Article

Empirical Analysis of the Driving Factors of China's 'Land Finance' Mechanism Using Soft Budget Constraint Theory and the PLS-SEM Model

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Received: 22 December 2018; Accepted: 26 January 2019; Published: 31 January 2019

Abstract: “Land finance” refers to the key fiscal strategy in which local governments in China generate revenue through land grant premiums and land tax revenues. A burgeoning body of literature has focused on the driving factors of China’s land finance from different aspects including fiscal decentralization, revenue decentralization, competition among local governments, land marketization, infrastructure development, and economic development. However, little research has provided a comprehensive perspective integrating social, economic and institutional aspects to investigate the driving forces of these unique and profound issues in China. This study aims to investigate the driving factors and working mechanism of land finance. A theoretical and empirical model was proposed using soft budget constraint theory and least squares structural equation modeling (PLS-SEM). The panel data of 35 Chinese major cities were assessed between 2006 and 2015. The empirical results contend the following: (1) the land transfer and fiscal systems provide the key impetus for land financing because the land transfer system forms a stable modality, and the fiscal system is an important incentive for land financing; (2) the effects of the economic development and political system are insignificant; and (3) the political and land systems significantly influence economic development. Our contributions focus on two aspects. Firstly, a comprehensive framework of factors germane to land finance is constructed. Secondly, a new research methodology for land use study is proposed. To the best of our knowledge, the current study is the first to employ the PLS-SEM method to delineate and verify the influence paths between multiple driving factors and land finance in different cities. Hence, research reliability can be improved.

Keywords: land finance; driving factors; soft budget constraint theory; fiscal system; local governments; PLS-SEM

1. Introduction

In recent years, local governments in China have heavily relied on land conveyance fees, also known as “land finance” [1]. Several studies consider land finance as an umbrella concept, which encompasses land-related taxes, land-leasing revenues, and land-as-collateral borrowings. The discussion on land finance in this study, however, will be confined to the most crucial category of local nonbudgetary funds (i.e., the land conveyance fee) to distinguish land finance from formal

budgetary public finance. Moreover, land finance is distinct from land-as-collateral borrowings because such borrowings are essentially local debts. China's unique development model where local governments employ land collection, land development, and land transfer has set in the "riddle of the growth in China's land finance," thereby generating significant research interest. Land-centered development is the most obvious feature of urbanization in China, and land finance is the key factor to connect land resources and region development. China's land finance is similar to that of foreign land value capture in essence, both of which are the process by which local government obtains the land value-added income through the implementation of the land financial function. However, the land finance of China is rooted in its special land system and financial system; the government obtains land income for several years by monopolizing the land property right at one time, which mostly happens in the part of land transfer.

In 1994, a new set of reform measures (tax-sharing reform) was introduced by China, which redivided the fiscal and tax revenues between the central and local governments, but it also led to a substantial decline in the proportion of the local government's fiscal revenue to the State's total fiscal revenue since the intergovernmental authority and expenditure responsibility were still the same [2]. As a result, the proportion of China's local fiscal revenue to the country's fiscal revenue plummeted from 77.98% in 1993 to 44.3% in 1994, whereas the proportion of transaction expenditure dropped only by 2% from 71.74% to 69.72% (China Statistical Yearbook, 1994). Pressured by high expenditures, local governments were forced to explore new sources of revenue. At the same time, local governments have monopolistic power in the supply of land under China's special land transfer system [3]; they are authorized to manage the supply of land for construction and sequester peasants' land at a low price for public interest. Thus, local governments are usually inclined to sell industrial land at a low price to attract investment to drive economic development, bring industrial tax revenue, and sell commercial and residential land at a high price for maximum land income, and efforts to gain new sources of fiscal income from the land market became the focus of the local governments at all levels. This emphasis on fiscal income contributed to an inexorable growth of fiscal revenue generated by local governments through land sales and related taxes as China's economy and urbanization underwent rapid development. The ratio of the local government's financial expenditures to fiscal revenue from land soared from 5.7% in 1999 to 23.4% in 2015, thereby indicating the growing reliance of the local government on land finance (Figure 1).

Figure 1. China's land finance income and expenditure and the correlation (1999–2015) (units: 100 million CNY). Source: China Statistical Yearbook (1998–2016).

The local government's focus on the land transaction market guaranteed profits from land appreciation and generated sufficient revenue. Meanwhile, land resources are also distributed through

an administrative arrangement, whereby low-cost land is granted for industrial use, whereas high-cost land is given for commercial use and housing. Such an arrangement led to China's rapid development of low-cost industrialization and the long-term prosperity of the real estate market [4]. However, the social and economic concerns triggered by this seemingly reasonable model are not negligible. Therefore, the issue of land finance as a special financial and economic phenomenon during China's social and economic transition and the local governments' behavior is more than just a mere economic issue. It is also a political problem related to State governance. It is a legal concern pertaining to the governments' legitimacy and other complicated social maladies, including heavy reliance on real estate and the disproportionately large share of the tertiary sector (i.e., "industry hollowing"). Therefore, improving land finance is essentially a comprehensive reform involving China's land transfer, fiscal, and legal systems, and the transformation of government functions because these aspects are highly intertwined.

Numerous empirical studies have been conducted on the driving forces and the internal mechanism of land finance. Most of the studies focused on specific or isolated perspectives, such as fiscal incentives [5], decentralization [6], political economy [7], competition between local governments [1], and the land system [8,9]. Generally, research providing a holistic account by integrating social, economic, and institutional aspects into land finance investigation is lacking. Therefore, the current study integrates the land system, fiscal system, economic factors, and political elements to construct a theoretical model that provides a systematic explanation for the factors that influence China's land finance using soft budget constraint theory. On the basis of soft budget theory, the PLS-SEM model is used to analyze the panel data of 35 cities in China from 2006–2015, thereby empirically dissecting the influencing factors and interaction mechanisms of land finance. PLS-SEM allows measurement errors between dependent and independent variables and can also estimate the relationship between factor structure and factors simultaneously. Thus, it is suitable for the complex analysis of the land finance in China. The results will provide a relatively comprehensive framework regarding research germane to China's land finance. The framework will act as an important reference for future studies on optimizing China's land fiscal system and promoting sustainable socioeconomic development.

