

## ABSTRACT

Title of dissertation:      **ESSAYS ON  
CHINA'S RURAL LAND RENTAL MARKET:  
INSTITUTIONS AND CONTRACT DESIGN**

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China's rural land rental market, a gradually maturing market, is now revolutionizing agriculture in China by facilitating the upgrading of smallholder production to factory farming. I study a mature rural land rental market using survey data I collected in 2014, concentrating on institutions of the market and rental contract design.

Chapter 1 focuses on the relationship between the rural land rental market and China's institutions for rural land and agricultural production in the past 30 years. Chapter 2 is devoted to survey design and data collection, introducing a new survey method that remedies deficiency of existing data and important variables that capture recent developments of the market. Chapter 3 describes the survey data from three perspectives to emphasize recent developments of the market, which includes heterogeneity in transactions (large-scale vs. small-scale) and market structure (modern vs. traditional) and changes in the role the village administration played in the market.

Chapters 4 and 5, with different research focuses, analyze rental contracts as ex-ante responses to ex-post contract violation associated with the primary uncertainty in the

market.

Chapter 4 focuses on a hold-up transaction cost associated with the bargaining over contractual formality, which is caused by rental partners asymmetric preferences over contractual formality. I find that traditional rental transactions that occur only because of social proximity and the involvement of village administration are gradually being eliminated due to high transaction cost. Instead, the renting-in entrepreneurs from outside of the village are encouraged. In addition, I find that the renting-in agents usually lead the bargaining.

Chapter 5 concentrates on the bargaining over two important contractual terms: contractual flexibility and rental payment. My theory shows which equations should be estimated in an empirical test of the bargaining process. I draw two empirical conclusions. First, local entrepreneurs, as the renting-in agents, decrease contractual flexibility and increase rental payment, which promotes agricultural and village development. Second, the rental payment offered to the renting-out agents with long-term non-agricultural employment is higher than that offered to the renting-out agents with short-term or temporary employment, suggesting a potential increase in income inequality within the village.

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by

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## Chapter 1: Institutions Related to China's Rural Land Rental Market

China's rural land rental market was initiated and developed in the context of China's transitional economy. Two institutional features of China's transitional economy distinguish this rural land rental market from those in the rest of the world. First, China has a collective land property rights system (Ho, 2001) with comparatively secure private land use rights, which is different from the incomplete private land property rights systems in some developing countries (Field, 2007) and also different from the perfect private land property rights systems in developed countries. Second, the rural land rental market experiences the lag of law and regulations because the market emerged without the permission of the central government. Hence, the institutions related to the rural land rental market are essential in shaping current market operation and affecting future market development.

The most two important institutions related to the rural land rental market are China's land property rights system and the institutions for agricultural production corresponding to the property rights system. These two types of institutions directly determine the legitimacy of rural land rentals. Thus, any changes in the national policies on rural land and agricultural production indirectly reveal the central government's attitudes towards the rural land rental market. This chapter focuses on the relationship between the

rural land rental market and China's institutions for rural land and agricultural production. I review the historical changes to the two types of institutions in the past 30 years. In addition, I discuss the prospect of the interactions between the rural land rental market and the institutions in the future. Section 1 is devoted to the historical development of China's institutions for rural land and agricultural production, emphasizing the impacts of the institutions on market emergence and market operation. Section 2 concentrates on the prospect of future challenges related to the current institutions for rural land and agricultural production.

## 1.1 Land and Production Institutions and China's Rural Land Rental Market: A Review

In the literature on the Chinese rural economy, the terminology most frequently used to describe China's institutions for rural land and agricultural production is the Household Responsibility System (HRS) (Lin and Yang, 1998; Li, Rozelle and Huang, 2000; Brandt et al., 2002; Cai, 2003; Jia and Kock, 2007; Cao and Wu, 2010). In fact, the formal statement of China's national land and production institution has three parts:<sup>1</sup> (1) the land owned collectively by the village is distributed to each household based on egalitarianism and thus, each household is responsible for its own production on that piece of HRS contracting land (*Jia Ting Lian Chan Cheng Bao*); (2) agricultural production should integrate collective management with individual production (*Tong Fen Jie He*); (3) each rural household is responsible for both the national grain quota and personal livelihood

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<sup>1</sup>This is formally stated in "Decisions to Further Strengthen Agricultural and Rural Development (1991)"

(*Shuang Ceng Jing Ying*). Thus, I summarize the national institutions for rural land and agricultural production in four points. First, rural land is collectively owned by the village commune (Ho, 2001). Second, each household has private land use rights over the HRS contracting land distributed by the village commune. Third, in general, a rural household is the smallest production unit. Fourth, the collective commune could practice collective management in household agricultural production.

The first three points show that there are three types of rights associated with China's rural land: collective property rights, private HRS contracting rights, and private use rights. With collective property rights, it is unclear who the landowners are (Ho, 2001). However, collective property rights are the unshakable principle of China's land property rights system (The State Council, 2016<sup>2</sup>). The HRS contracting rights define rural citizens' rights to claim household farms from their collective communes. So far, there have been two rounds of collective land distribution, executed in 1978-1984 (*Yi Lun Cheng Bao*) and 1995 (*Er Lun Cheng Bao*). The discussion on the HRS contracting rights mainly focuses on their security under a collective property rights system (Liu, Carter and Yao, 1998; Jacoby, Li and Rozelle, 2002; Brandt and Benjamin, 2002). The land use rights refer to the rights to use land in agricultural production. The main debate associated with private land use rights is whether the use rights can be transferred to others. The fourth point in the previous paragraph shows that the national institutions for rural land and agricultural production emphasize the role of collective communes in agricultural production. Thus, supported by collective property rights, the collective communes

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<sup>2</sup>In 2016, the State Council launched the regulations on the separation of the three types of rights in "*The Suggestions on Separating Land Property Rights, HRS Contracting Rights, and Use Rights*"

have decisions rights over land and agricultural production issues, which counterbalances the private HRS contracting rights and land use rights.

Although the current national institutions for land property rights and agricultural production are the most important achievement of the agricultural reform in the early 1980s, the reforms of these three types of rights have never ceased since the foundation of the country in 1949. To facilitate the understanding of the historical changes in the institutions, I summarize the historical development of the institutions for land property rights and production between 1949 and 2016 in Table 1.1, focusing on the three types of rights associated with rural land.

To further distinguish between the changes in the institutions, I discuss the HRS contracting rights and use rights from multiple perspectives. I describe the HRS contracting rights in terms of the recipients of the HRS contracting land (“Household Recipients” in Table 1.1), tenure of the HRS contracting land (“HRS Tenure” in Table 1.1), and whether village administration’s change household farmland in size or location after the HRS land distribution (“Land Adjustment” in Table 1.1). I measure the use rights by whether a family is the smallest production unit (“Household Production”) and whether use rights can be transferred (“Transfer”). In Table 1.1, each type of rights that has been privatized since the corresponding listed year is marked as “Yes,” while each type of rights that has not been privatized is marked as “No.” For each listed year, if a national policy or a law was launched to strengthen privatization, a plus sign “+” is given. In contrast, if a national policy or a law launched in that year weakened privatization, a minus sign “-” is given.



### 1.1.1 Historical Institutions

In general, between 1949 and 2016, China's institutions for rural land and agricultural production can be divided into seven stages (Qian, 2005; Liao, 2008; Liu, 2007; Wang and Zhang, 2011). The collective era started in 1954, which was the year the Socialism Transformation (*She Hui Zhu Yi Gai Zao*) was accomplished. The collective era between 1954 and 1979 fully collectivized the three types of land rights. Consistent with the highly collective land property rights system, agricultural production was organized by a collective working point system, which could not match individual effort with individual reward due to imperfect monitoring (Lin, 1988). Since the agricultural reform in 1978, privatization of land property rights has gradually progressed. In 1982, rural households were legally allowed to claim private HRS contracting rights and land use rights under the HRS system. Compared to collective production, the HRS system improves production efficiency because it rewards individual marginal effort by the value of the individual marginal product rather than by the joint marginal value of a collective working team, which solves the metering problem in the classical literature of producer cooperatives (Alchian and Demsetz, 1972; Porter and Scully, 1987; John P. Bonin and Putterman, 1993).

In the HRS-I period (1980-1984), the private HRS contracting rights and use rights were extremely insecure (Li, Rozello and Brandt, 1998). Although rural households could claim the HRS contracting rights and land use rights to organize household production, the village administration had a prior decision right to make land adjustments for collective purposes or to reflect demographic changes after the HRS land distribution, which

changes land distribution in size or location after signing the HRS contracts. In the HRS-I period, the frequency of minor land adjustment was once every three years (*San Nian Yi Xiao Tiao*) and the frequency of major adjustment was once every five years (*Wu Nian Yi Da Tiao*). Since the HRS was an unprecedented policy experiment in 1978, the HRS tenure was as short as 15 years. Even this short HRS tenure was a result of rounds of tough negotiation between one that side insisted on collective production and one side that supported the HRS (Brandt et al., 2002). In 1982, almost all of the provinces dismissed the collective working point system (Lin, 1992). In the HRS-I period, collective property rights were formally separated from the HRS contracting rights and use rights. However, since land transfers in all possible forms were prohibited, the HRS contracting rights and use rights were bundled together.

In the HRS-II period (1985-1992), the HRS was further expanded. At the end of the HRS-II, the State Council committed to a longer HRS tenure of 30 years for the second round of collective land distribution, which started in 1995. The longer HRS tenure boosted rural citizens' confidence in the HRS, and thus improved agricultural productivity. Although land transfers in all possible forms were still prohibited, a loose rural land rental market was gradually initiated in some developed regions with fast-growing non-agricultural economies (Yao, 2000).

In the Rental-I period (1993-2001), rental transactions were small-scale intra-family land transfers. The World Bank China Living Standard Survey (CLSS) in Hebei and Liaoning Province (1995-1997) showed that more than 93.6% of the rentals were among relatives (Rozelle, 2003). The CLSS further shows that the average rental scale was as small as 2.72 mu, which hardly doubled the production scale before rentals. Furthermore,

the rental transactions were characterized by trivial rental payments and the involvement of the village administration. In the Rental-I period, more than 70% of rental involved almost trivial rental payments in cash or grain (Rozelle, 2003; Ye, Jiang and Feng, 2006). Meanwhile, the CLSS shows that more than 95% of rental transactions were organized by village administrations (Rozelle, 2003).

In the Rental-I period, the renting-out agents with non-agricultural employment participated in the rural land rental market to get rid of their agricultural tax and grain quota. Hence, the rental payment was not comparatively important to the renting-out agents. Since the scales of the rentals were comparatively small, most of the land rented out was not adjacent to the land of the renting-in agents. Thus, without the scale effects, the potential renting-in agents borne more costs from the extra agricultural tax and quota than the benefits obtained from the production on the rented-in land. Hence, hardly being able to pursue profits from agricultural production, the rural households without non-agricultural employment had no economic incentives to voluntarily participate in the rural land rental market as renting-in agents.

The village administration, thus, stepped in and used the collective decision rights over land to ensure the accomplishment of agricultural tax and quota. The village administration redistributed the land of the households that migrated to the urban areas to households that did not. Thus, the early renting-in actions were either a help offered to agents with a close personal relationship or a result of administrative enforcement. The village administration, using land adjustment, accelerated the initiation of the rural land rental market, which had a profound impact on the development of the market. The early literature on China's land property rights argue that land adjustment, which weakens the

security of land use rights, decreases agricultural productivity (Li, Rozello and Brandt, 1998; Jacoby, Li and Rozelle, 2002). In contrast to the early literature, land adjustment in the early stages of the rural land rental market improves agricultural productivity and efficiency of land allocation.

### 1.1.2 Current Institutions

In 2001, the State Council announced that land rentals were to be legalized, marking the start of the Rental-II period (2002-2007). In this period, the private HRS contracting rights and use rights were further protected by the “*National Contracting Law of Cultivated Land (2003)*” and the “*Law of Usufructuary Right (2007)*”, which prohibited any forms of village land adjustment. With the legislative protection of the private HRS contracting rights and use rights, in 2008, the State Council extended the 30-year HRS tenure to a permanent HRS tenure, marking the start of the Rental-III period (2008-present). In 2008, the State Council officially encouraged the development of the rural land rental market. However, this announcement lagged behind the initiation of the rural land rental market by more than 10 years. In the Rental-III period, the central government gradually released new policies to accelerate the development of the rural land rental market. With the release of “*Major Issues of Rural Reform and Development (2008)*”, the central government officially allowed the transfer of private land use rights for the first time. The official permission of the transfer of land use rights indicated that private land use rights were no longer bundled with private HRS contracting rights. Thus, in 2008, the government established an embryonic land property rights system of separated property rights,

HRS contracting rights, and use rights.

The separation of the three types of land rights was further strengthened in “*Opinions on Deepening Rural Reform and Accelerating Agricultural Modernization (2014)*”. “*The Suggestions on Separating Land Property Rights, HRS Contracting Rights, and Use Rights (2016)*” formally established the separation of the three types of rights. In contrast to the national policies of 2008 and 2014, which only allowed for the transfer of land use rights, the national policies launched in 2016 also propose to design a new mechanism distinct from the rural land rental market to facilitate the transfer of HRS contracting rights.

The newly established rural land and agricultural production institutions are consistent with the institutions of the 1930s, showing a common thread in rural land and agricultural production throughout Chinese history (Qian, 1961). In the 1930s, rural land was institutionally divided into two layers: the surface and the subsoil (Fei, 1938; Palmer, 1987; Huang, 1985; Liu, 2007; Peterson, 2012). In the context of the 1930s, owning the surface rights is equivalent to owning the land use rights; owning the subsoil rights is equivalent to owning the land property rights. Fei, in his book *Peasant Life in China-A Field Study of Country Life in the Yangtze Valley*, detailed described China’s land property rights in the 1930s as follows:

The possessor of the subsoil is the title holder of the land. His name will be registered with the government because he pays the taxes on the land. But he may possess only the subsoil without the surface, that is, he has no right to use the land directly for cultivation. Such a person is classed an

absentee landlord. The person possessing both the surface and the subsoil is termed the full owner. The one possessing only the surface without the subsoil is termed tenant. [...] The owner of the surface, whether full owners or tenants, can cultivate the land themselves; this distinguishes them from absentee landlords. They also can lease the land to others, or employ labors to work for them. Thus, we must distinguish between the actual cultivator, the surface owners, and the owner of the subsoil. They maybe the same person and they may be different persons with reference to the same piece of land.

Table 1.2 shows the legal rights associated with each possible identity, as summarized by Fei. Based on Fei's description, only the "full owners," owning both the surface and the subsoil, had perfect private land property rights. The "absentee landlords" and "tenants" possessed either the subsoil or the surface but not both. By translating HRS contracting rights as ownership of the subsoil and land use rights as ownership of the surface, China's current land and production institutions are consistent with the institutions of the 1930s. The rural households in the 2010s that have secure HRS contracting rights and do not participate in the rural land rental market correspond to the "full owners" in the 1930s. The rural households in the 2010s that are rural land rental market participants correspond to the "absentee landlords" in the 1930s because these rural households only have HRS contracting rights (the subsoil) but not land use rights (the surface). The renting-in agents in the 2010s correspond to the "tenants" in the 1930s who have the ownership of the surface but not the subsoil.

What distinguishes the institutions of the 2010s from the institutions of in the 1930s

is the design mechanism. The institutions of the 1930s were designed to facilitate investment in agriculture from the urban economy without interrupting agricultural production. In contrast, the institutions of the 2010s gradually evolved to facilitate labor migration from the rural economy to the urban economy without reducing agricultural production.

## 1.2 Land and Production Institutions and China's Rural Land Rental Market: A Prospect

A key feature of the current institutions for rural land and agricultural production is the separation of the three types of rights, which secures private HRS contracting rights and land use rights. The secure HRS contracting rights encourage rural households to participate in the rural land rental market, and thus, accelerate the development of the rural land rental market (Field, 2007; Deininger, Jin and Xia, 2014). However, due to other transitional institutions, there are two potential problems associated with the current rural land and agricultural production institutions. First, it might be challenging to execute these two national policies at the village level. Second, while the current institutions encourage market participation, they might also create new challenges in rural land rental transactions.

### 1.2.1 New Challenges in Village-Level Execution

Compared to the Rental-II period, the current institutions for rural land and agricultural production strengthen the security of private HRS contracting rights from two perspectives. First, village land adjustment is prohibited. Second, HRS tenure is a perma-

ment tenure. However, other socioeconomic constraints challenge the execution of these two national policies at the village level.

There are two situations in which a village administration has incentives to organize village land adjustment. The first is driven by labor migration. This type of land adjustment seeks to avoid agricultural efficiency loss caused by fallow land and a shortage of agricultural labor. However, this type of land adjustment is gradually replaced by initiated the rural land rental market. The second type of village land adjustment is driven by household demographic changes, which becomes the main driving force of village land adjustment.

*Rural Land Management Law (1998)* allowed village land adjustment if and only if more than two-third of village members agreed on the land adjustment plan. Thus, even before the prohibition on village land adjustment, land adjustment required extra administrative costs because the land adjustment plan could not be easily passed. Households with newborn babies or new daughters-in-law would ask for more land in village land adjustment. However, because the fact that the total acreage of land in a village is fixed, households with no demographic changes might experience a decrease in household farm size, creating strong conflicts of interests among rural households in a village.

In some households, the contradiction between the growing population and the fixed quantity of land greatly reduces household incomes and welfare. As this type of contradiction gradually sharpens in a great proportion of households in the village, it negatively affects village-level agricultural production and social welfare, which creates extra administrative costs in other areas of socioeconomic life. To minimize these administrative costs, the village administration has private incentives to organize village land adjustment



(Rozelle and Li, 1998).

The prohibition on village land adjustment was the premise of issuing a permanent HRS tenure. However, the necessity of village land adjustment in some villages determines that it is challenging to let the majority of the rural households agree on the current land distribution. All the households with potential demographic changes have great incentives to grab more land because the permanent HRS contracts would fully protect the newly distributed. Although the land titles could be used as a baseline in setting the permanent HRS tenure, the quality of the current land titles is too low to support a permanent HRS tenure.

### 1.2.2 New Challenges in Rental Transactions

A secure HRS tenure interacted with a separated urban-rural social structure could create new distortions in the rural land rental market. Established in 1958,<sup>3</sup> China's urban-rural social structure separates the rural economy and the urban economy (Naughton, 2007). Chinese rural citizens, historically categorized by their agricultural *Hukou*, are isolated in agricultural sectors (Cheng and Selden, 1994; Chan and Zhang, 1999). As China has developed rapidly in non-agricultural sectors since the *Reform and Opening Up* (Lin, Cai and Li, 1996), traditional agricultural producers, the rural citizens have gradually migrated to cities (Cai, Park and Zhao, 2008; Kung, 2002), attracted by non-agricultural employment (Zhao, 1999; Zhang and Song, 2003; Deininger, Jin and Xia, 2014).

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<sup>3</sup>China's *Hukou* system was formally established in 1958 based on *Hukou Deng Ji Tiao Li* (Household Registration Regulation).

However, although they accounted for 28% of labor in non-agricultural sectors in 2013 (Yearbook, 2013), rural citizens experience high uncertainty in non-agricultural employment in China's separated urban-rural social structure. The separated social structure isolates rural citizens from the mainstream of the urban economy by keeping them in non-agricultural industries that do not offer long-term employment contracts (Cai, Park and Zhao, 2008). Thus, if the wage rate of a renting-out agent unexpectedly drops below a threshold at which it is optimal to allocate all labor to non-agricultural sectors, a rural citizen has an incentive to reallocate labor back to agriculture by terminating the rental contract before the end of the agreed tenure. Therefore, the renting-in and renting-out agents have asymmetric responses to the potential contract violation because they have different probabilities of requesting termination. The protection of rural households' HRS contracting rights further supports for the renting-out agents' violation requests. If the rental contracts are informal, the renting-out agents with their land titles could violate the rental contracts at a comparatively low violation cost.

In sum, the strengthened HRS contracting rights in a separated urban-rural social structure could cause two potential problems in China's rural land rental market. The first problem is that the security of rental contracts is threatened. The renting-out rural households are more likely to violate contracts under secure HRS contracting rights. The second problem is a worsening of the bargaining conflicts between the renting-in agents and the renting-out agents over the contractual terms related to the security of rural contracts. These two potential problems are caused by China's transitional institutions in other areas of socioeconomic life, which indicates that reforms in the land property right system alone could not further improve efficiency in China's rural land rental market or

agricultural production.

Table 1.1: Historical Development of the Institutions for Rural Land and Agricultural Production

Stage	Year	Property Right	HRS Contracting Right			Use Right		National Policy	Law
			Household Recipients	HRS Tenure	Land Adjustment	Household Production	Transfer		
Private	1949	Yes	NA	NA	No	Yes			
	1950	+					1947: China's Land Law Outline <sup>a</sup> (3.6)	1950: Land Reform Law (30)	
	1951-1953				+			1954: National Constitution (8.1)	
	1954	+							
Collective	1955	No	No	NA	NA	No		1956: Regulations on Advanced Agricultural Production Cooperatives(2)	
	1956	-							
	1957						1958: Resolution on the Establishment of the People's Communes in Rural Areas		
	1958	-	-				1962: Amendment Regulations on Rural People's Communes (People's Commune 60)		
	1959-1961								
	1962				-				
	1963-1976								
	1977								
	1978								
	1979	-	-					1979: Decisions on Accelerating the Development of Agriculture Battle	
HRS I	1980	No	Yes	15 years	Yes	Yes	No		
	1981								
	1982	-	+			+		1982: Minutes of the National Rural Work Conference(2)	
	1983	+	+			+		1983: Current Issues of Rural Economic Policy (3.4)	
HRS II	1984	+	+			+		1984: Announcement of 1984 Rural Work (3.1)	
	1985	No	Yes	15 years	Yes	Yes	No		
	1986	+				+		1986: Land Management Law (2.20)	
	1987							1987: Local Regulations of Compensated Land Use in Shanghai and Shenzhen	
Rental I	1988							1988: National Constitution (10.4)	
	1989-1992								
	1993	No	Yes	30 years	Yes	Yes	No	1993: Several Policies on Current Agricultural and Rural Economic Development (1)	
	1994-1997							1998: Rural Land Management Law (2.14)	
Rental II	1998	-							
	1996-2000							2001: Announcement of Rural Land Transfer of Contract Land	
	2001						+		
	2003	No	Yes	30 years	No	Yes	Yes	2003: National Contracting Law of Cultivated Land (27)	
Rental III	2003-2005	+	+		+			2006: National Contracting Law of Cultivated Land (33)	
	2006							2007: The Law of Usufructuary Right (25, 12.6)	
	2007	+	+		+	+			
2009-2013	2008	No	Yes	permanency	No	Yes	Yes	2008: Major Issues of Rural Reform and Development (3.1)	
	2009	+	+		+				
	2014	+				+		2014: Opinions on Deepening Rural Reform and Accelerating Agricultural Modernization (17)	
	2016	+	+		+			2016: The Suggestions on Separating Land Property Rights, HRS Contracting Rights, and Use Rights	

Yes/No represents whether this type of right belongs to households, +/- represents national policy or law strengthens or weakens this privatization of this type of right

Note: The HRS contracting rights are described in terms of the recipients of the HRS contracting land (“Household Recipients”), tenure of the HRS contracting land (“HRS Tenure”), and institutions for village land adjustment after the HRS land distribution (“Land Adjustment”). The use rights are measured by whether a family is the smallest production unit (“Household Production”) and whether use rights can be transferred (“Transfer”). In Table 1.1, each type of rights that has been privatized since the corresponding listed year is marked as “Yes,” while each type of rights that has not been privatized is marked as “No.” In each listed year, if a national policy or a law was launched to strengthen privatization, a plus sign “+” is given. In contrast, if a national policy or a law launched in that year weakened privatization, a minus sign “-” is given.

Table 1.2: Land Property, Legal Rights, and Obligation (Fei, 1938)

Identity	Legal Right	Reward	Obligation	Implements
Short-term Employee		Daily/Yearly Wage,	Cultivation	No/Yes
Long-term Employee		Food and Shelter	Cultivation	No/Yes
Lessee	Temporary use of the land surface	Produce	Cultivation, rent to lessor	Yes
Tenant	Permanent ownership of the land surface	Produce	Rent to absentee landlord, cultivation	Yes
Absentee Landlord	Ownership of subsoil	Rent from Tenant	Taxes to government	No
Full-Owner	Ownership of land surface and subsoil	Produce	Taxes to government	Yes

Note: This is a table from Fei (1938).

## Chapter 2: Survey and Data Collection

Existing literature on China's rural land rental market mainly focuses on market emergence and the constraints on market participation in the late 1990s and early 2000s (Kung, 2002; Yao, 2000; Zhang, Ma and Xu, 2004; Deininger and Jin, 2005). The data on China's rural land rental transactions used in existing literature are byproducts of rural household surveys conducted between 1995 and 2005.<sup>1</sup> However, as the maturing rural land rental market gradually covers 30% of national farmland and involves the participation of 25.5% of Chinese rural households (MOA, 2015), economic behaviors and decisions after entering the land rental market become more interesting than the decisions on entering the market.

Thus, the existing datasets, though they have a good reputation for selecting rural households (Jalan and Ravallion, 1999), are not the most appropriate for studying economic behaviors and decisions in the maturing land rental market. First, existing datasets cannot provide sufficient information on the critical institutions shaping the market in the 2010s. The institutions that had crucial roles between 1995 and 2005 have become less important in the 2010s as national economic reform has progressed. The security of private land use rights studied in Kung (2002) and Jin and Deininger (2009) was strength-

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<sup>1</sup>There is only one exception. Gao, Huang and Rozelle (2012) provide observations of the market in 2008 in the six most important agricultural provinces.

ened by the 2003 *National Contracting Law of Cultivated Land* (Gao, Huang and Rozelle, 2012). The grain quota studied in Kung (2002) and Zhang, Ma and Xu (2004) was abolished in 2006.<sup>2</sup> As the Central Committee of the Communist Party of China (CCCPC, 2013) recommended,<sup>3</sup> the land rental market is now open to parties from outside of villages, greatly reducing incidence of the village-level outsider exclusion studied by Jin and Deininger (2009).

Second, rural household surveys, sampling from all households regardless of their market status, might not fully represent each local market. In each local land rental market, rural household surveys cannot take the possible heterogeneity in rental transactions into consideration. In the early stages of the market, most rental transactions were small-scale rentals between friends and relatives (Jin and Deininger, 2009). As the market matures, large-scale rentals transacted with outsiders of the village are gradually becoming more common. In addition, market structures may be different across markets due to the heterogeneity in market maturity.<sup>4</sup> Thus, rural household surveys, ignoring the heterogeneity in transactions and market structures, could present an unclear combination of transactions with different attributes from markets with different levels of maturity, making it difficult to estimate causalities.

Hence, the two problems associated with the existing data call for up-to-date data that represents the market and its institutions in the 2010s. In addition, new data collec-

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<sup>2</sup>The grain quota was abolished nationwide along with the abolishment of the *Agricultural Taxation Clause* in 2006.

<sup>3</sup>“Central Committee of the Communist Party of China, Document #1”, a series of suggestions on national economic policies.

<sup>4</sup>Based on Yao (2000) and Kung (2002), Zhejiang Province, with a much higher rate of market participation than other provinces in the late 1990s, had different market structures than the rural land rental markets in other provinces even in the early stages of the market.

tion should directly emphasize rental transactions rather than relying on rural household surveys as the old datasets did. To remedy these deficiencies, I conducted a survey on rental transactions in two mature markets in 2014: Jinghai County in Tianjin Municipality<sup>5</sup> and Feixi County in Anhui Province. By surveying stakeholders in each rural land rental market, namely renting-in agents, renting-out agents, and the village administration, this survey collected information on 332 land rental contracts from 13 villages in five towns.

Using a new survey method, this data has two advantages over existing datasets on China's rural land rental transactions. First, the survey focuses on rental transactions in mature markets, which captures recent developments of the market. Meanwhile, information on mature markets also sheds light on prospective market operation and policy design in less mature markets. Second, the survey represents each local market by sampling from the pool of market participants based on local market structure, which represents more than 50% of land involved in each local rental market, on average.

This chapter has three sections. Section 1 discusses existing datasets and shows the necessity of designing new data collection methods for research on rental transactions. Section 2 introduces the newly designed survey, emphasizing the important variables that capture recent developments of the market but have not been studied by previous literature. Section 3 is devoted to the survey method and data collection.

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<sup>5</sup>A direct-controlled municipality is equivalent to a province but with higher political and economic importance.



## 2.1 Previous Datasets

Most previous datasets are directly derived from rural household surveys conducted before 2010. The data in Kung (2002) was collected in 1999 by China's Ministry of Agriculture in six provinces. Zhang, Ma and Xu (2004) use a survey data collected in Zhejiang Province in 2001. Several datasets are derived from panel rural household surveys. The data in Yao (2000) uses panel data collected in three counties of Zhejiang Province in 1988 and 1993. The data in Deininger and Jin (2005) was collected by China's National Bureau of Statistics in 1997-1999 and 2001 in the three poorest provinces: Guizhou, western Hunan, and Yunnan. The survey in Jin and Deininger (2009) was conducted by China's National Bureau of Statistics in 2002-2004 in the nine most important agricultural provinces. The latest rural household survey used in research on China's rural land rental market was conducted by Gao, Huang and Rozelle (2012) in 2008 in the six provinces selected as representative of China's major agricultural regions.

These rural household surveys selected samples of rural households among all the rural households regardless of their market status, producing appropriate datasets for the study of market participation. However, sampling based only on rural households leads to two potential problems for research on rental transactions in the maturing rural land rental market. The first problem is that these survey exclude market participants that are not rural households. As the 17th Province China Land Property Survey conducted by *Landesa* in 2010 showed, the "big bosses" from outside of the villages are crucial stakeholders in the rural land rental market. However, existing datasets, as byproducts of rural household surveys, could hardly represent any market participants that are not rural

households. Since the outsiders with greater financial strength are more likely to bring new production knowledge and apply mechanization in agricultural production, their role in the rural land rental market and post-rental agricultural production could be different from that of the renting-in agents from rural households. Thus, the surveys that only include the rural households in the rural land rental market might not capture the changes in the demographics of renting-in agents in the maturing rural land rental market.

The second problem associated with a rural household survey is that rental transactions in a local rural land rental market might not be correctly represented. I take the survey data in Jin and Deininger (2009) as an example to show how rural household surveys could misrepresent a local market. In Jin and Deininger (2009), 13.49% of the rural households participated in the rural land rental market as renting-in agents, which is even higher than the percentage of the rural households that participated in the market as renting-out agents. However, due to farm fragmentation in China, it is almost impossible to rent one household farm to multiple renting-in agents. What is possible is that one renting-in agent collects land from multiple renting-out agents. The incorrect representation is caused by the sampling. In Jin and Deininger (2009), on average, only 10 households per village were interviewed, at an average market participation rate of 20%.<sup>6</sup> Thus, on average, the survey included only two market participants per village, either renting-in or renting-out, which is not sufficient to represent a rural land rental market.

The non-representativeness of rural household surveys on rental transactions is exacerbated by heterogeneity in transactions and market structures. As the market matures, large-scale rentals transacted with strangers gradually occur in more developed regions

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<sup>6</sup>The survey method is the same in Deininger and Jin (2005).

with comparatively perfect non-agricultural labor markets, just as the rural land rental market emerged earlier in more developed regions, such as Zhejiang Province and Guangdong Province (Yao, 2000). Large-scale rentals could be different from traditional small-scale rentals among friends and relatives in many ways. In addition, the heterogeneity in transactions further leads to the heterogeneity in market structure, which represents the maturity of a rural land rental market. Rural household surveys, which cannot distinguish different types of transactions and market structures, could present unclear combinations of different types of rental transactions occurring in markets with different market structures, making it difficult to estimate casual relationships.

The status of the existing datasets and the growing research interest in rental transactions jointly create the need for collecting new data on China's rural land rental transactions. The new datasets on rental transactions should represent rental transactions directly by covering all possible stakeholders in the market rather than only focusing on the rural households. Meanwhile, since maturity is a general development trend of the market, investigating the comparatively mature markets not only facilitates the current development of the market but also sheds light on prospective market operations and policy design in less mature markets. Hence, new data collection should focus on rental transactions in mature land rental markets.

## 2.2 Survey Design

In contrast to the existing datasets that only include information on rural households, this survey includes three types of stakeholders in China's rural land rental mar-

ket: the renting-out agents, the renting-in agents, and the village administration. All the renting-out agents are rural households, but the renting-in agents could come from outside the villages. Thus, I design three survey questionnaires: a rental transaction survey for the renting-in and renting-out agents, a rural household survey, and a survey on village institutions. The questionnaires were written in English first and then translated into Chinese. Full questionnaires in Chinese and English are attached in the appendix.

### 2.2.1 Survey on Rental Transactions

All market participants, the renting-in and the renting-out agents, filled in the survey on rental transactions. The survey collected three types of information related to the ongoing or the latest rental transactions associated with each market participant. The first type of information was detailed information on contractual terms. Besides the conventional contractual terms covered by the existing datasets, such as contractual formality, tenure format, tenure length, I added other contractual terms to further distinguish rental transactions from each other. For the questions related to rental payments, the survey included the payment formats, price adjustment provisions, and the delivery time of rental payments.

The second type of information related to the bargaining process over contractual terms, which previous datasets have not included. The survey went through the bargaining process by recording market participants' proposals of contractual terms in the initial negotiation with their rental partners. The information on the bargaining captured individual preferences over contractual terms, which reflects their responses to ex-post contractual

adaptation. The survey recorded the identities of market participants, which affect the bargaining process and rental attributes. The identity of one market participant, mainly the identity of a renting-in agent, was described by the relationship with his/her rental partners, the ownership of enterprises, and the membership in the village.

The third type of information is related to agricultural production before and after rentals. The renting-out agents answered questions about agricultural production before rentals with a focus on the soil quality, agricultural facilities, and commonly grown crops. The renting-in agents answered questions on mainly two aspects of the post-rental production: investment in agricultural facilities and soil conservation and prospective crops. Land smoothing is a frequently seen investment in agricultural facilities and soil conservation. It reduces heterogeneity in soil quality and agricultural facilities caused by independent household production across land collected from multiple renting-out agents, which improves soil quality and agricultural facilities and facilitates post-rental production. The perspective crops were recorded to be compared with the traditional/original crops before rentals. Thus, changes in crops before and after rentals were covered by the survey. Other questions related to post-rental production included capacity for mechanization and the willingness to use outsourcing in production.

By collecting information on contract details, the bargaining process, and agricultural production before and after rentals, this survey on rental transactions could be used for research on contract design in the rural land rental market and to assess the impacts of land rentals on agricultural production and sustainability. In addition, this survey on rental contracts can be used to answer more general questions on contract bargaining and uncertainty in the context of contractual adaptation.

### 2.2.2 Survey on Rural Households

A market participant, a renting-in or a renting-out agent, filled in the survey on rural households if he/she was a member of the village. Three aspects of a rural household are of particular interest. The first aspect relates to a rural household's security of private land use rights. The survey measured the security of private land use rights in two ways. First, it collected information on household land endowment in 1995 and at present, showing changes in land acreage. Second, the survey noted the changes in the visible borders of household farms before and after participating in the rural land rental market. In addition, the survey collected information on location specificity of each surveyed rural household's farm. Due to farmland fragmentation, a village could have multiple pieces of adjacent land in different size. This survey collected information on whether a household farm is along the borders of one adjacent piece of land of the village.

The second aspect is the non-agricultural employment status of a rural household. This survey collected detailed information on the industries of the non-agricultural employment, employment contractual format and length, and non-agricultural income. The third aspect is the rural households' characteristics, including demographic information, education, marriage status, and Hukou status. This survey on rural households also measured rural households' trust in strangers vs. non-strangers in the context of land rental issues.

### 2.2.3 Survey on Village Institutions

The survey on village institutions has two focuses: administrative institutions and socioeconomic institutions. First, the administrative institutions include the village's execution of national policies and its administrative system. The important national policies related to rural society are rural medical insurance, one-child policy (before 2015), and most importantly, the land policy. The most important national land policy was the national prohibition on village land adjustment proclaimed in 2003. Village land adjustment refers to the village administration's decisions on changing household farmland in size or location after the collective land distribution in 1995. Village execution of these policies varied. The survey collected information on village land adjustment between 1995 and 2003 and after 2003. These two variables not only reflect the administrative power and capacity of the village administration but also measure the enforcement of the 2003 national prohibition. The survey assessed the village administration system by the length of the village party secretary's administrative term, kinships among the members of village administrations, and the public services related to land rental issues offered by the village administration. The public services that could be offered included but were not limited to searching for potential outside renting-in agents, delivering free contract templates, being the witnesses for rental agreements, and mediating the disputes related to land rental issues.

Socioeconomic institutions provide information about the economic status of a village. Thus, the variables of interest are related to economic development in agricultural and non-agricultural sectors, labor migration, and village infrastructure. The survey mea-

sured economic development in a village by the contribution of agriculture to village GDP, number of township-village enterprises in the village, and the township GDP ranking of the village. I paid more attention to agricultural development by covering information on the village irrigation system, acres of land for different land uses, and acres of land rented out to the land rental market. Labor migration of a village is measured by the percentage of migrated laborers over total laborers of a village. The survey measured village infrastructure by its residential housing status. A village with a strong collective economy is able to construct a uniformly designed residential area with new sanitation and clean water system, which greatly improves the living conditions of rural citizens.

By collecting information on both the administrative and socioeconomic institutions corresponding to each rural land rental market, the survey on village institutions can be used to study the impacts of village institutions on rental transactions and market structures.

### 2.3 Survey Methods and Data Collection

In light of the heterogeneity in rental transactions and market maturity, I designed a new survey method to represent rental transactions in more mature land rental markets. The new survey method has two steps. The first step controls for market maturity, which determines the selection of villages. The second step selects the sample of rental transactions within each village.



## 2.3.1 Sampling

### 2.3.1.1 Selection of Villages

In the first step of village selection, the regions of interest are those developed non-agricultural economies because they are more likely to have mature rural land rental markets. I selected two developed regions with comparatively perfect non-agricultural labor markets: Jinghai County in Tianjin Municipality and Feixi County in Anhui Province. I selected Jinghai County, an agricultural county that belonged to Hebei Province before 1973, to represent agriculture in the North China Plain, one of the most important commercial field crop production areas. I selected Feixi County, located in the middle of Anhui Province with China's north-south dividing line running through it, to represent the agricultural operations of the north and south across all three types of land terrain.<sup>7</sup> As of 2014, the land rental market in both counties, surrounded by developed non-agricultural economies, had covered more than half of the total farmland endowment, and half of the land rented out was being cultivated by large-scale farms (Li, 2014*a,b*). Thus, from the perspective of market participation rate and post-rental farm size, these two counties are good candidates for the study of fast-growing mature markets.

Within each county, I applied a three-stage cluster sampling based on the administrative system: township, village, and rental transactions. An administrative village is a local rural land rental market. At the national level, more than 25% of rural households

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<sup>7</sup>Anhui Province is located in the middle of China and encompasses all three types of land terrain (plains, hills, and mountains), as well as the production operations of the north (wheat) and the south (paddy rice). Anhui Province is historically the weathervane of national agricultural policies because of its representativeness of Chinese agriculture.

rented their land out in the rural land rental market. Thus, I defined an active local rural land rental market as a local market that covers more than 25% of the land in the village. The county-level officials in Jinghai County and Feixi County each provided a list of towns in that county with active local rural land rental markets. The township leaders of randomly selected towns each provided a list of villages in that town with active local rural land rental markets.

Table 2.1 shows the final selection of villages (see Figure 2.1 for the location of the selected villages). In Jinghai County of Tianjin, I randomly selected two towns from the six towns with active rural land rental markets. Within each selected towns, I randomly selected two villages from 20 active local rural land rental markets. In Feixi county of Anhui Province, I also considered the geographic variation in the three-stage cluster sampling. Feixi County encompasses all three types of land terrain: plains, hills, and mountains. Thus, in Feixi County, I applied stratified sampling based on land terrain along with the three-stage cluster sampling. I randomly selected one town in each geographic stratum was randomly selected from the three towns with active rural land rental markets in that stratum. Within each selected town, I randomly selected three villages from 10 to 30 active local rural land rental markets. Following this sampling procedure, the finally sample comprised 13 villages, located between 13 and 22 miles from the nearest cities, Tianjin and Hefei,<sup>8</sup> respectively, these rural land rental markets are surrounded by similar economic environments, thus, have similar market maturity.

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<sup>8</sup>Hefei is the province capital of Anhui Province

### 2.3.1.2 Selection of Rental Transactions

In each selected village, I selected rental transactions to represent the local rural land rental market. Existing datasets excluded renting-in agents from outside the village and selected rural households regardless of their market participation. In contrast, I applied stratified sampling based on market structure, which greatly improves representativeness of each rural land rental market on rental transactions.

In each local market, all the important renting-in agents with large market shares were surveyed, and the rest of the renting-in agents with comparatively smaller post-rental farms were randomly selected if they jointly occupied a significant proportion of land. This selection method for the renting-in agents has two advantages. First, the survey included renting-in agents regardless of whether they were rural households. Second, the renting-in agents surveyed based on their market share sufficiently represented each land rental market, reflecting the market structure.

In a concentrated market with fewer renting-in agents, the selected renting-in agents jointly occupy a larger proportion of the land involved in the local land rental market. In contrast, in a less concentrated market with many small-scale rentals, the selected renting-in agents jointly occupy a smaller proportion of the land involved in the local rural land rental market. The column “Sum Renting-in Acreage (mu)” in Table 2.1 shows the sum of the land occupied by all the selected renting-in agents in each village. The column “Market Share in the Survey” in Table 2.1 shows the share of land rented-out in each village covered by the survey. On average, the survey covered more than 50% of the land involved in the local land rental market.

The renting-out agents, who are all rural households, were stratified based on their renting-in partners. Each important renting-in agent (or group of renting-in agents) has a pool of renting-out partners. I randomly selected the renting-out agents from each pool in proportion to the corresponding renting-in agent's market share. This method made it possible to pair the renting-out agents with the renting-in agents. Having information on both the renting-in agents and the renting-out agents associated with one rental transaction provides a new and thorough perspective for understanding a rental transaction.

### 2.3.2 Organization of Survey

The survey was conducted as a joint effort of the Agricultural Bureau of Anhui Province and Tianjin Municipality. The provincial officials organized meetings with the township and village leaders, who provided the general information on local rural land rental markets and the lists of towns and villages with active rural land rental markets. The enumerators were undergraduate students in the Department of Rural Development at China Agricultural University. These students were systematically trained to conduct rural household surveys and first-hand data collection in their required undergraduate curriculums. All team members had structured survey experience in rural villages in more than three Chinese provinces.

Before the field survey, I organized a summer session for these selected enumerators, which included a 15-day lecture course on China's rural economy with a focus on China's land property rights and the rural land rental market and a 5-day training session on conducting surveys that immediately preceded the launch of the survey. I designed

the lecture course to help enumerators understand the institutions related to China's rural land rental market and current market operation, which facilitated their understanding of the design of the surveys and their familiarity with the survey objectives. I divided the interviewers into two teams conducted surveys in Feixi County and Jinghai County, covering all the selected villages in the corresponding county in 2-4 weeks. I led the survey teams of both locations.

We conducted the survey in July (Jinghai) and August (Feixi) 2014. In each village, enumerators administered the survey in two steps. The first step was the structured interview about village institutions, with either the party secretary, the chairman of the village administration, or the village accountant. Next, each village administration provided a list of all the renting-in agents in the local rural land rental market and the cohorts of renting-out agents associated with each renting-in agent. In the second step, enumerators started by interviewing the renting-in agents. Then they interviewed the renting-out agents associated with the renting-in agents. The renting-out agents were randomly selected in numbers proportionate to the market shares of the renting-in agents.

### 2.3.3 Data Entry, Checking, and Using in Empirical Analyses

The first round of data entry was done in the last surveyed village of each selected town. Under my supervision, three enumerators were assigned to enter data each selected town. After enumerators finished interviewing all the selected villages in both locations, I reentered the data to compare it with the data entered during the survey. I used a customized program that checked all the logic loops in the questionnaires to detect

errors and inconsistencies. No major problems occurred during the field work. The data should be used in conjunction with the questionnaires. Both the English and the Chinese versions are available in the appendix for surveys on rental transactions, rural households, and village institutions. The Chinese questionnaires contain the exact wording and order of the questions asked in the surveys.

