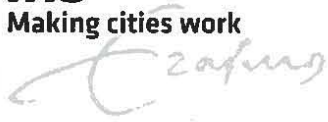


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Thesis

Land Value Capture through Market-oriented Public Land Leasing: The
Case Study for Metro System Finance in Changsha City, China

Sisi Nie, China

Supervisor: Dr. Paul Rabé

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Summary

This research mainly focus on the studies of land values capture instrument, namely, public land leasing. Particularly, this research conducted under the circumstance of China, which we introduced a market-oriented land leasing mechanism called bidding, auction and listing leasing system. In the past decades, local government generates revenue from land to finance infrastructure implementation. With respect of bidding, auction and listing approaches, compare with the past land dispose methods, it made considerable land revenue. This research intended to figure out land market with different land transfer method in Changsha city. More significantly, to testified the high profitable and effective of bidding, auction and listing leasing approaches. Besides, in terms of social perspective, the metro system establishment will be select for interpret the land value appreciate by infrastructure and land revenue feedback for metro construction. This research is a descriptive research, which intended to comprehend the land value capture concept in the real operation, to find how of market-oriented public land leasing performed in Changsha city and analysis and summarize its merits and demerits.

Due to the data collection and analysis, there are three major findings or conclusions. Firstly, bidding, auction and listing leasing approaches abide by the market rules and generate more revenue than other means, besides, it reflect the real relationship of land supply and demand. Secondly, land value can be affect by metro implementation, which precisely matches the notion from land value capture that government sharing the incremental land value for public goods, which is a feasible circle for this progress. Because of metro produced land appreciation. Thirdly, land revenue is adequate for current metro construction, however, for long-term metro project, land revenue has its own shortage and need financing diversification. In summary, although bidding, auction and listing mechanism have certain imperfection attribute to many reason, however, it perform fair enough as a land value capture instrument to generate revenue and financing for initial part(2 metro lines) for metro system finance in Changsha city.

Key words

Land value capture; Bidding, auction and listing leasing approaches; Land value variation; Metro system construction finance.

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Abbreviations

IHS	Institute for Housing and Urban Development
LVC	Land Value Capture
SPSS	Statistical Package for Social Science
USD	United State Dollar
CNY	China Yuan
CBD	Central Business District
FAR	Floor Area Ratio
VAT	Value Add Tax
CIT	Corporate Income Tax
PPP	Public and Private Partnership

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◆ Chapter 1. Introduction

1.1. Background

1.1.1. City context

Changsha city is the capital of Hunan Province which located in central south of China. It is the second large metropolis area in the central area of China. Since 2007, the central government authorized the special policy to accelerating the development at multi-dimension in this region. Specifically, Changsha with the other two cities, namely Zhuzhou and Xiangtan (which two are geographically neighboring with similar economic capacity and structure), consist an urban integration process. Moreover, this city group has been selected to conducting the national resource-saving and environment-friendly society comprehensive reform.

The research area focuses on the capital city of Hunan Province, namely, Changsha city. As the capital of Hunan province, and due to the urban integration project, Changsha have tremendous requirement of urbanization. Considerable infrastructure need to be realized for economic growth and investment attraction. Meanwhile, the city also needs to enhance resident's living standard. Municipality disposes land through land leasing to generate revenue for infrastructure implementation. City's basic information listed in the following table.

TABLE 1. BASIC INFORMATION ABOUT CITY CHANGSHA

Total Area	11,800 square kilometers
Urban Area	1938 square kilometers
Population	7.04 million(2010)
Population with Hukou	6.51 million(2010)
Resident population	4.10 million(2010)
GDP	640 billion Yuan(2012)
Urban average disposal income	22814 Yuan
Rural average disposal income	11206 Yuan

* A hukou is a record in the system of household registration required by law in the People's Republic of China (mainland China)

*Exchange rate: 1USD=6.2855CNY (2012)¹

1.1.2. Policy context

The People Republic of China was founded in 1949, since then, we were implementing long-term planned economy until around 1980's. Land as a significant asset of the city, all

¹ All the price and value are transformed from Chinese currency Yuan (CNY) into American currency dollar (USD), and the exchange rate is 1USD=6.2855CNY, this rate issued in 31st Dec. 2012.

urban land belongs to the state and farmlands are collectively owned by the peasants, government take full responsibility of the land resource distribution. The distribution depends on the requirement of land for certain use without payment. Actually, in 1982, the Constitution law still points out that any organization or individual cannot occupy, trade, lease or transfer land by any other method. This type of land disposal approach named as administrative allocation, and Professor Deng point out the characteristics of this land disposal method as a Three No system, which means "no payment, no time limit and no transfer right" (Deng, 2003). This kind of system creates many issues such as the ownership problem, inflexibility of land use, absence of land market etc. More importantly, it generates no revenue for municipality etc. In 1986, the promulgation and implementation of Law of Land Management established the public land leasing approach for land disposal. In May, 1990, *The Provisional regulation of urban state-owned land use right grant and transfer* legalized public land leasing. In 2002, the announcement of *The Provisions of bidding, auction and listing to lease state-owned land use rights* started this market-oriented public land leasing mechanism.