The rest of the paper is structured as follows. Section 2 presents the review of existing studies. Section 3 discusses the theoretical framework and hypotheses. Section 4 deals with the research method and data. Section 5 tackles the empirical results. Section 6 concludes the paper. Policy recommendations for optimizing China's land financial system are also listed in accordance with the empirical findings of this study.

2. Literature Review

The era of social transformation in China saw the emergence of land finance at its beginning; land finance had been crucial in tackling the fiscal deficit of the local governments, industrial stimulation, urbanization, and local economic progress [10]. Therefore, land finance stimulates an increasing academic interest. In the context of China's special land and fiscal systems, land has become the most important asset of local governments [11]. It has also become an important financing vehicle to China's economy with the commercialization of housing and the marketization of land [1]. Land transactions, therefore, are considered the means by which local governments overcame their resource crunch and acquired solid financial support for infrastructure development [12]. Thus, land finance drove urbanization in China and ushered in many diverse models for urban expansion [13,14]. However, economic growth triggered by land finance is unsustainable because it is confined by limited land resources and by the externality of land finance [15]. Local governments tend to carry out economic activities using land sales revenues, which are likely to set an unfavorable trend of local economic development. The local governments must expropriate land from village collectives during which time nonstandard procedures and unfair distribution of land through value-added benefits can exert a tremendous negative influence on social stability. The reduction of farmland caused by the rapid

development of land urbanization also threatens national food security [16]. Additionally, the influence of land finance on the environment cannot be ignored. The debris and waste generated during construction activities for the expansion of cities are commonly dumped into the suburbs, thereby causing considerable damage to the landscape and environment. The situation is not optimistic in the city either. The local governments are in pursuit of maximizing land lease revenue, which curtails the availability of public green spaces [16,17]. In terms of business, land finance has the greatest influence on the real estate market; it statistically affects the total value of commercial buildings on the market [18]. On top of that, the econometric model shows that the overall effect of land financing is likely to increase the business cycle fluctuations by 12.6% [10].

The contributing factors to land finance and its mechanisms have also been studied to some degree. In regard to the formation mechanism and influencing factors of land finance, existing research focuses on finance, politics, and socioeconomics. The varying fiscal capacities of governments at all levels, transfer dependency, revenue decentralization, and expenditure decentralization, have great influence on land finance [19]. Moreover, their influence on local fiscal deficits is significant [18]. The main reason why local governments choose land finance via fiscal decentralization is to meet their political objectives and economic development. The second reason is that local governments can easily obtain additional budgetary revenue from land sale [1]. Moreover, the reliance of local governments on land finance is largely influenced by external fiscal compulsions, such as expenditure decentralization in a province. As the degree of expenditure decentralization increases, the dependence of local government on land finance heightens [7]. Politically, several scholars think that land finance is a strategy adopted by local governments to contest the reorganization of the central-local power equation brought about by the 1994 tax-sharing scheme [20]. The land price difference between urban and rural areas caused by China's split land ownership system and land use regulations definitely provide an opportunity for local governments to access a new fiscal revenue stream [19]. Since the implementation of the reform and opening up policy, the shift to the performance-based cadre evaluation and mobility system has driven local leaders to promote their careers by conducting large-scale and visible projects during their tenure to demonstrate their achievements [21]. Thus, land has become the focus of attention. With its capability to increase local GDP growth, land finance is praised by local officials to varying degrees, thereby making party secretaries' tenure and time to retirement important to land finance [22]. Furthermore, the intense competition amongst local governments also contributes to the widespread preference for land finance [7]. From the perspective of land itself, land marketization in China is a top-down process, and land finance promoted by the municipal government is a vital part of it [13]. Furthermore, the rapid urbanization of China, accompanied by massive urban expansion, has diverted substantial cultivated land for urban development. Moreover, the government has been able to obtain huge additional budgetary revenue through the low-cost acquisition of land [23]. Economically, most of China's urban GDP is driven by land. Land can serve as collateral and help the local government bring in capital and borrow from banks to promote infrastructure development [20]. GDP growth also further affects the use of land [19]. For instance, the regional industrial structure can directly affect the local structure of land use allocation [1,13]. Land finance is influenced by many factors. Hence, we consider the indicators presented in previous studies.

In terms of research methods, the provincial panel data with a long-term series were frequently used in previous studies, which are determined by the macro-characteristics of land finance. Econometric analysis is most common in the literature. Econometric models, such as the panel smooth transition regression model [18], two-stage least squares estimation, and many other regression models, are used to explore the relationship amongst land finance and fiscal, political, socioeconomic, demographic, or geographic factors [1]. Several studies have combined theoretical and spatial analysis to explore the dynamics of land use from a spatial perspective and to analyze the role of land finance in the process [24]. However, the formation of land finance is usually influenced by many factors operating at the same time. The traditional regression model cannot avoid the interference of multiple collinearity amongst the influencing factors. Therefore, a quantitative analysis model suitable for

multidimensional and inter-related variables is needed. The PLS-SEM model uses the multivariate statistical approach, which can meet the aforementioned requirements. It can relax the demand for sample sizes and reflect the mutual influence of each element in the model [25]. However, it has never been used in the field of land finance. Hence, the application of the PLS-SEM model in this research is innovative.

In sum, existing research on land finance mainly pertains to land finance's causes, effects, and policy recommendations. Regression analysis is adopted to assess the relationship between individual factors and land finance. However, few aforementioned studies have provided a comprehensive perspective integrating social, economic, and institutional elements. Land finance, as a special financial economic phenomenon and government approach in the process of China's socioeconomic transformation, provides complicated correlations with various aspects in the economy, society, and politics. Therefore, probing into this issue entails a comprehensive analysis. The PLS-SEM model, which features multivariate interactive analysis, and soft budget theory are employed in this study to integrate the land system, fiscal system, and economic development to construct a comprehensive system of influencing factors and perform an in-depth study of the mechanism of fiscal growth through land.