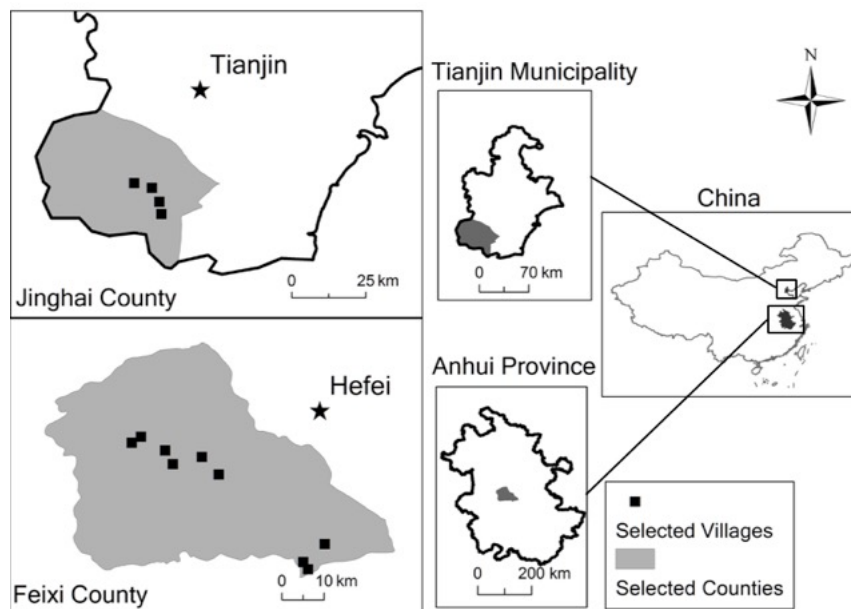
Applying the new survey method, my survey correctly represents each local land rental market and captures recent developments in the rural land rental market. The last column of Table 2.2, “Yang (2014),” show statistics for the variables that are comparable to those included in the data used by Jin and Deininger (2009). My survey shows that 85% of the market participants are renting-out agents, and the number of renting-out agents is more than six times of the number of renting-in agents, which correctly represents the ratio between the renting-in agents and the renting-out agents in China’s rural land rental market.

Meanwhile, as the most up-to-date empirical evidence on China’s rural land rental market, my survey captures recent developments in the market. Compared to the finding in Jin and Deininger (2009) that 30% to 40% of transactions were between relatives, I survey data shows that only 7% of the renting-out agents and 26% of the renting-in agent transact with relatives in the 2010s. The share of formal contracts across all rental transactions increased from less than 10% in Jin and Deininger (2009) to more than 50% in Yang (2014). Similarly, the share of fixed-tenure contracts across all rental transactions increased from less than 30% in Jin and Deininger (2009) to more than 60% in Yang (2014). In sum, the rural land rental market in the 2010s is notable for its openness to strangers, more secure rental tenures, and less flexible rental contracts.

The survey covers 332 rental transactions in 13 villages of 5 towns. These 332 rental transactions are associated with 332 renting-out rural households and 63 renting-in agents. The summary statistics of these 332 rental contracts of selected variables are in Table 2.3. Among the 332 rental transactions, 128 rental transactions have matched information on both the renting-in and renting-out agents. These 128 rental transactions are associated with 128 renting-out agents and 17 renting-in agents.

Chapter 3 concentrates on the heterogeneity in transactions and market structure derived from the difference between the 128 contracts with matched information from both sides and the rest 204 contracts. Data using in the empirical analyses of Chapters 4 and 5 is shown in Table 2.4. Chapter 4, with a focus on the transaction cost associated with inconsistent preferences over contractual terms between a pair of renting-in and renting-out agents, uses the 128 contracts with matched information on both sides. Chapter 5, with a focus on the contract design with multiple contractual terms, uses the full sample of 332 rental contracts.

Figure 2.1: Survey Locations in Tianjin and Anhui



Note: Four villages were selected in Jinghai County, Tianjin. Nine villages were selected in Feixi County, Anhui



Table 2.1: Sample Selection

County	Towns	Selected Towns	Villages	Selected Villages	Sum Renting-in Acreage (mu)	Market Share in the Survey	No. Contracts
Jinghai	2 (6)	Daqiu Zhuang	2(26)	YueJia	2894	100%	55
				JinMei	4727.5	100%	37
		Caigong Zhuang	2(21)	CaiGongZhuang	4100	100%	64
				TuHei	8000	100%	60
		Guanting	3(33)	GuanTing	5	5%	6
				HuiMin	2085	15%	46
		Sanhe	3(26)	ZhangCi	1300	13%	38
				RenNi	484	61%	30
Feixi	1(3)*3		3(12)	QiaoAn	19	12%	17
				MuLan	650	68%	45
		Zipeng	3(12)	XingZhuang	384	23%	14
				Xin Nong	NA	46%	19
				Luo Ba	26	NA	24

Note: The column “Towns” shows the 2 out of 6 towns were randomly selected from Jinghai County and 1 out of 3 towns in each of the three possible land terrain stratum was randomly selected in Feixi County. The column “Villages” shows the number of villages randomly selected from the pool of villages. The number of villages within the pool of a town is in parentheses. The column “Sum Renting-in Acreage (mu)” in Table 2.1 shows the sum of the land occupied by all the selected renting-in agents of each village. The column “Market Share in the Survey” in Table 2.1 shows the share of land rented-out in each village covered by the survey. The column “

Table 2.2: Short Data Summary of Jin and Deininger (2009) and Yang (2014)

	Jin (2001-04) Entire	Jin (2001-04) North&NorthEast	Yang (2014) Entire
<b><i>Household Characteristics</i></b>			
Household size	3.94	3.89	4.63
Head's age	46.52	46.85	57.09
Head with secondary education (%)	52.12	58.98	44.04
Head with high school education (%)	18.3	21.02	10.48
Household land endowment (mu)	6.24	8.41	7.74
<b><i>Rental Participation</i></b>			
Households renting in (%)	13.49	10.72	14.59
Households renting out (%)	9.81	6.15	85.41
<b><i>Renting-out</i></b>			
Renting out to relatives (%)	31.04	55.81	7.24
Share of contracts (all forms) (%)	59.29	22.73	100
Share of contracts, formal (%)	8.63	0.00	53.41
Share of contract, fixed term (%)	26.61	34.09	68.32
If yes, length of term (years)	2.92	1.6	8.97
Share of contract, with price renegotiation (%)			46.3
If yes, length of price renegotiation (years)			1.91
<b><i>Renting-in</i></b>			
Renting in from relatives (%)	39.32	58.59	26.23
Share of contracts (all forms) (%)	59.44	37.84	100
Share of contracts, formal (%)	7.78	18.46	56.45
Share of contract, fixed term (%)	24.15	30.16	66.13
If yes, length of term (years)	2.71	3.82	7.93
Share of contracts, with price renegotiation (%)			41.94
If yes, length of price renegotiation (years)			2.9

Note: Jin and Deininger (2009) use a survey data collected in 2002-2004 in the nine most important agricultural provinces. Yang (2014) is the survey data I collected in 2014 in Anhui and Tianjin.

Table 2.3: Statistics Description

Variable	Definition	Obs.	Mean	S.D
<b>Contractual Terms and Bargaining</b>				
NO. RENT PARTNERS	Number of renting-out partners associated with the same renting-in	52	88.212	188.667
FORMAL	Contractual formality (1=Formal Contract, 0=Informal Contract)	332	0.536	0.499
FIX-TENURE	Tenure format (1=fixed Tenure, 0=Non-fixed Tenure)	332	0.714	0.453
RENTS	Annual rental payment per mu	332	463.527	180.230
DELIVERY	The rental payment delivered time (1=Before Production, 2=Middle of the Growing Season, 3=After Harvest)	328	1.585	0.884
FORMAL PRPS-OUT	The renting-out proposed formality (1=Formal Contract, 0=informal Contract)	332	0.343	0.476
FORMAL PRPS-IN	The renting-in proposed formality (1=Formal Contract, 0=informal Contract)	63	0.714	0.455
<b>The Renting-out's Characteristics</b>				
BORDER	Renting-out's household farmland along the borders of an adjacent piece of land	332	0.494	0.501
GRAIN EX-ANTE	The renting-out's original crops before rentals are grains (1=Grain, 0=Non Grain)	332	0.910	0.287
LONG NON-AGRI	The renting-out has a long agricultural employment contract (1=Long Contract, 0=Short/Temporary Contract)	332	0.584	0.494
TRUST	The renting-outs' trust on non-strangers more than strangers in the context of land rental issues (1=Yes, 0=No)	332	0.229	0.421
<b>The Renting-in's Characteristics</b>				
VEGE POST	The renting-in's production plan is vegetable production (1=Vegetable, 0=Non Vegetable)	63	0.175	0.383
CROP CHANGE	The renting's production plan replace traditional/original crops by new crops (1=Replace, 0=Do Not Replace)	63	0.286	0.455
LDSSMOOTH	Land smoothing in the renting-in's production plan (1=Land Smoothing, 0=No Land Smoothing)	63	0.619	0.490
ENTERPRISE	The renting-in is an entrepreneur (1=Enterprise, 0=Individual)	63	0.286	0.455
NON-STRANGER	The renting-in and renting-out are non-strangers (1=Non-stranger, 0=Strangers)	63	0.651	0.481
<b>Market Institutions</b>				
AGGR VILLAGE TRUST	The fraction of the villagers trust non-strangers more than strangers in the context of land rental issues (leave out)	332	0.221	0.122
DIRCT COMM	The bargaining between the renting-in and renting-out is a direct communication without the involvement of a third party (1=Direct Communication, 0=Third Party)	63	0.635	0.485

Note: Summary statistics of important variables in the full sample of rental transactions.

Table 2.4: Data Using in Empirical Analyses

	Full Sample	Paired Rental Partners
Obs.	332	128
Renting-out	332	128
Renting-in	63	17
Empirical Analyses	Chapter 5	Chapter 4

Note: The empirical analysis of Chapter 4 uses a subset of the full sample with matched information on both the renting-in and agents and the renting-out agents. Chapter 5 uses the full sample of rental contracts in the empirical analysis.

## Chapter 3: Data Description: Transactions, Market Structure, and Village Institutions

Existing datasets on China's rural land rental market capture the emergence of the market in the late 1990s and early 2000s by carefully sampling rural households either nationwide or in the most important agricultural provinces (Jin and Deininger, 2009; Yao, 2000; Zhang, Ma and Xu, 2004). However, because the previous data were collected when transactions and market structure were comparatively homogenous across local rural land rental markets, the heterogeneity in transactions and market structures observed in the 2010s has not been sufficiently discussed. Indeed, the newly observed heterogeneity in transactions and market structures captures recent developments in the gradually maturing market.

In general, in the 2010s, there have been two types of transactions in China's rural land rental market: small-scale rentals and large-scale rentals.<sup>1</sup> The main difference between these two types of transactions is the number of renting-out agents associated with one renting-in agent. In small-scale rentals, one renting-in agent transacts only with one or a few renting-out agents. In contrast, in large-scale rentals, one renting-in agent

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<sup>1</sup>Large-scale and small-scale rentals are relative concepts based on local market structure. A large-scale rental in one village could be smaller in size than a small-scale rental in another village. Thus, large-scale and small-scale rentals are defined within each local land rental market.

transacts with a cohort of renting-out agents, whose household farms are adjacent to each other. The small-scale rentals are comparatively similar to the transactions that occurred in the early stages of the market's development. The large-scale rentals have gradually occurred in areas that have developed rapidly with maturing land rental markets. As of 2014, the maturing land rental market had created more than three million large-scale farms (MOA, 2015).<sup>2</sup>

Post-rental agricultural production could be different in these two types of transactions. Post-rental agricultural production in small-scale rentals might not differ significantly from production before the rentals because the post-rental farms might not be big enough to upgrade production technology. However, in large-scale rentals, the greatly increased scale of production has made mechanized production feasible, which has enhanced the potential for revolutionizing agricultural production in China. The distribution of these two types of transactions in each local market, therefore, determines the market structure. Consistent with the heterogeneity in transactions, there are two types of market structure. A less concentrated market with many small-scale rentals is defined as a traditional market structure. A concentrated market with few large-scale rentals is defined as a modern market structure.

The newly observed heterogeneities in transactions and market structures pose a new question for scholars and policy makers. Assuming the market structure was comparatively homogenous before 2005, what factors drive heterogeneity in transactions and market structures? Answering this question requires detailed information on recent rental transactions and market structures, as well as corresponding information on market and

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<sup>2</sup>Farms greater than 3.3 hectares (50 mu) are defined as large-scale farms.

village institutions. This chapter provides detailed information on transactions and market structures and discusses the role of the village administration in the maturing rural land rental market. Section 1 compares the two types of transactions from four perspectives: contractual terms and bargaining, the renting-out agents' characteristics, the renting-in agents' characteristics, and market institutions. In addition, this section discusses the factors that affect the negotiation cost associated with multiple renting-out agents. Section 2 discusses the role of the village administration in rental transactions. Village land adjustment refers to the village administration's decisions on changing household farmland in size or location after the last HRS land distribution in 1995. Whether village land adjustment existed between 1995-2003 and after 2003 is the most important institutions related to the rural land rental market determined by the village administration. I compare the transactions that occurred in two types of villages: those with land adjustment and those without land adjustment. Section 3 introduces the heterogeneity in market structures and discusses the impacts of village institutions on market structures.

### 3.1 Heterogeneity in Transactions

In previous datasets (Yao, 2000; Deininger and Jin, 2005; Jin and Deininger, 2009; Gao, Huang and Rozelle, 2012), small-scale rentals were surveyed based on the distribution of rural households, regardless of their market participation status. Thus, the likelihood of matching the information of the renting-in agents with their corresponding renting-out agents is low because the renting-out agents associated with the same renting-in agents scattered throughout the village were possibly missed in the random sampling

of rural households. In contrast to the previous survey method, my survey represents each local market by applying stratified sampling based on market structure, along with three-stage cluster sampling based on China's administrative system. In each local market, all the important renting-in agents with large market shares were surveyed and the rest of the renting-in agents with comparatively smaller post-rental farms were randomly selected if they jointly occupied a significant market share. The renting-out agents were stratified based on their renting-in partners. Each important renting-in (or group of renting-in) agent has a cohort of renting-out partners. The renting-out agents were randomly selected from each cohort in proportion to the corresponding renting-in agent's market share.

Thus, this selection approach guarantees that the data represents, on average, more than 50% of the land participated in each local rural land rental market. More important is the fact that this sampling method makes it possible to pair the renting-out agents with their renting-in partners, which is distinct from other datasets on transactions. Most datasets on transactions only include information on one side of the transactions, which means no distinction can be made between the roles on one side of the transaction the roles on the other side (Saussier, 2000; Woodruff, 2002; Whinston, 2003; Gibbon, 2005; Lafontaine and Slade, 2007; Acemoglu et al., 2010). Indeed, by matching the renting-in agents and the renting-out agents, the distinct data structure determined by my survey method distinguishes large-scale rentals from small-scale rentals. Since all the renting-in agents with significant market share in one local market were surveyed, and the renting-out agents associated with these important renting-in agents were randomly selected within each renting-out cohort, the transactions with matched information from both the rental partners are large-scale rentals. In contrast, the transactions with informa-



tion from only one side of a pair of rental partners are small-scale rentals.

Among the 332 rental transactions, 128 renting-out agents, who transacted with 17 renting-in agents, participated in large-scale rentals; the remaining 204 renting-out agents and 46 renting-in agents participated in small-scale rentals. On average, a small-scale rental is associated with 50 renting-out agents, and a large-scale rental is associated with 175 renting-out agents. The average household farm size is 0.4 hectare (6 mu). Thus, the average post-rental production scale of a small-scale rental is 20 hectares (300 mu) and the average post-rental production scale of a large-scale rental is 70 hectares (1050 mu). On average, the post-rental production scale of a large-scale rental is more than three times the production scale of a small-scale rental.

Due to the difference in rental scale, the two types of rentals could be different in other aspects related to transactions and production. In the following subsections, I compare the two types of transactions from four aspects. The first aspect, contractual terms and bargaining, focuses on the key contractual terms in rural land rental contracts. The second aspect is the renting-out agents' characteristics, which describes the renting-out agents in terms of their household agricultural production, non-agricultural employment, and their trust in non-strangers vs. strangers in the context of land rental issues. The third aspect is the renting-in agents' characteristics, which focuses on the renting-in agents' farming capacity and identities. The last aspect is the market institutions of each local land rental market. The comparisons are shown in Table 3.1.

### 3.1.1 Comparisons on Contractual Terms and Bargaining

A rural land rental contract has four important contractual terms. First, the degree of contractual formality (*FORMAL*), formal contracts or informal formal contracts, which measures the legal enforceability of all contractual terms, especially legal enforcement of violation compensation. Among the 332 rental contracts, only 53.6% of the contracts are formal, which shows that the general security of rental contracts is low. Second, is the rental tenure (*FIX-TENURE*), which could be a fixed or non-fixed tenure. 71.4% of the contracts are fixed-tenure contracts. The contractual formality and tenure format jointly reflect the flexibility of a rental contract with respect to the uncertainty of ex-post contract adaptation.

Third, rental payment (*RENTS*) measures the value of land use rights. The average annual rental payment per mu (0.06 hectare) is RMB 463.52 (less than USD 70). The price adjustment provisions are almost homogeneous across contracts. Most contracts set the rental payment in units of rice, and the final payment is the agreed number of units of rice (around 200kg-300kg per mu) times the national purchase price of the year. What varies across contracts is the delivery time of rental payment (*DELIVERY*), which is the fourth important contractual term. The three possible delivery time windows are before production, in the middle of the growing season, and after harvest. 67% of the contracts pay rent before using the land; 6% of the contracts pay rent in the middle of the growing season; the rest of the contracts pay rents after harvest. The later the rental payment is delivered, the higher the risk the renting-out agents bear.

Except for rental payments, the other three contractual terms differ significantly be-

tween large-scale and small-scale rentals. In general, the contracts of 128 large-scale rentals are more secure and less flexible than the contracts of small-scale rentals. A possible reason that large-scale rentals are associated with less flexible contracts is that these rentals correspond to large-scale post-rental agricultural production. The renting-in agents in large-scale post-rental agricultural production may greatly invest ex-ante for post-rental agricultural production. Thus, these renting-in agents bargain hard to get low flexible contracts to prevent potential loss in agricultural production due to ex-post contract adaptation. Meanwhile, these renting-in agent associated with large-scale rentals are more likely to have strong financial strength, which makes it possible to afford rental payment even before production.

Only 49% of small-scale rentals sign formal contracts, while 61% of large-scale rentals have formal contracts. Similarly, the percentage of fixed-tenure contracts is 77% among large-scale rentals, which is 9 percentage points higher than that among small-scale rentals. On average, the renting-out agents in large-scale rentals get their rental payments earlier than the renting-out agents in small-scale rentals. Among the large-scale rentals, 84.3% of the renting-out agents are paid before production and only 14.8% are paid after harvest. Among the small-scale rentals, 57% of the renting-out agents are paid before production and 34% are paid after harvest. Thus, at insignificantly different rental payments, the renting-out agents in small-scale rentals bear more risk than the renting-out agents in large-scale rentals.

The significant differences in contractual terms between large-scale and small-scale rentals are related to the fact that participants' preferences over contractual terms are different between the two types of transactions. My survey captures participants' preferences

over contractual formality by recording their proposed contractual formality (*FORMAL PRPS-OUT/PRPS-IN*), formal or informal, in the initial contract negotiation. The proposed contractual formality represents each agent's response to the trade-off associated with the potential ex-post contract adaptation.

On average, only 34.3% of the renting-out agents proposed formal contracts while 71.4% of the renting-in agents proposed formal contracts. Among the large-scale rentals, 26.6% of the renting-out agents and 88.2% of the renting-in agents proposed formal contracts. Among the small-scale rentals, 39.2% of the renting-out agents and 65.2% of the renting-in agents proposed formal contracts. These statistics shed light on the expected benefit or cost associated with a potential ex-post contract adaptation. First, the renting-in agents in both small-scale and large-scale rentals are more likely to experience an expected net loss in potential ex-post contract adaptation than their renting-out partners, which encourages them to propose more formal contracts to avoid the expected loss associated with ex-post contract adaptation. Second, the renting-in agents in large-scale rentals may experience a greater expected loss associated with the ex-post contract adaptation, which encourages more renting-in agents in large-scale rentals propose formal contracts.

### 3.1.2 Comparisons on the Renting-out Agents' Characteristics

The renting-out agents' characteristics are described from three perspectives: household agricultural production, non-agricultural employment, and the trust in non-strangers vs. strangers in the context of land rental issues. First, the location of household farms and the production before rentals reflect the renting-out agents' household agricultural

production. Around 50% of the renting-out agents' household farms are located along the borders of a large adjacent piece of land (*BORDER*). The percentage of renting-out agents' household farmers along the borders is not significantly different between the two types of transactions. 91% of the renting-out agents were in grain production before rentals (*GRAIN EX-ANTE*). That percentage of *GRAIN EX-ANTE* is significantly higher by 7 percentage points in large-scale rentals than in small-scale rentals. Since grain production is normally practiced in traditional agricultural regions with historically high agricultural favorability, this comparison indicates that traditional agricultural regions develop faster in facilitating large-scale rentals.

Second, 41.6% of the renting-out agents do not have long-term non-agricultural employment contracts (*LONG NON-AGRI*). This statistic suggests why renting-out agents, compared to renting-in agents, have less incentive in proposing formal contracts. The renting-out agents with short-term or temporary non-agricultural employment might experience unanticipated failure in non-agricultural sectors, which induces a potential contract violation requested by the renting-out agents. Thus, with higher uncertainty in ex-post contract adaptation, the renting-out agents have more incentives than the renting-in agents in proposing informal contracts. Among the large-scale rentals, 65.6% of the renting-out agents have *LONG NON-AGRI*, which is 11.7 percentage points higher than that in small-scale rentals.

Third, 22.9% of the renting-in agents trust non-strangers more than strangers on land rental issues (*TRUST*). The percentage of non-stranger trust is significantly higher in small-scale rentals. Among the small-scale rentals, 26.5% of the renting-out agents trust non-strangers more than strangers. Among the large-scale rentals, only 17.2% of the

renting-out agents trust non-strangers more than strangers. This comparison shows that the renting-out agents are easier to organize large-scale rentals with a cohort of renting-out agents who do not trust strangers more than non-strangers in the context of land rental issues, which potentially improves efficiency of the land rental market.

In sum, two factors affect the scale of a rental. The first factor is agricultural profits. Traditional and high profitable agricultural regions in grain production attract large-scale rentals because these renting-in agents are more serious in pursuing agricultural profits. Meanwhile, a secure rental tenure determined by a renting-out agent's non-agricultural employment status also affects post-rental production profits. Thus, large-scale rentals with large-scale post-rental production are associated with the renting-out agents who have long-term non-agricultural employment contracts. The second factor is the negotiation cost of organizing a large-scale rental. A cohort of renting-out agents who trust non-strangers more than strangers in the context of land rental issues is more likely to create a greater joint bargaining power, which increases the negotiation cost borne by the renting-in agents. Thus, a cohort of renting-out agents who do not trust non-strangers more than strangers in the context of land rental issues facilitates the development of large-scale rentals.

### 3.1.3 Comparisons on the Renting-in Agents' Characteristics

The renting-in agents' characteristics are mainly the renting-in farming capacity and their identities. Farming capacity is reflected by their production plan and potential agricultural investment. The two most important types of production are vegetable and

grain production. Among all the renting-in agents, 17.4% of them plan to establish vegetable production after rentals (*VEGE POST*). This statistic shows that grain is the main production in post-rental production, which relieves the concern that the rural land rental market would reduce China's grain production (MLR, 2015<sup>3</sup>). The renting-in agents are more likely to have high farming capacity and financial strength if they plan to replace traditional/original crops with new crops (*CROP CHANGE*) and plan to invest in land smoothing (*LDSMOOTH*), which is a soil conservation investment. 28.6% of the renting-in agents plan to replace traditional/original crops and 61.9% of the renting-in agents plan to invest in land smoothing. These three variables describing the renting-in agents' farming capacity and financial strength are insignificantly different between large-scale and small-scale rentals.

The identity of a renting-in agent is described by whether that renting-in agent is a non-stranger to renting-out agents (*NON STRANGER*) and whether the renting-in agent owns an enterprise (*ENTERPRISE*). Among all the rentals, 65% of the renting-in agents are non-strangers to their corresponding renting-out partners, and 28.6% of the renting-in agents are entrepreneurs. These two variables are insignificantly different between large-scale and small-scale rentals. However, the number of renting-out partners associated with large-scale and small-scale rentals is significantly different as discussed above.

The insignificant differences between the variables related to the renting-in agents' characteristics show that it is not the renting-in agents' characteristics that determine the scale a rental. The fact that the renting-in agents' identity, *ENTERPRISE* and *NON STRANGER*, does not affect the scale of a rental is that enterprises vs. individuals and

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<sup>3</sup>Ministry of Land and Resource of the People's Republic of China

non-strangers vs. strangers experience different types of difficulties in organizing large-scale rentals, which may balance the percentage of *ENTERPRISE* and *NON STRANGER* between small-scale and large-scale rentals. Individuals and non-strangers may not be able to organize a large-scale rentals due to limited access to credit. In contrast, enterprises and strangers, who may have better financial status, may not be familiar with the renting-out agents and the village institutions, which increases the cost of organizing a large-scale rental.

### 3.1.4 Comparisons on Market Institutions

Besides contractual terms and the characteristics of market participants, market institutions are vital in shaping market operations. The two important market institutions are aggregate village-level trust towards non-strangers vs. strangers regarding land rental issues (*AGGR VILLAGE TRUST*) and the negotiation format (*DIRECT COMM*). *AGGR VILLAGE TRUST* is generated by individual trust toward non-strangers on land rental issues using the leave-one-out strategy, which measures the villagers' trust among non-strangers regarding land rental issues. On average, 22.1% of the village inhabitants trust non-strangers more than strangers in the context of land rentals. The aggregate village-level trust between large-scale and small-scale rentals are insignificantly different. The previous subsection shows that individual trust of non-strangers vs. strangers is significantly different between large-scale and small-scale rentals. Thus, the statistics that *AGGR VILLAGE TRUST* is insignificantly different between the two types of transactions indicates that it is each renting-out agent's individual trust in strangers vs. non-strangers



rather than the other villagers' trust in strangers vs. non-strangers that affects the scale of a rental.

There are two possible negotiation formats: direct communication between a pair of rental partners or the involvement of a third party, which is often the village administration. Thus, the involvement of a third party indicates the intervention of the village administration. On average, 63.5% of renting out agents negotiate directly with their renting-in partners. In the early stages of the market, 95% of rental transactions were organized by the village administration (Rozelle, 2003). Thus, the fact that more than half of the transactions in the maturing land rental market in 2014 were organized without the involvement of any third parties shows that the market mechanism has gradually played a more important role in rental transactions than the village administration.

### 3.1.5 Negotiation Cost in Large-Scale Rentals

The biggest challenge in organizing a large-scale rental are the difficulties involved in negotiating with a cohort of renting-out partners. Even in a small-scale rental between one pair of rental partners, there might be a nontrivial negotiation cost due to potentially inconsistent preferences over contractual terms. If the negotiation extends from one renting-in agent with one renting-out agent to one renting-in agent with multiple renting-out agents, it is possible the total negotiation cost is increasing and convex with respect to the number of renting-out partners. Thus, the relationship between the total negotiation cost and the number of renting-out partners is the key in investigating the catalyzers of large-scale rentals. Two factors that influence the total negotiation cost associated with a

cohort of renting-out partners.

The first is the heterogeneity in the renting-out agents' preferences over contractual terms. If all the renting-out partners associated with the same renting-in agent have identical preferences over contractual terms, negotiating with one renting-out partner is no different from negotiating with multiple renting-out partners. Under this circumstance, the total negotiation cost with multiple renting-out partners is almost equal to the negotiation cost associated with one renting-out partner, which indicates that the negotiation has an increasing return to scale. However, the renting-out agents' preferences over contractual terms are heterogeneous across rural households because of their idiosyncratic household characteristics. In an extreme case, if all the renting-out partners have different preferences, and the negotiation cost associated with each of them is identical, the total cost of negotiation would be the product of the negotiation cost associated with one renting-out partner and the number of renting-out partners, which indicates that the total negotiation cost increases proportionally to the scale.

The second factor is whether the renting-out agents interact with each other within a renting-out cohort. If the renting-out partners with different preferences and bargaining powers are isolated, the total negotiation cost is the sum of the negotiation cost associated with each of them. However, if the renting-out partners with different preferences and bargaining powers interact with each other, the renting-in agent has to coordinate with all the renting-out partners because the renting-in's bargaining outcomes with one renting-out partner affect his/her negotiation with other renting-out partners. Indeed, it is very likely that the renting-out agents in the same renting-out cohort interact actively on the land rental issues because of their historically inherited connection in agricultural

production and socioeconomic life. The renting-out agents in the same renting-out cohort are more likely to have land adjacent to each other, which indicates that they are more likely to belong to the same farmer team since the collective production era. Therefore, due to the interaction within a renting-out cohort, the total negotiation cost is the sum of the negotiation cost associated with each renting-out partner plus a coordination cost.

### 3.2 Village Administration and Transactions

In the China Living Standards Survey 1995-1997, the village administration organized 95% of rental transactions (Rozelle, 2003). In the early stages of the market, the village administration actively organized land rentals to complete village-level grain quotas when migrant laborers abandoned the land (Li, 2014*a,b*). Therefore, in the early stages of the market, the village administration played a vital role in establishing the land rental market and facilitating rental transactions. In addition, the village administration represents the collective property rights of land by having decision rights over land related issues (Ho, 2001). Thus, in China's collective land property rights system, it is always necessary to discuss the role of the village administration in rental transactions. Especially, using the survey data collected in 2014, I highlight the role of the village administration in the maturing land rental market, which is different from its historical role.

Since the essence of a rural land rental transaction is transferring land use rights from the renting-out agents to the renting-in agents, the village-level land policies shaped by the village administration should profoundly affect market operation. Among the

village-level land use policies, village land adjustment, which is the village administration's decisions on changing household farmland in size or location after the last HRS land distribution in 1995, greatly reflects the village administration's decision over the trade-off between collective land property rights and private land use rights (Li, Rozello and Brandt, 1998; Brandt et al., 2002; Jacoby, Li and Rozelle, 2002). Although village land adjustment was prohibited by the *2003 National Contracting Law of Cultivated Land*, the institution on land adjustment varies across villages, which is an opportunity to study the impact of village land adjustment on rental transactions. Thus, this section compares transactions in villages with and without land adjustment.

In previous literature, village land adjustment has been described as a hazard of land expropriation, which reduces producers' incentives to investment (Li, Rozello and Brandt, 1998; Jacoby, Li and Rozelle, 2002). However, although the prohibition on village land adjustment strengthens the security of private land use rights, it does not take into consideration that the possibility that prohibiting land adjustment could lead to production inefficiency and social conflicts under comparatively big demographical changes in households. Hence, more recent literature shows that although village land adjustment threatens the security of private land use rights, it could also be the village administration's optimal choice in the face of land abandonment and labor migration, a choice that could improve villagers' welfare and agricultural production (Zhao, 2014).

I update the understanding of village land adjustment in the 2010s from two perspectives. First, in contrast to Zhao (2014), village land adjustment still existed after 2003. Based on the 13 villages I surveyed, the enforcement of prohibiting village land adjustment was weak. In fact, the villages that do not adjust land stopped land adjustment

in 1995, which is not a decision enforced by the 2003 national prohibition. Second, village land adjustment does not necessarily lead to insecure private land use rights. In two surveyed villages, a virtual land property right system was experimented after a complete land smooth that homogenized soil quality and agricultural facilities across households. In a virtual land property right system, a household's farm size is transferred into a land quota, which can be redeemed anywhere in the village without weakening private land use rights. Thus, village land adjustment is an indicator of strong administrative power and capacity.

The four sets of comparisons on rental transactions between transactions in a village with land adjustment and a village without land adjustment are shown in Table 3.2. These comparisons shed light on the role of the village administration in the maturing land rental market. First, consistent with Zhao (2014), I find a similar pattern that a village administration decides to adjust land or not based on local socioeconomic status to improve market efficiency. Second, in contrast to the early stages of the market, the village administration influences the land rental market without directly being involved in rental transactions. The comparisons and two conclusions are discussed further in the following subsections.

### 3.2.1 Comparisons on the Renting-out Agents' Characteristics

In a village with land adjustment, 29.6% of the renting-out agents trust non-strangers more than strangers regarding land rental issues, which is 13.6 percent points higher than that in a village without land adjustment. In addition, the aggregate village trust in a

village with village adjustment is significantly higher than that in a village without land adjustment. Since, the village administration are directly selected from the villagers, an unsatisfactory village administration, which is unable to mitigate intra-community conflicts, could decrease the trust among villagers. Thus, this comparison shows that village land adjustment requires extra administrative effort and high administrative capacity.

In a village with land adjustment, 54.4% of the renting-out agents' household farms are along the borders of a large adjacent piece of land. However, in a village without land adjustment, only 44.2% of the renting-out agents' household farms are along the borders. This comparison shows that farmland in the villages with land adjustment are more fragmented than that in the villages without land adjustment. Thus, it is more likely that the villages with land adjustment are villages with huge household demographic changes and sharp conflicts between a growing population and a fixed quantity of farmland.

In a village with land adjustment, 52.7% of the renting-out agents have long-term non-agricultural employment contracts, which is significantly lower by 11.7 percentage point than that in a village without land adjustment. Rural citizens with uncertain non-agricultural employment might need to switch between agricultural production and non-agricultural employment irregularly, which negatively affects production efficiency and the development of the rural land rental market. Village land adjustment could reduce irregular farmland abandonment and underinvestment in agricultural production, which potentially improves production efficiency and facilitates land rental transactions.

Hence, these three comparisons show that village land adjustment could be endogenously evolved in the villages with high land fragmentation and high uncertainty in non-agricultural employment. Thus, the endogenously selected village land adjust-

ment potentially mitigate production inefficiency caused by migrant labor and farmland fragmentation. In addition, the decision to make land adjustments, driven by local socioeconomic status, are potentially supported by villagers through trust.

### 3.2.2 Comparisons on the Renting-in Agents' Characteristics

All five variables measuring renting-in agents' characteristics are significantly different between the transactions in a village with land adjustment and the transactions in a village without land adjustment. Hence, it is very likely that villages with land adjustment attract certain types of renting-in agents.

In a village with land adjustment, the percentage of *VEGE POST* is 40%, which is significantly higher than that in a village without land adjustment. Meanwhile, a village with land adjustment attracts renting-in agents who plan to replace traditional crops and invest in land smoothing. The renting-in agents in a village with land adjustment are more likely to be strangers but entrepreneurs. The percentage of renting-in agents who are *NON STRANGERS* to the renting-out partners is 44% in a village with land adjustment, which is 25 percentage points lower than the percentage of renting-in agents in a village without land adjustment. In a village with land adjustment, 48% of the renting-in agents are entrepreneurs, which is more than three times the percentage in a village without land adjustment.

Since *ENTERPRISE* and *LDSMOOTH* are indicators of strong financial strength, the villages with land adjustment are attractive to renting-in agents with strong financial strength, which potentially improves agricultural efficiency. Meanwhile, the villages with

land adjustment have more open land rental markets. These open markets attracts outsiders who are more willing to adopt new knowledge in agricultural production. Thus, the villages with land adjustment facilitate the personnel, capital, and information exchanges between the rural and urban economies.

These statistics show that post-rental agricultural production in a village with land adjustment is distinct from a village without land adjustment, which could be associated with the fact that agricultural production before rentals in these two types of villages is different. Since land is more fragmented in villages with land adjustment, households' agricultural profits could be lower in this type of village. Thus, the renting-in agents with local production information, who are less likely to be *ENTERPRISE* and *NON STRANGERS* but only have local production skills (less likely to have *CROP CHANGE*), are less interested in participating in rural land rental markets embedded in villages with land adjustment. Instead, the outside renting-in agents, who either do not have local production information or have new production skills, are more likely to participate in rural land rental markets embedded in villages with land adjustment.

### 3.2.3 Comparison on Contractual Terms and Bargaining

Although the rental scales between transactions in a village with land adjustment and a village without land adjustment do not differ significantly, the contractual terms and the bargaining process are significantly different between the two types of villages.

First, rental contracts in a village with land adjustment are significantly more likely to be formal contracts with higher rental payment. In a village with land adjustment,



58.6% of the rental contracts are formal, which is 10 percentage points higher than that in a village without land adjustment, suggesting that rental contracts are more secure in villages with land adjustment. The average rental payment in a village with land adjustment is RMB 500, which is RMB 72 higher than that in a village without land adjustment, suggesting that the renting-out agents obtain higher rental profits in villages with land adjustment.

Second, both the renting-in and renting-out agents are more likely to propose formal contracts in a village with land adjustment. 42.6% of the renting-out agents in a village with land adjustment proposed formal contracts in the bargaining, which is 1.6 times higher than that in a village without land adjustment. Similarly, under the circumstance that the renting-in agents generally prefer to propose formal contracts, the renting-in agents in a village with land adjustment are still 28 percentage points more likely to propose formal contracts than the renting-in agents in a village without land adjustment.

In villages with land adjustment, higher degree of contractual formality is more favorable to the renting-in agents; while higher rental payment is more favorable to the renting-out agents. A possible explanation is that land adjustment reduces the importance of contractual flexibility placed by the renting-out agents. In a village with land adjustment, it is more likely that a renting-out agent failed in non-agricultural employment could get a new piece of land from the village administration and then restart farming without violating his/her rental contract. Thus, the renting-out agents in villages with land adjustment have an alternative solution other than contract violation when they unexpectedly fail in non-agricultural employment, which reduces the importance of contractual flexibility to the renting-out agents and thus encourages them to propose formal contracts.

Meanwhile, as the renting-out agents place less importance to contractual formality, they place more importance to rental payment, which increases the rental payment.

### 3.2.4 Comparisons on Market Institutions

Although villages with land adjustment have significantly different renting-in agents and rental contracts, these village administrations are not necessarily directly involved in rental transactions. The percentage of rental transactions involving a third party is not significantly different between villages with land adjustment and villages without land adjustment. This comparison shows that the role of the village administration in the maturing land rental market is different from its role in the early stages of the market.

In the early stages of the market, the village administration is directly involved in rental transactions. However, in a maturing land rental market, a village administration with a strong administrative power indirectly influences the selection of the renting-in agents and the bargaining outcomes, without directly being involved in the negotiations between the renting-in and renting-out agents. Compared to the early stages of the market, the new role of the village administration is more efficient in facilitating market operation, promoting agricultural development, and improving village welfare.

## 3.3 Heterogeneity in Market Structures

In most cases, an administrative village is a local rural land rental market. The market structure is determined by the distribution of two types of transactions, small-scale and large-scale transactions. Consistent with the heterogeneity in transactions, there

are two possible market structures: modern and traditional market structures. A modern market is a comparatively concentrated market in which a few large-scale rentals occupy a great share of land; a traditional market is a less concentrated market in which a group of small-scale rentals jointly occupies a great share of land.

Thus, the market structure is measured by the maximum number of rental partners associated with one renting-in agent in one local market. Since the average number of rental partners associated with small-scale rentals is 50, I categorize a market as a modern market (*MODERN*) if the largest-scale rental in that market has more than 50 renting-out partners, which means a modern land rental market has to have at least one rental greater than 20 hectares (300 mu). Table 3.3 reports the maximum number of renting-out partners associated with one rent-in agent in each local market. Based on my criterion, seven villages are classified as traditional markets (*MODERN* = 0) and six villages are classified as modern markets (*MODERN* = 1). The market structure could be affected by the village institutions, the two most important of which are the administrative institutions and socioeconomic institutions. Table 3.3 features the statistics of the selected variables.

The administrative institutions are reflected by the land policy on land adjustment (*LAND ADJUST*) and the length of the village party secretary's administrative term. Normally, villagers elect village party secretary every five years. Thus, being elected village party secretary for more than once (*ADMIN*  $\geq$  10) suggests strong administrative power. A village's economic institutions are described by its economic development, labor migration, and residential housing status. The contribution of agriculture to village GDP (*AGRI GDP*) captures the importance of the agricultural economy in a village. The number of the township-village enterprises in a village (*TVE*) reflects the village's development in a

non-agricultural economy (Jin and Qian, 1998; Jiahua Che, 1998). The more township-village enterprises there are in a village, the more active the non-agricultural economy. Labor migration of a village is measured by the percentage of migrated laborers over total laborers of a village (*MIGRATION*). Residential housing status reflects the financial strength of a village's collective economy. A village with a strong collective economy is able to construct a uniformly designed residential area (*NEW HOUSING*) with new sanitation and a clean water system, which greatly improves the living conditions of rural citizens.

I descriptively analyze *MODERN* by the selected village institutions in a Probit model with provincial fixed-effects, which provides the big picture of the impact of each village institution on market structures. The results of the Probit model on *MODERN* are featured in Table 3.4. Indicating strong administrative power, *LAND ADJUST* and  $ADMIN \geq 10$  are associated with a traditional rural land rental market. Developed local non-agricultural sectors and a strong collective village economy facilitate the development of modern markets. Having a large number of *TVEs* characterizes a modern market. *NEW HOUSING*, indicating a strong collective economy, is more likely to encourage a modern market. In contrast, high importance in agriculture (*AGRI GDP*) is more likely to be associated with a traditional market.

I draw two conclusions from these tentative results. First, consistent with the previous section, strong administrative power does not facilitate the development of modern land rental markets. In contrast, because the technology of large-scale production lags behind in China, a strong village administration might intent to support smaller-scale rentals to avoid the risk of a complete agricultural failure in the village. Second, the villages that

developed faster in the past economic reform, with more township-village enterprises and strong collective village economies, have advantages in organizing modern land rental markets. By improving local non-agricultural labor markets, the comparatively developed villages decrease rural citizens' uncertainty in non-agricultural employment, which encourages market participation (Yao, 2000; Kung, 2002) and reduces the cost associated with large-scale rentals.

### 3.4 Conclusion

Compared to the rural land rental market in the early stage of the market, this market matures from two perspectives in the 2010s. First, large-scale rentals and modern markets gradually occur in fast-developed regions in the 2010s. On the one hand, large-scale rentals and modern markets have potentials in improving agricultural efficiency through mechanization; on the other hand, the negotiation cost between renting-in and renting-out agents created by asymmetric responses to ex-post contract adaptation is a severer problem in large-scale rentals and modern markets. Second, in contrast to the direct village interventions in contract bargaining in the 1990s and 2000s, with high trust among villagers and the necessity of village coordination due to local socioeconomic situations, the village administration in the 2000s indirectly mitigates the conflict on individual responses to ex-post contract adaptation through village land adjustment, which reduces the negotiation cost between a pair of rental partners.

These two maturing perspectives reveal a research question of interest: under the circumstance that the renting-in and renting-out agents respond asymmetrically to ex-

post contract adaptation, how a pair of rental partners bargain over a land rental contract, which reflects their trade-off associated with ex-post contract adaptation (Masten and Saussier, 2000; Corts and Singh, 2004; Lafontaine and Slade, 2013). Chapter 4 and 5 answer this question with different focuses. Chapter 4 focuses on the hold-up transaction cost associated with the renting-in and renting-out agents' asymmetric responses to ex-post contractual adaptation. Chapter 5 concentrates on the important contractual terms in a rural land rental contract and theoretically justifies the empirical strategy that should be used in estimating a bargaining over multiple simultaneously determined contractual terms.

