

Factors Affecting Rural Arable Land Lessors' Choices of Different Types of Lessees: Evidence from Two Counties in Jiangsu Province, China

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Abstract

Since 2008 more and more new land regulations and policies were established in China. Chinese rural households had more choices to rent out their land. This empirical study examines the factors and their impact on the arable land lessors' choices of different lessees. Based on data from two counties in Jiangsu Province, this research establishes Logit models to analyse the data. The results show that households with fewer durable assets and living in villages with higher average rents in the village are more likely to rent out the land to non-relatives and neighbours (NRN) in Guanyun County. In Jinhua County, on the other hand, households with the less contracted land and living in villages with lower average rents in the village are more likely to rent out land to NRN. A potential explanation of the different impact of average rents in the village in the two villages is two villages in Jinhua County have much higher average rental prices than other villages in Jinhua.

Keywords: Arable Land, Lessors' Choices, Lessees, China, Logit model

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Contents

ABSTRACT	I
ACKNOWLEDGEMENTS	II
1. INTRODUCTION	1
2. THEORETICAL FRAMEWORK	6
2.1 LESSORS' CHOICES OF LESSEES	6
2.2 LIVELIHOOD RESOURCES	7
2.3 RURAL MARKET CHARACTERISTICS	8
2.4 HOUSEHOLD CHARACTERISTICS	9
2.5 EXPECTED EFFECTS	9
3. MODEL SPECIFICATION & DATA DESCRIPTION	10
3.1 PRIMARY MODEL	10
3.2 DATA DESCRIPTION	10
3.3 MODEL DESCRIPTION	17
3.4 QUESTIONNAIRE AND DATA LIMITATIONS	18
3.5 DATA SELECTION	19
4. RESULTS & DISCUSSION	20
4.1 RESULT DESCRIPTIONS	20
4.2 DISCUSSION	24
5. CONCLUSION	27
REFERENCES	28
APPENDIX	32
APPENDIX A STATA OUTPUT T-TEST OF VARIABLES OF GUANYUN COUNTY	32
APPENDIX B STATA OUTPUT T-TEST OF VARIABLES OF JINHU COUNTY	35
APPENDIX C SUMMARY OF AVERAGE RENT (AVERENT) IN GUANYUN AND JINHU COUNTY	38
APPENDIX D STATA OUTPUT FOR FOUR MODEL ESTIMATIONS	39

1. Introduction

Starting from the 1980s, the household responsibility system (HRS) has risen the rural development rapidly in China (Zhang & Chang, 2015). HRS set several law and policies about land in rural areas that have been used by now in China: the village collective has the ownership of rural land; it's not allowed to buy or sell land for political reasons; rural households only have the use right of rural land; rural households can transfer the use right of rural land by signing contracts with different lessees (Liu et al., 2017). In the 1980s, the Chinese government promoted the development of old agricultural organisations such as small households. However, after 2000, these old agricultural organisations cannot satisfy the needs of developing agricultural production. This problem is mainly caused by the inefficient agricultural operation and lack of advanced arable technology of the old agricultural organisations (Wang, 2016). To improve agricultural productivity, the Chinese government implemented various land policies and regulations documented in the annual “No.1 Document” (Ma et al., 2015; Gao et al., 2017; Luo, 2017).

Since the 2000s, many “No.1 Document” have promoted the development of various new agricultural organisations. Under these “No.1 Documents”, China has seen the rapid development of many emerging agricultural organisations such as professional cooperatives (Gao et al., 2013). Professional cooperatives (*zhuan ye he zuo she*) aim to commercialize farmers' product, offer market information, and make a better bargain in terms of market trade (Ito et al., 2016). Since 2004 professional cooperatives have been mentioned for many times in every annual “No. 1 Document” (Huang & Liang, 2017). In 2007, the China Central Government firstly issued Farmers' Professional Cooperatives Law, which promoted the development of professional cooperatives (Ito et al., 2016). In 2008, professional cooperatives served for 21% of China's villages and about 24 million farm households, and both values increased every year after 2008 (Deng et al., 2010; Huang & Liang, 2017). Large professional farms¹ (*zhuan ye da hu*) specialise in agricultural production and aim to achieve the scale of operation (Zewdu & Malek, 2010). At the end of 2015, there were 3.41 million professional large farms in China that are larger than 3.33 hectare (Kong, 2016). Family farms (*jiating nongchang*) refer to the new agricultural organisations where family members are the primary labour force engaged in agricultural production, and their arable income is the primary source of income for the family (He & Xiong, 2014). In January 2013, the Chinese government issued the No.1 Document to encourage rural households to transfer land to large professional farms, family farms and agricultural cooperatives (including various types of cooperatives such as professional cooperatives) (MOA, 2015; Luo, 2017). In 2009, it was the first time that the No.1 Document mentioned the development of professional large farms and agricultural cooperatives, and also encouraged and supported the development of family farms (Ye, 2015; Gao et al., 2017; Luo,

¹ Also translated as specialised big households (Zhang et al., 2004), leading specialised farmers (Luo, 2017), and big farm (Huang, 2011).

2017). Until the end of 2013, China had 1.139 million family farms, and there were more than 13 thousand agricultural organisations in the form of shareholding partnership and corporation. The total output value of family farms increased 15.1 percent, and profit rose 11.3 percent during 2013 (MOA, 2015). The No.1 Document in 2016 firstly mentioned shareholding cooperatives (*gufen hezuoshe*) and also encouraged rural households to voluntarily join the agricultural enterprises and agricultural cooperatives (Liu & Yang, 2017; MOA, 2017). Shareholding cooperatives aims to protect the security of land use right (Ito et al., 2016). Rural households could become a member of shareholding cooperatives by contributing their use right of land and obtain the bonus from shareholding cooperatives (Zhang, 2018).

The arable land transfer – in fact, it's the transfer of land use right – is of great significance to promoting agricultural modernisation in China (Ma et al., 2015). Before 2007 Chinese rural households that (temporarily) migrated to urban areas were more likely to rent out their land to relatives and neighbours (RN) instead of non-relatives and neighbours (NRN) (Kong & Xu, 2010). Rural households who had a closer relationship with land lessees are more likely to rent the land out to different lessees before 2007 (Kong & Xu, 2010; Wang, 2017). The “No.1 Document” of 2008 emphasised the improvement of land use rights in the land transfer market under the principle of voluntary compensation (Luo & Liu, 2013; Qian & Ji, 2016). After 2008, more and more rural household are willing to rent out their land to different types of land lessees (Kong & Xu, 2010; Luo & Liu, 2013; Wang, 2017). MOA (Ministry of Agriculture) has collected the data of different types of land lessees since 2011. Table 1 compares these categories of different lessees in China in 2011 and 2015².

² I will analyse the data collected in Jiangsu Province in 2015 in the further discussion. Hence I compare the data of 2011 and 2015 in the introduction.

Table 1 Arable land transfers in China, 2011 and 2015

Arable Land Lessees	2011				2015				Percentage increase ³
	Area (mln ha.)	Share	% ¹	% ²	Area (mln ha.)	Share	% ¹	% ²	
Farmers	10.3	67.6	12.1	7.6	17.5	58.6	19.8	12.9	70.0
Professional Cooperatives	2.0	13.4	2.3	1.5	6.5	21.8	7.3	4.8	218.7
Enterprises	1.3	8.4	1.5	1.0	2.8	9.5	3.2	2.1	121.8
Others	1.6	10.6	1.9	1.2	3.0	10.1	3.4	2.2	86.7
Total	15.2	100	17.8	11.3	29.8	100	33.7	22.0	96.1

Data Source: MOA (2013, 2017).

Notes:

1: Percentage of the area of contract arable transferred land of the area of **all the rural households' contracted arable land** in China (area of all the rural households' contracted arable land was 89.5 million ha in 2015, 85.2 million ha in 2011)

2: Percentage of the area of contract arable land transferred land of the area of **all the arable land** in China (area of all the arable land was 135.0 million ha in 2015, 135.2 million in 2013, the area of arable land in 2011 is not available at the China Agriculture Yearbook 2012 by MOA)

3: Percentage increase from 2011 to 2015.

Table 1 shows that MOA measures the areas of each type of lessee in 2011: farmers (with 10.3 million hectares), professional cooperative (2.0 million hectares), enterprises (1.3 million hectares) and others (1.6 million hectares) (MOA, 2013). There was 15.2 million hectare of cultivated land transferred in China at the end of 2011 (MOA, 2017). All four types of lessees increased in a different amount within four years: land of farmer lessees grew by 70.0%, of professional cooperatives increased by 218.7%, enterprises grew by 121.8%, others increased by 86.7% (MOA, 2017). As a result, in 2015, the number of all lessees enlarged remarkably (with an overall rise of 96.1%). As the classifications were not very precise, family farms and shareholding cooperatives were regarded as components of “others” in the classifications in 2011 and 2015. The problem of the classification of MOA is that it doesn't use precise definitions of each category of land lessees.

