China Economic Review 60 (2020) 101223

Contents lists available at ScienceDirect

China Economic Review

journal homepage: www.elsevier.com/locate/chieco

Efficiency and distribution of rural construction land marketization in contemporary China

Rongyu Wang, Rong Tan*

School of Public Affairs, Zhejiang University, Hangzhou, China

ARTICLE INFO

Keywords:
Rural construction land
Land market
Efficiency
Social welfare
China

ABSTRACT

Since 2015, a national trial on rural construction land marketization has been conducted in 15 counties in China; this trial is regarded as the most significant step taken to date to reform the extant rural-urban dual land governance system. The trial aims to investigate the performance of an integrated rural-urban construction land market in facilitating land resource allocation efficiency and land revenue distribution equality. The objective of this paper is to understand the ongoing rural construction land marketization in China, with a particular focus on its efficiency and distribution effects. To this end, the theoretical model for rural construction land marketization is extended based on Tan, Qu, Heerink, and Mettepenningen (2011), a partial equilibrium model is developed for the empirical analysis, and recent rural construction land marketization practices in Deqing County, Zhejiang Province, are examined for empirical evidence. The study concludes that 1) rural construction land marketization indeed improves land allocation efficiency, and 2) rural construction land marketization also leads to a welfare gain for the rural sector, in particular by inducing redistribution effects from the urban to the rural sector.

1. Introduction

After over 30 years of development, the land market in China has evolved into a typical rural-urban dual system with the feature that rural and urban land cannot be traded in the same market and in particular that rural-to-urban land transfers outside of government land acquisitions are strictly prohibited (Lai, Peng, Li, & Lin, 2014; Liu, Yang, Long, Gao, & Wang, 2014). Such a dual land market governance structure not only leads to land allocation inefficiency because of administratively set land prices (the government sets both the compensation standard for land acquisitions and the conveyance prices for industrial land, Tan et al., 2011) (Ding, 2007; Lin & Ho, 2005; Zheng, Wang, & Cao, 2014) but also triggers an imbalanced interest structure among different social actors (e.g., rural households and the government, rural and urban sectors), thus impeding integrated rural-urban development (Hui, Bao, & Zhang, 2013; Lin & Zhu, 2014; Liu, 2014).

In recent years, the Chinese government has started reforming the rules of the land market. In 2013, the government proposed establishing an integrated rural-urban construction land market with the purpose of reforming the rural-urban dual system and facilitating rural-urban integration (the 18th CCCPC, 2013). At the beginning of 2015, empowered by the National People's Congress, the Ministry of Land and Resources selected 33 county-level pilot areas throughout the nation for a reform of rural land institutions. One of the most important tasks was allowing rural construction land to be directly transferred to urban land users with the precondition of conforming to land-use planning and regulations in 15 pilot areas. This change represented the starting point for a new round of land marketization in China with rural construction land as the major target.

* Corresponding author at: Yuhangtang Road 866, Xihu District, Hangzhou 310058, China.
E-mail address: tanrong@zju.edu.cn (R. Tan).

https://doi.org/10.1016/j.chieco.2018.09.004
Received 14 September 2017; Received in revised form 7 September 2018; Accepted 7 September 2018
Available online 10 September 2018
1043-951X/

A multitude of international studies have analyzed or assessed the diverse effects generated by China's urban land marketization, including improving the urban land allocative efficiency (Du, Thill, Peiser, & Feng, 2014; Zhu, 2005), accumulating adequate capital for urban development and accelerating China's economic development (Cao, Feng, & Tao, 2008; Lin & Yi, 2011) but also increasing the social wealth gap between rural and urban areas (Lin & Ho, 2005; Paik, 2014).

Other studies have discussed the effects of rural construction land marketization in China. For instance, scholars have noted that shifting the rural-urban construction land market from a dual system to an integrated one could gradually ameliorate efficiency and the social welfare (Qian & Ma, 2007). Some studies showed that the collective-owned land marketization at the end of the 20th century helped reduce rural households' interest losses caused by land acquisition and thereby enabled rural households to share more incremental land revenue during industrialization (Jiang & Liu, 2004; Liu, 2008). Based on a practice in Chengdu City, some scholars found that rural construction land transfers were able to increase the land-use efficiency and to appropriately add to the land revenue earned by rural households from industrialization and urbanization (Chen & Gao, 2011; Yan & Wang, 2011). By contrast, scholars also worried that rural construction land marketization would result in land oversupply, negatively affect the urban primary land market and ultimately hinder local governments' land financing abilities. In such a case, local governments would not be able to afford urban infrastructure construction and would even be unable to promote rural-urban integration (He, 2013; Xia, 2013).

What exactly are the allocation and distribution effects induced by China's ongoing rural construction land marketization and its aim to foster an integrated rural-urban land market? To the best of our knowledge, there is a lack of literature that quantitatively investigates this issue because the data on rural construction land marketization in China were insufficient prior to the central government-initiated rural land institution reform that began in 2015. However, the goals of the new round of land marketization in contemporary China, such as optimizing the land allocation, protecting rural households' interests, and narrowing the income gap between rural and urban areas (The 18th CCCPC, 2013) as well as the practices of national pilot areas allow us to investigate the efficiency and distribution of rural construction land marketization in depth. We therefore provide a more explicit theoretical analysis than Tan et al. (2011) and more convincing empirical evidence given the unique dataset collected in this study.

In summary, this paper intends to address the following issues: 1) to better understand rural construction land marketization in China and, more specifically, 2) to identify the allocation and distribution effects of rural construction land marketization. To that end, taking the perspective of the interplay between efficiency and distribution, we attempt to develop a theoretical model for rural construction land marketization to provide new insights into rural land institution reform in China. Additionally, we intend to conduct an empirical analysis of the allocation and distribution effects of rural construction land marketization based on the evidence from a pilot area.

The paper is organized as follows. The second section briefly introduces the ongoing rural construction land marketization in China. The third section discusses the effects of China's rural construction land marketization in theory, develops a partial equilibrium model, and then proposes the research hypotheses. The fourth section takes the trial in Deqing County, Zhejiang Province, as an example to estimate the allocation and distribution effects of rural land construction marketization and to test the theoretical hypotheses. The last section draws conclusions and offers a discussion.

2. Ongoing rural construction land marketization in China: From land acquisition to direct transfer

Rural land development not only leads to physical changes in the land itself but also induces various utilization and distribution outcomes due to differentiated social elements such as institutions and governance structures. Land acquisitions and direct transfers, as two different institutions and governance structures, both affect rural land development in China.

2.1. Land acquisition

For decades in China, rural collective-owned land involving rural construction land has been permitted for urban construction use only after being converted into state-owned land through a land acquisition under the rural-urban dual land market (Fig. 1). This process reflects the government's tight use of regulations and planning to control all types of rural land resources (Tan, Beckmann, van den Berg, & Qu, 2009). Land acquisition, as the sole legal method for rural-to-urban land transfer, also reflects the strict regulations on rural land property rights, including the right to use, the right to income, and the right to alienate (Lin & Ho, 2005; Tan et al., 2009). For example, rural collective-owned land, including rural construction land, cannot be used for nonagricultural production or to generate nonagricultural revenue.[1] Rural land transfers between collective members and noncollective members are also forbidden. Rural collectives must comply with government-led land acquisition and do not have the right to reject it.

