Land Transfer Fees for Urban Infrastructure Development in China

Zhirong Jerry Zhao and Chengxin Cao

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Abstract

Using the data from China Urban Development Statistical Yearbook (*Zhongguo chengshi jianshe tongji nianjian*), 2000–2008, this paper systematically describes the trends and patterns of land transfer fee and its usage for urban infrastructure. This study concentrates on the following research questions. First, it clarifies the national trend and pattern of land transfer fee from 1990 to 2007. Second, this paper further discusses provincial disparity and finds out the major factors that influence land transfer fee level. Third, this paper relates land transfer fee with infrastructure expenditure structure; it answers the following question: which expenditure item(s) is (are) significantly associated with land transfer fee? How does this relationship vary among regions?

Keywords: Infrastructure Finance, Land Finance, Land, China, Urban

About the Authors

Zhirong Jerry Zhao is an associate professor at Hubert H. Humphrey School of Public Affairs, University of Minnesota. His research interests focus on state and local fiscal issues.

Zhirong Jerry Zhao
Hubert H. Humphrey Institute of Public Affairs
University of Minnesota
#246 Humphrey Center
301, 19th Avenue South
Minneapolis, MN 55455
612-625-7318
zrzhao@umn.edu

Cengxin Cao received a masters degree in public policy from the Humphrey School and is currently a doctoral student in Carlson School of Management, University of Minnesota.

Chengxin Cao
Hubert H. Humphrey Institute of Public Affairs
University of Minnesota
#246 Humphrey Center
301, 19th Avenue South
Minneapolis, MN 55455
612-423-7062
caoxx161@umn.edu

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1. Introduction

After the legal foundation was established in the late 1980s, land transfer fee has gradually become one of the most important revenue sources for local governments. Furthermore, as a special form of value capture, public land leasing in China accelerates urban infrastructure development. Land transfer fee is important in that local governments have very little flexibility over generating more revenue by new taxes and user charges (Peterson 2006); therefore, land transfer fee is the revenue source that local government has the most control over.

However, land transfer fee is vulnerable to regional disparity and high volatility. According to the data reported by *Fenghuangwang* (http://www.ifeng.com), in the ten highest-ranking cities, only three of them are in central or western area. Furthermore, while land transfer fee increased close to 300 percent in *Dalian* from 2009 to 2010, *Hangzhou* has decreased approximately 25 percent during the same period. Therefore, this paper systematically describes the provincial disparity of land transfer fee in China and tests the factors that influence the level of this fee at provincial level.

Also, there are the following three concerns about land leasing and land transfer fee. First, farm land is taken for urban use while farmers were compensated by a very unfair share (Peterson 2006). Over-urbanization might happen since taking rural land is almost costless. Second, local governments play conflicting roles in land leasing process. Local government is landowner and real estate developer simultaneously, which provides opportunity for corruption and inefficient pricing (Deng 2003; Anderson 2011). Third, local government as land monopoly tends to charge excessive price for the land (Deng 2003).

Using the data from China Urban Development Statistical Yearbook (*Zhongguo chengshi jianshe tongji nianjian*), 2000–2008, this paper systematically describes the trends and patterns of land transfer fee and its usage for urban infrastructure. This study concentrates on the following research questions. First, it clarifies the national trend and pattern of land transfer fee from 1990 to 2007. Second, this paper further discusses provincial disparity and finds out the major factors that influence land transfer fee level. Third, this paper relates land transfer fee with infrastructure expenditure structure; it answers the following question: which expenditure item(s) is (are) significantly associated with land transfer fee? How does this relationship vary among regions?

This paper is composed of 5 sections. The first section above introduces some background information. The second section reviews the history of land transfer fee and current literatures. The third section states the data source and methodology used in the paper. The fourth section is the major analysis, which includes the discussion of national trend, regional disparity and the relationship between land transfer fee and expenditure structure. Finally, the fifth section concludes.

2. History and Literature Review

This chapter reviews the history of land leasing and land transfer fee as well as current literatures. Land leasing started in the second period of three stages[1] of urban infrastructure development. In the second period, with fiscal decentralization, local governments were given more freedom for generating revenues to support urban infrastructure development. The two-item fees, infrastructure connection fees, and user charges were introduced in this period. More importantly, public land leasing became a legal revenue source for local governments in late 1980s. It is a milestone for urban infrastructure development.

China's land reform did not start until the late 1980s. Before that, urban land use was based on a central-government-controlled administrative system in which no land transaction was allowed (Deng 2003). This system caused the problem of inefficient land use since the lack of market mechanism lead to inefficient allocation of land parcels (Deng 2003).

