Farmers' satisfaction with compensations for farmland expropriation in China – Evidence from micro-level data

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Abstract

The expropriation of farmland in China by local governments and the compensations paid to farmers are a major source of social conflicts. Using rural household survey data collected among 450 households in three provinces, this paper examines the impacts of compensation payments and different compensation modes on farmers' satisfaction with the land compensation. The major findings are: (1) farmers' satisfaction with the compensation depends not only on the size of the compensation but also on the gap between the compensation and the market value of the expropriated land; (2) the compensation amount positively affects farmers' satisfaction when the social security compensation mode is used, but does not significantly affect farmers' satisfaction when other modes are used. We conclude by discussing the policy relevance of our findings.

1. Introduction

China has been experiencing urbanization and industrialization at a rapid rate since the economic reforms and open door policy started in 1978. According to NBS (2013), China's urbanization rate steadily increased from 20.9% in 1982 to 53.7% in 2013. During the same period, economic growth has been one of the highest priorities of the Chinese government at all levels, and industrial development is widely seen as the key to the rapid economic growth and rising standards of living (Lichtenberg and Ding, 2009). An important element of this strategy is the provision of space needed for industrialization and urbanization through farmland conversion, i.e. the change from agricultural to non-agricultural land use (Tan et al., 2009). Land monitoring data of the Ministry of Land and Resources (MLR) indicates that 0.18 million hectares of land have been taken out of cultivation annually for construction purpose during the period 2000-2008, and 0.24 million hectares per year during the period 2010-2013 (MLR, 2001-2014).

Land in China is legally owned by the state. Most urban land is controlled by local officials who act as representatives of the state under the supervision of higher level officials. It can be leased by public and private parties for commercial, industrial, or residential uses. Rural land is owned by village collectives. Land use rights are assigned by the village committees to households living in their villages. Rural land cannot be directly transferred by farmers or village committees to urban users. It must first be transferred to the government, and thereby becomes state-owned land. The acquisition of rural land, changing its status into urban land, and subsequently leasing to urban users serves as an important source of "extra-budgetary" fiscal revenues for local governments (Ding, 2004). This phenomenon is known as "land finance" in the relevant literature (e.g. Cao et al., 2008).

One of the main challenges accompanying rural land acquisition is providing an appropriate compensation for land-expropriated farmers. According to the Annual Report on Urban Development of China (2012), there were roughly 40-50 million land-lost farmers by 2011. It is estimated that each year, approximately 2.5 to 3 million farmers are dispossessed through land requisition (Cao et al., 2008). It should be noted that land is not only a primary and reliable source of income for rural households in China. It also serves as social security for migrants

losing their jobs in urban areas. Rural households without their land lose a fixed source of revenues that allows them to maintain their basic living standard. Land acquisitions can be a major source of social tension, because of obscure stipulations of relevant laws, the forced nature of rural land acquisitions, and the relatively low compensations paid to farmers (Ding, 2007). Many disputes and conflicts arise over land compensations between local governments and farmers. More than 50 percent of the petition letters[1] in 2012 received by the People's Congress of China were concerned with land issues such as unfair compensation of land acquisition (Wu and Heerink, 2014).

Making use of flaws in existing land laws, farmers' rights and interests can easily be encroached upon. Ding (2007) points out that, although the Land Administration Law (LAL) (2004) states that farmers' living standard cannot be compromised after land expropriation, the law does not provide a clear and measurable definition of non-worse-off living standards nor specify concrete measures to achieve this objective. Without definite guidelines for just and fair compensation, the eventual compensation is prone to be arbitrary. Tang et al. (2012) examine the interests distribution among stakeholders of land compensation and conclude that ambiguous property rights for owners, unclear conceptions of the public interest, and the overlap of power and interest among multiple levels of authority are the reasons why legitimated stakeholders' (especially farmers') interests are encroached upon. Tan et al. (2011) use a partial equilibrium model to show that the current hybrid governance structure of farmland conversion in China results in a net social welfare loss and impairs especially the interests of farmers. Hui et al. (2013) assess the impact of compensation policies for land-lost farmers on social exclusion and conclude that land-lost farmers continue to suffer from cultural, psychological, social network and other types of exclusion in society, even though the compensations have gradually increased in nominal terms over time.

Land expropriation and the compensations paid to farmers have received much attention in the Chinese literature. Most studies are based on qualitative analysis and formulate recommendations to increase compensation standards, resettle land-expropriated farmers, open land expropriation procedures, and improve land markets and institutions (Chen and Zhang, 2007;

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[1] Petition letter is a commonly used instrument by citizens to lodge complaints when their rights are infringed upon as a result of the abuse of power by authorities, public institutions, enterprises, or civil groups.

