The Relationship between Land Finance and the Tax-Sharing System Reform: An Empirical Study

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ABSTRACT With the reform of the fiscal and taxation system, the local government adjusts sources of revenue accordingly. In 1994, Chinese government began to the tax-sharing system reform. The local government financial powers and responsibilities did not match. At the same time, the proportion of the land transfer fees in fiscal revenue kept rising after 1994. This article analyzes the relationship between land finance and the tax-sharing reform, and sets up a corresponding model. Then by using the method of regression analysis, it is concluded that they were both positive proportional relationship. Finally, we make suggestions about strengthening the fiscal and taxation system reform and doing a good budget planning.

Keywords Land Finance; Tax-Sharing System Reform; Fiscal Incentives.

I. INTRODUCTION

Land finance is a variety of behavior of the local government, and it is a common phenomenon after 1994. As shown in Figure 1, with the continuous increase of the land transfer fees, the central government took the purse but the responsibilities still remained in the local government. What's more, in terms of GDP (gross domestic product) performance comparisons, the local government is under pressure. So the local government makes money by expropriating land from farmers and auctioning it off to property developers. The collection of a series of fees is relevant to land, including the land transfer fees and related taxes.
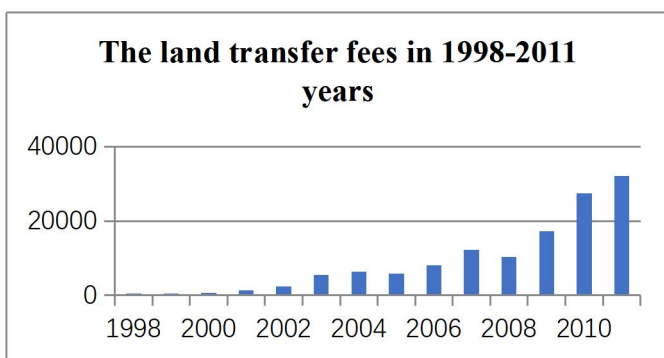

Figure 1 The land transfer fees in 1998-2011 years

As shown in Figure 2, land finance accounts for a large part of the local government revenue. Especially in recent years, the land transfer fees account for 60%.
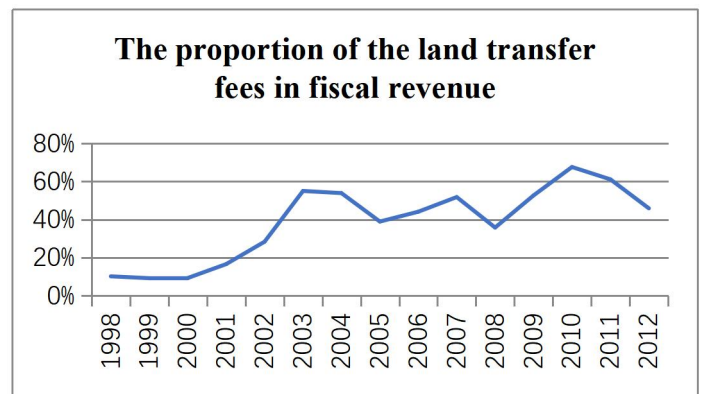

Figure 2 The proportion of the land transfer fees in fiscal revenue

Since land finance becomes a special phenomenon in the world, there are few studies by searching literatures. As we known, the more income from the added value of the land the local government gains, the higher the housing prices are. Thus, the real estate industry will be seriously affected. It can be seen from this that land finance is not only a government action, but also relates to a variety of livelihood issues. Therefore, it is necessary for us to research this field. By analyzing the relationship between the tax-sharing system reform and land finance, thinking about the purpose of the local government, I can enrich the research in this field.

The article is divided into the following six parts: the first part introduces the background of land finance; secondly, the origin of land finance and the tax-sharing system reform are briefly introduced; thirdly, making

assumptions, defining variables and proposing model; next is analyzing result; the fifth part is the discussion of the result; finally is conclusion.

II. Literature review

In 1994, the tax-sharing system was implemented by the central government in order to ameliorate their own financial condition and relieve the dilemma of the central financial capacity that was gradually weakening. The tax-sharing system is that tax category is divided into three parts, including the central tax, the local tax and the central-local shared tax. The relationship of the central government and the local government can limit the local government behaviors, especially influence the reform of the fiscal and tax system after 1994.