In late 1980s urban land reform was first started in coastal cities and then spread to the whole country. This reform changed the central-government dominated administrative system into a more decentralized one, which allows local governments to have the right to lease public land and generate additional fiscal revenue for urban infrastructure. The first lease happened in Shenzhen in 1987, September 9. But public land leasing was not officially legal until 1998—when the central government amended the Constitution legalizing land leasing. The real land leasing development did not happen until 1992, when the Land Law was issued. At the meantime, Beijing and Shanghai adopted it. By 1994, land-use right had been sold in all provincial units except Tibet (Chan 1998). At the beginning, the land leasing reform tended to stimulate economy by letting local governments providing land use rights to foreign companies to encourage investment (Peterson 2006).

In the development of land leasing, revenue share between central and local governments has changed, as well as the form of land leasing. At the beginning, the central government's share of land transfer fee was set at 60 percent (Peterson 2006). Starting from 1994, this share has being decreasing to 0 percent (Peterson 2006, 4–5; Chan 1997). Concerning the forms of land leasing, private negotiation was the primary way at the start. However, because this form is very likely to cause corruption, in 2002, the central government announced that all land leasing need to be done through public bidding at auction (Peterson 2006). Currently, there are three forms of land leasing: private negotiation, tender, and public auction[2].

In the study of land leasing and land transfer fee, there are three main streams of research: (1) mechanisms and feature of land leasing; (2) the impact of land leasing; and (3) factors that determine or influence the amount of land leasing and revenue generated.

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[1] See "*Funding China's Urban Infrastructure: Revenue Structure and Financing Approaches*". The three stages are: first, before 1978, the central-planning period; second, 1978 to 1994, which is the period that established the foundation; third, 1994 to now, it is the period of accelerated development.

[2] Private negotiation refers to one-to-one negotiation between the lessee and the government about leasing terms. Tender is an (often public) invitation for multiple bids on the land. Tender is different from auction in that it may not necessarily select the higher bidder; instead, it can also consider other terms such as a bidder's reputation or design. (Deng, 2003)

First, many literatures discuss land leasing mechanisms and features in the context of China. Peterson 2006 discusses the land leasing mechanism in China and compares it to the land sale experience of other countries. Peterson 2006 studies the land leasing process and its implementation in China. In the process of funding urban infrastructure through land transfer fee, while part of the funding comes from land leasing directly, the rest (which is the majority for most of the time) is from borrowing from state owned commercial and development banks collaterized by public land. The infrastructure built increases the land value dramatically; by leasing the land, the local government pays off the debt (Peterson 2006). Peterson 2006 uses a case study of Chengdu to illustrate this process in detail. In addition, Anderson 2011 provides the rationale of ground leases in general as well as detailed land leasing features in China, including lease term, payments, conditions, etc. (Anderson 2011).

Second, Deng 2003 describes the land reform and its impact on urban productivity and local government behavior. This paper finds out that the ratio of administrative allocation to land leasing in terms of total land area has a negative impact on urban labor productivity, which is measured by GDP per capita using provincial data 1994–1996; on the other hand, the ratio in terms of number of land leasing cases does not have significant impact on urban labor productivity. Tao et al 2010 explores the impact of different forms of land leasing, including negotiation and auction/tender on other revenue sources (Tao et al. 2010; Anderson 2011, 9). This paper finds out that the number of land sites leased through auction is positively related with business tax but not total local taxes, while the number of land sites through negotiation (lagged two and three years) is positively related with total local taxes, enterprise income tax, business tax, as well as VAT.

Third, besides the impact of land leasing, there are also literatures studying factors that influence the amount of land leasing. Yao 2000 studies the land lease market in rural China. Yao 2000 tests the impact of the tightness of local labor market and local firm ownership on land market participation in three rural counties in Zhejiang. The tightness of local labor market are local firm ownership are measured by percentage of outside workers and private firms. This paper finds out that both outside workers and private ownership have positive impact on land market participation.

Although current literatures study the land leasing mechanism and the impact in detail, no literature systematically studies regional disparity and the reason behind it. This paper plans to provide detailed description of regional disparity of land transfer fee and explore the socio-economic factors that influence the level of this fee. In addition, another contribution of this paper is that it tries to relate land transfer fee with infrastructure expenditure structure; in other word, which spending item is land transfer fee closely related to, utility, transit, roads and bridges, environmental facility, or landscaping.

3. Data and Methodology

Generally, the activities of infrastructure investment include: Energy (power generation and supply); transport (toll roads, light rail systems, bridges and tunnels); water (sewerage, waste water treatment and water supply); telecommunications (telephones); social infrastructure (hospitals, prisons, courts, museums, schools and government accommodation) (Grimsey and Lewis 2000). This paper uses a narrower definition, according to the one given by Ministry of Housing and Urban-Rural Development of China, which is also the authority for administrating urban infrastructure finance, includes public utilities (water supply and drainage, residential gas and heating supply, and public transportation), municipal works (roads, bridges, tunnels, dock, and sewerage), parks, sanitation and waste management, and flood control. Power, telecommunications and other transportation sectors (ports, airports and railway) are not counted as a part of urban maintenance and construction in China (Wu 1999).