Jin et al., 2010; Qian, 2004; Qu et al., 2001). Little attention has been paid so far to factors explaining farmers' degree of satisfaction with the land compensations. Chen et al. (2009) compare acceptable compensation standards between farmland converted into public infrastructure and farmland converted into industrial land, using survey data from four cities in Hubei Province, and find that farmers are willing to accept a lower compensation for land converted into public infrastructure. Liu et al. (2012) use village-level data from 17 provinces in China to investigate the impact of land acquisition procedures on farmers' satisfaction, and find that the fair acquisition procedures play a crucial role in farmers' satisfaction and are even more significant than compensation amounts. Wang (2013) reviews 44 Chinese studies on land compensations, and finds that the most frequently involved factors can be ranked as: compensation amount, compensation mode, compensation distribution, and compensation procedure. To our knowledge, studies providing quantitative estimates of farmers' perceptions of land compensations are lacking so far. Such studies should focus not only on the compensation amount but in particular also on the role played by the compensation mode. For example, whether the compensation is a lump-sum payment or is paid at fixed time intervals, will affect how expropriated farmers can use the money and hence is likely to affect their degree of satisfaction. The aim of this paper is therefore to examine the impact of the compensation amount as well as the mode through which compensations are paid on farmers' satisfaction with the compensation received for farmland expropriation in China. Household survey data collected in rural areas in three different provinces will be used for this purpose.

The rest of this paper is organized as follows. Section 2 provides an overview of the expropriation compensation policy for rural land in China. Section 3 describes the research area and the method of data collection. Section 4 presents the model specification and the definition of each explanatory variable. In section 5, estimation methods and model results are presented and discussed. Conclusions follow in the last section.

2. Background

2.1 Land acquisition in China

Since 1980, the conversion of agricultural land to non-agricultural land has been a widespread and common phenomenon in China (Ho and Lin, 2004). Rapid economic growth, population expansion, urbanization, technological change and policy reform are all found to contribute to agricultural land conversion (Azadi et al., 2011; Fazal, 2001; Han and He, 1999; Lichtenberg and Ding, 2008; Xie et al., 2005). Because infrastructure construction is in urgent demand to sustain further improvements of people's living standards, local officials are pushed to use their control over primary land expropriation to promote large-scale public infrastructure development and meet the financial obligations of municipal governments at the same time (Lichtenberg and Ding, 2009). The first modern agricultural census that was held in China in 1996 provided the first accurate benchmark data on cultivated land[2] (Qu et al., 2011). The estimate cultivated land area in 1996 equalled 130.1 million hectares. Agricultural land conversion is considered to account for more than two-thirds of the land loss in several areas (Azadi et al., 2011; Gale, 2002; Hansen et al., 2002; MLR, 1998-2000). According to the China Land & Resources Almanac (2000-2013), farmland loss for construction uses equalled 0.16, 0.14, 0.25 and 0.22 million hectares in 2000, 2005, 2011 and 2013, respectively.

In China, the central government possesses the full bundle of urban land rights, and the village collective holds a series of rural land ownership rights, except the right to sell the land (Tan et al., 2011). Farmers obtain farmland use rights from the village collective according to the rural Household Responsible System (HRS)[3]; these land use rights can be transferred among village members, or rented to outsiders, but only for agricultural production purposes (Van den Berg et al., 2006). When the state-owned urban land is transferred to commercial users, the state separates land use rights from land ownership so that land use rights can be conveyed to commercial users for a fixed time period (Tan et al., 2009). Rural land needs to be converted into

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[2] According to Qu et al. (2011), data on the size of the cultivated land is plagued with severe measurement problems. Annual data derived from a bottom-up reporting system are available, but before the First Agricultural Census held in 1996 the cultivated land area was underreported by more than 30%.
[3] The HRS allows the rural households to contract land use right from the village collective, and the contract period equals 30years.

state-owned urban land first before it can be used for industrial and other urban purposes, and local governments should compensate the farmers for the expropriated land according to the relevant stipulations (Ding, 2007). Local governments are given excessive powers to determine project planning, expropriated scale, compensation amount and resettlement modes. Farmers are in a weak bargaining position and seldom have the right to oppose or suspend implementation of conversion projects, or even appeal against unjust treatment (Tan et al., 2009). Thus, local governments can obtain major financial gains from expropriating farmland, converting it into urban land, and conveying urban land use rights to commercial users. Although the central government sets annual quota for the maximum amount of land that can be converted from farmland into urban land, much illegal land acquisition that exceeds the assigned quota takes place (Cao et al., 2008; Ding and Lichtenberg, 2011; Tan et al., 2011).