Table 3.1: Comparisons between Large-Scale Rentals and Small-Scale Rentals

	Small-Scale Rentals			Large-Scale Rentals			
	Obs.	Mean	S.E	Obs.	Mean	S.E	
<b>Contractual Terms and Bargaining</b>							
NO. RENT PARTNERS	36	49.583	22.845	16	175.125	64.005	**
FORMAL	204	0.485	0.035	128	0.617	0.043	**
FIX-TENURE	204	0.681	0.033	128	0.766	0.038	*
RENTS	204	459.480	15.088	128	469.977	8.995	
DELIVERY	200	1.765	0.066	128	1.305	0.063	***
FORMAL PRPS-OUT	204	0.392	0.034	128	0.266	0.039	**
FORMAL PRPS-IN	46	0.652	0.071	17	0.882	0.081	*
<b>The Renting-out's Characteristics</b>							
BORDER	204	0.515	0.035	128	0.461	0.044	
GRAIN EX-ANTE	204	0.882	0.023	128	0.953	0.019	**
LONG NON-AGRI	204	0.539	0.035	128	0.656	0.042	**
TRUST	204	0.265	0.031	128	0.172	0.033	**
<b>The Renting-in's Characteristics</b>							
VEGE POST	46	0.196	0.059	17	0.118	0.081	
CROP CHANGE	46	0.304	0.069	17	0.235	0.106	
LDSMOOTH	46	0.609	0.073	17	0.647	0.119	
ENTERPRISE	46	0.304	0.069	17	0.235	0.106	
NON STRANGER	46	0.696	0.069	17	0.529	0.125	
<b>Market Institutions</b>							
AGGR VILLAGE TRUST	204	0.255	0.847	128	0.167	0.909	
DIRCT COMM	46	0.652	0.071	17	0.588	0.123	

Note: Asterisks in the last column shows whether the mean of each variable of larger-scale rentals is significantly different from the mean of that variable of smaller-scale rentals. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table 3.2: Rentals in Villages with and without Land Adjustment

	No Village Adjustment			Village Adjustment			
	Obs.	Mean	S.E	Obs.	Mean	S.E	
<b>Contractual Terms and Bargaining</b>							
NO. RENT PARTNERS	31	81.419	34.881	21	98.238	40.247	
FORMAL	163	0.485	0.039	169	0.586	0.038	*
FIX-TENURE	163	0.718	0.035	169	0.710	0.035	
RENTS	163	425.221	10.123	169	500.473	16.335	***
DELIVERY	162	1.617	0.073	166	1.554	0.065	
FORMAL PRPS-OUT	163	0.258	0.034	169	0.426	0.038	**
FORMAL PRPS-IN	38	0.605	0.080	25	0.880	0.066	**
<b>The Renting-out's Characteristics</b>							
BORDER	163	0.442	0.039	169	0.544	0.038	*
GRAIN EX-ANTE	163	0.914	0.022	169	0.905	0.023	
LONG NON-AGRI	163	0.644	0.038	169	0.527	0.039	**
TRUST	163	0.160	0.09	169	0.296	0.035	**
<b>The Renting-in's Characteristics</b>							
VEGE POST	38	0.026	0.026	25	0.400	0.100	***
CROP CHANGE	38	0.053	0.037	25	0.640	0.098	***
LDSMOOTH	38	0.500	0.082	25	0.800	0.082	**
ENTERPRISE	38	0.158	0.060	25	0.480	0.102	**
NONSTRANGER	38	0.789	0.067	25	0.440	0.101	**
<b>Market Institutions</b>							
AGGR VILLAGE TRUST	163	0.164	0.696	169	0.276	0.958	***
DIRCT COMM	38	0.711	0.075	25	0.520	0.102	

Note: Asterisks in Column 3 shows whether the mean of each variable in villages with land adjustment is significantly different from the mean of that variable in the villages without land adjustment. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$



Table 3.3: Statistics of Village Institutions

VID	VILLAGE	Max. No. Partners	MODERN	LAND ADJUST	NEW HOUSING	ADMIN $\geq$ 10	AGRI GDP	TVE	MIGRATION
1	Guan Ting	550	1	1	0	0	0.3	1	0.3
2	Ren Ni	50	0	0	0	0	0.6	0	0.7
3	Xiang Zhuang	25	0	1	0	0	0.5	0	0.2
4	Hui Min	400	1	1	1	0	0.2	1	0.1
5	Zhang Ci	40	1	1	1	0	0.2	0	0.4
6	Qiao An	5	0	0	0	0	0.2	0	0.9
7	Mu Lan	6	0	0	1	1	0.4	0	0.6
8	Yue Jia	275	1	1	1	1	0.5	1	0.6
9	Jin Mei	35	0	1	1	1	0.4	1	0.2
10	Cai Gong Zhuang	700	1	0	0	1	0.5	1	0.5
11	Tu Hei	500	1	0	0	1	0.2	1	0.3
12	Xiin Nong	14	0	1	0	1	0.8	0	0.4
13	Luo Ba	25	0	1	0	1	0.95	0	0.2
	MEAN		0.46	0.62	0.38	0.54	0.44	0.46	0.42

Note: The market structures determined by the maximum number of renting-out agents associated with one renting-in agent in each local markets. A local market is defined as a traditional market if the maximum number of renting-out partners associated with the one renting-in agent is no greater than 50.

Table 3.4: Modern Market Structure and Village Institutions

VARIABLES	MODERN	Average Marginal Effects
LAND ADJUST	-4.249** (2.031)	-0.707** (0.246)
ADMIN $\geq$ 10	-9.301*** (2.438)	-1.547*** (0.426)
AGRI GDP	-3.038*** (0.812)	-0.505** (0.239)
TVE	10.72*** (0.683)	1.783*** (0.382)
MIGRATION	0.348 (3.800)	0.0579 (0.643)
NEW HOUSING	4.492** (1.897)	0.747** (0.291)
Constant	0.224 (3.897)	
Provincial Fixed-Effects	Y	
Observations	13	
Log likelihood	-3.841	

Note: Robust standard errors clustered at the township level in parentheses \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## Chapter 4: One-Dimensional Contract Design: Degree of Contractual Formality

China's separated urban-rural social represented by its *Hukou* system, was established in 1958<sup>1</sup> separates the rural economy and the urban economy (Naughton, 2007). Chinese rural citizens, historically categorized by their agricultural *Hukou*, are restricted in agricultural sectors (Cheng and Selden, 1994; Chan and Zhang, 1999). As China has developed rapidly in non-agricultural sectors since the *Reform and Opening Up* (Lin, Cai and Li, 1996), traditional agricultural producers, the rural citizens have gradually migrated to cities (Cai, Park and Zhao, 2008; Kung, 2002), attracted by non-agricultural employment (Zhao, 1999; Zhang and Song, 2003; Deininger, Jin and Xia, 2014). The migration of rural citizens has induced cropland abandonment nationwide since the 1990s (Yan et al., 2016).

China's rural land rental market, established in the late 1990s (Liu, Carter and Yao, 1998; Brandt et al., 2002; Kung, 2002; Zhang, Ma and Xu, 2004), offers a solution to cropland abandonment. This market replaces traditional agricultural producers with renting-in agents who voluntarily choose agriculture for the pursuit of profit. By the end of 2014, 25.5% of Chinese rural households had participated in the rural land rental market, result-

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<sup>1</sup>China's *Hukou* system was formally established in 1958 based on *Hukou Deng Ji Tiao Li* (Household Registration Regulation).

ing in a market that occupies 30.4% of national farmland (China Ministry of Agriculture (MOA), 2015). Meanwhile, as of 2014, the rural land rental market had created more than three million large-scale farms (MOA, 2015). Thus, this market is revolutionizing agriculture by upgrading smallholder production to factory farming, which greatly improves agricultural productivity. Jin and Deininger (2009) show that the rural land rental market improves agricultural productivity by 60%.

While the previous literature concludes that the rural land rental market improves agricultural productivity, it also asserts that a nontrivial transaction cost in China's rural land rental market prevents it from attaining its full potential in improving agricultural productivity (Deininger and Jin, 2005; Jin and Deininger, 2009; Kimura, Otsuka and Rozelle, 2011). However, previous literature has only studied the transaction cost theoretically, as a fixed cost (Deininger and Jin, 2005; Jin and Deininger, 2009; Kimura, Otsuka and Rozelle, 2011). Thus, from both empirical and theoretical perspectives, the transaction cost in the rural land rental market requires further study. First, similar to the challenges of measuring transaction cost in other contexts (Wang, 2007; Masten and Saussier, 2000; Chiappori and Salanie, 2003a; Murrell and Paun, 2010), transaction cost in China's rural land rental market is not empirically measured, so it is unclear how much it affects the efficiency of the market. Second, it is theoretically ambiguous which and how institutional characteristics induce the transaction cost.<sup>2</sup>

Focusing on the transaction cost associated with the ex-post contract adaptation

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<sup>2</sup>Existing literature argues that the fixed transaction cost could be associated with imperfect property rights, information searching, contract negotiation, restriction to outsiders, or imperfect non-agricultural labor markets (Deininger and Jin, 2005; Jin and Deininger, 2009; Kimura, Otsuka and Rozelle, 2011). However, it is unclear how each of these factors creates transaction cost; furthermore, imperfect property rights and restriction to outsiders are no longer obstacles in the rural land rental market (Gao, Huang and Rozelle, 2012).

that leads to the most consequential efficiency loss, I fill these theoretical and empirical gaps in the literature. In China's rural land rental market, the most consequential contract adaptation, contract violation requested by the renting-out agents, is caused by China's rural separated urban-rural social structure. Facing this institutionally induced uncertainty, rental partners bargain over the degree of contractual formality, and therefore the legal enforcement of violation compensation, which reflects the security of land rental contracts. As the rural land rental market gradually replaces rural citizens with renting-in agents in agricultural production, the security of land rental contracts replaces the importance of the security of private land use rights<sup>3</sup> in affecting agricultural production and operation (Feder and Feeny, 1991; Besley, 1995; Li, Rozello and Brandt, 1998; Deininger and Feder, 2001).

However, the low degree of contractual formality, which threatens the security of rental contracts, has become a latent danger to China's future agricultural development. Only 8.63% of the land rental contracts studied by Jin and Deininger (2009) for the period 2002-2004 were formal contracts. Since 2006,<sup>4</sup> the bureaucratic system has put effort into providing public services to promote formal land rental contracts, such as offering contract templates and notarization, which has greatly reduced the cost of writing formal contracts. However, even with regulations, only 67.8% of rental contracts nationwide in 2015 were formal contracts (Zhang, 2016). Thus, understanding the transaction cost of bargaining and the bargaining mechanism for the degree of contractual formality is essential in finding policies to improve the security of rental contracts, which further

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<sup>3</sup>Private land use rights in China's collective land property rights system are almost equivalent to private land property rights in the other private property rights systems (Ho, 2001).

<sup>4</sup>In 2006, agricultural tax and quota were abolished nationwide, marking the government's intention to support agriculture, promote rural economy, and help rural citizens.

facilitates agricultural development.

From a theoretical perspective, I study how China's separated urban-rural social structure creates the transaction cost associated with the bargaining over the degree of contractual formality. My theory shows that a pair of rental partners could have inconsistent preferences over the degree of contractual formality because of their asymmetric responses to the institutionally induced uncertainty of contract violation. That difference between the preferred degrees of contractual formality creates a transaction cost of bargaining. I further identify the factors that affect individual preferences over the degree of contractual formality, and thus, affect the transaction cost of bargaining.

From an empirical perspective, following the lesson of my theoretical framework, I examine the bargaining mechanism for the final degree of contractual formality given individual preferences over the contractual term and measure the transaction cost associated with the bargaining. Past empirical literature on contract design hardly ever test the bargaining process (Joskow, 1987; Crocker and Masten, 1988; Lyons, 1994; Saussier, 2000). Instead, the existing literature skips the bargaining process and relies on the general transactional attributes or information from one side of a transaction to explain contract design because the information on both sides of a transaction is rarely matched in the contexts previously studied. Using general transactional attributes or information on only one side of a transaction could not show the importance of agents on contract design or ignore the differences in preferences over contractual design between a pair or rental partners. In addition, since the transactional partners could be endogenously matched in previously studied contexts, using information on both sides of a transaction might introduce a matching endogeneity in a causal analysis (Lafontaine, 1992).

In contrast to the existing empirical studies, I collected the data on paired individual preferences over the degree of contractual formality, which is distinct from other datasets on transactions. Most datasets on transactions only include information on one side of the transactions, which means no distinction can be made between the roles on one side of the transaction and the roles on the other side (Saussier, 2000; Woodruff, 2002; Whinston, 2003; Gibbon, 2005; Lafontaine and Slade, 2007; Acemoglu et al., 2010). Taking advantage of the facts that the rural land rental market is a comparatively simple market and rental partners are not endogenously matched due to historically determined land location, in my survey, I measured individual preferences over contractual formality by the degree of formality proposed by each agent to his/her rental partner in the initial contract negotiation. In addition, because existing datasets on China's rural land transactions (Jin and Deininger, 2009; Deininger and Jin, 2005; Gao, Huang and Rozelle, 2012) are rural household surveys, there is a low rate of information matching between renting-in and renting-out agents. My 2014 survey greatly improves the matching rate between rental partners by sampling based on local market structure rather than based on rural households.

Applying survey data that pairs agents' proposed degrees of contractual formality with those of their rental partners, I measure the transaction cost associated with the bargaining. Consistent with my theory, I show that uncertainty in non-agricultural employment increases the transaction cost associated with the bargaining. This result suggests that unifying the urban and the rural economies, which reduces uncertainty in non-agricultural employment, could accelerate the development of the market. Furthermore, I capture the growth of the maturing market. I find that, although in the early stages

of the market, social proximity and the involvement of village administration facilitated transactions (Rozelle, 2003), these types of transactions are being gradually eliminated due to high transaction cost. Instead, capable renting-in entrepreneurs from outside of the village are encouraged in the maturing market.

In addition to measuring the transaction cost, I also examine the bargaining mechanism for the final degree of contractual formality. I find that the bargaining is usually led by the renting-in agents. The renting-in's proposal of a high degree of contractual formality significantly increases the degree of contractual formality and the renting-in agents are sensitive to the changes in the cost of compromising. Although the renting-out agents are comparatively disadvantaged in the bargaining, their preferences over the degree of contractual formality are further protected by the social proximity among non-strangers fostered in the village in the bargaining. The renting-in agents' preferences are further protected by their financial strength but are weakened by the new production technology.

The remainder of the paper is organized as follows. Section 1 introduces the feature of China's rural land rental contracts. Section 2 solves for individual optimal formalities and identifies the exogenous parameters that affect the individual preferences over contractual formality. Section 3 introduces the survey data, empirical measurements or proxies for the exogenous parameters, and the hypotheses associated with these selected exogenous variables. Section 4 is the empirical section corresponding to Section 2; it shows how exogenous parameters affect individual preferences over contractual formality. Section 5 measures the transaction cost associated with the bargaining and discusses the three key aspects of a rental transaction that affect the transaction cost. Section 6 examines the bargaining mechanism for the final degree of contractual formality. Section 7



concludes by discussing the policy implications for China.

## 4.1 Introduction

The security of China's rural land rental contracts is threatened by the separated urban-rural social structure. On the one hand, the huge income gap created by this social structure<sup>5</sup> encourages rural citizens to move to non-agricultural sectors in the urban economy. As of 2013, rural citizens accounted for 28% of labor in non-agricultural sectors (Yearbook, 2013). On the other hand, this social structure isolates the rural citizens from the mainstream of the urban economy by keeping them in non-agricultural industries that do not offer long-term employment contracts (Cai, Park and Zhao, 2008). Thus, the separated urban-rural social structure provides rural citizens with the incentives to rent land out and take up non-agricultural employment but also with an institutionally induced uncertainty about their non-agricultural employment.

The renting-out agents' uncertainty about their non-agricultural employment affects the security of land rental contracts. If the wage rate of a renting-out agent unexpectedly drops below a threshold at which it is optimal to allocate all labor to non-agricultural sectors, a rural citizen has an incentive to reallocate labor back to agriculture before the end of the agreed tenure. This incentive to violate the land rental contract is further encouraged by the separated social structure: an unemployed renting-out agent who cannot access the urban social welfare system cannot survive in the urban economy on only the income of less than 5000 RMB per year from a land rental. Violating the rental contract is almost the

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<sup>5</sup>The disposable personal income per capita of an urban household was three times of that of a rural household in 2013 (Yearbook, 2013)

only recourse for a renting-out who is disappointed in the urban economy. Meanwhile, the rural citizens are regarded as disadvantaged due to the huge income gap between rural and urban households<sup>6</sup> created by the separated social structure. To prevent the unemployed renting-out from losing his/her livelihood, the local governments acquiesce to the renting-out's contract violation at a low compensation by taking over dispute mediation of the market. Thus, the renting-outs incentives of contract violation is further encouraged because the local government reduces the renting-out's cost of contract violation.

Production efficiency loss associated with the renting-out's contract violation is particularly serious in China because the area of farmland per capita is extremely low (Yearbook, Annual). Large-scale farming on rented land, which is more profitable due to the scale of economy, is only possible using individual pieces from multiple renting-out partners. Termination of a contract on a piece of land in the middle of rented land could make mechanical farming on other pieces of that land infeasible, creating a negative externality from location specificity that leads to efficiency loss on other pieces of land. Thus, the potential contract violation, which affects the security of land rental contracts, prevents the rural land rental market from attaining its full potential in improving agricultural productivity.

The security of land rental contracts is reflected by the degree of contractual formality, which is measured by the strength of the legal enforcement of violation compensation. Renting-in agents pay rental payments to renting-out agents for land use rights, and renting-out agents who violate contracts pay violation compensation to their renting-in

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<sup>6</sup>The disposable personal income per capita of an urban household was three times of that of a rural household in 2013 (Yearbook, 2013).

partners. A higher degree of contractual formality indicates stronger legal enforcement of violation compensation. Thus, a rental contract with a lower degree of contractual formality is less secure because the renting-in agent's agricultural production could be interrupted due to the unexpected contract violation and he/she may not be well compensated by the renting-out violator. In contrast, the security of a rental contract with a higher degree of contractual formality is better protected because higher contractual formality either reduces the possibility of contract violation or better enforces the payment of compensation by the renting-out violators to the renting-in agents.

Although agricultural production has its own uncertainties, the most consequential and frequently seen ex-post contract adaptation in this market is contract violation caused by the renting-out's uncertainty in non-agricultural employment.<sup>7</sup> Assuming that the renting-out's uncertainty in non-agricultural employment is the only uncertainty in the market, only the renting-out agents have incentives to request ex-post adaptation; the renting-in agents have no such incentives. Therefore, the renting-out and the renting-in respond to this institutionally induced uncertainty asymmetrically.

The asymmetric responses to uncertainty are captured by the bargaining over the degree of contractual formality. Each agent first balances his/her individual trade-off between the cost and benefit associated with contractual formality to solve for individual optimal formalities. However, the renting-in and renting-out agents have opposite preferences over contractual formality; a benefit associated with contractual formality to one agent is his/her rental partner's cost. With the revealed individual preferences over con-

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<sup>7</sup>Contract adaptation caused by uncertainty in agriculture is rarely seen in real practice because the rents are comparatively low so that the renting-in are able to pay for the rents even in agricultural failure.

tractual formality, each agent then bargains cooperatively with his/her rental partners to determine the final degree of contractual formality.

The bargaining over the degree of contractual formality in China's rural land rental market could provide general lessons for the empirical literature on contract design. First, in this market, the two sides respond asymmetrically to one primary uncertainty. Thus, this market sheds light on the impact of uncertainty on contractual terms in more general cases in which one side has comparatively more incentive to request ex-post adaptation with respect to a certain type of uncertainty. Second, this market provides an advantage in studying the heterogeneity in preferences over uncertainty in contracting. Each renting-in agent first chooses an adjacent piece of land based on his/her agricultural production plan and then negotiates with the rural households owning the use rights to that piece of land. Thus, the renting-in and renting-out agents are not matched endogenously based on their characteristics but matched exogenously based on farm distribution shaped by the first collective land distribution in the late 1970s (Ho, 2001). Therefore, it is possible to study the impacts of heterogeneous preferences over uncertainty on contract design without amplifying the problem of endogenous matching (Lafontaine, 1992).

## 4.2 Theoretical Considerations

### 4.2.1 Individual Preferences over Contractual Formality

Two parties ( $\{m, n\} \in \{in, o\}$ ) bargain over a rental contract. A renting-out agent (superscripted by  $o$ ) has land endowment  $L$ , which was distributed in 1995 by the collective community. Without loss of generality, I assume that a renting-out agent either rents

out all land endowment or does not enter the market. A renting-out agent rents out all land endowment  $L$  if his/her expected annual non-agricultural wage rate ( $w_e$ ) is greater than the annual profit of labor from agricultural production ( $w_a^o(L)$ ).  $w_a^o(L)$  is increasing and concave in  $L$ .

The renting-out agents' decision sequence is the following. In the first step, if the expected wage rate  $w_e > w_a^o(L)$ , the rural citizen decides to enter the rural land rental market as a renting-out agent and signs a two-year rental contract at contractual formality  $C$  with a renting-in agent. Contractual formality ( $C$ ) is ranged between  $\underline{C}$  and  $\bar{C}$ . After signing the two-year rental contract, the annual rental payment  $B(.)L$ , which is the annual rents ( $B(.)$ ) times the renting-out agent's land endowment, is prepaid to the renting-out agent. I assume that  $w_a^o(L) \leq B(.)L$  because the rental payment only reflects the value of land in agricultural production.

However, the actual wage of the first year  $w_1$  revealed at the end of the first year could be different from  $w_e$ . Thus, at the end of the first year, which is the second step, the renting-out agent has two options: violating the rental contract or stay with the rental contract. If the renting-out agent violates the rental contract, he/she pays the renting-in agent the violation compensation ( $N$ ) based on the strength of the legal enforcement of the contract ( $E(C)$ ). The strength of the legal enforcement ( $E(C)$ ), which could be interpreted as a probability of implementation, a scale between 0 and 1, is increasing and concave in its contractual formality  $C$ . The violation compensation  $N$  is determined exogenously by village institutions. As contractual formality ( $C$ ) increases, the actually paid rental violation compensation ( $E(C)N$ ) increases. Meanwhile, by violating the rental contract, the renting-out agent could restart household production, expectedly obtaining

$w_a^o(L)$  in agricultural production, and experiences an extra cost of switching between non-agricultural and agricultural sectors ( $\delta$ ). If the contract is not violated, the rental payment  $B(\cdot)L$  is delivered to the renting-out agent and the renting-out agent obtains the non-agricultural income of the second year ( $w_2$ ). To simplify mathematics, I assume that  $w_2 = w_1$ .

Thus, the decision of contract violation is made based on the expected cost and benefit associated with contract violation. Based on the theoretical setup, the expected benefit of contract violation is  $w_a^o(L) - E(C)N - \delta$ . The expected cost of contract violation is  $B(\cdot)L + w_1$  because  $w_1$  is assumed to be a perfect predictor of  $w_2$ . Hence, the renting-out agent violates the rental contract if  $w_a^o(L) - B(\cdot)L - E(C)N - \delta - w_1 > 0$ . The probability that  $w_a(L) - B(\cdot)L - E(C)N - \delta - w_1 \leq 0$  is defined as  $\rho$ , where  $w_a^o(L) - B(\cdot)L - E(C)N - \delta - w_1$  is denoted as  $K^o$ . Hence, for a renting-out agent, his/her violation probability is  $1 - \rho(K^o)$ .<sup>8</sup>

Each renting-out agent's expected net gain from contract violation could be positive or negative. In addition, in the theoretical setting that only the renting-out agents would request contract violation, a part of a renting-out agent's cost (benefit) of contract violation is also a part of the corresponding renting-in agents' benefit (cost) associated with contract violation. Thus,  $\rho(K^o)$  could be associated with a cost function or a benefit function across agents, which indicates that  $\rho(K^o)$  should be either convex or concave with respect to  $^o$  across agents. To simplify mathematics in comparative statics, I assume that  $\rho(K^o)$  is linear in  $K^o$ , which indicates that  $\rho(K^o)$  is both concave and convex in  $K^o$

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<sup>8</sup>This setup could cover the situation that the renting-out agents perfectly predict their actual non-agricultural income  $w_1$  from  $w_e$ . If  $w_1 \geq w_e$ ,  $\rho = 1$ .

This two-year fixed tenure model could be extended to a two-period model without changing the theoretical results. In the first period, the renting-out agents participate in the rural land market without perfect predictions of their non-agricultural wage rates. In the second period, the actual wage rates are revealed and the renting-out agents could decide on violating the rental contracts or not based on the actual wage rates.

A renting-in agent (superscripted by *in*) plans to rent in  $\bar{L}$  units of adjacent land and  $\bar{L} \geq L$ . The  $\bar{L}$  units of adjacent land are collected from multiple renting-out partners. A renting-in agent's profit of agricultural production ( $w_a^{in}(\bar{L})$ ) is increasing and concave in  $\bar{L}$ . If a renting-out agent with land endowment  $L$  violates the contract the end of the first year, the renting-in agents' agricultural profit of the second year is  $w_a^{in}(\bar{L} - L)$ . The annual rental payment offered by a renting-in agent to one renting-out partner is the product of the renting-out partner's household farm size  $L$  and the annual rent per unit of land  $B(\bar{L})$ , which is concave and increasing in  $\bar{L}$ . Similar to the security of land property right, the security of rental presented by higher degree of contractual formality could positively affect  $w_a^{in}(\cdot)$  and  $B(\cdot)$  (Besley, 1995). However, due to a comparatively low violation compensation,<sup>9</sup> the renting-in agents have great incentives to avoid low degree of contractual formality even ignoring the positive affects of  $C$  on  $w_a^{in}(\cdot)$  and  $B(\cdot)$ . Thus, assuming that  $w_a^{in}(\cdot)$  and  $B(\cdot)$  are exogenous to  $C$ , which simplifies the mathematics, would not affect the theoretical analysis.

There is a cost of writing a formal contract (Hart and Moore, 1988), which is defined as a function ( $G(\cdot)$ ) of contract formality ( $C$ ) and the support obtained from the village

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<sup>9</sup>The local governments protect the renting-out agents' benefits by institutionally setting low violation compensation.

administration ( $V^m$ ).  $G(C;V^m)$  is increasing and convex in  $C$ . The support obtained from the village administration could be different between a pair of rental partners ( $V^{in} \neq V^o$ ). As support from the village administration increases, such as receiving free contract templates, the marginal cost of writing a formal contract decreases ( $G_{CV^m} < 0$ ). Public services provided by the village administration are important to both the renting-in and renting-out agents.

#### 4.2.2 Individual Optimal Contractual Formality

I make ASSUMPTION 1 to ensure that bargaining over contractual formality does not affect the decision on market participation. The expected individual rental profit, affected by the degree of contractual formality ( $C$ ), is denoted as  $H^m(\cdot)$ .

ASSUMPTION 1: All potential renting-out agents satisfy the following two conditions:

$$H^o(\cdot) > 2w_a^o(L) \forall C$$

$$H^{in}(\cdot) > 2w_a^{in}(\bar{L} - L) \forall C$$

The renting-in and renting-out agents' decisions on market participation are not affected by the bargaining over contractual formality if the rental profits at any possible  $C$  are greater than the reservation incomes of the renting-in and renting-out. A renting-in agent's reservation income is a two-year profit in agricultural production excluding the  $L$  units of land belonging to the corresponding renting-out partner, which is  $2w_a^{in}(\bar{L} - L)$ . If a renting-out agent cannot reach an agreement with the renting-in, the renting-out



could keep farming, move to non-agricultural sectors, or partially work in both sectors. I assume that a renting-out agent stays in agriculture if an agreement is not reached.<sup>10</sup> Thus, a renting-out agent's reservation income is a two-year household agricultural profit ( $2w_a^o(L)$ ). Thus, ASSUMPTION 1 rules out the possibility that the profits of rental transactions at final contract formality are lower than the reservation incomes.<sup>11</sup>

#### 4.2.2.1 The Renting-Out's Optimal Contractual Formality

A renting-out agent's individual optimal formality maximizes the renting-out's expected profit of a two-year rental contract ( $H^o(\cdot)$ ). The renting-out's expected profit of a rental contract  $H^o(\cdot)$  includes the pre-paid first-year rental payment ( $B(\bar{L})L$ ), the non-agricultural wage of the first year ( $w_1$ ), and the expected profit of the second year less the cost of contract writing ( $G(C^o; V^o)$ ). In the second year, at the probability of  $\rho(K^o)$ , the renting-out agent obtains a rental payment ( $B(\bar{L})L$ ) and the non-agricultural wage ( $w_2$ ). At the probability of  $1 - \rho(K^o)$ , the renting-out terminates the contract by paying the violation compensation according to contractual formality ( $E(C^o)N$ ) and obtains a profit from household production ( $w_a^o(L)$ ) less a cost of switching between sectors ( $\delta$ ). Thus,  $H^o(\cdot)$  is the following:

$$\max_{C^o} H^o(C^o) = B(\bar{L})L + w_1 + \rho(K^o)[B(\bar{L})L + w_2] + (1 - \rho(K^o))[-E(C^o)N - \delta + w_a^o(L)] - G(C^o; V^o)$$

<sup>10</sup>Since agricultural profits and expected non-agricultural wage rates are exogenous, the source of the renting-out's income without rentals does not affect individual optimal contractual formalities.

<sup>11</sup>Relaxing ASSUMPTION 1 does not affect the bargaining mechanism nor the final bargaining outcomes but increases the likelihood of negotiation failure.

subject to

$$\bar{C} \geq C^o \geq \underline{C}.$$

$\lambda^o$  and  $\tau^o$  are the respective shadow prices of the constraints  $\underline{C} \leq C^o$  and  $C^o \leq \bar{C}$  at the renting-out's optimal formality  $C^{o*}$ . The first-order conditions that characterize the renting-out's optimal formality ( $C^{o*}$ ) are the following:

$$\begin{aligned} & -\rho_{K^o} E_{C^o} N [B(\bar{L})L + w_2] - (1 - \rho(K^o)) E_{C^o} N \\ & + \rho_{K^o} E_{C^o} N [-E(C^o)N - \delta + w_a^o(L)] - G_{C^o} + \lambda^o - \tau^o = 0 \end{aligned} \quad (4.1)$$

$$\lambda^o (C^o - \underline{C}) = 0 \quad (4.2)$$

$$\tau^o (\bar{C} - C^o) = 0. \quad (4.3)$$

An increase in contractual formality ( $C^{o*}$ ) increases the actually paid violation compensation and reduces the probability of contract violation ( $1 - \rho$ ). Thus, the marginal benefit of an additional increase in  $C^{o*}$  is the benefit gained from the rental payment and non-agricultural wage of the second year ( $-\rho_{K^o} E_{C^o} N [B(\bar{L})L + w_2]$ ). An additional increase in  $C^{o*}$  also leads to two types of loss. The first type of loss comes from a higher actually paid violation compensation if the contract is violated:  $1 - \rho(K^o) E_{C^o} N$ . The second type of loss is the opportunity cost associated with the decreased violation probability caused by  $\Delta C^{o*}$ :  $\rho_{K^o} E_{C^o} N [-E(C)N - \delta + w_a^o(L)]$ . These two types of loss are the marginal cost of contractual formality.

Eq (4.1) shows, at  $C^{o*}$ , the renting-out agent's marginal benefit of contractual formality equates the marginal cost of contractual formality. The comparative statics of

interior  $C^{o*}$  with respect to the exogenous parameters show the impact of each parameter on the interior optimal formality. The second-order conditions are satisfied based on the previous assumptions. The comparative statics of  $C^{o*}$  are as follows, where  $S^o$  represents the negative determinant of the renting-out's Hessian matrix:

$$\begin{aligned}\frac{\partial C^{o*}}{\partial w_1} &= -\frac{-\rho_{K^o} E_{C^{o*} N}}{S^o} > 0 \\ \frac{\partial C^{o*}}{\partial \delta} &= -\frac{-\rho_{K^o} E_{C^{o*} N}}{S^o} > 0 \\ \frac{\partial C^{o*}}{\partial w_a^o(L)} &= -\frac{\rho_{K^o} E_{C^{o*} N}}{S^o} < 0 \\ \frac{\partial C^{o*}}{\partial B(\bar{L})L} &= -\frac{-2\rho_{K^o} E_{C^{o*} N}}{S^o} > 0 \\ \frac{\partial C^{o*}}{\partial V^o} &= -\frac{-G_{C^{o*} E}}{S^o} > 0 \\ \frac{\partial C^{o*}}{\partial N} &= -\frac{-\rho_{K^o} E_{C^{o*}} [B(\bar{L})L + w_2 - (-E(C^{o*})N - \delta + w_a(L))]}{S^o} \\ &\quad -\frac{-(1 - \rho(K^o))E_{C^{o*}} - 2\rho_{K^o} E(C^{o*})E_{C^{o*} N}}{S^o} \leq 0.\end{aligned}$$

As the renting-out's non-agricultural wage rate ( $w_1$ ) increase, violation probability ( $1 - \rho^o$ ) drops, which increases  $C^*$ . An increase in the cost of switching between sectors ( $\delta$ ) increases  $C^{o*}$  by decreasing the renting-out's expected benefit of contract violation. An increase in the renting-out's expected agricultural profit after contract violation ( $w_a^o(L)$ ) decreases  $C^{o*}$  because the renting-out's expected benefit of contract violation increases. An increase in the rental payment offered by the renting-in ( $B(\bar{L})L$ ) decreases the renting-out's expected benefit of contract violation, thus increasing  $C^{o*}$ . More support obtained from the village administration ( $V^o$ ) reduces the marginal cost of contractual

formality, which increases  $C^{o*}$ .

The violation compensation ( $N$ ) has a mixed impact on  $C^{o*}$ . First, an increase in  $N$  increases the actually paid violation compensation if the contract is violated ( $(1 - \rho(K^o))E_{C^{o*}}$ ), which decreases  $C^{o*}$ . Second, an additional increase in  $N$ , through decreasing the probability of contract violation, increases  $C^{o*}$ . Thus, the sign of the comparative static of  $C^{o*}$  with respect to  $N$  is ambiguous.

#### 4.2.2.2 The Renting-In's Optimal Contractual Formality

The renting-in agent's optimal contract formality ( $C^{in*}$ ) maximizes the renting-in's expected profit of a two-year rental contract ( $H^{in}(\cdot)$ ). In the first year, the renting-in pre-pays the rental payment ( $B(\bar{L})L$ ) and obtains an agricultural profit  $w_a^{in}(\bar{L})$ . In the second year, at the probability of  $\rho(K^o)$ , the renting-in keeps paying the rental payment ( $B(\bar{L})L$ ) and obtains an agricultural profit on  $\bar{L}$  units of land ( $w_a^{in}(\bar{L})$ ). At the probability of  $1 - \rho(K^o)$ , the renting-in is compensated by the renting-out according to contractual formality ( $E(C^{in})N$ ) and obtains an agricultural profit on  $\bar{L} - L$  units of land ( $w_a^{in}(\bar{L} - L)$ ). Thus,  $H^{in}(\cdot)$  is the following:

$$\begin{aligned} \max_{C^{in}} H^{in}(C^{in}) &= -B(\bar{L})L + w_a^{in}(\bar{L}) + \rho(K^o)[-B(\bar{L})L + w_a^{in}(\bar{L})] \\ &+ (1 - \rho(K^o))[E(C^{in})N + w_a^{in}(\bar{L} - L)] - G(C^{in}; V^{in}) \end{aligned}$$

subject to

$$\bar{C} \geq C^{in} \geq \underline{C}.$$

$\lambda^{in}$  and  $\tau^{in}$  are the respective shadow prices of the constraints  $\underline{C} \leq C^{in}$  and  $C^{in} \leq \bar{C}$  at the optimal formality  $C^{in*}$ . The first-order conditions are the following:

$$\begin{aligned} & -\rho_{K^o} E_{C^{in}} N [-B(\bar{L})L + w_a^{in}(\bar{L})] + (1 - \rho(K^o)) E_{C^{in}} N \\ & + \rho_{K^o} E_{C^{in}} N [E(C^{in})N + w_a^{in}(\bar{L} - L)] - G_{C^{in}} + \lambda^{in} - \tau^{in} = 0 \end{aligned} \quad (4.4)$$

$$\lambda^{in} (C^{in} - \underline{C}) = 0 \quad (4.5)$$

$$\tau^{in} (\bar{C} - C^{in}) = 0. \quad (4.6)$$

The renting-in agent obtains two types of marginal benefit from contractual formality. First, an increase in  $C^{in*}$  increases the renting-in agent's expected compensation paid by the renting-out agents, which is  $(1 - \rho(K^o)) E_{C^{in}} N$ . Second, an increase in  $C^{in*}$  secures the renting-in's agricultural production because the contract is less likely to be violated, which is  $-\rho_{K^o} E_{C^{in}} N [-B(\bar{L})L + w_a^{in}(\bar{L})]$ . Meanwhile, as  $\Delta C^{in*}$  decreases the renting-out agent's violation probability, the renting-in agent experiences an opportunity cost associated with it, which is  $\rho_{K^o} E_{C^{in}} N [E(C^{in})N + w_a^{in}(\bar{L} - L)]$ . Eq (4.4) shows that, at  $C^{in*}$ , the renting-in's marginal benefit of contractual formality equates the renting-in's marginal cost associated with it.

I assume that the renting-in's maximization problem also satisfies the second-order condition, so that the renting-in's Hessian matrix has a negative determinant ( $S^{in}$ ).<sup>12</sup> The

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<sup>12</sup>This is a more restrictive assumption than the case of the renting-out. The determinant of the renting-in's Hessian matrix ( $S^{in}$ ) is smaller in magnitude than the determinant of the renting-out's Hessian matrix ( $S^o$ ) because of the concavity of contract enforcement.

comparative statics of  $C^{in*}$  with respect to the parameters are the following:

$$\frac{\partial C^{in*}}{\partial w_1} = -\frac{\rho_{K^o} E_{C^{o*}} N}{S^{in}} < 0$$

$$\frac{\partial C^{in*}}{\partial \delta} = -\frac{\rho_{K^o} E_{C^{o*}} N}{S^{in}} < 0$$

$$\frac{\partial C^{in*}}{\partial w_a^o(L)} = -\frac{-\rho_{K^o} E_{C^{o*}} N}{S^{in}} > 0$$

$$\frac{\partial C^{in*}}{\partial B(\bar{L})L} = -\frac{2\rho_{K^o} E_{C^{o*}} N}{S^{in}} < 0$$

$$\frac{\partial C^{in*}}{\partial V^{in}} = -\frac{-G_{C^{in*}E}}{S^{in}} > 0$$

$$\begin{aligned} \frac{\partial C^{in*}}{\partial N} = & -\frac{-\rho_{K^o} E_{C^{o*}} [-B(\bar{L})L + w_a^{in}(\bar{L}) - (E(C^{o*})N + w_a^{in}(\bar{L} - L))]}{S^{in}} \\ & + \frac{(1 - \rho(K^o))E_{C^{o*}} + 2\rho_{K^o} E(C^{o*})E_{C^{o*}}N}{S^{in}} \leq 0. \end{aligned}$$

The parameter  $V^{in}$  affects  $C^{in*}$  in the same direction as  $V^o$  affecting  $C^{o*}$ . Except for  $V^m$ , all other parameters that increase  $C^{o*}$  decrease  $C^{in*}$ , which indicates that the renting-in and renting-out's preferences over contractual formality are diverged by these parameters. As  $w_1$  and  $\delta$  increase, the renting-out's violation probability drops, which decreases  $C^{in*}$ . An increase in  $w_a^o(L)$  that increases the renting-out's violation incentives increases  $C^{in*}$ . An increase in  $B(\bar{L})L$  decreases  $C^{in*}$  by reducing the renting-in's expected benefit of keeping the contract.

Similar to the impact of violation compensation ( $N$ ) on  $C^{o*}$ , the impact of  $N$  on  $C^{in*}$  is also mixed. First,  $\Delta N$  increases the actually paid violation compensation, which increases  $C^{in*}$ . Second, an increase in  $N$  decreases the probability of contract violation, which increases  $C^{in*}$ .

## 4.3 Data, Empirical Measurements, and Hypotheses

### 4.3.1 Data

The data come from the survey I conducted in Jinghai County of Tianjin Municipality and Feixi County of Anhui Provinces in 2014. I selected Jinghai County to represent agriculture in the North China Plain, one of the most important commercial field crop production areas. I selected Feixi County, located in the middle of Anhui Province with China's north-south dividing line running through it, to represent the agricultural operations of the north and south across all three types of land terrain. The survey included questions on renting-out agents' household characteristics and the degree to which they trust non-strangers vs. strangers in the context of land rental issues, renting-in agents' agricultural production plans, relationships between rental partners, bargaining processes on contractual terms, and contract details.

In contrast to previous datasets that are byproducts of rural households, my survey represents each local market by applying stratified sampling based on market structure along with three-stage cluster sampling based on a three-layer administrative system: town, village, and rental transactions. In each local market, all the important renting-in agents with large market shares were surveyed and the rest of the renting-in with comparatively smaller post-rental farms were randomly selected if they jointly occupied a significant proportion of land. The renting-out agents were stratified based on their renting-in partners. Each important renting-in (or group of renting-in) has a pool of renting-out partners. The renting-out were randomly selected from each pool in proportion to the

corresponding renting-in's market share.

This sampling approach guarantees that contracts associated with large-scale rentals have matched information on a pair of rental partners, which distinguishes 128 large-scale rental contracts in the sample with matched information on a pair of rental partners from the rest 204 small-scale rental contracts. Larger-scale rentals are different from the land rentals in the late 1990s that hardly doubled the production scale (Jin and Deininger, 2009). Although there could be differences in rental attributes between larger-scale and smaller-scale rentals; for rental partners in both types of rentals, the economic logic that shapes individual preferences and bargaining mechanisms over contractual formality is the same. Thus, the signs of the coefficients on the exogenous variables are the same across transaction types, although the magnitudes could be different. As mature transactions, larger-scale rentals are more likely to occur in advanced markets with greater potential in improving agricultural productivity compared to smaller-scale rentals. Studying the security of larger-scale rental contracts is crucial for agricultural development and sheds lights on the prospective market operation and policy design in less advanced markets. Table ?? gives summary statistics of the 128 large-scale rentals and the definitions of the variables used in the analysis.

## 4.3.2 Measurements and Hypotheses

### 4.3.2.1 Individual Optimal Formality and Data Using

Individual optimal formality is measured by the formality proposed by each agent in the initial contract negotiation. The exact question asked in the survey was *what was*



*the contract formality you proposed in the first contract negotiation?* Each agent could either propose a formal or an informal contract. Based on the statistics description in Table 4.7, among the 128 larger-scale rental contracts, 26.6% of the renting-out proposed formal contracts while 88.2% of the renting-in proposed formal contracts. Among these 128 pairs of rental partners, 29 of the pairs both proposed informal contracts; 65 of the pairs had the renting-in proposing formal contracts and the renting-out proposing informal contracts; 31 of the pairs both proposed formal contracts; and only 3 had the renting-in proposing informal contracts and the renting-out proposing formal contracts. In the end, 61.7% of the contracts are formal contracts.

Table 4.3 explains data using in the following three empirical sections of Chapter 5. In the first two sections 4.4 and 4.5, I use the 128 contracts with matched information on a pair of rental partners to estimate individual optimal formalities and compute the transaction cost associated with the 128 pairs of bargaining. In the last empirical section on bargaining mechanism, I use the 65 contracts associated with the circumstance that the renting-out agents proposed formal contracts but the corresponding renting-in agents proposed informal contracts ( $C^o = 0$  and  $C^{in} = 1$ ). I exclude the 3 contracts that  $C^o = 1$  and  $C^{in} = 0$  in the analysis on bargaining mechanism because these 3 contracts, 2.3% of the 128 large-scale rentals, do not reflect the most important conflicts in the bargaining.

Each parameter in the theoretical model is a function of several factors either directly measured or proxied in the context of China's rural land rental market. The hypotheses associated with each explanatory variable are determined by (1) the relationships between the explanatory variable and one or more corresponding parameters and (2) the comparative statics with respect to the corresponding parameters. Each explana-

tory variable that only affects one parameter is matched with one testable hypothesis. The explanatory variables with multiple roles are matched with multiple hypotheses that could offset one another. The impacts of the variables with multiple roles could be identified if and only if the impact through one channel dominates the impacts through other possible channels. The hypotheses of explanatory variables are listed in Table 4.4 and explained in the following subsections.

#### 4.3.2.2 The Renting-out's Non-Agricultural Wage Rate( $w_1$ )

An increase in the renting-out's non-agricultural wage rate of the first year ( $w_1$ ) increases  $C^{o*}$  and decreases  $C^{in*}$ . A proxy of the renting-out's non-agricultural wage rate is the contract format of their non-agricultural employment. A long-term employment contract (*LONG NON-AGRI*), compared to a short-term or temporary contract, is associated with a higher non-agricultural wage rate, which indicates a higher  $C^{o*}$  and a lower  $C^{in*}$  compared to the alternatives.

