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## Effects of dual land ownerships and different land lease terms on industrial land use efficiency in Wuxi City, East China

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#### ABSTRACT

In the current Chinese land administration system, two types of land ownership including state and collective ownership coexist and the industrial land use rights can be transferred between different land lease terms. Previous studies found the significant relationship between land ownerships and lease terms with agriculture land use efficiency, but it is still unclear for the industrial land use efficiency. This study researched the effects of China's dual land ownerships and land lease terms on rural town industrial land use efficiency. Questionnaires of 294 industrial enterprises in Hudai, Qianqiao, and Xibei in Wuxi City, East China, were studied using two multiple linear regression models. The results showed that collective land with incomplete property rights caused land use inefficiency of lower industrial enterprises' output per hectare of land. The industrial enterprises' outputs per hectare from collective land were 2.16 million Yuan (0.31 million US dollar) and 2.06 million Yuan (0.30 million US dollar) less than those from state land in these two models, respectively. Different land lease terms negatively correlated with the use efficiency of rural industrial land. The outputs per hectare of industrial enterprises using the long-term lease were 1.30 million Yuan (0.19 million US dollar) less than those using the short-term lease in model 2. Our results highlight the importance of the integrated urban-rural land system and tailored lease terms of industrial land to increase the utilization efficiency of industrial land.

#### 1. Introduction

High use efficiency of land resources can relieve the conflict between increasing population and limited land (Kuang, Liu, Dong, Chi, & Zhang, 2016; Tang & Ho, 2015; Wu, Zhang, Skitmore, Song, & Hui, 2014). With rapid urbanization and industrialization in China, the human-land relationship has been more and more intense (Huang, Li, Zhang, & Zhang, 2018; Zhong, Chen, & Huang, 2016). The low efficiency of industrial land use has received increasing attention from the government and public (Du, Thill, & Peiser, 2016). Almost all levels of government in China have made relevant policies and regulations to improve the efficiency of industrial land use (Choy, Lai, & Lok, 2013). Rural land use has also received increasing attention (Liu, Yang, Long, Gao, & Wang, 2014; Long, Liu, Wu, & Dong, 2009).

#### 1.1. Institutional background in China

China's urbanization and industrialization process is different from

many countries, which is based on a unique institution called the urbanrural dual land system (Chen, Qu, & Huang, 2007; Choy et al., 2013; Ding, 2007; Koroso, van der Molen, Tuladhar, & Zevenbergen, 2013). China's constitution decrees that rural land is owned by the "collectives" and urban land is owned by the "state". According to the relevant provisions of the Land Management Law of People Republic of China, the market exchange of the collective construction land is forbidden in rural areas (Chen, Wang, & Huang, 2015). Any rural land to be transferred to the private sector must be firstly expropriated by the state (Lin, 2010). In the process, the private sector must pay a comprehensive conveyance fee to the state, compensation fees to the collective, and other administrative fees (Bao & Peng, 2016). It is illegal to directly use collective land for non-agricultural purpose (Tian & Zhu, 2013; Wang, Zhang, Wang, & Skitmore, 2017; Zhang, 2013). In order to prevent land to be expropriated and also for economic development, village collectives or farmers sometimes sell agricultural land directly to the enterprises and individuals without legal expropriation in some areas (Hao, Sliuzas, & Geertman, 2011; Po, 2008; Tian, 2008; Zhong, Huang,

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Ye, & Scott, 2014). Although farmers do not have the legal right to change the use of rural collective land, farmers make the effort to protect their land ownership by illegally converting the collective land (Liu, Wong, & Liu, 2012; Xu, Tang, & Chan, 2011). For example, they usually transferred land use rights of rural collectives by means of landrenting instead of expropriating and grabbing land and illegally building, expanding or renovating houses (Chen, Wang, Chen, & Huang, 2015).

In China's current urban and rural land system, there are two land ownerships including the state-owned land ownership and collective land ownership (Zhong et al., 2017, 2018), but they are unequal. According to the Provisional Regulations of Urban State-Owned Land Use Right Transfer in China in 1990, state-owned land can be sold, transferred and mortgaged, but the collective land cannot. The collective land is at the risk of being expropriated by local communities (Choy et al., 2013). There is concern that whether two different land ownerships will cause differences of land use efficiency.

At present, the maximum lease term of China's industrial land is 50 years. According to the State Administration for Industry and Commerce in 2008–2012, 59.1% Chinese enterprises can survive in less than 5 years, 24.9% can survive in 6–9 years, 12.8% can survive in 10–19 years, and only 3.2% can survive for over 20 years. Comparison of the life cycle of most enterprises, the use term of industrial land is very long in China, with the consequence of idle use of industrial land. Therefore, the Chinese government is considering to shorten the lease term of industrial land and to adopt a flexible grant period. However, it is also concerned that the shortened lease term may reduce the use efficiency of industrial land.