2.2 Compensation standards for land expropriation

The Chinese government enacted a series of regulations and laws to specify the compensation terms for expropriated farmland. The *Regulations Concerning Land Requisition for State Construction*[4] was passed by the NPC Standing Committee on May 4, 1982 and subsequently implemented by the State Council (Feng, 2001). Regarding the compensation standard, the *Regulations* states four main components: land compensation, resettlement fee, compensation for young plants and compensations for attachments on land. Specifically, Article 9 stipulates that the land compensation of expropriated land shall be 3-6 times the average annual output value of the cultivated land in the three years prior to the expropriation, while the compensation for young plants and attachments on land can be determined by the provincial government. And Article 10 stipulates that the resettlement fee shall be calculated according to the size of the agricultural population to be resettled. For each land-expropriated farmer to be resettled, the resettlement fee shall be 2-3 times the average annual output value of the cultivated land in the preceding three years, but the maximum values per mu[5] shall not exceed 10 times the three-year averaged annual output value. Furthermore, the sum of the land compensation and resettlement fee shall not exceed 20 times the average annual output value in the three years prior to the expropriation.

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[4] http://www.npc.gov.cn/wxzl/gongbao/2000-12/07/content_5009542.htm; Articles 27 - 30 of the 1986 Land Administration Law follow the same provisions for land acquisition compensations.
[5] One hectare equals 15 mu

Article 11 states that the compensation for young crops and attachments shall be given to the landowner, whereas the land compensation and resettlement fees shall be retained in rural collective communes and used for assisting unemployed farmers.

Before 1990, the scale of land acquisition was not very large. Few farmers lost all their land and most of them could rely on the remaining land they had (Hui and Bao, 2013). China has experienced large-scale land acquisitions since then. This phenomenon is related to the 1993 tax reform. One of the means adopted by local governments to deal with budgetary deficits that resulted from fiscal decentralization is "land finance". It is associated with cheap land costs and economic incentives such as tax exemptions (Ding, 2007). Rapid economic growth and urban expansion increased the pressure on land expropriation at the demand side. The amended *Land Administration Law (LAL)*, which was enacted in 1998 in response to the growing number of land conflicts, significantly raised the compensation standard. For instance, the land compensation was set to 6-10 times the average annual output value of acquired land in the three years prior to the expropriation, and the resettlement fee for farmers that had to move elsewhere was set to 4-6 times the average annual output value of acquired land in the preceding three years per family member[6]. And, upon approval from the provincial authorities, the combined amount of the land compensation and resettlement fee can increase if needed to maintain constant living standards for land-expropriated farmers; but it cannot exceed 30 times the derived land productivity (Ding, 2007).

These stipulations were still in use in the 2004 version of the *LAL*. Significant amendments regarding the calculation of compensation standards were specified in the stipulations on *Decisions on Deepening Reform of Land Administration* (2004)[7], *Guidelines on Improving Land Acquisition Compensation and Resettlement System* (2004)[8] and *Notification on Formulating Unified Criterion of Annual Yield and Comprehensive Price for Land Acquisition* (2005)[9]. The term "the average annual output value of the cultivated land in the preceding three years" was abandoned. Instead, provincial governments were required to either formulate a unified criterion

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[6]The maximum value of the resettlement fee per hectare should not exceed 15 times the average annual output for the whole family.

[7] http://www.gov.cn/zwgk/2005-08/12/content_22138.htm

[8] http://www.mlr.gov.cn/zwgk/flfg/tdglflfg/200506/t20050617_638344.htm

[9] http://www.nnland.gov.cn/show.aspx?id=272&cid=235

for the assessment of current annual yields and the multiplier or a comprehensive price for land acquisition based on wide-ranging conditions such as expropriated land types, output value, land location and land grades as well as supply-demand relationships in the land market, local economic development, citizen's basic life security, and so on. This reform, to some extent, introduced land market value into the calculation of compensation standards. But in practice, given that the unified criterion or the comprehensive price are difficult to formulate, most regions still follow the previous calculation method.

Although the compensation standard has gradually increased in nominal terms, land-expropriated farmers still receive relatively low compensations as compared to the conveyance fees local governments receive as upfront payments for use-right leases in rapidly growing urban areas (Lichtenberg and Ding, 2009). Hui et al. (2013) argue that the current evaluation method for compensations, based upon the farmland's unified annual yield and a multiplier, is essentially an extension of that used under the planned economy, but it seems no longer applicable under the market-oriented economy in China. Ding (2007) claims that current compensation provisions give little consideration to compensation consistency in both horizontal and vertical dimensions. Horizontal fairness implies that land acquisition compensation should be indifferent among different land uses, different villages, or different land in the same village. Vertical fairness and justice implies that the compensation should be comparable after discounting inflation and social economic growth. Zou and Oskam (2007) suggest that, since farmers are supposed to possess the property right of land, land value increments after farmland conversion should be distributed among the land-expropriated farmers, the developer and the government.

2.3 Current compensation modes

In the current *LAL* (2004), there are no definite stipulations about the compensation modes for land-expropriated farmers. Local governments are encouraged to develop a variety of appropriate modes in accordance with local conditions. In the *Guidelines on Improving Land Acquisition Compensation and Resettlement System* (2004)[10], the Ministry of Land and Resources (MLR)

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[10] http://www.mlr.gov.cn/zwgk/flfg/tdglflfg/200506/t20050617_638344.htm,
http://www.chinajob.gov.cn/gb/insurance/2006-05/31/content_118114.htm,
http://www.mlr.gov.cn/zwgk/zytz/201007/t20100713_154433.htm,

summarized some typical modes like agricultural production resettlement, retaining expropriated land resettlement, and shareholding and bonus distribution resettlement. Subsequent guidelines provided by the MLR and regional governments[6] state that the so-called social security mode should especially be promoted to guarantee farmers' long-run living.