3. Theoretical Framework and Hypothesis Development

3.1. Theoretical Underpinnings

Soft budget constraint theory (SBC) was initially proposed by Kornai in 1980. Kornai (1980) [26] argued that an organization's expenditure must be matched with its income; otherwise, the organization could not make ends meet, which leads to deficit. Moreover, the organization's limits on liquidity, solvency, or debt set a ceiling for the sustainability of the fiscal deficit. If no other organization can provide support to cover the deficit, then an organization must reduce or even stop its activities. However, it can survive if one or more organizations are willing to participate in helping make up its budget. Thus, it will be subject to soft budget constraints. Furthermore, Kornai summarizes the five common types of soft budget constraints: corporate sector, banks and other financial intermediaries, nonprofit organizations, local governments, and soft budget constraints at the national level (see Figure 2). Since 1980, soft budget constraint theory has become an important analytical concept and theoretical approach in explaining the socialist planned economy and the behavior of its enterprises. Under the planned economic system, the soft budget behavior of local governments at all levels is prominent. It is often reflected as a bottom-up acquisition of resources. When local governments are in debt and unable to repay, the central government generally helps them break through budgetary revenues and obtain additional budgetary resources. In China, scholars have affirmed that, in the administrative reform of the 1990s, the central government attempted to harden the budgets of lower level governments through administrative responsibility, income, and expenditure diversion and linking fiscal appropriation and revenue. However, the poor final results have led to the local governments' tendency to grab resources from the top down. Local governments with fiscal off-budget income are restricted by the government at a higher level through administrative means or at a lower level through grabbing of public resources. These public resources include fees to companies and individuals outside the formal tax, or all surtaxes through various political pressure, or the exchange relationship between the area of the enterprise or other entity unit record to the government advocated by a project or other public facilities. Moreover, superior government use of part of the money as bait to encourage government at a lower level or unit using various methods to collect and complete a project are included. This type of organizational behavior is called the "reverse soft budget constraint" phenomenon [27]. Although the effect of soft budget constraint is opposite that of reverse soft budget constraint and the affected groups are different, the consequence is the same, which is also the institutional defect of government expenditure expansion.

Figure 2. Soft budget constraint theory. Source: drawn by the authors based on the literature review.

The mechanism of soft budget constraint behavior is a hot research topic. Two main research ideas exist in this regard. Firstly, the occurrence of soft budget constraint behavior is mainly influenced by specific exogenous variables, such as paternalism [28], political objectives, property rights, and rent seeking [29]. Secondly, on the basis of game theory and information economics, soft budget constraint behavior is considered an endogenous variable, which assumes that the problem is mainly due to the nonconsistency of time and asymmetric information [30,31].

At the institutional level, the existing research mainly focuses on fiscal decentralization and the political system. Moesen and Cauwenberge (2000) synthesized data from 19 OECD countries (1990–1992) to analyze hard budget constraints empirically in comparison with soft budget systems. They concluded that the actual level of public output and the amount of idle resources under hard budget constraints are lower than those under soft budget systems. In fiscal decentralization, local governments tend to enlarge the organizational budget through borrowing and then easily trigger soft budget constraint behavior [32]. Upon conducting a case study in China, Liu (2012) corroborated that fiscal decentralization has stimulated local government officials to borrow illicitly, seek windfall profits, obtain rent from land, make external donations, and perform other soft budget constraints. At the political level, existing research holds that politicians' demand for political promotion is closely related to soft budget constraints [33]. Tjerbo and Hageon (2009) observed that soft budget constraints meet the short-term interest-seeking needs of political bureaucrats; hence, governments tend to use this behavior to obtain additional political benefits during the election period [34]. Qian and Roland (1998) conceived of a federal structure as a three-level hierarchy and argued that federalism can help to harden budget constraints through regional competition with the assumption that governments are in pursuit of maximizing welfare. Therefore, soft budget constraint theory forms an appropriate theoretical underpinning to understand the contributing factors and mechanism of China's land financing.

3.2. Hypotheses

According to the studies conducted by local and international scholars on land finance and the relationships between contributing factors (Table 1), the economic development, fiscal system, land system, and political system have a positive effect on land finance. Meanwhile, land and political systems have a positive effect on economic development. Therefore, several hypotheses are proposed in this study.

Table 1. Summary of the existing empirical studies on the relationships.

Reference	Countries	Periods	Methodologies	Causality Relationship
[23]	China	1999–2005	Panel data analysis	Land system correlates positively with land finance
[8]	China	1999–2008	Panel data analysis	
[35]	China	2009–2013	Spatial analysis	
[7]	China	1999–2009	Econometric models	
[8]	China	1994–2007	Panel data analysis	Land system correlates positively with economic development
[9]	China	2013	Econometric models	
[19]	China	1999–2009	Fixed effects models and random effects models	Economic development correlates positively with land finance
[13]	China	1999–2010	Panel data analysis	
[36]	China	1999–2009	Econometric models	
[37]	China	2005–2008	Local spatial statistic	
[1]	China	1999–2008	Econometric models	Political system correlates positively with land finance
[19]	China	1999–2009	Panel data analysis	
[7]	China	1999–2009	Econometric models	
[24]	China	2001–2010	Spatial analysis	
[38]	China	1990–2006	Econometric models	
[5]	China	1980–2006	Regression analysis	Political system correlates positively with economic development
[39]	Russia and China	2000–2015	Contrastive analysis	
[40]	China	1990–2012	Econometric models	
[41]	China	1986–2002	Fixed survey	
[42]	Asia	in the late 1980s	Contrastive analysis	
[24]	China	2001–2010	Spatial analysis	
[38]	China	1990–2006	Econometric models	
[1]	China	1999–2008	Econometric models	Fiscal system correlates positively with land finance
[19]	China	1999–2009	Panel data analysis	
[35]	China	2009–2013	Spatial analysis	
[7]	China	1999–2009	Econometric models	
[6]	China	1982–1992	Econometric models	
[43]	China	2013	Second Generation Fiscal Federalism theoretical model	

3.3. Several Hypotheses on Land Financing are Proposed for Testing Based on SBC Theory

Hypothesis 1: Economic development, which is usually measured by a stylized list of indicators such as urbanization level, GDP, tertiary industry ratio, secondary industry ratio, and population density, has a positive effect on the level of land finance.