Table 1 also illustrates that generally the rural households' contracted land increased by 4.3 million ha (= 89.5-85.2) from 2011 to 2015, and the percentage of contract cultivated transferred land of all the rural households' contracted arable land increased within the same period. We can also find that under the relatively fixed area of overall arable land (135.2 m ha compared to 135.0 m ha in 2015), the proportion of transferred arable land of overall arable land increased remarkably (from 11.3% in 2011 to 22.0% in 2015). This indicates that more

and more rural households rented out land to different farmers or agricultural organisations during 2011 - 2015.

Until now there is no fixed classifications of the categories of land lessees in China (Wang, 2017). Lots of research have their own classifications of land lessees. Qian & Ji (2016) analyse the data of arable land lessees in Jiangsu Province and whole China from 2006 to 2013 (see Table 2). They find that the percentage of rented-out-land of the arable land in Jiangsu (28.01% in 2013, averagely 17.67% from 2006 to 2013) is higher than other provinces such as Guangxi (10.64% in 2013, averagely 6.96% from 2006 to 2013) and Heilongjiang (23.60% in 2013, averagely 14.50% from 2006 to 2013). This is mostly based on the better Jiangsu Province's better economics. Qian & Ji (2016) also find the percentage of renting out land to family farms, cooperatives and agricultural enterprises of all the land lessors increase from 1.57%, 7.87%, 0% to 4.72%, 9.65%, 6.57% respectively in whole China, and the percentage of renting land out to relatives and neighbours (RN) decrease around 4% within 7 years. But the reasons for the remarkable change of this percentage haven't discussed in this research.

Table 2. Percentage of arable land lessees in 2006 and 2013 in China and Jiangsu Province (Unit: %).

Lessees	China			Jiangsu, China		
	2006	2013	Dif.	2006	2013	Dif.
Relatives	40.94	32.85	-8.09	16.22	10.07	-6.15
Neighbours	27.56	30.80	3.24	10.81	22.30	11.49
Village collectives	8.66	6.16	-2.50	29.73	15.83	-13.90
Family farms	1.57	4.72	3.15	5.41	10.79	5.38
Cooperatives	7.87	9.65	1.78	27.03	19.42	-7.61
Agricultural enterprises	0.00	6.57	6.57	0.00	9.35	9.35
Others	13.39	9.24	-4.15	10.81	12.23	1.42

Source: Qian & Ji (2016)

Various factors may affect arable land lessors' choices of lessees, including livelihood resources (different types of capitals, including natural capitals, economic capitals, human capitals, social capitals), household characteristics (gender percentage, average age), rural market characteristics (average rental price) (Scoones, 1998, 2015; Kong & Xu, 2010; He et al., 2016; Brandt et al., 2017). Until now, there is very limited research about factors affecting arable land lessors' behaviours. Kong & Xu (2010) find that households with the higher educational level of household head, lower labour ability and younger the household head is, rural household is more likely to transfer the land to relatives or neighbours. Cai & Liu find that possibility of transferring out land to RN depends on the two effects of household head's

education. Although those research specify the factors affecting the arable land lessor's behaviours, they haven't researched on the lessors' choices of newly established agricultural organisations.

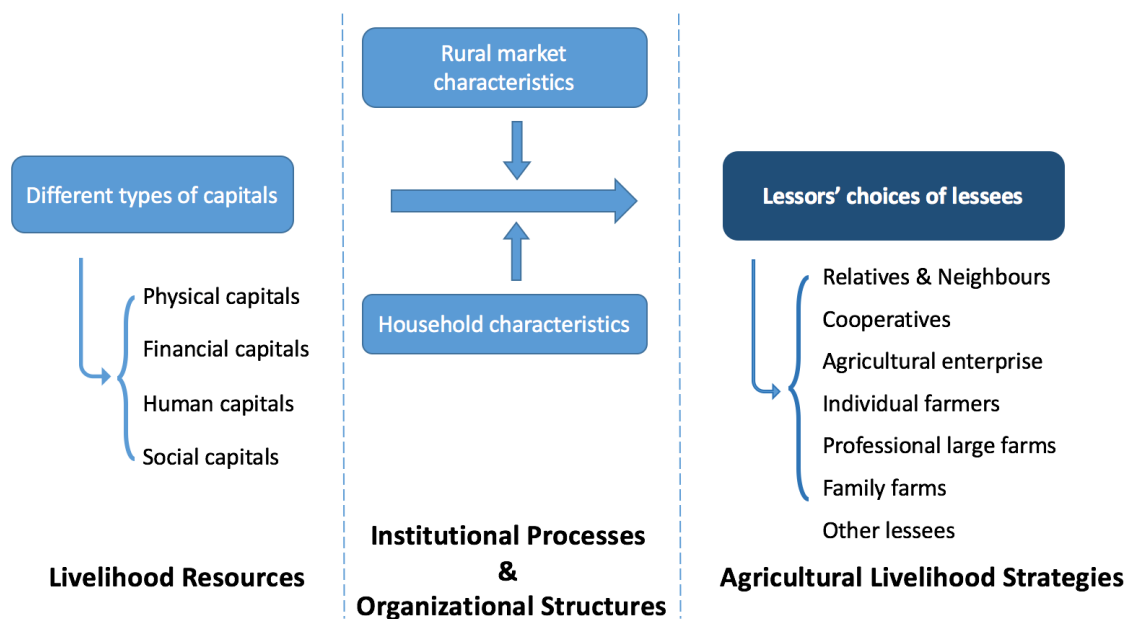
There were not many new agricultural organisations such as cooperatives or large professional farms before the policy change in 2013. It remains unknown how factors affect household's choices of new agricultural organisations after 2013. Thus more research is needed about this topic. The objective of my study is to examine the factors that affect arable land lessors' choices of types of lessees. More specifically (as motivated in more details in the next chapter), this study is to examine the impact of *rural market characteristics*, *livelihood resources* and *household characteristics* on arable land lessors' choices of various categories of lessees after 2013 such as large professional farms and family farms. Following the research of Kong & Xu (2010), I will use Logit models to examine the impacts.

2. Theoretical Framework

In my research, I make a theoretical framework (see Figure 1) that provides a view of the process where people can achieve well-being and reduce poverty in livelihood strategies that are shaped by their livelihood resources (Scoones, 1998, 2015). In this framework, rural household makes choices of renting out their land to particular lessees as livelihood strategies to obtain a better-off living. Livelihood resources, institutional process and organisational structures can influence the livelihood strategies. Land rental decision – that is, to rent out land, rent in land or no land rent – is an important livelihood strategy decision. However, only the data of households who renting out land are available in my research. Thus the livelihood strategies in the theoretical framework only include lessors' choices of lessees.

Lessors' choices of lessees include relatives and neighbours, professional cooperatives, shareholding cooperatives, enterprises, and others lessees. Other lessees contain individual farmers outside the village, individual farmers inside the village, large professional farms, family farms, agricultural commissions and other stakeholders. In short, I judge that there are several factors may affect lessors' choices of lessees: rural market characteristics, livelihood resource, and household characteristics.

Figure 1. Factors affecting lessors' choices of lessees



Source: Based on Scoones (1998, 2015).

2.1 Lessors' Choices of Lessees

Livelihood strategies refer to agricultural intensification, agricultural extensification, and livelihood diversification and migration (Scoones, 1998). In this research, I will only focus

on agricultural livelihood strategies. Lessors' choice of lessees is one type of the agricultural livelihood strategies which aims to improve the lessors' well-being by renting out land to specific lessees (Kong & Xu, 2010; Zewdu & Malek, 2010). Based on the lessors' choices, lessors and lessees will sign the rental contract of arable land, which leads to land transfer.

Recent studies of lessees' choices are mainly based on work of Fei et al. (1992) and Hwang (1987) (Wang, 2017). Many researchers indicate the lessors' choices of lessees are in order because the social relationships can be divided into different levels in China (Hwang, 1987; Wang, 2017). Wang (2017) indicates in current China, people's relationships in rural areas will lead to a different social relationship network, further to differential order governance (*chaxu zhili*), which refers to a special administration that is based on the social relationships in different levels. In the research of Liaoning and Jiangxi Province, Wang finds that rural households have four kinds of social relationships: strong relation, familial relation, weak relation, and no relation. Parallel to the social relationships, arable land lessors transfer arable land to four types of stakeholders: friends and relatives, households inside the same village, households outside the village, and scale-operation stakeholders such as company or agricultural cooperatives.