Implementation Measures of Hunan Province state-owned land use right leasing and transfer (revision, 30th December 1997) set the legal framework for public land leasing in Hunan Province. Then, *the Provisions of Bidding, auction and listing to lease state-owned land use rights* established in Hunan Province at 1st July 2002, and the revision released at 1st November 2007, which built the foundation of the operation of land market. Since 2002, many laws associate with land issue start introduced, including *The Hunan Province land market Administration Measures (1st March, 2005)*, *The Announcement of Hunan Provincial People's Government economical and intensive land use promotion (2007)* etc. Moreover, the urban land use planning and other national special policy (the urban integration project) base on the conditions of public land leasing regulations.

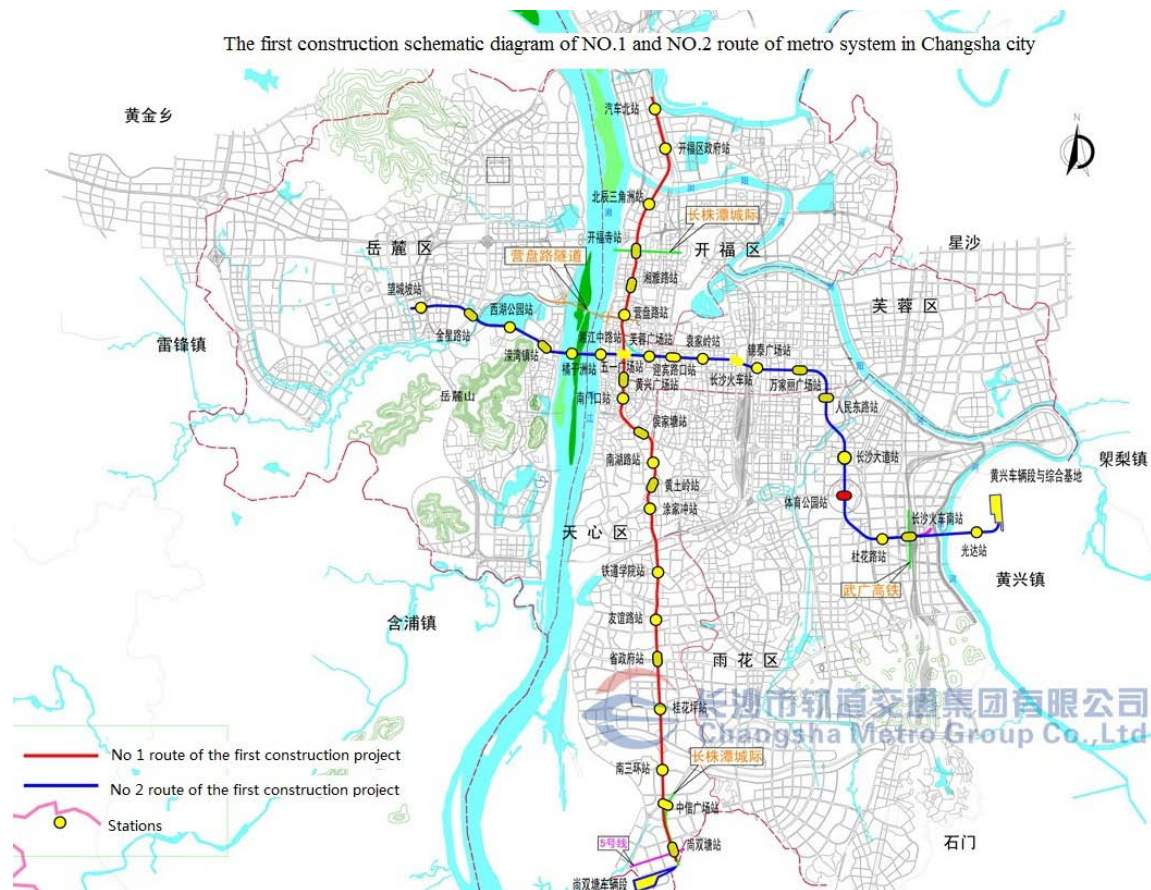
1.1.3. Metro system program

With the accelerating urbanization process in Changsha, the carrying capacity of transportation becomes a significant issue. According to the notification of enhancing urban rapid transit system implementation, when one city reach certain conditions will be certificated to introduce metro system. For instance, the municipality have over 6 billion Yuan (approximately 955 million dollars) fiscal budget, the city have over 1.5 million urban population and the regional GDP reach 60 billion Yuan (approximately 9.5 billion dollars) etc. In terms of the development in Changsha, in recent years, both data and reality shows the emergence of transportation improvement. In 2006, the municipality applied the introduction of metro system and started the planning projects. Four lines of subway have already been included, two lines are under construction.

The length of NO.1 metro route is 23.55km, with total of 20 stations, including 19 underground stations and 1 elevated station. The constructions start at December 26, 2010. On the schedule, the tunneling process will be completed in March 2013, then, the track laying process will be completed in September 2013, and entire construction will be finished in March 2014. The trial operation will be started in December 2014.