#### 4.3.2.3 The Renting-out's Cost of Switching between Sections ( $\delta$ )

An increase in the renting-out's cost of switching between agricultural and non-agricultural sectors increases  $C^{o*}$  and decreases  $C^{in*}$ . The renting-out's cost of switching between sectors increases if the renting-in's production plan is in conflict with the renting-out's farming expertise. Two proxies of  $\delta$  are selected. The first is land smoothing (*LDSMOOTH*) in the renting-in's production plan and the second is whether the renting-in plans to replace traditional/original crops with new crops (*CROP CHANGE*). Both vari-

ables may lead to irreversible changes in land use, which are associated with a higher cost of switching back to agricultural production. Hence, both proxies increase  $C^{o*}$  and decrease  $C^{in*}$ .

#### 4.3.2.4 The Renting-out's Agricultural Profit after Contract Violation ( $w_a^o(L)$ ) and the Renting-in's Offered Rental Payment ( $B(\bar{L})L$ )

An increase in the renting-out's agricultural profit after contract violation decreases  $C^{o*}$  and increases  $C^{in*}$ . Household production after contract violation is affected by soil quality. Traditionally, the land with the best soil quality is used for grain production (*GRAIN EX-ANTE*). Therefore, *GRAIN EX-ANTE*, an indicator of higher soil quality, is associated with a higher  $w_a^o(L)$  and thus indicates a lower  $C^{o*}$  and a higher  $C^{in*}$ . An increase in the rental payment offered by the renting-in increases  $C^{o*}$  and decreases  $C^{in*}$ . Rental payment is positively affected by the renting-out's expected production profit. Thus, *GRAIN EX-ANTE*, indicating high soil quality, is associated with a higher rental payment offered by the renting-in and thus indicates a higher  $C^{o*}$  and a lower  $C^{in*}$ .

#### 4.3.2.5 Support from the Village Administration ( $V^m$ )

The support obtained from a village administration reduces the writing cost of a formal contract, which increases the agent's individual optimal formality ( $C^{m*}$ ). Two proxies are selected. The first proxy is whether rental partners negotiated directly without a third party in the initial negotiation (*DIRECT COMM*). The third party is normally a villager with high status in the village bureaucratic system. Thus, *DIRECT COMM* is

associated with less support obtained from the village bureaucratic system for both the renting-in and renting-out. The second proxy is whether the rental was initiated after 2006 (*AFTER 2006*). In 2006, the central government officially abolished the national agricultural tax nationwide, which was an indicator that public finance and services tilted to rural areas after 2006. Thus, *AFTER 2006*, associated with higher  $V^{in}$  and  $V^o$ , leads to higher  $C^{o*}$  and  $C^{in*}$ .

#### 4.3.2.6 Violation Compensation ( $N$ )

An increase in violation compensation ( $N$ ) could increase or decrease  $C^{o*}$  and  $C^{in*}$ . An increase in  $N$  increases  $C^{o*}$  and decreases  $C^{in*}$  if its impact on reducing violation probability outweighs its impact on increasing violation compensation, and vice versa. Violation compensation is institutionally determined by the relationship between rental partners. Proxies are selected from two aspects.

First, the renting-in agents' ownership of enterprises<sup>13</sup> and the social proximity between rental partners affects  $N$  through the village social network. Three variables are important measurement of the identities of the renting-in and the social proximity: *NON STRANGER*, *ENTERPRISE*, and *AGGR VILLAGE TRUST*.

*NON STRANGER* measured whether the rental partners are non-strangers to each other. Between a pair of *NON STRANGERS*, the violation compensation is comparatively higher than it would be with strangers. In a village social network, contract violation may be seen as a signal of not being trustworthy in other aspects of socio-economic life. Thus,

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<sup>13</sup>All the renting-out agents are rural households.

an extra reputation cost is added to the violation compensation.<sup>14</sup> *ENTERPRISE* refers to whether or not the renting-in agent owns an enterprise. The violation compensation paid to an *ENTERPRISE* with an organizational structure is higher than that paid to an individual renting-in agent. The renting-out violator pays extra to the *ENTERPRISE* to compensate the bureaucratic cost of the enterprise associated with contract violation. *AGGR VILLAGE TRUST* is the village-level aggregate trust, which is generated by individual trust of non-strangers in land rental issues using the leave-one-out strategy. Since *AGGR VILL TRUST* encourages support among the renting-out agents, higher *AGGR VILLAGE TRUST* is associated with a lower violation compensation.

Second, some general rental attributes, mainly the negotiation format and the renting-in's investment affect the violation compensation. *DIRCT COMM* indicates a higher violation compensation compared to the transactions that are more likely to be protected by the village administration. *LDSMOOTH* and *CROP CHANGE*, both suggesting a big investment plan of the renting-in agent, are associated with a higher violation compensation.

## 4.4 Empirical Analysis: Individual Preferences

### 4.4.1 Empirical Strategy

Based on the first-order conditions characterized by the renting-in and renting-out's individual optimal formalities, the same six parameters affect both  $C^{in*}$  and  $C^{o*}$ . The renting-out agent  $m$ 's optimal formality and the renting-in agent  $n$ 's optimal formality

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<sup>14</sup>Whether the renting-in receives this reputation cost as part of the compensation does not affect the comparative statics of  $C^{in*}$  with respect to all parameters.

associated with one rental contract are determined by the following empirical model:

$$C_{mn}^{o*} = \begin{cases} 1 & \text{if } \beta_{1mn}^o w_1 + \beta_{2mn}^o \delta^o + \beta_{3mn}^o w_a^o(L) + \beta_{4mn}^o B(\bar{L})L + \beta_{5mn}^o V^o + \beta_{6mn}^o N + \mu_{mn}^o > 0 \\ 0 & \text{Otherwise} \end{cases} \quad (4.7)$$

$$C_{mn}^{in*} = \begin{cases} 1 & \text{if } \beta_{1mn}^{in} w_1 + \beta_{2mn}^{in} \delta^o + \beta_{3mn}^{in} w_a^o(L) + \beta_{4mn}^{in} B(\bar{L})L + \beta_{5mn}^{in} V^{in} + \beta_{6mn}^{in} N + \mu_{mn}^{in} > 0 \\ 0 & \text{Otherwise.} \end{cases} \quad (4.8)$$

I assume that  $\mu_{mn}^o$  is independently and normally distributed at zero mean and  $\mu_{mn}^{in}$  is also independently and normally distributed at zero mean. It is possible that  $corr(\mu_{mn}^o, \mu_{mn}^{in}) \neq 0$  due to unobserved characteristics of the renting-in and renting-out agents. However, since the renting-in and renting-out are exogenous matched based on the renting-out agents' land location determined in the 1995 collective land distribution, not only  $\mu_{mn}^o$  is not correlated with the variables related to the renting-out agents and the institutionally determined variables, it is also not correlated with the variables related to the renting-in agents, such as  $B(\bar{L})L$  and  $V^{in}$ . Similarly,  $\mu_{mn}^{in}$  is not correlated with the variables related to the renting-in agents, the institutionally determined variables, and also not correlated with the variables related to the renting-out agents. Thus,  $corr(\mu_{mn}^o, \mu_{mn}^{in}) \neq 0$  does not bias the estimation. A two-Probit system on  $C^{in*}$  and  $C^{o*}$  is estimated by full information maximum likelihood estimation (FIML) to address this potential error correlation between  $\mu_{mn}^o$  and  $\mu_{mn}^{in}$ .

I denote that  $corr(\mu_{mn}^o, \mu_{kn}^o) = \zeta^o$  and  $corr(\mu_{mn}^{in}, \mu_{kn}^{in}) = \zeta^{in}$ .<sup>15</sup> A nontrivial  $\zeta^o$  indicates that the optimal formalities of two renting-out agents  $m$  and  $k$  associated with

<sup>15</sup>I assume that  $corr(\mu_{mn}^o, \mu_{kn}^{in}) = 0$ . Besides, since each renting-out is only associated with one renting-in due to small household farm size,  $corr(\mu_{mn}^o, \mu_{mj}^o)$  is not observed.

the same renting-in agent  $n$  are correlated. The potential correlation between  $\mu_{mn}^o$  and  $\mu_{kn}^o$  is driven by unobserved characteristics of the renting-in. A nontrivial  $\zeta^{in}$  shows that the optimal formalities of the renting-in agent  $n$  in the rental agreements with different renting-out agents  $m$  and  $k$  are correlated. Thus,  $\zeta^{in} \neq 0$  if the renting-in agent  $n$  has an idiosyncratic way to determine individual optimal formality regardless of the characteristics of the renting-out. Meanwhile, it is also possible that individual optimal formalities are correlated within a town due to township institutions.<sup>16</sup> Hence, in the following empirical analysis, I report two types of estimations using the same specification; one clusters the standard errors at the township level and the other clusters by the renting-in agents.<sup>17</sup>

#### 4.4.2 Empirical Results

In Table 4.5, the first two columns are the FIML estimations with township fixed-effects and the standard errors are clustered at the township level. The last two columns are the FIML estimations with township fixed-effects and the standard errors are clustered by the renting-in agents. The empirical results in Table 4.5 show that the significant coefficients are consistent with the theoretical hypotheses listed in Table 4.4. Both specifications show that the correlation between  $\mu_{mn}^o$  and  $\mu_{mn}^{in}$  is significantly different from zero at 0.273. The positive and significant  $corr(\mu_{mn}^o, \mu_{mn}^{in})$  indicates that the omitted variables that affect both individual optimal contractual formality are assumed by the FIML.

Comparing the coefficients clustered at the township level and clustered by the

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<sup>16</sup>Since each local market is highly concentrated with few larger-scale rentals, it is more reasonable to have township fixed-effects and cluster the standard errors at the township level rather than at the village level.

<sup>17</sup>There is only one renting-out agent has rental transactions across township.

renting-in agents, the standard errors are close in magnitude. For simplicity, I focus on interpreting the FIML estimations clustered by the renting-in agents. Table 4.6 shows the marginal effects of explanatory variables at the means clustered by the renting-in agents.

*CROPCHANGE* decreases  $C^{o*}$  shows that the impact of *CROPCHANGE* on increasing the violation compensation outweighs its impact on increasing the cost of switching sectors. *CROPCHANGE* increases the probability that  $C^{o*} = 0$  by 0.12. *AGGR VILLAGE TRUST* decreases  $C^{o*}$ , indicating that its impact on increasing the renting-out's violation probability outweighs its impact on decreasing the renting-out's cost associated with contract violation. *AGGR VILLAGE TRUST* decreases by 0.01 the probability that the renting-out proposes a formal contract. *DIRECT COMM* increases  $C^{o*}$  shows that its impact on the violation compensation is more important than the other mechanism. *DIRECT COMM* decreases the probability that  $C^{o*} = 0$  by 0.11

#### 4.5 Empirical Analysis: Transaction Cost

Although transaction cost in China's rural land rental market has been theoretically studied as a fixed cost (Jin and Deininger, 2009; Deininger and Jin, 2005), no specific type of transaction cost in this market is measured. The probability of proposing a formal contract could be interpreted as the individual optimal formality if it is a continuous variable. I create a proxy for transaction cost (*TC*) associated with the bargaining over the degree of contractual formality. The index is the absolute difference in the predicted probability of proposing a formal contract between a pair of rental partners. Thus.



$$TC = |\text{prob}(\hat{C}^{in*} = 1) - \text{prob}(\hat{C}^{o*} = 1)|.$$

There is one reason that  $|C^{in*} - C^{o*}|$  is not directly used in creating the proxy for transaction cost. In the survey question on formality proposals, only two options, formal or informal, were provided. Compared to a survey question that asked for the probability of proposal a formal contract, the survey question with two options was easier to be answered. Therefore, the possible proxy  $|C^{in*} - C^{o*}|$  has only two possible values, 0 or 1. My transaction proxy,  $TC$ , thus, has more variations across pairs of rental partners, which further distinguishes the market participants with the same formality proposals.

Based on Table 4.7, the situation that  $C^{o*} = 1$  and  $C^{in*} = 0$  only happened in 3 rental transactions. These 3 observations are excluded in the analysis on transaction cost and final contractual formality. Since the transaction cost index ( $TC$ ) is computed from the predicted  $C^{m*}$ , it is explained by the same set of the exogenous explanatory variables in Eq 4.7 or 4.8. I regress  $TC$  on the explanatory variables in Eq 4.7 or 4.8 using township fixed-effects and cluster the standard errors by the renting-in agents. Table 4.7 reports the results.

Base on the significant coefficients in Table 4.7, I summarize the four most important aspects of a rental transaction that affect the transaction cost associated with the bargaining. The first aspect is the identity of the renting-in agents. The second aspect is the renting-out's non-agricultural employment status. The third aspect is the renting-in's production plan. The last aspect is local administrative institutions. Table 4.8 summaries the transaction cost index associated with each possible scenario of the four aspects if

other variables are fixed at 0.

The identity of the renting-in agents is described by whether the renting-in is a non-stranger to the renting-out agent and whether the renting-in agent owns an enterprise. Table 4.8 shows that being a *NON STRANGER* renting-in agent significantly increases the transaction cost index by 0.32. Owning an *ENTERPRISE* decreases the transaction cost index by 0.25. *NON STRANGER* and *INDIVIDUAL* used to be the majority of the renting-in agents in the early stage of the market. Based on Jin and Deininger (2009), land transfers among relatives between 2001 and 2004 accounted for almost 40% of the land rental transactions. However, a high transaction cost index associated with *NON STRANGER* and *INDIVIDUAL* suggests that opening the rural land rental market to outsiders and entrepreneurs, who have more market experiences, could reduce the transaction cost caused by bargaining and improve market efficiency.

Combining the theoretical predictions of the coefficients on *NON STRANGE* and *ENTERPRISE* in the regressions of  $C^{in}$  and  $C^o$  in Table 4.4 and the empirical results in Table 4.5, I reveal the mechanisms on how *NON STRANGE* and *ENTERPRISE* affect *TC*. The extra bureaucratic cost of violating a contract signed with an *ENTERPRISE* reduces the renting-out agent's violation probability, which decreases the differences in individual optimal formalities. The renting-out agents' reputation cost and their loss in other aspects of socio-economic life associated with violating contracts signed with *NON STRANGERS* increase the actually paid violation compensation and further enlarges the difference between individual optimal formalities between a pair of rental partners.

Table 4.8 further shows that *NON STRANGER* explains most of the hold-up transaction cost of bargaining. In previous studies that could not reveal individual preferences

of matched rental partners, by reducing both sides' uncertainty of ex-post contract adaptation associated with opportunism, extra cost (i.e. reputation cost) of contract adaptation associated with social proximity explains the enforcement of informal contracts (Arun G. Chandrasekhar and Larreguy, 2014). However, in the context of China's rural land rental market, the renting-out agents' ex-post uncertainty of contract violation is exogenously determined by China's separated urban-rural social structure rather than opportunism. The renting-out agents, facing severe challenges in subsistence caused by their unanticipated failure in non-agricultural employment, could not reduce their violation probability even between non-stranger rental partners. Thus, by revealing preferences of matched rental partners, I show that if social proximity could not reduce the uncertainty of ex-post contract adaptation but increases the cost of contract adaptation, it encourages precautions of both sides for the exogenous uncertainty of ex-post contract adaptation. In the context of China's rural land rental market, the renting-out agents further decrease their individual optimal formalities and the renting-in agents further increase their individual optimal formalities, which increases the hold-up transaction cost.

The renting-out's non-agricultural employment status is described by whether a renting-out agent has a long-term non-agricultural employment contract. *LONG NON-AGRI* represents a low uncertainty in non-agricultural employment, which reduces the renting-out agents' probability of contract violation and further reduces the transaction cost of bargaining. Table 4.8 shows that having a *LONG NON-AGRI* decreases the transaction cost index by 0.051. Since uncertainty in non-agricultural employment is caused by China's separated urban-rural social structure, this result indicates that unifying the urban and rural economies could reduce the transaction cost and accelerate the development

of the land rental market.

The renting-in's production plan is described by whether the renting-in agents plan to replace the traditional/original crops with new crops and whether the renting-in agents plan to smooth the land. *CROP CHANGE*, which increases the actually paid violation compensation, further decreases the renting-out optimal formality and increases the renting-in agents' optimal formality. Thus, based on Table 4.8, *CROP CHANGE*, indicating new knowledge on agricultural production, increases the transaction cost index by 0.19. This result suggests that the rural land rental market sets barriers to new knowledge on agricultural production so that the rural land rental market might not attain its full potential in improving production efficiency. However, *LDSMOOTH*, an investment in soil conservation, which benefits the renting-out agents in the long run, could reduce the transaction cost index by 0.06 because *LDSMOOTH* decreases the renting-out agents' violation probability through increasing the cost of switching between agricultural and non-agricultural sectors. Thus, the transaction cost increased by *CROP CHANGE* could be mitigated by the investment in soil quality through *LDSMOOTH*.

Local administrative institution is described by whether the bargaining between the renting-in and renting-out involves a third party, which is usually the village administration. Compared to the rental transactions with the involvement of the village administration, *DIRECT COMM* decreases the transaction cost index by 0.22 because *DIRECT COMM* increases the renting-out agents' violation probability through increasing violation compensation. Since the involvement of the village administration indicating a strong administrative power,<sup>18</sup> this result shows that strong administrative power, which was a

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<sup>18</sup>Strong administrative power does not necessarily mean that private land use right is not secure. Strong

strong driving force of rental transactions at the early stage of the market,<sup>19</sup> does not facilitate rental transactions in the maturing land rental market.

In sum, I draw three conclusions from the analysis on the transaction cost index associated with the bargaining over the degree of contractual formality. First, it empirically shows that the separated urban-rural social structure creates a transaction cost in rental transactions. Second, it captures the growth of this market. Traditional rental transactions that only occur only because of social proximity and the involvement of village administration are gradually being eliminated due to high transaction cost. Instead, capable renting-in entrepreneurs from outside of the village are encouraged. Third, it gives hint on the main problem that impedes the development of the market, which is transaction cost associated with new production knowledge.

## 4.6 Final Contractual Formality

Facing different individual optimal formalities ( $C^{o*} \neq C^{in*}$ ), the renting-in and renting-out agents bargain cooperatively to design the final contractual formality ( $\tilde{C}$ ). I assume that the final contract formality is chosen from the individual optimal contractual formalities ( $C^{in*}$  and  $C^{o*}$ ). Thus, there is always one agent who compromises and gives up his/her individual optimal formality when  $C^{o*} \neq C^{in*}$ . Although, it is theoretically possible to apply a mixed strategy by randomizing contractual formality, it is not a practical equilibrium for market participants of China's rural land rental market because of cognitive difficulty in using random outcomes (Anmann, 1985). Thus, if  $C^{o*} \neq C^{in*}$ , one

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administrative power means the village administration is influential in village socio-economic issues.

<sup>19</sup>In China Living Standards Survey 1995-1997, 95% of rental transactions were organized by the village administration (Rozelle, 2003)

side of a rental transaction fully compromise in the bargaining over contractual formality.

In a cooperative Nash bargaining, the renting-in and renting-out agents choose the final contractual formality  $\tilde{C}$  that maximizes the joint profits of both the renting-in and the renting-out agents. To achieve a higher joint profit, at the final contractual formality ( $\tilde{C}$ ), one agent must give up his/her individual optimal formality and bear the cost of compromising,<sup>20</sup> In addition,  $\tilde{C}$  that maximizes the joint profit also minimizes the joint cost of compromising. Hence, the efficiency of the Nash bargaining game ensures that the agent with a higher cost of compromising drives the final contractual formality and the agent with a lower cost of compromising bears that cost of compromising.

#### 4.6.1 Bargaining Mechanism

The bargaining mechanism is tested by the observations that  $C^{o*} = 0$  and  $C^{in*} = 1$ , which is denoted by the dummy variable  $D01$ . Among the 65 observations of  $C^{o*} = 0$  and  $C^{in*} = 1$ , 21.54% ended with informal contracts. Table 4.9 lists the hypotheses associated with the empirical measurements.

##### 4.6.1.1 Proxies for the Cost of Compromising

Agent  $m$ 's cost of compromising ( $CmpCost^m$ ) is theoretically defined as  $H^m(C^{m*}) - H^m(C^{n*})$ . Empirically, the cost of compromising is measured by the absolute difference between agent  $m$ 's estimated probability of proposing a formal contract and 50%,  $|prob(\hat{C}^{m*} = 1) - 0.5|$ . If  $m$ 's estimated probability of proposing a formal contract is

<sup>20</sup>The cost of compromising is only part of the negotiation cost of a rental transaction. The cost of compromising is borne by one agent while the rest part of the negotiation cost could be jointly borne by both rental partners.

close to 50%, agent  $m$ 's expected rental profit with a formal contract should be similar to his/her expected rental profit with an informal contract. In contrast, a more extreme probability of proposing or not proposing a formal contract indicates that the expected profit at individual optimal formality is more likely to be much greater than the expected rental profit at the alternative formality. Since only  $D01 = 1$  is studied, an increase in  $CmpCost^{in}$  increases final contractual formality while an increase in  $CmpCost^o$  decreases final contractual formality.

#### 4.6.1.2 Empirical Strategy and Results

$\tilde{C}$  is a function of the linearly estimated individual optimal formality,  $CmpCost^{in}$  and  $CmpCost^o$ .

$$\tilde{C} = \begin{cases} 1 & \text{if } \theta_1 \hat{C}^{o*} + \theta_2 \hat{C}^{in*} + \theta_3^{01} CmpCost^{in} + \theta_4^{01} CmpCost^o + v > 0 \\ 0 & \text{Otherwise} \end{cases}$$

The standard errors of the coefficients could be clustered at the township level or by the renting-in agents. Table 4.9 shows the empirical results of the Probit estimation of  $\tilde{C}$ . The corresponding average marginal effects are reported in Table 4.10. I highlight two results. First, an increase in the renting-in agents' linear prediction of  $C^{in*} = 1$  increases the probability of  $\tilde{C} = 1$  by 0.03, while an increase in the linear prediction of  $C^{o*} = 1$  does not significantly affect the probability of  $\tilde{C} = 1$ . Thus, the renting-in agents lead the bargaining. Second, the renting-in are sensitive to the changes in the cost of

compromising but the renting-out agents are not sensitive to the changes in the cost of compromising. An increase in  $CmpCost^{in}$  increases the probability that the counterparty compromises by 0.59 ( $\tilde{C} = C^{in*}$ ). In addition, the cost of compromising is much more important than the initial formality proposal in affecting the bargaining outcome over  $\tilde{C}$ .

#### 4.6.2 Who Compromises?

If  $C^{m*} \neq C^{n*}$ , the agent who gives up his/her individual optimal formality bears the cost of compromising. This section analyzes how exogenous explanatory variables in Eq 4.7 or 4.8 affect the probability that the renting-in or the renting-out compromises in the bargaining over contractual formality. I define that the renting-in agent bears the cost of compromising (*RENTING-IN COMP*) as follows:

$$RENTING-IN COMP = \begin{cases} 1 & \text{If } \tilde{C} = 0 \& C^{o*} = 0 \& C^{in*} = 1 \\ 0 & \text{If } \tilde{C} = 1 \& C^{o*} = 0 \& C^{in*} = 1 \end{cases}$$

I regress *RENTING-IN COMP* on the exogenous variables in Eq 4.7 or 4.8 with township fixed-effects and cluster the standard errors by the renting-in agents. The results and the average marginal effects are reported in Table 4.11. The social proximity among *NON STRANGERS* protects renting-out agents' preferences over the degree of contractual formality by increasing the probability that the renting-in agents compromise by 1.08. A renting-in agent's financial strength is reflected by *ENTREPRISE*. Being an entrepreneur decreases the probability that the renting-out compromises by 0.33. Thus, the renting-in agents' financial strength further protects the renting-in agents' preferences over the



degree of contractual formality under the circumstance that the renting-in agents have advantages in the bargaining. However, CROP CHANGE, representing new production technology introduced by the renting-in agents, increases the probability that the renting-in compromises by 0.11. Thus, new production technology reduces the renting-in agents' advantages in the bargaining over the degree of contractual formality.

## 4.7 Conclusion

I study the transaction cost associated with the bargaining over contractual formality in China's rural land rental market. In the theoretical analysis, I show theoretically that individual preferences over contractual formality are asymmetric due to the potential contract violation caused by the renting-out's uncertainty in non-agricultural employment. Using a unique survey data I collected, I develop two empirical sections. First, I create an index for the transaction cost caused by the bargaining using the differences in the estimated probability of proposing formal contracts between the renting-in and renting-out. I uses the same set of exogenous explanatory variables that affect individual preferences to explain the transaction cost index. Second, I examine the bargaining mechanism for the final degree of contractual formality given individual preferences.

These two empirical analyses updates the recent development of the market from two perspectives. First, the progress of the market is captured by showing that traditional rental transactions that only occur only because of social proximity and the involvement of village administration are gradually being eliminated due to high transaction cost. Second, the renting-out agents, with uncertainty in contract violation, have advantages in

the bargaining, which greatly threatens the security of land rental contracts and further impedes agricultural development.

From the empirical results, I draw two policy implications. First, local governments should not be involved actively in the bargaining of land rental contracts and deliberately reduce the violation compensation to indulge rural citizens' requests of contract violation. Instead, local government could work on reducing rural citizens' uncertainty in non-agricultural employment, which reduced the transaction cost of the bargaining. Second, a unified urban-rural social structure could reduce the transaction cost associated with bargaining over rental contracts and improves post-rental agricultural productivity by improving contract security. Local government could unify the rural and urban economy from two perspectives. The first is to perfect non-agricultural labor market, which reduces rural citizens' uncertainty in non-agricultural employment. The second is to break the barriers of entering the rural economy from outside of the villages, which helps the rural economy to embrace capital and personnel from the urban economy.

Table 4.1: Summary Statistics of 128 Large-Scale Rentals

Table 4.2: The Renting-in and Renting-out's Formality Proposals

		Renting-in's Proposals		
		Informal	Formal	
Renting-out's Proposals	Informal	29	65	94
	Formal	3	31	34
		32	96	128

Note: Among the 128 rental contracts, 26.6% of the renting-out proposed formal contracts while 88.2% of the renting-in proposed formal contracts.

Table 4.3: Data Using in Chapter 5

	No. Obs.
Section 4.4: Individual Preferences	128
Section 4.5: Transaction Cost	128
Section 4.6: Bargaining Mechanism	65

Note: The 128 contracts with matched information on both sides of a transaction are used in Sections 4.4 and 4.5. The 65 contracts with the renting-out agents proposing informal contracts and the corresponding renting-in agents proposing formal contracts are used in the empirical analysis on bargaining mechanism in Section 4.6.

Table 4.4: Theoretical Predictions on Individual Optimal Formality

	$C^{O*}$	$C^{in*}$
<b>w<sub>1</sub>: Renting-out's Non-Agricultural Employment</b>		
LONG NON-AGRI	+	-
<b>V<sup>m</sup>: Support from the Village Administration</b>		
AFTER2006	+	+
<b>N: Violation Compensation</b>		
NON STRANGER	?	?
AGGR VILLAGE TRUST	?	?
ENTERPRISE	?	?
<b>Variables with Multiple Roles</b>		
CROP CHANGE ( $\delta$ and $N$ )	+	-
	?	?
LDSMOOTH ( $\delta$ and $N$ )	+	-
	?	?
GRAIN EX-ANTE ( $w_a^o(L)$ and $B(\bar{L})L$ )	-	+
DIRCT COMM ( $V^m$ and $N$ )	+	-
	-	-
	?	?

Note: The predictions of the coefficients on the explanatory variables are listed based on the comparative statics. “+” represents a positive coefficient, “-” represents a negative coefficient. The explanatory variables with multiple roles are matched with multiple hypotheses, and “?” represents an ambiguous prediction.

Table 4.5: Individual Optimal Formality

	Clustered at Township		Clustered by the Renting-in	
	$C^{O*}$	$C^{in*}$	$C^{O*}$	$C^{in*}$
<b>w<sub>1</sub>: Renting-out's Non-Agricultural Employment</b>				
LONG NON-AGRI	0.304 (0.369)	0.158 (0.126)	0.304 (0.385)	0.158 (0.146)
<b>V<sup>m</sup>: Support from the Village Administration</b>				
AFTER 2006	0.477 (0.537)	0.760*** (0.214)	0.477 (0.438)	0.760 (0.471)
<b>N: Violation Compensation</b>				
NON STRANGER	-0.0657 (0.443)	1.730*** (0.173)	-0.0657 (0.340)	1.730*** (0.445)
AGGR VILLAGE TRUST	-0.0500*** (0.0152)	-0.0550* (0.0330)	-0.0500*** (0.0126)	-0.0550 (0.0340)
ENTERPRISE	0.820 (0.513)	-0.0696 (0.0544)	0.820 (0.506)	-0.0696 (0.188)
<b>Variables with Multiple Roles</b>				
CROP CHANGE	-0.633** (0.313)	0.172 (0.208)	-0.633** (0.281)	0.172 (0.156)
LDSMOOTH	0.124 (0.480)	0.164 (0.207)	0.124 (0.435)	0.164 (0.192)
GRAIN EX ANTE	0.995** (0.438)	1.567* (0.922)	0.995* (0.551)	1.567* (0.910)
DIREC COMM	0.909*** (0.345)	-0.0137 (0.218)	0.909*** (0.352)	-0.0137 (0.245)
Township Fixed-Effects	Y		Y	
$corr(\mu_{mn}^o, \mu_{mn}^{in})$	0.273**		0.273**	
Observations	128		128	
Log Likelihood	-90.750		-90.750	

Note: Clustered robust standard errors at the township level (columns 1-2) and clustered robust standard errors clustered by the renting-in agents (columns 3-4) in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table 4.6: Marginal Effects at the Means: Individual Optimal Formality

	$C^{O*}$	$C^{in*}$
<b>w<sub>1</sub>: Renting-out's Non-Agricultural Employment</b>		
LONG NON-AGRI	0.0493 (0.0638)	0.0036 (0.0065)
<b>V<sup>m</sup>: Support from the Village Administration</b>		
AFTER 2006	0.08616 (0.08935)	0.0281 (0.0405)
<b>N: Violation Compensation</b>		
NON STRANGER	-0.0099 (0.0502)	0.0867** (0.0434)
AGGR VILLAGE TRUST	-0.0076*** (0.0020)	-0.0012 (0.0019)
ENTERPRISE	0.1508 (0.1281)	-0.0014 (0.0048)
<b>Variables with Multiple Roles</b>		
CROP CHANGE	-0.1199* (0.0706)	0.0033 (0.0039)
LDSMOOTH	0.01928 (0.0700)	0.0037 (0.0064)
GRAIN EX ANTE	0.2539 (0.1707)	0.1700* (0.0945)
DIREC COMM	0.1123** (0.0401)	-0.0003 (0.0050)

Note: Robust standard errors clustered by the renting-in agents in parentheses \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table 4.7: Transaction Cost Index I

	Transaction Cost Index
LONG NON-AGRI	-0.0513** (0.0199)
CROP CHANGE	0.188*** (0.0567)
LDSMOOTH	-0.0595** (0.0242)
AFTER2006	-0.0331 (0.0497)
NON STRANGER	0.317** (0.114)
AGGR VILLAGE TRUST	0.00148 (0.00329)
ENTERPRISE	-0.254** (0.107)
GRAIN EX-ANTE	-0.0435 (0.0806)
DIRECT COMM	-0.217*** (0.0460)
Township Fixed Effects	Y
Observations	125
R-squared	0.831

Note: Robust standard errors clustered by the renting-in agents in parentheses \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table 4.8: Transaction Cost Index II

<b>Identity of the Renting-in Agents</b>	<b>TC Index</b>
<b>Non-stranger</b> vs. Stranger	<b>0.317**</b>
<b>Enterprise</b> vs. Individual	<b>-0.254**</b>
<b>The Renting-out's Non-Agricultural Employment Status</b>	<b>TC Index</b>
<b>Long-Term Contracts</b> vs. Short/Temporary Contracts	<b>-0.051**</b>
<b>The Renting-in Agents' Production Plan</b>	<b>TC Index</b>
<b>Crop Change</b> vs. No Crop Change	<b>0.188**</b>
<b>Land Smooth</b> vs. No Land Smooth	<b>-0.060**</b>
<b>Local Administrative Institutions</b>	<b>TC Index</b>
<b>Direct Negotiation</b> vs. Third Party Negotiation	<b>-0.217***</b>

Note: I summarize the four most important aspects of a rental transaction that affect the transaction cost associated with the bargaining. One scenario in each aspect, which is the scenario *not in bold*, is set as the baseline.

Table 4.9: Theoretical Predictions and Empirical Results on Final Contractual Formality

	Predictions	Clustered at Township $\tilde{C}$	Clustered at Renting-in $\tilde{C}$
<b>Individual Optimal Formality</b>			
Linear prediction of $C^{o*}$	+	0.195 (0.233)	0.195 (0.790)
Linear prediction of $C^{in*}$	+	0.148** (0.069)	0.148* (0.088)
<b><math>CmpCost^m</math></b>			
$CmpCost^o$	-	1.327 (1.866)	1.327 (3.476)
$CmpCost^{in}$	+	3.226** (0.646)	3.226** (0.999)
Province Fixed-Effects		Y	Y
Observations		65	65
Log Likelihood		-21.956	-21.956

Note: The predictions of the coefficients on the explanatory variables are listed based on the comparative statics. “+” represents a positive coefficient and “-” represents a negative coefficient. Robust standard errors clustered by the renting-in agent in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$



Table 4.10: Average Marginal Effects on Final Contractual Formality

	Clustered at Township $\tilde{C}$	Clustered at Renting-in $\tilde{C}$
Individual Optimal Formality		
Linear prediction of $C^{o*}$	0.036 (0.046)	0.036 (0.144)
Linear prediction of $C^{in*}$	0.027** (0.009)	0.027* (0.015)
<i>CmpCost<sup>m</sup></i>		
<i>CmpCost<sup>o</sup></i>	0.244 (0.318)	0.244 (0.642)
<i>CmpCost<sup>in</sup></i>	0.594*** (0.139)	0.584*** (0.150)

Note: Robust standard errors clustered by the renting-in agent in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table 4.11: Whether the Renting-in Compromises in the Bargaining? ( $D_{01} = 1$ )

	RENTING-IN COMP	Average Marginal Effects RENTING-IN COMP
LONG NON-AGRI	1.655** (0.634)	0.217** (1.677)
CROP CHANGE	1.016** (0.439)	0.106** (0.439)
LDSMOOTH	0.265 (0.345)	0.035 (0.050)
AFTER 2006	-11.22*** (1.289)	-1.474*** (0.195)
NON STRANGER	8.220*** (1.066)	1.080*** (0.180)
AGGR VILLAGE TRUST	0.0993 (0.0870)	0.133 (0.047)
ENTERPRISE	-2.531* (1.352)	-0.333** (0.131)
GRAIN EX-ANTE	-0.478 (0.740)	-0.063 (0.102)
DIRECT COMM	-0.133 (0.646)	-0.018 (0.084)
Province Fixed-Effects	Y	
Observations	65	
Log Likelihood	-15.842	

Note: Robust standard errors clustered by the renting-in agents in parentheses \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

## Chapter 5: Two-Dimensional Contract Design: Contractual Flexibility and Rental Payment

China's rural land rental market was established in the late 1990s (Liu, Carter and Yao, 1998; Brandt et al., 2002; Kung, 2002; Zhang, Ma and Xu, 2004). In the last two decades, this gradually maturing market has had an unprecedented impact on the rise of future agricultural production and national economic development (Wen, 2010). By the end of 2014, 25.5% of Chinese rural households had participated in the rural land rental market, resulting in a market that occupies 30.4% of national farmland (China Ministry of Agriculture (MOA), 2015).

In contrast to the land rentals in the late 1990s, which barely doubled the production scale by increasing the average farm size from half a hectare to one hectare (Jin and Deininger, 2009),<sup>1</sup> the land rentals in the 2010s are facilitating large-scale farming on more than 3.3 hectares (50 mu).<sup>2</sup> As of 2014, the land rental market had created more than three million large-scale farms (MOA, 2015). Thus, the market in the 2010s is revolutionizing agriculture by upgrading smallholder production to factory farming.

Besides improving agricultural productivity, the rural land rental market functions

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<sup>1</sup>The summary statistics in Jin and Deininger (2009) show that the average mu rented-in is less than 5 mu and the average household land endowment is less than 9 mu. Hence, the maximum post-rental farm is no greater than 14 mu (less than 1 hectare)

<sup>2</sup>50 mu is the minimum farm size to be considered a large-scale farming operation at the national level (MOA, 2015). Provinces in the north may set a higher minimum production scale for large-scale farming.

as a central hub between the separated urban and rural economies (Cheng and Selden, 1994). Through investment in agriculture through the market, capital from the urban economy flows to agriculture, relaxing credit constraints in the rural economy (Deininger and Jin, 2005). At the same time, the market facilitates a major shift of labor from agriculture to non-agricultural sectors in the cities (Deininger, Jin and Xia, 2014), which reduces the shortage of labor in non-agricultural sectors (Zhang, Yang and Wang, 2011). Thus, the rural land rental market is a vital part of the ongoing national economic reform intended to unify the separated urban and rural economies.

The existing literature focuses on studying market emergence and the constraints on market participation in the late 1990s and early 2000s. Kung (2002),<sup>3</sup> Yao (2000),<sup>4</sup> Zhang, Ma and Xu (2004),<sup>5</sup> and Deininger and Jin (2005)<sup>6</sup> consistently show that rural citizens' active participation in non-agricultural employment accelerated the emergence of the market. Yao (2000) and Deininger and Jin (2005) further built on the literature by identifying the impact of heterogeneity in agricultural capacity on promoting land rentals.<sup>7</sup> Although the rural land rental market in the early 2000s improved post-rental agricultural productivity by 60% (Jin and Deininger, 2009),<sup>8</sup> scholars believe that transaction costs caused by an imperfect labor market (Yao, 2000) and a collective land property right system (Jin and Deininger, 2009) are not trivial. The transaction costs constrain

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<sup>3</sup>The survey data in Kung (2002) was collected in 1999 by MOA in six provinces.

<sup>4</sup>The data in Yao (2000) is a two-year panel in 1988 and 1993 in three counties of Zhejiang Province.

<sup>5</sup>Zhang, Ma and Xu (2004) use a survey data collected in Zhejiang Province in 2001.

<sup>6</sup>The survey data in Deininger and Jin (2005) was collected by China's National Bureau of Statistics in 1997-1999 and 2001 in the three poorest provinces: Guizhou, western Hunan and Yunnan.

<sup>7</sup>Both studies show that land flows from farmers with low capacity to farmers with high capacity in the rural land rental market.

<sup>8</sup>Survey conducted by China's National Bureau of Statistics in 2002-2004 in the nine most important agricultural provinces.

market participation and prevent the market from attaining its full potential in improving productivity (Deininger and Jin, 2005).

However, as the previous literature concentrates on the early stage of the market within a limited timeframe, 1995-2005,<sup>9</sup> there are two large gaps in the literature. First, the mechanism of contract design in China's rural land rental market has not been studied thoroughly. Investigation of rental contracts has remained at a descriptive level (Ye, Jiang and Feng, 2006; Jin and Deininger, 2009) because the early contracts were characterized by low formality,<sup>10</sup> trivial rental payments,<sup>11</sup> short and non-fixed tenures,<sup>12</sup> and comparative homogeneity. As the market moves towards maturity, the rental contracts in the 2010s can be interpreted as careful and rational bargaining outcomes between the renting-in and renting-out. Thus, the rental contracts, which were not fully functioning at the early stage, have gradually become important in affecting participants' welfare and post-rental production.

The second gap in the literature is that our understanding of the critical institutions shaping the market in the 2010s is insufficient. The institutions that had crucial roles between 1995 and 2005 have become less important in the 2010s as national economic reform has progressed. The security of private land use right studied in Kung (2002) and Jin and Deininger (2009) was strengthened by the 2003 *National Contracting Law of Cultivated Land* (Gao, Huang and Rozelle, 2012). The grain quota studied in Kung (2002)

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<sup>9</sup>There is one exception. Gao, Huang and Rozelle (2012) provide observations of the market in 2008 in the six most important agricultural provinces.

<sup>10</sup>8.63% were formal contracts in Jin and Deininger (2009).

<sup>11</sup>In the World Bank China Living Standard Survey (CLSS) for 1995-1997, 29% of contracts had non-trivial rental payments.

<sup>12</sup>24.15% were fixed-tenure at an average length of 2.71 years in Jin and Deininger (2009).

and Zhang, Ma and Xu (2004) was abolished in 2006.<sup>13</sup> As a recommended policy of the Central Committee of the Communist Party of China (CCCPC, 2013),<sup>14</sup> the land rental market is now open to parties from outside of villages, greatly reducing incidence of the village-level outsider exclusion studied by Jin and Deininger (2009).

Hence, the two gaps in the literature call for up-to-date data that reflects the market and its institutions in the 2010s. In addition, new data collection should directly emphasize rental transactions rather than relying on rural household surveys as the old datasets did.<sup>15</sup> Using rural household surveys in the research on rental contracts leads to two potential problems. First, rural household surveys that select samples from all households (market participants and non-participants) may provide a truncated representation of rental attributes and market decisions. Second, rural household surveys that ignore the heterogeneity in market maturity<sup>16</sup> could present an unclear combination of markets with different maturity and thus transactions with different attributes, making it difficult to estimate causal relationships.

To remedy these deficiencies, I conducted a survey on rental transactions in two mature markets in 2014, providing the most up-to-date evidence of mature markets and shedding light on prospective market operation and policy design in less mature markets. This new dataset offers advantages over the existing datasets by (1) selecting the sample from the pool of market participants and (2) focusing on rental transactions in markets

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<sup>13</sup>Grain quota was abolished nationwide along with the abolishment of *Agricultural Taxation Clause* in 2006.

<sup>14</sup>Central Committee of the Communist Party of China, Document #1, a series of suggestions on national economic policies

<sup>15</sup>Yao (2000); Kung (2002); Zhang, Ma and Xu (2004); Deininger and Jin (2005); Jin and Deininger (2009); Gao, Huang and Rozelle (2012)

<sup>16</sup>Based on Yao (2000) and Kung (2002), Zhejiang Province had a higher rate of market participant than other provinces in the late 1990s.

with high maturity.

The use of this dataset is guided by a model of Nash bargaining over two terms of a rental contract: contractual flexibility and rental payment. The results from the bargaining model provide some general lessons for the empirical literature on contract design. In that literature, researchers (Joskow, 1988; Crocker and Masten, 1991; Brickley, 1999; Poppo and Zenger, 2002; Argyres, Bercovita and Mayer, 2007; Ryall and Sampson, 2009) have adopted either a simultaneous-equations framework or a reduced form regression; in both frameworks, one contractual term is viewed as an explanatory variable for another contractual term. I show that this framework is not consistent with a standard bargaining model and use these insights to explain seemingly contradictory results in the existing literature.

Using the survey data for the empirical model justified by my theory, I verify the bargaining mechanism and draw two empirical conclusions. First, I find that the renting-in agents who are non-strangers to their renting-out partners sign less flexible contracts and pay higher rental payments. In addition, contractual flexibility further decreases and rental payments are even higher when the non-stranger renting-in partners own enterprises. Hence, entrepreneurship fostered by the human capital within a village social network promotes agricultural development and village prosperity. Second, the rental payment offered to the renting-out agents with long-term non-agricultural employment is higher than that offered to the renting-out agents with short-term or temporary non-agricultural employment, suggesting a potential increase in income inequality within the village. These empirical conclusions further underscore the pivotal role that the rural land rental market has played in promoting the ongoing economic reform.

The remainder of the paper is organized as follows. Section 1 introduces the features of contract design in China's rural land rental market. Section 2 presents the Nash bargaining game between the renting-in and renting-out agents. It reveals the bargaining mechanism and derives comparative statics results. Drawing support from the theory I present, Section 3 is devoted to clarifying empirical puzzles and theoretical ambiguities in the empirical literature on the relationship between contractual terms. Section 4 describes the data, introduces the empirical measurements of contractual terms and the definitions of exogenous explanatory variables, and states the hypotheses derived from the comparative statics. Section 5 presents the empirical strategy justified by my theory and describes the results. Section 6 concludes by both discussing the policy implications for China and commenting on the broader implications for the empirical modeling and estimation of equations explaining the choice of contractual terms.

## 5.1 Introduction

A Chinese rural land rental contract transfers use right of farmland from the renting-out agents to the renting-in. The rural citizens who are entitled to a land use right (Ho, 2001) are the only potential renting-out agents in the market. The renting-in could be individuals or enterprises owned by rural citizens or non-rural citizens. The primary uncertainty associated with a rental contract is the renting-out's position in non-agricultural employment. Although they accounted for 28% of labor in non-agricultural sectors in 2013 (Yearbook, 2013), rural citizens experience high uncertainty in non-agricultural employment in China's separated urban-rural social structure. The separated social structure



isolates the rural citizens from the mainstream of the urban economy by keeping them in non-agricultural industries that do not offer long-term employment contracts (Cai, Park and Zhao, 2008). Thus, if the wage rate of a renting-out agent unexpectedly drops below a threshold at which it is optimal to allocate all labor to non-agricultural sectors, a rural citizen has an incentive to reallocate labor back to agriculture by terminating the rental contract before the end of the agreed tenure.