China is now experiencing urbanization at an unprecedented speed and scale [44]. This rapid development is usually accompanied by extensive urban land expansion that is characterized by the excessive conversion of rural land for urban use in the context of China's dual land system [1]. With the establishment of a market economy system, China's public land leasing was introduced in 1980 and piloted in Shenzhen. It then spread all over the country in 1992. It provides institutional impetus for local governments to seek additional budgetary income through land resources and laid the foundation of the system of land finance [23]. Moreover, economic development has improved the living standards of people so greatly that they have surplus money. Given their traditional beliefs, Chinese citizens tend to spend surplus funds on home ownership or investment, thereby pouring substantial money into the real estate industry which led to a surge in land prices. The huge profits in the process have further stimulated the government's land sales, thereby increasing focus on land finance [18].

Hypothesis 2: The fiscal system, which is assumed to be closely related to budgetary revenue, transfer dependency, revenue decentralization, expenditure decentralization, and fiscal deficits, has a positive effect on land finance.

The 1994 tax reform only redistributed fiscal revenues between the central and local governments. However, no corresponding change occurred in the responsibilities of government with respect to authority and expenditure. When the local government is burdened with excessive expenditure commitments under limited revenue, it has no choice but to choose land finance to meet its financial

needs and operation [19]. Local governments that are more dependent on the central government's fiscal transfer for expenditure are likely to rely on land conveyance fees. As the level of decentralization of provincial government expenditure increases, the likelihood to depend on land finance escalates. By contrast, as the level of decentralization of income decreases, or the worse the fiscal capacity of local governments is, municipalities can easily rely on land finance revenue [7].

Hypothesis 3: The land system, which is usually characterized by real estate investment, land marketization level, and per capita cultivated land area, has a positive effect on land finance.

China's Constitution clearly stipulates that "urban land belongs to the State." Thus, the right to earnings through ownership of urban land property should rest with the government. Furthermore, the main source of land finance is the land conveyance fees. Such fees refer to the land rent collected by the State for a certain number of years through transferring the right to use of State-owned land to the land user as landowner. Thus, the government's land finance is reasonable and legal under the institutional arrangement of urban land State ownership [45]. In addition, the city undergoes expansion continuously with the development of urbanization. Natural differences in land prices exist between urban and rural areas given the background of China's land requisition and public leasing system. Hence, the government can obtain land from farmers through low-cost land expropriation, which becomes the fundamental mode of land finance [23].

Hypothesis 4: The land system has a positive effect on economic development.

Land is the spatial carrier of all socioeconomic activities, including land tenure, the land use system, and a range of other institutional systems. All of these activities are the main factors that affect land use and economic development. In capitalist cities, the importance of land to economic development and the change of urban spatial structure have attracted research interest to a small extent. Several scholars believe that postwar urban expansion and suburbanization are the result of capital transfer from commodity production to building environment in response to over-accumulation crises. Fiscal policies, legal restriction of private rights to use urban land, and direct undertaking of development programs are the three main strategies currently used by capitalist countries for land. As a socialist country, China's land and capital reform are the two major factors that affect its transition from a planned economy to a market economy. In China, land resources are transferred from central control to lower levels of governments to make the extraction of land revenue a major driver of urban development, especially infrastructure construction related to land development [46].

Hypothesis 5: The political system, which is mainly manifested in terms of competition amongst local governments and party secretaries' tenure and their distance to retirement age, has a positive effect on land finance.

The political system is the most impactful variable of government behavior. Under China's political system, party secretaries are the top-ranking officials (*yi ba shou*, or first-in-command), whose tenure and retirement age along with the competition amongst local governments are closely related to land finance. The new leadership is unlikely to adopt aggressive actions on land finance. However, as a leader's stay in office increases, his or her inclination to use land finance to attract foreign investment or encourage industrial development escalates. It is reasonable that, during a stable tour of service, local elites are inclined to promote the development of the industrial economy to receive sustainable tax revenue. Similarly, officials who are farther from retirement are eager to promote the development of the local economy and thus achieve early promotion [33]. Therefore, using the variables of party secretaries' distance to retirement age and competition between local governments is reasonable to represent the situation of the political system. Specific reasons are elaborated in the paper as follows. (1) Party secretaries' distance to retirement age: China's regulations on the appointment of local cadres clearly require the age, seniority, and academic qualifications of leading cadres. Therefore, the age of officials significantly affects their promotion prospects [19]. In reality, Chinese governments have a "ceiling phenomenon" in the promotion process. As officials approach retirement age, their promotion space decreases. Therefore, the government will reduce its efforts to reduce its land finance behavior. (2) Competition between local governments: The central government implements the local

performance evaluation system mainly based on economic growth rates, thereby resulting in fierce promotion amongst local government officials around local economic development. However, after the reform of the tax distribution system in 1994, the fiscal power has moved up whilst political voice has gone down [22]. The local governments are faced with great financial pressure. Thus, obtaining substantial short-term budgetary funds to develop the regional economy becomes difficult. Therefore, they can only rely on the help of off-budget funds. In addition, local governments have to turn their attention to land finance and obtain substantial off-budget income through land transfer such that they have enough capital to participate in the promotion competition of the government, thereby resulting in the growth of land finance.

Hypothesis 6: The political system has a positive effect on economic development.

In a socialist market economy with Chinese characteristics, the macro-control of the government plays a vital role in the economy. Thus, the political factors can have great influence on economic development. Current studies mostly focus on the relationship between the local economic development level and the individual leader. Generally speaking, the stronger the leaders are, the higher the level of local economic development will be [47]. Moreover, the incumbents can manipulate fiscal and monetary policies to inflate short-term economic performance in the run-up to the elections to win popular support, thereby influencing the political business cycle [48,49]. In addition, the GDP of the official's location is considered by the central government an important criterion for the promotion of local officials; hence, they must focus on the regional economic development to be promoted [21]. Meanwhile, competition between local governments is mainly reflected in the efforts made to improve the infrastructure and facilities. Thus, local political competition can easily turn into economic power competition [1].

A research model is established on the basis of the abovementioned hypotheses (see Figure 3). It shows that the economic development, fiscal system, land system, and political system have a positive effect on land finance. Meanwhile, land and political systems have a positive effect on economic development.

Figure 3. Driving factors in land finance and the model of the corresponding mechanism.