At first, the central government intended to constraint during the reform, nevertheless, it failed. The local government was likely to obtain the fiscal resource by other monetary activities, to name only a few, "Land Finance". Land finance is that the local government spends low price levying the cultivated land. They are tempered, developed and sold in the second hand market by auction and bid (Qu, Zhou and Ying, 2008). Li (2016) thought land finance is that the local government aid for getting enough money guarantees the expenditure of public services by selling land and debt financing to get an equilibrium state between financial revenue and expenditure. Additionally, Land finance has been defined as a behavior by mortgaging the land, establishing the local government investment and financial platform to raise fund (Wang, Tao and Liu, 2017). The heavy reliance of Chinese local government on land-leasing revenues has attracted widespread criticism due to its potential risks and problems in recent decades (Wang and Ye, 2016). They have made a living by selling land and developing real estate industry which leads to housing price is continuously rising.

For the local government, land finance not only can substantially increase the income of internal and external budget, but also magnifies infrastructure investment and attracts foreign investment. The provincial government grabs the extra-budgetary fiscal return by "the hands of distortion". The system of the local government competition further has driven which it adopted the progressive land financial strategies (Wu and Li, 2010). This study conducted an extensive literature research and proposed a conceptual framework to demonstrate the effects of land financial incentives on urban sprawl in China (Liu, Fang, Yue and Song, 2018).

In conclusion, land finance is a series of behaviors that the provincial government wants to improve the political achievement. For instance, by selling land and mortgaging land. As far as I am concerned, it is extremely essential that we learn the housing price transforms direction. With the promotion of real estate tax reforming, the topic of land finance is increasingly universal. Thus, this article analyzes the process of tax system reform and the reason of land finance production to get their relationship..

III. Methodology

(1) Hypothesis

Under the new financial system, the more the local government loses, the greater the incentive to earn income from land acquisition, development and transfer. That is, the greater the local loss, the more the land transfer fee.

(2) Data

Since 1994, China's statistics began to make public the land transfer situation of the local governments. The data used in this paper are all from published statistics. This paper chooses data from 1998 to 2004. Data mainly come from China Statistical Yearbook and the National Bureau of Statistics.

(3) Dependent variables

This paper attempts to explain the differences in land expropriation behavior of the local governments. The dependent variable is defined as the number of land transfer fees obtained by the local governments through land transfer.

(4) Independent variables

This paper assumes that under the new financial system, the more the central government takes away from the local finance, the more intense the land expropriation behaviors of the local government. Therefore, the core independent variable is the "tax loss" of the local government in the new financial system.

In 1994, the central government collected 100% of consumption tax and 75% of value-added tax into the central finance. In 2002, the central government also collected 50% of enterprise income tax and personal income tax into the central finance (after 2002, the proportion increased to 60%). Therefore, the tax loss formula is as follows:

(1) [Before 2002] tax revenue losses = (consumption tax + VAT×0.75)

(2) [2002] tax revenue losses = (consumption tax + VAT×0.75) + (enterprises income tax + individual income tax) × 0.5

(3) [After 2002] tax revenue losses = (consumption tax + VAT × 0.75) + (enterprises income tax + individual income tax) × 0.6

(5) Control variables

Population size, per capita GDP, industrialization level (the percentage of the secondary industry to GDP) and urbanization level (the percentage of non-agricultural population to total population).

(6) Model

$$Y_{it}=\beta_0+\beta_1 X_{it}+\beta_2 IN_{it}+\beta_3 UR_{it}+\beta_4 GDP_{it}+\beta_5 SIZE_{it}+\varepsilon$$

We use Y_{it} to stand for the per capita land transfer fees of province i in year t, Xit to stand for per capita tax revenue losses. The land transfer fees and tax losses are in the form of natural logarithm per capita. INit represents the level of industrialization, UNit represents the level of urbanization, GDPit represents the natural logarithm of per

capita GDP, and SIZEit represents the natural logarithm of population size, and ε is the residual.

IV. Results

(1) Descriptive statistics

As shown in Table 1, the descriptive statistical results of each variable are as follows. The collected data are processed by statistical software. The average, standard deviation, maximum and minimum values of each variable are summarized and sorted out.