The agricultural production resettlement mode means that spare arable land shall be provided for land-expropriated farmers to continue with their agricultural production. This mode is probably more acceptable for farmers, because they can still retain some farmland to farming. But the problem is that spare arable land in a village may be limited and that land readjustments are nowadays forbidden by law (Yang, 2012).

The retaining expropriated land mode can be illustrated by its implementation in Zhejiang Province. A certain share of the expropriated land, generally 10-15%, is retained by the village collective and used for rural non-agricultural industry. Expropriated farmers can engage in the newly established business in order to obtain stable income (Li, 2008).

The shareholding and bonus distribution mode, an innovative and advanced mechanism, was created by Shaoxing County in Zhejiang Province. Under this mode, land-expropriated farmers use the land compensation to participate in the village economic cooperative and obtain corresponding shares in the cooperative. The collective assets, including the land compensations, are to be operated as a business, and farmers will gain an annual bonus based on their quantified shares. This mode, just like the retaining expropriated land mode, requires the village collective to have a strong business management capacity to generate long-term stable returns for farmers.

The social security mode implies that the government offers basic living subsidies every month to land-expropriated farmers until their death. For instance, guidelines issued in Zhenjiang City of Jiangsu Province[11] distinguish three different age groups, namely minors (age under 16 years old), working-age people (age between 16 and 60 years old) and elderly people (age over 60 years old). The minimum standard for each age group is no less than 1.1 times the urban basic

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[11] http://hrss.zhenjiang.gov.cn/pfzl/zcfl/nwfl/bzdbx/201406/t20140624_1263278.htm

living standard. For minors, the subsidies are paid in a lump sum. For working-age farmers and elderly farmers, the subsidies are paid every month and range between RMB 120 – 440 [12].

This social security mode is applicable in relatively developed regions, where the local government can provide strong financial support. For instance, a fund for financial security has been established in Zhejiang Province, with contributions by local governments, rural collectives and individual farmers. The government contributes no less than 30% of the fund (extracted from the revenue generated from land transfers), the collective no less than 40% (extracted from the land compensation), and farmers contribute the rest (extracted from the resettlement fee) (Hui et al., 2013).

Although the Chinese government encourages various compensation modes, a large majority of regions still adopt lump-sum cash compensations as the main mode. Nevertheless, more and more regions are gradually promoting the social security mode to guarantee the long-run livelihood of expropriated farmers.

3. Study area and data collection

3.1 Study area

A field survey to collect data on farmers' satisfaction with compensations for farmland expropriation was conducted in June - September 2013. Given the major differences in levels of economic development and agro-ecological conditions among eastern, central and western China, our project group selected one typical province from each region, namely Jiangsu Province (eastern China), Jilin Province (central China) and Sichuan Province (western China). In each province, three typical suburb, average rural and remote rural counties were selected and two villages were randomly chosen within each selected county, and 25 randomly chosen households were interviewed in each selected village. This gave a total sample size of 3 x 3 x 2 x 25 = 450 households.

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[12] USD 1 = 6.14 RMB (2014).

3.2 Data description

The household questionnaire involved a set of closed questions, mainly comprised of four aspects: basic characteristics of household, information of contracted and cultivated land, land expropriation experience during the period 1996 – 2013, and land compensation received. Out of the 450 selected households, 30 households were not available at the time of survey and 14 households had missing data on major variables used in the empirical analysis. We therefore obtained valid data for 396 households. Out of these 396 questionnaires, 126 questionnaires come from Jiangsu Province, 143 from Jilin Province and 127 from Sichuan Province.

The number of households in our sample that experienced farmland expropriation during the period 1996 – 2013 equals 110, that is 27.8%. Out of these 110 households, 63 live in Jiangsu Province (i.e. 50.0% of the interviewed households in Jiangsu), 21 in Jilin Province (i.e. 14.9%) and 26 in Sichuan Province (i.e. 20.5%). Hence, the share of the interviewed farmers that experienced farmland expropriation during the chosen period was highest in the province with the highest level of economic development and the highest degree of urbanization.[13]

Although we have information about land expropriation cases that happened from 1996 to 2013, we cannot exploit the panel nature of our analysis because basic household characteristics and farmers' subjective perceptions of land expropriations were collected for the year 2012. Hence, we use a cross-section analysis based on information collected among the 110 farmland expropriation cases.