The length of NO.2 metro route is 21.926km, with total of 19 stations, including six transfer stations. The constructions start at September 28th, 2009. On the schedule, the tunneling processes have completed in June 2012, then, the track laying processes have completed in October 2012, and entire constructions have finished in March 2013. The trial operation will be started in October 2013.

MAP 1. THE FIRST CONSTRUCTION SCHEMATIC DIAGRAM OF NO.1 AND NO.2 ROUTE OF METRO SYSTEM IN CHANGSHA CITY



Source: http://www.hncsmtr.com/images/gfjt/2h_Big.jpg from the website of Changsha Metro Group Co., Ltd

1.2. Problem statement

In the past decades, the main instrument for land disposal in China is land leasing, and the government introduced bidding, auction and listing system to create a marketable and flexible approach for local authorities' fiscal issue. Moreover, many municipalities go through infrastructure implementation to achieve multi-dimension development for city, which attribute to the interrelationship between infrastructure and economy growth. The national policy associate with urban integration project have made considerable attractive conditions to attract investment in this regions, therefore substantial project and plan allocated in this area which create numerous land demand and facilities introduction and upgrades

There are two major issues with respect to the land value capture for infrastructure. Firstly, in terms of the public land leasing, after the introduction of bidding, auction and listing system, the municipality generate numerous revenue rely on this instrument, however, the bidding, auction and listing pushes up the land price which create high land cost for developers and automatically transferred into housing price for the residents eventually. This issue attributed to the situations that the state monopolizing land market, meanwhile municipalities' revenue heavily rely on land leasing, hence, government take this advantage and controlling land price through land supply in some extent.

Secondly, even though the bidding, auction and listing system address fiscal issue in large extent in many Chinese cities due to this kind of fiscal decentralization (local government can keep large proportion of land revenue as fiscal budget); the distribution of land revenue is not transparent and lack of sustainability for infrastructure finance. Specifically, the fiscal situation of local government is not transparent enough, the flow of funds are probably not really expend for public good due to corruption and relative affairs. Moreover, the leasing mechanism motivating local government sale land at front cause the huge premium payment, and it also provoking government to adjust the urban land use planning to maximize the leasable land area though change the use of land and expropriate farmland etc. Those behavior will lead the situation that future government has none or lower income from land in long period.

In terms of infrastructure financing issue(in the case study is metro system) , the diversification issue of financing option is a big concern for local government, cause local government heavily rely on land revenue to solve financing issue, low utilization rate of private investment. Besides, large amount shares of local government or state-owned enterprises will also create efficiency and effective issue for management. To diversify the financing option will release the fiscal burden for municipalities and guarantee the funds for future operation and maintenance and enhance the economic development around the metro stations. For local government it will also give fiscal flexibility for other public good such as subsidizes housing price and social housing.

1.3. Research objective

Land is fixed and immoveable and it is a commodity which lack of elasticity. The administration of land market and the value captured form land are crucial affairs to promoting the development of cities thought land intensive and effective use and financing urban project by land value. In China, with the burgeoning of economy in central region, increasing amount of investment and infrastructure need to be implementing in those area, bidding, auction and listing system brought a flexible and marketable way, it is important for local government to introduce this mechanism. It generated benefits from the past decades, however, the challenge of land management remains. To concentrate the research for bidding, auction and listing system is meaningful for understand the benefit from market power, meanwhile, let us deepen the internal principle and recognize the imperfect and problematic part for better land management and city urgent development needs.

1.4. Research questions

1.4.1. Main question

How did market-oriented public land leasing performed as a land value capture instrument to financing metro system construction?

1.4.2. Sub-questions

Legal perspective:

What is the legal framework of Public land leasing under bidding, auction and listing system?

Economic perspective:

How did bidding, auction and listing system affect land price? And what are the increase changes of land value?

Financial and Social perspective:

Did this approach generate adequate revenue for local government to promote the urban integration programme² and financing metro system construction?

1.5. Significance of the study

National owned urban land is valuable property; the management of urban land with transparent and effective land market will optimize the allocation of land resource and produce more revenue for urbanization. Under the traditional land distribution pattern, administrative land allocation, which generate no profit for government and no conformity with market principle, have wasted the assets and leaded to a number of issues, such as uncertainty of property right and chaotic land planning etc. Therefore, land as a crucial resource, the value of land cannot be realized and municipality cannot optimize the land in profitable and spatial way. Land leasing as a basic value capture instrument realized the controlling of land and market -oriented system in principles brings more efficient distribution of these assets for government. Hence, the research focus on this approach of land management is meaningful for government to intervene land market and utilizing land resource in the rational way.