4. Data and Research Method

4.1. Indicator

On the basis of the previous discussion, the additional budget income (consisting of tax surcharges and user fees levied by central and local government's agencies, as well as earnings from state-owned enterprises, which are not subject to State financial management and do not have to be shared with the central government) of the local government is concluded to be one of the important forms of local governments' soft budget constraint. Under China's tax-sharing system, land leasing revenue is allotted to the local government. This revenue provides the government with substantial additional budgetary resources and eliminates the practical binding effect of the size of the budget set by the higher authorities on organizational behavior. Thus, the motives, ways, and methods of land finance share similar characteristics of budget softening. Thus, this study uses the institutional elements of

soft budget theory whilst combining the previous relevant factors to study the land finance problem. It then constructs partial least squares structural equation modeling PLS-SEM to analyze the factors influencing land finance systematically by adding fiscal and political elements.

4.1.1. Endogenous Indicators

Land finance: Land finance is a special financial phenomenon in the context of the decentralization of central and local finance in China [19]. When the central and local governments' financial and administrative powers are unbalanced, local governments will try to find ways to increase their own extra-budgetary funds to maintain fiscal balance [18]. Hence, land resources become local governments' main object of dependence due to China's split land ownership and land use regulation. Therefore, land-related transactions become the main source of extra-budgetary funds [24]. As such, the so-called land finance has been formed. Therefore, the current study uses annual land leasing revenue by province as the main indicator of land finance, which is also widely utilized in other studies [1,19,24].

4.1.2. Exogenous Indicators

On the basis of the land finance literature, this study selects typical land system and economic development level indicators. It adds fiscal and political indicators of soft budget constraint theory as the main independent indicators. The relationship between exogenous and endogenous indicators is then systematically analyzed through the PLS-SEM model. The testing of the relevant hypothesis is completed to explore the influence of land finance and its mechanisms.

On the basis of a review of local and international research, this paper proposes four driving factors and their corresponding indicators (see Table 2).

Table 2. Indicator evaluation system.

Category	Indicators	Explanations	Ref.
Political system	Party secretaries' tenure	Party secretaries' accumulated time in office (in months by the end of that year)	[19,21,22]
	Party secretaries' distance to retirement age	Legal retirement age minus party secretaries' age	[19,49]
	Competition amongst local governments	Use per capita foreign direct investment (FDI) to measure the degree of competition amongst local governments	[1,7,22]
Fiscal system	Budgetary revenue	General budget revenues of local governments, State-controlled funds under budget management	[1,19,35]
	Transfer dependency	Percentage of fiscal transfer from upper-level government in local budgetary expenditure	[7,19]
	Revenue decentralization	Budgetary revenue share of sub-provincial governments in a province (measured at the provincial level)	[1,7,35]
	Expenditure decentralization	Budgetary expenditure share of sub-provincial governments in a province (measured at the provincial level)	[19,35]
	Fiscal deficits	Gap between fiscal expenditure and fiscal revenue	[22,37]
Land system	Real estate investment	Annual investment in land development projects	[19,35]
	Land marketization level	Measures the weight of each transaction type by the relative land price and then calculates the degree of marketization of the land market (%; the higher the value, the higher the degree of marketization is)	[22,37,50]
	Cultivated land	Per capita cultivated land area	[19,35]
Economic development	Urbanization level	Percentage of nonagricultural population in the total population	[1,13,35]
	GDP	Measure of the economic development level	[19,22,37]
	Tertiary industry ratio	Percentage of tertiary industry output in GDP	[19]
	Secondary industry ratio	Percentage of secondary industry output in GDP	[13,19]
	Population density	Number of residential population per km ² of land area	[19,23,35]

4.2. Data Source

In 2002, the Ministry of Land and Resources promulgated the Provisions on the Transfer of State-owned Land Use Rights by Bidding, Auction and Listing (zhaobiao paimai guapai churang guoyoutudi shiyongquan guidiing). This provision clearly stipulates that the subject of land transfer can only be handled by the municipal and county governments. Given the availability of data, this study was conducted in 35 major cities in China. The samples from 2006–2015 were selected for analysis.

On the basis of the data availability and regional differences, the current study selected 35 major cities that are the most typical cities in China, where the land finance problem is outstanding. These cities can exert far-reaching influence on the local political and economic pattern and even the whole national political and economic pattern. Thus, they are the ideal research objects in terms of the land financial problem, thereby endowing the entire study with great practical significance.

Specifically, the data of tenure and retirement age of top-ranking officials were compiled according to the city leaders' resume database on the official website of People's Daily, Military and Political Online Network and other official websites. The competition amongst local governments (as measured by per capita foreign direct investment), real-estate investment, fiscal revenue and expenditure, transfer payments from the central government, GDP, industrial structure, and the data of urbanization were all collated from the China City Statistical Yearbook (zhongguo chengshi tongji nianjian). Moreover, land leasing revenue, the quantity of land transferred by bidding, auction, listing, assignment, and negotiation were obtained from China Land and Resource Almanac (zhongguo guotu ziyuan nianjian).

4.3. Research Method

As an approach to building up the causal relationship networks, PLS-SEM primarily aims to maximize the explained variance of the dependent latent constructs with smaller abnormal sets of samples [51]. The fundamental PLS-SEM algorithm consists of two phases that synthesize the estimation of latent constructs' scores and calculation of final estimates of path coefficients in the final structural model. The feasibility and validity of the application of PLS-SEM to models synthesizing a comparatively compact sample size are disputable. Nevertheless, multidimensional studies have contributed to the consensus that PLS-SEM attains better statistical capability compared with the covariance-based SEM (CB-SEM) approach [52]. Given that the PLS-SEM algorithm transforms abnormal data in adherence to the central limit theorem, the results exhibit high robustness and consistency, even if the dataset is uneven.

The results from the PLS-SEM models entail interpretation by two steps: validity and reliability testing and assessment of the relationships based on the path coefficients. Validity and reliability testing are evaluations through the examination of the individual loadings of latent factors for internal composite reliability and discriminant validity [53]. After adjusting the model items and accepting the ultimate model, the interconnections between the independent latent variables and dependent variables are appraised in accordance with standardized beta estimates as the path coefficients. This is followed by the examination of the plausibility of the proposed hypotheses with these path coefficients [54]. PLS-SEM is thus essentially a way to establish models based on regression and to analyze path models through a component-based technique [51,55]. Thus, the explained variance of the endogenous latent variables is maximized by estimating partial model relationships in an iterative sequence of ordinary least squares (OLS) regressions [56].