4. Model specification

4.1 Basic model

Our objective is to examine the relationship among farmers' satisfaction with the compensation of farmland expropriation on the one hand, and the compensation amount, the compensation mode and other factors on the other hand. The basic equation is specified as follows:

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[13] GDP per capita in the year 2012 equalled 68,347 RMB in Jiangsu Province, 43,415 RMB in Jilin province and 29,608 RMB in Sichuan Province. Rates of urbanization in the same year equalled 63.0% in Jiangsu, 53.7% in Jilin and 43.5% in Sichuan Province (NBS, 2013).

$$FS_i = \beta_0 + \beta_1 CST_i + \sum \beta_{3k} X_{ki} + u_i \qquad \text{equation 1}$$

$$FS_i = \gamma_0 + \sum \gamma_{2j} CST_i * CMO_{ji} + \sum \gamma_{3k} X_{ki} + \epsilon_i \qquad \text{equation 2}$$

Here FS denotes the satisfaction with the compensation for farmland expropriation, CST is the received compensation amount per mu, CMO refers to the corresponding compensation mode, X refers to a vector of control variables such as household characteristics, regional characteristics, a time variable and so on. Besides, u and ϵ are error terms with standard properties. The index i refers to the i-th respondent, the index j refers to the different compensation modes and the index k to the different control factors. The unknown coefficients are labelled as $\beta_0, \beta_1, \gamma_{2j}, \beta_{3k}, \gamma_{3k}$, with β_1 and γ_{2j} being of primary interest for our analysis. The compensation mode is specified as a cross-product with the compensation amount in this specification so that we can test whether the satisfaction with the compensation amount differs between the different compensation modes that are used.

4.2 Definitions of variables

 [Table 1] contains the definitions and descriptive statistics of the variables used in the regression. Our dependent variable, denoted as "farmers' satisfaction", is measured by farmers' subjective perception of the compensation received for farmland expropriation. Farmers express their opinions based on the conditions of compensation and changes in their lives after their farmland was expropriated. The variable is classified as three discrete choices, the score of "3" indicates farmers' attitude is positive and they are willing to accept the compensation for land expropriation, the score of "2" indicates farmers maintain a neutral attitude, and "1" indicates farmers are dissatisfied with the compensation. As can be seen from Table 1, the mean value of this variable equals 2.17; 46.7% of the farmers in our sample are satisfied with the compensation conditions, while 29.5% of the farmers are dissatisfied.

[Table 1]

The explanatory variables of our prime interest are the compensation amount and the compensation mode for expropriated land. Many Chinese and international scholars consider the

relatively low compensation as one of the main factors causing farmers' discontent and land conflicts (Ding, 2007; Hui and Bao, 2013; Ji and Qian, 2011; Lin, 2009). We therefore assume that the compensation amount is a major variable affecting farmers' satisfaction in a positive way. In our survey areas, the current evaluation method for land compensation is based upon the farmland's annual production value and a multiplier. However, when the compensation is paid to farmers, different modes are adopted. The actual payment acquired by farmers therefore varies with the compensation modes. In our field survey, we found four compensation modes, namely monetary compensation paid as a lump sum, monetary compensation paid at specified time intervals, monetary compensation combined with farmland reallocation, and social security payments. The value of farmland reallocation is difficult to evaluate. Since this mode was used for only five, i.e. 4.5%, of the expropriated households that we interviewed, we deleted these cases from our sample.

In order to be able to compare the compensation amounts, all the compensations are converted into a lump sum amount per mu in constant prices of 2012. For the social security payments, an expected life expectancy of 75 years[14] is used. The results show that the compensation amount has increased over time, from about 2,000 yuan/mu in 1996 to about 50,000 yuan/mu in 2013.

Dummy variables are used for each compensation mode. As can be seen from Table 1, the majority of the farmers, namely 70%, received the compensations as a lump sum. The sizes of the groups that received the compensation at fixed time intervals or as social security payments are almost equal, around 15%. We use the three cross-products of the compensation amount and the compensation mode in our regression model in order to examine whether farmers receiving the same compensation amount differ in their degree of satisfaction when this compensation is paid using different modes. It is expected that the social security mode, which provides a minimum level of long-term livelihood, provides more satisfaction among farmers than cash compensations (Hui et al., 2013; Lin, 2009; Yang, 2012).

The control variables in the regression equation can be classified into five groups. We discuss them successively.

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[14] Based on the 2010 China Population Census conducted by the National Bureau of Statistics.

Regional characteristics

Our field survey is conducted in different regions of China. Two dummy variables (Z1, Z2) are introduced to control for the possible effects of differences in levels of economic development and agro-ecological conditions between these regions. It is expected that farmers in the eastern, coastal region are more satisfied with their compensations, because they have more alternative job opportunities; farmers in western China depend more heavily agriculture for making a living and are therefore more likely to feel dissatisfied with the compensation they receive for farmland expropriation (Wang, 2010).