In a land acquisition, the local government becomes the sole legal owner of rural construction land and other types of rural land resources instead of other urban land users. The local government exerts the power of expropriation or eminent domain, which is even stronger than monopoly power. This means that local governments can decide both the price (compensation to rural households) and the amount of land acquired, while rural households (or the rural sector) normally cannot refuse land acquisitions. Although rural households are still granted a limited right to negotiate compensation, the range of compensation is predefined by China's Land Administration Law, which is similar to a type of ceiling price. Specifically, rural households can be compensated at a level of 15 to 30 times the average land output under agricultural use during the previous three years rather than basing the

[1] In general, rural collective-owned land cannot be used by enterprises; however, there is an exception in which rural collective-owned enterprises can use rural collective-owned land for agricultural purposes.

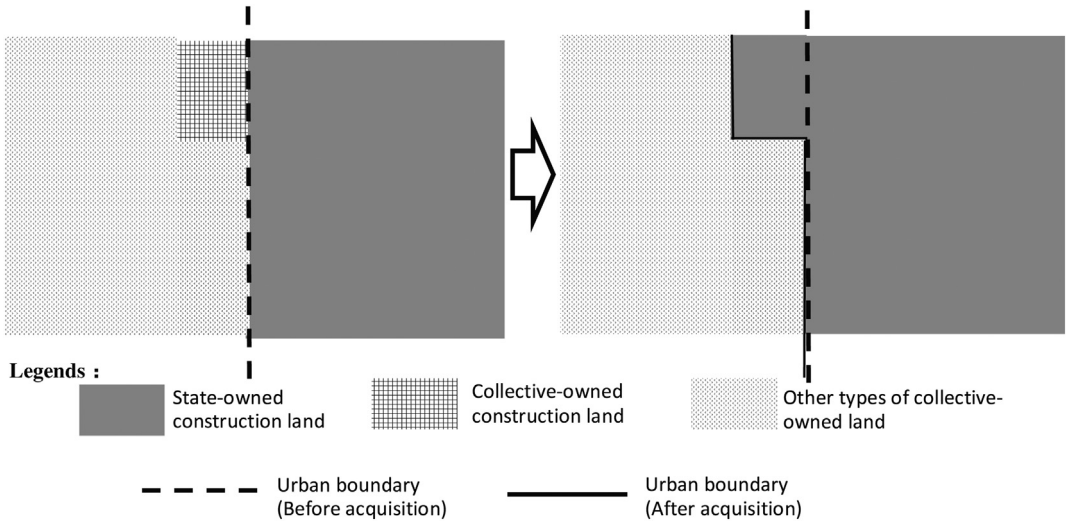

Fig. 1. Land acquisition.

compensation on the value of urban construction use after land acquisition (Ding, 2007). Thus, local governments can convert collective-owned rural land into stated-owned land at a relatively low compensation price.

Consequently, the administratively set and relatively low compensation price for land acquisition fails to reflect the real supply-demand relationship in the land market; eliminates budget constraints on land users, especially local governments; triggers excessively high demand for land resources; and ultimately causes a phenomenon in which the amount of rural land resources (e.g., rural construction land) transferred to urban land users exceeds the socially optimal level, i.e., rural-to-urban land (e.g., construction land) over-transfer. In addition, the rural sector, as the supplier, is not able to share in the incremental revenue generated from rural-to-urban land transfers, inducing an inequity in the rural-urban land revenue distribution.

In general, the government monopolizes the rural-to-urban land resource allocation through land acquisitions and hinders rural households, the owners of rural collective-owned land, by alienating their land resources, which thereby leads to a comparatively low degree of marketization for rural-to-urban land transfers.

2.2. Direct transfer

Rural construction land marketization targets the release of government intervention in rural land allocation, for example, by reducing the government's intervention in price mechanisms (e.g., the ceiling price) (Klomp, 2014; Williams, Ewert, Hamann, & Vink, 1998), removing regulations on transaction actors, scope and methods (e.g., sale and rent), and enriching land rights (e.g., the right to transfer and right to mortgage) (Cladera & Burns, 2000; Deininger, 2003; Vachadze, 2013). Currently, the Chinese government intends to allow rural households to directly supply rural construction land in the market as well as to narrow the scope of land acquisitions to partially address the efficiency and equity issues created by the rural-urban dual land governance.

In fact, rural construction land marketization in China dates back to the 1980s. After that period, a variety of marketization modes appeared, such as collective-owned land capitalization to promote rural industrialization and urbanization in Nanhai, Guangdong Province, and Zhenggezhuang, Beijing City (Jiang & Liu, 2004; Liu, 2008); the rural construction land transfer experiment in Wuhu, Anhui Province, Suzhou, Jiangsu Province, and Huzhou, Zhejiang Province (Tang, Wang, & Tan, 2014); the widespread LUTRG (linkage between urban land taking and rural land giving) policy across the country (Long, Li, Liu, Woods, & Zou, 2012; Tan, Wang, & Sedlin, 2014); and the rather liberalized practices advocated by local governments in recent years, such as rural construction land bidding and long-term transfers (Tan, Wang, & Heerink, 2018; Zou, Zhao, & Mason, 2014). Although these trials associated with rural construction land marketization occurred in the early period of China's economic reforms, this is the first time that a trial was initiated to reform national rural land institutions by suspending some of the current laws.

After the Third Plenary Session of the 18th Central Committee of the Communist Party of China (CCCPC) in 2013, rural construction land direct transfer (*direct transfer*) became a popular topic for policy makers, academics and other social sectors. Having gained support from the central authority, direct transfer was granted a national reform trial by the National People's Congress, and the laws prohibiting direct transfer were suspended in the pilot areas. Direct transfer means that given the preconditions of conforming to land-use planning and regulations (e.g., rural residential land is excluded, and rural construction land is not available for urban residential use) and maintaining collective land ownership, rural construction land-use rights can be directly transferred to urban land users through conveyances, leases, mortgages, etc. Thus, rural construction land is now compatible with urban development. However, land acquisition is still the only legal way to transfer other types of collective-owned land, such as farmland, to the urban sector for urban development. As shown in Fig. 2, during urbanization, other types of rural collective-owned land become urban state-owned land through land acquisition. The expanded urban area consists of collective-owned construction land obtained