1.6. Scope and limitation

1.6.1. Scope

The research basically focus on the land leasing in Changsha with one major land leasing approaches, namely, bidding, auction and listing system(marketable land leasing)(See Table 3 for the discussions of these terms and more explicit definitions). Besides, for the land revenue comparison purpose, the status of administrative allocation land disposal method and

² Mentioned in the city context before, it is a programme through promoting the economic development of ChangZhuTan city group to realize the enhancement at multi-dimension (economic growth, living standard etc.). This urban integration also connected with metro system, because with the spread of metro lines, it will increase the accessibility among cities.

negotiation leasing will also include in the meantime. Moreover, the public good for land value capture through land leasing will be finance for the metro system, which is the significant promotion of transportation. The research concentrates on the bidding, auction and listing system's performance for revenue production since 2002, when the system was introduced. In terms of the metro case, the land value effect by metro analyzed by certain means of detailed information reflected from land transaction. Combining the metro system construction with land revenue analyses the affordability of government for financing infrastructure through this market-oriented public land leasing. Additionally, the long-term metro perspective and financing sustainability issue will interpret and analysis by the land issue experts from Changsha municipal official department and high education institution.

1.6.2. Limitation

In terms of data, the transaction data of land leasing through bidding, auction and listing system will be offered from government statistic department with 5 years records, which still create bias. Firstly, the amount of information might be not adequate to interpret the phenomenon. Secondly, those transaction data still have minor part missing or incorrect due to the data collection process, but this situation is just in a tiny scale .Third, official data always served for the government which will create certain bias, specifically, it means that the result of utilize those data will potentially and deviate the conclusion in slight extent.

In terms of the project that selected, the metro system have four lines to be build³, until now only two lines have started but still not put into practice, which means the research will not cover the entire project, and will not reflect all the financing process of the metro system, specifically, from the construction to operation and maintenance, thus, the revenue generate from land leasing will sufficient or not for the future use is uncertain, and this part might be important for the sustainable financing process.

In terms of the theory, in the circumstance of China, since the implementation of reform and opening-up policy, Government started using the power of invisible hand⁴. However, government have intervened the operation of economy substantially. Therefore, many of experiences in China can not truly or entirely reflect the conclusion summarized by certain market theories.

³ For the metro system in Changsha city, four lines have already been including in the construction schedule, moreover, for long-term perspective, approximately 12 lines will be including in the entire system.

⁴ This is an analogy between invisible hand with market forces by Adam Smith.

◆ Chapter 2. Literature review

2.1. Characteristics of Land

Land is a crucial asset for humankind. According to the land economic theory and other theories, two aspects always have been emphasized that are fixed or immovable and scarcity characteristics, among that other land features. These two elements show the distinction of land with other asset, such as human source or capital source.

2.1.1. Definition of Land Value Capture (LVC)

According to Martim O. Smolka and David Amborski, local government has the mandate to design bunch of policies and instruments associate with land use and fiscal purpose. Those policies that are either fiscal or regulatory in nature have been originated from the concept of land value capture (Martim O. Smolka, David Amborski, 2000).

Moreover, Susan S. Fainstein demonstrate the concept of land value capture founded on the theory of Henry George that land incremental value generated by regulatory changes, population growth and economic development should belong to all residents of the city. She also cites Henri Lefebvre's idea to emphasis that the prosperity created by the collective action and thus should not be privately owned (Susan S. Fainstein, 2012), which means that the sharing of wealth growth should be return back to the society.

Throughout the definition of land value capture in many literatures, there are two perspectives essential for this concept, namely, sharing the incremental value and public purpose. More specifically, the increasing land value not only created by the private investment but the public intervention; the mechanism of land value sharing and public goods orientation established a virtuous circle for cities redevelopment.

2.2. Theory and Mechanism of Public Land Leasing

Public leasehold has been defined as bundle of rights (usually referred as a "bundle of sticks" in legal framework) at an abstract level. More specifically, each components or rights of the bundle can be allocated to and controlled by different stakeholders. Logically, we can regard public leasehold system as a instrument that allow government (representative of public sector) and private sector to negotiate the delineation and distribution of multiple land rights (Steven C. Bourassa, Yu-Hung Hong, 2003).

2.2.1. Definition of Public Land Leasing in China

In the Provisional Regulations on the sale and transfer of the urban state-owned land use rights of the People's Republic of China, authority define that land use rights leasing is the behavior that government name of state act as landowner leasing state-owned land to land users under certain terms and period, and land user should pay for the land right transfer fee

(upfront payment including land leasing premium and other fees) to the state.

2.2.2. Why Public Land Leasing

Public land leasing as a major value capture instrument in China, analyzing this mechanism at theoretical and contextual level is significant to comprehend the reason for public land leasing implementation.

Substantial research focus on why public land leasing should be introduced. As John E. Anderson mentioned that the common justification is that public investment (majority for infrastructure) raising the value of property under government's objectives and actions, hence, it is reasonable to sharing the incremental land value to pay for infrastructure (John. E. Anderson, 2012).

