State Capitalism: A New Perspective of Land Sale in China

Wei Tian, Liugang Sheng, Hongyan Zhao*

July 5, 2015

Abstract

This paper presents a new perspective in understanding land sale in China featuring the "institutional trinity" of land market, namely, state ownership, economic performance based political promotion, and the unbalanced fiscal structure. The paper argues that the main motivation of local government to sell land is to promote industrial growth and government fiscal capacity. These two hypotheses are tested using the prefecture-level data covering approximately 330 municipalities during the period of 1999–2007. The paper finds that the industrial output and fiscal expenditure increase to approximately 1.8% and 1%, respectively, if the area of land sale doubles. Evidence also shows that land sale promotes industrial growth by boosting fixed assets investment and foreign direct investment. Interestingly, the paper also finds that the land-sale strategy is more effective in the eastern provinces than in other regions.

Key words: Land, industrialization, fiscal decentralization, state ownership

JEL: O23, O25, Q15, E62

1. Introduction

Land is of central importance to industrialization and economic structural change. The history of industrialization starting in England in the eighteenth century is closely connected with the structural change in land usage. Land has been the most important production factor in agriculture for thousands of years; however it becomes even more valuable in modern society. Factories and infrastructure need to be built on land to promote industrial development. Real estate, skyscrapers, and modern cities rise in historical rural area. Land is also an endowed capital and collateral, which is particularly important for developing countries such as China because of the scarcity of physical capital (Caselli and Feyrer, 2007).

The land policy about how the government can allocate land efficiently between agricultural need and industrial development is an ongoing debate topic. China also encounters this challenge along with its astonishing economic growth since 1979. Recently, the area of land sale (conversion) in China has risen significantly along with the dramatic increase in industrialization and urbanization. This development triggers a wave of public anxiety on the causes and consequence of land sale of local government; thus, this issue resurges as a hot topic of discussion among academic researchers and policy makers.[1] However, existing literature either only examines the effect of land conversion on agricultural output (Zhang, Mount, and Boisvert, 2004) or studies the effect of land sale on the fiscal revenue of local the government. However, a systematic view regarding the motivation and strategy of the government or careful empirical assessment of the effect of land sale on the local economy is scarce.

This paper offers a new perspective on land sale in China since the 1990s, arguing that the view from state capitalism provides an integrated framework to understand the institutional features of the land market, the political motivation of local government, and the effect of their practices on the local economy.[2] The dual track rural–urban land tenure system entitles local government the monopoly power on urban land supply, and also authorizes it to

---

[1]For example, a recent report of the World Bank on urbanization in China expresses its concerns that the dramatic rise in land conversion might lead to unsound urban growth, waste of land resources, unsustainable local government finance, and fiscal risk.

[2]The term "state capitalism" has various meanings, but it is usually characterized by the dominance of state owned entity or business enterprises in certain industry or market. Recently, the revival of state capitalism because of the economic success of BRIC countries (especially China) contrasted with the recent deep recession in developed countries (Li, Liu and Wang, 2014).

discriminate against buyers with various purposes of land usage. Meanwhile, the economic performance-based political promotion scheme motivates local government officials to boost economic growth using various resources, and apparently land is one important instrument to stimulate investment and industrial development (Li and Zhou, 2005). Moreover, the fiscal reform in 1994 deprived local government of a large share of their revenue while their responsibilities for economic development and public service provision remained largely unchanged. This fiscal imbalance imposed great pressure on local government, and land sale has become an important additional source to finance the fiscal deficit (Liang, 2009, Cao, et al., 2007). Therefore, the "institutional trinity" of state ownership, political promotion mechanism, and unbalanced fiscal structure strongly motivates the local government to sell land to promote industrial growth and government fiscal capacity.

In this paper we first discuss the relevant institutional environment of the land market in China, and then derive two main hypotheses on land sale. Our main objective is to carefully quantify the effect of government land sale by estimating the elasticity of industrial output and fiscal capacity with respect to land sale. We also explore the possible channels or regions through which the effects work. The question of whether land sales have meaningful effects on the local industrialization and government fiscal capacity has great policy relevance in China. Nevertheless, previous research on land sale consists mainly of case studies and non-systematic empirical analysis. For this analysis, we use the prefecture-level municipality data in China between 1999 and 2007, which cover approximately 330 cities. We exclude the four large metropolitan areas, namely, Beijing, Tianjin, Shanghai, and Chongqing as they might be significantly different from other cities due to the special administration arrangement. We also construct a unique data set including the information in land sale, industrial output, fixed asset investment, foreign direct investment (FDI), and fiscal revenue and expenditure, which allowed us to estimate the effect of land sale on industrial output and fiscal capacity.

We find that land sale has a positive effect on industrial output and fiscal expenditure. Industrial output and fiscal expenditure increase by approximately 1.8% and 1%, respectively, if the area of land sale doubles. Evidence also shows that land sale promotes industrial growth by boosting fixed assets investment and FDI. Quantitatively, fixed asset investment and FDI will increase by 4.5% and 7.8%, respectively, if the land sale increases by 100%. Those elasticities are also economically significant. For example, compared with the sample average, one additional square kilometer of land sale could result in a constant increase of

RMB 148 million in industrial output on average, which is slightly less than half a percent of the average real GDP across cities during the sample period. Moreover, contradicting conventional wisdom, we find that the marginal return from land sale measured by its effects on industrial output and investment does not decline. However, we find that the positive effect of land sale on industrial output is more effective in the eastern provinces than in other regions, and the strategy of using land sale to enhance fiscal capacity seems to be effective only in the eastern provinces.

This paper contributes to the literature on land policy and industrialization in developing countries. Converting land from agricultural to industrial usage by establishing industrial zones is a popular policy in newly industrialized countries such as Japan, Korea, Singapore, and Taiwan during their period of economic takeoff. These industrial zones serve as policy means to facilitate international trade and FDI through improvements in infrastructure and resource utilization, and thus promote structural change and economic growth. Due to the initial success of East Asian countries, other countries such as China, India, and Mexico also established special economic zones (Li, K., J. Whitwell, and S. Yao, 2005). Recently, Alder, Shao, and Zilibotti (2013) find that the establishment of a state-level zone resulted in a significant increase in the level of GDP by approximately 12% in China.[3] Wang (2013) also finds that the special economic zones in China have economically and statistically positive effects on investment, particularly on foreign direct investment.[4] Complementary to their results, we also find that the local Chinese governments usually sell land at a low price to boost investment and attract foreign investment, which consequently increases industrial output. Moreover, our quantitative analysis sheds light on the central issue of land conversion on whether the gain from land conversion can compensate for the loss of agricultural output and occurrence of rural poverty. To our knowledge, this study is the first to estimate the elasticity of industrial output with respect to land sale. This study is particularly useful for policy makers as they need to precisely assess the benefit of land conversion.

