(0.046)	(0.046)
Household Members Engage in Self-Employed Business					0.143		0.186
					(0.234)		(0.235)
Nationality							-0.137
							(0.236)
Are You Communist?							-0.786***
							(0.213)
Constant	1.341***	1.392***	1.225*	1.293**		1.026	1.08
	(0.378)	(0.414)	(0.633)	(0.633)		(0.764)	(0.810)
Observations	983	983	496	496		495	493

Note: Standard errors in parentheses,* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

4.2 IV Results

Table 3 Analysis Results of Variable (IV)

	(1)	(2)	(3)
	m1	m2	m3
migration			
rent_per	2.588***	2.598***	2.600***
	(4.749)	(4.777)	(4.783)
prov	0.002	0.002	0.002
	(0.234)	(0.215)	(0.239)
gender	0.654**	0.661**	0.668**
	(2.028)	(0.215)	(0.239)
logincome	0.063	0.063	0.068
	(1.102)	(1.099)	(1.200)
age	-0.038***	-0.039***	-0.038***
	(-4.140)	(-4.227)	(-3.964)
edu	-0.354**	-0.360**	-0.367**
	(-2.430)	(-2.468)	(-2.533)
han	-0.143	-0.110	-0.105
	(-0.585)	(-2.468)	(-2.533)
party	-0.409	-0.416	-0.407
	(-1.593)	(-1.620)	(-1.567)
health	-0.038	-0.031	-0.027
	(-0.548)	(-0.443)	(-0.381)
private_busi		0.274	0.286
		(1.124)	(1.189)
parents			-0.148
			(-0.821)
_cons	2.006**	1.473	1.612*
	(2.560)	(1.528)	(1.649)
rent_per			
prov	-0.004	-0.004	-0.004
	(-1.403)	(-1.400)	(-1.425)
gender	0.087	0.088	0.084
	(1.010)	(1.008)	(0.991)
logincome	0.020	0.020	0.018
	(0.804)	(0.798)	(0.729)
age	0.002	0.002	0.001
	(1.084)	(1.056)	(0.610)
edu	0.113**	0.115**	0.119**
	(2.020)	(2.031)	(2.090)
han	0.050	0.044	0.041
	(0.704)	(0.611)	(0.588)
party	(0.092)	(0.094)	(0.100)
	(-0.795)	(-0.801)	(-0.847)
health	0.001	0.001	-0.002
	(0.053)	(0.037)	(-0.106)
IV	-0.142**	-0.143**	-0.143**
	(-2.179)	(-2.190)	(-2.206)
private_busi		0.014	0.007
		(0.151)	(0.078)
parents			0.094
			(1.411)
cons	-0.258	-0.278	-0.365
	(-0.924)	(-0.714)	(-0.881)
athrho2_1	-0.859**	-0.860**	-0.857**
	(-2.172)	(-2.190)	(-2.175)
lnsigma2	-1.120***	-1.120***	-1.125***
	(-11.153)	(-11.240)	(-11.519)
N	481	480	480

Note: statistics in parentheses, * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$.

5. Discussion and Analysis

5.1 Interpretation of Regression Results and Robustness Checks

This probit regression analysis reveals insights on the market mechanism impacting rural-urban migration. Namely, Table 1 to Table 3 shows the correlation between proportion of rural land rented out as defined in the methodology. Holding other factors constant through control variables, the overall results demonstrate a positive relationship between rural land transfer and propensity to migrate. The control variables appear to partially mediate this relationship. Specifically, coefficients range from 0.283 to 0.396, with statistical significance at the 10% level of this positive relationship preserved across robustness checks ($p<0.10$). This outcome indicates that the relationship does not appear to be heavily dependent on the presence of control variables. This finding confirms existing literature from Ze (2022)[13], the only other known study that uses the proportion method to quantify land rights, that finds a positive correlation between proportion of land rented out and migration likelihood.