John E. Anderson also made a comparison between property tax and public land leasing to illustrate the process and significance of public land leasing. He believes property tax and land lease are similar approaches to share the land incremental value with government who provide the infrastructure or other public goods. This assumption is based on the comparison between private leasehold regime and public leasehold regime. Usually, in terms of property tax and private leasehold regime, the private landowner leases the land to the lessee, meanwhile, they transferred the entire benefit and cost of land to the lessee. It is similar under public leasehold regime; the entity of landowner is government. Thus, lessee enjoys the benefit of public improvement and cost of the type of benefit. Presumably the benefits are public services and appreciate land value; the cost is premium charged by authority (John. E. Anderson, 2012).

There is another viewpoint to interpret the introduction of public land leasing. Assets sale can be regarded as an approach to mobilize investment resources. For municipality perspective, local government have more flexibility to administer land assets than modifying tax rate or introducing new tax and borrowing funds from investor or agencies, which are require high-level of governance and constrained by the intergovernmental fiscal framework. From the macro fiscal management perspective, assets disposal to achieve the goal of increased and improved infrastructure without incurring debt is an intelligent way (George E. Peterson, 2006).

In addition, the fact that developer are liquidity constrained and ground leases are approaches to facilitate development financing and government is required to control land ownership showed the reasons from governance perspective.

In terms of the circumstance of China, severe problems with negotiation and administrative land allocation system indicates that the old system lack of transparency, which became a major barrier to foster an efficient land market. Moreover, under fiscal decentralization local governments are strongly motivated to maximize property-related revenue and to generate prosperity (F. Frederic Deng, 2003). Therefore, land leasing has become the triggering factor of China's fiscal decentralization (George E. Peterson, 2006).

Several characteristics of land leasing showed the possibility of realization. First, it is politically feasible for municipalities to control the land title, base on the facts that Chinese government is politically powerful but economically weak, the government dominate economy growth; second, land leasing is suitable under the economic reform circumstance in China, which is characterized by gradually and partially (Lin Cyril Z., 1995). Third, after the implemented of Reform and opening-up policy, the urbanization process was sprawling extensively in cities. Considerable infrastructures are required for facilitate urban development, hence, theoretically, retaining land ownership is crucial for authority to control and implement urban construction projects. Fourth, the land leasing adopted in Hong Kong also induces the central government to introduce land leasing system (Yeh Anthony G.-O, 1994).

2.2.3. Objectives of Public Land Leasing

The objective from the central government standpoint is more concentrated on the administration of the land. This notion has been inserted in the legal framework. The following four aims illustrated the concern about efficient land use by the authorities.

- A. To reform state-owned urban land use system.
- B. To development, use and manage the land rationally.
- C. To strengthen land management.
- D. To promote urban construction and economic development⁵.

Although the central government regard land leasing more as a tool for land management, however, in practice, the nature of land leasing is for value capture and it is more sensible to interpret the behavior of authority. From Bourassa and Hong's case studies, they point out that the governments have different priorities, but they all aim at achieving a set of common goals (Steven C. Bourassa, Yu-Hung Hong, 2003).

- A. Retaining the public's share of land incremental value for infrastructure investment.
- B. Facilitating urban development (or redevelopment).
- C. Manage urban sprawl and economic growth
- D. Reserve land for public purpose, for instance, education facilities and environmental protection etc.
- E. Stabilizing land and housing price

2.2.4. Features of public leasehold system in China

The following table demonstrates the basic elements of land leasing in China

⁵ According to Provisional Regulations on the sale and transfer of the urban state-owned land use rights of the People's Republic of China

TABLE 2. LAND LEASING FEATURES IN CHINA

Lease term	70 years for residential land lease; 40 years for commercial land lease; 50 years for industrial land lease
Right for renewal	Lessees have the right to renew land contract.
Ownership of leasehold improvements	Lessees own all leasehold improvements during the term of lease. Yet, when lease expires, improvements will revert back to government if the lease is not renewed.
Lease payments	Lessee makes several upfront payments, including land premium and community and urban infrastructure fees. Other fees may include an urban renew fee, as required. Lessee also pays annual land use fee (sometimes called tax).
Use lease conditions to control land use	Lease usually has list of separate land use conditions; enforcement of condition is lax. There is also requirement for development of certain portion of land within 2 years. Some local governments may charge vacant land fee if land is not developed after 2-year limit expires.
Additional requirements for redevelopment	N/A
Transferability of land right	Lessee can sell, mortgage or transfer land rights.
Government's right to repossess land	Government can terminate lease and retake land for public purpose.
Public attitude toward public leasehold	In the 1980s there was opposition to public leasehold, especially leasing public land to foreign investors. Public land leasing is generally accepted by the public.

Source: Steven C. Bourassa, Yu-Hung Hong ed. 2003. Leasing public land: policy debates and international experience.

2.2.5. Characteristics of distinct land leasing pattern in China

Bidding, auction and listing are market-oriented leasing approaches, and there is another approach called negotiation or agreement leasing which is not a marketable method. All four categories are compensated leasing which means utilize all this approaches to obtain certain plot need to pay the premium for land use.

Moreover, there is another land disposal approach called administrative allocation system which is for special land use and unnecessary to pay.