Time period

The survey data covers farmland expropriations that happened between 1996 and 2013. Given that the (real) compensation amount increases over time, we assume that farmers adjust their expectations about the amount that they will receive and may be less satisfied with the same amount in later years. We therefore include a dummy variable T as explanatory variable which equals one if the land expropriation happened during 2008 – 2012, and equals zero otherwise. The time period is chosen so that one half of the expropriations in our sample took place before, and the other half took place during, that period.

Household characteristics

We use age, gender and years of formal education of the respondent as indicators of the experience and cognition of the respondent. These characteristics are expected to affect farmers' subjective perception. Non-agricultural revenue per capita is included in the analysis to control for the degree of dependence on farmland as a basic livelihood resource. Generally speaking, households with higher non-agricultural revenue per capita are more likely to be satisfied with the compensation, due to the relatively lower impact of giving up farmland on their livelihoods (Kong, 2008). On the other hand, non-agricultural revenue per capita may reflect local economic conditions. Non-agricultural revenues are usually higher in more developed local economies where the market price of land after conversion tends to be higher and farmers may be less satisfied with a given compensation amount. Hence, the sign of the coefficient of non-agricultural revenue per capita is indeterminate.

Land characteristics

Land characteristics in the model include residual land share, land fragmentation and land location. Residual land share measures the percentage of the original contracted land area that remains to the household after expropriation. When the expropriated land share is smaller farmers are assumed to be more willing to have their land expropriated and accept the compensation conditions (Lin, 2010). Land fragmentation is measured by the number of plots. Assuming that land fragmentation adversely affects land productivity, household with more land plots would be more willing to have their land expropriated and accept the compensation. Land location indicates the distance from the village to the nearest town or city. It is measured by two dummy variables, D1 (suburb) and D2 (remote rural area). Land close to a town or city is expected to have a relatively high value for non-agricultural use compared to distant land (Zhong et al., 2011). So, farmers whose land is located in suburban areas (D1) tend to require higher land compensations and are more likely to be dissatisfied when their land is expropriated under the current compensation regulations.

Farmland expropriation

Finally, we include a number of control variables concerning the land expropriation itself, namely expropriated land use, revenue change and compensation in arrears. Expropriated land use is represented by a dummy variable that equals one if the land is used for public infrastructure, and zero otherwise. According to Hui and Bao (2013), farmers tend to concede to land acquisition for public interests, but deny land acquisition for other interests. In 77% of the cases, the expropriated land is used for public infrastructure (Table 1). Revenue change is measured by asking the respondent's opinion about their own revenue change after land expropriation. It is measured on a scale from 1 (decrease) to 3 (increase) and supposed to be positively correlated with farmers' satisfaction. A dummy variable indicating whether the compensation is in arrears or not is included in the model to examine whether there exists corruption in the compensation allocation. It is expected to have a negative impact on farmers' satisfaction with the compensation. As much as 26.4% of the respondents report that the compensation is in arrears.

5. Estimation results

Given the dependent variable "farmers' satisfaction" has three ordered discrete choices, namely "satisfied, average and dissatisfied", the Ordinal Probit model is used for estimating the model. Deleting the five expropriated households that were resettled from the sample, we use 105 observations for the estimation. Given that several households are living in the same village, we correct for clustered errors at the village level in the regression. Table 2 reports the regression results.

[Table 2]

First, we run a simple regression using only compensation amount as explanatory variable (column 1 of Table 2). The results show that the compensation amount has a significant negative impact on farmers' satisfaction (at the 5% significance level). In other words, if we do not include the compensation mode and the control variables in the model, we surprisingly find that farmers receiving a higher compensation amount are more likely to feel dissatisfied.

When we add the control variables into the model, this result changes. When we include the regional dummy variables, time trend and non-agricultural revenue per capita, the estimated coefficient of the compensation amount becomes significantly positive (at the 5% significance level), as expected (column 2 of Table 2). The time trend has a significant, negative impact on farmers' satisfaction (at the 5% significance level), which suggests that farmers have become more dissatisfied in recent years with the same compensation amount. A possible explanation is that with the land value increasing over time, especially in the recent years, the gap between the land transaction price and the compensation amount is widening and farmers show more discontent as a result. Lichtenberg and Ding (2009) provide fragmentary anecdotal evidence that conveyance fees, which are collected by local governments as up-front payments for long-term leases in the secondary land market, often amount to 10-20 times the level of compensation for requisitioned farmland.

Land values differ greatly among different regions in China, with eastern regions generally having higher land values and western regions having lower value than the central regions (the base in the regression). So, to the extent that the regional dummy variables reflect differences in

land values, the dummy variable Z1 (the east) is expected to have a positive coefficient and Z2 (the west) to have a negative coefficient. The regression results, however, show that both Z1 and Z2 have a positive impact on farmers' satisfaction (at the 1% significance level). Besides differences in land values, there appear to be other factors related to differences in agro-ecological conditions and levels of economic development that explain the relatively higher level of satisfaction in the eastern region. The estimated coefficient of non-agricultural revenue per capita is highly significant and negative (at the 1% significance level). In other words, the negative effect on farmers' satisfaction of a more developed local economy with relatively high land prices seems to dominate the impact of this variable.