The renting-out's incentives for contract violation are further encouraged by the separated social structure. First, rural citizens are not fully covered by the national unemployment insurance offered to urban citizens. An unemployed renting-out agent who cannot access the urban social welfare system cannot survive in the urban economy on only the income of less than 5000 RMB per year from a land rental. Violating rental contracts is almost the only recourse for a renting-out who is disappointed in the urban economy. Second, the rural citizens are regarded as disadvantaged due to the huge income gap between rural and urban households<sup>17</sup> created by the separated social structure. To prevent the unemployed renting-out from losing his livelihood, the local governments acquiesce to the renting-out's contract violation at a low compensation by taking over dispute mediation of the market. Thus, the local government reduces the renting-out's cost of contract violation.

The renting-out's potential contract violation leads to efficiency loss in post-rental agricultural production. Since investment in agriculture is relation-specific, potential contract violation results in the renting-in's under-investment in agricultural production (Hart

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<sup>17</sup>The disposable personal income per capita of an urban household was three times of that of a rural household in 2013 (Yearbook, 2013).

and Moore, 1988). Furthermore, potential termination of the contract on one piece of land could lead to productivity loss on other pieces of land because of location specificity. Since the area of farmland per capita is extremely low in China (Yearbook, Annual), large-scale farming is only possible using individual pieces from multiple renting-out partners. Termination of a contract on a piece of land in the middle of rented land could make mechanical farming on other pieces of that land infeasible. Hence, the negative externality from location specificity aggravates the efficiency loss caused by the renting-out's potential contract violation.

Although agricultural production has its own uncertainties, the renting-out's uncertainty in non-agricultural employment is the uncertainty that leads to the most consequential ex-post contractual adaptation in the rural land rental market.<sup>18</sup> Hence, this paper assumes that the renting-out's uncertainty in non-agricultural employment is the only uncertainty in the market. Facing this uncertainty, the renting-in and renting-out agents design contracts to influence the allocation of ex-post surplus (Segal and Whinston, 2002).

One part of the ex-post surplus is determined by the trade-off between the renting-out's net gain and the renting-in's net loss associated with the renting-out's contract violation (Crocker and Reynolds, 1993). This trade-off is reflected in the bargaining over contractual flexibility, defined as the probability that the renting-out must pay an institutionally determined violation compensation<sup>19</sup> to the renting-in if the renting-out violates

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<sup>18</sup>Contract adaptation caused by uncertainty in agriculture is rarely seen in real practice because the rents are comparatively low so that the renting-in are able to pay for the rents even in agricultural failure.

<sup>19</sup>Since the local governments take over dispute mediation, the violation compensation is exogenous to contract design because it is a fixed monetary transfer determined by village institutions with trivial variation across contracts in a local market.

the contract. The higher the contractual flexibility the lower the probability that a violator would pay the violation compensation to the renting-in. Another part of the ex-post surplus is determined by the trade-off between the renting-in's willingness to pay and the renting-out's willingness to accept the use right of the renting-out's land, reflected by the bargaining over the rental payment.<sup>20</sup>

In sum, rental payment and contractual flexibility are the two key contractual terms that affect the ex-post surplus of a rental contract. The renting-in and renting-out have conflicts of interest in both. To avoid negotiation failure caused by the conflicting preferences, the renting-in and renting-out bargain cooperatively on contract design to maximize the joint ex-post surplus. The features of China's rural land rental contracts provide two advantages in simplifying the modeling of contract design.

First, location specificity in the market restricts endogenous matching between rental partners. Each renting-in agent first chooses an adjacent piece of land based on his/her agricultural production plan and then negotiates with the rural households owning the use right to that piece of land. The characteristics of the renting-in agent, such as farming expertise, could be endogenously matched with the characteristics of a village. However, the renting-in and renting-out are matched exogenously based on farm distribution shaped by the first collective land distribution in the late 1970s (Ho, 2001). Hence, in the context of China's rural land rental market, it is possible to study the impacts of heterogeneous preferences over uncertainty on contract design without amplifying the problem of endogenous matching (Lafontaine, 1992).

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<sup>20</sup>The price adjustment provisions are almost identical across contracts within a village. A great proportion of contracts set the rental payment in the units of rice. The final payment is the agreed units of rice times the national purchase price of the year. In this paper, fluctuation of the national purchase price is not discussed and is assumed constant over years.

Second, it is possible to identify the conflicting responses to uncertainty between the “buyers” and “sellers” in this market with only one primary uncertainty that leads to one type of ex-post contractual adaptation. Insights learned from the two parties’ asymmetrical responses to one type of uncertainty could potentially enrich the literature on contracting. Although China’s rural land rental market is an extreme context in that only one side has an incentive to request ex-post contractual adaptation, it sheds light on the impact of uncertainty in more general cases in which one side has comparatively more incentive to request ex-post contractual adaptation with respect to a certain type of uncertainty.

## 5.2 Theoretical Considerations

This section draws on the existing literature on contract design, which assumes that efficient contracting yields higher joint surplus (Corts and Singh, 2004). The contracting process is that two parties ( $\{m, n\}$ ), the renting-in ( $in$ ) and renting-out ( $o$ ), bargain over two contractual terms ( $\{i, j\}$ ): contractual flexibility ( $F$ ) and rental payment ( $R$ ). These two contractual terms are the arguments in the individual utility functions over a land rental contract ( $U^m(i, j)$ ).

### 5.2.1 Properties of Individual Utility Functions

A renting-out agent gains utility from contractual flexibility ( $U_F^o > 0$ ) by reducing the probability of paying the violation compensation. As the owner of land use right, the renting-out’s marginal utility of rental payment is positive ( $U_R^o > 0$ ). I assume that the

$U^o(\cdot)$  is concave. A renting-in agent loses utility from contractual flexibility ( $U_F^{in} < 0$ ) because an increase in contractual flexibility decreases the expected compensation paid by the renting-out. Paying for land use right, the renting-in's marginal utility of rental payment is negative ( $U_R^{in} < 0$ ).  $U^{in}(\cdot)$  is assumed to be concave.

Besides the conflicting preferences between the renting-in and renting-out over contractual terms, there is a heterogeneity in preferences among the agents of the same side that weigh  $F$  and  $R$  differently. An individual weight given to each contractual term represents its comparative importance in individual utility. Without loss of generality, I model the heterogeneity in preferences using individual utility functions with specific functional forms.<sup>21</sup> The renting-out's utility function ( $U^o$ ) is assumed to be a Cobb-Douglas function  $F^b R^{1-b}$ . The parameters  $b$  and  $1 - b$  represent the comparative importance the renting-out places on  $F$  and  $R$  respectively. Conditional on fixed contracts with other renting-out partners,<sup>22</sup> the renting-in's utility of a rental contract with one renting-out partner ( $U^{in}$ ) is assumed to be  $A - kF - (1 - k)R$ , where  $A$  represents the renting-in's expected utility of agricultural production on the land collected from all the renting-out partners. Parameters  $k$  and  $1 - k$  represent the comparative importance the renting-in places on  $F$  and  $R$ , respectively.

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<sup>21</sup>To ensure the existence of unique solutions to each contractual term,  $U^o$  is not a linear transformation of  $U^{in}$ . The optimal contractual terms cannot be solved uniquely because all combinations of contractual terms on one party's indifference curves are also on the indifference curves of the other party.

<sup>22</sup>It is possible for a renting-in to have multiple renting-out partners.

### 5.2.2 Nash Bargaining Game

The renting-in and renting-out bargain over  $F$  and  $R$  to maximize the joint surplus of a rental contract. The bargaining power of the renting-out and renting-in are  $\alpha$  and  $1 - \alpha$  respectively. The bargaining power is defined as the capacity to dominate the other in the negotiation. The threat points of the renting-in and renting-out are denoted as  $\bar{U}^{in}$  and  $\bar{U}^o$ . A threat point represents the utility obtained by each agent when an agreement is not reached.

The threat point of the renting-in ( $\bar{U}^{in}$ ) is the expected utility of agricultural production excluding the land belonging to the single renting-out partner. Losing the land of the single renting-out, the renting-in experiences a direct loss on this piece of land and an indirect loss on other pieces of land through the negative externality of location specificity. The sum of these two types of loss captured by  $A - \bar{U}^{in}$  is the renting-in's maximum willingness to pay for the rental contract on this piece of land.

Without reaching rental agreement, the renting-out could keep farming, move to non-agricultural sectors, or partially work in both sectors. Without loss of generality, I assume that the renting-out stays in agriculture if an agreement is not reached agreement.<sup>23</sup> Hence,  $\bar{U}^o$  represents the renting-out's utility of household agricultural production before rentals, which is the renting-out's minimum willingness to accept the contract on this piece of land.

The Nash bargaining game leads to an optimal contract that maximizes the joint

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<sup>23</sup>Since agricultural profits and non-agricultural wage rates are exogenous, the impacts of  $\bar{U}^o$  on the bargaining and thus on the contractual terms are not affected by the source of  $\bar{U}^o$ .

surplus of the renting-in and renting-out by choosing  $F$  and  $R$ .

$$\max_{F,R} (F^b R^{1-b} - \bar{U}^o)^\alpha (A - kF - (1-k)R - \bar{U}^{in})^{1-\alpha}$$

Assuming an interior solution, which is justified below, Eqs (5.1) and (5.2) provide the solution for each contractual term (see Appendix A1).

$$F^* = \frac{b}{k} [\alpha(A - \bar{U}^{in}) + (1-\alpha)\bar{U}^o \frac{k^b(1-k)^{1-b}}{b^b(1-b)^{1-b}}] \quad (5.1)$$

$$R^* = \frac{1-b}{1-k} [\alpha(A - \bar{U}^{in}) + (1-\alpha)\bar{U}^o \frac{k^b(1-k)^{1-b}}{b^b(1-b)^{1-b}}] \quad (5.2)$$

I denote one party's ( $m$ ) marginal utility of one contractual term ( $i$ ) at the interior solution ( $\frac{\partial U^m}{\partial i} |_{F=F^*, R=R^*}$ ) as  $U_{i^*}^m$  for short. The expression  $\frac{k^b(1-k)^{1-b}}{b^b(1-b)^{1-b}}$  in Eqs (5.1) and (5.2) is the ratio between  $U_{i^*}^{in}$  and  $U_{i^*}^o$  (see Appendix A2). The interior solutions are rearranged as follows:

$$F^* = \left(\frac{b}{k}\right) [\alpha(A - \bar{U}^{in}) + (1-\alpha)\bar{U}^o \frac{|U_{F^*}^{in}|}{|U_{F^*}^o|}] \quad (5.3)$$

$$R^* = \left(\frac{1-b}{1-k}\right) [\alpha(A - \bar{U}^{in}) + (1-\alpha)\bar{U}^o \frac{|U_{R^*}^{in}|}{|U_{R^*}^o|}]. \quad (5.4)$$

I assume that the interior solutions in Eqs (5.3) and (5.4) are finite by making ASSUMPTION 1 (see Appendix A3). The  $b$  and  $k$  excluded by ASSUMPTION 1 are shown by the shaded area along the borders in Figure 5.1.

ASSUMPTION 1:  $0 < b < 1$  and  $0 < k < 1$ .

The interior solutions achieve optimality if the renting-in and renting-out's individ-

ual utility at the interior optimal contract  $(U^m(F^*, R^*))$  is greater than the two parties' respective threat points  $(\bar{U}^m)$ . To ensure the optimality of interior solutions, I make ASSUMPTION 2 (see Appendix A4).<sup>24</sup>

$$\text{ASSUMPTION 2: } \frac{A - \bar{U}^{in}}{|U_{i^*}^{in}|} > \frac{\bar{U}^o}{|U_{i^*}^o|}$$

$\frac{A - \bar{U}^{in}}{|U_{i^*}^{in}|}$  and  $\frac{\bar{U}^o}{|U_{i^*}^o|}$  respectively translate the renting-in's maximum willingness to pay and the renting-out's minimum willingness to accept into the units of the same contractual term. The intuition of ASSUMPTION 2 is that the joint surplus maximized by the interior  $F^*$  and  $R^*$  is non-negative if the maximum units of each contractual term that the renting-in is willing to pay is greater than the minimum units of that contractual term that the renting-out is willing to accept.

Besides fitting the split-the-difference rule,<sup>25</sup> the renting-in and renting-out's utilities at the optimal contract (Eqs (5.5) and (5.6)) reveal that the value of a contract<sup>26</sup> is a bargaining outcome between the renting-in's maximum willingness to pay and the renting-out's minimum willingness to accept in units of utility.

$$U^o(F^*, R^*) = \alpha(A - \bar{U}^{in}) \frac{|U_{i^*}^o|}{|U_{i^*}^{in}|} + (1 - \alpha)\bar{U}^o \quad (5.5)$$

$$U^{in}(F^*, R^*) = A - [\alpha(A - \bar{U}^{in}) + (1 - \alpha)\bar{U}^o \frac{|U_{i^*}^{in}|}{|U_{i^*}^o|}] \quad (5.6)$$

Each optimal contractual term (Eqs (5.3) and (5.4)) has two composite terms. The

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<sup>24</sup>To satisfy ASSUMPTION 2,  $b \notin \{0, 1\}$ , which is excluded by ASSUMPTION 1 (see Appendix A4)

<sup>25</sup>The renting-in and renting-out split  $A - \bar{U}^{in} - \bar{U}^o$  based on respective bargaining power.

<sup>26</sup>Multiplying  $\frac{A - \bar{U}^{in}}{|U_{i^*}^{in}|}$  by  $|U_{i^*}^o|$  and  $\frac{\bar{U}^o}{|U_{i^*}^o|}$  by  $|U_{i^*}^{in}|$  represent one party's utility valuation of the other party's willingness to pay/accept.



first component,  $\alpha(A - \bar{U}^{in}) + (1 - \alpha)\bar{U}^o \frac{|U_{F^*}^{in}|}{|U_{F^*}^o|}$ , is the value of the optimal contract.<sup>27</sup>

Taking this first component as a standard unit of measurement,  $F^*$  and  $R^*$  are respectively  $\frac{b}{k}$  and  $\frac{1-b}{1-k}$  units of the standard measurement. Thus, the second component,  $\frac{b}{k}$  or  $\frac{1-b}{1-k}$ , reveals the bargaining rule of specific contractual terms after maximizing the joint surplus. Since a decreasing  $|b - k|$  indicates an escalated conflict between rental partners on each contractual term, the bargaining rules show that the difference between  $F^*$  and  $R^*$  in relative magnitude decreases in the intensity of conflicts.<sup>28</sup>

### 5.2.3 Comparative Statics

The bargaining power and the threat points impact  $F^*$  and  $R^*$  by affecting the value of the optimal contract. With ASSUMPTION 2, the renting-out's gain from  $\Delta\alpha$ ,  $A - \bar{U}^{in}$ , is greater than the renting-in's loss associated with  $\Delta\alpha$ ,  $\bar{U}^o \frac{|U_{i^*}^{in}|}{|U_{i^*}^o|}$ . Hence, an increase in  $\alpha$  increases both  $F^*$  and  $R^*$  by increasing the value of the optimal contract, which results in a contract favoring the renting-out.

$$\frac{\partial F^*}{\partial \alpha} = \frac{1-b}{1-k} [(A - \bar{U}^{in}) - \bar{U}^o \frac{|U_{F^*}^{in}|}{|U_{F^*}^o|}] > 0$$

$$\frac{\partial R^*}{\partial \alpha} = \frac{b}{k} [(A - \bar{U}^{in}) - \bar{U}^o \frac{|U_{R^*}^{in}|}{|U_{R^*}^o|}] > 0$$

An increase in one party's threat point results in a contract more favorable to that

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<sup>27</sup>It is the renting-in's valuation of the renting-out's utility received at the optimal contract ( $\frac{|U_{i^*}^m|}{|U_{i^*}^n|} \times U^o(F^*, R^*)$ ) and it is also equivalent to the renting-in's utility paid at the optimal contract ( $A - U^{in}(F^*, R^*)$ )

<sup>28</sup>An increase in  $b$  indicates that the renting-out gains a higher marginal utility from  $F$  while an increase in  $k$  indicates that the renting-in experiences a higher marginal utility loss from  $F$ . Hence, closely matched  $b$  and  $k$  (small  $|b - k|$ ) indicates high intensity of conflicts over each contractual term.

party.  $\Delta \bar{U}^o$  increases the value of the optimal contract, which favors the renting-out by increasing both  $F^*$  and  $R^*$ .  $\Delta \bar{U}^{in}$  decreases the value of the optimal contract, which favors the renting-in by decreasing both  $F^*$  and  $R^*$ .

$$\frac{\partial F^*}{\partial \bar{U}^o} = (1 - \alpha) \left( \frac{k(1-b)}{(1-k)b} \right)^{b-1} > 0$$

$$\frac{\partial R^*}{\partial \bar{U}^o} = (1 - \alpha) \left( \frac{k(1-b)}{(1-k)b} \right)^b > 0$$

$$\frac{\partial F^*}{\partial \bar{U}^{in}} = -\frac{\alpha b}{k} < 0$$

$$\frac{\partial R^*}{\partial \bar{U}^{in}} = -\frac{\alpha(1-b)}{1-k} < 0$$

In sum, the bargaining power and the threat points affect  $F^*$  and  $R^*$  in the same direction. The contract curve, which is a mapping between  $F^*$  and  $R^*$  with respect to  $\alpha$  or  $\bar{U}^m$ , slopes upward. Figure 5.2 shows the indifference curves of the renting-out ( $a$ ,  $a'$  and  $a''$ ) and the renting-in ( $b$ ,  $b'$ , and  $b''$ ) and visualizes the upward-sloping contract curve with respect to  $\alpha$  as an example showing the impacts of  $\alpha$  or  $\bar{U}^m$  on  $F^*$  and  $R^*$ .

The comparative importance of contractual flexibility ( $b$  or  $k$ ) impacts  $F^*$  and  $R^*$  from two perspectives. First,  $b$  and  $k$  directly affect  $F^*$  and  $R^*$  through the bargaining rule ( $\frac{b}{k}$  and  $\frac{1-b}{1-k}$ ).<sup>29</sup> Second,  $b$  and  $k$  indirectly affect  $F^*$  and  $R^*$  through the weighting index  $\frac{|U_{i^*}^{in}|}{|U_{i^*}^o|}$ .<sup>30</sup> The direct and indirect impacts of  $b$  and  $k$  could be opposite in sign due specific functional forms (see Appendix A5).

<sup>29</sup>Example: direct impact of  $b$  on  $F^*$  is  $\frac{\partial \frac{b}{k}}{\partial b} \times [\alpha(A - \bar{U}^{in}) + (1 - \alpha)\bar{U}^o \frac{|U_{F^*}^{in}|}{|U_{F^*}^o|}]$ .

<sup>30</sup>Example: indirect impact of  $b$  on  $F^*$  is  $\frac{b}{k} \times \frac{\partial [\alpha(A - \bar{U}^{in}) + (1 - \alpha)\bar{U}^o \frac{|U_{F^*}^{in}|}{|U_{F^*}^o|}]}{\partial b}$ .

I assume that the most important property of  $b$  and  $k$  is to directly determine the bargaining rule of  $F^*$  and  $R^*$ , which indicates that the direct impacts of  $b$  and  $k$  outweigh the indirect impacts if the direct and indirect impacts are opposite in sign. The indirect impacts of  $b$  and  $k$  when opposite in sign to the direct impacts are less important because the weighting index  $(\frac{|U_{i^*}^{in}|}{|U_{i^*}^o|})$  mainly facilitates the comparison between two parties' utility with different preferences. Thus, the combinations of  $b$  and  $k$  are ruled out if the indirect impacts of  $b$  or  $k$  are opposite in sign to the corresponding direct impacts.

The direct impacts of  $k$  on  $F^*$  and  $R^*$  dominate the comparative statics with respect to  $k$  without further assumptions (see Appendix A5).

$$\frac{\partial F^*}{\partial k} = -\frac{1}{k^2} \alpha (A - \bar{U}^{in}) b - (1 - \alpha) b \left( \frac{b(1-k)}{k(1-b)} \right)^{-b} \frac{1}{k^2} \bar{U}^o < 0$$

$$\frac{\partial R^*}{\partial k} = \frac{1}{(1-k)^2} \alpha (A - \bar{U}^{in}) (1-b) + (1 - \alpha) b \left( \frac{b(1-k)}{k(1-b)} \right)^{-b} \frac{1}{k-k^2} \bar{U}^o > 0$$

As  $k$  increases,  $F$  becomes more costly than  $R$  to the renting-in. Hence,  $\Delta k$  decreases  $F^*$  and increases  $R^*$  because the bargaining rule gives less weight to  $F^*$  and more weight to  $R^*$ .

The comparative statics of  $F^*$  and  $R^*$  with respect to  $b$  are the following.

$$\frac{\partial F^*}{\partial b} = \frac{\alpha (A - \bar{U}^{in})}{k} + \frac{1 - \alpha}{k} \left[ \frac{|U_{F^*}^{in}|}{|U_{F^*}^o|} \left( 1 + b \ln \frac{k(1-b)}{b(1-k)} \right) \right] \bar{U}^o \quad (5.7)$$

$$\frac{\partial R^*}{\partial b} = -\frac{\alpha (A - \bar{U}^{in})}{1-k} - \frac{1 - \alpha}{1-k} \left[ \frac{|U_{F^*}^{in}|}{|U_{F^*}^o|} \left( 1 + (b-1) \ln \frac{k(1-b)}{b(1-k)} \right) \right] \bar{U}^o \quad (5.8)$$

To have the direct and indirect impacts of  $b$  in the same direction, I assume that  $b$

and  $k$  satisfy ASSUMPTION 3 (see Appendix A5). The combinations of  $b$  and  $k$  ruled out by ASSUMPTION 3 are at the southeast and northwest corners in Fig 5.1 (see Appendix A5).

ASSUMPTION 3

$$\text{Condition 1: } 1 + b \ln \frac{k(1-b)}{b(1-k)} \geq 0$$

$$\text{Condition 2: } 1 + (b-1) \ln \frac{k(1-b)}{b(1-k)} \geq 0$$

Figure 5.1 shows that the combinations of  $b$  and  $k$  satisfying ASSUMPTIONS 3 are comparatively small in  $|b-k|$ . Since smaller  $|b-k|$  indicates a stronger conflict on each contractual term, the intuition of ASSUMPTIONS 3 is that the direct impact of  $b$  is more likely to dominate the comparative statics with respect to  $b$  if there is an intensified conflict between rental partners. Hence, I focus on the comparative statics of  $F^*$  and  $R^*$  with respect to  $b$  and  $k$  in intensified bargainings.

With ASSUMPTION 3,  $\frac{\partial F^*}{\partial b} > 0$  and  $\frac{\partial R^*}{\partial b} < 0$ . As  $b$  increases,  $F$  becomes more valuable than  $R$  to the renting-out. Hence,  $\Delta b$  increases  $F^*$  and decreases  $R^*$ .

The contract curves with respect to  $b$  and  $k$  are downward-sloping because the impacts of  $b$  and  $k$  on  $F^*$  and  $R^*$  are in the opposite direction. Figure 5.3 visualizes the contract curve with respect to  $k$  as an example showing the impacts of  $b$  or  $k$  on  $F^*$  and  $R^*$ .

### 5.3 Lessons for the Empirical Literature on Contract Design

The solutions of the Nash Bargaining game suggest an empirical structure that should be estimated in an empirical test of the bargaining process. However, this theoretically justified empirical strategy is markedly different from that in existing empirical literature on contract design.<sup>31</sup> I present the empirical strategy justified by my theory, giving insights on the econometric problems associated with the conventional strategies used in the existing empirical contributions. Furthermore, I compare the conventional strategies with the theoretically justified strategy. The comparisons explain seemingly contradictory results on the relationship between the same pair of contractual terms in the existing literature.

#### 5.3.1 Justifying the Empirical Strategy

The solutions of  $F^*$  and  $R^*$  (Eqs (5.1) and (5.2)) justify using the following empirical system:

$$F^* = g_f(\alpha, b, k, \bar{U}^o, \bar{U}^{in}) \quad (5.9)$$

$$R^* = g_r(\alpha, b, k, \bar{U}^o, \bar{U}^{in}) \quad (5.10)$$

However, this empirical system is different from the conventional one that is implicit when there is an interest in estimating the correlation between two contractual terms across contracts (Poppo and Zenger, 2002; Argyres, Bercovita and Mayer, 2007). Many papers study the relationship between contractual terms by regressing one contractual

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<sup>31</sup>e.g., Joskow (1988); Crocker and Masten (1991); Brickley (1999); Poppo and Zenger (2002); Argyres, Bercovita and Mayer (2007); Ryall and Sampson (2009)

term ( $C_1$ ) on the other contractual term ( $C_2$ ) and exogenous variables (Joskow, 1988; Crocker and Masten, 1991; Holstrom and Milgrom, 1994; Brickley, 1999; Poppo and Zenger, 2002; Argyres, Bercovita and Mayer, 2007; Ryall and Sampson, 2009). The conventional empirical strategy is captured in Eqs (5.11) and (5.12), where  $G$  and  $H$  are the exogenous vectors.

$$E(C_1) = a_1C_2 + \beta\mathbf{G} \quad (5.11)$$

$$E(C_2) = a_2C_1 + \theta\mathbf{H} \quad (5.12)$$

The theoretically justified empirical system, Eqs (5.9-5.10), gives insights on empirical strategies from two perspectives. First,  $F^*$  and  $R^*$  are expressed as functions of the same exogenous variables, but not of each other. The empirical strategy justified by the theory is a system of two separate regressions<sup>32</sup> with the same set of exogenous variables, which is different from the conventional empirical strategy in the aforementioned existing literature (Eqs (5.11-5.12)). Hence, the correlation between two contractual terms across agreements, appealing in the empirical literature but questioned in literature reviews (Shelanski and Klein, 1995; Masten and Saussier, 2000; Chiappori and Salanie, 2003b; Lafontaine and Slade, 2013), does not reflect causal links between two contractual terms.

Second, Eqs (5.9) and (5.10) offers insights into the use of instrumental variables (IVs). Research focused on substitutability and complementarity between two contractual terms (Argyres, Bercovita and Mayer, 2007; Crocker and Masten, 1991; Saussier, 2000;

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<sup>32</sup>The error terms of  $F^*$  and  $R^*$  could be correlated, similar to the seemingly uncorrelated regressions. The simultaneous correlation, which is further discussed in the empirical section, does not change the arguments in this section.

Brickley, 1999) regresses one contractual term on the other and instruments the regressor contractual term by the IVs that are assumed to be uncorrelated with the regressand contractual terms. However, the IVs may be correlated with not only the regressor contractual term but also the regressand (Lafontaine and Slade, 2013). For example, the plausible selection criteria of IVs give rise to contradictory arguments across studies. In Poppo and Zenger (2002), longevity of contractual relationship as an IV is assumed not to be correlated with contractual complexity. However, relationship history explains contractual complexity<sup>33</sup> in Argyres, Bercovita and Mayer (2007).

Indeed, Eqs (5.9-5.10) show that, among the five exogenous explanatory variables ( $\alpha$ ,  $b$ ,  $k$ ,  $\bar{U}^o$ , and  $\bar{U}^o$ ), there is no variable that affects one contractual term but does not affect the other one. If only  $C_1$  is studied and regressed on  $C_2$  (e.g., Joskow (1988)), none of the five variables can be used as an IV for  $C_2$  because these variables are determinants of both  $C_1$  and  $C_2$ . If both  $C_1$  and  $C_2$  are studied (e.g., Poppo and Zenger (2002)), none of the five variables can be used to satisfy the order condition because no variable can be excluded from either Eq (5.11) or (5.12).

### 5.3.2 Conventional Strategies versus the Justified Empirical Strategy

In the existing literature, correlations between contractual terms have been estimated by four types of conventional strategies with common structures. I analyze each conventional strategy when the justified empirical system is Eqs (5.9-5.10). The comparisons between the conventional strategies and the justified empirical strategy show that  $a_1$  and  $a_2$ , as studied in the literature, are actually functions of the elements of the empirical

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<sup>33</sup>Contractual complexity refers to detailed contingency plan and task description.

system that my theory justifies.

The justified empirical system (Eqs (5.9-5.10)) can be simplified as Eqs (5.13-5.14) by assuming that  $\varepsilon_{1i}$  and  $\varepsilon_{2i}$  are independent and normally distributed at zero mean and  $corr(\varepsilon_{1i}, \varepsilon_{2i}) = corr(\varepsilon_{1i}, \varepsilon_{2j}) = 0$ . For simplicity,  $x_i$  and  $w_i$  are single variables.

$$F_i = \beta_1 x_i + \theta_1 w_i + \varepsilon_{1i} \quad (5.13)$$

$$R_i = \beta_2 x_i + \theta_2 w_i + \varepsilon_{2i} \quad (5.14)$$

To capture the essential elements of the comparative statics, I assume that  $x_i$  represents a proxy for  $\alpha$  or  $\bar{U}^m$  and  $w_i$  represents a proxy for  $b$  or  $k$ . Hence,  $\frac{\beta_1}{\beta_2} > 0$  because  $\alpha$  and  $\bar{U}^m$  affect  $F^*$  and  $R^*$  in the same direction while  $\frac{\theta_1}{\theta_2} < 0$  because  $b$  and  $k$  affect  $F^*$  and  $R^*$  in the opposite direction. There are four possible conventional strategies for estimating  $a_1$  and  $a_2$  in Eqs (5.11) and (5.12).

### 5.3.2.1 No Omitted Exogenous Variables (OLS)

The first situation is that no exogenous explanatory variables are omitted in the corresponding conventional strategy (Eqs (5.15) and (5.16)).

$$F_i = a_1 R_i + \kappa_1 x_i + \tau_1 w_i + \mu_{1i} \quad (5.15)$$

$$R_i = a_2 F_i + \kappa_2 x_i + \tau_2 w_i + \mu_{2i} \quad (5.16)$$

Regressing Eqs (5.15) and (5.16) separately by OLS, the *plims* of the expected



values of  $a_1$  and  $a_2$  in Eqs (5.15) and (5.16) are zero (see Appendix A6), showing that the correlation between  $F_i$  and  $R_i$  is insignificantly different from zero conditional on the variances of exogenous variables.

### 5.3.2.2 Omitting Exogenous Variables in One Single Equation (OLS)

The second situation is that the corresponding conventional strategy omits one or more exogenous explanatory variables and only  $a_1$  in Eq (5.11) is of interest. Two possible conventional strategies have been used in the literature. The first strategy is to regress  $F_i$  on  $R_i$  and on the non-omitted exogenous variables directly (e.g., MacAvoy (1962); Joskow (1988)). Eq (5.17) is an example of this conventional strategy omitting  $x_i$ .

$$F_i = a_1 R_i + \tau_1 w_i + \mu_{1i} \quad (5.17)$$

The *plim* of the expected value of  $a_1$  is shown below (see Appendix A6). Given that Eqs (5.13) and (5.14) are the theoretically justified model,  $plim(\hat{a}_1)$  in Eq (5.17) should be equal  $\frac{\beta_1}{\beta_2}$ . However, the strategy Eq (5.17) introduces a bias ( $\sum \varepsilon_{2i}^2 \sum w_i^2$ ) in the estimation of  $a_1$  by including  $R_1$  and omitting  $x_i$ .<sup>34</sup>

$$plim(\hat{a}_1) = plim\left\{ \frac{\beta_2 \beta_1 [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2]}{\beta_2^2 [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2] + \sum \varepsilon_{2i}^2 \sum w_i^2} \right\}$$

The expression of  $plim(\hat{a}_1)$  shows that the relationship between  $F_i$  and  $R_i$  is always non-negative if  $x_i$  is omitted because  $\beta_1$  and  $\beta_2$  have the same sign and  $\sum x_i^2 \sum w_i^2 -$

<sup>34</sup>Chiappori and Salanie (2003b), Masten and Saussier (2000), and Lafontaine and Slade (2013) all argue that the simultaneity bias in estimating the complementarity between two contractual terms is the primary econometric challenge facing the research on complementarity.

$(\sum x_i w_i)^2$  is non-negative based on Cauchy-Schwartz inequality. However, if I modify Eq (5.17) by including  $R_i$  and omitting  $w_i$  ( $F_i = a_1 R_i + \kappa_1 x_i + \mu_{1i}$ ),  $plim(\hat{a}_1)$  is the following (see Appendix A6):

$$plim(\hat{a}_1) = plim\left\{\frac{\theta_2 \theta_1 [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2]}{\theta_2^2 [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2] + \sum \varepsilon_{2i}^2 \sum x_i^2}\right\}.$$

By omitting  $w_i$ ,  $plim(\hat{a}_1)$  becomes non-positive because  $\theta_1$  and  $\theta_2$  have different signs and  $\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2$  is non-negative. That the sign of  $\hat{a}_1$  is affected by the omitted variables could explain the different relationships between the same pair of contractual terms estimated by OLS in the literature. MacAvoy (1962) shows that the relationship between initial contractual price and the dummy of renegotiation clauses is positive, opposite to his own theoretical prediction. In contrast to MacAvoy (1962), Joskow (1988) shows that the initial contractual price is insignificantly affected by the price renegotiation provisions. Thus, it is possible that MacAvoy (1962) omits a group of variables that jointly affect the two contractual terms in the same direction while the potentially omitted variables in Joskow (1988) may not jointly affect both contractual terms significantly.

### 5.3.2.3 Omitting Exogenous Explanatory Variables in One Single Equation (IV)

Some papers, rather than using OLS, instrument the regressor contractual term to remove any simultaneity bias caused by the correlation between the regressor contractual term and the unobserved error term of the regressand contractual term (e.g., Crocker and Masten (1991); Poppo and Zenger (2002)). Eqs (5.18-5.19) is an example of estimating

$a_1$  by instrumenting  $R_i$ .

$$F_i = a_1 R_i + \tau_1 w_i + \mu_{1i} \quad (5.18)$$

$$R_i = \beta_2 x_i + \theta_2 w_i + \mu_{2i} \quad (5.19)$$

The “plausible IV” for Eqs (5.18-5.19) is  $x_i$ , which is actually an omitted variable in Eq (5.18) (see Eqs (5.13) and (5.14)). In a 2SLS estimation, the estimators of  $\hat{a}_1$  and  $\hat{\tau}_1$  are as follows (see Appendix A6):

$$plim(\hat{a}_1) = \frac{\beta_1}{\beta_2}$$

$$plim(\hat{\tau}_1) = \frac{\beta_2 \theta_1 - \beta_1 \theta_2}{\beta_2}.$$

Using  $x_i$  as a “plausible IV” for  $R_i$ ,  $plim(\hat{a}_1)$  is positive at  $\frac{\beta_1}{\beta_2}$ . However, if I modify Eqs (5.18-5.19) by using  $w_i$  as the “plausible IV” as Eqs (5.20-5.21),  $plim(\hat{a}_1)$  changes to negative at  $\frac{\theta_1}{\theta_2}$ .

$$F_i = a_1 R_i + \kappa_1 x_i + \mu_{1i} \quad (5.20)$$

$$R_i = \beta_2 x_i + \theta_2 w_i + \mu_{2i} \quad (5.21)$$

Hence, the sign of  $\hat{a}_1$  is affected by the selection of the “plausible IVs” which clarifies the contradictory relationships between the same pair of contractual terms estimated using IVs in the literature. For example, both Corts and Singh (2004) and Poppo and Zenger (2002) use proxies of asset specificity as the IVs for relational governance. Corts and Singh (2004) show that repeated interaction and high-powered formal contracts<sup>35</sup>

<sup>35</sup>The high-powered formal contracts refer to fixed-cost contracts.

are substitutes in the offshore drilling industry, which is supported by non-IV results in Kalnins and Mayer (2004) studying the information technology industry and Gulati (1995) using a multi-industry alliance dataset. In contrast to Corts and Singh (2004), Poppo and Zenger (2002) show that relational governance and contractual complexity are complements in the information service industry, which is consistent with non-IV results in Ryall and Sampson (2009) and Argyres, Bercovita and Mayer (2007) studying the same industry. Thus, the justified empirical system reconciles the contradictory empirical results by distinguishing the IVs that affect  $F^*$  and  $R^*$  in the same versus opposite directions.

#### 5.3.2.4 Omitting Exogenous Variables in a Two-Equation System

The fourth situation is to study both  $a_1$  and  $a_2$  in Eq (5.11) and (5.12). To study  $a_1$  and  $a_2$ , each equation must exclude at least one exogenous variable if the order condition is to be satisfied. The following is an example of omitting  $x_1$  in Eq (5.22) and omitting  $w_i$  in Eq (5.23). Similar to the previous comparison, the estimators of  $a_1$  and  $a_2$  are also affected by the selection of the excluded variables (see Appendix A6). Ignoring the correlation between  $\mu_1$  and  $\mu_2$  and estimating the system Eqs (5.22-5.23) using 2SLS,<sup>36</sup> omitting  $x_i$  in Eq (5.22) results in a positive  $plim(\hat{a}_1)$ , and omitting  $w_i$  in Eq (5.23) results in a negative  $plim(\hat{a}_2)$ . If  $w_i$  is omitted in Eq (5.22) and  $x_i$  is omitted in Eq (5.23), the

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<sup>36</sup>Assuming non-trivial correlation between  $\mu_1$  and  $\mu_2$  does not affect the following argument on the impact of omitted variables on  $plim(\hat{a}_1)$

signs of  $plim(\hat{a}_1)$  and  $plim(\hat{a}_2)$  are reversed.

$$F_i = a_1 R_i + \tau_1 w_i + \mu_{1i} \quad (5.22)$$

$$R_i = a_2 F_i + \kappa_2 x_i + \mu_{2i} \quad (5.23)$$

### 5.3.2.5 General Lessons for the Literature

The four sets of comparisons between the conventional strategies and the justified empirical strategy consistently show that the relationship between two contractual terms, as a function of the elements in the justified empirical system, is affected by the impact patterns of the omitted exogenous variables (or IVs) on contractual terms. The correlation between two contractual terms, therefore, does not reflect any causality between contractual terms. Not only is the correlation between contractual terms spurious, the correlation, captured by estimators such as  $\hat{a}_1$  in Eq (5.18), is not interpretable without disentangling the elements in the justified empirical system.<sup>37</sup> The interpretation is even more ambiguous when multiple exogenous variables are omitted (or selected as IVs) because the correlation between contractual terms is a sum of positive or negative correlations with respect to each omitted variable (or IV).<sup>38</sup>

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<sup>37</sup>Existing transaction-cost and agency theories cannot directly explain the dependency among multiple contract terms. (Saussier, 2000; Brickley, 1999; Lafontaine and Slade, 2013)

<sup>38</sup>For the same reason, the estimators of the coefficients on the exogenous variables (e.g.,  $\tau_1$  in Eq (5.18)) are not interpretable either.

## 5.4 Data, Empirical Measurements, and Hypotheses

### 5.4.1 Data

The data comes from the survey I conducted in Jinghai County of Tianjin Municipality and Feixi County of Anhui Provinces in 2014. I selected Jinghai County to represent agriculture in the North China Plain, one of the most important commercial field crop production areas. I selected Feixi County, located in the middle of Anhui Province with China's north-south dividing line running through it, to represent the agricultural operations of the north and south across all three types of land terrain. Randomly selecting five towns with active land rental markets in these two counties, the survey collected information on 332 land rental contracts from 13 villages. The survey included questions on renting-out agents' household characteristics and the degree to which they trust non-strangers vs. strangers in the context of land rental issues, renting-in agents' agricultural production plans, relationships between rental partners, bargaining processes on contractual terms, and contract details.

This data has two advantages over existing datasets on China's rural land rental transactions. First, the survey focuses on rental transactions in mature markets with comparatively homogenous rental attributes. The five selected towns in Jinghai and Feixi are between 13 and 22 miles from the nearest cities, Tianjin and Hefei,<sup>39</sup> respectively. As of 2014, the land rental market in both counties, embedded in comparatively perfect non-agricultural labor markets, had covered more than half of the total farmland endowment,

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<sup>39</sup>Hefei is the province capital of Anhui Province

and half of the land rented out was being cultivated by large-scale farms (Li, 2014*a,b*). From the perspective of market involvement and post-rental farm size, the survey reflects fast-growing mature markets facilitating large-scale farming.

Second, the survey represents each local market by applying stratified sampling based on market structure along with three-stage cluster sampling based on a three-layer administrative system: town, village, and farmer team. In each local market, all the important renting-in agents with large market shares were surveyed and the rest of the renting-in agents with comparatively smaller post-rental farms were randomly selected if they jointly occupied a significant proportion of land. The renting-out agents were stratified based on their renting-in partners. Each important renting-in (or group of renting-in) agent has a pool of renting-out partners. The renting-out agents were randomly selected from each pool in proportion to the corresponding renting-in agent's market share. This selection approach guarantees that the data represents, on average, more than 50% of land involved in each local market.

The next two subsections describe the variables used in the analysis. Table 5.1 gives summary statistics and the definitions of the variables.

#### 5.4.2 Empirical Measurements of Contractual Terms

Contractual flexibility is defined as the probability that a renting-out must pay the violation compensation to the renting-in if the renting-out violates the contract. Contractual flexibility is reflected by two dummy variables affecting the likelihood that a judge will declare a contractual violation: contract formality (*FORMAL*) and tenure format

(*FIX-TENURE*). First, contract formality, classified as formal or informal, represents the legal enforcement of all contractual provisions including the implementation of violation compensation. A formal contract with higher enforcement is less flexible than an informal contract. Second, the tenure format, classified as fixed or non-fixed tenure, provides the basis for judging whether an ex-post action is a violation or not. Terminating a contract before the end of a specified fixed tenure is more likely to be judged as a violation than the same behavior under a contract with non-fixed tenure. Thus, a fixed-tenure contract is less flexible than the alternative.

Since it is unclear which dummy is more important in affecting contractual flexibility, I create an index of contractual flexibility (*FLEX*), giving an equal weight to each dummy.

$$FLEX = (1 - FORMAL) + (1 - FIXTENURE)$$

Contractual flexibility varies from “no flexibility” to “moderate flexibility” to “high flexibility” as *FLEX* increases from 0 to 2. Among the 332 land rental contracts, 45.58% are formal and fixed-tenure contracts with no flexibility. Among the contracts with at least one flexible term, 35.33% reach “high flexibility” and the rest are “moderately flexible” contracts (see Figure 5.4). Among the “moderately flexible” contracts, 74.79% are informal with fixed tenure and the rest are formal with non-fixed tenure. The mean of the rental payment (*RENTS*) per mu of land is 463.53 RMB. The average *RENTS* drops from 480.28 RMB at “no flexibility” to 475.25 RMB at “moderate flexibility” to 403.92 RMB at “high flexibility.”



### 5.4.3 Hypotheses and Empirical Measurements of Explanatory Variables

Each parameter in the theoretical model is a function of several factors either directly measured or proxied in the context of China's rural land rental market. The hypotheses associated with each explanatory variable are determined by (1) the relationships between the explanatory variable and one or more corresponding parameters and (2) the comparative statics with respect to the corresponding parameters. Each explanatory variable that only affects one parameter is matched with one testable hypothesis. The explanatory variables with multiple roles are matched with multiple hypotheses that could offset each other. The impacts of the variables with multiple roles could be identified if and only if the impact through one channel dominates the impacts through other possible channels. The hypotheses of explanatory variables are listed in Table 5.2 and explained in the following subsections.

#### 5.4.3.1 Variables for the Comparative Importance the Renting-out Places on Contractual Flexibility ( $b$ )

An increase in the comparative importance the renting-out places on contractual flexibility ( $b$ ) increases contractual flexibility and decreases rental payment. The comparative importance the renting-out places on contractual flexibility increases with the renting-out's expected benefit of contract violation. The vector  $\mathbf{W}^0$  contains the variables reflecting  $b$  from five factors.

First, the renting-out's expected benefit of contract violation increases in the time

interval between the time of potential violation and the end of the expected tenure. A longer time interval induces a greater expected loss associated with labor misallocation, which increases the renting-out's expected benefit of contract violation. However, the measurements of expected tenure and the potential violation are not available. Land smoothing (*LDSMOOTH*) in the renting-in's production plan is a proxy for the expectation of a long tenure. *LDSMOOTH* is an investment for long-term productivity, which is more cost-efficient for the renting-in with a longer expected tenure. Hence, a longer tenure proxied by *LDSMOOTH* is associated with an increase in  $b$ .