While rural land transfer is the primary independent variable of study, other statistically significant coefficients for other factors are worth noting. The regression analysis shows several statistically significant coefficients for the variables of age ($p<0.01$), gender ($p<0.01$), education ($p<0.05$). Overall, the signs of the coefficients indicate that males are more likely to migrate likely to migrate, while job holders with stable employment are less likely to migrate. This finding aligns with intuitive understanding: men tend to relocate to cities for better employment opportunities, while individuals with higher social status exhibit reduced migration needs due to their established position. Meanwhile, the probability to migrate declines as age and education levels rise. Overall, the statistically significant presence of these factors indicates that these control variables partially mediate the relationship between rural land transfer rights and migration[20].

5.2 Interpretation of IV Results and Robustness Checks

The statistically significant results on the IV causation analysis indicated by three stars for significance at the 1% level demonstrate fairly high confidence in a causal relationship between rural land transfer and the propensity to migrate. Likewise, as in the correlation analysis, we find that age, gender, and education are significant contributors to migration as well. Additional robustness checks through adding control variables, as shown in 3.2, verify the original findings. Overall, these results confirm not only a mere coincidental relationship between rural land transfer and migration, but go further as to claim that the former causes the latter.

5.3 Limitations

Several limitations exist in interpreting these results. First, as previously mentioned, we can only conclude a positive relationship between rural land transfer and migration with a moderate level of confidence. Furthermore, because observations in the CHARLS data set must be available for every variable to be utilized in the regression and the impossibility of imputing certain missing data, the sample size is relatively small ($N = 493$ after adding all controls). Household surveys, particularly on the topic of rural-urban migration and land rights, are often incomplete in the recorded results for all survey questions, leaving researchers to deal with smaller samples of data that yield less statistically reliable result. This issue has been a persistent problem with rural and urban household surveys that were conducted in the wake of governmental reforms. To mitigate this issue, we recommend the collection of household data from official government data rather than relying on survey methods[20].

Lastly, this research remains limited by the scope of study. First, it does not study the impact of the government mechanisms that impact rural-urban migration: namely, land appropriation and expropriation. The literature on impacts of land compensation for land seizures on likelihood to migrate is an intriguing new field of research. Furthermore, this study does not engage in perception-based analysis, specifically with regards to rural households' perception on land tenure security (Ma et al., 2016; Chen et al., 2025)[4,16].

6. Conclusion and Policymaking Implications

This paper concludes that rural land transfer rights, defined quantitatively as the percentage of land survey participants in the CHARLS sampling to be rented out, are positively predictive of the likelihood for a household to migrate based on the given dataset. While this paper stops short of finding sufficient evidence to establish a causal relationship between land transfer and migration, it is nevertheless worth exploring the mechanisms which link the two variables. To that end, scholars have proposed several plausible explanations. First, when farmers lease out land, they become less tied to farming as their sole means of living, meaning that the opportunity cost of migrating decreases. This situation of choice enables rural residents to feel financially secure since they generally maintain ownership of management rights of the land, thus motivating rural-urban migration (Zhang et al., 2023; Su, et al., 2023)[12,17]. Another socio behavioral mechanism besides the idea of land security that influences migrant behavior is the process of social integration and gradual detachment from rural land as part of their identity (Su, et al., 2023)[17].

As the paper does not focus on these intermediate mechanisms, they can be a prime area of focus in future studies. Additionally, researchers can explore the causal relationship between rural land transfer and likelihood to migrate, including exploring the possibility of reverse causality. Nevertheless, even from the correlation itself, we can derive significant conclusions with implications for policymaking. The most immediate conclusion is that policymakers should strengthen and clarify contracting rights in rural land transfer to allow for stronger land security and incentivize land transfer. Specifically, these findings suggest the use of market mechanisms through rental contract subsidies as a means of encouraging such market behavior, as well as implementing land right reforms simultaneously with hukou reforms. Reformed and strengthened rural markets will also have the added benefit of helping China maintain a balanced rural-urban development in its changing demographic landscape. At the same time, monitoring and regulation of these rental markets by government officials is necessary to prevent speculation and manipulative practices, ensuring that the land rental market continues to be a form of empowerment that incentivizes farmers to migrate for a better future in urban areas.

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