---

[3] Sheng and Yang (2014) find that state-level industrial policy zones promote exports and export varieties by reducing the offshoring cost. China has various types of policy zones, including Economic and Technological Development Zones, New and High-technology Industrial Development Zones, Export Processing Zones, and Border Economic Cooperative Zones.

[4] China has various types of policy zones, including Economic and Technological Development Zones, New and High-technology Industrial Development Zones, Export Processing Zones, and Border Economic Cooperative Zones. Wang and Wei (2010) find that high-tech zones appear to contribute significantly to the rising sophistication of China's exports.

Our study also contributes to the literature on land sale and fiscal capacity in developing countries. Weak fiscal capacity is an important obstacle to the governments in developing countries that are aiming to invest in infrastructure and provide better public goods and employment opportunities.[5] The sale revenue of land can be an important source of income for those governments with fiscal deficits. China is an exemplary case for analyzing how government can use land policy to enhance government fiscal capacity together with the promotion of structural change for economic growth. Most of the existing studies either only focus on the fiscal incentive of local government because of the fiscal decentralization reform in 1994 or pay limited attention to fiscal capacity by only examining the revenue side of land sale (Lichtenberg and Ding, 2009). By contrast, our study investigates the effect of land sale on fiscal expenditure to capture the effect of land sale on the local government's spending partly because the sales revenue of land usually are not recorded in the fiscal balance sheet in China. Another novel finding is that land sale enhances local government fiscal capacity only in the eastern provinces, but not in other regions. This finding implies that local government in the middle and western China should not simply imitate the same land policy from the eastern provinces.

This paper is organized into sections as follows. Section 2 discusses the institution features and recent development of land market in China, and shows how our new perspective from state capitalism helps us to understand the Chinese land market. Section 3 tests two main hypotheses derived from the perspective of state capitalism, and also presents our econometric specifications and empirical analyses. Section 4 concludes the paper.

2. China's Land Market

Since the late 1970s, China's land policy and legal framework have evolved gradually in response to economic and social changes, moving from the dual track rural–urban land tenure system to individual property rights. This reform not only involves the ownership change of land, but also promotes a more market oriented allocation of land. In this section, we will briefly review the institutional features of the land market, and propose a novel perspective

---

[5] He, Zhang, and Zhang (2009) estimate the effects on output and employment of the Chinese stimulus package during 2009-2010. The Chinese government spending multiplier is less than 1.

from the view of state-capitalism to understand the motivation of the land sale behavior of local government.

China's dual-track tenure system separates collectively owned rural land and state-owned urban land, which are governed by different regulations and institutions. Before the 1980s, China employed a land allocation system in which land was tightly controlled and allocated by the state. Thus, land market was practically nonexistent. This system was criticized for the lack of allocation efficiency as economic development increased the demand of land, and thus the country has gradually implemented a series of reforms to strengthen the individual land use right and foster market oriented land allocation.[6]

The separation of the use rights and ownership rights in the early 1980s marked the meltdown of state ownership of land in China. From 1988–1989, the private use rights of land were legally allowed to be transferred among private users, and the use right of urban land can also be traded in land markets. Thus, local government can first convert the collectively owned rural land into state-owned urban land, and then sell the use rights of the converted land to private sectors.[7] As a consequence, land expropriation and conversion started to emerge prominently in the 1990s.

The use right of state-owned land may be transferred to private sector in many different methods. Transfer through negotiation and agreement has played an important role in the early stage of land concession. However, further reforms occurred in the following decade to establish more market-based allocation principles, and more competitive allocation procedures, such as tendering, auction, and bidding were introduced. In 1998, Shenzhen sold land use rights of the state land through public tendering. Since 2002, all transfer of land use rights for commercial use, comprising commerce, tourism, entertainment, and real estate development, were stipulated through market competitive approaches by the Ministry of Land and Resources. The requirement was expanded to the transfer of land for industrial uses in 2004. The transfer price should be above the minimum price set by the State Council in 2006. These regulations on the use right of land for commercial and industrial uses are further documented in The Property Law of 2007.

---

[6] See: The World Bank and DRC, *Urban China Toward Efficient, Inclusive and Sustainable Urbanization, 2014.*
[7] In China, the ownership of land belongs to the state and it is non-exchangeable. However, the use right of land can be sold to private sector with limited tenure. Thus, the term "land sale" in this paper means that the transfer of use right of land.

One important feature of the land market reform is the exclusive power of the local government in the chain of land collection, conversion, and land supply. With such monopoly power, local government can easily convert rural land into urban land and sell them for their own purposes. Meanwhile, local government can retain most of the land revenues instead of transferring them to the central government. Thus, land sale became an important policy instrument that the local government can operate to influence the local economy.

Next, we discuss two important institutional reforms that shaped the motivation of local government to sell their land. The first is the economic performance-based political promotion for local government officials, and the second is the unbalanced fiscal structure resulting from the fiscal reform in 1994.

The intensive competition for promotion among local government officials yields a strong impulse for economic growth through industrialization and investment (Li and Zhou, 2005). Given that the local government is the single supplier of land, they began to pursue a land-based industrialization framework, and abundant rural land is converted to urban and industrial development uses at a low price to attract the inflow of FDI, and hence generate economic growth. One piece of evidence is the boom of industrial policy zones throughout China since the 1980s. Serving as a tool of industrial competition, most of the industrial policy zones are conducted purely by local government without approval from higher level of government. A large amount of policy zones emerged in the coastal areas in the late 1990s, and then expanded gradually to inland regions as their infrastructure improved. By 2006, each county in China has on average approximately two industrial zones, and the total number has reached over 6000 (Zhai and Xiang 2007). Wang (2013) shows that the Special Economic Zones increase per capita FDI by 58% without crowding out domestic investment, and also improved the total factor productivity by 0.6 percentage point.

In total, more than 1,500 square kilometers of urban construction lands are newly established each year from 2001 to 2011, of which 90% comes from rural land requisition. Meanwhile, the industrial-use land growth is outstandingly high. Over half of the increase in total urban construction land is attributed to industrial use, and residential land only accounts for 26%, public utilities 18%, and commercial use 9%.[8]

---

[8] Source: China Urban Construction Statistical Yearbook, 2002–2012.