In our definition, infrastructure funding includes fiscal revenue, market financing and other sources. Fiscal revenue under Urban Maintenance and Construction Revenues include not only budgetary funds, but also extra budget, and land transfer fee. Therefore, fiscal revenue for urban infrastructure includes budgetary allocation, local earmarked taxes, fees and user charges, and land transfer fee. Market financing includes domestic loans, other bonds, self-raised funds, foreign capital and stocks. In addition, in this paper, total fiscal revenue for local government refers to the sum of budgetary revenue, extra budget, and total land transfer fee (not only the LTF used on urban infrastructure).

In the analysis, the urban infrastructure revenue and expenditure data is from *Zhongguo chengshi jianshe tongji nianjian*, 2000–2008, while the data before 1999 comes from Wu (2008). In addition, total fiscal revenue, extra budget, and total LTF are from Finance Yearbook of China (*Zhongguo caizheng tongji nianjian*) and China Land and Resources Statistical Yearbook (*Zhongguo guotu ziyuan tongji nianjian*). Other socio-economic factors of each province come from China Statistical Yearbook (*Zhongguo tongji nianjian*).

The analysis has three sections in total. The first section describes the national trends and patterns of land transfer fee and its role in urban infrastructure construction. The second section discusses the provincial disparity of LTF in detail. The third section tries to link land transfer fee with infrastructure expenditure items.

The national trend and pattern of LTF includes the description of per capita LTF used on urban infrastructure, compared to other revenue sources, and the reliance of urban infrastructure and fiscal revenue in general on LTF.

The discussion of provincial disparity is composed of the description of per capita LTF and the reliance of urban infrastructure construction and total fiscal revenue on LTF at the province level, the different patterns in municipality, the east, central and west, and socio-economic factors that affect LTF. In the analysis of these factors, this paper runs pooled Original Least Square Regression, fixed-effect, and random-effect regressions using province-level 2001–2006 panel data. There are 29 provinces in total; Beijing and Xizang have been excluded for the reason mentioned above.

The dependent variables of interest are *per capita LTF used in urban infrastructure (log form)* and *total LTF (log form)*. The explanatory variables include *per capita GDP (log form)*, *prime ratio*[3], *urban population density (log form)*, *fiscal capacity variable—the sum of per capita fiscal revenue and Extra Budgetary Revenue (log form)*, *Minority*, and *dummy variables* indicating the location of the province and year.

- The variable "Minority" is the number of Ethnic Minority Autonomous Region at county level divided by the total number of county level regions in each province in 2007. Since it almost did not change from 2001 to 2007, we only pick out one year 2007.

- The "*fiscal capacity*" variable *the sum of per capita fiscal revenue and Extra Budgetary Revenue* is used to reflect the ability of local governments to generate revenue other than land transfer fee. In general, local government revenue source includes *Fiscal Revenue (taxes and fees)*, *Extra Budgetary Revenue* and *LTF*. Therefore, this variable is the total local government revenue excluding land transfer fee. The inclusion of "*fiscal capacity*" in the regression is based on our hypothesis that self-sufficient provinces tend to have higher LTF level; in other words, this paper assumes that LTF has widened the provincial gap of fiscal resources.

- The dummy variables include both the location of the province and year. Three location dummies are added: central, west and municipality; therefore, the east is the base category. Also, year 2001 is used as the base of year dummy variables.

The third section links LTF with infrastructure expenditure items including utilities, transit, roads and bridges, environmental facility, and landscaping. The analysis section will further explore which item(s) land transfer fee has significant impact on. Regression analysis is used to establish the relationship between expenditure and revenue structure. It uses provincial revenue and expenditure data from year 2001 to 2005 (Beijing and Xizang have been excluded because of missing data problem). It uses Original Least Square estimation with year dummies. The dependent variable is the log form of per capita expenditure on utility, transit, roads and bridges, environmental facility, and landscaping. The independent variables include log form of all the infrastructure revenue items: per capita central budgetary allocation, local budgetary allocation, local earmarked taxes, fees and user charges, land transfer fee, domestic loans, self-raised fund, and foreign capital. Also, year dummy variables have been added, using 2001 as the base year.

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[3] The proportion of GDP from the prime (agricultural) industry.

4. Analysis

4.1 National Trends and Patterns of LTF for Urban Infrastructure Finance

Although land transfer fee started as early as 1981, being a separate item in *China Urban Construction Yearbook (Zhongguo chengshi jianshe tongji nianjian)* did not begin until 2001. Before 2001, land transfer fee, combined with infrastructure connection fee, is shown in *Other Sources*.