2.2 Livelihood Resources

Physical, financial, human capital and social capital are known as the livelihood resource (Scoones, 2015). I will examine the effect of the various capitals on arable lessors' decisions of types of lessees.

Physical capital includes natural capital (such as land and water) and economic capital (such as agricultural and non-agricultural durable assets). Various researchers find that the impact of natural capital and economic capital on lessors' choices of lessees are very similar (Kong & Xu, 2010; Deininger et al., 2014; Xie & Lu, 2017). Xie & Lu (2017) argue that the possibility of unemployment positively correlates with the value of the arable land asset. Kong & Xu (2010) prove that household head's non-agricultural unemployment positively relates to renting out land to non-relatives or neighbours (NRN). Thus the physical capital – including natural capitals and economic capital – is negatively associated with the possibility of transferring land to NRN.

Financial capital represents credit access, financial debt and financial security. Zhang et al. (2004) find a household's financial endowment has significant effects on its strategy of participating in the agricultural market. Apergis (2015) finds that there is no significant relationship between the business cycle and venture capital. Households will change their behaviours in light of their expectation of economic prosperity and recession. However, despite the evidence of the impact of financial assets on rural household's behaviours, previous research never shows any effects of financial assets on renting out land to any lessees (Apergis, 2015; Yao et al., 2016). Thus the impact of financial capital on lessors' decision of types of lessees will be no longer analysed in my research.

Human capitals contain lessor's educational level and agricultural training. The *education level* of household head has two types of effects on the arable land transfer. The first effect indicates that the improvement of household head's education will increase household head's employed opportunities in non-agricultural jobs (Cai & Liu, 2017). Cai & Liu also finds that household head's non-agricultural unemployment positively correlates to possibility of transferring out land to NRN. Hence the higher household head's education would drop the possibility of renting out land to relatives. The second effect illustrates that if household head's education is pretty high, the household head could easily possess knowledge about agricultural production. For such household head, he/she often has a strong will to rent out the land to non-relatives or neighbours (NRN) to get high returns (Cai & Liu, 2017). As the two effects work conversely, whether land lessors rent out land to NRN or NRN depends on the overall effect of the first effect and the second effect.

Social capital denotes the particular capital that is used to pursue coordinated livelihood strategies. Political status is an example of social capital (Scoones, 1998). The village cadres' behaviours closely relate to the land transfer in the village (Chen, 2014). The village cadres have weakened their power since the 1980s, but still, possess great power in how land uses in the village (Xiao, 2006; Li, 2013). Village cadres have responsibility and power to seek land lessee during the transfer of farmland (Guo & Wang, 2010). If the household head has a political status such as village cadre, he/she is more likely to rent out arable land to big lessees such as cooperatives and large farms (Li, 2013).

2.3 Rural Market Characteristics

Rural market characteristics contain average land rental price in the local village (Liu et al., 2014; He et al., 2016). Rental price may have an impact on lessors' income, and further influence their choices (Liu et al., 2014). Wang et al. (2015) indicate rural households will rather rent out their arable land to NRN if and only if they can achieve significantly higher rental payments. Under the assumption that NRN provides more land rents, if rural households lack labour and they decide to rent out the land, the rural households are less likely to rent out their land to NRN to get higher returns. Thus in the rental market, we judge that higher average rental price in a village may result in more land rented out to NRN.

Rural market characteristics also include rural households' understanding of land contracting rights and land policies (Cai & Liu, 2017). Ye et al. (2010) show that if rural households have a better comprehension of changing land policies, they will have more confidence in participating in the negotiation of arable land transfer. Therefore, under the condition that livelihood resources and household characteristics remain unchanged, rural households who know better about current land policies are more likely to transfer land to the more efficient agricultural organisations such as cooperatives or family farms.

2.4 Household Characteristics

Household head's age is an important indicator of household characteristics (Kong & Xu, 2010). The use right of agricultural land is vital for Chinese rural household. But if the household head age increases, his/her ability to work for agricultural production will be weaker. As most rural family income relies on the children's wage from non-agricultural industries, we can infer that the older the head of household is, the more he/she is inclined to be workless (Cai & Liu, 2017). Kong & Xu (2010) find that household head's off-farm employment is negatively associated with the probability of renting out land to lessees in a close relationship. Thus an older household head is more likely to rent out land to RN instead of NRN.

2.5 Expected Effects

According to the analysis above, we can predict the expected effects of renting out land to NRN rather than RN as Table 3 shows.

Table 3. Expected impact of selected variables on the choice of non-relatives and neighbours (NRN)

		Variables	Sign of expected impact
Livelihood resources	Natural capitals	Contracted land	-
	Economic capitals	Non-agricultural durable assets	-
	Human capitals	Educational level	+/-
	Social capitals	Political status	+
Rural market characteristics		Average rental price	+
		Acquaintance of the land policy	+
Household characteristics		Age of household head	-

3. Model Specification & Data Description

3.1 Primary Model

I will separate all the lessees into two general categories: relatives & neighbours (RN) and non-relatives & neighbours (NRN), to compare the impact of factors on the two types. I set the dependent variable Y_k as dummy variable. In Jiangsu Province lessors have various choices of lessees (Y_k) such as neighbours and relatives (Y_1), cooperatives (including professional cooperatives and shareholding cooperatives) (Y_2), agricultural enterprise (Y_3), individual farmer (Y_4), professional large farms (Y_5), family farms (Y_6), and other lessees (Y_7). RN only includes Y_1 . NRN includes $Y_2, Y_3, Y_4, Y_5, Y_6, Y_7$. The factors include livelihood resources (including natural capital (NC), economic capital (EC), human capital (HC), social capital (SC), rural market characteristics (RM), and household characteristics (H). The primary function is shown in equation (1).

$$Y_k = f(NC, EC, HC, SC, RM, H) \quad (1)$$

3.2 Data Description

I collected the research data from the project of ‘Farmland Transferring’ of Nanjing Agricultural University. The sample data were collected in 2015 in Guanyun County and Jinhua County, which both locate in north Jiangsu Province in China. These collected data includes the data of households that rents out land, rent in land and no land transfer. However, only the data of households renting out land is available in my research.

The reasons to choose Jiangsu Province and Guanyun and Jinhua County lie in three fields. First, until now there is no literature about the lessors’ choices towards lessees in Jiangsu Province. Existing literature is about lessors’ choices of lessees in other provinces of China such as Anhui Province (Kong & Xu, 2010). Second, the ratio of rental land to total arable land in Jiangsu Province increased from 8.19% to 21.99% from 2006 to 2013, higher than other provinces such as Heilongjiang (from 9.96% to 23.60% during 2006 to 2013) and Hubei (from 0.65% to 11.55% during 2006-2013) (Qian & Ji, 2016). The ratio is relatively high compared to other coastal or crop production regions in China since 2006 (Zhang et al., 2014; Li et al., 2016). Third, northern Jiangsu has more arable land size than other parts of Jiangsu Province (Bureau of Statistics of Jiangsu Province, 2016). Guanyun County and Jinhua County are randomly selected in Northern Jiangsu. Table 4 shows the data about agriculture and GDP of Guanyun and Jinhua County.

Table 4. Main indicators of Guanyun County and Jinhu County

	GDP per capita (yuan)	Agricultural GDP (billion yuan)	Agricultural GDP ¹ (%)	Grain production (1,000 ha)	Non-food crop production (1,000 ha)	Ratio of grain to non-food crop land
Guanyun	37,542	5.981	19.93	112.65	22.72	4.96
Jinhu	65,476	3.094	14.30	74.63	8.01	9.32

Source: Bureau of Statistics of Jiangsu Province (2016)

Note:

1: Ratio of agricultural GDP to overall GDP

Table 4 shows that the GDP per capita in Jinhu County is almost two times Guanyun's GDP per capita, implying Jinhu is much richer than Guanyun. In addition, in 2015 the percentage of the agricultural sector of GDP of Guanyun County (19.93%) was the largest one among all the 15 counties in north of Jiangsu, while for Jinhu County (14.30%) it was in the middle level in north of Jiangsu (Bureau of Statistics of Jiangsu Province, 2016). Besides, as the agricultural GDP of Guanyun and agricultural GDP percentage are larger than that of Jinhu, we conclude that the GDP of Jinhu depend less on agricultural production compared to the GDP of Guanyun. We may also find that the grain production area and especially also the non-food crop production area is larger in Guanyun County, the poorer county, than in Jinhu County.