Figure 1A presents time trends of the nationwide industrial value added and area of land sales, and shows that both industrial value added and land sales increase significantly from 1999 to 2007. Figure 1B plots the simple scatterplot of the two variables by using the average city level data from 1999 to 2007, suggesting an apparent positive correlation.

However, industrialization is not the only incentive for local government to sell land. The fiscal reform in 1994 reallocated the fiscal revenue and expenditure responsibility between the central and local governments. A large share of local government income has been taken by the central government. After the reform, the tax base of local government only contains business taxes, 25% of value added taxes, and 40% of corporate income taxes. However, their expenditure responsibility for economic development and public goods, and social service remains the same. Figure 2A presents the fiscal revenue and expenditure of local government from 2000 to 2013. Both government fiscal revenue and fiscal expenditure show an increasing trend, with the latter higher than the former for most of years, suggesting a persistent local government fiscal deficit.

However, fiscal reform in 1994 considers the revenue of land sale as part of the local government revenue. This motivates the local government to finance the fiscal deficits through land sales. In the last decade, the land sale revenues significantly contribute to the total income of the local government. The income has grown from RMB 542 billion in 2004 to RMB 3.21 trillion in 2012.[9] This additional source of income enhances the fiscal capacity of local government, allowing them to invest in infrastructure, to promote industrialization and provide public goods. Figure 2B plots the fiscal expenditure of local government and the area of land sales. We calculate the average statistics between 1999 and 2007 for each city, and the result suggests a positive correlation between fiscal expenditure and land sales.

In summary, the state ownership of land, the political promotion mechanism, and the unbalanced fiscal structure constitute the institutional trinity of the land market in China, making land an important instrument for local government to promote industrialization and enhance fiscal capacity. This state capitalism perspective helps understand the behavior of local government in the land market. Given that the market demand for land from the private sector increased dramatically along with the rapid economic growth and urbanization, and the demand elasticity of land is relatively low, the local government can allocate land between

---

[9] Source: China Land and Resources Statistical Yearbook, 2006–2012.

industrial uses and other commercial purposes. To promote industrialization by boosting investment and attracting more FDIs, the government would sell land at a low price through mutual negotiation and agreement. By contrast, if the local government aims to finance the increasing fiscal expenditure, then the government will limit the supply of land for residential and commercial uses and sell at a high price through market competition.[10] Moreover, to increase land profit, local government often uses land conversion by reducing the compensation fee for farmers. From 2000 to 2010, the prices of land for commercial and residential uses increase by 310% and 530%, respectively, whereas the price of land for industrial use increases by only 70%[11], and remains below the market price. The average prices per square meter of land in 2014 were approximately RMB 740 for industrial use and RMB 6500 and RMB 5300 for commercial and residential uses, respectively.[12]

The different treatments for industrial, residential, and commercial uses of land are also observed in the transaction methods of land sales. To attract investment, land for industrial use is directly provided at cheap subsidized prices through negotiated agreements with investors rather than competitive approaches. By doing so, the local government expects to achieve the economic growth target and collect tax income to compensate for the financial loss from the cost of compensation fee and infrastructure expenditure. By contrast, local government has a different strategy toward land sales for commercial and residential uses. The local government usually restricts land supply for such uses to raise and maintain the price at a high level via competitive allocation approaches.

We present some preliminary evidence by using the frequency of the transaction modes. We calculate the intensity of land sales through negotiated agreement by using the percentage of its frequency to the total number of land sales in each city, and present the scatterplot of the intensity of land sales through agreement, industrial value added, and the fiscal expenditure in Figures 3A and 3B. Figure 3A suggests a positive correlation between the industrial value added and the intensity of land sales through negotiated agreement, which is consistent with our conjecture. Figure 3B suggests a slightly positive correlation between fiscal expenditure and the intensity of negotiated agreement land sales. This is possibly due to the enhanced tax base from industrialization, which in turn strengthens the fiscal capacity of local government.

---

[10] See Chow and Niu (2015) for a detailed discussion on the supply and demand for Chinese urban housing market.

[11] Source: Development Research Center of the State Council, China (DRC 2013) survey.

[12] Source: Ministry of Land and Resources of the People's Republic of China.

In summary, the state-capitalism perspective helps us understand the institutional environment of the land market in China, the motivations, and corresponding practices of the local government. In the next section, we further test the two main motivations of local government for selling land by using the prefecture-level data covering approximately 330 municipalities during 1999–2007.

3. Empirical analysis

A. Data and Key Variables

We test two main motivations of local government for selling land in China using prefecture-level municipality data during 1999 and 2007:

H1: Land sale increases industrial output.

H2: Land sale improves the fiscal capacity of local government.

The sample includes approximately 330 prefectures in the majority of cities in China, but we exclude four municipalities, namely, Beijing, Tianjin, Shanghai, and Chongqing. The primary data sources of land sales (square kilometer) are obtained from *China Land and Resources Statistical Yearbook* and *China Land and Resources Almanac*. We only use the data on land sales that are granted or sold through market channels including agreement, bidding, auction, and listing (Xieyi, Zhaobiao, Paimai and Guapai) because we want to understand the role of land sale to promote industrial growth and government fiscal capacity. We exclude land transfer through direct government allocation and leasing. This type of land allocation is mainly used for infrastructure and other public amenities, and leasing is mainly for limited commercial and service businesses. Moreover, we use the area of land sales instead of sales revenue to estimate elasticity with respect to the sold area rather than sales revenue, which contains the significant price variance across regions.

We use industrial value added deflated by prefectural GDP deflator as the measure of real industrial output in the mining, construction, and manufacturing sectors. Local government sells land to attract more investments to boost industrial growth. Thus, we also examine the effect of land sale on investment. We use fixed asset investment to proxy investment, but this measure also covers agriculture and service sectors and thus captures the overall effect of

land sale on aggregate investment. We also study the effect of land sale on FDI to verify whether the attraction of foreign investment is another important channel.[13]

To study the effect of land sale on the fiscal capacity of local government, we are particularly interested in the fiscal expenditure rather than the fiscal revenue. The ultimate goal of local government for land sale is to boost their capacity and to use this additional source of revenue for various expenditure demands. Although fiscal revenues measure the income side of local government, they might not be converted into government spending because of bureaucratic red tapes and corruption. The second reason is more practical. The fiscal budget revenue reported in the government balance sheet does not include the revenue from land sale. In fact, the income from land sale is excluded from the fiscal balance sheet of local government, and thus from the scrutiny of the central government. Excluding the land sale revenue would underestimate the effect of land sale on fiscal revenue. However, this concern becomes trivial if we focus on fiscal expenditure because our goal is to test whether land sale is one of the important channels in which the local government can finance their expenditure.