As table 1 has shown, land transfer fee for urban infrastructure finance started at 13.1 Yuan/Person in 2001 and increased to 61.8 in 2006; in 2004, it reached as high as 77.9 Yuan/Person. From 2001 to 2006, per capita land transfer has increased 470 percent! The importance of land transfer fee can also be seen from the proportion of it in fiscal revenues and in Urban Maintenance and Construction Revenue. In 2001, land transfer fee accounts for about 16 percent of fiscal revenues; until 2006, the proportion has increased to 30 percent. However, the volatility of LTF is also very high. The growth rates of LTF used in urban infrastructure in 2002 to 2004 are as high as 67 percent, 74 percent and 104 percent, respectively. But from 2004 to 2005, LTF decreased almost 50 percent, from 77.9 to 41.2 Yuan/Person.

In addition, LTF is getting more important in urban infrastructure revenue. In 2001, total LTF accounted for 10 percent of total fiscal revenue; LTF for urban infrastructure accounts for 7 percent. However, by 2004, land transfer fee accounts for 21 percent in urban infrastructure revenue but only 11 percent in total fiscal revenue. Therefore, local governments incline to spend LTF on urban infrastructure. Section 4.3 explores which item of urban infrastructure expenditure is the most related to LTF.

4.2. Provincial Disparity of Land Transfer Fee Reliance and Its Determinants

Among all the revenue sources for urban infrastructure construction, land transfer fee not only is the only source that grows the fastest, it also shows significant regional disparity. This section concentrates on the provincial disparity of land transfer fee. In this section, we first describe the size and regional pattern of this disparity; and then talk about the determinants of the provincial disparity.

First, our data has shown that among all the revenue sources of urban infrastructure, land transfer fee has the highest provincial disparity. In 2005, the federal ratio of LFT is 31.2, while the federal ratios of total infrastructure revenue, fiscal sources other than LTF, and market sources are 7.9, 8.0, and 9.75, respectively.

Table 2 has shown the per capita land transfer fee, total infrastructure revenue, other fiscal sources, market sources respectively, and their ranking. Also, all the provinces have been grouped into municipality, east, central and west. First, table 2 indicates that municipalities and the eastern provinces have higher land transfer fee than the central and west. From the third and fourth columns of table 2, we can see that almost all municipalities (except Tianjin) and eastern provinces have the rank higher than 12. *Zhejiang* has the highest per capita land transfer fee 245 Yuan/Person in 2005, while the lowest Yunnan, which is in the west, is as low as 2 Yuan/Person.

Second, compared to central, provinces in the west tend to have even lower land transfer fee. No provinces in the west have per capita LTF[4] higher than 30 Yuan/Person. 5 in the west have LTF lower than 10 Yuan. Third, from column 5-6, we can see that total LTF has almost the same pattern as the land transfer fee used for urban infrastructure: the total LTF is much higher in municipality and the east than the central and west; also, the west has the lowest total LTF on average. However, Tianjin and Sichuan show quite different pattern. Although Tianjin ranks only nineteenth in per capita LTF used on urban infrastructure, its total LTF is the second highest in the nation. In addition, Sichuan has the fourth highest per capita total LTF, but it is almost the lowest when it comes to LTF on urban infrastructure.

Table 3 shows the reliance on LTF. First, although municipality (except Tianjin) spends fairly high per capita LTF on urban infrastructure, the reliance on land transfer fee is the lowest among all the provinces (except Chongqing). This pattern is predictable considering the fact that the Municipalities received special financial support from the central government: they have much higher nationally issued bonds (which is in market sources) and other fiscal sources. Second, on average, the eastern and central provinces have higher reliance on land transfer fee for both urban infrastructure and fiscal revenue. Columns 3 and 5 in table 3 show that most eastern and central provinces have relatively high ranking in the proportion of LTF in urban infrastructure revenue and total fiscal revenue[5].

Table 4 shows the results of the regression. The first three columns are the pooled OLS, fixed-effect and random-effect regression of per capita LTF used in urban infrastructure, while column 4-6 has the dependent variable per capita total LTF. First, the first three models show that the impact of urban population density has significantly positive impact; therefore, densely-populated (in urban area) provinces have higher LTF for urban infrastructure construction. Second, consistent with what we expect, the coefficient of PC fiscal resource is significantly positive (in model 1 and 3); what is more, the elasticity is even higher than one. This supports our hypothesis that LTF actually widens the regional disparity rather than making it smaller. Third, in model 1, provinces with higher percentage of Ethnic Minority Autonomous Regions tend to have higher LTF level. Fourth, model 1 shows that the central, west, and municipality have significantly lower per capita LTF level than the east.