The research questionnaire includes questions land lessors' assets and contacted land, and basic household information of lessees, and non-rent household information. The questions are closed questions and open-ended questions. Until 2015 the arable land has been transferred for at most two times Guanyun County and Jinhu County. The interviewed households rented out their land at most two times. If some land lessors have two or more land contracts, we select data from the first land contract.

Only the data of land lessors are available. Data about 463 households are complete among all 473 sampled households. There are 183 and 280 valid observations of lessors in Guanyun and Jinhu County respectively. Table 5 summarizes lessors' choices of different categories of lessees in Guanyun County and Jinhu County.

Table 5. Lessors' choices of lessees in Guanyun County and Jinhu County

Lessees	Guanyun County	Jinhu County
1. Relatives & neighbours (RN)	31	27
2. Non-relatives or neighbours (NRN)		
2.1 Cooperatives	17	6
2.2 Agricultural Enterprise	27	31
2.3 Individual farmer		39
2.4 Professional large farms		71
2.5 Family farms		7
2.6 Other lessees	108	99
Total number	183	280

We find that fewer than ten cooperatives and family farms are in Jinhu County, which can easily cause statistical biases. The data of Guanyun County were firstly collected by the interviewers, followed by the data of Jinhu County. The missing options of questionnaires caused the blanks of individual farmers (2.3), professional large farms (2.4) and family farms (2.5) in Guanyun County. In the initial investigation in Guanyun County, there were only five options of lessees in the questionnaire: 1. Relatives or neighbours, 2. Professional cooperatives, 3. Shareholding cooperatives, 4. Agricultural enterprise and 5. Other lessees. However, the results of the investigation show that more than half of lessors selected “other lessees”, and very limited lessors (fewer than 10) select “2. Professional cooperatives” or “3. Shareholding cooperatives”. This finding implies that the options in the questionnaire are not precise enough and that the interviewers in Guanyun County don't specify the “other lessees”. Jinhu's investigations followed the Guanyun's with some modifications in interviews. In the investigation in Jinhu County, interviewers added notes to the option “Other lessees”. Individual farmer (2.3), professional large farms (2.4), family farms (2.5) were not additional answer options, but were derived from the notes that interviewers added to the “Other lessees” option. Still, nearly 1/3 of the lessors answered “Other lessees” in Jinhu County. As not all investigators in Jinhu County added notes to the “Other lessees” option, the great amount of “Other lessees” in Jinhu County is probably caused by missing notes of interviewers and should therefore be interpreted with care.

Physical capital includes natural capital and economic assets. As there is not much information of natural capital in the questionnaire, natural capitals (*NC*) will be only calculated as the area of contracted land in 2013. Economic capitals (*EC*) are the sum of durable agricultural assets and non-agricultural durable assets. Agricultural assets are the current value of the farm machine. The present value of the farm machine is estimated as the value of automobiles, tractors, harvesters, threshers, pumps, cattle, horses, donkeys, mules, etc. Non-agricultural durable assets are the sum of the present value of household fixed assets for

consumption (cars, air conditioners, refrigerators, washing machines, electric cars, etc.) and rural residential present value. Human capitals (*HC*) serve as proxies of the household head's educational level (*EDUC*), whose value is given by 1 for illiteracy, 2 for primary school, 3 for middle school, 4 for high school (including professional secondary school) and 5 for college level or higher. *STATUS* denotes the political status of social capital (*SC*). Political status indicates whether the household head is the village cadre, with the value of 0 (no village cadre in the rural household) and 1 (with village cadre in the rural household).

Household characteristics (*H*) contains the average age (*AGE*). Rural market characteristics (*RM*) includes interviewee's acquaintance of the local land policy (*ACQUAI*) and the average arable land rental prices of each village (*AVERENT*). The acquaintance of the local policy shows rural households' subjective feeling of their acquaintance of the agricultural policies, with the value of 0 (unfamiliar) and 1 (familiar). Average rental price is the average rent that lessees will offer to lessors in a village. The reason that I want to use average rental price of one village instead of individual price is that the average of rental price could reflect the rental market of a village but the individual rental price cannot. Before calculating the average rental rents in one village (*AVERENT*), I firstly apply two methods for the rental price for an individual rural household (RM^r) calculation: if land lessees give annual rent to land lessors, I will use this yearly rent as RM^r ; if the land lessors receive the whole rent for the remaining contract period at one time, the household rent will be measured by the second method as equation (2).

$$RM^r = \frac{\text{total rental price}}{2028 - \text{initial year of renting out}} \quad (2)$$

The year of 2028 is the end of the 2nd round of contracting land. The 1998 Land Management Law (LML) emphasises that rural households obtain written documentation of land use rights lasting 30 years until 2028 (Wang et al., 2015). Thus the total rent is divided by the difference between 2028 and the year of rent. For example, a household was given the total rent 20000 yuan/ mu (1 mu = 1/15 ha) in 2011. Then the annual household rent is derived from 20000/ (2028-2011), which equals 1176.47 yuan/ (year*mu). Table 6 shows the detailed average rents of each village of two counties.

Table 6. Average rents of each village in Guanyun and Jinhu County

Guanyun			Jinhu		
Village	No. of Inter.	Average rents	Village	No. of Inter.	Average rents
Yilu	26	1000	Chendu	12	895
Zhangbaoshan	2	700	Magang	1	720
Tuhe	12	852	Wanzhuang	15	882
Xinglong	2	0	Gaoqiao	36	715
Xudagou	1	360	Lianhe	41	690
Shanxi	12	800	Liuba	40	804
Shanqian	16	966	Heying	36	807
Wangyu	13	1243	Zhangba	29	787
Pijiadun	6	400	Xinqiao	9	761
Wuhu	25	688	Wuli	37	802
Shijian	2	544	Wuqiao	24	754
Gangxi	18	480			
Jiling	4	550			
Liuli	7	904			
Hanyu	19	1113			
Suntiao	2	300			
Xinglian	4	313			
Zhendong	4	130			
All	183	810.77	All	280	776.24

Although their means are quite close, Table 6 implies that the standard deviation of average rent of Guanyun County (281.44) is much larger than that of Jinhu County (56.36) (see calculations of standard deviation in Appendix C), which indicates that the land market of Guanyun shows greater variation than that of Jinhu County. The average values of independent variables in both counties are shown in Table 7 and Table 8.

Table 7. Average values of factors of lessors in **Guanyun County**

Independent variables			Categories of Lessees					Average
			Relative & neighbours (RN)	Non – relatives or neighbours (NRN)				
				1 Relatives and neighbours	2.1 Cooperatives	2.2 Agricultural enterprise	2.6 Other lessees	
Sample size			31	17	27	108		
Livelihood resources	Natural capitals	Contracted land (Mu)	3.968	3.275	5.311	4.055	4.191	4.153
	Economic capitals	Durable assets (Million yuan)	0.243	0.230	0.169	0.279	0.254	0.252
	Human capitals	Educational level	2.55	2.41	2.59	2.46	2.478	2.490
	Social capitals	Political status	0	0.24	0.19	0.05	0.096	0.0798
Rural market characteristics		Average rental price (yuan)	472.09	845.97	769.42	911.58	878.99	810.07
		Acquaintance of the local policy	0.16	0	0.11	0.23	0.183	0.179
Household characteristics		Age of household head (year)	60.65	53.06	59.96	57.19	57.220	57.801

Table 8. Average values of factors of lessors in **Jinhu County**

Independent variables			Categories of Lessees								Average
			Relative & neighbours (RN)	Non – relatives or neighbours (NRN)							
				1 Relatives and neighbours	2.1 Cooperatives	2.2 Agricultural enterprise	2.3 Individual farmer	2.4 Large professional farms	2.5 Family farms	2.6 Other lessees	
Sample size			27	6	31	39	71	7	99		
Livelihood resources	Natural capitals	Contracted land (Mu)	8.133	0	8.058	1.718	1.612	2.143	4.190	3.403	3.859
	Economic capitals	Durable assets (Million yuan)	0.121	0.153	0.167	0.170	0.123	0.110	0.160	0.150	0.148
	Human capitals	Educational level	2.62	3.17	2.53	2.61	2.56	2.29	2.54	2.569	2.569
	Social capitals	Political status	0.04	0	0.19	0	0.11	0.14	0.31	0.166	0.166
Rural market characteristics		Average rental price (yuan)	804.76	755.54	788.29	750.78	767.47	806.48	816.87	773.19	776.24
		Acquaintance of the local policy	0.3	0.33	0.19	0.23	0.17	0.29	0.31	0.244	0.249
Household characteristics		Age of household head (yuan)	59.63	53.83	58.83	60.95	59.51	61.29	56.38	58.338	58.463

Generally, the contracted land rented out to RN in Jinhu County is two times than that in Guanyun County. The average rental price of Jinhu County is almost the same as that of Guanyun County. The average contracted land transferred to NRN in Jinhu County is of a similar amount as Guanyun County. However, the durable assets show Guanyun's land lessors have two times durable assets than Jinhu's. This is because of the high current value of the rural residual house in Guanyun (nearly 220000 yuan averagely in Guanyun, 110000 averagely in Jinhu County). The results show that other indicators don't show many differences between two counties.