The prefecture level data, including industrial value added, fixed asset investment, FDI, fiscal expenditure, real GDP per capita, and population density, are mainly from *China Statistical Yearbook for Regional Economy* and *China City Statistical Yearbook*. Table 1 reports the summary statistics and city coverage of each variable used in our regression analysis.

B. Empirical Specification

We adopt panel regression method for the basic empirical specification below:

$$ln(y)_{it} = \alpha_i + \beta_1 \ln(landsale)_{it-1} + dt + X_{it}\theta' + \epsilon_{it} \qquad (1)$$

The dependent variables are the log values of industrial value added, fixed asset investment, FDI, and fiscal expenditure at year t for city i, and the key independent variable is the (log) area of land sold in year $t-1$. We use the land sale in the last year to take into account the time lag for the land sale and the change in land usage, with the additional benefits of avoiding the simultaneous bias. X_{it} denotes other control variables such as (log) real GDP per

---

[13]Ideally, we should use investment price index to compute the real value of investment. However, China does not provide prefecture-level investment price index. Hence, we also use the GDP deflator for the fixed asset investment and FDI.

capita and population density, whereas α_i captures the city fixed effect, and dt denotes yearly fixed effect.

Given that β_1 is the elasticity of land sale on industrial output and fiscal expenditure; we expect the key coefficient $\beta_1 > 0$ for both hypotheses H1 and H2. This specification in Equation (1) is rather simple because it only captures the linear unconditional effect of land sale on industrial output and fiscal expenditure. First, people may wonder whether the marginal return to land sale decreases as the local government continues to sell more land. To capture this nonlinear effect, we include the quadratic terms of land sale. The second concern on this specification is that a significant spatial variation in regional economic difference exists, and thus we include the real GDP per capita and population density to control for the stage of economic development and market size. We also include province-year fixed effect to control for unobserved provincial time-varying factors such as provincial government policies. Third, the variables might be co-integrated because the regression also uses the time variation in the dependent and independent variables. To control for the common trend, we include a common quadratic trend in the regression. Finally, cities are connected with each other through inter-city trade and migration or spillover from their neighbors. Thus, we adopt the Driscoll-Kraay (1998) panel estimator to control for the cross-sectional dependence in the error term.

Table 2 reports the regression results on the effect of land sale on the industrial value added. We start with the panel fixed effect model with yearly fixed effect in column (1), and the result shows that the elasticity of industrial value added to land sale is approximately 1.7%, which is also statistically significant. Column (2) includes the quadratic term of land sale and its coefficient is not statistically different from zero. This result implies that the marginal return from land sale does not decrease, contradicting the common wisdom that local government sold too much land, and thus the return declined. Column (3) includes more control variables such as real GDP per capita, population density, and province-year pair dummy. Our result shows that the effect of the land sale on industrial output is robust with those additional controls. We also find that the industrial output is higher in richer cities, but not in populated area. Column (4) includes a common quadratic trend, and column (5) estimates the model by using the Driscoll-Kraay (1998) panel fixed effect estimator. Our results are not sensitive to the inclusion of trend and possible cross-sectional dependence.

In summary, Table 2 shows that the estimated elasticities of industrial output with respect to land sales across various specifications are very close, and thus robust at approximately 1.8%. In other words, if the land sale doubles, the industrial output will increase by 1.8%, which implies that real GDP will increase by approximately 0.77% because the average share of industrial output in total GDP is approximately 42.5%. Thus, this elasticity is also economically significant. In fact, this simple calculation tends to understate the total effect of land sale on total GDP because it does not consider the effect of land sale on other sectors. More specifically, if we use the sample average of industrial output in Table 1, the estimated elasticity implies that the industrial output would increase by RMB 237 (=exp(23.30)*0.018) million at constant 2011 level if the local government sells additional 1.6 square kilometers of land. In other words, one square kilometer of land sale could lead to an increase of RMB 148 million at constant 2011 level in industrial output on average, which is slightly less than half a percent of average real GDP across cities in the sample.

To further explore the channels for the positive effect of land sale by local government on the industrial output, we investigate two possibilities: the land sale decreases the cost of investment for domestic firms and foreign investors. We test whether land sales promote fixed asset investment and FDI. Table 3 presents the estimation results by adopting both the panel fixed effect model and the Driscoll-Kraay (1998) panel fixed effect estimator with controls for real GDP per capita, population density, common quadratic trend, and province-year pair dummy. The result shows that land sales do increase the fixed asset investment and FDI, and the elasticities of fixed asset investment and FDI with respect to land sales are relatively larger than those for industrial output. Quantitatively, if the land sale increases by 100%, then the fixed asset investment and FDI will increase by 4.5% and 7.8%, respectively. If the local government sells one additional square kilometer of land, then the fixed asset investment and FDI on average would increase by approximately RMB 327 million and RMB 20 million at constant 2011 level. Overall, we find evidence to support our first hypothesis: local government sells land to increase industrial output by boosting investment.

Next, we investigate the second hypothesis by exploring the effect of land sale on local government fiscal expenditure. We adopt the same specifications as that for the industrial output. The estimation results are presented in Table 4. Column (1) reports the simple panel fixed effect estimator and column (2) includes the quadratic term of land sale. Column (3) includes additional control variables and column (4) adds the common quadratic trend.

13

Column (5) re-estimates the model by using Driscoll-Kraay (1998) panel fixed effect estimator. All specifications consistently show that the land sale has a positive significant effect on local government fiscal expenditure. Using the estimates in column (5), the elasticity of fiscal expenditure with respect to land sale is approximately 1%. In other words, if the land sale doubles then the local government expenditure will increase by 1%. Thus, if the local government sells one additional square kilometer of land, the government fiscal expenditure will increase by approximately RMB 63 million at constant 2011 RMB on average. In addition, we also find that the government expenditure is higher in wealthy cities, but not in areas with large population. We also investigate the effect of land sale on government fiscal revenue. As expected, we find that more land sale does not lead to higher fiscal revenue.[14] This result implies that local government uses off-balance sheet land sale revenue to finance the expenditure demand on the balance sheet.