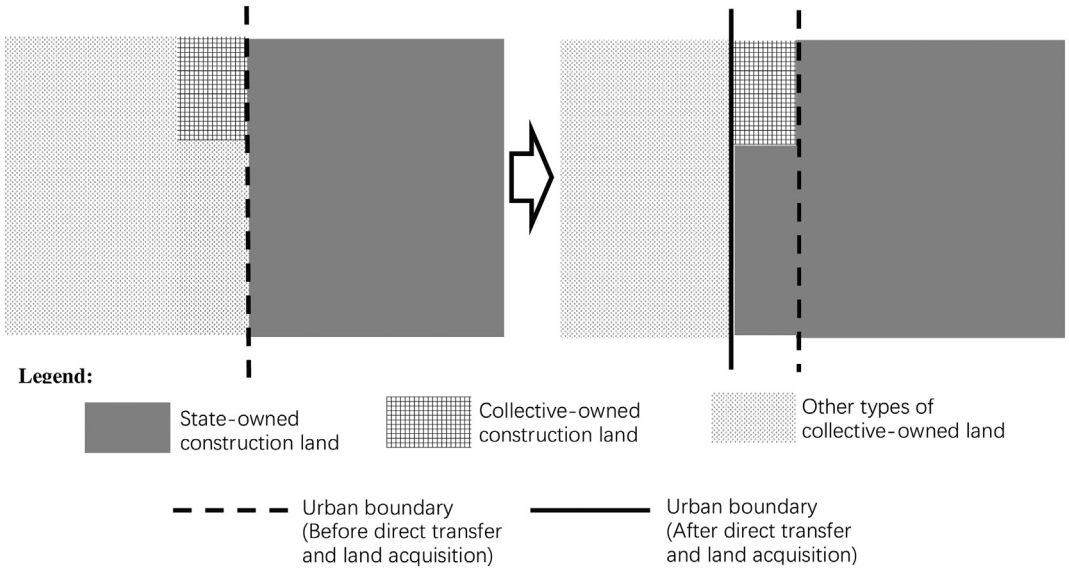

Fig. 2. Direct transfer.

from direct transfers and stated-owned construction land obtained from land acquisitions. Similar to land acquisition, direct transfer, as a type of institution and governance arrangement, can also support rural land resource development in China. The highlight of this policy is that it breaks the rule that only state-owned land is legitimate for urban construction use, thus lifting government regulations on rural-to-urban construction land transfers and reducing the institutional constraints on rural construction land rights, including the right to use, the right to income and the right to alienate, in order to increase the degree of marketization.

Specifically, direct transfer attempts to break the government monopoly on rural-to-urban construction land transfer and enable rural households to transfer land to the urban sector by bargaining with urban land users instead of undergoing the mediation process of land acquisition. It is expected that using a price signal rather than administrative command will have a more profound impact on land allocation in rural and urban areas and contribute to improving the allocative efficiency of land (Cao et al., 2008). Moreover, budget constraints for land use are expected to be tightened to prevent the over-transfer of rural-to-urban construction land by local governments and to promote intensive and rational land use (Tang, Wang, & Tan, 2016).

Higher allocative efficiency will enhance the value of rural construction land and raise its price, thereby benefitting the rural sector. Additionally, because farmers gain the opportunity to directly negotiate with land users to compete for more land revenue, it will become difficult for local governments to obtain excessive land revenue by monopolizing and intervening in the land market (Ding, 2007). As a consequence, a more balanced rural-urban land revenue distribution should be established by virtue of direct transfer.

Overall, compared with land acquisition, the direct transfer policy intends to give the market mechanism a key role in rural-urban land resource allocation and to give rural households the right to dispose of and transfer their own land, such that the rural sector can potentially gain more land revenue. Hence, it is assumed that direct transfer will limit the over-transfer of rural-to-urban construction land stemming from the traditional rural-urban land allocation pattern established through government over-intervention and will create an economic incentive for efficient land use. Moreover, direct transfer is expected to redistribute land revenue between rural and urban areas and improve the welfare of the rural sector.

3. Effects of rural construction land marketization: A partial equilibrium model

Here, the theoretical model developed by Tan et al. (2011) is extended to examine the performance of the ongoing rural construction land marketization in China. In Fig. 3, D and S represent the demand curve for urban construction land and the supply curve for rural construction land in a competitive rural-urban construction land market, respectively. The market equilibrium is at E, with price P^* and quantity Q^*. We can further analyze the allocation and distribution effects generated by the marketization reform based on the partial equilibrium model. In other words, by comparing this model with a situation in which it is compulsory for the government to acquire rural construction land, we can discern the changes in the quantity of construction land as well as the welfare distribution between rural and urban sectors resulting from rural construction land direct transfer.

3.1. The efficiency and distribution effects of land acquisition

As shown in Fig. 3, the local government usually acquires rural construction land Q^S (land acquisition quantity), which exceeds the socially optimal transfer quantity Q^* at a much lower price P^A (land acquisition price) than P^* to gain more space for industrialization and urbanization as well as to obtain more revenue. Accordingly, (Q^S-Q^*) is the amount of rural construction land

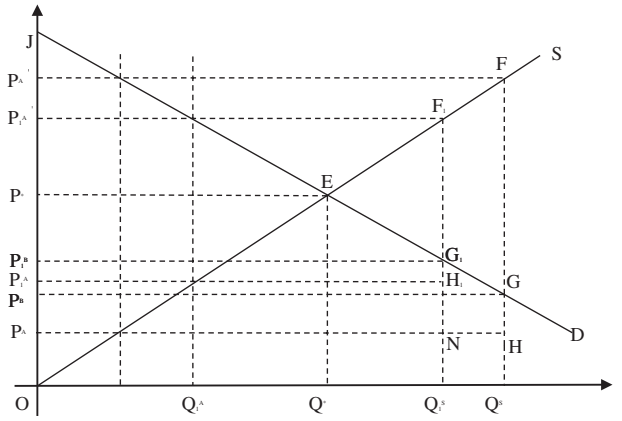

Fig. 3. The partial equilibrium model.

over-transfer, thus suggesting inefficient land allocation under the land acquisition policy.

Rural construction land over-transfer and the extremely low compensation price clearly hamper the interests of the rural sector. The welfare of the rural sector drastically decreases from P^*EO in a competitive market to (P^AHQ^SO-OFQ^S) with land acquisition. However, because land revenue is financially vital for urban socioeconomic development in China, e.g., constructing or maintaining urban infrastructure, the urban sector certainly benefits (Cao et al., 2008; Tao, Su, Liu, & Cao, 2010; Zhu, 2002). The welfare of the urban sector drastically increases from JEP^* in a competitive market to $JGHP^A$ under land acquisition. The welfare loss of the rural sector and the gain of the urban sector reflect the unequal welfare distribution in the context of land acquisition. The overall impact of land acquisition is a net loss to the social welfare – EFG.

3.2. The efficiency and distribution effects of direct transfer

Based on the partial equilibrium model, we propose the following hypotheses about the allocation and distribution effects of rural construction land marketization (i.e., direct transfer) in comparison with land acquisition (Fig. 3).

H1.*Rural land marketization improves the allocative efficiency of land.*

During rural construction land marketization, rural construction land prices increase to $P_1{}^A$, which is higher than the compensation price of land acquisition P^A and trends toward P^*. Because the increased land-use cost caused by the increasing land price gradually affects land-use decisions, the quantity of rural-to-urban construction land transfer will also decrease.