Table 1 Descriptive statistical analysis of variables

Variable	Obs	Mean	Std.Dev.	Min	Max
y	217	4.14	1.63	0.30	8.35
x	217	-2.96	1.45	-4.53	4 .00
in	217	0.42	0.08	0.20	0.58
ur	217	0.29	0.13	0.10	0.65
gdp	217	9.01	0.57	7.76	10.69
size	217	8.01	0.89	5.53	9.18

(2) Correlation analysis

As can be seen from Table 2, tax losses are positively correlated with the amount of the land transfer fees, which preliminarily proves the validity of the hypothesis.

Table 2 Variable correlation analysis

	y	x	in	ur	gdp	size
y	1.0000					
x	0.2784	1.0000				
in	0.2911	-0.1982	1.0000			
ur	0.5191	0.2538	0.2632	1.0000		
gdp	0.7940	0.4163	0.3677	0.7983	1.0000	
size	0.1044	-0.5027	0.4741	-0.1938	-0.0434	1.0000

(3) Hausman test

Hausman test of the model, the original hypothesis: random effect model, alternative hypothesis: fixed effect model, the test results are shown in the following table. Hausman test shows that corresponding P value is 0.0000, which is far less than 0.05. It shows that the model is significant at 5% significance level. Hausman test shows that the original hypothesis is rejected and fixed-effect model is adopted.

Table 3 Hausman test

Model	Chi-Sq.Statistic	Prob.
$Y_{it}=\beta_0+\beta_1 X_{it}+\beta_2 IN_{it}+\beta_3 UR_{it}+\beta_4 GDP_{it}+\beta_5 SIZE_{it}+\varepsilon$	259.87	0.0000

(4) F test

F test of the model, the original hypothesis: using mixed effect model, alternative hypothesis: using fixed effect model, the test results are shown in Table 4.

Through F-test, we can get from Table 4 that the F value of the above model is 9.47, and its corresponding P value is 0.0000, which is far less than 0.05. It shows that the model is significant at 5% significance level. Through F-test, we reject the original hypothesis again and adopt the fixed-effect model.

Table 4 F test

Model	F Statistic	Prob.
$Y_{it}=\beta_0+\beta_1 X_{it}+\beta_2 IN_{it}+\beta_3 UR_{it}+\beta_4 GDP_{it}+\beta_5 SIZE_{it}+\varepsilon$	9.47	0.0000

(5) Analysis of regression results

（I）Fitting goodness test

From Table 5, it can be seen that the resolvable coefficient R^2 of the model is 0.7628, greater than 0.5, which indicates that the sample regression has good fitting goodness and the model has strong explanatory ability.

（II）T test

Given a significant level of alpha=0.05, it can be seen from Table 5 that the absolute value of T-statistics corresponding to other variables is greater than the critical value except urbanization level variables. The P value corresponding to urbanization level variables is significantly greater than 0.05, which shows that other variables have a significant impact on the number of the land transfer fees, while the control variable UR. At the 5% level, UR did not pass the T test, which preliminarily shows that UR has no significant impact on the land transfer fee.

Table 5 Analysis of regression results

Variable	Coefficient	T-Statistic	Prob.	R^2
x	1.4070	3.4500	0.0010	
in	4.2562	1.6600	0.0980	
ur	-0.5325	-0.2100	0.8320	0.7628
gdp	2.4591	3.3800	0.0010	
size	-6.0839	-3.2100	0.0020	
cons	33.2408	1.8100	0.0710	

V. Discussion

The purpose of this paper is to analyze the relationship between the tax-sharing reform and land finance, by defining variables, setting model and regression tests. Finally, a positive proportional relationship between them is concluded. This paper mainly analyzes the relationship between the land transfer fees and tax losses to obtain the relationship between tax distribution and land finance. Using a series of theories related to land finance, the main method is regression analysis.