In summary, our empirical analysis supports the two hypotheses that the local government sells land to increase industrial output by boosting investment, and to improve their own fiscal capacity through off-balance sheet funds. Next, we further explore regional difference because the cities in the eastern provinces sold land more intensively.[15] Among those 332 cities with recorded land sales, 98 cities are in the eastern provinces, less than a third of total number of cities. However, the area of land sold in the eastern cities is 3.4 times of that in other cities on average. Coincidentally, the industrial output in the eastern cities is 3.6 times that in other cities. Thus, we include an interaction term between land sale and a dummy variable, indicating whether a city is located in the eastern provinces. The left panel in Table 5 presents the results for industrial output and fiscal expenditure.[16] The result shows that land sale in cities in the eastern provinces indeed has a large effect on industrial output, even with control of income difference. Quantitatively, one square kilometer of land sale in the non-eastern cities could increase the industrial output by approximately RMB 61 million, but it will increase the industrial output by approximately RMB 770 million in the eastern cities. The effect of land sale on fiscal expenditure seems to be only from the cities in the eastern

---

[14] We do not report the regression results for fiscal revenue in the paper, but these results are available upon request.

[15] The eastern provinces include Hebei, Liaoning, Jiangsu, Zhejiang, Fujian, Shandong, Guangdong, and Hainan provinces.

[16] The eastern dummy is also included but dropped automatically because of the city fixed effect.

provinces.[17] The coefficient of land sale itself becomes smaller and statistically insignificant once we include the interaction term. This result implies that selling land to enhance fiscal capacity may not be a feasible strategy for local government in the middle and western part of China.

Meanwhile, the sale price of land through agreement is cheaper than other market transactions such as bidding, listing, and auction. Between 2003 and 2007, the average price per square kilometer of land through agreement is approximately 70% lower than prices of those land sold through listing and 15% lower than those by sold through bidding and auction. Therefore, we wonder whether the transaction modes also matter. In particular, if local government aims to stimulate industrial output growth by boosting investment, then they might sell land at a lower price by mutual agreement. However, if they want to enhance fiscal capacity by collecting more sales revenues from the land, then they might prefer other transaction modes. To test this possibility, we include the quantity share of land sale through agreement in the basic specification. The right panel of Table 5 presents the results.[18] One caveat to this approach is that the data of land sale by transaction modes are available only after 2002, and thus our sample becomes smaller. However, we find that land sale through agreement does have extra positive effect on the industrial output, but it is puzzling that it also increases the fiscal expenditure more significantly than other transaction modes, although the extra effect is smaller. One possible explanation is the increasing tax revenue from the industrial sector as a result of land sale with low price, which in turn improves the fiscal capacity of local government. Admittedly, we would have obtained a better analysis if we have disaggregated data of land sold for different purposes such as for industry, residential, commercial, and service uses. However, this type of information is not available at prefecture-level until 2010.

To summarize, our empirical findings are largely consistent with the hypotheses that local government sells land to promote industrialization and enhance their fiscal capacity. One omission of this analysis is the fiscal revenue because the budget fiscal revenue does not

---

[17] We do not include the quadratic term of land sale because its estimated coefficients are insignificant and close to zero in all previous specifications.

[18] We use the quantity share defined as the ratio of the frequency of land sale through agreement in total number of transaction rather than the area share, which might better capture the institutional rigidity for different transaction modes. From the data we also observe that the frequencies of different transaction modes are relatively more stable than their shares in total area of land sale. In addition, the area of sold land is more likely to be manipulated by the local government due to different concerns on the business cycle and housing price.

contain the land sales revenue. Thus, future research should devote to the construction of the fiscal balance sheet for the public sector (not only local government) that includes land sales revenue. Meanwhile, this paper only studies the temporary effect of land sales on industrial output and fiscal capacity. To explore the dynamic effects is also interesting if a panel with longer period is available in the future. Thus, time series econometric method such as panel vector autoregressive regression can be applied.

4. Conclusion

This paper presents a novel perspective, that is, state capitalism on the land sale in China, to help us understand the "institutional trinity" of Chinese land market. The combination of state ownership, economic performance-based political promotion, and the unbalanced fiscal structure granted the local government with monopoly power on land management and impulse to sell land for industrialization and fiscal enhancement. We also test the two derived hypotheses on the motivation of the government to sell land to promote industrial growth and enhance government fiscal capacity by using the prefecture-level data covering approximately 330 municipalities from 1999–2007. Our findings largely support the two hypotheses. Moreover, the marginal return from land sales does not decline. However, the positive effects of land sales are larger in the eastern provinces than in other regions (if any). Our quantitative results on the elasticities of land sale on industrial value added and fiscal expenditure are also useful for policy analysis.

REFERENCE

Alder, S., L. Shao and F. Zilibotti (2013) "The Effect of Economic Reform and Industrial Policy in a Panel of Chinese Cities", SSRN Working Paper Series.

Cao, G., F. Yuan and R. Tao (2007) "Land Finance, Industrial Structure Changes and Rapid Tax Revenue Growth in China", *China Industrial Economy*, 13-21.

Caselli, F. and J. Feyrer (2007) "The Marginal Product of Capital", *Quarterly Journal of Economics* 122(2), 535-568.

Chow, G. and L. Niu (2015) "Housing prices in urban China as determined by demand and supply." *Pacific Economic Review* 20(1), 1-16.

Driscoll, J. C. and A. C. Kraay (1998) "Consistent Covariance Matrix Estimation with Spatially Dependent Panel Data", *Review of Economics and Statistics* 80.4, 549-560.

He, D., Z. Zhang, and W. Zhang. "How large will be the effect of China's fiscal stimulus package on output and employment?" *Pacific Economic Review* 14.5 (2009): 730-744.

Li, X., X. Liu and Y. Wang (2014) "A Model of China's State Capitalism", SSRN Working Paper Series.

Li, H. and L.-A. Zhou (2005) "Political Turnover and Economic Performance: the Incentive Role of Personnel Control in China", *Journal of Public Economics* 89.9, 1743-1762.

Liang, R. (2009) "Promotion Incentives, Departmental Interests and Land Lawbreaking under Fiscal Decentralization," *China Economic Quarterly,* 283-306.

Lichtenberg, E. and C. Ding (2009) "Local Officials as Land Developers: Urban Spatial Expansion in China", *Journal of Urban Economics* 66, 57–64.

Li, K., J. Whitwell, and S. Yao (2005) "A growth model for China's special economic zone." *Pacific Economic Review* 10.4 439-449.

Ministry of Housing and Urban-Rural Development, *China Urban Construction Statistical Yearbook. 2001–12,* Beijing: China Planning Press.