All the variables of Guanyun and Jinhu County are examined by two-sample t-test using groups to check the differences between RN and NRN (see Appendix). As I assume the variances of variables are different in Guanyun and Jinhu County, I estimate their means by the Welch's approximation (StataCorp, 2017). The result shows most indicators of RN and NRN are not significantly different. But the political status and average rental price of RN are smaller than NRN in Guanyun County at 5% significant level. This result illustrates that the households transferred land to NRN instead of RN in Guanyun has higher political status and higher average rental price than the households rented out land to RN. We also find that the average rent of NRN is significantly smaller than that in Guanyun County. The reason is that as the number of lessee NRN (253) is far more than lessee RN (27), several extremely high values of rental price offered by RN to individual households lead to higher average rental price of RN than NRN. From the t-test results, we could also find the natural capital of NRN is significantly larger than that of RN in Jinhu County. The t-test results show that there are no significant differences in other factors between the RN and NRN in Guanyun and Jinhu County. We need further model estimations to see the impact of factors on lessors' choices of types of lessees.

3.3 Model Description

Research about arable land lessors' multiple choices usually applies Probit or Logit model for estimation of the impact of factors affecting lessors' choices of categories of lessees (Kong & Xu, 2010; An & Hong, 2015; Ma et al., 2015; He et al., 2016). In order to compare the choices of types of lessees by the factors, Logit models will be used in my research. My research applies two types of Logit models: when lessees are divided into two groups (RN and general NRN), the *binary Logit model* will be applied for estimation; if lessees are divided into various groups (RN and specific NRN), then I will use *Multinomial Logit model*. As the choices of lessors are various and unordered, each dependent variable (each lessor's choice) may vary with different factors. If the dependent variables could be given more than two values, the multinomial Logit model is more useful than binary Logit model because the values of its dependent variables are multiple independently irrelevant alternatives while binary Logit model has only two alternatives (Verbeek, 2004; Xie & Jiang, 2016; Brandt et al., 2017). Both Logit models are defined as equation (3).

$$Y_k = \alpha_0 + \alpha_1 NC + \alpha_2 MEC + \alpha_3 EDUC + \alpha_4 STATUS + \alpha_5 AVERENT + \alpha_6 ACQUAI + \alpha_7 AGE + \varepsilon_k \quad (3)$$

Where *NC* denotes area of contracted land, *MEC* denotes durable assets, *EDUC* denotes household's head's educational level, *STATUS* denotes household's political status, *AVERENT* denotes market average rents of one village, *ACQUAI* denotes the acquaintance to the land policy, *AGE* denotes the household's age. $\alpha_0, \alpha_1, \alpha_2, \alpha_3, \alpha_4, \alpha_5, \alpha_6, \alpha_7$ are the estimated parameters. ε_k denotes the residuals of model (3). In the Multinomial Logit model, Y_k is valued as 1, 2, 3, 4, 5, 6 or 7. In Binary Logit model, Y_k is given the value 0 or 8 (the value of 8 is to discriminate it from the value 1 of Y_k in Multinomial Logit model).

One rural household has different behaviours to other rural households in different relationships. Since it will be more comprehensive if I compare the choices based on the different level of relations, and since close relations (such as family member and relatives) are the central circle of people's relationships, I select the option of "relatives and neighbours" as a base alternative in both Logit Models.

3.4 Questionnaire and Data Limitations

The study has some limitations that cannot be evaded. In this sector, I will list the questionnaire limitations and limitations of collected data.

The questions and options of the questionnaire are not precise. The impreciseness can be reflected in two aspects. Firstly, the options of lessors' choices in the questionnaire cannot represent all the categories of lessees — there are no options for family farms, large farms, individuals, or agricultural commissions in the questionnaire of Guanyun and Jinhu. All these types of lessees should be added to the questionnaire to reduce the biases. Secondly, the lessors' choices are easily influenced by the quality of arable land (Brandt et al., 2017), but there are no questions about arable land in the questionnaire. Thus from the questionnaire of Guanyun and Jinhu County, I cannot examine whether the quality of arable land would affect lessors' decisions.

Data limitations are in two respects. First, the available data are just the detailed data of rent-out-land households (lessors), and the general information of rent-in households (lessees) and no-rent households. I cannot judge the interviewee's attitudes and land lessees' agricultural productions, and the impact of lessees' scale on the lessors' choices of types of lessees. Second, as I didn't participate in the survey of Jiangsu Province in 2015, I could only perceive the land lessors' feelings based on the interviewers' written descriptions.

3.5 Data Selection

Not all the complete data will be used in two Logit models. Based on the data collection of lessees, we find that more than half of lessees are “other lessees” in Guanyun County, and nearly 1/3 of the lessors transfer land to “other lessees” in Jinhu County. To exclude the possibility that there are still some lessees such as individual farmers and family farms in the “other lessees” because of the missing data caused by investigators, I will not use the data of “other lessees” of Jinhu County when compare the impact of factors on specific NRN. Table 9 shows whether to take “other lessees” of Y_k into account in model estimations.

Table 9. Inclusion of “other lessees” in model estimation

	General NRN model	Separate category in specific NRN model
Guanyun County	YES	YES
Jinhu County	YES	NO

NRN denotes non – relatives or neighbours

4. Results & Discussion

4.1 Result Descriptions

I estimate the model (3) for the factors' impacts on general NRN and specific NRN in Guanyun and Jinhu County respectively. STATA 13.0 and STATA 14.0 were used for all the estimations. Table 10 and Table 11 summarize the results for each county.

Table 10. Logit model estimation results, Guanyun County

Variable of factor	Overall non – relatives or neighbours (NRN)	Specific non – relatives or neighbours (NRN)		
		2.1 Cooperatives	2.2 Agricultural enterprise	2.6 Other lessees
Area of contracted land	0.0375 (0.68)	-0.0269 (-0.29)	0.0501 (0.79)	0.0393 (0.69)
Durable assets	-1.111** (-2.14)	-1.958 (-1.33)	-2.339* (-1.70)	-1.084** (-2.04)
Household head's Education	-0.283 (-1.08)	-0.513 (-1.43)	-0.205 (-0.67)	-0.284 (-1.03)
Political status	0 (omitted)	17.3 (0.01)	16.5 (0.01)	14.3 (0.01)
Average rents	0.0070** (5.60)	0.0057*** (3.46)	0.0049*** (3.62)	0.0080*** (5.95)
Acquaintance of land policy	0.795 (1.12)	-14.346 (-0.01)	-0.050 (-0.05)	1.337* (1.77)
Household head's age	-0.0342 (-1.39)	-0.0782** (-2.17)	-0.0079 (-0.26)	-0.0414 (-1.56)
(Constant term)	-0.277 (-0.15)	1.692 (0.66)	-2.110 (-0.90)	-1.123 (-0.57)
Pseudo R2	0.3696	0.2551		

Note: z-value in parentheses. *, **, *** represent the significant parameter at 10%, 5%, and 1% significant level respectively.

Table 11. Logit model estimation results, Jinhu County

Variable of factor	Overall non – relatives or neighbours (NRN)	Specific non – relatives or neighbours (NRN)				
		2.1 Cooperatives	2.2 Agricultural enterprise	2.3 Individual farmer	2.4 Large professional farms	2.5 Family farms
Area of contracted land	-0.044** (-2.11)	-28.474 (-0.01)	-0.012 (-0.44)	-0.118** (-2.41)	-0.124*** (-3.18)	-0.124 (-1.44)
Durable assets	1.683 (0.84)	0.180 (0.04)	2.902 (1.18)	1.814 (0.74)	-0.094 (-0.04)	0.405 (0.09)
Household head's Education	-0.234 (-0.98)	0.738 (1.18)	-0.155 (-0.49)	-0.302 (-0.94)	-0.200 (-0.70)	-0.604 (-1.12)
Political status	1.171 (1.02)	-21.77 (-0.00)	2.557** (2.02)	-21.08 (-0.00)	1.689 (1.32)	2.85 (1.60)
Average rents	-0.0070* (-1.88)	-0.0197** (-2.02)	-0.0040 (-0.72)	-0.0193*** (-3.34)	-0.0128** (-2.47)	0.0049 (0.52)
Acquaintance of land policy	-0.355 (-0.72)	-0.024 (0.02)	-1.102 (-1.64)	-0.346 (-0.52)	-0.373 (-0.64)	-0.210 (-0.20)
Household head's age	-0.021 (-1.02)	-0.037 (-0.83)	-0.009 (-0.33)	0.003 (-0.10)	-0.004 (-0.19)	0.004 (0.10)
(Constant term)	9.901*** (2.77)	14.526* (1.80)	4.005 (0.81)	16.578*** (3.29)	12.241*** (2.72)	-3.778 (-0.46)
Pseudo R2	0.0813	0.1401				

Note: z-value in parentheses. *, **, *** represent the significant parameter at 10%, 5%, and 1% significant level respectively.