According to the result of regression test, most variables are significant, and there is a positive correlation between the land transfer fees and the tax losses. Along with the local government tax revenue loss increase, the land transfer fee will also increase. It shows that local governments make up for the loss of tax revenue with land

transfer fees to a large extent. And it can be seen from Table 5 that other variables will also affect the amount of the land transfer fees to some extent. As can be seen from Table 5, the coefficient of tax loss is 1.4070, and the tax loss variable is significant at the level of 1% in the T test process. Therefore, it is concluded that there is a positive proportional relationship between the land transfer fee and the tax loss, which is consistent with previous research conclusions. It shows that the reform of tax distribution system will indeed lead to the increase of the land transfer fees. Therefore, tax reform has a great impact on local governments in China. The rise of land finance is due to excessive pressure from local governments. In order to achieve GDP performance appraisal, the local government began to use land transfer fees to earn off-budget income. In the early stage of implementing land finance, the tax revenue and expense income related to land making up the fiscal gap for local finance. However, the more fiscal revenue brought by land, the more the local government relies on land to earn funds and increase investment in land, meanwhile it ignored other industries related to people's livelihood.

The limitations of this study are clear: the level of industrialization and urbanization in this model have not passed the T test, indicating that the two variables are not significant and the choice of variables is still problematic. Moreover, to the best of my knowledge, there will still be differences between the calculated value and the actual value of tax loss, which is the key and difficult point of the research in this field. Land finance and the tax-sharing reform are behaviors about the local government. Land finance brings to the local government revenue. At the same time, it also makes more dependent on land finance of the local government to maintain the level of GDP. So in the future, the research direction in this field should be how to motivate the local government behavior, to make land finance produce more positive external effects.

VI. Conclusion

From the above analyze, it can be seen that the main reason for the emergence of land finance is the excessive pressure of the local government. The indwelling of routine power makes it difficult for the local government to reasonably arrange fiscal expenditure, so it is necessary to rationally adjust the distribution of financial power and responsibilities to further promote the reform of the fiscal and tax system. At the same time, we should encourage creative efforts to open up new sources of government revenue. In addition, we should make government information more open and transparent, release government budgets in a timely manner, and ensure that people are supervised by the whole people so that they can enjoy real benefits. Finally, in the process of reform, the actual situation of the local and the central government should be taken into account to avoid serious mismatch between financial power and administrative power. The annual fiscal budget should be well prepared and the direction of capital flow should be reasonably planned.

REFERENCES

[1] Chen, A. J. M. C. (2008). The 1994 Tax Reform and Its Impact on China's Rural Fiscal Structure. 34(3), 303-343.
[2] Chen, G., & Zhiqiong, Q. J. N. J. (2009). China Land Finance under the Financial Illusion from the Perspective of Law and Economics.
[3] Fan, Z. Y. J. C. I. E. (2015). The Source of Land Finance: Fiscal Pressure or Investment Incentives.
[4] Liu, Y., Fan, P., Yue, W., & Song, Y. J. L. U. P. (2018). Impacts of land finance on urban sprawl in China: The case of Chongqing. 72, 420-432.
[5] Sun, X., Zhou, F., & Lin, W. J. S. S. i. C. (2014). Land Finance and the Tax-sharing System: An Empirical Interpretation. 35(3), 47-64.
[6] Wang, W., Ye, F. J. P. B., & Finance. (2016). The Political Economy of Land Finance in China. 36(2), 91-110.
[7] Wong, C. P. W. J. C. P. (2000). Central-local Relations Revisited: The 1994 tax-sharing reform and public expenditure management in China. (31), 52-63.
[8] Yin, X. G., Gang, C., Yang, P. J. J. o. F., & Economics. (2006). Tax Sharing Reform, Governmental Intervention and the Efficiency of Financial Development.
[9] Zhang, Q. J. S. S. E. P. (2017). Distributive Politics under Institutionalized Authoritarianism: Evidence from China's Subnational Land Finance.
[10] Zhang, Q. J. S. S. E. P. (2017). Distributive Politics under Institutionalized Authoritarianism: Evidence from China's Subnational Land Finance.
[11] Zhao, H. Y. J. E. S. (2017). A Study on the Influence of Land Finance on the Wage Rise of China's Urban Labor.
[12] 李琳. 现行分税制财政体制存在问题及改革新思路[J]. 中国集体经济, 2016(4):84-85.
[13] 渠敬东, 周飞舟, 应星. 从总体支配到技术治理——基于中国30年改革经验的社会学分析[J]. 中国社会科学, 2009(6):104-127.
[14] 吴群, 李永乐. 财政分权、地方政府竞争与土地财政[J]. 财贸经济, 2010(7):51-59.
[15] 王瑞民, 陶然, 刘明兴. 中国地方财政体制演变的逻辑与转型[J]. 国际经济评论, 2016(2):31-41.