The aim of constructing a PLS-SEM model herein is to assess the influence of key factors influencing land finance in China. The cause of the formation of land finance is complex, and it is the result of multiple variables' comprehensive action. In comparison with the traditional regression analysis, the structural equation model can deal with multiple dependent variables simultaneously. It allows measurement errors between dependent and independent variables. It can also estimate the relationship between factor structure and factors simultaneously. Thus, it is suitable for the complex analysis of the land finance in China. PLS-SEM is chosen for the following reasons. Firstly, PLS-SEM

is distinct from CB-SEM, where the input data must fit in a multivariate normal distribution, which means less demand on normal distribution and empowerment to obtain the estimated latent variable scores via parameter estimation [25]. Secondly, PLS-SEM outperforms CB-SEM due to it being flexible when a single measurement construct is utilized [51]. Thirdly, PLS-SEM outscores CB-SEM in its extraordinary suitability in predictive research [57]. The result of this study is expected to serve as a projection of factors that influence land finance.

5. Results and Discussion

5.1. External Examination of the Model

To guarantee the reliability of the model for examining the hypotheses, external model checking was conducted through average variance extracted (AVE). In statistics (classical test theory), AVE is a measure of the amount of variance that is captured by a construct in relation to the amount of variance due to measurement errors. Its value is normal if it is over 0.5. Thus, more than 50% of the variance of the observed variables is utilized. By this standard, seven indicators in Table 3 are expelled. Figure 4 exhibits the constructed model.

Table 3. Average variance extracted test.

	Economic Development	Fiscal System	Land System	Political System
Urbanization level	0.559			
GDP	0.921			
Tertiary industry ratio	0.504			
Secondary industry ratio	−0.087			
Population density	0.787			
Budgetary revenue		0.901		
Transfer dependency		−0.418		
Revenue decentralization		0.92		
Expenditure decentralization		0.741		
Fiscal deficits		0.001		
Per capita cultivated land area			0.034	
Real estate investment			0.989	
Land marketization level			−0.215	
Party secretaries' tenure				0.082
Party secretaries' distance to retirement age				−0.47
Competition between local governments				0.929

Figure 4. Model specifications.

5.2. Internal Examination of the Model

The goodness-of-fit test of the PLS-SEM model was tested via reliability and validity tests, including indices, such as AVE, Cronbach's alpha, and composite reliability.

The reliability test includes the internal consistency and composite reliability [58]. The former is tested using Cronbach's alpha value. In general exploratory research, values over 0.6 indicate significance. The latter is the test of significant difference amongst the means of the samples, which reflect the consistency of the internal indicators of the latent variables. It is commonly tested via the composite reliability (CR) value, and it is deemed significant if the value is over 0.7. Table 4 exhibits that Cronbach's alpha is higher than 0.6 and that the CR value is also greater than 0.7. Thus, the measurement model has a relatively high reliability.

Table 4. Convergent validity.

	Cronbach's Alpha	rho_A	Composite Reliability (CR)	Average Variance Extracted (AVE)
Economic development	0.687	0.989	0.796	0.509
Fiscal system	0.839	0.913	0.899	0.75
Land system	1	1	1	1
Land finance	1	1	1	1
Political system	1	1	1	1

The validity test in the PLS model consists of convergence and discriminant validity, which are primarily based on the AVE test. Fornell and Larker (1981) corroborated that 0.5 is the critical criterion for AVE [58]. Table 4 shows that the research data satisfied the above criterion. Thus, linear equivalence exists between the observed and the latent variables in which the observed variables can appropriately explain the latent variables. The model's discriminant validity test achieved by the cross-loading analysis of the latent variables was primarily used to determine the degree of difference amongst latent variables [59]. Table 5 shows that the figures on one of the diagonal lines are the square root of AVE's value and that the others are the correlation coefficient of each level of variable. If the value shown in the diagonal line is larger than the value of the correlation coefficient in the horizontal column or the vertical column, then they are characterized with discriminant validity. Table 5 shows that the value of the square root of AVE is higher than the value of the correlation coefficient amongst these factors and other factors. Hence, variables at each level should be different primary variables with discriminant validity. The proposed formula functions well because all the statistics in this study pass the reliability and validity tests.

Table 5. Discriminant validity.

	Economic Development	Fiscal System	Land System	Land Finance	Political System
Economic development	0.914				
Fiscal system	0.824	0.866			
Land system	0.69	0.75	1		
Land finance	0.639	0.723	0.83	1	
Political system	0.554	0.418	0.276	0.3	1

5.3. Results and Analysis

The calculations based on the proposed model provide the path coefficients of the latent variables and the corresponding significance (Figure 5). The results of the calculation can be directly used to examine the hypotheses.

Figure 5. Path coefficient.

Figures 5 and 6 show that the results obtained from the model support the four hypotheses mentioned above (H2, H3, H4, and H6). In addition, the political and land systems have a significant positive influence on economic development (H4 and H6). However, the roles of the political system and economic development are insignificant. The details are as follows.

Figure 6. Significance of the coefficients. Note: The numbers in the figure are the value of t . The arrows with a cross mean fail to pass the t -test, whereas the others support the original hypotheses.

5.3.1. Economic Development Has an Insignificant Influence on Land Finance

The path coefficient between economic development and land finance was -0.038 , which is of low relevance; therefore, H1 cannot pass the significance test; that is to say, the level of economic development has no significant impact on land finance. Theoretically speaking, economic development is an important influencing factor of the regional environment that has a certain influence on land finance. However, according to the results from our model, the influence of economic development on land finance is insignificant. This is mainly because of the certain order between economic development and land finance. Land finance is a means to achieve economic development [24],

which is in accordance with the existing research that land finance is more of a “driving effect” than a “spillover effect”, for a low land price to sell industrial land to attract investment to develop the manufacturing industry [60]. Therefore, its stimulus effect on land finance may not be significant. However, the relationship between economic development and land finance still needs to be further explored, since it is also possible that the indicator of economic development can only manifest an effect when linked to other indicators that have not been considered in this research.