The results show that there are not many significant impacts from the regression results. Household head's education never has the significant effect on the selection of types of lessees. The empirical research of Cai & Liu (2017) also indicate the insignificant result of overall effects of education on lessors' choices of NRN, based on the data of Hubei and Anhui Provinces. My research result provides another evidence that the households in different educations shows no significant preference to whom they like to rent out land in both counties.

Column 2 in Table 10 shows binomial logistic regression result of RN and overall NRN in Guanyun County. This also result indicates that less durable assets and higher average rents in the village contribute the lessors to be more likely to rent out land to overall NRN.

The estimation results change a bit after separating the NRN into different categories. Households with received higher average rents in the village will have the higher possibility of renting out land to cooperatives: the possibility of renting land out to cooperatives is 0.57% higher than the possibility of transferring land to RN since $\exp(0.0057) = 1.0057$. The results show that when the household head is one year older, the relative possibility of him/her to rent out land to cooperatives will be 8.1% (as $\exp(0.0782)=1.081$) higher than the possibility of renting out land to RN. The results show that households with one more unit of durable assets and one unit more average rents in one village, we will see 90.4% decrease (as $\exp(-2.339) = 0.096$) and 0.49% increase (as $\exp(0.0049) = 1.0049$) in the possibility of renting out land to agricultural enterprise. Besides, the more rural households are acquainted to land policy, the more they are likely to rent out land to "other lessees", though these "other lessees" are not precise. Estimation results implies the 66.18% decrease in the possibility of renting out land to "other lessees" for a one-unit increase in durable assets since $\exp(-1.084) = 0.3382$. One-unit increase in average rents in a village will lead to the 0.8% increase in possibility of transferring land to "other lessees" as $\exp(0.0080) = 1.008$. Also, we will see the 280.8% increase in odds of renting out land to "other lessees" if household head is one year older.

In general, from the regression results of Guanyun, we can judge that the average rents as rural market characteristics and durable assets as economic capitals are the most critical factors affecting the land lessors' decisions of lessors. Table 10 shows that all the significant impacts of factors in Guanyun are consistent with expected outcome as Table 3 shows. The area of contracted land, household head's education and political status have no explanatory powers on any category of lessors' choices of lessees, which needs more research to explain this phenomenon.

Table 11 shows the estimation results of Jinhu County. The results show that two variables, areas of contracted land and acquaintance to land policy, have significant impacts on overall NRN. If the area of contracted land and acquaintance to land policy both increase one unit, the relative likelihood of renting out land to overall NRN would be 4.5% ($\exp(0.044) = 1.045$) and 0.70% ($\exp(0.0070) = 1.0070$) lower than the possibility of renting out land to RN.

Then we separate the NRN into specific NRN. In Jinhu County, only the factor of

average rents plays an role in deciding on the possibility of renting out land to cooperatives. If the average rents increase one unit, the relative possibility that the rural households rent out land to cooperatives will be 1.99% ($\exp(0.0197) = 1.0199$) lower than the possibility of renting out land to RN. And political status is the only factor affecting the lessors' choices of agricultural enterprise: if political status increases one unit, the rural households have a 1190% ($\exp(2.557) = 12.89$) higher possibility of renting out land to agricultural enterprise than the possibility to rent out to RN. The results show that both area of contracted land and average rents have negative impacts on the likelihood to renting out to individual farmers and large professional farms. If the rural households in Jinhu County have one mu of contracted land and average rents increase one yuan, the households will have a relatively 12.5% ($\exp(0.1176) = 1.125$) and 1.9% ($\exp(0.0193) = 1.019$) respectively lower possibility of renting out land to individual farmers than the possibility of transferring land to RN. Also, rural households with one more yuan of average rents and one more mu of contracted land will have relatively 13.2% ($\exp(0.124) = 1.132$) and 1.3% ($\exp(0.0128) = 1.013$) higher probability of renting out land to large professional farms rather than to RN. Estimation results also indicate that no factors could affect the lessors' choices of family farms. This is mostly because of the small sample number (only seven) of family farms in Jinhu County.

Table 11 suggest that as the average rental price rises, land lessors are less likely to rent out their land to NRN. This finding, however, contradicts the theories I have discussed above. The reason for this case may be the fact that pressure of village cadres in Jinhu County leads to land transfer to different lessees with even though the lessors could receive extremely low average rental price, which will be discussed in section 4.2. For the rural households in Jinhu County, the durable assets, education, knowledge to land policy and age are not decisive for their choices of any type of lessees.

Estimation results indicate that goodness-of-fits of models applied into the data of Jinhu (see Table 10 & Table 11, 0.0813 and 0.1401 for overall and specific NRN estimations respectively) are much lower than that of Guanyun (0.3696 and 0.2551 for overall and specific NRN estimation respectively). This indicates that the logit models could explain the affecting factors in Guanyun better than the factors in Jinhu.

In short, except average rents in Jinhu County, all the other significant results of both Guanyun and Jinhu County support the expected outcome. Apart from the significant impact of factors on the lessors' choices of types of lessees, there are far more insignificant coefficients than those significant as they are shown in Table 10 and Table 11. This result may be affected by the village-mediation transfer. Village-mediated transfer refers to the redistribution of land-use rights from the rural arable landowner to the third parties through the village as an intermediate agency (Brandt et al., 2017). In these cases, the higher-level government may cause important impacts in transferring out arable land to a particular lessee.

Based on the estimation results, we have found the impact of some factors on lessors' choices of lessees. The impact of average rents is distinct among all the factors: it can affect

the arable land lessors' choices of cooperatives, agricultural enterprises, individual farmers, and large professional farms. But the effects are different in two counties. The empirical research finds the results as shown in Table 12.

Table 12. Impact of selected variables on the choice of non-relatives and neighbours (NRN)

		Variables	Sign of expected impact
Livelihood resources	Natural capitals	Contracted land	-
	Economic capitals	Non-agricultural durable assets	-
	Social capitals	Political status	+
Rural market characteristics		Average rental price	+ in Guanyun - in Jinhu
		Acquaintance of the land policy	+
Household characteristics		Age of household head	-

4.2 Discussion

Here are several discussions about this research.

The first thing is about the negative impact of Jinhu's average rents on lessors' choices of categories of lessees. From Table 8 we find that the households transferring land to NRN receive higher market rental price in a village (804.76 yuan) than the households transferring land to RN do (773.19). This is caused by the extremely high average rental prices in Wanzhuang Village (882 yuan, see Table 6) and Chendu Village (892 yuan, see Table 6). Table 13 shows average rents of each village and the lessors' choices of RN in Jinhu County.

Table 13. Average rents of each village in Jinhu County

Village	No. of Inter.	Jinhu			
		Average rents	No. ¹	% ²	% ³
Chendu	12	895	6	50.0%	22.2%
Magang	1	720	0	0.0%	0.0%
Wanzhuang	15	882	5	33.3%	18.5%
Gaoqiao	36	715	4	11.1%	14.8%
Lianhe	41	690	1	2.4%	3.7%
Liuba	40	804	0	0.0%	0.0%
Heying	36	807	1	2.8%	3.7%
Zhangba	29	787	0	0.0%	0.0%
Xinqiao	9	761	0	0.0%	0.0%
Wuli	37	802	1	2.7%	3.7%
Wuqiao	24	754	9	37.5%	33.3%
All	280	776.24	27	-	100%

Notes:

1. Number of households renting out land to relative and neighbours (RN) in the village.
2. Percentage of households renting out land to RN to the overall households renting out land in the same village.
3. Percentage of households renting out land to RN in each village to the overall households renting out land to RN in Jinhu County.

Table 13 shows that 40.7% (11/27) of all the households of renting out land to RN are from Wanzhuang and Chendu Villages, where the average rental prices are higher than other villages. And only 6.3% (16/254) of the households renting out land to NRN are from Wanzhuang and Chendu Villages. Hence the households transferring land to NRN have the lower rental prices in Village than the households transferring land to RN in Jinhu, which further leads to the negative impact of average rents on NRN in Jinhu County.