Sheng, L. and D. Yang (2014) "Expanding Export Variety: The Role of Institutional Reforms in Developing Countries", IZA Discussion Paper No. 7611.

The World Bank and Development Research Center of the State Council, the People's Republic of China (PRC) (2014) *Urban China Toward Efficient, Inclusive and Sustainable Urbanization,* Washington DC: the World Bank.

Wang, J. (2013) "The Economic Impact of Special Economic Zones: Evidence from Chinese Municipalities", *Journal of Development Economics* 101, 133-147.

Wang, Z. and S. J. Wei (2010) "What Accounts for the Rising Sophistication of China's Exports?" *China's Growing Role in World Trade,* University of Chicago Press, 63-104.

Zhai, N. and G. Xiang (2007) "An Analysis of China's Current Land Acquisition System and Policy Implications", *China Administration* 3.

Zhang, X., T. D. Mount and R. N. Boisvert (2004) "Industrialization, Urbanization and Land Use in China", *Journal of Chinese Economic and Business Studies* 2.3, 207-224.

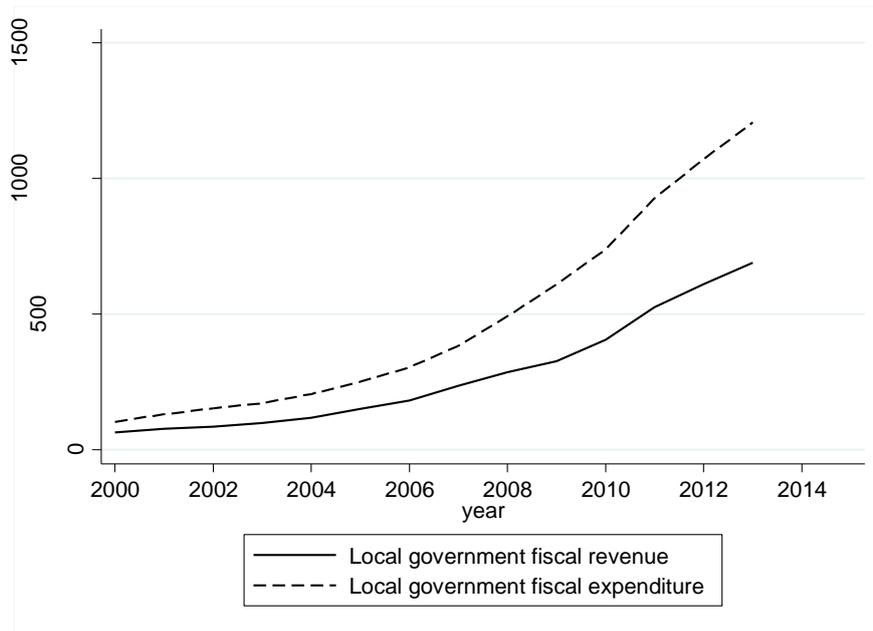Figure 1A Trend of Land Sales and Industrial Value Added
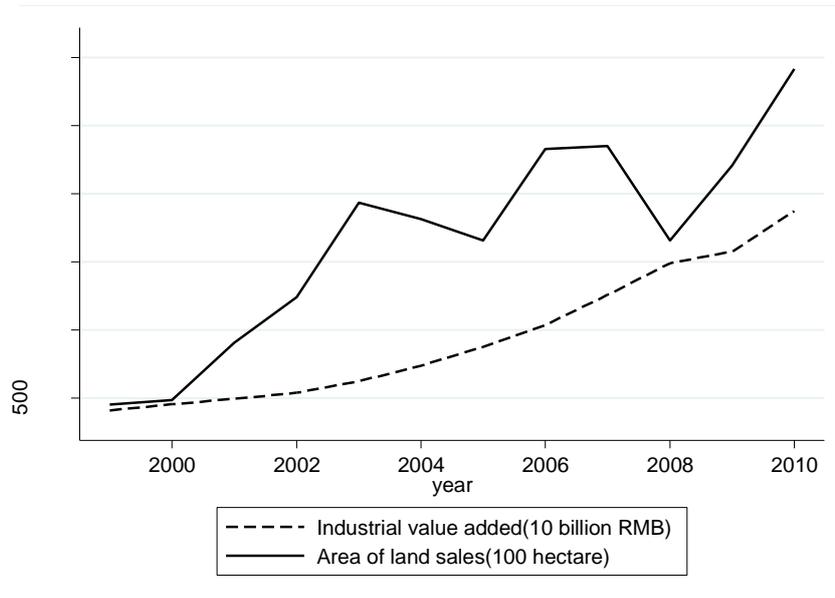
Data source: *China Land and Resources Statistical Yearbook, 2000–2008*, and *China Statistical Yearbook for Regional Economy* and *China City Statistical Yearbook, 2000–2008*. The figure is compiled by the authors. This figure shows an increasing trend for both industrial value added and land sales. The sharp decline in 2008 is possibly due to the economic crisis.

Figure 1B Industrial Value Added and Land Sales
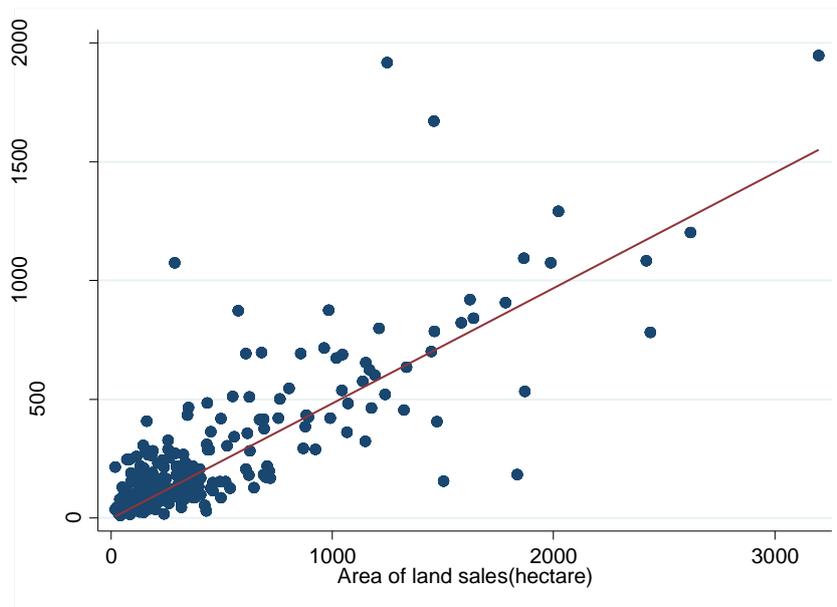
Data source: *China Land and Resources Statistical Yearbook, 2000–2008*, *China Statistical Yearbook for Regional Economy*, and *China City Statistical Yearbook, 2000–2008*. The figure is compiled by the authors, and each dot represents a city. The figure shows a positive correlation between the average industrial value added and land sales.