5.3.2. The Fiscal System Has a Significant Positive Correlation with Land Finance

The path coefficient of the fiscal taxation system and land finance was 0.238. Hence, H2 is valid, that is the fiscal tax system has a significant positive correlation with land finance. This result can be attributed to the fact that, in the process of gradual reforms in China, the conflict between the fiscal autonomy restricted by the central tax-sharing system reform and the decentralization of the market economy has put local governments under enormous financial pressure [45]. Although the financial transfer payment system was established to adjust the financial disparities between different regions and different levels of government, meeting the local government’s expenditure needs remains difficult. Particularly, under the circumstances of high-speed urbanization and intensifying regional competition, rapidly expanding demand for capital expenditure has exacerbated the predicament of local governments. With the declining autonomy in fiscal revenue and tightened budget regulations, the land resources at the disposal of local governments have proven to be the most effective and feasible path to obtain off-budget revenues and make up for the deficit [18]. In addition, owing to tax-sharing reform, local governments’ sources of tax revenue have shrunk remarkably. Agricultural and animal husbandry taxes have been abrogated, and agricultural-related taxes have been eliminated. In addition, individual and corporate income taxes are shared by the central and local governments in a 6:4 ratio. Currently, the main types of local taxes are business taxes mostly gained from construction businesses and the real estate sector. The rest of the building, contract, land value-added, and urban land use taxes are mostly paid by land developers and real estate proprietors. Thus, local governments can obtain a remarkable amount of land transaction fees and various associated tax revenues from those developers [1]. The mechanism pumps strong institutional incentive in local governments to expand their budgets through land finance. Hence, China’s current fiscal system is the direct cause of land finance behavior and a key factor in prompting the transformation of local government’s land finance behavior from spontaneous to self-conscious.

5.3.3. The Land System Correlates Positively and Significantly with Land Finance

The path coefficient of the land system and land finance was 0.667, with the *t*-test being significant. Thus, H3 is valid, that is the land system has a significant positive correlation with land finance. The existing ownership system guarantees the legality of land fiscal revenue. Urban land is in State possession, whereas township and county governments are entitled with the power to transfer the use of land. Thus, consideration, or revenue from land transfer, is realized by the local government when land users need access to land. Therefore, the essence of land transfer revenue is the reasonable and legal realization of land ownership by economic means [45]. China’s Constitution, land management law, and other related regulations stipulate clearly that “the State may, for the needs of the public interest, expropriate or requisition land in accordance with the law and provide compensation”. Land transfer is the governments’ extension of State-owned land under the dual urban-rural land system. It provides policy sanction to compensate for the inadequacy of limited urban stock and to maintain revenue from land for a certain period of time [23]. In addition, under China’s current land management system, the land’s supply end is monopolized by the government. The development of the market economy has led the urban land market to become increasingly mature, and land prices and land transactions have continued to develop, especially in the 1980s. After the emergence of the real estate market, land was used as the basis of real estate, and its transaction prices continued to be coordinated with the market. Therefore, the trend of the simultaneous rise in transaction prices with

real estate growth occurred. Under the government's monopoly of land supply and the circumstance that the demand side determines the market price, the revenue from land transfer continued to increase, thereby boosting land finance further.

5.3.4. The Land Systems Bears Significant Positive Correlation with Economic Development

The path coefficient between land system and economic development was 0.581, which is significant as indicated by the *t*-test. Therefore, H4 is valid, and the land system has proven to have a significant positive correlation with economic development. The land system provides capital accumulation for economic development. As one of the main factors of production, land can be directly put into production to create value. In addition, given the influence of land market reform, land can be used as an important financial tool to attract foreign investment; it can also be used as collateral for a bank loan [18]. The land system makes local governments the only legal supplier of non-agricultural construction land. Local governments attracted investment development of the manufacturing industry by selling industrial land at a low price and obtaining financial revenue by selling commercial residential land at high price to form capital accumulation; hence, they can invest in infrastructure construction to drive local economic development further [7]. The practice has been to capitalize on land as a factor of production in the process, which is a key element for the accumulation of capital for urbanization in China and a major driver of China's rapid economic growth. Last but not least, land is one of the core elements of economic development. The land transfer system by bidding, auction, and listing marks the development of the land market. Moreover, the development of the market of elements is the foundation of China's market-oriented economic development. Hence, it is conducive to the improvement of economic efficiency and development level [61].

5.3.5. The Political System Has an Insignificant Influence on Land Finance

The path coefficient between the political system and land finance was 0.037. Hence, the correlation is low. H5 fails to pass the significance test, that is the political system has no significant effect on land finance. The political system is an important component of regional environment with theoretically positive influence on land finance. However, according to the results from our model, the influence of the political system on land finance is insignificant. Various factors are at play. Firstly, no direct causal relationship exists between this variable and land finance itself. Secondly, the multivariate analysis using the PLS-SEM model in the research validates that the relationship between the political system and land finance is generated when other variables are involved. Last, but not least, this study only analyzed the relationship between the political system and land finance based on three indicators: the tenure of officials, the retirement time of party secretaries, and local government competition. Such an analysis is different from existing studies, thereby resulting in inconsistency with the research hypothesis. Thus, differences may exist from the case where only these three indicators are considered. Hence, the relationship amongst the political system and land finance is worthy of further exploration.

5.3.6. The Political System Has a Significant Positive Impact on Economic Development

The path coefficient between the political system and economic development was 0.394, which means H6 is valid, and the political system can truly exert a positive impact on economic development. This is mainly because the official assessment system and intergovernmental competition inherent in the State political system provide the main impetus for regional economic development. Local officials are assessed with reference to their economic achievements in China's political system, and the competition amongst local governments is the fundamental driving force for regional economic development, which has been practiced since the 1980s. Therefore, economic growth as a looming issue has directly affected the promotion of local officials [27] and has intensified competition amongst local government officials who are in pursuit of promotion [62]. Local governments, supported by

soft budgets, proceeded to increase investment in infrastructure improvement and enhanced revenue through the soft environment, which has brought about huge progress in economic growth [45].