TABLE 3. DEFINITION AND DISTINCTIONS FOR BIDDING, AUCTION AND LISTING APPROACHES AND NEGOTIATION LEASING.

Categories	Definition	Difference
Bidding	Land administrative departments of municipality who through publish bidding announcement and invite specific or non-specific citizens, legal persons and organizations to participate in the bidding to determine the land users according to bidding result.	<p>1. Range Commerce, tourism, entertainment and commodity housing and other types of commercial land, must transfer by bidding, auction or listing approaches. Negotiation leasing is applicable for the situation that the parcel that must utilized bidding, auction and listing approaches or administrative allocation under regulations. In practice, the agreement leasing applied on certain project land use base on adjustment of the economy structure and industrial policies.</p> <p>2. Different formation of premium Land price formed by bidding, auction and listing approaches determined by market. Negotiation contract land price mainly determined by government.</p> <p>3. The principle of minimum price The minimum price of bidding, auction and listing system determined based on land value assessment. Negotiation leasing is not lower than the sum of new construction land premium with land compensation for expropriation and other charges under laws. If the parcel has determined benchmark premium, then the agreement leasing price must not lower than 70% of the benchmark premium.</p>
Auction	Land administrative departments of municipality who through publish auction announcement and conduct auction in assigned time and location to determine land users according to the auction result.	
'Listing' ⁶	Land administrative departments of municipality who through publish listing announcement and all information of this transaction (e.g. parcel information, pricing period and process etc.) to public and conduct listing to determine land users base on the eventual bid price before the deadline.	
Negotiation	Government and land users sign the land right leasing contract through negotiation leasing approach base on certain projects or regulations. The lessee must pay the land right transfer fee (premium), then municipality will transfer the land use right to the lessee during certain period ⁷	

Source: Provision of leasing state-owned land through bidding, auction and listing mechanism, 2003, China

⁶ 'listing' is the terminology to identify a land leasing approach which has similar characteristics with auction (highest bidder own the land), but still has its own features (different preconditions and special rules). This terminology is under the context of mainland China.

⁷ Bidding, auction, listing and Negotiation here are government behaviors.

TABLE 4. DEFINITION AND CHARACTERISTICS OF ADMINISTRATIVE ALLOCATION SYSTEM

Category	Definition	Characteristics
Administrative allocation	Administrative allocation means that land users use through a variety of ways other than public land leasing to legally acquire state-owned land use rights.	<ol style="list-style-type: none"> 1. For land users, land under administrative allocation regulation has two form of acquisition pay for the cost of resettlement and compensation (such as urban reserved land and expropriated collective farmland) or free of charge. No matter in which form, there is no land right transfer fee (or land leasing premium) need be charge. 2. The allocated land is not a limitation of the duration except the regulation of law and provision, if there is no permit of this plot, the land rights to transfer, lease, mortgage and other business activities are prohibit. 3. When public land leasing mechanism did not widely implemented by authority, except the leasing land, all state-owned land disposed by administrative allocation.

* Administrative allocated land can transfer into public leasing land

Source: Provision of leasing state-owned land through bidding, auction and listing mechanism, 2003, China

2.2.6. Land acquisition in China

According to Changsha municipal administrative measures of Land banking, six categories of land included in the land banking system, namely, the land expropriation, land purchase, land right leasing recovery, recovery of uncertain ownership of land and others. Land acquisition status tells the land supply situation.

TABLE 5. MAIN LAND ACQUISITION AND RESERVATION APPROACHES

Categories	Content	Compensation/Payment
Land expropriation	Land expropriation have two major type, one is expropriate from the collective owned land (farmland) transferred into state-owned urban land. The second one is expropriate the state-owned urban land for public good(infrastructure)	According to Changsha municipality implementing regulation for land compensation and resettlement, the compensation calculated based on this regulation and paid for the tenants.
Land purchase	Land purchase including buy the land with development potential and the land with underestimate value. Besides, the government will also buy the land which the developer has no capacity for further development.	The purchase price will base on the assessment agencies (according to the market value) or on the original contact.

Land recovery	Including recover the land without ownership and land recovered thought certain regulation (e.g. idle land) and recover the expired leasing land.	None
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Source: Jiye Bi, 2003, of Land acquisition price of definition, connotation and calculation method. Changsha municipal administrative measures of Land banking (2009)

2.3. Land market issues and features

Land market is an imperfectly competitive market, and due to the features of fix and unity, land market only means a local market in large extent. Stem from the characteristic of land market, information asymmetry will lead to the malfunction of pricing mechanism, thus, increasing the transaction cost, which ultimately bring inefficient distribution of resources (Xianghui Li, 2011). The imperfectly competitive of land market create four issues.

- A. Land market monopolization
- B. Land speculation
- C. Inefficient land distribution structure and unbalancing land supply and demand
- D. Inefficiency of infrastructure distribution

2.3.1. Land supply and demand

The definition of land supply is that under the certain technical and economical conditions, the sum quantity of land resource, including exploring and reserving land.