Second, the renting-out's expected benefit of contract violation increases with the renting-out's likelihood of non-agricultural employment failure. As the probability of non-agricultural employment failure increases, the renting-out are more likely to benefit from flexible contracts. The probability of employment failure is directly measured by whether the renting-out have long-term non-agricultural employment contracts (*LONG NON-AGRI*). A long-term non-agricultural employment contract, compared to a short-term or temporary contract, reduces the renting-out's likelihood of employment failure. Therefore, *LONG NON-AGRI* is associated with a decrease in  $b$ .

Third, the renting-out's expected benefit of contract violation increases with the expected profits of household farming after contract violation. Facing unanticipated non-agricultural employment failure, an increase in the expected profits of household production motivates the renting-out to violate the contract. Because they are not directly measurable, the renting-out's household farming profits are proxied by two dummy variables. The first dummy is whether the renting-in plan to replace traditional/original crops with new crops in post-rental production (*CROP CHANGE*). The second dummy is land

smoothing (*LDSMOOTH*). Both variables may lead to irreversible changes in land use, which decrease the renting-out's expected benefit of household farming after contract violation. Hence, a change in land use that decreases the renting-out's expected profits of household farming after contract violation decreases  $b$ .

Fourth, the transaction cost associated with contract violation decreases the renting-out's expected benefit of contract violation. The transaction cost borne by the renting-out is the cost not specified in the contracts, which includes but is not limited to the cost of informing the renting-in of the violation decision and arranging ex-post negotiation. The transaction cost is measured by the dummy of the renting-in's ownership of enterprises (*ENTERPRISE*). The renting-out violator experiences more difficulties in dealing with the organizational system of an enterprise. Therefore, *ENTERPRISE* is associated with a decrease in  $b$ .

Fifth, another type of cost borne by the renting-out that decreases his/her expected benefit of contract violation is reputation cost in a social network. In a village social network, contract violation may be seen as a signal of not being trustworthy in other aspects of socio-economic life. The reputation cost is proxied by two dummy variables. The first dummy is whether the rental partners are non-strangers (*NON STRANGER*). Reputation cost is higher between non-strangers because the violation is exposed to the social network. Hence, *NON STRANGER* is associated with a decrease in  $b$ . The second dummy is the interaction between the *NON STRANGER* and aggregate village-level trust (*AGGR VILL TRUST*), where *AGGR VILL TRUST* is generated by individual trust in non-strangers in land rental issues using the leave-one-out strategy (see Table 5.1). Given that the renting-in is a non-stranger, an increase in aggregate village-level trust de-

creases the reputation cost of violation because a village with higher aggregate trust is more likely to forgive the violation rather than become suspicious of the violator. Hence, *NON STRANGER*  $\times$  *AGGR VILL TRUST* is associated with an increase in  $b$ .

#### 5.4.3.2 Variables for the Comparative Importance the Renting-in Places on Contractual Flexibility ( $k$ )

In contrast to the comparative statics with respect to  $b$ , an increase in the comparative importance the renting-in places on contractual flexibility ( $k$ ) decreases contractual flexibility and increases rental payment. The comparative importance the renting-in places on contractual flexibility is positively affected by the renting-in's expected cost associated with the renting-out's violation.<sup>40</sup> The vector  $\mathbf{W}^{\text{in}}$  contains the variables reflecting  $k$  from three factors.

First, an increase in the time interval between the time of potential violation and the end of the expected tenure increases the renting-in's expected cost associated with contract violation. As this time interval increases, the renting-in's expected loss in agricultural production due to losing the land of the potential violator increases. *LDSMOOTH* is the proxy of this time interval, which is associated with an increase in  $k$ .

Second, the renting-in's expected cost of contract violation increases if the probability of the renting-out's non-agricultural employment failure increases. As the violation probability increases, the renting-in is more likely to experience loss in agricultural production. *LONG NON-AGRI* measures the renting-out's probability of non-agricultural

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<sup>40</sup>An increase in the comparative importance the renting-in places on contractual flexibility  $k$  increases the renting-in's marginal cost of contractual flexibility.

employment failure, which is associated with a decrease in  $k$ . However, as *LONG NON-AGRI* decreases both  $b$  and  $k$ , the impacts of *LONG NON-AGRI* on contractual terms through  $b$  and  $k$  are opposite to each other because the comparative statics with respect to  $b$  and  $k$  are opposite in sign. Thus, the impact of *LONG NON-AGRI* on contractual terms through  $k$  is potentially offset by its opposite impacts through  $b$ .

Third, the renting-in's expected cost of contract violation increases in the negative externality of the potential violator's land. As the negative externality from local specificity increases, the renting-in's expected loss on other pieces of land increases. Location specificity is directly measured by whether one piece of land is close to the border of adjacent land (*BORDER*). Land along the borders has lower negative externality than land in the middle because losing the land along the borders may not affect the feasibility of using mechanized farming on other pieces of land. Location specificity is also proxied by whether the renting-in plan to grow vegetables (*VEGE*). The negative externality from location specificity is lower for vegetable production than for other types of production because the greenhouses used in vegetable production are independent of each other.

#### 5.4.3.3 Variables for the Renting-out's Comparative Bargaining Power ( $\alpha$ )

An increase in the renting-out's bargaining power increases both contractual terms. The bargaining power of the renting-out ( $\alpha$ ) increases if the renting-out is more capable of dominating the renting-in and decreases if the renting-in is more capable of dominating the renting-out in the bargaining. The vector  $\mathbf{X}$  contains the explanatory variables for  $\alpha$ .

The renting-in's bargaining power is affected if the renting-in has or wishes to have business dealings with other members of the renting-out's social network. The renting-in is less capable of dominating the bargaining if negotiation failure with one renting-out leads to negotiation failure with other potential rental partners. *AGGR VILL TRUST* measures the social network among the renting-out partners. Since higher *AGGR VILL TRUST* encourages support among the renting-out, it increases the renting-in's difficulty in bargaining with multiple renting-out partners, which decreases the renting-in's bargaining power ( $1 - \alpha$ ).

The renting-out's bargaining power is affected by two overlapping systems in a village: the formal bureaucratic system and the informal social network. The renting-out's capacity to dominate the bargaining decreases if any conflicts with the renting-in induce conflicts with the village administration or the elite class<sup>41</sup> who have collective decision rights over land use and other aspects of socio-economic life. The impacts of the bureaucratic system and social network on  $\alpha$  are measured by two dummy variables.

The first dummy is whether rental partners negotiated directly (without a third party) in the initial negotiation (*DIRECT COMM*). The third party is normally a villager with high social status either in the bureaucratic system or the social network. Thus, the renting-out is less capable of dominating the bargaining with *NON DIRECT COMM* because the third party is socio-economically tied to the renting-out. The second dummy is the interaction between *ENTERPRISE* and *NON STRANGER*. The renting-out is less capable of dominating the bargaining compared to other alternatives if the non-stranger renting-in owns an enterprise because this renting-in has a high possibility of being in the

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<sup>41</sup>e.g., family/relatives of members of the village administration or highly educated people.

elite class of the village or in charge of the village administration.

#### 5.4.3.4 Variables for the Threat Points ( $\bar{U}^m$ )

An increase in one party's threat point ( $\bar{U}^m$ ) contributes to the likelihood that a contract is favorable to that party. The vector containing the explanatory variables for  $\bar{U}^m$  is denoted as  $\mathbf{Z}^m$ .  $\bar{U}^o$  is the renting-out's utility in household production before rentals. Traditionally, the land with the best soil quality is used for grain production (*GRAIN EX-ANTE*). Therefore, *GRAIN EX-ANTE*, associated with a comparatively higher  $\bar{U}^o$ , increases both contractual terms.  $\bar{U}^{in}$  is the renting-in's utility in agricultural production without the land of the potential violator, which is negatively affected by the externality from location specificity. The two proxies that decrease the externality from location specificity, *BORDER* and *VEGE*, are associated with a higher  $\bar{U}^{in}$ , and decrease both contractual terms. Meanwhile, *GRAIN EX-ANTE* that indicates high soil quality also associates with a higher  $\bar{U}^{in}$ .

### 5.5 Empirical Analysis

#### 5.5.1 Empirical Model

Each parameter in the theoretical model is empirically captured by a vector of exogenous explanatory variables ( $\mathbf{X}$ ,  $\mathbf{W}$ , and  $\mathbf{Z}$ ). Linearizing the relationship between the variables and the corresponding parameters, the empirical model indicated by the theo-

retical framework is the following:

$$F_{ij} = \beta_0 + \beta_1 \mathbf{X}_{ij} + \theta_1 \mathbf{W}_{ij} + \gamma_1 \mathbf{Z}_{ij} + \mu_{f_j} + \varepsilon_{f_{ij}} \quad (5.24)$$

$$R_{ij} = \beta_0 + \beta_2 \mathbf{X}_{ij} + \theta_2 \mathbf{W}_{ij} + \gamma_2 \mathbf{Z}_{ij} + \mu_{r_j} + \varepsilon_{r_{ij}}. \quad (5.25)$$

For a contract  $i$  observed in village  $j$ , the contractual flexibility  $F_{ij}$  and rental payment  $R_{ij}$  are explained by the vectors  $\mathbf{X}$ ,  $\mathbf{W}$  and  $\mathbf{Z}$ . Eq (5.24) is an ordered probit model because  $F_{ij}$  is discretely measured by the number of flexible contract terms varying from 0 to 2. Eq (5.25) is linear with  $R_{ij}$ , the log of *RENTS*. There are two components in each error term: a village fixed effect ( $\mu_{f_j}$  or  $\mu_{r_j}$ ) and a normally distributed error ( $\varepsilon_{f_{ij}}$  or  $\varepsilon_{r_{ij}}$ ) varied across contracts. The distribution of  $\varepsilon_{f_{ij}}$  and  $\varepsilon_{r_{ij}}$ ,  $\begin{pmatrix} \varepsilon_{f_{ij}} \\ \varepsilon_{r_{ij}} \end{pmatrix} = \mathcal{N}\left(\begin{pmatrix} 0 \\ 0 \end{pmatrix}, \Sigma\right)$ . The estimation methods depend on the assumptions on  $\text{corr}(\varepsilon_{f_{ij}}, \varepsilon_{f_{kj}})$ ,  $\text{corr}(\varepsilon_{r_{ij}}, \varepsilon_{r_{kj}})$ , and  $\text{corr}(\varepsilon_{f_{ij}}, \varepsilon_{r_{ij}})$ , which characterize the covariance matrix  $\Sigma$ .<sup>42</sup>

$\text{corr}(\varepsilon_{f_{ij}}, \varepsilon_{r_{ij}})$  is a simultaneous correlation. The assumption on  $\text{corr}(\varepsilon_{f_{ij}}, \varepsilon_{r_{ij}})$  determines whether the unobserved error term of one contractual term is correlated with the unobserved error term of the other contractual term within a single contract. If  $\text{corr}(\varepsilon_{f_{ij}}, \varepsilon_{r_{ij}}) = 0$ , a system estimation of Eqs (5.24) and (5.25) using full information maximum likelihood (FIML) is reduced to a separated maximum likelihood estimation of each equation. If  $\text{corr}(\varepsilon_{f_{ij}}, \varepsilon_{r_{ij}}) \neq 0$ , the empirical model should be estimated by FIML. The FIML estimation of a simultaneous-equation system with an ordered probit model (Eqs (5.24)) and a linear model (Eq (5.25)) is implemented by the Stata command *cmp*.

<sup>42</sup>I assume that there is no cross-village correlation on contractual terms:  $\text{corr}(\varepsilon_{f_{ij}}, \varepsilon_{f_{km}}) = \text{corr}(\varepsilon_{r_{ij}}, \varepsilon_{r_{km}}) = \text{corr}(\varepsilon_{f_{ij}}, \varepsilon_{r_{km}}) = 0$ .



With flexibility in model types and allowing mixing of models,<sup>43</sup> the Stata command *cmp* provides consistent SUR estimations for a large class of fully observed, recursive, and mix-process simultaneous-equation systems (Roodman, 2011).

$corr(\varepsilon_{f_{ij}}, \varepsilon_{f_{kj}})$  and  $corr(\varepsilon_{r_{ij}}, \varepsilon_{r_{kj}})$  are cross-contract correlations within a village. The assumptions on  $corr(\varepsilon_{f_{ij}}, \varepsilon_{f_{kj}})$  and  $corr(\varepsilon_{r_{ij}}, \varepsilon_{r_{kj}})$  depend on whether the unobserved error term of each contractual term is correlated across contracts within a village. I assume that the assumption on  $corr(\varepsilon_{f_{ij}}, \varepsilon_{f_{kj}})$  applies to  $corr(\varepsilon_{r_{ij}}, \varepsilon_{r_{kj}})$ . If  $corr(\varepsilon_{f_{ij}}, \varepsilon_{f_{kj}}) \neq 0$ , the standard errors of the coefficients should be clustered at the village level. If  $corr(\varepsilon_{f_{ij}}, \varepsilon_{f_{kj}}) = 0$ , the standard errors could be made robust by the Huber-Eicker-White estimator.

## 5.5.2 Empirical Results

Table 5.3 shows the empirical results under the four possible combinations of assumptions on the covariance matrix  $\Sigma$ . The clustered robust standard errors are greater than the robust standard errors, which suggests a positive cross-contract correlation within a village between  $\varepsilon_{f_{ij}}$  and  $\varepsilon_{f_{kj}}$  (also  $\varepsilon_{r_{ij}}$  and  $\varepsilon_{r_{kj}}$ ). However, although clustered robust standard errors decrease the significance levels of some coefficients, only two coefficients that are significant with the robust standard errors become insignificant at the 10% significance level with the clustered robust standard errors.

Comparing the FIML and separated ML estimation, the coefficients and standard errors are close because the simultaneous correlations with and without clustering are small

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<sup>43</sup>Each model is conditional on observation of one dependent variable. A model could be continuous, left/right censored, profit, ordered probit, interval-censored, truncated, or rank-ordered probit. A simultaneous-equation system allows mixing of these models.

in magnitude and insignificant both at -0.031. If Eqs (5.24) and (5.25) omit the same set of variables that could significantly affect both contractual terms, the  $corr(\epsilon_{f_{ij}}, \epsilon_{r_{ij}})$  should be significantly different from zero. Hence, a small and insignificant  $corr(\epsilon_{f_{ij}}, \epsilon_{r_{ij}})$  indicates that this empirical setting does not omit any variables that significantly affect both contractual terms. Since the empirical results across the four possible combinations of assumptions are quite similar, I focus on the empirical results derived from the separated ML estimation.

Tables 5.4 and 5.5 present the results of separated ML estimations with robust and clustered robust standard errors respectively. Tables 5.4 and 5.5 show that the predictions of the bargaining mechanism are corroborated empirically. Except for two insignificant coefficients at small magnitudes, the signs of all the coefficients are consistent with the corresponding signs predicted by the theory. All the coefficients significant at or below the 10% level further confirm the theoretical predictions. I comment on all pairs of coefficients that are significant in both Eqs (5.24) and (5.25) with at least one type of specification.

The variable *LONG NON-AGRI* affects the two contractual terms through two possible channels: the comparative importance the renting-in and renting-out place on contractual flexibility (*b* and *k*). However, as the theory predicts, the impacts through the two channels offset each other. The coefficient on *LONG NON-AGRI* is significantly negative in the regression of  $F_{ij}$  and significantly positive in the regression of  $R_{ij}$ , indicating that the impact of *LONG NON-AGRI* through *b* outweighs its impact through *k*. Compared to a short-term or temporary non-agricultural employment contract, *LONG NON-AGRI* increases the probability of having a contract with no flexibility by 0.11 and decreases

the probability of having a contract with moderate or high flexibility by 0.03 and 0.08, respectively. *LONG NON-AGRI* increases the rental payment by 7.86%.

Renting-out agents with *LONG NON-AGRI* are more likely than renting-out agents with short-term or temporary non-agricultural employment contracts to be skilled workers with higher incomes. In the rural land rental market, the comparatively richer renting-out agents with *LONG NON-AGRI* obtain higher rental payments because contractual flexibility is less important to the renting-out with low employment uncertainty. Thus, I conclude that, with heterogeneity in non-agricultural employment uncertainty, the rural land rental market could make the village-level income distribution more unequal.

The coefficients on *NON STRANGER* and *ENTERPRISE* and their interaction show the impact of the renting-in's identity on contract design. The coefficients on *NON STRANGER* and *ENTERPRISE* are negative in the regression of  $F_{ij}$  and positive in the regression of  $R_{ij}$ . The coefficients on *NON STRANGER*  $\times$  *ENTERPRISE* are negative in the regressions of  $F_{ij}$  and  $R_{ij}$ . Among the four possible identities of the renting-in characterized by *NON STRANGER* and *ENTERPRISE*, a stranger renting-in agent who does not own enterprises (*STRANGER+INDIVIDUAL*) is taken as the baseline in the following comparisons. Table 5.6 shows the impacts of the renting-in's identity on contractual design.

Compared to the baseline, the *STRANGER+ENTERPRISE* identity increases the probability of having no flexibility by 0.01, decreases the probability of having moderate flexibility and high flexibility by 0.01 and 0.10 respectively and increases the rental payment by 52.30%. The *NON STRANGER+INDIVIDUAL* identity increases the probability of having no flexibility by 0.11, decreases the probability of having moderate or high

flexibility by 0.03 and 0.04, respectively, and increases the rental payment by 49.9%. The *NON STRANGER+ENTERPRISE* identity increases the probability of having no flexibility by 0.37, decrease the probability of having moderate or high flexibility by 0.14 and 0.22, respectively, and increases the rental payment by 63.7%.

Agricultural development in post-rental production relies on secure land rental contracts with low flexibility because secure rental contracts encourage the renting-in's investment in long-term soil conservation, technology adoption, and production facilities. Higher rents paid to the renting-out agents in a village increase the average village income, which improves the overall welfare of the village. Hence, the rental contracts with low flexibility and high rental payment are beneficial for agricultural development and village prosperity.

With this argument in mind, Table 6 suggests two progressive conclusions related to village development. First, regardless of *ENTERPRISE*, the contracts with non-strangers are less flexible and have higher rental payments than those with strangers. The non-stranger renting-in are the villagers “who got rich first” (Deng, 1978)<sup>44</sup> with higher capacity in production and business operations. Through the rural land rental market, the more capable non-stranger renting-in agents improve village agricultural productivity and increase the village average income, which according to Deng (1978) could finally achieve village prosperity. Thus, the *NON STRANGER* renting-in agents, reflecting the human capital within a village social network accumulated during the past 30 years of economic

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<sup>44</sup>In Xiaoping Deng's remarks to the CPC (Communist Party of China) Central Committee at the Central Work Conference in 1978, he stated that if some people got rich first, this would inevitably be an impressive example to their “neighbors” and an impressive support to their “neighbors,” which would finally promote village prosperity. This statement was emphasized again in the report of the 1984 Third Plenary Session of the Twelfth Central Committee (“Decisions on National Economic Reforms”) and Xiaoping Deng's remarks to the 1985 CPC national congress.

reform, profoundly shape village development in the present and future.

Second, the *NON STRANGER+ENTERPRISE* identity offers the highest rental payment at the lowest flexibility among the four types of the renting-in. Compared to contracts with the *NON STRANGER +INDIVIDUAL*, contracts with the *NON STRANGER+ENTERPRISE* are 35.8 percentage points more likely to be inflexible and 12.9 and 32.1 percentage points less likely to be moderately or highly flexible. Contracts with *NON STRANGER+ENTERPRISE* also feature 27.7% higher rental payments than those with *NON STRANGER+INDIVIDUAL*. The *NON STRANGER+ENTERPRISE*—who are very likely in the elite class of the village—are potentially richer than the *NON STRANGER +INDIVIDUAL* and have more market experience and more resources in and outside of the village. Hence, the more advanced a non-stranger renting-in is, the more important the role he/she plays in promoting agricultural development and village prosperity, indicating that local entrepreneurship positively affects the agricultural development and prosperity of the village.

The conclusions from the empirical results reveal the relationship between the rural land rental market and the national economic reforms. On the one hand, the villagers who got richer first are organizing more productive farming through the rural land rental market in their hometowns and are promoting village prosperity among their fellow villagers. Thus, the rural land rental market increases the spillover effects of the economic achievements gained from the national reform that started in the late 1970s. On the other hand, due to the separated urban-rural social structure, the rural land rental market potentially increases income inequality among the renting-out, which will influence the direction of the ongoing reform in unifying the urban and rural economies.

Some variables have significant coefficients in the regression of  $F_{ij}$  but not in the

regression of  $R_{ij}$ . This is potentially related to the fact that the village fixed effects reduce the variation of rental payments within a village. However, these variables also reflect the bargaining mechanism. *DIRECT COMM* decreases the probability of having a contract with no flexibility by 0.16, increases the probability of having a contract with moderate or high flexibility by 0.05 and 0.11, respectively. *GRAIN EX-ANTE* decreases the probability of having a contract with no flexibility by 0.20 and increases the probability of having a contract with moderate or high flexibility by 0.06 and 0.14, respectively.

## 5.6 Conclusion

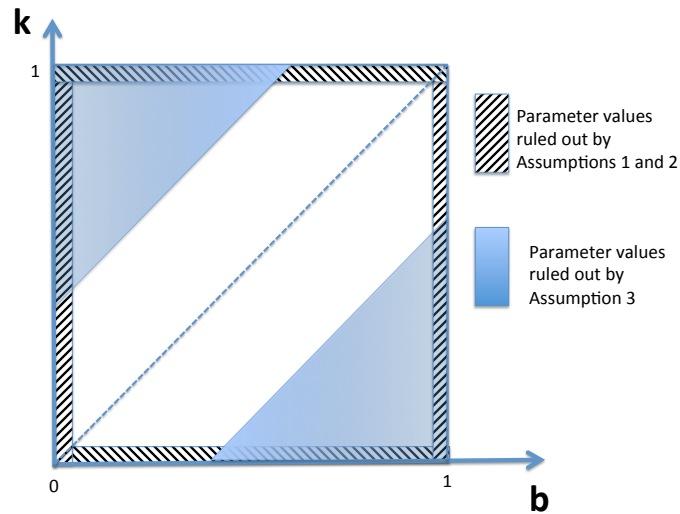
The ex-post surplus of a rental transaction is determined by bargaining over contractual flexibility and rental payment. Contractual flexibility captures the trade-off between the renting-in and renting-out's conflicting preferences over the primary uncertainty in ex-post contractual adaptation. The rental payment captures the trade-off in the value of land use right. A rental contract characterized by these two contractual terms is an ex-ante response to the allocation of ex-post surplus. The empirical model justified by the bargaining model clarifies that the correlation between two contractual terms in the empirical literature of contract design does not reflect causality. The estimated correlation is affected by the omitted exogenous variables or the selection of "plausible IVs" in the conventional empirical strategies, which explains the seemingly inconsistent empirical results in the existing literature.

The empirical results of the variables with multiple roles shed light on future research applying transaction-cost theory. In the setting of transaction-cost theory, the

variable *LONG NON-AGRI*, which indicates a less uncertain environment, is expected to reduce contractual flexibility. However, a negative coefficient on *LONG NON-AGRI*, although it supports the transaction-cost theory, is not a direct application of the theory. If two parties respond asymmetrically to one type of uncertainty, the coefficient on uncertainty would be significant if and only if the two parties' offsetting responses to uncertainty are not closely matched. The sign of the coefficient is determined by the side responding more strongly to the uncertainty in magnitude, which potentially explains the empirical contradiction between Levy (1985) and MacMillan, Hambrick and Pennings (1986) on one side and Harrigan (1986) on the other on the effects of uncertainty on integration.

I draw two policy implications from the empirical results. First, the non-stranger renting-in agents pay higher rents to their fellow villagers and obtain less flexible contracts, which is beneficial for post-rental productivity and village prosperity. Thus, policies encouraging local agricultural entrepreneurship and facilitating the production and business operation of the non-stranger renting-in can improve agricultural production and overall welfare at the village level. Second, the potentially increasing income inequality among the renting-out agents is a consequence of the heterogeneity in non-agricultural employment uncertainty. Unifying the separated urban and rural economies by involving rural citizens in the urban social welfare system can tackle this problem fundamentally. These two policy implications have the potential to amplify the impact of the rural land rental market on village development and avoid future income inequality.

Figure 5.1:  $b$  and  $k$  excluded by Assumptions



Note: Assumptions 1 and 2 rule out  $b \notin \{0, 1\}$  and  $k \notin \{0, 1\}$ , which are the shaded area along the borders. Assumption 3 rules out  $b$  and  $k$  at the northwest (*Condition 1*) and southeast (*Condition 2*) corners.

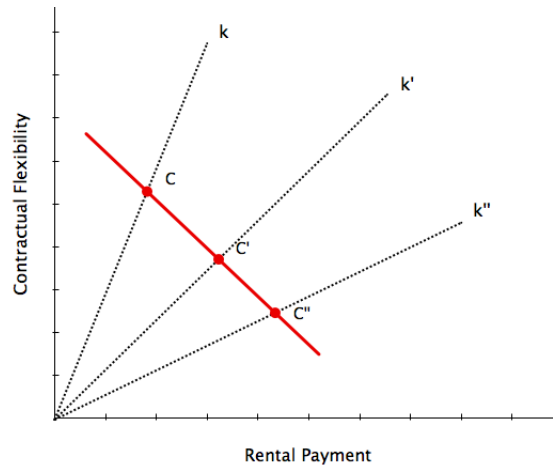
Figure 5.2: Contract Curve with respect to Bargaining Power ( $\alpha$ )



Note: The renting-out's utility increases as the indifference curve moves from  $a$  to  $a''$ . The renting-in's utility increases as the indifference curve moves from  $b$  to  $b''$ . The contract moves from  $C$  to  $C''$  as the renting-out's bargaining power ( $\alpha$ ) increases. The contract curve with respect to  $\alpha$  is  $CC''$ , which is upward sloping.

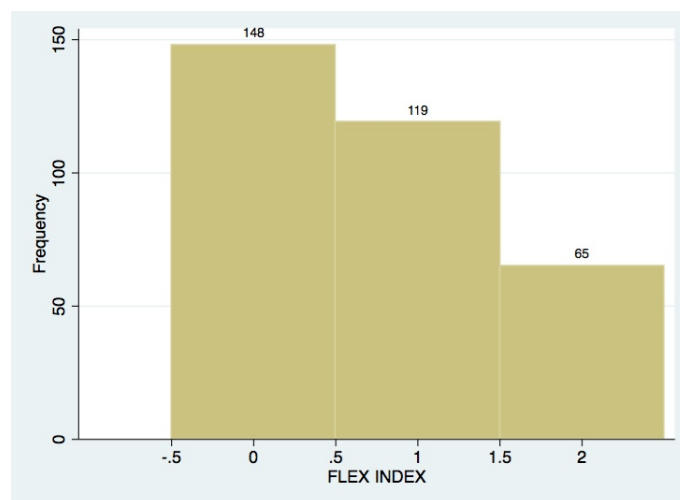


Figure 5.3: Contract Curve with respect to the Comparative Importance of the Renting-in Places on Contractual Flexibility ( $k$ )



Note: The contract moves from  $C$  to  $C''$  as the comparative importance the renting-in places on contractual flexibility increases from  $k$  to  $k''$ . The contract curve with respect to  $k$  is  $CC''$ , which is downward sloping.

Figure 5.4: Distribution of Index FLEX



Note: There are 332 contracts. 148 contracts have no flexible term (formal with fixed tenure). 119 contracts have one contractual term, informal with fixed tenure or formal with non-fixed tenure. 65 contracts have two flexible terms, informal with non-fixed tenure.

Table 5.1: Summary Statistics

Variables	Definition	Mean	SD
Contractual Terms			
FORMAL	Contractual formality (1=Formal Contract, 0=Informal Contract)	0.536	0.499
FIX TENURE	Tenure format (1=Fixed Tenure, 0=Non-fixed Tenure)	0.714	0.453
RENTS	Rental payment per mu (RMB)	463.53	180.23
Renting-out's Characteristics			
BORDER	Renting-out's household farmland close to the border of an adjacent piece of land (1=Close, 0=Not Close)	0.494	0.501
LONG NON-AGRI	The renting-out has a long-term agricultural employment contract (1=Long-term Contract, 0=Short-term/Temporary Contract)	0.584	0.494
GRAIN EX-ANTE	The renting-out's original crops before rentals are grains (1=Grain, 0=Non Grain)	0.910	0.287
AGGR VILL TRUST	The fraction of the villagers that trust non-strangers more than strangers in land rental issues (leave-one-out strategy)	0.221	0.122
Renting-in's Production Plan			
VEGE	The renting-in's production plan is planting vegetables (1=Vegetable, 0=Non Vegetable)	0.148	0.355
CROP CHANGE	The renting-in's production plan replaces traditional/original crops with new crops (1=Replace, 0=Do Not Replace)	0.352	0.478
LDSMOOTH	Land smoothing in the renting-in's production plan (1=Land Smoothing, 0=No Land Smoothing)	0.642	0.545
Relationship between Rental Partners			
DIRCT COMM	The bargaining between the renting-in and renting-out is a direct communication without the involvement of a third party (1=Direct Communication, 0=Third Party)	0.358	0.480
ENTERPRISE	The renting-in owns an enterprise (1=Enterprise, 0=Individual)	0.569	0.496
NON STRANGER	The renting-in and renting-out are non-strangers (1=Non-strangers, 0=Strangers)	0.470	0.500
Number of Contracts: 332			
Number of Villages: 13			

Table 5.2: Summary of Predictions

Explanatory Variables	Predictions	
	Flex	Rents
<b>W: Comparative Importance the Renting-out Places on Contractual Flexibility (<math>b</math>)</b>		
CROP CHANGE	-	+
ENTERPRISE	-	+
NON STRANGER	-	+
NON STRANGER $\times$ AGGR VILL TRUST	+	-
<b>X: Comparative Bargaining Power of the Renting-out (<math>\alpha</math>)</b>		
AGGR VILL TRUST	+	+
DIRECT COMM	+	+
NON STRANGER $\times$ ENTERPRISE	-	-
Variables with Multiple Roles		
GRAIN EX-ANTE ( $\bar{U}^o$ and $\bar{U}^{in}$ )	+	+
	-	-
LDSSMOOTH (2 channels $\times b$ and $k$ )	-	+
	+	-
LONG NON-AGRI ( $b$ and $k$ )	-	+
	+	-
BORDER ( $k$ and $\bar{U}^{in}$ )	+	-
	-	-
VEGE ( $k$ and $\bar{U}^{in}$ )	+	-
	-	-

Note: The predictions of the coefficients on the explanatory variables are listed based on the comparative statics. “+” represents a positive coefficient and “-” represents a negative coefficient. The explanatory variables with multiple roles are matched with multiple hypotheses.

Table 5.3: FIML versus Separated Estimation

Variables	Separated ML (robust)			FIML (robust)			Separated ML (clustered)			FIML (clustered)		
	Flex	Log Rents	Flex	Log Rents	Flex	Log Rents	Flex	Log Rents	Flex	Log Rents	Flex	Log Rents
<b>W: Comparative Importance the Renting-out Places on Contractual Flexibility (<i>b</i>)</b>												
CROP CHANGE	-0.053 (0.220)	0.075 (0.094)	-0.051 (0.220)	0.075 (0.090)	-0.053 (0.287)	0.075 (0.104)	-0.051 (0.284)	0.075 (0.104)	-0.051 (0.284)	0.075 (0.100)	-0.051 (0.284)	0.075 (0.100)
ENTERPRISE	-0.393 (0.248)	0.421*** (0.094)	-0.391 (0.248)	0.421*** (0.090)	-0.393 (0.251)	0.421** (0.147)	-0.391 (0.255)	0.421** (0.147)	-0.391 (0.255)	0.421*** (0.142)	-0.391 (0.255)	0.421*** (0.142)
NON STRANGER	-1.167*** (0.332)	0.405** (0.172)	-1.166*** (0.333)	0.405** (0.166)	-1.167*** (0.408)	0.405* (0.188)	-1.166*** (0.408)	0.405* (0.188)	-1.166*** (0.408)	0.405** (0.181)	-1.166*** (0.408)	0.405** (0.181)
NON STRANGER × AGGR VILL TRUST	0.056*** (0.014)	-0.0043 (0.005)	0.056*** (0.014)	-0.004 (0.005)	0.0557*** (0.011)	-0.004 (0.003)	0.056*** (0.011)	-0.004 (0.003)	0.056*** (0.011)	-0.004 (0.003)	0.056*** (0.011)	-0.004 (0.003)
<b>X: Comparative Bargaining Power of the Renting-out (<math>\alpha</math>)</b>												
AGGR VILL TRUST	0.031 (0.040)	-0.003 (0.012)	0.031 (0.040)	-0.003 (0.012)	0.031 (0.033)	-0.003 (0.009)	0.031 (0.033)	-0.003 (0.009)	0.031 (0.033)	-0.003 (0.009)	0.031 (0.033)	-0.003 (0.009)
DIRCT COMM	0.565*** (0.163)	0.080 (0.052)	0.567*** (0.163)	0.080 (0.0499)	0.565*** (0.252)	0.080 (0.066)	0.567*** (0.252)	0.080 (0.066)	0.567*** (0.252)	0.080 (0.064)	0.567*** (0.252)	0.080 (0.064)
NON STRANGER × ENTERPRISE	-0.922** (0.381)	-0.333** (0.133)	-0.923** (0.381)	-0.333*** (0.128)	-0.922** (0.387)	-0.333* (0.175)	-0.923** (0.386)	-0.333* (0.175)	-0.923** (0.386)	-0.333** (0.168)	-0.923** (0.386)	-0.333** (0.168)
<b>Variables with Multiple Roles</b>												
GRAIN EX-ANTE	0.711*** (0.266)	-0.021 (0.133)	0.711*** (0.267)	-0.021 (0.129)	0.711*** (0.209)	-0.021 (0.102)	0.711*** (0.210)	-0.021 (0.102)	0.711*** (0.210)	-0.021 (0.099)	0.711*** (0.210)	-0.021 (0.099)
LDSMOOTH	-0.173 (0.147)	0.066 (0.068)	-0.173 (0.147)	0.066 (0.065)	-0.173 (0.167)	0.066 (0.079)	-0.173 (0.167)	0.066 (0.079)	-0.173 (0.167)	0.066 (0.076)	-0.173 (0.167)	0.066 (0.076)
LONG NON-AGRI	-0.390*** (0.148)	0.076* (0.044)	-0.390*** (0.148)	0.076* (0.043)	-0.390*** (0.164)	0.076 (0.056)	-0.390*** (0.164)	0.076 (0.056)	-0.390*** (0.164)	0.076 (0.054)	-0.390*** (0.164)	0.076 (0.054)
BORDER	-0.162 (0.141)	-0.002 (0.045)	-0.161 (0.141)	-0.002 (0.043)	-0.162 (0.123)	-0.002 (0.039)	-0.161 (0.125)	-0.002 (0.039)	-0.161 (0.125)	-0.002 (0.0378)	-0.161 (0.125)	-0.002 (0.0378)
VEGE	0.311 (0.247)	-0.248** (0.113)	0.307 (0.249)	-0.248** (0.109)	0.311 (0.251)	-0.248 (0.146)	0.307 (0.247)	-0.248 (0.146)	0.307 (0.247)	-0.248* (0.140)	0.307 (0.247)	-0.248* (0.140)
Constant Cut1	1.240 (1.983)		1.262 (1.980)		1.240 (1.859)		1.262 (1.857)		1.240 (1.857)		1.262 (1.857)	
Constant Cut2	2.681 (1.986)		2.704 (1.982)		2.681 (1.912)		2.704 (1.909)		2.681 (1.909)		2.704 (1.909)	
Constant	6.437*** (0.648)		6.437*** (0.624)		6.437*** (0.447)		6.437*** (0.431)		6.437*** (0.431)		6.437*** (0.431)	
$corr(\epsilon_{fj}, \epsilon_{tj})$												
Observations	332	332	332	332	332	332	332	332	332	332	332	332
R-squared/Log Likelihood	-265.313	0.537	-432.08	-265.313	-265.313	0.537	-432.07	-265.313	-432.07	0.537	-432.07	0.537

Note: Robust standard errors (columns 1-4) and robust standard errors clustered at the village level (columns 5-8) in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table 5.4: Theoretical Predictions, Empirical Results, and Average Marginal Effects (robust)

Explanatory Variables	Predictions			Separated ML (robust)			Average Marginal Effects on Flex		
	Flex	Log Rents	Flex	Log Rents	Flex	Log Rents	No Flex	Moderate Flex	High Flex
<b>W: Comparative Importance the Renting-out Places on Contractual Flexibility (<i>b</i>)</b>									
CROP CHANGE	-	+	-0.053 (0.220)	0.075 (0.094)	0.015 (0.062)	-0.005 (0.019)	-0.010 (0.043)		
ENTERPRISE	-	+	-0.393 (0.248)	0.421*** (0.094)	0.241*** (0.046)	-0.084*** (0.018)	-0.157*** (0.039)		
NON STRANGER	-	+	-1.167*** (0.332)	0.405** (0.172)	0.151** (0.046)	-0.085*** (0.024)	-0.065* (0.035)		
NON STRANGER × AGGR VILL TRUST	+	-	0.056*** (0.014)	-0.004 (0.005)					
<b>X: Comparative Bargaining Power of the Renting-out (<math>\alpha</math>)</b>									
AGGR VILL TRUST	+	+	0.031 (0.040)	-0.003 (0.012)	-0.016 (0.011)	0.006* (0.004)	0.010 (0.008)		
DIRCT COMM	+	+	0.565*** (0.163)	0.080 (0.052)	-0.158*** (0.045)	0.049*** (0.016)	0.109*** (0.031)		
NON STRANGER × ENTERPRISE	-	-	-0.922** (0.381)	-0.333** (0.133)					
Variables with Multiple Roles									
GRAIN EX-ANTE			0.711*** (0.266)	-0.021 (0.133)	-0.199*** (0.073)	0.062*** (0.024)	0.137*** (0.052)		
LDSMOOTH			-0.173 (0.147)	0.066 (0.068)	0.048 (0.041)	-0.015 (0.013)	-0.033 (0.028)		
LONG NON-AGRI			-0.390*** (0.148)	0.076* (0.044)	0.109*** (0.041)	-0.034** (0.013)	-0.075*** (0.029)		
BORDER			-0.162 (0.141)	-0.002 (0.045)	0.046 (0.040)	-0.014 (0.012)	-0.031 (0.027)		
VEGE			0.311 (0.247)	-0.248** (0.113)	-0.087 (0.069)	0.027 (0.022)	0.060 (0.048)		
Constant Cut1			1.240 (1.983)						
Constant Cut2			2.681 (1.986)						
Constant			6.437*** (0.648)						
Observations			332	332	332	332	332		
R-squared/Log Likelihood			-265.313	0.537					

Note: “+” predicts a positive coefficient and “-” predicts a negative coefficient. Robust standard errors in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table 5.5: Theoretical Predictions, Empirical Results, and Average Marginal Effects (clustered)

Explanatory Variables	Predictions		Average Marginal Effects on Flex				
	Flex	Log Rents	Flex	Log Rents	No Flex	Moderate Flex	High Flex
<b>W: Comparative Importance the Renting-out Places on Contractual Flexibility (b)</b>							
CROP CHANGE	-	+	-0.053 (0.287)	0.075 (0.104)	0.015 (0.080)	-0.005 (0.025)	-0.010 (0.056)
ENTERPRISE	-	+	-0.393 (0.251)	0.421** (0.147)	0.241*** (0.061)	-0.844* (0.022)	-0.157** (0.046)
NON STRANGER	-	+	-1.167*** (0.408)	0.405* (0.188)	0.151* (0.081)	-0.085** (0.036)	-0.065 (0.053)
NON STRANGER × AGGR VILL TRUST	+	-	0.056*** (0.011)	-0.004 (0.003)			
<b>X: Comparative Bargaining Power of the Renting-out (<math>\alpha</math>)</b>							
AGGR VILL TRUST	+	+	0.031 (0.033)	-0.003 (0.009)	-0.016* (0.009)	0.006** (0.003)	0.010* (0.006)
DIRCT COMM	+	+	0.565** (0.252)	0.080 (0.066)	-0.158** (0.066)	0.049** (0.021)	0.109** (0.046)
NON STRANGER × ENTERPRISE	-	-	-0.922** (0.387)	-0.333* (0.175)			
<b>Variables with Multiple Roles</b>							
GRAIN EX-ANTE			0.711*** (0.209)	-0.021 (0.102)	-0.199*** (0.058)	0.062*** (0.019)	0.137*** (0.039)
LDSMOOTH			-0.173 (0.167)	0.066 (0.079)	0.048 (0.046)	-0.015 (0.014)	-0.033 (0.032)
LONG NON-AGRI			-0.390** (0.164)	0.076 (0.056)	0.109** (0.046)	-0.034** (0.014)	-0.075** (0.033)
BORDER			-0.162 (0.123)	-0.002 (0.039)	0.046 (0.033)	-0.014 (0.011)	-0.031 (0.023)
VEGE			0.311 (0.251)	-0.248 (0.146)	-0.087 (0.071)	0.027 (0.022)	0.060 (0.049)
Constant Cut1			1.240 (1.859)				
Constant Cut2			2.681 (1.912)				
Constant			6.437*** (0.447)				
Observations			332	332	332	332	332
R-squared/Log Likelihood			-265.313	0.537			

Note: “+” predicts a positive coefficient and “-” predicts a negative coefficient. Robust standard errors clustered at the village level in parentheses. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

Table 5.6: The Renting-in's Identity and Contract Design

Renting-in's Identity	No Flexibility		Moderate Flexibility		High Flexibility		Rental Payment	
	baseline		baseline		baseline		baseline	
STRANGER+INDIVIDUAL	0.008		-0.015		-0.098		0.499	
NON STRANGER+INDIVIDUAL	0.114		-0.027		0.035		0.523	
STRANGER+ENTERPRISE	0.366		-0.144		-0.223		0.637	
NON-STRANGER+ENTERPRISE								

Note: The *STRANGER+ENTERPRISE* identity is taken as the baseline in the following comparisons. The impact of the renting-in's identity on contractual flexibility (no flexibility, moderate flexibility, and high flexibility) is shown by the changes in the probability of having certain flexibility. The impact of the renting-in's identity on rental payment is shown by the change in rental payment in percentage.