However, because rural construction land marketization is an accumulative process, there still exists a notable gap in the degree of marketization between the current situation and the ideal competitive one. In particular, the regulation of collective-owned rural construction land is stronger than the regulation of state-owned land. For example, the scope of utilization of rural construction land is limited, and rural construction land cannot be directly transferred for urban residential use; further, obstacles to obtaining rural construction land mortgages have not yet been entirely eliminated. The demand for land for urban construction can be met either through land acquisition or direct transfer (Fig. 2). In addition, as a self-interested and rational supplier, an owner of rural construction land is expected to seize the rare opportunity (i.e., direct transfer) to transfer more land to urban land users for increased revenue. Therefore, the urban sector, as the demander, retains advantages over the supplier, the rural sector, when bargaining. Under the condition of imperfect competition, the gross quantity of rural-to-urban construction land transfer will exceed the market supply quantity $Q_1{}^A$ at price $P_1{}^A$ and the socially optimal quantity Q^*. Urban land users can, as usual, obtain more rural construction land $Q_1{}^S$ at a lower price (given the land quantity $Q_1{}^S$, the highest price that urban land users are willing to pay is $P_1{}^B$).

Nevertheless, due to marketization, the increased land price indeed lowers the amount of rural-to-urban construction land transfer to $Q_1{}^S$ to below the quantity of land acquisition Q^S and trending toward Q^* (Fig. 3). Therefore, the amount of rural construction land over-transfer declines from (Q^S-Q^*) under land acquisition to ($Q_1{}^S$-Q^*) under direct transfer for a total change of (Q^S-$Q_1{}^S$). Thus, rural construction land marketization decreases the amount of rural-to-urban construction land over-transfer and thereby prevents extensive and inefficient land use.

H2.*Rural land marketization induces a welfare gain for the rural sector and reduces the net social welfare loss.*

In Fig. 3, the welfare of the rural sector increases from (P^AHQ^SO-OFQ^S) under land acquisition to ($P_1{}^AH_1Q_1{}^SO$-$OF_1Q_1{}^S$) under direct transfer, which represents a gain in welfare of ($P_1{}^AH_1NP^A$ + F_1FHN). Meanwhile, the welfare of the urban sector decreases from $JGHP^A$ under land acquisition to $JG_1H_1P_1{}^A$ under direct transfer, which represents a welfare loss of -($P_1{}^AH_1NP^A$ + G_1GHN). Additionally, the net social welfare loss decreases from -EFG under land acquisition to -EF_1G_1 under direct transfer, which represents a gain of F_1FGG_1. Furthermore, the welfare gain in the rural sector is derived from the welfare loss in the urban sector and the net gain in the social welfare, namely, ($P_1{}^AH_1NP^A$ + F_1FHN) = ($P_1{}^AH_1NP^A$ + G_1GHN + F_1FGG_1).

During rural construction land marketization, the social welfare changes stem from increases in the rural construction land prices. Given a specific quantity of rural construction land (i.e., $Q_1{}^S$) transferred to the urban sector, the increased land price adds to the producer surplus of the rural sector, which indicates that urban land users have to pay more (i.e., the value of $P_1{}^AH_1NP^A$) for the same

quantity of rural construction land compared to the situation under land acquisition. Thus, $P_1{}^AH_1NP^A$ is recognized as a welfare transfer (I) from urban to rural areas directly caused by the increase in the rural construction land price. Meanwhile, as noted above, the increased land price limits the scale of rural-to-urban construction land over-transfer, suggesting that the urban sector transfers the consumer surplus (i.e., the value of G_1GHN) gained by rural construction land over-transfer at a relatively low price to the rural sector. Therefore, G_1GHN is recognized as a welfare transfer (II) from urban to rural areas indirectly caused by the increase in land prices. In addition, less rural construction land over-transfer due to the higher land prices causes a net social welfare gain of F_1FGG_1. Therefore, by raising the rural construction land price, rural construction land marketization not only facilitates a more efficient allocation of land resources but also profoundly affects the social welfare distribution.

4. Application of the model: Evidence from Deqing County, Zhejiang Province

4.1. Rural construction land marketization in Deqing County

At the beginning of 2015, Deqing County, as one of the 15 pilot areas, was authorized by the central government to conduct a reform of its rural construction land regulations (i.e., direct transfer) to promote rural construction land marketization.

Deqing County is located in Zhejiang Province in the eastern part of China. It has a total area of 936 km^2 and 430,000 inhabitants. The market economy in Deqing County is well developed, with an especially active private sector. Deqing County ranks 41st and 1st in economic development and its development potential, respectively, among the top 100 counties in China. In 2016, the gross domestic product (GDP) of Deqing reached 4.25 billion Yuan, and its fiscal income was 7.28 billion Yuan. In the 1980s and 1990s, as private enterprises rapidly developed, illegal land transfers for rural construction became increasingly common in Deqing County. Thus, Deqing and the surrounding areas were familiar with this phenomenon. Early in 2000, Huzhou City, the prefecture in which Deqing is situated, was selected as a pilot area for rural construction land-use rights transfers by the Ministry of Land and Resources. During that early experiment in rural construction land transfer, the “Huzhou mode” addressed the transaction scope, transaction methods, land use, revenue distribution, etc.[2] In general, Deqing's well-developed economy, active private sector and experience with rural construction land transfer provided a good basis for its selection as a pilot area for ongoing rural construction land marketization beginning in 2015.

After Deqing County was nominated as a national pilot area, a series of rules covering direct transfer were enacted that delineated the actors, objects, land-use types, property rights and land-use expiration period. Specifically, for direct transfers in Deqing, the suppliers are rural collective economic organizations (e.g., village-level collectives and township-level collectives) that own rural construction land, while the demanders are urban land users (e.g., enterprises, other organizations and private individuals) who are only allowed to own the use rights of rural construction land. The transaction objects are the legally obtained use rights for the extant rural construction land (rural residential land is excluded), in conformity with land-use planning policies. The land-use types after transfer include industrial, commercial and tourism uses, but residential use is strictly prohibited. Rural construction land that is in compliance with the above regulations can be directly transferred through chargeable methods of conveyance (*Churang*), leases (*Chuzu*) and investments (*Rugu*). The transaction methods are further categorized into tender (*Zhaobiao*), negotiation (*Xieyi*), listing (*Guapai*) and auction (*Paimai*). The tradable rural construction land-use rights are available for re-transfer, re-lease and mortgage within the land-use expiration period. The land-use expiration period varies by land type, i.e., the period for industrial use is 50 years, and that for commercial use and tourism use is 40 years.

Currently, a more liberalized rural construction land market is gradually developing in Deqing. Intuitively, these marketization efforts increased the rural construction land prices and generated significant distribution effects. We use the first plot of directly transferred rural construction land as an example. Through several rounds of auction, this piece of rural construction land was transferred for industrial use at the price of 864.99 Yuan/m^2, which was nearly 11.5 times the administratively set compensation price for land acquisition. In addition, the village collective, as the owner of the rural construction land, earned approximately 11.5 million Yuan in total. By the end of 2016, a total of 81 plots of rural construction land had been directly transferred in Deqing County. The total acres of transferred land was 39.28 ha, with a total land revenue of 143.83 million Yuan. Among all the pilot areas, Deqing ranked first in both the number of plots and the acres of directly transferred rural construction land and accounted for nearly 50% of the total plots and the total acres directly transferred across all pilot areas.