Land is non-renewable resources, land supply is long-term lack of elasticity and short-term varied by certain condition (population, technology, economic structure and policy) (Shuheng Liu, 2004)

Land demand is the quantity of land required for development and survival of humanity.

Despite the time issue, land demand is continuously increasing. Due to the scarcity of land and growing population, the curve of land demand match the feature of general commodity demand curve, specifically, land demand is elastic, which means that demand of land fluctuating with the change of price (Alan W. Evans, 2004).

2.3.2. Land value determinants

Among substantial studies and researches, the size of a parcel is the basic factors to determine the value of land. Moreover, parcel size is an essential indicator for land subdivision and assembly effects, the theory of convex structure and plottage effect illustrate that assembling or subdividing of land will modify the value of land.

In addition, location factors have been seemed as a crucial indicator for land value. Location factors are a proxy of social and economic characteristic of neighborhood of land parcel.

There are considerable studies focus on location factor, for instance, land value determination considered the distance to Central Business District(CBD), tram station and region boundary

etc. Overwhelming of evidence shows the significance of location for land value. Furthermore, zoning regulation and urban planning are primary effects for land value. Empirical studies suggest that the land use type will verify the value of land, for instance, government made certain density control for certain land use or transfer residential use into industrial or commercial use will immensely change the land value.

In the circumstance of China, the leasehold system and the evolvement of land disposal approaches showed that the dramatic land value change though municipalities intervene. Because all land is owned by the state, government thus has predominant power to affect the land value. As density control or floor area ratio(FAR) are important methods to effect land value, besides, changing land use also reflects the intervene of local governments(Helen X. H. Bao and Sherry Z. Zhou, 2007).

Apart from this, Land value can be determined by various factors.

- A. Public investments in infrastructure and social services;
- B. Changes in land use regulations;
- C. Population growth and economic development;
- D. Private investments that increase land value;
- E. The original productivity of the land (Gregory K. Ingram, 2003).

2.4. Land Leasing Revenue to Financing Infrastructure

It is well-known that there is an essential relationship between infrastructure and economic growth. Some scholars believe that public investment on infrastructure is a primary factor for economic development.

2.4.1. Why land revenue cultivating infrastructure

Municipalities search for various infrastructure-finance options, and those assets owned by the local government will generate decent revenue for fiscal issues, thus, local government have already know that asset sale have huge potential for financing the infrastructure. Nevertheless, assets sale is not the long-term optimal tactics stem from many experiences, but sale the state or municipality owned land have different direction, because this special features of land leasing which will furnishing longer-term financing possibility for those facilities construction and institution establishment. Besides, land sale or leasing have the advantage of yield profit faster and larger than other value capture approach, such as taxations. Apart from the merits of long-term sustained and quick revenue generation, land can be 'create' through expansion form urban to rural area, and leasing can be renewed. Therefore, land leasing is the feasible and rational choice for infrastructure. (George E. Peterson, 2006).

2.4.2. The financing pattern for infrastructure in China

There are three primary financial modes for metro system financing in China. The first model predominant relies on the fiscal budget of local government. This type of financing model

based on the quasi-public good and externalities features of metro system, and it is a tradition mode for financing infrastructure which implementing for long period, especially in the planned economy period, since the fiscal decentralization, the municipality generate substantial revenue from land for financing infrastructure, this approach throughout considerable cities, however, the single entity of investment shaping the complexity of management and operation with heavy burden and low-efficiency for municipality. Second, in terms of the disadvantage of single-investor mode, many of municipalities have transferred to the next level that liabilities based investment and financing mode, which means government borrow money from the market(loans and debts). More specifically, local governments utilize the state-owned enterprises and future land revenue as a guarantee for loans. The third one is the diversification of financing means, especially the PPP (private and public partnership), which attempt to alleviate the burden of fiscal issue (Fengxuan. Sun, 2006).