Next, using stepwise regression, we continue to add more control variables to the regression (column 3 of Table 2). The age of the respondent is found to have a significant positive effect on farmers' satisfaction (at the 1% significance level). Hence, older farmers tend to be more satisfied with the compensation amount that they receive for farmland acquisition than younger ones. And we also find that the residual land share has a positive impact (at the 10% significance level) on farmers' satisfaction. This result is consistent with our expectations that when the remaining farmland is larger after expropriation farmers are more likely to be satisfied with the compensation per mu that they receive for the expropriated land.

When we include all other control variables in the model (column 4 of Table 2), we find that the compensation amount, time period, non-agricultural revenue and age of the respondent continue to have a significant impact on farmers' satisfaction. Although the estimated coefficients are slightly different, the direction of the impact of these variables does not change. On the other hand, the estimated coefficients for the dummy for the eastern region and for the residual land share after expropriation are no longer statistically significant. It should also be noted that, contrary to the findings by Hui and Bao (2013), we find that it does not matter for farmers' satisfaction with the compensation whether the land is used for public infrastructure or for other purposes after expropriation.

To examine the impact of different compensation modes on the degree of farmers' satisfaction with the compensation amount, we use three cross-products of the compensation amount and compensation modes to replace the compensation amount variable. The compensation amount

under the third mode is found to have a positively significant impact (at the 5% significance level), while the other two cross-products have smaller coefficients which do not differ significantly from zero (column 5 of Table 2). In other words, the results suggest that the compensation mode indeed matters for the impact of compensation amount on farmers' satisfaction. Farmers who are paid according to the social security mode are more likely to be satisfied when they get a larger compensation. But for farmers who are paid under the other two modes, the amount they receive does not significantly affect their degree of satisfaction. In fact, providing lump sum payments to farmers is the common mode used in land expropriations. But during the field survey, we found that many farmers failed to manage the large amount of money they receive and ended up living under worse conditions several years after their land was taken than they did before. This problem seems less likely to happen to the mode of cash paid at some specified intervals (usually 1200 - 2000 yuan/mu every year for 8 years). But the total amount of the compensation is much less than the lump sum payment when taking inflation rates into account. As for the social security mode, although it cannot make farmers rich either, it provides sustained income to support farmers' security and ensure their minimum level of livelihood. So farmers seem to be more satisfied with the compensations that they receive under this mode. The regression results for the control variables are comparable with the results that we obtained in the equation for the compensation amount without cross-products.

6. Conclusion

The expropriation of farmland in China by local governments and the compensations paid to farmers are a major source of social conflicts. In order to provide science-based input into policy making which aims to improve the level of satisfaction of land-expropriated farmers, this paper examines the impact on farmers' satisfaction with the compensation of the compensation amount as well as the mode through which compensations are paid. Household survey data collected among 450 households in rural areas living in nine counties in three different provinces are used for this purpose. The results provide new insights into the determinants of farmers' satisfaction with the compensations received for farmland expropriation. Their validity should preferably be checked at a larger scale through more extensive household surveys in these provinces and in other parts of China.

The main findings of our study are that the compensation amount is indeed crucial in (positively) affecting farmers' satisfaction with the compensation. But besides the absolute level of the compensation, farmers also care about the gap between the compensation and the market value of expropriated farmland. The first finding is consistent with China's national policies in recent years, which increase the compensation amount and promote improvements in resettlement conditions. However, as long as local governments have a monopoly position in rural-urban land transfers, injustice and unfair compensations are likely to occur. The second finding supports statements that the current evaluation method for compensations, based upon the farmland's current production value and a multiplier, is no longer a proper instrument for determining compensations in China's increasingly market-oriented economy. This compensation policy inherited by the old planned system, with compensations equal to 200-300 times the value of annual yield of farmland, has artificially suppressed the value of land after expropriation (Ding, 2007). Some studies argue that land compensations should be varied with different land conversion uses, and that the land value increment should also partly be allocated to land-expropriated farmers (Ding, 2007; Zou and Oskam, 2007). Our study suggests that, in order to avoid social unrest caused by land conflicts, future policies should focus on removing the monopoly of local governments in converting rural land into urban land, and gradually introducing land market prices into formulating the compensation standard.

Our study also shows that the compensation mode affects the impact of compensation amounts on farmers' satisfaction. Among the three modes, farmers compensated under the social security mode are more likely to feel satisfied when the compensation amount increases than farmers paid under the other two modes. In other words, our finding suggests that sustaining farmers' long-term minimum level of livelihood is superior to cash compensations and receives more support among farmers. Land is not only an income generator for farmers in China, but also (and more importantly) a means of life security. The minimum amount of social security payments therefore requires to be much more than the compensation received for the land (Ding, 2007). Actually, the current average level of monthly social security payment is certainly not enough to guarantee the basic living conditions of land expropriated farmers (Hui et al., 2013). Therefore, it is advisable that the government adjust the existing standard of social security and indeed guarantee farmers' long-run livelihood. Besides that, we also advise that local governments use

additional compensation modes to help farmers adapt to their new lives in different ways, such as job offers, shareholding and bonus distribution, cross-regional migration and so on.