Thus, rural construction land marketization in Deqing County can provide sufficient samples for an empirical analysis because of the early start, sound basis and impressive results. Furthermore, the allocation and distribution effects of the advanced marketization practices in Deqing may reflect the potential outcomes once rural construction land marketization moves forward nationwide in the future. Overall, the evidence from Deqing County deserves a detailed inspection.

4.2. Methods

We intend to conduct a comparison between land acquisition and direct transfer to examine the allocation and distribution outcomes of rural construction land marketization based on a partial equilibrium model (Fig. 3) and the cases from Deqing County. In other words, we intend to explore the extent to which the allocative efficiency of land and the distribution effects differ due to the institutional and governance differences between land acquisition and direct transfer.

[2] The above information was collected from an interview with local officials in Deqing County.

4.2.1. Equation estimations

The supply curve S and demand curve D in a competitive land market are estimated to establish the partial equilibrium model as follows:

$$Q = \alpha_1 P + \alpha_2 P_A + C_1 \tag{1}$$

$$Q = \beta_1 P + \beta_2 P_H + C_2 \tag{2}$$

where Eq. (1) presents the supply curve S, and Eq. (2) presents the demand curve D; Q and P denote the land quantity and the land price in a competitive market, respectively; P_A denotes the land acquisition price; P_H denotes the housing market price; C_1 and C_2 denote the constant terms; and α_1, α_2, β_1 and β_2 are the coefficients.

In China, there is intense competition in commercial and residential land trading in the urban primary land market (i.e., by means of auction and listing); thus, the resulting prices and quantities are normally considered to be competitive prices and quantities (Liu, Cao, Yan, & Wang, 2016; Tan et al., 2011). We can therefore use the commercial and residential land auction and listing cases with variables including price, quantity, plot characteristics and socioeconomic factors to estimate the S and D curves. The approach for estimating the S and D curves, a type of simultaneous equation, is the generalized method of moments (*GMM*). GMM is able to make the correlations between instruments and disturbances as close to zero as possible. In addition, GMM is a robust estimator because it does not require information on the accurate disturbance distribution. Many standard simultaneous equations can be properly estimated by GMM (Pindyck & Rubinfeld, 1998).

Moreover, the land acquisition price and the housing market price are used to identify the supply curve S and demand curve D, respectively. Each auction or listing case has a corresponding land acquisition price, but the housing market price of each auction or listing case is not available. Hence, the equation for the housing market price is estimated by using house trading cases with different plot characteristics (e.g., quality and location). The price equation for the housing market is as follows:

$$P_H = \theta_1 Q_H + \theta_2 LG + \sum_{i=1}^{n} \theta_{3i} \boldsymbol{d}_i + C \tag{3}$$

where Q_H denotes the housing trading quantity; LG denotes the land grade; $\boldsymbol{d_i}$ denotes the vector variables for location, which represent the distances to socioeconomic centers and ecological areas (e.g., the nearest commercial center and the nearest green area); i denotes the number of specific location variables; n is the total number of location variables; C denotes the constant term; and θ_1, θ_2 and θ_{3i} are the coefficients.

In addition, the equation for land acquisition quantity needs to be estimated based on the land acquisition cases because we intend to estimate the land acquisition quantity of each direct transfer case, assuming that all of the cases were acquired by the government. The quantity equation for land acquisition is as follows:

$$Q_S = \gamma_1 P_A + \gamma_2 LG + \sum_{i=1}^{n} \gamma_{3i} \boldsymbol{d}_i + \sum_{k=1}^{m} \gamma_{4k} TC_k + \sum_{r=1}^{j} \gamma_{5r} SE_r + C \tag{4}$$

where Q_S denotes the land acquisition quantity; TC_k denotes the variables for the transaction characteristics, such as the land-use type after the land acquisition; SE_r denotes the socioeconomic variables, such as fiscal income; k denotes the number of specific variables for the transaction characteristics; r denotes the number of specific socioeconomic variables; m and j are the total numbers of the transaction characteristic variables and the socioeconomic variables, respectively; and γ_1, γ_2, γ_{3i}, γ_{4k} and γ_{5r} are coefficients.

The method for estimating the above two equations is the double-logarithmic specification because it can reduce the potential impact of outliers (Tan et al., 2011).

4.2.2. Estimating land allocative efficiency

The values of Q^*, Q^S and ${Q_1}^S$ are estimated to obtain the amount of rural-to-urban construction land over-transfer (Q^S-Q^*) and (${Q_1}^S$-Q^*), which provides a land allocative efficiency comparison between land acquisition and direct transfer (Fig. 3).

Specifically, ${Q_1}^S$ is the sum of all of the direct transfer quantities. Given the explanatory variables (e.g., plot characteristics) in certain direct transfer cases, the housing market price for the direct transfer case is estimated via the housing market price equation, and the land acquisition price for the direct transfer case is estimated according to the land acquisition compensation standard enacted by the local government. Subsequently, for each direct transfer case, the equations of the D and S curve together with the estimated housing market price and land acquisition price of the case are used to estimate the equilibrium price and quantity for that case in a competitive market. Aggregating the equilibrium quantities over all the direct transfer cases yields Q^*, while P^* is obtained as the average of all equilibrium prices. Additionally, given the values of the explanatory variables in each direct transfer case, the acquired quantity of a case is estimated via the quantity equation for land acquisition. Aggregating the land acquisition quantities over all direct transfer cases yields Q^S.

As such, the amount of rural-to-urban construction land over-transferred under land acquisition (Q^S-Q^*) is obtained and can be compared with that over-transferred under direct transfer (${Q_1}^S$-Q^*), thus highlighting the land allocation efficiency of rural construction land marketization.

4.2.3. Estimating the social welfare distribution

The values of $({P_1}^A H_1 NP^A + F_1 FHN)$, $-({P_1}^A H_1 NP^A + G_1 GHN)$ and $F_1 FGG_1$ are estimated to compare the distribution effects

between land acquisition and direct transfer. Specifically, $P^{A'}$and $P_1^{A'}$are obtained by inputting the estimated Q^S and Q_1^S into the equation for curve S. In addition, P^B and P_1^B are obtained by inputting the estimated Q^S and Q_1^S into the equation for curve D. As noted above, P^A is obtained from the official compensation standard for land acquisition, and P_1^A is obtained from the average of all direct transfer prices.

As such, given P^A, P_1^A and Q_1^S, the welfare transfer (I) $P_1^AH_1NP^A$ is obtained. Given P^A, P^B, P_1^B, Q^S and Q_1^S, the welfare transfer (II) G_1GHN is obtained. Given $P^{A'}$, $P_1^{A'}$, P^B, P_1^B, Q^S and Q_1^S, the net social welfare gain F_1FGG_1 is obtained. Subsequently, the welfare changes in the rural sector ($P_1^AH_1NP^A + F_1FHN$) and the urban sector ($P_1^AH_1NP^A + G_1GHN$) are obtained, thus suggesting the distribution effects of rural construction land marketization.

4.3. Data collection

According to the methods elaborated above, we collected the following information in Deqing County[3]: 1) 468 land acquisition cases from 2011 to 2015 (more than 75% of the cases during the period); 2) 468 house trading cases from 2011 to 2015 (extracted from all cases during the period using the stratified random sampling method); 3) 100 commercial and residential land auction and listing cases in the urban primary land market from 2011 to 2015 (more than 90% of the cases during the period); and 4) 81 direct transfer cases from 2015 to 2016 (all the cases during the period).