4.3. Linking Land Transfer Fee and Infrastructure Expenditure

Table 5 shows the results of the regression of the five expenditure categories on all urban infrastructure revenue items. Column 2, 3 and 9 estimate the impact of different revenue items on utility, transit, and environmental facility, using data from all provinces excluding Beijing and Xizang from year 2001 to 2005. The two highlighted parts illustrate the impact on roads and bridges, and landscaping. Within these regressions, not only the relationship among all provinces has been estimated, also the same relationship has been estimated in the sub-sample of non-municipality[6], the east, central and west. The reason for doing this is that among all the coefficients of LTF, the impact on roads and bridges, and landscaping is statistically significant.

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[4] Land transfer fee.

[5] Total fiscal revenue includes taxes, extra budgetary revenue, and land transfer fee.

[6] The reason for estimating the regression for non-municipality instead of municipality is that the sample size of "municipality" is very small.

Therefore, we are further interested in how this significant relationship varies depending on the region.

Again, as we mentioned above, LTF does not have significant impact on utility, transit, or environmental facility. But it has significantly positive impact on the expenditure on roads and bridges, and landscaping. From the estimation in column 4 and 10, the elasticity of LTF on roads and bridges, and landscaping is 0.059 and 0.074 nationally, respectively. In this sense, the impact of LTF is fairly small given that 100 percent change in LTF is related with 5.9–7.4 percent change in expenditures on roads and bridges, and landscaping.

Columns 5–8 and 11–14 in table 5 indicate that the impact of land transfer fee is dramatically different among regions. From the results in the first highlighted area, we can see that LTF only has significant impact on the expenditure of roads and bridges in the central area (whether it is significant in municipality is unknown), in which the elasticity is as high as 0.228—four times of the overall elasticity. The result also shows that the elasticity among non-municipality is 0.09, higher than national 0.059; this fact indicates that the impact of LTF is lower in municipality than other regions combined. The estimation in the second highlighted area shows that the impact of LTF on landscaping is statistically significant in the east and central, but not in the west. Furthermore, among all the regions, the elasticity of LTF is the highest in the east; the impact in the central area is also fairly high, with an elasticity of 0.178.

The bottom part of table 5 includes the coefficients of LTF on all expenditure items. This table clearly shows the regional pattern of LTF impact. Nationally, as we mentioned above, LTF significantly increases the expenditure on roads and bridges, and landscaping. Regionally, LTF in the eastern provinces is primarily used on environmental facilities, including flood control and environmental sanitation. In the central area, LTF is significantly related to the expenditure on roads and bridges and landscaping. In addition, there is no empirical evidence in our model showing strong relationship between LTF and infrastructure expenditure in the west. By comparing the coefficients of national and non-municipality, we can see that the elasticity of LTF in municipality is lower than other regions on average. The positive impact of LTF on roads and bridges, and landscaping can be explained by the fact that higher spending on these two items might help increase the value of the land and create opportunities for local governments to collect even more LTF.

5. Conclusion

Because local governments do not have the flexibility to raise fiscal revenue from taxes and other fees, LTF has become a significant revenue source for meeting spending responsibilities. Also, the nature of public land leasing as value capture makes LTF inevitably relate to infrastructure development. However, different regions have diverse socio-economic conditions; therefore, provincial disparity of LTF has widened.

This paper finds out that prime ratio, urban population density and local fiscal revenue other than LTF, and the region of the province are important factors for explaining LTF used in urban infrastructure. Also, prime ratio, total fiscal revenue other than LTF has significant impact on

total LTF. One important relationship we find is that land transfer fee widens the provincial disparity in local fiscal capacity. The elasticity of LTF on local fiscal revenue other than LTF is higher than 1, meaning that not only more fiscally self-sufficient provinces collect more LTF, but they also get higher portion of LTF than what they get in other fiscal revenue. Therefore, LTF has significantly widened the provincial disparity in fiscal capacity. In addition, LTF has mainly been used on roads and bridges and landscaping. One explanation of this observation is that these two spending items are more likely to increase land value in order to obtain more revenue from value capture for local governments.

Due to data limitation, this paper only tests the relationship on the provincial level. Future research can focus on finding determinants of LTF on the city level. In addition, because of the missing data problem for Beijing and Xizang, they are excluded from Municipality and the west. However, they are considered representative in each region; therefore, some information is missed due to the above reason mentioned. Furthermore, in order to figure out how LTF is related to the structure of urban infrastructure expenditure, a systematic research on the mechanism of how LTF is spent is necessary.

References

Anderson, J. E. 2010. Housing, taxation, and urban development in China. A draft for a presentation at the International Symposium on Urban Development and Land Economics, Peking University-Lincoln Institute Center for Urban Development and Land Policy.

Anderson, J. E. 2009. Financing urban development in China. *The Chinese Economy* 42(2): 48–62.