6. Conclusions

Most of the existing studies focused on a limited number of factors. They lack a comprehensive framework for the theoretical analysis of the system. The present study, which is based on soft budget constraint theory, integrates the land system, fiscal system, economic factors, and political elements to formulate a theoretical model to give a systematic interpretation of the factors that influence China's land finance. Meanwhile, the PLS-SEM model is adopted to analyze the panel data of 35 major cities in China from 2006–2015 to investigate the driving factors and the interaction mechanism of land finance. Our results lead to the following findings:

(1) The fiscal and land systems are still in the formative stage and follow progress in land finance because the fiscal and land systems can exert a positive effect on land finance. For the promotion of regional economic development, local governments need additional financial support; the special dual land and land management systems can exactly provide a reasonable source of funds [1]. Thus, local governments use the land resources under administrative jurisdiction to obtain final funds from the social subjects, such as banks, government-invested companies, and private or public enterprises, amongst others. If a local debt crisis emerges, then the central government will immediately provide financial support to local governments to maintain social stability [63]. Thus, soft budget constraints from the central to the local exist side by side with reverse soft budget constraints from the local government to the society.

These studies propose several important policy recommendations to improve land and fiscal systems. Firstly, governments should improve the land expropriation system, narrow the scope of land acquisition, standardize the land expropriation procedures, and prevent the abuse of the governments' land expropriation rights. Secondly, governments should be aware of the truth that the market-oriented reform of the land transfer model is an important institutional basis for local governments to leverage land finance. However, the key to break down local governments' dependence on land finance is to reform the government-led land revenue distribution mechanism. Such a reform may further improve the mechanism of land transfer income distribution and support the decisive role of the market mechanism in land transfer income distribution. Moreover, adjusting and deepening the reform of fiscal and taxation systems, increasing the vertical transfer payments by the central government to local governments, delineating further the spending responsibilities of the central and local governments, and establishing a system of administrative powers that matches fiscal rights are all vital.

Identifying how to reposition the roles of different levels of government is a fundamental issue to improve the sustainable development of the land market. The central authority and the local governments actually follow a principal-agent relationship. However, against the current backdrop of fiscal and administrative decentralizations, the principal-agent relationship usually leads to deviated or even inconsistent goals between the central and local governments, which undermines the effects of implementing policy. The central government should shoulder the role of policy maker and supervisor to rectify the deviation and form an effective principal-agent relationship. By contrast, local governments should play the role of policy executive or innovative explorer. Moreover, constructing a public participation platform and mechanism is important. Therefore, a "stable triangle" amongst the central government, local governments, and the public is established to rectify the abnormality of aggressive land finance.

(2) The economic development and the political system exert weaker influence on land finance. These two factors were the vital composites of land finance in previous studies. However, the PLS-SEM model analysis in this study reveals that their influence on land finance is insignificant. Thus, land finance as the spinoff of multiple factors bears trivial, if any, correlation with the two variables. Such correlation is formed with intermediate variables. Local government elites in China are not only "economic participants," but also "political participants." They are usually highly concerned with

political promotion and benefits. Promotion gives local government officials a strong incentive to promote local economic development [64]. Therefore, under the strict control of the central government in the reform of the tax distribution system, local governments acquire economic capital accumulation through land transfer. Therefore, land transfer may be the reason why the economic development factors have no significant influence on land finance. This study takes the first use of the AVE test to get rid of insignificant indicators. In the AVE test, party secretaries' tenure and party secretaries' distance to retirement age are eliminated. Therefore, only a political system factor index is measured by the competition between local governments, which is different from the existing research indicators. Thus, the political system to land finance cannot be adequately measured, thereby breaking away from the study's hypothesis. However, such an argument is yet to be evident, and further exploration is required.

(3) The political and land systems are crucial in driving China's economic boom. China is a typical socialist state, whose economic development is closely related to national institutions and economic achievement and is fundamental in assessing officials. Thus, competition amongst local governments for higher GDP is fierce. Hence, the intrinsic incentive for local economic development is sufficient. Furthermore, the land transfer system with Chinese characteristics generates resources for economic development through transforming land resources into real capital, which has enabled China's fast accumulation of capital, thereby underpinning development in later phases.

The innovations of the paper include the following aspects. (1) For research perspectives, this study constructs a comprehensive framework of factors germane to land finance, including economic, institutional, and political factors. (2) For research methods, this study is the first to use the PLS-SEM method to delineate and verify the influence paths between multiple influencing factors and land finance in different cities. In comparison with the traditional regression analysis, the structural equation model can deal with multiple dependent variables simultaneously and allow measurement errors between dependent and independent variables. It can also estimate the relationship between factor structure and factors simultaneously. Thus, it is suitable for the complex analysis of the land finance in China. (3) Empirical findings revealed that land finance is jointly determined by various factors. For instance, the fiscal and land systems have a significant positive relationship with land finance. A combination of policy instruments is better than single policy in its use to settle the abnormality of land finance. Particularly, the reform and development of the fiscal and land systems should be coordinated. Specifically, the focus of the land system reform should be the consummations of the land expropriation system and the market-oriented reform of land transfer. In addition, the emphasis of the fiscal system reform is to ensure fiscal rights match administrative powers and remain unaffected by the central government.

Finally, several limitations of this study should be acknowledged. Although this research performs a systematic study of the land finance in China, it did not compare the dominant factors of land finance in different areas, which is important to the government's local policies and can provide reference for China's land finance transformation. In addition, this study only provides a general idea to alleviate the land finance problems in China. However, the concrete policy proposals must be studied further in the light of economics, politics, geography, and other disciplines. The research limitation of this study can provide ideas for future scholars to continue studying the land finance problem in the future. What is more, major cities are defined as 35 regional economic centers in China, including four municipalities directly under the Central Government of Beijing, Tianjin, Shanghai, and Chongqing, 26 provincial capitals (capitals), and five specific plan-oriented cities. However, due to the small number of samples, the research findings and conclusion cannot be generalized to other cities in China. Due to the vast territory of China and great regional heterogeneity, the direct generalization of the conclusions may lead to contaminated or misleading findings in other Chinese cities. For future study, it is an important and promising research theme to investigate the driving forces and working mechanisms of land finance in all 297 prefecture-level cities in China.

Author Contributions: Conceptualization, X.Z.; Data curation, Y.L. and C.D.; Formal analysis, Y.L.; Investigation, S.Z.; Methodology, Y.W.

Funding: This research was funded by [MOE (Ministry of Education in China) Liberal Arts and Social Sciences Foundation] grant number [17YJA630149], [Fundamental Research Funds for the Central Universities] grant number [2018B20814], and [China National Social Sciences Fund] grant number [15CGL077].

Conflicts of Interest: The authors declare no conflict of interest.

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