The information collected on these cases includes 1) transaction information, including size, price, transaction method and land-use type; 2) plot characteristics, including land quality, location and floor area ratio; and 3) socioeconomic data from the exact year when the specific case occurred, including regional population, regional GDP growth rate and regional fiscal income and expenditure growth rates. The mean values of the dependent and independent variables used in each equation are presented in Table 1.

4.4. Results

4.4.1. Equation estimation outcomes

Initially, we used the land acquisition cases and the house trading cases to estimate the quantity equation for land acquisition and the price equation for the housing market separately through the double-logarithmic specification. The outcomes are shown in Tables 2 and 3, respectively.

For the quantity equation for land acquisition, a significantly positive coefficient on the dummy variable for the transaction method after land acquisition indicates that the local government tends to acquire more land for conveyance, a chargeable transaction method, to gain more land revenue. In contrast, a significantly negative coefficient on the dummy variable for the land-use type reflects a strategy taken by the local government to make a profit. The local government is more apt to sell commercial land-use rights at as high a price as possible because most commercial land users provide location-specific services to residents in a particular region, and the local government is a monopolistic land supplier in that region (Tan et al., 2011). Thus, the local government tends to acquire less rural land for commercial use to control the commercial land supply in the urban primary land market with the aim of maintaining a relatively high conveyance price. In addition, plot characteristics such as land quality and location as well as socioeconomic factors such as fiscal income significantly affect the land acquisition scale. In particular, the land grade has a significantly negative impact on land acquisition quantity, which suggests that local governments tend to acquire more high-quality land in rural areas.

For the price equation of the housing market, there exists a significantly positive coefficient on the housing trading quantity and a significantly negative coefficient on the land grade. The location variables exert a relatively profound impact on the housing price in general, but the impacts vary depending on the types of location variables.

Next, we used information on the commercial and residential land auction and listing cases in the urban primary land market to estimate the land supply and demand curves in a competitive market using GMM. The land acquisition price in each case available in the dataset was used to identify the supply curve. Given the plot characteristics, the housing market price in each case estimated through the housing market price equation was used to identify the demand curve. The estimation results of the equation set are shown in Table 4.

All the estimated coefficients are significant at the 10% testing level. The price elasticity of the supply equation is slightly larger than that of the demand equation, which is consistent with the a priori expectation (Tan et al., 2011). The impact that the housing market price has on the land demand also meets our expectation, suggesting that as a type of derived demand, land demand will increase once the housing market price increases. The impact that the land acquisition price has on the land supply also meets our expectation that a higher land acquisition price may restrain local governments from acquiring rural land due to rising land acquisition costs.

4.4.2. Comparison between land acquisition and direct transfer

Taking the 81 direct transfer cases in Deqing County as the sample, we estimated the efficiency and distribution effects of rural construction land marketization by applying the methods described above to compare land acquisition with direct transfer. The results are shown in Table 5.

[3] The information was collected from the Bureau of Land and Resources in Deqing County. Readers interested in the dataset can contact the authors of this paper. We will help provide a possible way to obtain the data from the local authority.

Table 1
Mean values of variables used in empirical analysis.

	Land acquisition	Housing market	Urban primary land market (commercial and residential land)	Direct transfer
Size (m^2)	19,674.590	171.911	20,830.96	4849.832
Price (Yuan/m^2)	56.544	8641.434	2495.540	383.936
Land grade[a]	12.855	3.744	10.11000	21.024
Distance to (km):				
The nearest administrative center	13.514	8.380	10.227	17.497
The nearest bus station	3.896	2.154	3.203	5.482
The nearest commercial center	14.215	9.188	10.588	18.242
The nearest green area	0.370	0.505	0.348	0.647
The nearest main road	0.252	0.064	0.241	0.634
The nearest railroad	7.995	6.092	6.660	9.349
the nearest train station	8.770	6.803	7.528	11.632
Floor area ratio	–	–	1.918	–
Dummy variables for				
Transaction method[b]	0.850	–	0.930	1
Land-use type[c]	0.137	–	0.520	0.123
Growth ratios for (%)				
Fiscal income	13.501	–	13.414	7.630
Fiscal expenditure	15.407	–	15.351	–
GDP	–	–	9.599	–
Population	–	–	149,516.000	–

[a] Land grade refers to the value assigned to land as a part of the benchmark price system. Land of higher quality is assigned a lower grade.
[b] In the case of land acquisition, the transaction method refers to how the acquired land is traded in the urban primary land market, and the dummy variable for land conveyance is 1. In the case of the urban primary land market, the dummy variable for listing is 1. In cases of direct transfer, the dummy variable for chargeable uses, e.g., land conveyance and land lease, is 1.
[c] The dummy variable for commercial land is 1. In the case of land acquisition, land-use type refers to the type pertaining to the land after acquisition.

Table 2
Estimation results of the quantity equation for land acquisition.

Explanatory variables	Coefficient (*t*-statistic)
Constant (C)	9.840***(10.111)
Price (P_A)	–
Land grade (LG)	−0.417***(−3.274)
Distance to	
The nearest administrative center (d_1)	−0.505**(−2.119)
The nearest bus station (d_2)	–
The nearest commercial center (d_3)	–
The nearest green area (d_4)	0.149**(2.502)
The nearest main road (d_5)	–
The nearest railroad (d_6)	0.151*(1.727)
The nearest train station (d_7)	–
Dummy variables for	
Transaction method (TC_1)	0.634***(3.929)
Land-use type (TC_2)	−0.703***(−3.661)
Growth ratios for	
Fiscal income (SE_1)	0.376**(2.459)
Fiscal expenditure (SE_2)	–
R^2	0.162
F	7.935

Notes: *represents 10% significance; **represents 5% significance; ***represents 1% significance.

Compared to land acquisition, because rural construction land marketization in Deqing enables rural construction land and its use rights to be directly transferred to urban industrial and commercial land users through the market mechanism (e.g., conveyance, lease or mortgage), the rural construction land price increased. The average price of rural construction land in direct transfers was over 5 times that in land acquisitions.

For the allocative efficiency of the land, in accordance with the previous theoretical analysis (see Section 3.2), rural-to-urban construction land over-transfer still appeared (i.e., 2.09 ha). However, the price signal did play a key role in land allocation because of direct transfer, with the rural construction land over-transfer ratio declining from 12.78% to 5.62%. This finding indicates that the land allocation outcome under direct transfer was quite close to the social optimum in a competitive market. Therefore, rural construction land marketization improved the land allocation efficiency between rural and urban areas, Supporting Hypothesis 1.

For the distribution effects, compared to land acquisition, direct transfer greatly benefited the rural sector. Due to direct transfer,

Table 3
Estimation results of the price equation for the housing market.