Anderson, J. E. 2011. Collecting land value through public land leasing. A draft for a presentation at Lincoln Institute of Land Policy conference. May 23–24. Cambridge. MA.

Bird, R. M. 2005. Getting it right: financing urban development in China. *Asia-Pacific Tax Bulletin* 11(2): 107–117.

Deng, F. F. 2003. China's urban land reform, urban productivity, and local government behavior. *Eurasian Geography and Economics* 44(3): 210–227.

Department of Finance, Ministry of Housing and Urban-Rural Development of China (*Jianshebu zonghecauwusi*). China Urban Construction Yearbook (*Zhongguo chengshi jianshe tongji nianbao*). China Architecture & Building Press, Beijing, China.

Ministry of Finance People's Republic of China. 1995–2008. Finance Yearbook of China (*Zhongguo caizheng nianjian*). China Financial & Economic Publishing House, Beijing, China.

National Bureau of Statistics of China (*Zhongguo guojia tongjiju*). 1995–2008. China Statistical Yearbook (*Zhongguo tongji nianjian*). China Statistics Press, Beijing, China.

Peterson, G. E. 2006. Land Leasing and Land Sale as An Infrastructure-Financing Option. World Bank Policy Research Working Paper No. 4043. Retrieved on April 17th, 2011: http://ssrn.com/abstract=940509

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: 2217.

Yao, Y. 2000. The development of the land lease market in rural China. *Land Economics* 76(2): 252–266.

Table 1: Per Capita Urban Maintenance and Construction Revenues, 1990–2007 (Yuan/Person)

	1990	1993	1996	1999	2000	2001	2002	2003	2004	2005	2006
Fiscal Revenues	**19.2**	**23.3**	**26.4**	**45.5**	**49.4**	**82.3**	**101.1**	**132.5**	**182.4**	**164.6**	**211.7**
Budgetary allocation	4.9	9.1	8.1	22.2	25.5	32.3	36.3	45.9	50.9	59.5	76.9
Local earmarked taxes	13.9	13.7	17.8	22.7	23.0	25.0	28.3	32.2	35.8	42.1	43.7
Fees and user charges [b]	0.4	0.5	0.5	0.6	0.8	12.0	14.6	16.3	17.7	21.7	29.3
Land transfer fee [c]	**	**	**	**	**	13.1	21.9	38.1	77.9	41.2	61.8
Market Financing	**5.9**	**10.9**	**22.6**	**53.1**	**65.8**	**94.9**	**119.6**	**164.5**	**171.8**	**190.3**	**
Domestic loans	1.4	4.7	8.0	30.1	32.8	57.9	67.6	100.2	102.4	115.8	**
Other bonds	**	**	**	**	**	0.5	0.2	1.2	0.0	2.4	**
Self-raised funds	4.1	4.8	10.0	19.1	26.3	32.0	46.5	57.9	63.8	65.6	**
Foreign capital	0.4	1.4	4.7	4.0	6.7	4.4	4.7	5.1	5.3	6.4	**
Stocks	**	**	**	**	**	0.1	0.5	0.0	0.2	0.1	**
Other sources [a]	**8.3**	**26.7**	**21.8**	**32.1**	**42.0**	**20.0**	**23.6**	**24.8**	**18.5**	**21.2**	**28.9**
Total	*33.4*	*60.9*	*70.8*	*130.7*	*157.1*	*197.2*	*244.2*	*321.9*	*372.6*	*376.1*	*240.7*

Data sources: Wu (2008); China's Urban Construction Yearbook (2000-2008).

Note: ** for missing data.

All the data above has been adjusted by fixed assets index, 2000 constant price.

a. Other sources include infrastructure connection fee and land transfer fee before 2001. After 2001, other sources primarily include fees for temporary occupation of roads, roads destroying fee, and compensation fee for cutting down trees.

b. Fees and user charges include water resource fee, infrastructure connection fee, and user charges.

c. Only data of year 2006 and 2007 is available for assets exchange revenue; therefore, it is combined with land transfer fee.