Another issue is about the village-mediate transfer. Previous research finds that the village-mediate land transfer has played an important role in Jiangsu Province (Yang et al., 2012; Brandt et al., 2017). In the survey of 2015 in Jiangsu Province, it was found that many rural households participated in the land transfer that was forced by the village collective or village cadre (He et al., 2016; Brandt et al., 2017). But through the questionnaire, there are insufficient questions and answers about village-mediations. As it is impossible for me to get the data about the village-mediate transfer, I cannot judge how many villages involve in such unfree transfer. Hence I cannot estimate the role of village collective in an arable land transfer. Further research should focus on the village-mediations and its impact on types of land lessees.

This village-mediate transfer also relates to the concept of “choices”, which is another issue that should be discussed. In the MacMillan dictionary, “choices” mean the opportunity or right to choose between different things. Based on the questionnaire and the interview it is

unknown whether all the villagers are obliged to rent out land to specific land lessees. Through my discussion with the interviewers, I realise that in some villages lessors (though the names of these villages are not specified), rural households don't have right to make their own free choices of the type of lessees. The pressure may be from the village cadres or company (Zhang et al., 2015). Constraint by the limited data, my study cannot precisely analyse whether the rural household could rent out their arable land freely.

The last issue is that the goodness-of-fits of model applied into the data of Jinhu are very low (0.0813 and 0.1401 for overall and specific NRN estimation respectively). There could be other models for estimations such as ordered probit and mixed logit models (Ye & Lord, 2014). Further research could compare these different models and select the best model for estimations.

5. Conclusion

This study takes new agricultural organisations into account and provides a theoretical framework for analysing factors affecting lessors' choices affecting types of different types of lessees. The empirical research confirms that the different capitals (though empirical research doesn't show the human capital' impact on the selection of lessees' types), rural market characteristics and household characteristics affect lessors' decision of types of lessees. The significant research result are generally consistent with the expected impacts summarised in Table 3 (except average rental price). This information can provide a guideline for the government officials to know what factors are important to affect rural household's choices of various types of lessees. For instance, the research can lead the central or local government to help the rural households understand the land policy better so that rural households are more likely rent their land out to the new agricultural organisations.

Besides, further research could collect data of more specific categories of lessees. In my research, based on the questionnaire I cannot get sufficient types of lessees. Field research group leaders should spend sufficient time to pre-test their questionnaires and to train the interviewers. The interviewers should not only specify the "other lessees" if there are no such options in the questionnaires, but also report the problem of missing options in the questionnaire to the research group leader so that they can design a better questionnaire. Besides, further research could separate RN into relatives and neighbours, and separate cooperatives into shareholding cooperatives and professional cooperatives to specify the types of lessees. Further research could also collect data in the fields of village-mediated transfer and the rural households' pressure from village collective, and analyse how village-mediated transfer and village collective affect the land lessors' choices of sorts of lessees.

What's more, Table 5 indicates even though the questionnaire sets the options of specific cooperatives, there are not many cooperatives (including professional and shareholding cooperatives) selected as land lessors' choices (only 17 cooperatives in Guanyun and 6 in Jinhu County). Hence the further research for cooperatives needs a larger sample size.

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Appendix

Appendix A STATA output t-test of variables of Guanyun County

0 refers to relatives and neighbours (RN), and 8 relates to non-relatives or neighbours (NRN). I use the Welch's approximation to assume the variances are not equal.

```
. ttest NC, by(Y2) welch
```

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	31	3.967742	.9725743	5.415065	1.98148	5.954004
8	152	4.190658	.4125966	5.086833	3.37545	5.005866
combined	183	4.152896	.379163	5.129222	3.404776	4.901017
diff		-.222916	1.056474		-2.354585	1.908753

```
diff = mean(0) - mean(8)                                t = -0.2110
Ho: diff = 0                                             Welch's degrees of freedom = 42.2549

Ha: diff < 0                Ha: diff != 0                Ha: diff > 0
Pr(T < t) = 0.4170          Pr(|T| > |t|) = 0.8339          Pr(T > t) = 0.5830
```

```
. ttest EC, by(Y2) welch
```

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	31	243277.6	39034.77	217336.4	163558	322997.3
8	152	253749.9	31935.23	393724	190652.3	316847.5
combined	183	251975.9	27302.78	369345.1	198105.2	305846.6
diff		-10472.31	50433.84		-110847.9	89903.28

```
diff = mean(0) - mean(8)                                t = -0.2076
Ho: diff = 0                                             Welch's degrees of freedom = 79.5331

Ha: diff < 0                Ha: diff != 0                Ha: diff > 0
Pr(T < t) = 0.4180          Pr(|T| > |t|) = 0.8360          Pr(T > t) = 0.5820
```

. ttest EDUC, by(Y2) welch

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	31	2.548387	.1902952	1.059519	2.159752	2.937022
8	152	2.592105	.07774	.9584429	2.438507	2.745704
combined	183	2.584699	.0719539	.973374	2.442728	2.72667
diff		-.0437182	.2055621		-.4587617	.3713253

diff = mean(0) - mean(8) t = -0.2127
Ho: diff = 0 Welch's degrees of freedom = 41.32

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.4163 Pr(|T| > |t|) = 0.8326 Pr(T > t) = 0.5837

. ttest STATUS, by(Y2) welch

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	31	0	0	0	0	0
8	152	.0855263	.0227587	.2805878	.0405597	.1304929
combined	183	.0710383	.0190419	.2575935	.0334671	.1086094
diff		-.0855263	.0227587		-.1304929	-.0405597

diff = mean(0) - mean(8) t = -3.7580
Ho: diff = 0 Welch's degrees of freedom = 151

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0001 Pr(|T| > |t|) = 0.0002 Pr(T > t) = 0.9999

. ttest AVERENT, by(Y2) welch

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	31	472.0925	50.57016	281.5627	368.8145	575.3706
8	152	878.9905	18.40505	226.9127	842.6259	915.3552
combined	183	810.0625	20.80491	281.4437	769.0126	851.1123
diff		-406.898	53.8153		-515.7597	-298.0363

diff = mean(0) - mean(8) t = -7.5610
Ho: diff = 0 Welch's degrees of freedom = 38.8889

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0000 Pr(|T| > |t|) = 0.0000 Pr(T > t) = 1.0000

```
. ttest ACQUAI, by(Y2) welch
```

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	31	.1612903	.0671505	.3738783	.0241507	.29843
8	152	.1710526	.0306436	.3777998	.110507	.2315982
combined	183	.1693989	.0278045	.376133	.1145382	.2242596
diff		-.0097623	.0738121		-.1584927	.1389681

diff = mean(0) - mean(8) t = -0.1323
Ho: diff = 0 Welch's degrees of freedom = 44.2957

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.4477 Pr(|T| > |t|) = 0.8954 Pr(T > t) = 0.5523

```
. ttest AGE, by(Y2) welch
```

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	31	60.64516	2.344313	13.05258	55.85744	65.43289
8	152	56.84868	.7900876	9.740854	55.28763	58.40974
combined	183	57.4918	.7712197	10.43287	55.97012	59.01348
diff		3.796477	2.473872		-1.213473	8.806427

diff = mean(0) - mean(8) t = 1.5346
Ho: diff = 0 Welch's degrees of freedom = 37.5755

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.9334 Pr(|T| > |t|) = 0.1333 Pr(T > t) = 0.0666

Appendix B STATA output t-test of variables of Jinhu County

. ttest NC, by(Y2) welch

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	27	8.133333	1.997463	10.37912	4.02749	12.23918
8	253	3.403241	.4763547	7.576885	2.465098	4.341385
combined	280	3.859357	.4775266	7.990549	2.919345	4.79937
diff		4.730092	2.053478		.5319053	8.928279

diff = mean(0) - mean(8) t = 2.3035
Ho: diff = 0 Welch's degrees of freedom = 29.2643

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.9857 Pr(|T| > |t|) = 0.0285 Pr(T > t) = 0.0143

. ttest EC, by(Y2) welch

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	27	121178	16935.66	88000.29	86366.28	155989.8
8	253	150326	9158.843	145680.3	132288.4	168363.6
combined	280	147515.3	8444.123	141297.2	130893	164137.6
diff		-29147.96	19253.6		-67942.73	9646.816

diff = mean(0) - mean(8) t = -1.5139
Ho: diff = 0 Welch's degrees of freedom = 44.3363

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.0686 Pr(|T| > |t|) = 0.1371 Pr(T > t) = 0.9314