Explanatory variables	Coefficient (*t*-statistic)
Constant (C)	8.372***(69.976)
Size (Q_H)	0.229***(8.570)
Land grade (LG)	−0.132***(−2.987)
Distance to	
The nearest administrative center (d_1)	–
The nearest bus station (d_2)	−0.032**(−2.063)
The nearest commercial center (d_3)	−0.159***(−3.626)
The nearest green area (d_4)	−0.023**(−2.194)
The nearest main road (d_5)	0.021**(2.026)
The nearest railroad (d_6)	0.087***(3.947)
The nearest train station (d_7)	−0.101**(−2.070)
R^2	0.659
F	101.302

Note: *represents 10% significance; **represents 5% significance; ***represents 1% significance.

Table 4
Estimation results for land supply and demand equations.

Supply	Coefficients (*t*-test)	Demand	Coefficients (*t*-test)
Constant (C_1)	2.906*(1.666)	Constant (C_2)	−10.877***(−7.735)
Price (P)	1.004***(4.604)	Price (P)	−0.986***(−4.502)
Land acquisition price (P_A)	−0.258*(−1.668)	Housing market price (P_H)	2.785***(17.168)
J-statistic	0.447		

Note: *represents 10% significance; **represents 5% significance; ***represents 1% significance. The instrumental variables in the supply equation include land acquisition price, land grade, a dummy variable for land-use types, a dummy variable for transaction method and socio-economic variables. In the demand equation, housing market price, location variables, floor area ratio and socio-economic variables are employed as instrumental variables.

Table 5
Comparison between land acquisition and direct transfer.

	Modes	
	Land acquisition	Direct transfer
Average price (Yuan/m^2)	75	383.94
Rural-to-urban construction land over-transfer (ha)	4.75	2.09
Over-transfer ratios (%)	12.78	5.62
Rural welfare change (million Yuan)	–	141
Urban welfare change (million Yuan)		
Welfare transfer (I)	–	−121.36
Welfare transfer (II)	–	−16.15
Net social welfare gain (million Yuan)	–	3.49

Note: The welfare changes in the table result from the comparison between land acquisition and direct transfer.

the welfare gain for the rural sector was 141 million Yuan. In addition, the welfare gain in the rural sector resulted from the welfare transfer between rural and urban areas as well as the decrease in the net social welfare loss. In other words, the total amount of the rural welfare change (141 million Yuan) equaled the urban welfare change (137.51 million Yuan) and the net social welfare gain (3.49 million Yuan).

Furthermore, the average rural construction land price increased from 75/m^2 under land acquisition to 383.94/m^2 under direct transfer, given the same quantity of rural-to-urban construction land transfer (i.e., Q_1^S = 39.28 ha). Therefore, the urban sector had to pay 121.36 million Yuan more to the rural sector, i.e., welfare transfer (I), contributing to the welfare gain in the rural sector. Moreover, as discussed above (see Section 3.2), the higher rural construction land price restrained the amount of rural construction land over-transfer, which decreased by 2.66 ha. As a result, the urban sector returned 16.15 million Yuan in total to the rural sector that was originally earned through excessive acquisition of rural construction land at a much lower price, i.e., a welfare transfer (II). Meanwhile, the net social welfare loss due to excessive rural-to-urban construction land transfer decreased by 3.49 million Yuan. Hence, the rural welfare improvement was composed of a welfare transfer (I) of up to 121.36 million Yuan, a welfare transfer (II) of up to 16.15 million Yuan and a net welfare gain of 3.49 million Yuan. As expected, rural construction land marketization induces a welfare gain in the rural sector and reduces the net social welfare loss by increasing the rural construction land price. Hence, the

above findings provide empirical evidence to support hypothesis 2.

5. Conclusions and discussion

This study is meant to increase the understanding of rural construction land marketization in contemporary China, with a particular focus on its efficiency and distribution effects. A partial equilibrium model was developed for this purpose to simulate the situation under rural construction land marketization in a conceptual and simplified manner. Based on the theoretical model, two hypotheses were proposed: 1) rural land marketization improves the allocative efficiency of land, and 2) rural land marketization induces a welfare gain in the rural sector and decreases the net social welfare loss.

Data on rural construction land marketization (i.e., direct transfers) and land acquisitions in Deqing County were used to test the hypotheses. With regard to the first hypothesis, the ratio of rural-to-urban construction land over-transfer decreased by 7.16% due to marketization, thus indicating an increase in the allocative efficiency of land. With respect to the second hypothesis, a welfare gain in the rural sector resulted from rural construction land marketization, and the rural welfare change consisted of an urban-to-rural welfare transfer and a decrease in the net social welfare loss. This finding suggests that rural construction land marketization exerted significant distribution effects. We further found that the increase in rural construction land prices caused by rural construction land marketization directly led to the welfare gain in the rural sector, that is, an urban-to-rural welfare transfer up to 121.36 million Yuan. Additionally, the higher rural construction land price indirectly led to the rural welfare gain by restraining excessive rural-to-urban construction land transfers; namely, the urban-to-rural welfare transfer was valued at 16.15 million Yuan, and the net social welfare gain was 3.49 million Yuan. Thus, the evidence shows that rural construction land marketization can contribute to higher land allocation efficiency as well as welfare redistribution.

This study contributes to the existing literature in the following respects: 1) it establishes a partial equilibrium model that can be used as a basis for empirical studies of rural construction land marketization in China; 2) it develops a methodology to estimate the efficiency and distribution effects of marketization; and 3) it assesses the performance of rural construction land marketization in a pilot area based on the theoretical model and the proposed method.

We draw two policy implications from our study. First, the findings show that rural construction land marketization decreased the scale of rural-to-urban construction land over-transfer and led to a welfare gain for the rural sector. Therefore, the increasingly high level of marketization applied to rural construction land transfer and the scaling up of the pilot policy to the national level can be expected to significantly ameliorate the efficiency of land resource allocation and facilitate equality in the rural-urban welfare distribution. Thus, it is expected that liberalized and nationwide rural-to-urban construction land transfer will contribute to China's new round of land marketization reforms, the overarching goals of which are efficiency and equality.

Second, it is evident that rural construction land marketization has already jeopardized local government interests. In particular, the urban-to-rural welfare transfer policy originated as a result of the incremental land revenue gained by local governments working as a monopolistic demander in land acquisition and a monopolistic supplier in the urban primary land market. Nonetheless, local governments in contemporary China still rely heavily on the substantial profits generated by land acquisition to finance local development. As the reform in rural construction land marketization reinforces, urban-to-rural welfare transfers are expected to increase, and local governments will suffer large interest losses. Therefore, the complex and even contradictory relationships under land acquisition and direct transfer will provide non-negligible challenges to liberalized and nationwide rural-to-urban construction land transfer in China.

Acknowledgement

We are grateful to the anonymous reviewer for critical and considerate comments. We would like to thank Zhejiang Institute of Land Survey and Planning for the fieldwork support in Deqing County and to thank Deqing Bureau of Land and Resources for the indispensable information and data. We would also like to thank Prof. Nico Heerink from Wageningen University, Dr. Li Huang from China University of Geosciences and Dr. Changsheng Xiong from Zhejiang University for their useful advice on the earlier versions. This research has received financial support from the Natural Science Foundation of China through project No. 71573231, the Social Science Foundation of China through project No. 16ZDA020, No. 14AZD028, No. 13AZD012 and No. 14ZDA039, the China Scholarship Council through project No. 201706320201, the Zhejiang University Academic Award for Outstanding Doctoral Candidates through project No. 2018011, and the Fundamental Research Funds for the Central Universities. The authors sincerely thank the funding organizations for the grants.