Table 2: Provincial Rank of Total Infrastructure Revenue, Year 2005

| | Province | Land Transfer Fee | | | | Total Infrastructure Revenue | | Other Fiscal Source for UI [2] | | Market Source for UI | |
| | | LTF for UI [1] | | Total LTF | | | | | | | |
		Rank	Per Capita	Rank	Per Capita	Rank	Per Capita	Rank	Per Capita	Rank	Per Capita
Municipality	Shanghai	2	179	1	658	1	2766	1	599	1	1938
	Chongqing	7	47	8	254	5	821	3	362	4	396
	Tianjin	19	17	2	536	2	1779	2	515	2	1179
East	Zhejiang	1	245	3	368	3	961	4	357	5	317
	Jiangsu	3	156	7	256	4	906	5	289	3	429
	Liaoning	4	102	9	249	6	597	6	251	9	226
	Guangdong	5	64	13	135	8	486	9	146	13	208
	Shandong	6	56	5	302	7	524	8	198	8	232
	Hainan	8	47	6	289	13	342	20	74	11	221
	Fujian	9	36	10	193	15	331	11	120	17	167
	Hebei	12	33	18	103	16	319	16	85	15	187
Central	Shanxi	10	35	21	79	26	161	19	75	27	44
	Anhui	11	33	14	122	24	181	24	50	24	89
	Hunan	13	26	23	74	21	230	25	49	21	138
	Jiangxi	15	22	11	183	23	200	21	72	25	84
	Heilongjiang	16	21	15	115	18	302	13	105	22	131
	Jilin	20	16	12	145	12	355	18	80	7	236
	Henan	21	14	20	90	27	122	27	45	26	59
	Hubei	28	3	17	108	17	303	22	66	14	195
West	Guangxi	14	24	24	62	20	284	17	85	19	154
	Neimenggu	17	18	16	111	10	391	12	118	6	242
	Shaanxi	18	17	25	44	14	333	15	86	12	217
	Ningxia	22	13	19	103	9	419	7	224	16	176
	Xinjiang	23	11	22	77	19	289	14	102	18	160
	Guizhou	24	7	27	39	29	81	29	36	28	33
	Gansu	25	5	26	43	22	205	23	51	20	146
	Qinghai	26	5	29	19	25	176	28	44	23	111
	Sichuan	27	5	4	327	11	371	10	122	10	225
	Yunnan	29	2	28	29	28	87	26	45	29	32

1. UI: Urban Infrastructure.
2. Other fiscal source includes budgetary allocation, local earmarked taxes, and fees and user charges.

Table 3: Provincial Rank of LTF Reliance, Percentage as the Average of Year 2001–2006

	Province	Rank	LTF in UI / Total Infrastructure Revenue		Rank	Total LTF / Total Fiscal Revenue		Rank	LTF in UI / Total LTF
Municipality	Chongqing	10	16.6%		3	16.6%		13	24.1%
	Tianjin	28	6.1%		11	12.4%		29	2.9%
	Shanghai	29	5.0%		16	9.2%		24	15.7%
East	Zhejiang	1	36.4%		2	16.8%		1	62.7%
	Jiangsu	3	20.2%		4	16.4%		2	47.6%
	Liaoning	6	19.1%		9	12.5%		8	29.1%
	Shandong	8	18.0%		6	15.2%		18	20.0%
	Hebei	9	17.5%		10	12.4%		15	21.8%
	Hainan	14	13.9%		8	12.8%		19	19.3%
	Guangdong	17	12.7%		25	5.3%		14	24.0%
	Fujian	18	12.4%		13	11.1%		25	12.8%
Central	Shanxi	2	23.9%		24	5.8%		5	41.0%
	Anhui	4	19.8%		5	15.8%		23	16.2%
	Jiangxi	5	19.3%		7	14.7%		20	18.8%
	Hunan	11	15.3%		15	9.6%		11	27.5%
	Heilongjiang	12	14.4%		20	7.4%		12	25.3%
	Jilin	13	13.9%		14	10.7%		16	21.5%
	Henan	15	13.8%		18	8.3%		22	16.8%
	Hubei	24	10.0%		12	11.3%		28	6.3%
West	Yunnan	7	18.5%		27	4.3%		17	21.0%
	Ningxia	16	13.0%		19	8.3%		10	28.1%
	Neimenggu	19	12.4%		26	4.8%		6	36.2%
	Sichuan	20	11.7%		1	20.0%		27	8.1%
	Xinjiang	21	11.2%		21	6.6%		4	42.1%
	Guangxi	22	11.0%		17	8.4%		9	28.3%
	Gansu	23	10.2%		29	4.2%		21	18.6%
	Shaanxi	25	9.3%		23	5.8%		7	33.6%
	Guizhou	26	8.4%		22	6.3%		26	8.2%
	Qinghai	27	7.9%		28	4.2%		3	44.8%

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Table 4: Factors that Affect Land Transfer Fee