## Appendix A: Mathematical Proofs

### A1: Solution of the Nash Bargaining Game

$$\max_{F,R} (F^b R^{1-b} - \bar{U}^o)^\alpha (A - kF - (1-k)R - \bar{U}^{in})^{1-\alpha}$$

The first-order conditions for interior solutions as follows:

$$\alpha b \left( \frac{A - kF - (1-k)R - \bar{U}^{in}}{F^b R^{1-b} - \bar{U}^o} \right)^{1-\alpha} \left( \frac{R}{F} \right)^{1-b} - (1-\alpha)k \left( \frac{A - kF - (1-k)R - \bar{U}^{in}}{F^b R^{1-b} - \bar{U}^o} \right)^{-\alpha} = 0$$

$$\alpha(1-b) \left( \frac{A - kF - (1-k)R - \bar{U}^{in}}{F^b R^{1-b} - \bar{U}^o} \right)^{1-\alpha} \left( \frac{R}{F} \right)^{-b} - (1-\alpha)(1-k) \left( \frac{A - kF - (1-k)R - \bar{U}^{in}}{F^b R^{1-b} - \bar{U}^o} \right)^{-\alpha} = 0$$

By dividing both equations by  $\left( \frac{A - kF - (1-k)R - \bar{U}^{in}}{F^b R^{1-b} - \bar{U}^o} \right)^{-\alpha}$ . The first-order conditions are rearranged as follows:

$$\alpha b \left( \frac{A - kF - (1-k)R - \bar{U}^{in}}{F^b R^{1-b} - \bar{U}^o} \right) \left( \frac{R}{F} \right)^{1-b} - (1-\alpha)k = 0 \quad (\text{A.1})$$

$$\alpha(1-b) \left( \frac{A - kF - (1-k)R - \bar{U}^{in}}{F^b R^{1-b} - \bar{U}^o} \right) \left( \frac{R}{F} \right)^{-b} - (1-\alpha)(1-k) = 0 \quad (\text{A.2})$$

From Eqs (A.1) and (A.2),  $F = \frac{(1-k)b}{k(1-b)}R$ . Plugging in  $F = \frac{(1-k)b}{k(1-b)}R$  back to Eqs



(A.1) and (A.2), the interior  $F^*$  and  $R^*$  are found.

$$F^* = \frac{\alpha(A - \bar{U}^{in})b}{k} + (1 - \alpha)\left(\frac{k(1-b)}{(1-k)b}\right)^{b-1}\bar{U}^o \quad (\text{A.3})$$

$$R^* = \frac{\alpha(A - \bar{U}^{in})(1-b)}{1-k} + (1 - \alpha)\left(\frac{k(1-b)}{(1-k)b}\right)^b\bar{U}^o \quad (\text{A.4})$$

A2: The ratio of  $|U_i^m|$  and  $|U_i^n|$  at Interior Solutions

Marginal utility of each contractual term in each individual utility function ( $U_i^m$ ):

$$\frac{\partial U^{in}}{\partial F} = -k < 0$$

$$\frac{\partial U^{in}}{\partial R} = -(1-k) < 0$$

$$\frac{\partial U^o}{\partial F} = b\left(\frac{R}{F}\right)^{1-b} > 0$$

$$\frac{\partial U^o}{\partial R} = (1-b)\left(\frac{R}{F}\right)^{-b} > 0$$

The ratio of the absolute value of  $U_i^m$  between a pair of rental partners at  $F^*$  and  $R^*$ :

$$\frac{\left|\frac{\partial U^{in}}{\partial F}\right|}{\left|\frac{\partial U^o}{\partial F}\right|}\Big|_{F=F^*, R=R^*} = \frac{k}{b}\left(\frac{R^*}{F^*}\right)^{b-1}$$

$$\frac{\left|\frac{\partial U^{in}}{\partial R}\right|}{\left|\frac{\partial U^o}{\partial R}\right|}\Big|_{F=F^*, R=R^*} = \frac{1-k}{1-b}\left(\frac{R^*}{F^*}\right)^b$$

Since  $F^* = \frac{(1-k)b}{k(1-b)}R^*$  at the optimal (see Appendix A1)

$$\left| \frac{\frac{\partial U^{in}}{\partial F}}{\frac{\partial U^o}{\partial F}} \right|_{F=F^*, R=R^*} = \frac{k}{b} \left( \frac{(1-k)b}{k(1-b)} \right)^{1-b} = \frac{k^b(1-k)^{1-b}}{b^b(1-b)^{1-b}}$$

$$\left| \frac{\frac{\partial U^{in}}{\partial R}}{\frac{\partial U^o}{\partial R}} \right|_{F=F^*, R=R^*} = \frac{1-k}{1-b} \left( \frac{(1-k)b}{k(1-b)} \right)^{-b} = \frac{k^b(1-k)^{1-b}}{b^b(1-b)^{1-b}}$$

I denote  $\left| \frac{\frac{\partial U^m}{\partial i}}{\frac{\partial U^n}{\partial i}} \right|_{F=F^*, R=R^*}$  as  $\frac{|U_{i^*}^m|}{|U_{i^*}^n|}$ , where  $m = \{in, o\}$  and  $i = \{F, R\}$ . Hence

$$\frac{k^b(1-k)^{1-b}}{b^b(1-b)^{1-b}} = \frac{|U_{i^*}^{in}|}{|U_{i^*}^o|}.$$

### A3: Interior Solutions of $F^*$ and $R^*$

Based on Eqs (5.3) and (5.4),  $F^*$  and  $R^*$  could be infinite if at least one of the following two situations happens: (1)  $\frac{b}{k} = \infty$  or  $\frac{1-b}{1-k} = \infty$  or (2)  $\frac{k^b(1-k)^{1-b}}{b^b(1-b)^{1-b}} = \infty$ .

(1)  $\frac{b}{k} = \infty$  or  $\frac{1-b}{1-k} = \infty$ : If  $k \in \{0, 1\}$  and  $b \in \{0, 1\}$ , at least one of  $F^*$  and  $R^*$  is

equal to infinity.

(2)  $\frac{k^b(1-k)^{1-b}}{b^b(1-b)^{1-b}} = \infty$ : If  $b \in \{0, 1\}$ ,  $F^*$  and  $R^*$  could equal to infinity.

Thus, to have a finite interior solution,  $b \notin \{0, 1\}$  and  $k \notin \{b, k\}$ .

### A4: ASSUMPTION 1 in Chapter 5

$$U^m(F^*, R^*) - \bar{U}^m > 0 \text{ if and only if } \frac{A - \bar{U}^{in}}{|U_{i^*}^{in}|} > \frac{\bar{U}^o}{|U_{i^*}^o|}$$

The interior solutions achieve the optimality if  $A - kF - (1-k)R - \bar{U}^{in} > 0$  and  $F^b R^{1-b} - \bar{U}^o > 0$ .

### The renting-out's Part

$$U^o(F^*, R^*) - \bar{U}^o = \alpha(A - \bar{U}^{in}) \frac{b^b(1-b)^{1-b}}{k^b(1-k)^{1-b}} + (1-\alpha)\bar{U}^o - \bar{U}^o$$

$$U^o(F^*, R^*) - \bar{U}^o = \alpha[(A - \bar{U}^{in}) \frac{b^b(1-b)^{1-b}}{k^b(1-k)^{1-b}} - \bar{U}^o]$$

Recall from Appendix A2 that  $\frac{k^b(1-k)^{1-b}}{b^b(1-b)^{1-b}} = \frac{|U_{F^*}^{in}|}{|U_{F^*}^o|} = \frac{|U_{R^*}^{in}|}{|U_{R^*}^o|}$ .

Hence,  $U^o(F^*, R^*) - \bar{U}^o > 0$  if and only if  $(A - \bar{U}^{in}) \frac{b^b(1-b)^{1-b}}{k^b(1-k)^{1-b}} - \bar{U}^o > 0$ , which is equivalent to  $\frac{A - \bar{U}^{in}}{|U_{i^*}^{in}|} > \frac{\bar{U}^o}{|U_{i^*}^o|}$ .

### The renting-in's Part

$$U^{in}(F^*, R^*) - \bar{U}^{in} = A - [\alpha(A - \bar{U}^{in}) + (1 - \alpha)\bar{U}^o \frac{k^b(1-k)^{1-b}}{b^b(1-b)^{1-b}}] - \bar{U}^{in}$$

$$U^{in}(F^*, R^*) - \bar{U}^{in} = (1 - \alpha)[A - \bar{U}^{in} - \bar{U}^o \frac{k^b(1-k)^{1-b}}{b^b(1-b)^{1-b}}]$$

Hence,  $U^{in}(F^*, R^*) - \bar{U}^{in} > 0$  if and only if  $A - \bar{U}^{in} - \bar{U}^o \frac{k^b(1-k)^{1-b}}{b^b(1-b)^{1-b}} > 0$ , which is equivalent to  $\frac{A - \bar{U}^{in}}{|U_{i^*}^{in}|} > \frac{\bar{U}^o}{|U_{i^*}^o|}$ .

Therefore, there exists non-trivial  $F$  and  $R$  that maximize the joint utility of the renting-in and renting-out if  $\frac{A - \bar{U}^{in}}{|U_{i^*}^{in}|} > \frac{\bar{U}^o}{|U_{i^*}^o|}$ . To satisfy ASSUMPTION 1,  $\frac{|U_{i^*}^o|}{|U_{i^*}^{in}|} \neq 0$ , which is equivalent to  $b \notin \{0, 1\}$ .

## A5: Direct and Indirect Impacts of $b$ and $k$ and Assumption 3 in Chapter 5

### Direct and Indirect Impacts of $b$ and $k$

Recall that  $U^{in} = A - kF - (1 - k)R$  and  $U^o = F^b R^{1-b}$ . At the interior contract,  $F^* = \frac{(1 - k)b}{k(1 - b)} R^*$ . Hence,

$$\frac{\partial U^{in}}{\partial F} \Big|_{F=F^*, R=R^*} = -k < 0$$

$$\frac{\partial U^{in}}{\partial R} \Big|_{F=F^*, R=R^*} = -(1 - k) < 0$$

$$\frac{\partial U^o}{\partial F} \Big|_{F=F^*, R=R^*} = b \left( \frac{R^*}{F^*} \right)^{1-b} = b \left( \frac{(1 - b)k}{b(1 - k)} \right)^{1-b} > 0$$

$$\frac{\partial U^o}{\partial R} \Big|_{F=F^*, R=R^*} = (1 - b) \left( \frac{R^*}{F^*} \right)^{-b} = (1 - b) \left( \frac{(1 - b)k}{b(1 - k)} \right)^{-b} > 0$$

The direct impacts of  $b$  and  $k$  on  $b/k$  and  $(1 - b)/(1 - k)$  are clear in signs.

$$\frac{\partial \left( \frac{b}{k} \right)}{\partial k} = -\frac{b}{k^2} < 0$$

$$\frac{\partial \left( \frac{b}{k} \right)}{\partial b} = k > 0$$

$$\frac{\partial \left( \frac{1-b}{1-k} \right)}{\partial k} = \frac{1 - b}{(1 - k)^2} > 0$$

$$\frac{\partial \left( \frac{1-b}{1-k} \right)}{\partial b} = -\frac{1}{1 - k} < 0$$

The indirect impacts of  $k$  are the following:

$$\frac{\partial \left( \frac{b}{k} \left| \frac{\partial U^{in}}{\partial F} \Big|_{F=F^*, R=R^*} \right. \right)}{\partial k} = -\frac{(1 - b)k^b b}{b(1 - k) k^2} < 0$$

$$\frac{\partial \left( \frac{1-b}{1-k} \frac{\frac{\partial U^{in}}{\partial R} |_{F=F^*, R=R^*}}{\frac{\partial U^o}{\partial R} |_{F=F^*, R=R^*}} \right)}{\partial k} = -\frac{(1-b)k^b}{b(1-k)} \frac{b}{k-k^2} > 0$$

Thus, the signs of the direct and indirect impacts of  $k$  are the same. No further assumptions are required for the comparative statics.

The indirect impacts of  $b$  are the following:

$$\frac{\partial \left( \frac{b}{k} \frac{\frac{\partial U^{in}}{\partial F} |_{F=F^*, R=R^*}}{\frac{\partial U^o}{\partial F} |_{F=F^*, R=R^*}} \right)}{\partial b} = \frac{1}{b} \frac{(1-b)k^{b-1}}{b(1-k)} \left( 1 + b \ln \frac{k(1-b)}{b(1-k)} \right) \leq 0$$

$$\frac{\partial \left( \frac{1-b}{1-k} \frac{\frac{\partial U^{in}}{\partial R} |_{F=F^*, R=R^*}}{\frac{\partial U^o}{\partial R} |_{F=F^*, R=R^*}} \right)}{\partial b} = -\frac{1}{1-b} \frac{(1-b)k^b}{b(1-k)} \left( 1 + (b-1) \ln \frac{k(1-b)}{b(1-k)} \right) \leq 0$$

Thus, the signs of the direct and indirect impacts of  $b$  could be different. Further assumptions are required for the comparative statics.

### Assumption 3

Since the direct impact of  $b$  on  $F^*$  is positive and the indirect impact of  $b$  on  $R^*$  is negative, the indirect impacts of  $b$  on  $F^*$  and  $R^*$  follow the same sign if  $1 + b \ln \frac{k(1-b)}{b(1-k)} \geq 0$  and  $1 + (b-1) \ln \frac{k(1-b)}{b(1-k)} \leq 0$ , which are *Conditions 1 and 2* of Assumption 3.

To satisfy *Condition 1*, as  $k$  increases from 0 to 1, the correspondingly ruled out range  $[\underline{b}, 1]$  decreases as the lowest  $b$  ( $\underline{b}$ ) ruled out increases, which is the shaded area at the northwest corner of Figure 5.1. To satisfy *Condition 2*, as  $k$  increases from 0 to 1, the correspondingly ruled out range  $[0, \bar{b}]$  increases as the highest  $b$  ( $\bar{b}$ ) ruled out increases, which is the shaded area at the southeast corner of Figure 5.1. Figure 5.1 shows that the

combinations of  $b$  and  $k$  satisfying ASSUMPTIONS 3 are comparatively small in  $|b - k|$ . Since smaller  $|b - k|$  indicates a stronger conflict on each contractual term, the intuition of ASSUMPTIONS 3 is that the direct impact of  $b$  is more likely to dominate the comparative statics with respect to  $b$  if there is an intensified conflict between rental partners.

## A6: Econometrics Exercises in Chapter 5

The empirical models suggested by the theoretical model are the following:

$$F_i = \beta_1 x_i + \theta_1 w_i + \varepsilon_{1i} \quad (\text{A.5})$$

$$R = \beta_2 x_i + \theta_2 w_i + \varepsilon_{2i} \quad (\text{A.6})$$

Regress Eqs A.5 and A.6 separately. The estimators are the following:

$$\hat{\beta}_1 = \frac{\sum w_i^2 \sum x_i F_i - \sum x_i w_i \sum w_i F_i}{\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2} \quad (\text{A.7})$$

$$\hat{\theta}_1 = \frac{\sum x_i^2 \sum w_i F_i - \sum x_i w_i \sum x_i F_i}{\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2} \quad (\text{A.8})$$

$$\hat{\beta}_2 = \frac{\sum w_i^2 \sum x_i R_i - \sum x_i w_i \sum w_i R_i}{\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2} \quad (\text{A.9})$$

$$\hat{\theta}_2 = \frac{\sum x_i^2 \sum w_i R_i - \sum x_i w_i \sum x_i R_i}{\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2} \quad (\text{A.10})$$

## No Omitted Exogenous Variables (OLS)

The conventional strategy with no omitted variables is the following:

$$F_i = a_1 R_i + \kappa_1 x_i + \tau_1 w_i + \mu_{1i}$$

I define  $K = \begin{bmatrix} R & x & w \end{bmatrix}$ . Then  $\begin{bmatrix} a_1 \\ \kappa_1 \\ \tau_1 \end{bmatrix} = (K'K)^{-1}K'F$ .

Hence, taking  $\hat{a}_1$  as an example,

$$\begin{aligned} \hat{a}_1 = \frac{1}{\det(K'K)} & (\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2) \sum R_i F_i \\ & - (\sum R_i x_i \sum w_i^2 - \sum R_i w_i \sum x_i w_i) \sum x_i F_i \\ & + (\sum R_i x_i \sum x_i w_i - \sum x_i^2 \sum R_i w_i) \sum w_i F_i \end{aligned}$$

Replacing  $R_i$  by  $\beta_2 x_i + \theta_2 w_i + \varepsilon_{2i}$ ,

$$plim(\hat{a}_1) = 0$$

Going through similar calculations, the *plim* of  $\kappa_1$  and  $\tau_1$  are the following:

$$plim(\hat{\kappa}_1) = \beta_1; plim(\hat{\tau}_1) = \theta_1$$

## Omitting Exogenous Explanatory Variables in One Single Equation (OLS)

The conventional strategy includes  $R_i$  but omitting  $x_i$ .

$$F_i = a_1 R_i + \tau_1 w_i + \mu_i$$

Hence, the estimated  $a_1$  and  $\tau_1$  are the following:

$$\hat{a}_1 = \frac{\sum w_i^2 \sum R_i F_i - \sum R_i w_i \sum w_i F_i}{\sum R_i^2 \sum w_i^2 - (\sum R_i w_i)^2} \quad (\text{A.11})$$

$$\hat{\tau}_1 = \frac{R_i^2 \sum w_i F_i - \sum R_i w_i \sum R_i F_i}{\sum R_i^2 \sum w_i^2 - (\sum R_i w_i)^2} \quad (\text{A.12})$$

Replacing  $R_i$  by  $\beta_2 x_i + \theta_2 w_i + \varepsilon_{2i}$ , Eqs A.11 and A.12 are rearranged as the following:

$$\hat{a}_1 = \frac{\sum w_i^2 \sum F_i (\beta_2 x_i + \theta_2 w_i + \varepsilon_{2i}) - \sum w_i (\beta_2 x_i + \theta_2 w_i + \varepsilon_{2i}) \sum w_i F_i}{\sum (\beta_2 x_i + \theta_2 w_i + \varepsilon_{2i})^2 \sum w_i^2 - [\sum (\beta_2 x_i + \theta_2 w_i + \varepsilon_{2i}) w_i]^2}$$

$$\hat{\tau}_1 = \frac{\sum (\beta_2 x_i + \theta_2 w_i + \varepsilon_{2i})^2 \sum w_i F_i - \sum (\beta_2 x_i + \theta_2 w_i + \varepsilon_{2i}) w_i \sum (\beta_2 x_i + \theta_2 w_i + \varepsilon_{2i}) F_i}{\sum (\beta_2 x_i + \theta_2 w_i + \varepsilon_{2i})^2 \sum w_i^2 - [\sum (\beta_2 x_i + \theta_2 w_i + \varepsilon_{2i}) w_i]^2}$$

Based on Eqs (A.5) and (A.6), I substitute  $\sum w_i^2 \sum x_i F_i - \sum x_i w_i \sum w_i F_i$  by  $\hat{\beta}_1 \{ \sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2 \}$  and substitute  $\sum x_i^2 \sum w_i F_i - \sum x_i w_i \sum x_i F_i$  by  $\hat{\theta}_1 \{ \sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2 \}$ .

Thus,

$$plim(\hat{a}_1) = plim \left\{ \frac{\beta_2 \hat{\beta}_1 [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2]}{\beta_2^2 [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2] + plim \{ \sum \varepsilon_{2i}^2 \sum w_i^2 \}} \right\}$$

$$plim(\hat{\tau}_1) = plim \left\{ \frac{\beta_2 [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2] (\beta_2 \hat{\theta}_1 - \theta_2 \hat{\beta}_1) + \hat{\beta}_1 \sum \varepsilon_{2i}^2 \sum w_i x_i + \hat{\theta}_1 \sum \varepsilon_{2i}^2 \sum w_i^2}{\beta_2^2 [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2] + \sum \varepsilon_{2i}^2 \sum w_i^2} \right\}$$



The unbiasedness of OLS estimations of Eqs (A.5) and (A.6) ensures that

$$plim(\hat{\beta}_1) = \beta_1; plim(\hat{\beta}_2) = \beta_2$$

$$plim(\hat{\theta}_1) = \theta_1; plim(\hat{\theta}_2) = \theta_2$$

Thus,  $plim(\hat{a}_1)$  and  $plim(\hat{\tau}_1)$  are as follows:

$$plim(\hat{a}_1) = plim\left\{\frac{\beta_2\beta_1[\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2]}{\beta_2^2[\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2] + \sum \varepsilon_{2i}^2 \sum w_i^2}\right\}$$

$$plim(\hat{\tau}_1) = plim\left\{\frac{\beta_2[\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2](\beta_2\theta_1 - \theta_2\beta_1) + \beta_1 \sum \varepsilon_{2i}^2 \sum w_i x_i + \theta_1 \sum \varepsilon_{2i}^2 \sum w_i^2}{\beta_2^2[\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2] + \sum \varepsilon_{2i}^2 \sum w_i^2}\right\}$$

If  $F_i = a_1 R_i + \kappa_1 x_i + \mu_i$ , then

$$plim(\hat{a}_1) = plim\left\{\frac{\theta_2\theta_1[\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2]}{\theta_2^2[\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2] + \sum \varepsilon_{2i}^2 \sum x_i^2}\right\}$$

## Omitting Exogenous Explanatory Variables in One Single Equation (IV)

The conventional strategy of instrumenting  $R_i$  by  $x_i$ .

$$F_i = a_1 R_i + \tau_1 w_i + \mu_i$$

$$R_i = \beta_2 x_i + \theta_2 w_i + \varepsilon_{2i}$$

Regressing the above two equations in 2SLS is equivalent to replacing the estimated

$\hat{R}^i$  in the first equation. Thus, the 2SLS estimator of  $a_1$  and  $\tau_1$  are the following:

$$\hat{a}_1 = \frac{\sum w_i^2 \sum \hat{R}_i F_i - \sum \hat{R}_i w_i \sum w_i F_i}{\sum \hat{R}_i^2 \sum w_i^2 - (\sum \hat{R}_i w_i)^2} \quad (\text{A.13})$$

$$\hat{\tau}_1 = \frac{\sum \hat{R}_i^2 \sum w_i F_i - \sum \hat{R}_i w_i \sum \hat{R}_i F_i}{\sum \hat{R}_i^2 \sum w_i^2 - (\sum \hat{R}_i w_i)^2} \quad (\text{A.14})$$

Replacing  $\hat{R}_i$  by  $\hat{\beta}_2 x_i + \hat{\theta}_2 w_i$ , Eqs A.13 and A.14 are rearranged as following:

$$\hat{a}_1 = \frac{\sum w_i^2 \sum (\hat{\beta}_2 x_i + \hat{\theta}_2 w_i) F_i - \sum (\hat{\beta}_2 x_i + \hat{\theta}_2 w_i) w_i \sum w_i F_i}{\sum (\hat{\beta}_2 x_i + \hat{\theta}_2 w_i)^2 \sum w_i^2 - [\sum (\hat{\beta}_2 x_i + \hat{\theta}_2 w_i) w_i]^2}$$

$$\hat{\tau}_1 = \frac{\sum (\hat{\beta}_2 x_i + \hat{\theta}_2 w_i)^2 \sum w_i F_i - \sum (\hat{\beta}_2 x_i + \hat{\theta}_2 w_i) w_i \sum (\hat{\beta}_2 x_i + \hat{\theta}_2 w_i) F_i}{\sum (\hat{\beta}_2 x_i + \hat{\theta}_2 w_i)^2 \sum w_i^2 - [\sum (\hat{\beta}_2 x_i + \hat{\theta}_2 w_i) w_i]^2}$$

Based on Eqs 3 and 4, I substitute  $\sum w_i^2 \sum x_i F_i - \sum x_i w_i \sum w_i F_i$  by  $\hat{\beta}_1 \{ \sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2 \}$  and substitute  $\sum x_i^2 \sum w_i F_i - \sum x_i w_i \sum x_i F_i$  by  $\hat{\theta}_1 \{ \sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2 \}$ .

Thus,

$$plim(\hat{a}_1) = plim \left\{ \frac{\hat{\beta}_2 \hat{\beta}_1 [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2]}{\hat{\beta}_2^2 [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2]} \right\} = \frac{\beta_1}{\beta_2}$$

$$plim(\hat{\tau}_1) = plim \left\{ \frac{\hat{\beta}_2 (\hat{\beta}_2 \hat{\theta}_1 - \hat{\beta}_1 \hat{\theta}_2) [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2]}{\hat{\beta}_2^2 [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2]} \right\} = \frac{\beta_2 \theta_1 - \beta_1 \theta_2}{\beta_2}$$

## Omitting Exogenous Explanatory Variables in a Two-Equation System

The conventional strategy with two equations:

$$F_i = \alpha_1 R_i + \tau_1 w_i + \mu_{1i}$$

$$R_i = \alpha_2 F_i + \kappa_2 x_i + \mu_{2i}$$

Taking the regression of  $F_i$  as an example, the coefficient matrix estimated by 2SLS

$$\Psi_F = (\hat{K}'\hat{K})^{-1}\hat{K}'F_i, \text{ where } \hat{K} = \begin{bmatrix} w & x \end{bmatrix} \left( \begin{bmatrix} w & x \end{bmatrix}' \begin{bmatrix} w & x \end{bmatrix} \right)^{-1} \begin{bmatrix} w & x \end{bmatrix}' \begin{bmatrix} w & R \end{bmatrix}.$$

$$\text{By replacing } R_i \text{ by } \hat{\beta}_2 x_i + \hat{\theta}_2 w_i + \varepsilon_{2i}, \hat{K} = \begin{bmatrix} w & x \hat{\beta}_2 + w \hat{\theta}_2 + v_F \end{bmatrix},$$

$$\text{where } v_{Fi} = \frac{x_i \sum w_i^2 \sum x_i \varepsilon_{1i} - w_i \sum x_i w_i \sum x_i \varepsilon_{1i} - x_i \sum x_i w_i \sum w_i \varepsilon_{2i} + w_i \sum x_i^2 \sum w_i \varepsilon_{2i}}{\sum w_i^2 \sum x_i^2 - (\sum x_i w_i)^2}.$$

Hence,  $plim(\hat{a}_1)$  is similar to the estimator of  $a_1$  in the OLS estimator in one single equation but replacing the error term  $\varepsilon_1$  by  $v_F$ .

$$plim(\hat{a}_1) = plim\left\{ \frac{\beta_2 \beta_1 [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2]}{\beta_2^2 [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2] + \sum v_{Fi}^2 \sum w_i^2} \right\} > 0$$

Going through a similar calculation,

$$plim(\hat{a}_2) = plim\left\{ \frac{\theta_2 \theta_1 [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2]}{\theta_1^2 [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2] + \sum v_{Fi}^2 \sum x_i^2} \right\} < 0$$

If the system is changed to the following, the signs of  $plim(\hat{a}_1)$  and  $plim(\hat{a}_2)$  reverse.

$$F_i = \alpha_1 R_i + \kappa_1 x_i + \mu_{1i}$$

$$R_i = \alpha_2 F_i + \tau_2 w_i + \mu_{2i}$$

$$plim(\hat{a}_1) = plim\left\{ \frac{\theta_2 \theta_1 [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2]}{\theta_2^2 [\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2] + \sum v_{Fi}^2 \sum x_i^2} \right\} < 0$$

$$plim(\hat{\alpha}_2) = plim\left\{\frac{\beta_2\beta_1[\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2]}{\beta_1^2[\sum x_i^2 \sum w_i^2 - (\sum x_i w_i)^2] + \sum v_{Fi}^2 \sum w_i^2}\right\} > 0$$

## Appendix B: Survey Questionnaires

### B1: Survey on Rental Transactions (English)

## A: Pre-Interview Information [Investigator]

A1: City (a1)

Jinghai	0
Feixi	1

A2: Town (a2)

Guanting	1
Sanhe	2
Zipeng	3
Caigong	4
Daqiu	5

A3: Village (To be announced) (a3)

Guanting Cun	1
Renni Cun	2
Xing Zhuang Cun	3
Huimin Community	4
Zhang Ci Cun	5
Qiao An Cun	6
Mu Lan Community	7
Yuejia Zhuang	8
Jinmei Cun	9
Caigong Zhuang Cun	10
Tuhe Cun	11
Xinnong Cun	12
Luoba Cun	13

A4&A5: Names (codes) of interviewers (a4, a5)

First person	
Second person	

A6: Start time of the interview (a6d, a6m, a6y, a6h, a6min)

Day (dd)	Month (mm)	Year (yy)

Dear Participants:

Thank you very much for participating in the survey of "Land Rental Market". The Tianjin/Anhui Agricultural Extension Office is conducting this research. This project is to investigate the function of the land rental market. You will be answered questions related to your land rental activities in the past three years (2010-2013), agricultural and non-agricultural employment and income, and household background information such as education, farming capacity, etc.

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise would qualify. The Tianjin/Anhui Agricultural Extension Office protects your answers and confidential information. It will take you less than 2 hours to complete the survey. We sincerely appreciate your contribution.

Your signature indicates that you are at least 18 years of age; and you have read this consent form or have had it read to you; your questions have been answered to your satisfaction and you voluntarily agree to participate in this research study.

If you have any questions about this survey, you should always feel comfortable to contact staff in the Agricultural Extension Office.

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If you agree to participate, **please sign your name here:** \_\_\_\_\_

**Name (print):** \_\_\_\_\_ **Date:** \_\_\_\_\_

A7: Has this household ever participated in the land rental market in the last 6 years (2008-2014) (a7)

No	0
Yes	1

*[If No, end of the interview but ask where do the farmers who are in the land rental market live]*  
*[If Yes, move to A8]*

A8: Is this household having an on-going rental contract now? (a8)

No	0
Yes	1

A9: What was (is) the role of this household in the last (on-going) land rental transaction? (a9)

Renting in	0
Renting out	1

*[For income, only ask about the agricultural income]*  
*[For income, only ask about the non-agricultural income]*

A10: May I know your name? \_\_\_\_\_ (a10id)

What is the relationship between the household head and you? (a10id)

Self	0
Spouse	1
Children	2
Parents	3
Other	4

Which collective farmer team does your household belong to? \_\_\_\_\_ (a10a)

A11: How many households are/were involved in one of the land rental transactions? \_\_\_\_\_ (d2a)

*[If >1, move to "Extra Land rental Survey"; if=1, move to A12]*

A12: When did this transaction become effective? (a12) \_\_\_\_\_

A13: *[For ended contract]* What was the actual tenure of the transaction (a13) \_\_\_\_\_

A13': *[For on-going contract]* Regardless of the contract, in your opinion, what will be the tenure of this transaction (a13)

A14: How did this household successfully make this transaction? (a14)

Negotiate individually with the counter parties	1
Give authorization to the village administration	2
Give authorization to the farmer team	3

*[If 1, skip A15 and move to A16 ]*  
*[If 2 or 3, move to A15]*

A15: *[Renting-in]* Do you know which is the household that has the right of HRS of this piece of land? \_\_\_\_\_ (a15)

A15': *[Renting-out]* Do you know the real user of the land after the transaction? \_\_\_\_\_ (a15)

No	0
Yes	1

*[If No, skip A16 and move to A17]*  
*[If Yes, move to A16]*

A16: *[Renting-in]* Who is the holder of the right of the HRS of this piece of land? \_\_\_\_\_ (a16)

D7': *[Renting-out]* Who is/was the user of this land after the transaction? (a16)

Individual	TVEs	Outside enterprises	New Production Mode (Specialists, Family Farm, cooperatives)
1	2	3	4

Could you please tell me the name of the partner (personal name/enterprises name) \_\_\_\_\_ (a16id)

What is the relationship between this partner (representative of the enterprise) and your household?(d16a)

Relatives	Friends/Acquaintances	Villagers	Strangers
1	2	3	4

A17: What was the contract formality of this transaction. *[Authorization/rental contract]* (a17)

Formal Written Contract (Uniformed Contract)	Informal oral
1	2

A18: The area associated with this transaction (mu)(a18) \_\_\_\_\_



Fixed term	No fixed term
1	0

What was the initially contract length of this transaction? (a19b)

A20: After the transaction, was any land reclamations (land smoothing, adding irrigation facilities, etc.) (a20)

No	0
Yes	1
Do not know	2

A21: After the transaction, can people figure out the previous land border or not now (2014 July)? (a21)

No	0
Yes	1
Do not know	2

A22: What is/was the use of this piece of land before the rental transaction? (a22a)

Field Crops	Cash Crops (fruits/vegetable)	Nursery	Breeding	Wasted	Do not know
1	2	3	4	5	6

What is/was the use of this piece of land after the rental transaction? (a22b)

Field Crops	Cash Crops (fruits/vegetable)	Nursery	Breeding	Wasted	Do not Know
1	2	3	4	5	6

### E: Land Rental Details

E1: What was your ideal rental tenure when you decided to participate in the land rental market? (e1a)

Fixed term	No fixed term
1 [answer e1b]	0 [skip e1b]

What is your idea rental tenure? (e1b)

Do you think formal or informal contracts are significantly different when consider rental transactions?

Yes (different)	No
1 [answer e1d]	0 [skip e1d]

What is your ideal contract format? (e1d)

Uniformed Formal Contract	Informal oral
1	2

E2: What do you think was the ideal rental tenure of your partner for this transaction? (e2a)

Fixed term	No fixed term
1 [answer e2b]	0 [skip e2b]

What is the idea rental tenure of the counter party? (e2b)

E3: What was the contract formality that this household suggested during the first several negotiations? (e3)

Uniformed Formal Contract	Informal oral	No Suggestion
1	2	3

E4: What was the contract formality that the partner suggested during the first several negotiations? (e4)

Uniformed Formal Contract	Informal oral	No Suggestion
1	2	3

E5: For this household, what is the biggest concern of a land rental transaction? (e5)

Violation of the tenure	1
Lose the right of HRS contract	2

Other	5
No Concerns	6

E6: Were there any witnesses of the contract? (e6)

No	0	<i>[If No, skip E7 and move to E8]</i>
Yes	1	<i>[If Yes, move to E7.]</i>

E7: Who were the witnesses? (e7)

Members of the village administration	Family members	Representatives of the enterprises	Villagers
1	2	3	4

E8: Among the following channels to post the land rental requests, in your opinion, what is the most efficient one? (e8)

Village related organization (market/administration)	Relatives/friends	TV	Internet	Newspaper	Other
1	2	3	4	5	6

E9: Did (does) any family members of the owner of the right of HRS live in the village within the agreed tenure (including him/herself)? (e9)

No	0
Yes	1
Do not know	2

E10: Do you know the main source of income of your partner's household during this transaction (e10)

No	0	<i>[If No, skip E11-E12 and move to E13]</i>
Yes	1	<i>[If Yes, answer E11]</i>

E11: To your knowledge, what is the main source of income of your partner's household during this transaction? (e11)

Crop farming	1	<i>[If 1-6, move to E12]</i>
Poultry/Livestock	2	
Aquaculture	3	
Off-farm sector	4	
Tourism	5	
Other	6	

E12: How would you evaluate the performance of the partner in that industry? (e12)

Very good	Good	Fair	Poor
1	2	3	4

E13: Was there any rents in this land rental transaction? (e13a)

No	0	<i>[If No, skip E13a-E13f and move to E14]</i>
Yes	1	<i>[If Yes, move to E13a]</i>

Please describe the rents in details *[Take good notes if the rents are complex]*

Cash	Crop Name	Quantity
(e13a)	(e13b)	(e13c)

Whether the rent in cash is (was) associated with the national minimum-purchasing price of any types of crops (e13d)

No	0	<i>[If No, skip E13e-E13f and move to E14]</i>
Yes	1	<i>[If Yes, answer E13e]</i>

How the rent in cash is (was) associated with the national minimum-purchasing price of the crop

Crop Name	Quantity
(e13e)	(e13f)

E14: Whether the contract of this transaction stated that rents increase at a certain percentage during the tenure? (e14a)

No	0
Yes	1

What is the increment percentage that was stated in the contract? \_\_\_\_\_ (e14b)

What is the time interval (year) of rent increment within the contract length (or re-negotiation if rent increment was not stated in the contract)? \_\_\_\_\_ (e14c)

[If there is no fixed term re-negotiation, write the following options if applied and write zero if there is no price renegotiation]

Land Price	
Rice Price	
Random	

E15: Whether the cumulative rent within the tenure was paid in full? (e15a)

No	0	[If No, answer E15b-E15c]
Yes	1	[If Yes, skip E15b-E15c and move to E15d]

The rent should be paid every \_\_\_\_\_ (e15a1) year(s).

What is/was the supposed timing of rents payment? (e15b)

Before the first season (planting)	In the middle of two seasons	After the second season (Harvest)
1	2	3

Whether the most recent (last) payment was paid (got) (e15c)

No	0
Yes	1

Whether there is (was) other benefit associated with this transaction? (e15d)

No	0
Yes	1

E16: [Renting-in] Has this household ever experienced the situation when the renting-out partner asked to terminate the contract before the agreed tenure? (e16)

No	0	[If No, move to Part F]
Yes	1	[If Yes, move to E17]

E16': [Renting-out] Has this household ever experienced the situation when the renting-in partner refused to give back rented land after the agreed tenure? (e16')

No	0	[If No, move to Part F]
Yes	1	[If Yes, move to E17]

E17: When was the last time this household experienced this situation? (e17)

The most recent rental transaction	1
Transactions in the past	2

E18: [Renting-in] The partner informed this household that he would like to terminate the contract (e18i) \_\_\_\_\_ months ahead of the end of the agreed tenure. He/she would like to terminate the contract (e18m) \_\_\_\_\_ months before the agreed tenure.

E18': [Renting-out] The renting in partner refused to give back the land (e18m') \_\_\_\_\_ months after the expiration of the contract.

E19: Was the village administration informed about this issue? (e19)

No	0
Yes	1

E20: *[Renting-in]* Did the partner violate the contract eventually before the agreed tenure? (e20)

No, he/she did not terminate earlier.	0	<i>[If did not terminate earlier, skip E21 and move to E22]</i>
Yes, he/she did terminate earlier.	1	<i>[If did terminate earlier, move to E21]</i>

E20': *[Renting-out]* Did the partner give the land back to your household eventually? (e20)

He/she did give back to this household.	0	<i>[If did give land back, move to E21]</i>
He/she did not give back the land to this household.	1	<i>[If did not give land back, skip E21 and move to E22]</i>

E21: *[Renting-in]* He/she eventually terminated the contract (e21) \_\_\_\_\_ months before the end of the tenure.

E21': *[Renting-out]* He/she eventually gave back the land (e21) \_\_\_\_\_ months after the expiration of the contract.

E22: Did the partner compensate this household for his/her violation? (e22)

No	0	<i>[If No, move to Part F]</i>
Yes	1	<i>[If Yes, move to E23]</i>

E23: How much did the partner pay for this violation in total? (e23) \_\_\_\_\_.

E24: Who determined the compensation? (e24)

Both sides of the transaction	1
Village related organization	2
Collective farmer team	3
Rural Land Arbitral institution	4
Senior Citizens	5
Other	6

## F: Non-Agricultural Income

F1: Could you let me know who is the person that contributes most of the non-agricultural income to this household in 2013? (f1) \_\_\_\_\_ (personal id).

F2: What is the related industry of the most important non-agricultural employment of this person? (f2)

Services	Infrastructure	Transportation	Manufacture	Agriculture	Other
1	2	3	4	5	6

F3: How long has this person worked in this position (year) \_\_\_\_\_ (f3)

<=1 year	1-2 years	2-3 years	3-5 years	5-10 years	10 years and above
1	2	3	4	5	6

F4: What is the company type of this position? (f4)

Enterprises	Institution and organization	Government	Other
1	2	3	4
<i>[Move to F5]</i>	<i>[Skip F5 and move to F6]</i>		

F5: What is the ownership of this company? (f5)

State-owned	Self-owned	Village collective	Private owned	Rural cooperatives (TVEs)	Private-state jointly owned
1	2	3	4	5	6

*[Move to F7]*

F6: What is the contract format of this position? (f6)

Tenure-Track	Contract-Track	Temporary-Track
1	2	3

Does this position has Wu Xian Yi Jin (retirement and health insurance)? (f6a)

No	0
Yes	1

F7: What is the annual monetary payment of this position in 2013 (RMB)\_\_\_\_\_ (f7) .

F8: Does this position provide any non-monetary payment (including bonus, subsidies, holiday gift cards, etc) in 2013 (f8).

No	0
Yes	1

F9: How did this person find this job? (f9)

Replace a relative	Self Application	Other	Referred by another person
1	2	3	4
[Move to F12]			[Move to F10-F11]

F10: What is the relationship with this referee? [If there are more than one referees, then ask for the first referee in the reference chain](f10)

Parents	Spouse	Family members	Relatives	Neighbors	Friends	Colleagues	Classmates	Acquaintances
1	2	3	4	5	6	7	8	9

F11: Does/did this referee belong to this village? (f11)

No	0
Yes	1

F12: Does this position require living in an urban area for more than three months per year? (f12)

No	0	[If No, move to F13]
Yes	1	[If Yes, skip F13-F14 and move to F15]

F13: Has this person ever migrated to an urban area? (f13)

No	0	[If No, move to Part C]
Yes	1	[If Yes, move to F15]

F14: When did this person move back to the village from the last city that he/she migrated\_\_\_\_\_ (f14)  
[Move to F15]

F15: How often did this person visit the village in 2013? (f15) \_\_\_\_\_ times a year.

F16: Please write down the name of the current (last) city that this person live(d) \_\_\_\_\_ (f16)

F17: The number of cities this person has ever migrated for off-farm employment before the last (current) one \_\_\_\_\_ (f17)

[If 0, skip F18 and move to F19]

[If >0, move to F18]

F18: What is the name of the first city that this person migrated for an off-farm position\_\_\_\_\_ (f18)

F19: What was the annual income of this person in the first year of his/her migration (f19) \_\_\_\_\_(RMB)

F20: The number of jobs that this person has ever taken after migration before the current position/unemployment (f20)

[If 0, skip F21-F22 and move to F23]

[If >0, move to F21]

F21: How did this person get his/her first migrated off-farm job (f21)

Replace a relative	Self Application	Other	Referred by another person
1	2	3	4

- a) The number of fellow villagers did this person know when he/she first moved in to this city \_\_\_\_\_ (f22vc). The number of the fellow villagers does this person know now in this city \_\_\_\_\_ (f22vp).
- b) The number of locals did this person know when he/she first moved in to this city \_\_\_\_\_ (f221c). The number of the locals does this person know now in this city \_\_\_\_\_ (f221p).
- c) The number of relatives did this person know when he/she first moved in to this city \_\_\_\_\_ (f22rc). The number of the relatives does this person know now in this city \_\_\_\_\_ (f22rp).

0-5	5-10	10-20	>=20
1	2	3	4

[Move to Part C]

### G: Agricultural Production

G1: What are the major crops in your household? \_\_\_\_\_

What is the crop that brings the most economic profit on rented in land in 2013 (g1) \_\_\_\_\_.

G2: When did this household start to cultivate this crops (g2a) \_\_\_\_\_. When did this household start to rent in land to cultivate this crop (year) (g2b) \_\_\_\_\_.

G3: What is the total cultivated area of this crop 2013(mu) (g3) \_\_\_\_\_, yield per mu \_\_\_\_\_ (g3a)

G4: How many units of land of this crop are rented in land (mu)(g4) \_\_\_\_\_.

G5: What was the maximum cultivated area of this crop before renting in land (mu) (g5) \_\_\_\_\_.

G6: Total cost of agricultural investment (pesticide, mulch, fertilizer, etc) per mu (g6) \_\_\_\_\_.

G7: What is the total revenue of this crop in 2013 (RMB) (g7) \_\_\_\_\_.

G8: Has this household used any machines in 2013 for this crop? (g8)

No	0	[If No, skip G9 and move to G10]
Yes	1	[If Yes, move to G9]

G9: What types of machines have you used in 2013 for this crop? [Mark the machines with "check" if used.]

Tractor (g9t)	Harvester (g9h)	Water pump (f9w)	Thresher (g9th)	Grain thrower (g9g)	Other (g9o)

[Move to G10]

G10: Did you use any machines for the crop before renting in land? (g10)

No	0	[If No, skip G11 and move to G12]
Yes	1	[If Yes, move to G12]

G11: What types of machines did you use before renting in land for this crop? [Mark the machines with "check" if used.]

Tractor (g11t)	Harvester (g11h)	Water pump (g11w)	Thresher (g11th)	Grain thrower (g11g)	Other (g11o)

[Move to G12]

G12: Do you own any machines now? (g12)

No	0	[If No, skip G13 and move to G14]
Yes	1	[If Yes, move to G14]

G13: How many machines do you own (2013) (g13a) \_\_\_\_\_, and how many machines did you own before renting in land for this crop (g13b) \_\_\_\_\_.

[Move to G14]

G14: Have you used any outsourcing in 2013 for this crop (g14)

No	0	[If No, skip G15 and move to G16]
Yes	1	[If Yes, move to G15]

G15: What types of outsourcing have you used in 2013. (g15)

Soil Testing	Fertilizer/pesticides	Production Plan	Machinery	Dehydration	Other
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				delivery (g15g)	

G16: Did you use any outsourcing before renting in land for this crop? (g16)

No	0	<i>[If No, skip G17 and move to G18]</i>
Yes	1	

G17: What types of outsourcing did you use before renting in land for this crop?

Soil Testing (g15t)	Fertilizer/pesticides delivery (g15h)	Production Plan (g15w)	Machinery Cooperation (g15th)	Dehydration and grain delivery (g15g)	Other (g15o)

G18: Has this household registered as “The Family Farm” for this crop? (g18)

No	0
Yes	1

G19: Has this household registered as “Farming Specialist” for this crop? (g19)

No	0
Yes	1

G20: Has this household joined any rural cooperatives for this crop? (g20)

No	0
Yes	1

### C: Land Property Right Survey

C1: For this household, what is the total area of farmland that belongs to this household and what is the area of the HRS contract land in 2013?