Figure 2A Trend of Fiscal Revenue and Fiscal Expenditure

Data source: *China Statistical Yearbook 2001–2014*. It suggests that fiscal revenue, expenditure and deficit are increasing during the sample period.
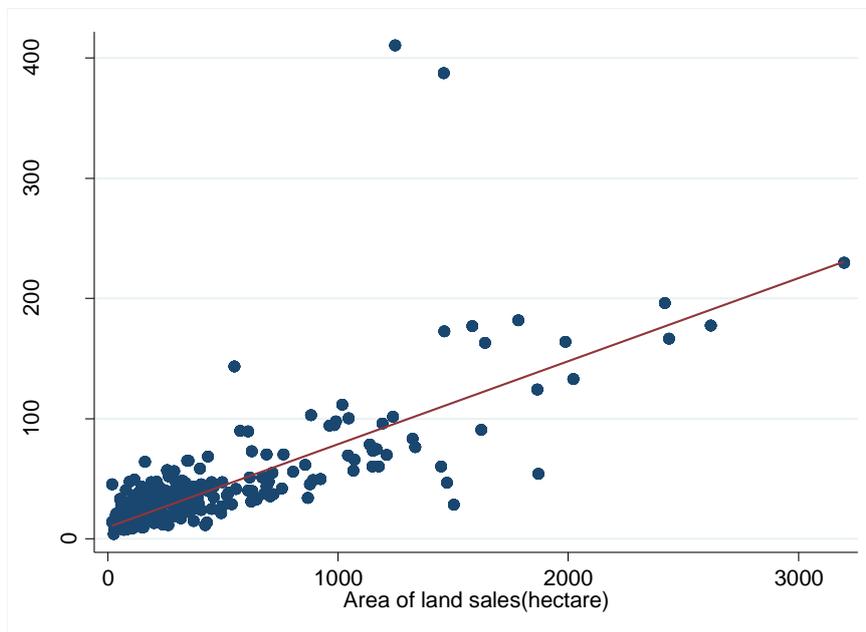
Figure 2B Land Sales and Fiscal Expenditure

Data source: *China Land and Resources Statistical Yearbook, 2000–2008*, *China Statistical Yearbook for Regional Economy*, and *China City Statistical Yearbook, 2000–2008*. The figure is compiled by the authors. Each dot represents a city, and it shows a positive relationship between average fiscal expenditure and land sales over the sample period.

Figure 3A Industrial Value Added and Agreement Land Sales
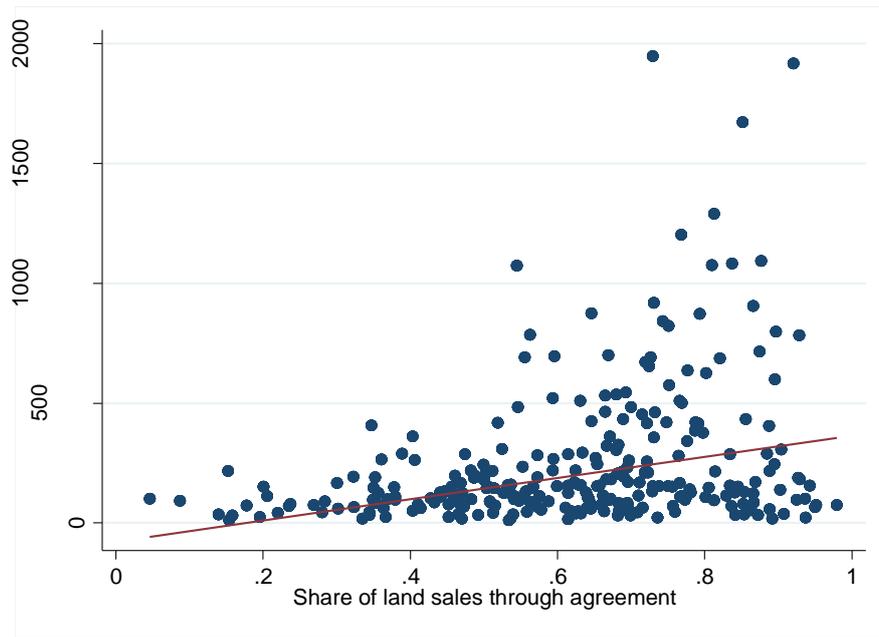
Data source: *China Land and Resources Statistical Yearbook, 2000–2008*, and *China Statistical Yearbook for Regional Economy* and *China City Statistical Yearbook, 2000–2008*. The figure is compiled by the authors. Each dot represents a city, and it shows a positive relationship between the average industrial value added and land sales during the sample period.

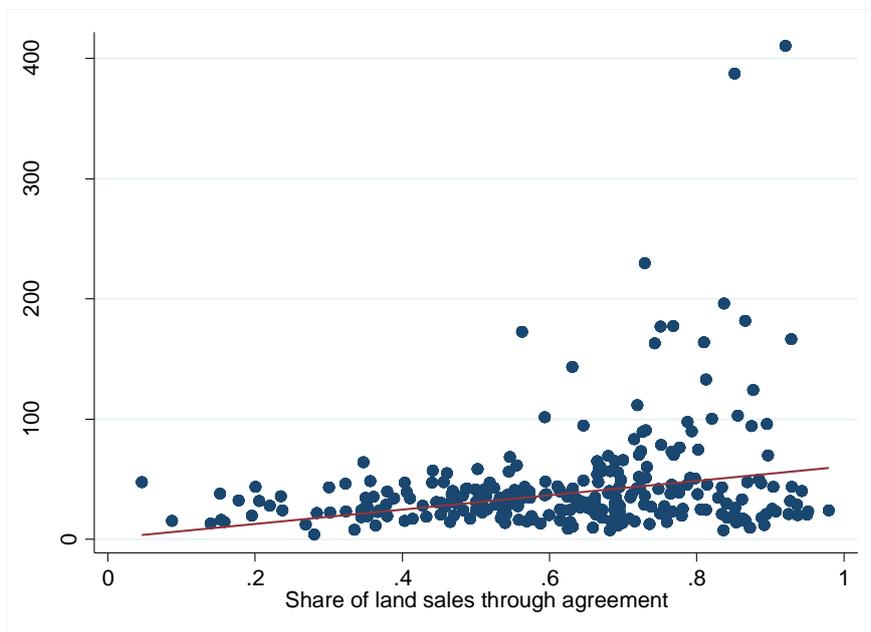## Figure 3B Fiscal Expenditure and Agreement Land Sales

Data source: *China Land and Resources Statistical Yearbook, 2000–2008*, and *China Statistical Yearbook for Regional Economy* and *China City Statistical Yearbook, 2000–2008*. The figure is compiled by the authors. Each dot represents a city, and it shows a positive relationship between the average industrial value added and land sales through agreement during the sample period.