VARIABLES	Dependent Variable: PC LTF in UI (log)			Dependent Variable: PC Total LTF (log)		
	(1)	(2)	(3)	(4)	(5)	(6)
	Pooled OLS	FE	RE	Pooled OLS	FE	RE
PC GDP (log)	-0.00993	1.167	0.325	0.0247	0.6	0.0667
	-0.12	-0.768	-0.266	-0.0811	-0.442	-0.138
Prime Ratio	0.205**	-0.0489	0.0739	0.138***	0.205**	0.162***
	-0.0833	-0.15	-0.106	-0.0389	-0.0852	-0.0577
Prime Ratio (Squre)	-0.00497***	0.00111	-0.00178	-0.00264***	-0.00577***	-0.00355***
	-0.00181	-0.00331	-0.00244	-0.000883	-0.00188	-0.00132
Urban Pop Density (log)	0.228**	0.185*	0.229**	-0.0525	0.0835	0.0761
	-0.113	-0.106	-0.0961	-0.0668	-0.0602	-0.0543
PC Fiscal Revenue + Extra Budgetary Revenue (log)	1.681***	0.63	1.453***	1.231***	0.503	1.194***
	-0.368	-0.796	-0.449	-0.19	-0.454	-0.245
Minority [1]	0.867**		1.315	-0.297		-0.0273
	-0.385		-0.854	-0.25		-0.435
Central	-0.358*		-0.0734	-0.349***		-0.373
	-0.207		-0.465	-0.116		-0.236
West	-1.147***		-0.804	-0.704***		-0.791**
	-0.31		-0.645	-0.214		-0.328
Manicipality	-1.041**		-1.159*	0.440**		0.479
	-0.51		-0.672	-0.171		-0.338
Year = 2002	0.136			0.662***		
	-0.267			-0.148		
Year = 2003	0.711***			0.395***		
	-0.237			-0.143		
Year = 2004	0.640**			0.433***		
	-0.316			-0.155		
Year = 2005	0.34			0.362**		
	-0.248			-0.16		
Year = 2006	0.388			0.505***		
	-0.37			-0.179		
Year = 2007	-12.12***	-12.00***	-12.13***	-5.169***	-5.901**	-5.910***
	-3.358	-4.451	-2.956	-1.633	-2.556	-1.63
Observations	173	173	173	173	173	173
R-squared	0.507	0.39		0.722	0.389	

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Note 1. Minority is the number of Ethnic Minority Autonomours Region at county level divided by the total number of county level regions in that province, year 2007.

Table 5: The Impact of Infrastructure Construction Revenue Items on Expenditure
Dependent Variable: log(Per Capita Expenditure Item)

	Utility	Transit	Roads and Bridges					Environmental Facility	Landscaping				
			National	Non-municipality	East	Central	West		National	Non-municipality	East	Central	West
Year 2002	- 0.006	0.197	0.080	0.050	0.145	- 0.181	0.151	0.079	- 0.013	- 0.045	- 0.05	- 0.261	- 0.091
Year 2003	- 0.011	- 0.154	0.024	- 0.001	0.117	- 0.439	- 0.013	- 0.072	0.004	- 0.019	- 0.113	- 0.029	0.022
Year 2004	- 0.075	- 0.142	0.199**	0.084	0.131	- 0.357	0.031	- 0.214	- 0.169	- 0.19	- 0.466**	- 0.3	- 0.013
Year 2005	- 0.199*	- 0.218	0.208**	0.085	0.050	- 0.381	0.078	- 0.254	- 0.171	- 0.16	- 0.553***	- 0.264	0.011
Central budgetary allocation	0.088***	- 0.010	0.013	- 0.016	- 0.062	0.049	0.026	0.018	0.004	- 0.016	- 0.025	- 0.091	0.037
Local budgetary allocation	0.156***	- 0.254*	0.082*	0.047	0.238***	0.028	0.094	0.267***	0.326***	0.270***	- 0.133	0.171	0.474***
Local earmarked taxes	0.084	0.159	- 0.038	- 0.031	0.223	- 0.153	0.039	- 0.057	0.075	0.162*	0.665**	- 0.473*	0.16
Fees and user charges	0.169***	0.541***	0.044	0.001	- 0.030	- 0.021	0.067	0.141*	0.102*	0.047	0.053	0.389**	0.133
Land transfer fee	- 0.035	0.087	0.059**	0.090**	- 0.103	0.228***	0.020	0.025	0.074**	0.137***	0.216**	0.178**	0.089
Domestic loans	0.086	0.234	0.596***	0.601***	0.770***	0.599***	0.694***	0.252***	0.101*	0.105	0.092	- 0.107	0.17
Self-raised fund	0.238***	0.337***	0.076*	0.146***	0.019	0.246**	0.148**	0.217***	0.302***	0.326***	0.624***	0.645***	0.039
Foreign capital	0.076**	0.279***	- 0.002	0.022	- 0.009	0.102	- 0.062*	- 0.024	0.045	0.069*	0.168***	- 0.015	0.101
Constant	1.227***	- 1.751***	1.257***	1.156***	0.020	1.300*	0.401	- 0.211	- 0.447**	- 0.667**	- 2.313***	0.741	- 0.954
Observations	128	128	128	114	38	38	38	127	128	114	38	38	38
R-squared	0.817	0.639	0.892	0.890	0.971	0.815	0.950	0.721	0.872	0.858	0.938	0.781	0.87

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1