References

Cao, G. Z., Feng, C. C., & Tao, R. (2008). Local "Land finance" in China's urban expansion: Challenges and solutions. *China & World Economy, 16*(2), 19–30.

Chen, A., & Gao, J. (2011). Urbanization in China and the Coordinated Development Model—The case of Chengdu. *Fuel & Energy Abstracts, 48*(3), 500–513.

Cladera, J. R., & Burns, M. C. (2000). The Liberalization of the Land Market in Spain: The 1998 Reform of Urban Planning Legislation. *European Planning Studies, 8*, 547–564.

Deininger, K. (2003). Land Markets in Developing and Transition Economies-Impact of Liberalization and Implications for Future Reform. *Journal of American Agricultural Economics, 85*, 1217–1222.

Ding, C. (2007). Policy and praxis of land acquisition in China. *Land Use Policy, 24*(1), 1–13.

Du, J., Thill, J.-C., Peiser, R. B., & Feng, C. (2014). Urban land market and land-use changes in post-reform China: A case study of Beijing. *Landscape and Urban Planning, 124*, 118–128.

He, X. (2013). Be vigilant against the extension of integrated rural-urban construction land market. *Land & Resources Herald, 11*, 32–33 (In Chinese).

Hui, E. C. M., Bao, H. J., & Zhang, X. L. (2013). The policy and praxis of compensation for land expropriations in China: An appraisal from the perspective of social exclusion. *Land Use Policy, 32*, 309–316.
Jiang, S., & Liu, S. (2004). Capitalization of land and rural industrialization——A case study of Nanhai City. *China Economic Quarterly, 4*, 211–228 (In Chinese).
Klomp, J. (2014). The political economy of agricultural liberalization in Central and Eastern Europe: An empirical analysis. *Food Policy, 49*, 332–346.
Lai, Y., Peng, Y., Li, B., & Lin, Y. (2014). Industrial land development in urban villages in China: A property rights perspective. *Habitat International, 41*, 185–194.
Lin, G. C. S., & Ho, S. P. S. (2005). The state, land system, and land development processes in contemporary China. *Annals of the Association of American Geographers, 95*(2), 411–436.
Lin, G. C. S., & Yi, F. (2011). Urbanization of capital or capitalization on urban land? Land development and local public finance in urbanizing China. *Urban Geography, 32*(1), 50–79.
Lin, R., & Zhu, D. (2014). A spatial and temporal analysis on land incremental values coupled with land rights in China. *Habitat International, 44*, 168–176.
Liu, S. (2008). Collective land capitalization and urbanization: A survey on Zheng Ge Zhuang Village. *Journal of Peking University,* (6), 123–132 (In Chinese).
Liu, S. (2014). Characteristics, problems and reform of China's dual urban-rural land tenure. *International Economic Review,* (3), 9–25 (In Chinese).
Liu, T., Cao, G., Yan, Y., & Wang, R. Y. (2016). Urban land marketization in China: Central policy, local initiative, and market mechanism. *Land Use Policy, 57*, 265–276.
Liu, Y., Yang, R., Long, H., Gao, J., & Wang, J. (2014). Implications of land-use change in rural China: A case study of Yucheng, Shandong province. *Land Use Policy, 40*, 111–118.
Long, H., Li, Y., Liu, Y., Woods, M., & Zou, J. (2012). Accelerated restructuring in rural China fueled by 'increasing vs. decreasing balance' land-use policy for dealing with hollowed villages. *Land Use Policy, 29*(1), 11–22.
Paik, W. (2014). Land developers, States, and Collusive Clientelism in Marketizing China. *Pacific Focus, 29*(1), 68–91.
Pindyck, R. S., & Rubinfeld, D. L. (1998). *'Econometric models and economic forecasts* (4th Edition). NewYork: McGraw-Hill.
Qian, Z., & Ma, K. (2007). Construction land market in China: Monopoly, segmentation and integration. *Management World,* (6), 38–44 (In Chinese).
Tan, R., Beckmann, V., van den Berg, L., & Qu, F. (2009). Governing farmland conversion: Comparing China with the Netherlands and Germany. *Land Use Policy, 26*(4), 961–974.
Tan, R., Qu, F., Heerink, N., & Mettepenningen, E. (2011). Rural to urban land conversion in China — How large is the over-conversion and what are its welfare implications? *China Economic Review, 22*(4), 474–484.
Tan, R., Wang, R., & Heerink, N. (2018). Liberalizing rural-to-urban construction land transfers in China: Distribution effects. *China Economic Review*. https://doi.org/10.1016/j.chieco.2018.01.001.
Tan, R., Wang, R., & Sedlin, T. (2014). Land-development offset policies in the quest for sustainability: What can China learn from Germany? *Sustainability, 6*, 3400–3430.
Tang, J., Wang, Q., & Tan, R. (2014). *Rural land policies reform experiment in the context of new-type urbanization.* Beijing: China Social Sciences (In Chinese).
Tang, J., Wang, Q., & Tan, R. (2016). *The existing construction land redevelopment in the context of new-type urbanization: Theory and practice.* Beijing: China Social Sciences (In Chinese).
Tao, R., Su, F., Liu, M., & Cao, G. (2010). Land leasing and local public finance in China's regional development: Evidence from prefecture-level cities. *Urban Studies, 47*(10), 2217–2236.
The 18th CCCPC. 'Decision of the CCCPC on some major issues concerning comprehensively deepening the reform. (2013). http://news.xinhuanet.com/politics/2013-11/15/c_118164235.htm (in Chinese).
Vachadze, G. (2013). Land market liberalization, transfer of agricultural technology, and the process of industrialization. *Land Use Policy, 35*, 388–394.
Williams, G., Ewert, J., Hamann, J., & Vink, N. (1998). Liberalizing markets and reforming land in South Africa. *Journal of Contemporary African Studies, 16*, 65–94.
Xia, Z. (2013). Re-investigation on the land institution reform in Chengdu. *Journal of Huazhong Agricultural University, 3*, 16–21 (In Chinese).
Yan, J., & Wang, C. (2011). Pattern analysis and policy choice on reform and innovation of land administration system based on urban-rural integration development: A case study of integrated reform pilot area for urban-rural integration development in Chengdou. *China Soft Science,* (7), 1–8 (In Chinese).
Zheng, H., Wang, X., & Cao, S. (2014). The land finance model jeopardizes China's sustainable development. *Habitat International, 44*, 130–136.
Zhu, J. (2002). Urban development under ambiguous property rights: A case of China's transition economy. *International Journal of Urban and Regional Research, 26*, 41–57.
Zhu, J. (2005). A transitional institution for the emerging land market in urban China. *Urban Studies, 42*(8), 1369–1390.
Zou, Y., Zhao, W., & Mason, R. (2014). Marketization of Collective-owned Rural Land: A Breakthrough in Shenzhen, China. *Sustainability, 6*, 9114–9123.