Total Area of Land (c1t)	Contract land (Chengbao) (c1c)

C2: What was the second round of HRS contract land of this household (1995)? \_\_\_\_\_ (c2)

C3: What is the reason of the major change of land size (c3)

Demographic changes	1
Village-level adjustment/individual taken-away	2
Village-level or higher taken-away	3
Unclaimed land	4
Other	

C4: Does this household have any pieces of farmland that are on the border of any road/facilities/unclaimed forest, etc? (c4)

No	0
Yes	1

### B: Household Background Information

## B2: Survey on Rental Transactions (Chinese)



**A: 访问之前基本情况[由调查人填写]**

**A1: 城市(a1)**

静海	0
肥西	1

**A2: 所在镇 (a2)**

官亭镇	1
三河镇	2
紫蓬镇	3
蔡公庄	4
大邱庄	5

**A3: 所在村 (a3)**

官亭村	1
任倪村	2
兴庄村	3
回民社区	4
张祠村	5
桥庵村	6
木兰社区	7
岳家庄	8
津美村	9
蔡公庄村	10
土河村	11
新农村	12
罗坝村	13

**A4 & A5: 调查者编号(a4, a5)**

第一调查员	
第二调查员	

**A6: 开始问卷调查时间(a6d, a6m, a6y, a6h, a6min)**

日期 (dd)	月份 (mm)	年 (yy)

您好，我们是中国农业大学的学生，正在做一个暑期社会实践，不知道能不能耽误您一些时间做一个关于土地流转方面的问卷。请问您家曾经流转过或者转入过土地么，大概在最近这 5，6 年？

**A7: 请问本户是否在过去 6 年内（2008-2014）参与过土地流转市场 (a7)**

没有	0	[如果没有,结束访问, 询问附近哪些村民参加过土地流转]
有	1	[如果曾经参加过, 转入 A8]

**A8: 那请问您现在还在流转么? (a8)**

没有	0	[土地流转问题, 主要是关于最后一次流转土地的情况]
有	1	[土地流转问题, 主要是关于目前这次土地流转的情况]

**A9: 请问您是承租户（转出）还是租出户（转入）? (a9)**

租入	0	[收入部分只回答关于农业生产的问题]
租出	1	[收入部分只回答关于非农业生产的问题]

**A10: 您贵姓(姓名)\_\_\_\_\_ (a10id)**

请问您家谁是户主? [和回答人关系] (a10)

本人	0
配偶	1
子女	2

父母	3
其他	4

请问您属于哪个村民小组\_\_\_\_\_ (a10a)

A11: 请问您家这次流转土地和多少户有流转约定? \_\_\_\_\_ (a11)  
[如果>1, 转入“转入户流转问卷”; 如果=1 回答 A12]

A12: 请问这次流转是哪年把土地流转出去(转入进来)的? (a12) \_\_\_\_\_

A13: [对于已经结束的流转]请问最终流转了多长时间 (a13) \_\_\_\_\_

A13': [对于正在进行的流转]不管当时双方如何约定, 您觉得这次可以流转多长时间 (a13)

A14: 请问您家是怎么找到这个承租方 (出租方)的? [如何找到流转交易对方, 例如: 承租户找出租方] (a14)

直接和流转对方商议	1	[如果选择直接商议, 跳过 A15 回答 A16]
授权村委会代为流转	2	[如果选择授权, 回答 A15]
授权村民小组代为流转	3	[如果选择授权, 回答 A15]

A15: [租入] 请问是否知道谁是该片土地的原承包方? \_\_\_\_\_ (a15)

A15': [租出] 请问是否知道谁是该片土地流转后的使用方? \_\_\_\_\_ (a15)

不知道	0	[如果不知道, 跳过 A16 并回答 A17]
知道	1	[如果知道, 回答 A16]

A16: [租入] 请问您家租入的土地承包方是谁? \_\_\_\_\_ (a16)

A16': [租出] 请问正在经营您家土地的使用方是谁? \_\_\_\_\_ (a16)

个人	当地企业	外地企业	新型农业生产经营模式(家庭农场, 大户, 合作社)
1	2	3	4

请问达成协议的个人 (企业) 姓名 (全称) \_\_\_\_\_ (a16id) [村民小组注明村民小组编号或者组长姓名]

请问租了您家地 (把地租给您家的) 的人 (企业负责人) 和您家什么关系? (a16a)

亲戚	朋友	村民	陌生人
1	2	3	4

A17: 请问这次流转的合约形式是什么? [授权村委会的是委托书, 其他为流转合约, 询问授权书或者流转合约的形式] (a17)

书面合同 [肥西: 农委统一合同]	非正式口头约定
1	2

A18: 请问本次土地流转涉及的土地面积 (a18) \_\_\_\_\_

A19: 请问本次流转当时商议的流转合同期限是多久 (a19a)

有固定期限	没有固定期限
1	0

当时商议的合同期限是多久 [比如每几年商议一次合同] \_\_\_\_\_ (a19b)

A20: 请问这片土地转入后, 是否进行了土地整治 (平整, 增加水利设施等) (a20)

没有	0
有	1
不知道	2

A21: 请问这片土地流转后, 现在 (2014) 年是否还能辨认原来土地边界 (a21)

不能	0
能	1
不知道	2

A22: 请问这片土地流转前的用途是什么? (a22a)

大田作物	经济作物 (蔬菜水果)	苗木	养殖	荒地	不知道
1	2	3	4	5	6

请问这片土地流转后的用途是什么? (a22b)

大田作物	经济作物（蔬菜水果）	苗木	养殖	荒地	不知道
1	2	3	4	5	6

### E: 土地流转细节问卷

E1: 请问您家在决定目前这次（最后一次）流转（租入）的时候本来打算流转（租入）多长时间? (e1a)

有固定期限	没有固定期限
1 [回答 e1b]	0 [跳过 e1b]

打算流转时间是多久? (e1b)

请问您家觉得拥有口头或者正式合同有区别么? (e1c)

有	没有
1 [回答 e1d]	0 [跳过 e1d]

请问您家希望拥有什么样的合同 (e1d)

书面合同（农委统一合同）	口头协议
1	2

E2: 您觉得流转（流转给）您家土地的农户当时本来打算流转(租入)多长时间? (e2a)

有固定期限	没有固定期限
1 [回答 e2b]	0 [跳过 e2b]

打算流转时间是多久? (e2b)

E3: 请问您家在协商时对流转合同形式有什么提议么? (e3)

书面合同（农委统一合同）	口头协议	没提出具体意见
1	2	3

E4: 请问该流转对象在协商时对合同形式有什么提议么?(e4)

书面合同（农委统一合同）	口头协议	没提出具体意见
1	2	3

E5: 对您家而言，您觉得土地流转中最大的顾虑是什么? (e5)

害怕对方违反约定期限	1
影响土地承包权	2
害怕受到租金浮动的影响	3
对方不好好使用土地	4
其他	5
没有顾虑	6

E6: 请问达成流转协议的时候有人作证么? (e6)

没有	0	[如果没有, 跳过 E7 并回答 E8]
有	1	[如果有, 转到 E7.]

E7: 请问他们（证人）是哪些人? (e7)

村委会（村民小组）成员	家庭成员	企业代表	村民
1	2	3	4

E8: 请问以下各种传播土地流转需求的途径中，您觉得哪种渠道最有效? (e8)

村级（村民小组组织）	亲戚、朋友	电视	网络	报纸	其他
1	2	3	4	5	6

E9: 请问您家的流转对象有没有家庭成员（包括本人）在流转期间是否住在本村? (e9)

不	0
是	1
不知道	2

E10: 请问您是否清楚您家这次土地流转对象的主要收入来源? (e10)

不知道	0
-----	---

[如果不知道, 跳过] 

知道	1
----	---

 E11-E12 并转向 E13]  
 [如果知道, 回答 E11]

E11: 您是否知道您家的流转对象的主要收入来源是什么? (e11)

种植	1	[如果回答 1-6, 转到 E12]
养殖	2	
水产	3	
非农经营/打工	4	
旅游	5	
其他	6	

E12: 您觉得您的流转对象(承租方或者租出方)在那个(上述 E11)行业做的怎么样? (e12)

非常好	不错	还可以	不太好
1	2	3	4

E13: 请问这次(最后一次)土地流转流转有租金么? (e13)

没有	0	[如果没有, 跳过 E13a-E13f 并回答 E14]
有	1	[如果有, 转到 E13a]

请问 2013 租金的具体情况?

现金	作物名称	作物数量
(e13a)	(e13b)	(e13c)

请问租金是否和某种作物的价格挂钩 (e13d)

否	0	[如果没有, 跳过 E13e-E13f 并回答 E14]
有	1	[如果有, 转到 E13e]

如何挂钩

作物名称	作物数量
(e13e)	(e13f)

E14: 请问租期内租金是否上涨? (e14a)

否	0
是	1

请问上涨幅度是多少? (e14b) \_\_\_\_\_

请问租金在合同期内每几年上涨一次[如果租金涨幅不明确, 多久重新谈价一次]? (e14c) \_\_\_\_\_  
 [若没有固定复议时间, 可填写一下选项, 或者填写 0]

随地价变动	
随粮价变动	
随机	

E15: 请问租期内租金是否一次付清? (e15a)

否	0	[如果没有, 回答 E15b-E15c]
是	1	[如果是, 跳过 E15b-E15c 并转向 E15d]

请问租金几年一付 \_\_\_\_\_ (e15a1)

请问租金应该何时交付 (e15b)

第一季作物种植前(播种前)	两季作物之间	第二季收获后(收获后)
1	2	3

请问最近一次租金(最后一次)是否交付 (e15c)

否	0
是	1

本次交易是否还有其他分红或者福利? (e15d)

否	0
有	1

E16: [租入方] 您家是否遇到过租出方要求提前终止流转合同 (e16)

没有	0	[如果没有, 结束本部分转到 F 部分]
有	1	[如果有, 转到 E17]

E16': [租出方] 您家是否遇到过承租方合约结束以后尚未归还租入的土地? (e16')

没有	0	[如果没有, 结束本部分问卷转到 F 部分]
有	1	[如果有, 转到 E17]

E17: 请问您家上一次遭遇到这种情况是什么时候? (e17)

最近的一次流转	1
曾经的一次流转	2

E18: [租入方] 流转对象在合约到期前的 (e18i) \_\_\_\_\_ 个月的时候 通知您家他/她想提前结束合约. 他/她想在合约结束前 (e19m) \_\_\_\_\_ 个月的时候结束合约.

E18': [租出方] 流转对象在合约到期 (e18m') \_\_\_\_\_ 个月后就未归还土地.

E19: 请问 (村委会) 村民小组知道当时的情况么? (e19)

不知道	0
知道	1
不清楚村委会是否知道	2

E20: [租入方] 请问租出方最终是否提前解除合同? (e20)

最后没有提前解除合同.	0	[如果没有提前解除, 跳过 E21 并回答 E22]
最后确实提前解除合同.	1	[如果提前解除, 转到 E21]

E20': [租出方] 请问承租方是否归还土地? (e20')

最终归还	0	[如果确实归还, 转到 E21]
最终没有归还	1	[如果没有归还土地, 跳过 E21 并回答 E22]

E21: [租入方] 对方最终在原定租期结束前 (e21) \_\_\_\_\_ 个月终止了合同.

E21': [租出方] 对方最终在原定租期结束后 (e21') \_\_\_\_\_ 个月归还土地.

E22: 请问对方是否因为这件事对您家进行赔偿? (e22)

没有	0	[如果没有, 结束本部分并转到 F]
有	1	[如果有, 转到 E23]

E23: 请问对方就此事如何赔偿您家的 (e23) \_\_\_\_\_.

E24: 是谁决定的赔偿金? (e24)

双方协商	1
村级相关机构	2
村民小组	3
土地仲裁机构	4
村里长者	5
其他	6

## F: 非农业收入与求职

F1: 请问在 2013 年您家谁对非农业收入的贡献最大 (f1) \_\_\_\_\_ (此成员个人编码).

F2: 请问这名家庭成员目前最重要的非农职业属于以下哪一个行业 (f2)

服务业	建筑业	交通运输业	制造业	农业	其他
-----	-----	-------	-----	----	----

1	2	3	4	5	6
---	---	---	---	---	---

F3: 请问这名成员已经在这个职位上工作了多久了? \_\_\_\_\_ 年 (f3)

少于 1 年	1-2 年	2-3 年	3-5 年	5-10 年	10 年以上
1	2	3	4	5	6

F4: 请问这名成员所在单位类型? (f4)

公司	事业单位	机关	其他
1	2	3	4
[ 回答 F5 ]		[ 跳过 F5 并回答 F6 ]	

F5: 请问这个单位的性质是什么? (f5)

国营	本人所有	乡村集体	私营	乡镇企业	公私合营
1	2	3	4	5	6

F6: 请问这个职位的工作类型是什么? (f6)

长期工	短期工	临时工
1	2	3

请问这个职位是否有五险一金 (f6a)

没有	0
有	1
不知道	2

F7: 请问这份工作在 2013 年全年的现金月收入是多少(RMB) \_\_\_\_\_ (f7) .

F8: 请问这份工作在 2013 年是否有其他福利 (包括年终奖, 津贴, 年节补贴等 (f8) .

没有	0
有	1

F9: 请问这名家庭成员当时是如何找到这份工作的? (f9)

顶替亲属	自己应聘 (创业)	其他	别人介绍
1	2	3	4
[ 转到 F12 ]			[ 回答 F10-F11 ]

F10: 请问本户同这个介绍人是什么关系? (如果有多名推荐人, 则询问推荐链中的第一个人) (f10)

父母	配偶	家庭成员	亲戚	邻居	朋友	同事	同学	熟人
1	2	3	4	5	6	7	8	9

F11: 请问这位介绍人是否是本村人 (或曾经) (f11)

不是	0
是	1

F12: 请问这份非农业工作是否要求这名家庭成员移居到其他城市每年至少 3 个月的时间? (f12)

不需要	0	[ 如果不需要, 回答 F13 ]
需要	1	[ 如果需要, 跳过 F13-F14 并回答 F15 ]

F13: 请问该家庭成员曾经是否移居到其他城市在一年中超过 3 个月的时间? (f13)

没有	0	[ 如果没有, 结束本部分转到 C ]
曾经	1	[ 如果曾经有, 回答 F15 ]

F14: 请问该家庭成员何时从该城市返乡的 \_\_\_\_\_ (f14)

[ 转到 F15 ]

F15: 请问该家庭成员 2013 年探家几次 (f15) 一年 \_\_\_\_\_ 次

F16: 请问这名家庭成员目前 (最后一次) 外出打工城市的名字 \_\_\_\_\_ (f16)

F17: 请问这名家庭成员到目前为止曾经在多少个城市打过工 \_\_\_\_\_ (f17)

[如果是 0, 跳过 F18 并回答 F19]

[如果大于 0, 回答 F18]

F18: 请问这名家庭成员第一次外出打工城市的名字 \_\_\_\_\_ (f18)

F19: 请问这名家庭成员第一次外出打工时的打工年收入是多少 (f19) \_\_\_\_\_ (RMB)

F20: 请问这名家庭成员在找到现在的工作 (或者不在从事非农业工作) 之前做过多少个工作 (f20)

[如果是 0, 跳过 F21-F22 并回答 F23]

[如果大于 0, 回答 F21]

F21: 请问这名家庭成员是如何找到第一份非农业工作的 (f21)

顶替亲属	自己应聘	其他	别人介绍
1	2	3	4

F22: [此题是关于目前所在 (或者最后一个) 外出打工的城市]

a) 该家庭成员刚到这座城市工作时认识多少老乡 \_\_\_\_\_ (f22vc). 该成员现在 (或离开时) 在这座城市认识多少老乡 \_\_\_\_\_ (f22vp).

b) 该家庭成员刚到这座城市工作时认识多少当地居民 \_\_\_\_\_ (f22lc). 该成员现在 (或离开时) 在这座城市认识多少当地人 \_\_\_\_\_ (f22lp).

c) 该家庭成员刚到这座城市工作时认识多少亲戚 \_\_\_\_\_ (f22rc). 该成员现在 (或离开时) 在这座城市认识多少亲戚 \_\_\_\_\_ (f22rp).

0-5	5-10	10-20	>=20
1	2	3	4

[转入 C 部分]

### G: 农业生产

G1: 请问您家主要种植哪些作物 \_\_\_\_\_

请问本户在 2013 年毛收入最高的作物是什么 (g1) \_\_\_\_\_.

G2: 请问您家是从哪年开始种植这种作物的 (g2a) \_\_\_\_\_ 请问本户是从哪年开始为种植这种作物而转入土地的 (g2b) \_\_\_\_\_.

G3: 请问目前 (2014) 您家种植该农作物的总面积 (亩) (g3) \_\_\_\_\_, 亩产 \_\_\_\_\_ (g3a)

G4: 请问您家种植该农作物的总面积中有多少亩是流转的土地 (g4) \_\_\_\_\_.

G5: 请问您家在没有流转土地之前种植该作物时的最大面积是多少 (g5) \_\_\_\_\_.

G6: 请问您家在种植该作物时每亩的农业投入 (包括能源, 化肥, 地膜, 等) 是多少 (元) (g6) \_\_\_\_\_.

G7: 请问该作物市场价格 (2013) 是 \_\_\_\_\_ (元/()) (g7a)

您家 2013 年种植该作物的总收入是多少 (元) (g7b) \_\_\_\_\_

G8: 请问本户在 2013 年种植该作物过程中是否使用了机械? (g8)

没有	0	[如果没有, 跳过 G9 并回答 G10]
有	1	[如果有, 回答 G9]

G9: 请问本户在 2013 年种植该作物时使用过哪些下面列举的机械? [使用过的机械下面请打钩].

拖拉机(g9t)	收割机(g9h)	水泵 (f9w)	打谷机 (g9th)	扬长机 (g9g)	其他(g9o)

[转到 G10]

G10: 请问您家在流转土地之前使用过农业机械么? (g10)

没有	0	[如果没有, 跳过 G11 并回答 G12]
有	1	[如果有, 回答 G12]

G11: 请问您家在租入土地之前种植该作物时使用过哪些下面列举的机械? [使用过的机械下面请打钩].

拖拉机(g9t)	收割机(g9h)	水泵 (f9w)	打谷机 (g9th)	扬长机 (g9g)	其他(g9o)

[转到 G12]

G12: 请问您家拥有一些农业机械么? (g12)

没有	0	[如果没有, 跳过 G13 并回答 G14]
有	1	[如果有, 回答 G14]

G13: 请问您家到 2013 年为止拥有了几台农业机械 (g13a) \_\_\_\_\_, 请问您在流转土地之前拥有几件农业机械 (g13b) \_\_\_\_\_.

G14: 请问本户在 2013 年为该作物用过农业外包服务 (社会化服务) 么 (g14)

没有	0	[如果没有, 跳过 G15 并回答 G16]
有	1	[如果有, 转到 G15]

G15: 请问本户在 2013 为该作物使用过那些外包服务. (g15)

测土配方 (g15t)	统一配种施肥农药等 (g15h)	制定生产方案 (g15w)	农机合作 (g15th)	收割后烘干交粮 (g15g)	其他 (g15o)

G16: 请问本户在租入土地前为该作物使用过农业外包服务么? (g16)

没有	0	[如果没有, 跳过 G17 并回答 G18]
有	1	[如果有, 回答 G17]

G17: 请问本户在租入土地之前为该作物使用了哪些农业外包服务?

测土配方 (g17t)	统一配种施肥农药等 (g17h)	制定生产方案 (g17w)	农机合作 (g17th)	收割后烘干交粮 (g17g)	其他 (g17o)

G18: 就该作物而言, 请问本户被认证为家庭农场了么? (g18)

没有	0
有	1

G19: 就该作物而言, 请问本户被认证为种植专业大户么? (g19)

没有	0
有	1

G20: 就该作物而言, 请问本户参加任何农民专业合作社了么? (g20)

没有	0
有	1

### C: 关于农地所有权的问卷

C1: 请问您家 2013 年的可经营面积 (相对而言属于您家的土地面积, 包括已经流转出去的土地) 是多少, 其中承包地的面积是多少 (以亩为单位)

总面积 (c1t)	承包地 (c1c)

C2: 请问您家二轮承包 (1995 左右) 的面积是多少? \_\_\_\_\_(亩)(c2)

C3: 请问相对于二轮承包土地面积变化的主要原因是什么 (c3)

人口变化	1
村级土地调配/被别人霸占	2
村级或更高级别行政单位征用土地	3
开荒	4
其他	5

C4: 请问所有所属于您家的地块是否有四至 (丈量土地四边方位) 靠近道路, 设施, 或者荒地的? (c4)

没有	0
有	1

### B: 家庭基本信息

见另一个附件, 主要强调的是家庭的界定, 是否是同一生产生活单元。



### B3: Survey on Rural Households (English)

B1-B18: Family Background (Family is determined by the production/living unit)

B1: Personal id(b1d)	B2: Relationship to the head (b2)	B3: Gender (b3)	B4: Whether belong to the same residency book(b4)	B5: Age (b5)	B6: Huku (b6)	B7: Marriage Status (b7)	B8: Spouse ID (b8)	B9: Whether lived in this village for more than 3 months in 2013 (b9)	B10: Reason of absence (b10)	B11: Education (b11)	B12: Political Identity (b12)	B13: Whether show up in peak seasons for farming (b13)	B14: Whether show up in non-peak seasons for farming (b14)	B15: Whether has non-agri income in 2013(b15)	B16: Whether has agri-related degrees/certificates (b16)	B17: Whether has the following training (b17)	B18: Health (b18)	B19: Location of the school that children enroll
	1:Head 2: Head spouse 3: Children 4:Siblings 5:Parent 6: Children-in-law 7: Grand children	0: Female 1: Male	0: No 1:Yes		1: Rural 2: Urban 3: No Huku	1: Married 2: Divorced 3: Widower 4: Single		<i>[Click if lived for more than 3 months]</i>	1: Migration 2: Primary School 3: Junior High 4:Senior High 5: Technical Secondary School 6:Community College 7:Undergrad 8:Graduate and above	1:Illiteracy 2:Primary School 3: Junior High 4:Senior High 5: Technical Secondary School 6:Community College 7:Undergrad 8:Graduate and above	1:Regular citizens 2:Village leader 3:Farmer team leader 4:Civil Servant in the Town 5 : Employees in the state-owned institution in the town (schools, agricultural extension office) <i>[Take notes here]</i>	<i>[Click if Yes]</i>	<i>[Click if Yes]</i>	<i>[Click if Yes]</i>	<i>[Click if Yes]</i>	Teaching;Driving;Cooking;Tailoring;Nursing;Haircuts <i>[Click if Yes]</i>	1:Very good 2:Good 3:Fair 4:Poor	1:This village 2:This Town 3:This City 4:Other cities
1	1																	
2	2																	
3																		
4																		
5																		
6																		
7																		

B19: In this household, besides the current members who are in office, did anyone in the past serving as a village leader or a leader of a collective farmer team or an even higher position? (b19)

No	0
Yes	1

How many members in total have ever been in leadership? \_\_\_\_\_ (b19a), What was the highest position \_\_\_\_\_ (b19a)

B20: In a land rental transaction, do you think you trust non-strangers that you know more than strangers that come from another region? (b20)

Trust non-strangers more	1
No difference/cannot answer	0
Trust stranger more	2

In a land rental transaction, for the same level of rent, were you more willing to have transaction with a non-stranger that you know or a stranger that you do not know? (b20a)

Prefer a non-stranger	1
No difference/cannot answer	0
Prefer a stranger	2

What is the most important criterion in choosing transaction? (b20b)

Rents	0
Government approval	1
Capacity	2
Relationship	3
Peer Response	4
No rentals	5

## B4: Survey on Rural Households (Chinese)

**B1-B18: 家庭成员基本情况 (以一起吃饭, 经济相通, 处于同一生活生产单元为标准)**

B1: 个人编码 (b1 id)	B2: 同户主的关系 (b2)	B3: 性别 (b3)	B4: 户籍是否在一个户口本中 (b4)	B5: 年龄 (b5)	B6: 户口类型 (b6)	B7: 婚姻状况 (b7)	B8: 配偶个人编码 (b8)	B9: 2013年是在本村居住时间超过3个月 (b9)	B10: 不在本村居住的原因 (b10)	B11: 教育程度 (b11)	B12: 身份面貌 (b12)	B13: 在农忙时候做农活么 (b13)	B14: 在非农忙时候做农活么 (b14)	B15: 有没有非农业收入 (b15)	B16: 有没有和农业生产有关的证书或文凭 (b16)	B17: 有没有下列技能的培训 (b17)	B18: 身体状况 (b18)	B19: 孩子上学地点
	1: 户主 2: 户主配偶 3: 户主子女 4: 户主兄弟姐妹 5: 户主父母 6: 户主儿媳或女婿 7: 孙子/女	0: 女性 1: 男性	0: 不是 1: 是		1: 农业 2: 非农业 3: 没有户口	1: 已婚 2: 离异 3: 寡妇/鳏夫 4: 单身		[在超过3个月的家庭成员空格外打勾]	1: 外出打工 2: 外出上学 3: 服役 4: 其他	1: 文盲 2: 小学 3: 初中 4: 高中 5: 技校 6: 大专 7: 本科 8: 研究生以上	1: 普通村民 2: 村干部 3: 村民小组组长/副组长 4: 镇上机关公务员 5: 村镇事业单位员工 (如教师, 农机推广员等) [以详细笔记为准]	[若符合在空格外打勾]	[若符合在空格外打勾]	[若符合在空格外打勾]	[若符合在空格外打勾]	教师; 驾驶; 烹饪; 服装剪裁; 护理 家政; 美容美发 [若符合在空格外打勾]	1: 非常好 2: 不错 3: 还可以 4: 不太好	1: 本村 2: 本镇 3: 本市 4: 外省市
1	1																	
2	2																	
3																		
4																		
5																		
6																		
7																		

**B19: 除去您家现在的家庭成员和现任村级以上领导, 以前在您家历史上是否有家庭成员担任村民小组, 村级领导, 或更高级别的领导 (b19)**

没有	0
有	1

一共有几位家庭成员曾经担任过村民小组以上级别的领导 \_\_\_\_\_ (b19a) 最高的具体职位是 \_\_\_\_\_ (b19b)

**B20: 在一个租赁交易中, 您是否更信任一个认识的村民而不是一个不太熟悉的其他地方的人 (b20)**

更信任村民	1
没区别/无法回答	0
更信任陌生人	2

在一个租赁交易中, 同等租金情况下, 您是否更愿意和一个认识的村民打交道而不是一个不太熟悉的其他地方的人 (b20a)

更倾向村民	1
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没区别/无法回答	0
更倾向陌生人	2

选择租赁交易对象时候，您觉得最重要的标准是什么? (b20b)

租金	0
政府许可	1
能力	2
关系	3
其他村民决定	4
无论如何都不租	5

## B5: Survey on Village Institutions (English)

**Village-Level Survey**

A1: City (a1)

Jinghai	0
Feixi	1

A2: Town (a2)

Guanting	1
Sanhe	2
Zipeng	3
Caigong	4
Daqiu	5

A3: Village (To be announced) (a3)

Guanting Cun	1
Renni Cun	2
Xing Zhuang Cun	3
Huimin Community	4
Zhang Ci Cun	5
Qiao An Cun	6
Mu Lan Community	7
Yuejia Zhuang	8
Jinmei Cun	9
Caigong Zhuang Cun	10
Tuhe Cun	11
Xinnong Cun	12
Luoba Cun	13

V0: Respondent (v0)

Director of the Village Administration (VA)	Party Secretary of the VA	Member of the VA	Accountant
1	2	3	4

Whether the director and the party secretary is the same person in this village? \_\_\_\_\_ (v0a)

No	0
Yes	1

V1: The number of farmer teams in the village \_\_\_\_\_ (v1)

V2: Surnames of the following village leaders

Director of the village administration \_\_\_\_\_ (v2d)

Party Secretary of the VA \_\_\_\_\_ (v2p)

Accountant \_\_\_\_\_ (v2a)

V3: How many members are there in the current village administration? \_\_\_\_\_ (v3)

V4: When did the current village administration take the office? \_\_\_\_\_ (v4)

V5: How long is the term of each village administration? \_\_\_\_\_ (v5)

V6: What is the travel time to the nearest city (Tianjin/Hefei) by car? \_\_\_\_\_ (min) (v6)

V7: Among the GDP of this farmer team in 2013,

Agriculture \_\_\_\_\_ (%) (v7)

V8: How would you rank the GDP of this village among all villages in this town? (v8)

Top 10%	Top 30%	Top 50%	Below 50%
1	2	3	4



V10: Does the village have any Township-Village Enterprises (TVEs)? (v10)

No	0	<i>[If No, skip V11 and move to V12]</i>
Yes	1	<i>[If Yes, move to V11]</i>

V11: How many TVEs are there in the village \_\_\_\_\_ (v11)

V12: How many households are there in the village in 2013? \_\_\_\_\_ (v12)

V13: How many residences are there in the village in 2013? \_\_\_\_\_ (v13)

V14: What is the percentage of labor in each sector in the village

Agriculture (%) \_\_\_\_\_ (v14a)

TVEs (%) \_\_\_\_\_ (v14t)

Non-agricultural employment (private business) within the town (%) \_\_\_\_\_ (v14n)

Migration (%) \_\_\_\_\_ (v14m)

V15: What is percentage of residence of each age group in the village in 2013

0-18 years old Children and Youth (%) \_\_\_\_\_ (v15c)

19-40 years old Young Labor (%) \_\_\_\_\_ (v15y)

41-60 years old Elder Labor (%) \_\_\_\_\_ (v15e)

61 years old and above Senior Citizens (%) \_\_\_\_\_ (v15s)

V16: How many major Surnames are there in the village? \_\_\_\_\_ (v16)

V16': What are they: \_\_\_\_\_

V17: Does at least one surname represent kinship? (v17)

No	0	<i>[If No, skip V18 and move V19]</i>
Yes	1	<i>[If Yes, move to V18]</i>

V18: What are the surnames that represent a family with kinship in the village? \_\_\_\_\_ (v18)

V19: What is the percentage of the each type of migration households among all the migration households?

Migration of the entire family (%) \_\_\_\_\_ (v19a)

Migration with spouse and children (leftover senior citizens) (%) \_\_\_\_\_ (v19b)

Migration with spouse (leftover senior citizens and children) (%) \_\_\_\_\_ (v19c)

Migration with no family members (leftover senior citizens, children and women) (%) \_\_\_\_\_ (v19d)

V20: Does the village allow land adjustment based on demographic changes in 2013? (v20)

No	0	<i>[If No, move to V21]</i>
Yes	1	<i>[If Yes, skip V21 and move to V22]</i>

V21: When did the village stop making land adjustment based on demographic changes? \_\_\_\_\_ (v21) *[NA if not applied]*

V22: Were there any farmland expropriation events in the village (farmland taken-away) in the past 5 years (2009-2013)? (v22)

No	0	<i>[If No, skip V23-V27 and move to V28]</i>
Yes	1	<i>[If Yes, move to V23]</i>

V23: Which administration of the following determined this farmland expropriation? (v23)

Village administration	Township administration	Provincial administration
1	2	3

V24: How many households were involved in this taken-away event? \_\_\_\_\_ (v24)

V25: What was the total area of farmland that involved in this taken-away event? \_\_\_\_\_ (v25)

V26: Whether households that were involved in this taken-away event have been compensated? (v26)

No	0	<i>[If No, skip V27 and move to V28]</i>
Yes	1	<i>[If Yes, move to V27]</i>

V27: How each household was compensated for each unit of land that was taken away? \_\_\_\_\_ (RMB) (v27)

V28: Has the village administration issued any land titles to villagers? (v28)

No	0	<i>[If No, skip V29-V30 and move to V31]</i>
Yes	1	<i>[If Yes, move to V29]</i>

V29: What is the percentage of farmland that is covered by the land titles issued by the village administration?

\_\_\_\_\_ (v29)

V30: Is land size clearly defined in the land title? \_\_\_\_\_ (v30a)

Does this village apply the virtual land property right? \_\_\_\_\_ (v30b)

No	0
Yes	1

V31: Does the village administration know all the land rental activities in the village? (v31)

No	0
Yes	1

V32: Does the village administration need to set up a meeting annually (seasonally) to discuss rents and other rental related issues? (v32)

Never	0
Always	1
Some times	2

V33: Does the village administration have the responsibility to post land rental request and offer help in finding partners? (v33)

Never	0
Always	1
Some times	2
Upon request	3

Is there a land rental market for information announcement in the village? (v33a)

No	0
Yes	1

When was it founded? \_\_\_\_\_ (v33ay)

Is there a land rental cooperative that helps farmers with land rental issues? (v33b)

No	0
Yes	1

When was it founded? \_\_\_\_\_ (v33by)

V34: Does the village administration offer help in preparing paper work for written land rental contracts? (v34)

Never	0
Always	1
Some times	2
Upon request	3

V35: Does the village administration serve as a witness/guarantee when villagers making land rental contracts? (v35)

Never	0
Always	1
Some times	2
Upon request	3

V36: Has the village administration ever transfer a large scale of farmland to an individual/enterprises? (v36)

No	0	<i>[If No, skip V37 and move to V38]</i>
Yes	1	<i>[If Yes, move to V37]</i>

V37: For the last collective land transfer, who was the renting-in partner? (v37)

Villager	1
TVE	2

Other enterprises	4	[Move to V38] [Skip V38 and move to V39] [Skip V38-V39 and move to V40]
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V38: What is the name of this villager/TVE? \_\_\_\_\_ [household ID] (v38)

V39: What is the major form of land rentals? (v39)

Collective Transfer	0
Individual Transfer	1

V40: What is the percentage of this type of rentals among all rental land? \_\_\_\_\_ (v40)

V41: Has the village administration ever provided any legal aid service for the villagers? (v41)

No	0	[Skip V42- V43 and move V44]
Yes	1	[Move to V42]

V42: What kind of organization is providing the legal service in the village right now? (v42)

Education Institution	1
NGOs	2
Government	3
Other	4

V43: How often does this organization offer any types of legal aid activities? \_\_\_\_\_ times (v43) a year.

V44: What is the total area of land of this village? \_\_\_\_\_ (v44)

What is the percentage of each types of land in the village?

Farmland (%) (Real) \_\_\_\_\_ (v44fa)

Farmland (%) (Reported) \_\_\_\_\_ (v44fb)

Farmland (%) (Forest) \_\_\_\_\_ (v44ff)

Residential (%) \_\_\_\_\_ (v44r)

Rental land (%) \_\_\_\_\_ (v44t)

V45: What is the percentage of irrigated farmland?

Collective irrigated (%) \_\_\_\_\_ (v45c)

Private irrigated (%) \_\_\_\_\_ (v45p)

V46: What is the farmland per capita? \_\_\_\_\_ (v46)

V47: What is the percentage of the following types of farmland?

Contract land (%) \_\_\_\_\_ (v47c)

Unclaimed land (%) \_\_\_\_\_ (v47u)

V48: Education Facilities of the village

School type	Is there a school of this type in the village or nearby (0: No; 1: Yes)	If no, how far is the nearest school of this type (travel time by car)
Kinder garden (v48k) 1		
Primary school (v48p) 2		
Junior High School (v48j) 3		
Senior High School (v48s) 4		
Vocational Senior High School (v48v) 5		
Technical Senior High School (v48t) 6		

V49: When was the first year that HRS implemented in the village? \_\_\_\_\_ (v49) [NA if not applied]

V50: When did this village finish the second round of HRS? \_\_\_\_\_ (v50) [NA if not applied]

No	0
Yes	1

V52: Is this village a provincial-level poverty village? (v52)

No	0
Yes	1

V53: Has this village ever belonged to another town? (v53)

No	0
Yes	1

*[If No, end of the interview]*

*[If Yes, answer V54]*

When did this village merge to the current town? \_\_\_\_\_ (v53y)

V54: Has this village ever changed the village name due to this village merging?

No	0
Yes	1

If Yes, what was the village name before merging\_\_\_\_\_ (v54n)

V55: Whether the village has the uniformed residential block?(v55)

No	0
Yes	1

## B6: Survey on Village Institutions (Chinese)

## 村级问卷

A1: 城市 (a1)

静海	0
肥西	1

A2: 镇 (a2)

官亭	1
三河	2
紫篷	3
蔡公庄	4
大邱庄	5

A3: 村(a3)

官亭村	1
任倪村	2
兴庄村	3
回民社区	4
张祠村	5
桥庵村	6
木兰社区	7
岳家庄	8
津美村	9
蔡公庄村	10
土河村	11
新农村	12
罗坝村	13

V0: 回答人 (v1)

村主任	村支书	村委成员	会计
1	2	3	4

目前本村村主任和支书是否为同一人? (v1a)

不是	0
是	1

V1: 本村村民小组的数目\_\_\_\_\_ (v1)

V2: 以下村级领导的姓氏

村主任 \_\_\_\_\_ (v2d)

村书记\_\_\_\_\_ (v2p)

村会计\_\_\_\_\_ (v2a)

V3: 请问本届村委会一共有多少成员? \_\_\_\_\_ (v3)

V4: 请问本届村委会哪年开始任职的 \_\_\_\_\_ (v4)

V5: 请问一届村委会任期多久? \_\_\_\_\_ (v5)

V6: 请问本村驱车去最近的城市的时间是多少 (分钟) \_\_\_\_\_ (v6)

V7: 请问本村 2013 年的 GDP 总值中

其中农业生产占 \_\_\_\_\_ (%) (v7a)

林业 (如果有) \_\_\_\_\_ (%) (v7b)

V8: 请问您如何评价本村相对本镇其他村庄的经济实力? (v8)

前 10%	前 30%	前 50%	50%以下
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1	2	3	4
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V9: 本村有多少企业? \_\_\_\_\_ (v9)

V10: 请问本村有集体所有企业么? (v10)

没有	0	[如果没有, 跳过 V11 并转到 V12]
有	1	[如果有, 回答 V11]

V11: 本村有多少村集体所有企业 \_\_\_\_\_ (v11)

V12: 请问 2013 年本村常驻家庭数目? \_\_\_\_\_ (v12)

V13: 请问 2013 年本村常驻人口数目? \_\_\_\_\_ (v13)

V14: 请问本村各行业劳动力比重

农业 (%) \_\_\_\_\_ (v14a)

本村非农经济 (私有企业) (%) \_\_\_\_\_ (v14n)

外出打工 (%) \_\_\_\_\_ (v14m)

V15: 请问在 2013 年本村常驻人口各年龄层比重

0-18 岁儿童及青少年 (%) \_\_\_\_\_ (v15c)

19-40 岁年轻劳动力 (%) \_\_\_\_\_ (v15y)

41-60 岁年老劳动力 (%) \_\_\_\_\_ (v15e)

61 岁及以上老年人 (%) \_\_\_\_\_ (v15s)

V16: 本村有多少主要姓氏? \_\_\_\_\_ (v16)

V16': 分别是什么: \_\_\_\_\_

V17: 是否至少有一个姓代表血缘关系? (v17)

没有	0	[如果没有, 跳过 V18 并转到 V19]
有	1	[如果有, 回答 V18]

V18: 本村的哪些姓氏代表血缘关系? \_\_\_\_\_ (v18)

V19: 本村外出务工家庭的类型的比重?

整家外出 (%) \_\_\_\_\_ (v19a)

携配偶孩子 (留守老人) (%) \_\_\_\_\_ (v19b)

携配偶 (留守老人和留守儿童) (%) \_\_\_\_\_ (v19c)

独自外出 (留守老人, 留守儿童, 和留守父母) (%) \_\_\_\_\_ (v19d)

V20: 本村在 2013 年允许因为人口变化而调整农地么? (v20)

不允许	0	[如果不允许, 回答 V21]
允许	1	[如果允许, 跳过 V21 并转到 V22]

V21: 请问本村从什么时候开始停止为人口变化微调土地? \_\_\_\_\_ (v21) [NA 如果从未停止]

V22: 请问本村在过去 5 年中(2009-2013)是否发生政府征地事件? (v22)

没有	0	[如果没有, 跳过 V23-V27 并转到 V28]
有	1	[如果有, 回答 V23]

V23: 以下哪一级别政府决定的这次征地? (v23)

村级	镇级	省级
1	2	3

V24: 请问这次征地涉及多少农户? \_\_\_\_\_ (v24)

V25: 请问这次征地涉及的土地面积是多少? \_\_\_\_\_ (v25)

V26: 请问这次征地涉及的农户是否接受了赔偿? (v26)

没有	0	[如果没有, 跳过 V27 并回答 V28]
有	1	[如果有, 回答 V27]

V27: 请问对于征走的每亩土地每户是如何补偿的? \_\_\_\_\_ (RMB) (v27)

V28: 请问土地是否已经变成或者部分变成了土地用途工作 (或者经济土地用途工作)? (v28)

没有	0	[如果没有, 跳过 V29-V30 并转到 V31]
有	1	[如果有, 回答 V29]

V29: 本村确权工作已经完成了多少 (如果没有开展确权工作) ? \_\_\_\_\_ (v29)

V30: 土地证是否清晰定义土地大小? \_\_\_\_\_ (v30a)

本村是否实行虚拟地权? \_\_\_\_\_ (v30b)

不是	0
是	1

V31: 本村村委会是否对所有的土地流转情况都有所了解? (v31)

不是	0
是	1

V32: 村委会是否定期举行会议商议土地流转事宜? (v32)

从不	0
经常	1
有时	2

V33: 本村村委会是否会帮助村民发布流转信息? (v33)

从不	0
经常	1
有时	2
需要的时候	3

本村有土地流转市场么? (v33a)

没有	0
有	1

哪一年建立的 \_\_\_\_\_ (v33ay)

本村有土地流转合作社么? (v33b)

没有	0
有	1

哪一年建立的 \_\_\_\_\_ (v33by)

V34: 请问村委会是否帮助村民准备正式书面合同所需要的文件? (v34)

从不	0
经常	1
有时	2
需要的时候	3

V35: 请问村委会是否会作为见证人出现在双方签订流转协议中? (v35)

从不	0
经常	1
有时	2
需要的时候	3

V36: 本村村委会是否曾经集体流转土地给个人或者企业? (v36)

没有	0	[如果没有, 跳过 V37 并回答 V38]
有	1	[如果有, 回到 V37]

V37: 最后一次集体流转的转入方是谁? (v37)

村民	1
村集体企业	2



其他企业	4
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[转到 V38]

[跳过 V38 并回答 V39]

[跳过 V38-V39 并回答 V40]

V38: 该村民/企业姓名? \_\_\_\_\_ [农户 编码] (v38)

V39: 本村主要的流转形式是什么? (v39)

集体流转	0
自发流转	1

V40: 请问该形式流转的土地占有所有流转土地的比重? \_\_\_\_\_ (v40)

V41: 本村村委会曾经给村民提供任何形式的法律援助么? (v41)

没有	0	[如果没有, 跳过 V42- V43 并回答 V44]
有	1	[如果有, 回答 V42]

V42: 目前哪些机构在本村提供法律援助? (v42)

科教机构	1
NGOs	2
政府部门	3
其他	4

V43: 请问该机构在本村多久提供一次法律援助? 一年\_\_\_\_\_次 (v43)

V44: 本村土地总面积?\_\_\_\_\_ (v44)

以下各类型土地的比重?

耕地 (%) (真实)\_\_\_\_\_ (v44fa)

耕地 (%) (上报)\_\_\_\_\_ (v44fb)

住宅用地(%) \_\_\_\_\_ (v44r)

流转土地(%)\_\_\_\_\_ (v44t)

V45: 本村灌溉耕地面积比重

集体灌溉 (%) \_\_\_\_\_ (v45c)

个人灌溉 (%) \_\_\_\_\_ (v45p)

V46: 人均耕地面积? \_\_\_\_\_ (v46)

V47: 以下各类耕地面积比重?

承包田 (%) \_\_\_\_\_ (v47c)

荒地 (%) \_\_\_\_\_ (v47u)

V48: 本村科教设施

学校类型	本村有该类型的学校么 (0: 没有; 1: 有)	如果没有, 最近的该类型学校开车多久到达
幼儿园 (v48k) 1		
小学 (v48p) 2		
初中 (v48j) 3		
高中 (v48s) 4		
职高 (v48v) 5		
技校 (v48t) 6		

V49: 本村实行包产到户的时间? \_\_\_\_\_ (v49) [NA 如果没有执行]

V50: 本村结束第二轮承包工作的时间? \_\_\_\_\_ (v50) [NA 如果没有执行]

V51: 本村是省级示范村或以上么? (v51)

不是	0
是	1

V52: 本村是否是省级贫困村或以上么? (v52)

不是	0
是	1

V53: 是否曾经属于其他行政镇? (v53)

不是	0	[如果不是, 结束问卷]
是	1	[如果是, 回答 V54]

本小组何时并入现在的镇的? \_\_\_\_\_ (v53y)

V54: 是否因此改过名字? (v54)

不是	0
是	1

如果改过, 之前的村名\_\_\_\_\_ (v54n)

V55: 是否全村有统一住房标准? (v55)

不是	0
是	1

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