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Tables

Table 1: Variable definitions and descriptive statistics

Variable	Definition	Mean	S.D.
Dependent variable			
Farmers' satisfaction with the compensation for farmland expropriation	Respondent's evaluation of the compensation received for farmland expropriation, 3= satisfied, 2= neutral, 1= dissatisfied	2.17	0.86
Explanatory variables			
Compensation amount	Compensation per mu (in 1,000 RMB/mu, 2012 prices)	20.0	11.4
Compensation mode 1	Monetary compensation paid in a lump sum	0.70	0.47
Compensation mode 2	Monetary compensation paid at certain intervals	0.16	0.36
Compensation mode 3	Social security	0.15	0.34
Control variables			
Regional characteristics			
Z1	1= East China (Jiangsu Province), 0= otherwise	0.55	0.50
Z2	1= West China (Sichuan Province), 0= otherwise	0.25	0.43
Time Period			
T	1= land expropriated during 2008 - 2013, 0= other years	0.50	0.50
Household characteristics			
Non-agricultural revenue per capita	Gross non-agricultural revenue per capita in 2012 (1,000 RMB)	8.13	7.64
Age	Age of the respondent (years)	54.6	11.3
Gender	Gender of the respondent, 1=male; 0=female	0.70	0.46
Education	Years of formal education of the respondent (years)	7.10	2.86
Land characteristics			
Residual land share	Remaining land area after expropriation as a share of the total contracted land area (%)	66.8	28.1
Land plots	Number of land plots allocated to a household	4.56	3.23
D1	1= suburb, 0= otherwise	0.58	0.50
D2	1= remote rural district, 0= otherwise	0.26	0.44
Farmland expropriation			
Expropriated land use	Land use after expropriation, 1= public infrastructure 0= other	0.77	0.42
Revenue change	Respondent's subjective evaluation on revenue changes after land expropriation, 3= increase, 2= no change, 1= decrease	1.62	0.73
Compensation in arrears	1= compensation is paid in arrears, 0= otherwise	0.26	0.44

Table 2: Regression results, ordinal probit model

Dependent variable: Farmers' Satisfaction	(1)	(2)	(3)	(4)	(5)
Compensation amount	-0.0203** (0.0101)	0.0343** (0.0159)	0.0443*** (0.0121)	0.0384*** (0.0130)	
Compensation amount * Compensation mode					
Compensation amount * cash paid in a lump sum					0.0293 (0.0221)
Compensation amount * cash paid at some certain times					0.0003 (0.0559)
Compensation amount * social security					0.0348** (0.0154)
Control variables					
Regional variable (reference group: central area)					
Z1 (East area)		1.1007** (0.5383)	1.2323*** (0.4565)	0.7266 (0.7168)	0.8422 (0.7697)
Z2 (West area)		1.2644** (0.5343)	1.3175*** (0.4678)	0.9787* (0.5405)	1.0153* (0.5337)
Time period (reference group: other years)					
Land expropriated in recent six years		-0.7701*** (0.2516)	-0.7985*** (0.2714)	-0.9527*** (0.2857)	-0.8644*** (0.2958)
Non-agricultural revenue per capita		-0.1942*** (0.0195)	-0.2082*** (0.01785)	-0.2145*** (0.0295)	-0.2149*** (0.0260)
Age			0.0331*** (0.0072)	0.0369*** (0.0106)	0.0377*** (0.0117)
Gender				0.5000 (0.4021)	0.4829 (0.3884)
Education				-0.0027 (0.0615)	-0.0064 (0.0633)
Residual land share			0.0111* (0.0061)	0.0038 (0.0070)	0.0043 (0.0072)
Land fragmentation				0.0542 (0.575)	0.0510 (0.0566)
Land location (reference group: middle area)					
D1 (suburb)				0.2621 (0.7068)	0.1142 (0.7411)
D2 (remote rural area)				-0.0687 (0.5229)	-0.0999 (0.5290)
Expropriated land uses (reference group: non-public infrastructure)					
Public infrastructure				0.2029 (0.4317)	0.1487 (0.4822)
Revenue change				0.0146 (0.1857)	0.0283 (0.2009)
Compensation in arrears (reference group: no arrears)					
In arrears				0.4873 (0.5810)	0.5461 (0.6033)
N	105	105	105	105	105
Pseudo R^2	0.0182	0.3797	0.4275	0.4514	0.4541

Robust standard errors in brackets. Standard errors are at the village level.

* Represents 10% significancy. ** Represents 5% significancy. *** Represents 1% significancy