. ttest EDUC, by(Y2) welch

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	27	2.62963	.1700356	.8835309	2.280116	2.979143
8	253	2.537549	.0599178	.9530512	2.419546	2.655553
combined	280	2.546429	.056502	.9454597	2.435204	2.657653
diff		.0920802	.1802838		-.2745739	.4587343

diff = mean(0) - mean(8) t = 0.5108
Ho: diff = 0 Welch's degrees of freedom = 33.3255

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
Pr(T < t) = 0.6936 Pr(|T| > |t|) = 0.6129 Pr(T > t) = 0.3064

. ttest STATUS, by(Y2) welch

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	27	.037037	.037037	.1924501	-.0390937	.1131678
8	253	.0790514	.016997	.2703538	.0455771	.1125256
combined	280	.075	.0157688	.2638629	.043959	.106041
diff		-.0420143	.040751		-.124452	.0404233

diff = mean(0) - mean(8) t = **-1.0310**
 Ho: diff = 0 Welch's degrees of freedom = **38.8362**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = **0.1545** Pr(|T| > |t|) = **0.3089** Pr(T > t) = **0.8455**

. ttest AVERENT, by(Y2) welch

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	27	804.7552	14.48498	75.26618	774.9809	834.5295
8	253	773.1938	3.34808	53.25448	766.6	779.7876
combined	280	776.2372	3.368239	56.36141	769.6068	782.8676
diff		31.56145	14.86689		1.158066	61.96483

diff = mean(0) - mean(8) t = **2.1229**
 Ho: diff = 0 Welch's degrees of freedom = **29.062**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = **0.9788** Pr(|T| > |t|) = **0.0424** Pr(T > t) = **0.0212**

. ttest ACQUAI, by(Y2) welch

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	27	.2962963	.0895512	.4653216	.1122212	.4803714
8	253	.2766798	.0298038	.4740588	.2179835	.3353762
combined	280	.2785714	.0282334	.4724353	.2229939	.334149
diff		.0196165	.0943805		-.1725145	.2117474

diff = mean(0) - mean(8) t = **0.2078**
 Ho: diff = 0 Welch's degrees of freedom = **32.4997**

Ha: diff < 0 Ha: diff != 0 Ha: diff > 0
 Pr(T < t) = **0.5817** Pr(|T| > |t|) = **0.8366** Pr(T > t) = **0.4183**

```
. ttest AGE, by(Y2) welch
```

Two-sample t test with unequal variances

Group	Obs	Mean	Std. Err.	Std. Dev.	[95% Conf. Interval]	
0	27	59.62963	2.287803	11.88777	54.92698	64.33228
8	253	58.28854	.6982894	11.10697	56.91331	59.66376
combined	280	58.41786	.6674929	11.16929	57.1039	59.73182
diff		1.341092	2.391997		-3.534726	6.21691

```
diff = mean(0) - mean(8)                                t = 0.5607
Ho: diff = 0                                             Welch's degrees of freedom = 31.428
```

```
Ha: diff < 0                                Ha: diff != 0                                Ha: diff > 0
Pr(T < t) = 0.7105                        Pr(|T| > |t|) = 0.5790                        Pr(T > t) = 0.2895
```

Appendix C Summary of average rent (AVERENT) in Guanyun and Jinhua County

. sum AVERENT

Variable	Obs	Mean	Std. Dev.	Min	Max
AVERENT	183	810.0625	281.4437	0	1242.781

. sum AVERENT

Variable	Obs	Mean	Std. Dev.	Min	Max
AVERENT	280	776.2372	56.36141	690	895.0833

Appendix D STATA output for four model estimations

Multinomial logistic regression result of relatives & neighbours and various categories of non-relatives & neighbours in Guanyun County

```

Multinomial logistic regression              Number of obs   =       183
                                             LR chi2(21)      =      104.11
                                             Prob > chi2      =       0.0000
Log likelihood = -152.00666                 Pseudo R2       =       0.2551

```

Y1	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
1	(base outcome)					
2						
NC	-.0268798	.091541	-0.29	0.769	-.2062969	.1525373
MEC	-1.957759	1.471516	-1.33	0.183	-4.841877	.9263597
EDUC	-.5130811	.3587171	-1.43	0.153	-1.216154	.1899914
STATUS	17.29253	1732.932	0.01	0.992	-3379.193	3413.778
AVERENT	.0056747	.0016411	3.46	0.001	.0024581	.0088912
ACQUAI	-14.34553	1086.357	-0.01	0.989	-2143.567	2114.876
AGE	-.0781786	.0359771	-2.17	0.030	-.1486924	-.0076648
_cons	1.691769	2.55637	0.66	0.508	-3.318625	6.702162
3						
NC	.0500895	.0637288	0.79	0.432	-.0748167	.1749957
MEC	-2.339398	1.377152	-1.70	0.089	-5.038566	.35977
EDUC	-.2046319	.3060426	-0.67	0.504	-.8044643	.3952005
STATUS	16.45322	1732.932	0.01	0.992	-3380.032	3412.938
AVERENT	.0048852	.001349	3.62	0.000	.0022412	.0075292
ACQUAI	-.0502928	.9503854	-0.05	0.958	-1.913014	1.812428
AGE	-.0079112	.0301574	-0.26	0.793	-.0670187	.0511963
_cons	-2.11013	2.345789	-0.90	0.368	-6.707792	2.487532
7						
NC	.0393091	.0568511	0.69	0.489	-.072117	.1507352
MEC	-1.084105	.5302012	-2.04	0.041	-2.123281	-.0449303
EDUC	-.2838984	.276929	-1.03	0.305	-.8266693	.2588725
STATUS	14.32887	1732.932	0.01	0.993	-3382.156	3410.814
AVERENT	.0076269	.0012809	5.95	0.000	.0051163	.0101375
ACQUAI	1.337379	.7554733	1.77	0.077	-.1433213	2.81808
AGE	-.0413739	.0265944	-1.56	0.120	-.0934979	.0107502
_cons	-1.123242	1.96702	-0.57	0.568	-4.97853	2.732046

Binary logistic regression result of relatives & neighbours and overall non-relatives & neighbours in Guanyun County

note: STATUS != 0 predicts success perfectly
STATUS dropped and 13 obs not used

Iteration 0: log likelihood = -80.740254
Iteration 1: log likelihood = -54.968739
Iteration 2: log likelihood = -51.023148
Iteration 3: log likelihood = -50.90018
Iteration 4: log likelihood = -50.900032
Iteration 5: log likelihood = -50.900032

Logistic regression	Number of obs	=	170
	LR chi2(6)	=	59.68
	Prob > chi2	=	0.0000
Log likelihood = -50.900032	Pseudo R2	=	0.3696

Y2	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
NC	.0375268	.0551117	0.68	0.496	-.0704902	.1455438
MEC	-1.110642	.518928	-2.14	0.032	-2.127723	-.0935622
EDUC	-.2834402	.2613343	-1.08	0.278	-.7956461	.2287656
STATUS	0	(omitted)				
AVERENT	.006603	.0011794	5.60	0.000	.0042915	.0089146
ACQUAI	.7948023	.7110365	1.12	0.264	-.5988037	2.188408
AGE	-.0341897	.0246303	-1.39	0.165	-.0824642	.0140849
_cons	-.2772788	1.837523	-0.15	0.880	-3.878757	3.3242

Multinomial logistic regression	Number of obs	=	181
	LR chi2(35)	=	77.23
	Prob > chi2	=	0.0001
Log likelihood = -236.97189	Pseudo R2	=	0.1401

41

Binary logit regression result of relatives & neighbours and overall non-relatives & neighbours in Jinhu County

Iteration 0: log likelihood = -88.805953
 Iteration 1: log likelihood = -83.162497
 Iteration 2: log likelihood = -81.599887
 Iteration 3: log likelihood = -81.589936
 Iteration 4: log likelihood = -81.589935

Logistic regression	Number of obs	=	280
	LR chi2(7)	=	14.43
	Prob > chi2	=	0.0440
Log likelihood = -81.589935	Pseudo R2	=	0.0813

Y2	Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
NC	-.0439206	.0208287	-2.11	0.035	-.084744	-.0030972
MEC	1.683146	2.000842	0.84	0.400	-2.238432	5.604723
EDUC	-.2339342	.2391432	-0.98	0.328	-.7026463	.2347779
STATUS	1.171031	1.149015	1.02	0.308	-1.080997	3.423058
AVERENT	-.0073215	.0039023	-1.88	0.061	-.0149699	.000327
ACQUAI	-.3549338	.4948118	-0.72	0.473	-1.324747	.6148795
AGE	-.0209609	.0206457	-1.02	0.310	-.0614257	.019504
_cons	9.900567	3.574468	2.77	0.006	2.894737	16.9064