Table 1: Summary Statistics

Variables	Obs	Number of cities	Mean	Std. Dev.	Min	Max
Ln(land sale)	2702	332	0.47	1.55	-7.42	4.51
Ln(industry value added)	2883	332	23.30	1.27	18.22	26.75
Ln(fixed asset investment)	2932	333	23.18	1.15	18.79	26.38
Ln(FDI)	2693	320	19.84	2.05	7.92	25.02
Ln(fiscal expenditure)	2963	331	21.67	0.89	18.75	25.01
Ln(real GDP per capita)	2997	333	4.71	0.04	4.51	4.91
Ln(population density)	2074	274	0.42	0.40	0.00	11.56

Table 2: The Effect of Land Sale on Industrial Value Added

Independent variables	Ln(industrial value added)				
	(1)	(2)	(3)	(4)	(5)
Ln(land sale)(t-1)	0.017***	0.015***	0.018***	0.018***	0.018**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.006)
Ln(land sale) square (t-1)		-0.002	-0.001	-0.001	-0.001
		(0.002)	(0.001)	(0.001)	(0.001)
Ln(real GDP per capita)t			0.487*	0.487*	0.487***
			(0.271)	(0.271)	(0.098)
Ln(population density)t			0.006	0.006	0.006
			(0.010)	(0.010)	(0.004)
Year fixed effect	+	+			
Province-year pair fixed effect			+	+	+
Common quadratic trend				+	+
Observations	2,331	2,331	1,786	1,786	1,786
Within group R-squared	0.895	0.895	0.953	0.953	0.953
Number of cities	329	329	274	274	274

Note the columns (1) to (4) adopt panel fixed effect estimation method and the robust standard errors are reported in parentheses. The column (5) uses Driscoll and Kraay fixed effect estimator to control for cross–sectional dependence. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 3: The Effect of Land Sale on Investment and FDI

Independent variables	Ln(fixed asset investment)		Ln(FDI)	
	Panel fixed effect	Driscoll and Kraay	Panel fixed effect	Driscoll and Kraay
	(1)	(2)	(3)	(4)
Ln(land sale)$_{(t-1)}$	0.046***	0.045***	0.078**	0.078*
	(0.011)	(0.006)	(0.031)	(0.034)
Ln(land sale) square $_{(t-1)}$	0.004	0.003	-0.007	-0.007
	(0.003)	(0.001)	(0.008)	(0.005)
Ln(real GDP per capita)$_t$	0.759*	0.989***	1.646	1.646*
	(0.390)	(0.122)	(1.060)	(0.820)
Ln(population density)$_t$	-0.011	-0.005	-0.058***	-0.058***
	(0.018)	(0.006)	(0.015)	(0.011)
Common quadratic trend	+	+	+	+
Province-year pair fixed effect	+	+	+	+
Observations	1,811	1,811	1,755	1,755
Within group R-squared	0.925	0.925	0.475	0.475
Number of cities	274	274	270	270

Standard errors are in parentheses, and the panel fixed effect estimators use robust option to control for misspecification in error terms. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 4: The Effect of Land Sale on Fiscal Expenditure

Independent variables	Ln(fiscal expenditure)				
	(1)	(2)	(3)	(4)	(5)
Ln(land sale)$_{(t-1)}$	0.008**	0.009**	0.010*	0.010*	0.010*
	(0.004)	(0.004)	(0.005)	(0.005)	(0.004)
Ln(land sale) square $_{(t-1)}$		0.000	-0.000	-0.000	-0.000
		(0.001)	(0.002)	(0.002)	(0.001)
Ln(real GDP per capita)$_t$			0.416**	0.416**	0.416*
			(0.183)	(0.183)	(0.178)
Ln(population density)$_t$			-0.004	-0.004	-0.004*
			(0.004)	(0.004)	(0.002)
Year fixed effect	+	+			
Province-year pair fixed effect			+	+	+
Common quadratic trend				+	+
Observations	2,362	2,362	1,803	1,803	1,803
Within group R-squared	0.936	0.936	0.967	0.967	0.967
Number of cities	329	329	272	272	272

Note the columns (1) to (4) adopt panel fixed effect estimation method and the robust standard errors are reported in parentheses. The column (5) uses Driscoll and Kraay fixed effect estimator to control for cross–sectional dependence. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

Table 5: The Differential Effects of Land Sale across Regions and Sale Modes

	Regions		Sale modes	
	Ln(ind. VA)	Ln(fiscal exp.)	Ln(ind VA)	Ln(fiscal exp.)
Independent variables	(1)	(2)	(3)	(4)
Ln(land sale)$_{(t-1)}$	0.011*	0.005	0.015*	0.010**
	(0.005)	(0.004)	(0.006)	(0.003)
Ln(land sale)$_{(t-1)}$*Eastern dummy	0.027**	0.016*		
	(0.011)	(0.008)		
The quantity share of land sale through agreement$_{(t-1)}$			0.065**	0.035***
			(0.016)	(0.005)
Ln(real GDP per capita)$_t$	0.463***	0.399*	0.324**	-0.024
	(0.083)	(0.178)	(0.080)	(0.117)
Ln(population density)$_t$	0.006	-0.004*	-0.303	-0.130
	(0.004)	(0.002)	(0.179)	(0.217)
Common quadratic trend	+	+	+	+
Province-year pair fixed effect	+	+	+	+
Observations	1,786	1,803	1,050	1,048
R-squared	0.953	0.967	0.924	0.969
Number of cities	274	272	274	272

Note: we use Driscoll and Kraay fixed effect estimator to control for possible cross-section dependence in error terms. Standard errors are in parentheses, *** $p<0.01$, ** $p<0.05$, * $p<0.1$.