#### 1.2. Theoretical background and literature review

Property right is the exclusive authority to determine how a resource is used, and its arrangement has marked effects on the resource use efficiency (Coase, 1960). The secured land rights can increase investment and promote efficient allocation of land resource (Besley, 1995; Deininger & Jin, 2006; Field, 2007; Galiani & Schargrodsky, 2010; Jin & Deininger, 2009). In other words, different property right arrangements may lead to variable land use efficiency (Barry & Roux, 2016).

There are studies on the influence of land property right on the land use efficiency in the agricultural sector (Galiani & Schargrodsky, 2010; Koirala, Mishra, & Mohanty, 2016; Ma, Heerink, Feng, & Shi, 2015; Manjunatha, Anik, Speelman, & Nuppenau, 2013). From the theoretical perspective, the most obvious effect of land property right insecurity is the uncertainty of obtaining benefits from the farmers' investment on the farmland (Deininger & Ali, 2008; Feder & Onchan, 1987; Ma et al., 2015). Therefore, clear property right is the key to promote long-term investment and effective utilization of land. On the contrary, the ambiguous property right is the root cause of many land issues: inefficient and wasteful land use, excessive conversion and development, and competition and disputes over land access (Lin, 2010; Wang, Zhang, Wu, & Skitmore, 2015). Similarly, the unclear collective land ownership in China limit the effective incentives to promote effective utilization of land (Putterman, 1995).

Previous studies have provided useful information to understand the rural town industrial land use in the rapid process of urbanization (Choy et al., 2013; Kuang et al., 2016; Meng et al., 2008; Tu, Yu, & Ruan, 2014). The studies on the effect of land property right on land use efficiency are mainly about the agricultural land (Awasthi, 2009; Rahman, 2010). However, it is still unclear about the effect of China's two land ownerships on the use efficiency of rural town industrial land.

Long-term land lease can reduce transaction costs (Feder & Onchan, 1987; Gavian & Ehui, 1999; Gavian & Fafchamps, 1996; Kumari & Nakano, 2016), while short-term lease will reduce the entrepreneur's willingness to expand investment. Studies found that short-term agricultural land lease could reduce the expected returns of long-term

investment, causing inefficiency of land use (Abdulai, Owusu, & Goetz, 2011; Koirala et al., 2016; Manjunatha et al., 2013; Rahman & Rahman, 2009). However, it is still not very clear about the effect of different industrial land lease terms on the efficiency of industrial land use.

#### 1.3. Theoretical hypotheses

Previous studies suggested clear property right was the key to promote effective utilization of land (Deininger & Ali, 2008; Feder & Onchan, 1987; Ma et al., 2015). The state-owned industrial land ownership is protected by law. The collective industrial land ownership from informal market is not protected by law, so there is the risk of the land requisition by the state. It is generally accepted that state-owned land ownership is securer than the collective land ownership. Therefore, our first hypothesis is as follows: the use efficiency of state-owned industrial land is higher than that of collective industrial land.

The effect of land lease terms on land use efficiency has received attention in China and other countries (Koirala et al., 2016; Kumari & Nakano, 2016; Pender & Fafchamps, 2006). In terms of agricultural land, the longer the land lease term is, the more the land users invest, and the higher the land use efficiency is (Kumari & Nakano, 2016). We investigate if there is a similar law for industrial land and proposed the second hypothesis: the longer land lease term will cause more investment and higher efficiency of industrial land.

To the best of our knowledge, there is no study on industrial land use efficiency integrating urban and rural land market. Because the collective land market is an invisible informal market and the transaction data are generally unavailable, most previous studies are qualitative analyses (Wang, Yueming, & Hu, 2011; Zhang, 2014; Zhang & Chen, 2008). In this study, we made the first attempt to evaluate the effects of different land ownerships and lease terms on the efficiency of rural town industrial land based on our questionnaire survey data in East China. Wuxi City was selected as study area as it is at the forefront of China's land market reform and is a representative area where stateowned industrial land and collective industrial land coexist. In Wuxi, the industrial enterprises acquire state-owned or collective land to set up plants in different transaction types with long-term lease (30–50 years) or short-term lease (1–5 years).

The text is divided into six parts, the second part is Institutional background in Wuxi, the third part is Model and data, the fourth part is Results, the fifth part is Discussion, and the sixth part is Conclusion.

#### 2. Institutional background in Wuxi

#### 2.1. Wuxi's construction land market development

There has been a unique rural construction land market in Wuxi City. By interviewing with staff in land management department in Wuxi City and village cadres in three towns, the following was researched: the development process of Wuxi construction land market, transfer policy of collective construction land, and the land double replacement policy. Development of construction land market in Wuxi went through four stages.

#### (1) The exploration stage (1995-2000)

During the period of 1995–2000, the reform of the property right system was carried out in many township enterprises. How to dispose of the stock of the collective construction land was the main challenge for the land management department. Village collective enterprise assets were leased or sell to individuals, and the individuals gained the collective industrial land by collective land one-time buyout or annual collective land rent in this period. Industrial land was mainly original township land. The annual collective land rent was 75–90 thousand Yuan/hectare/year (10.85–13.01 thousand US dollars/hectare/year), and collective land one-time buyout price was 750–900 thousand

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