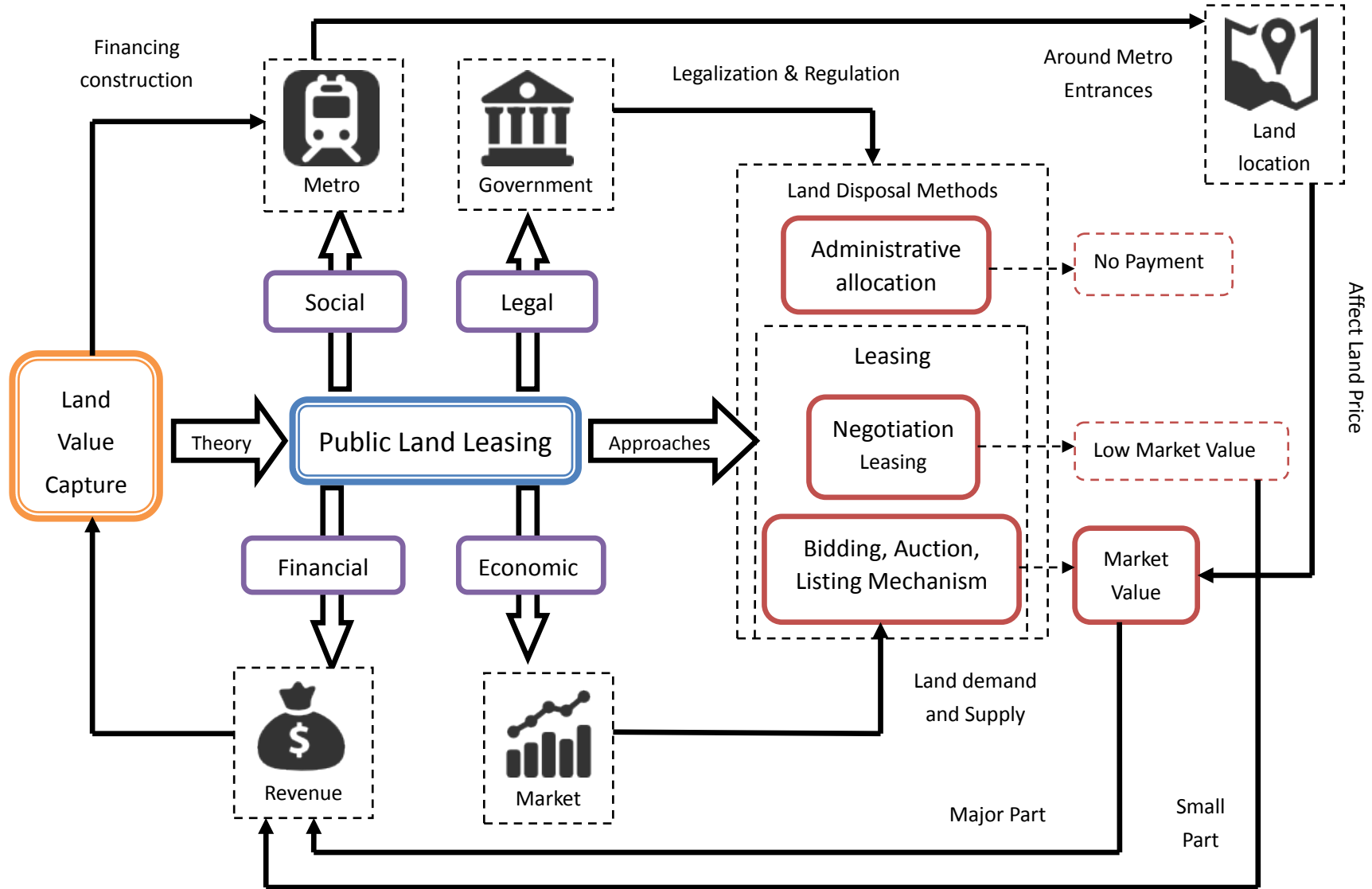
According to the concept of land value capture, the revenue captured from certain parcel will be feedback to the improvement of this particular area. It is precisely match the concept of sharing the incremental value. However, as public leasehold is practiced in China, local government regarded the land value captured originate from the whole city, and inserted the sharing and development and regeneration circle for the entire city. There is usually no direct link between the lease required for a given plot of land and the infrastructure provide for that plot (John. E. Anderson, 2012).

2.4.3. Why metro system financing is the priority

Metro system has obvious externalities of land value increase for adjacent regions, it reflects on two respects. First, from the accessibility perspective, metro system will alleviate the congestion trouble in urban area, especially for the area nearby the metro station, and reduce the distance to the CBD area with time and money-saving merits. Moreover, the enhanced accessibility also have magnet effects to aggregate many kinds of commercial, entertainment and living service, it will stimulate the development of real estate and dramatically increase the land value around metro stations. Second, the metro system project also supplied the opportunities for local government to adjust the urban planning, land use categories around those regions. Through the redevelopment and adjustment, municipality can make more efficient and intensive land use. Therefore, those planning will improve the level of location factor of this region and enhance the complementary benefit and internal relationship; it will create a comprehensive economic operation pattern surround the metro system and increase the entire value of neighboring land and spread the value of land throughout the entire urban region.

Besides, comparing with other transportation facilities and infrastructure, the potential externalities of metro system for land value is generally higher than others, especially it will massively promote the value in the CBD area, and when tracks spread, the value of land will have apparent enhancement and in large scale(Yue. Li, Meng. Chen, Xiaoyang. Huang, Ben. Ma, 2011).

2.5. Conceptual framework



◆ Chapter 3 Research Methodology

3.1. Revised research questions

The research questions concentrate on the co-relation between land leasing and infrastructure financing from the concept of land value capture. The topic has been divided into four dimensions and each dimension has been refined as specific questions. All the questions are listed on the following table.

TABLE 6. THE LIST OF MAIN AND SPECIFIC QUESTIONS

Main	How did market-oriented public land leasing performed as a land value capture instrument to financing metro system construction?		
Type	Questions	Specific Questions	Data Sources
Legal	What is the legal framework of Public land leasing under bidding, auction and listing system?	<ul style="list-style-type: none"> ◆ What is the definition and implement process of public land leasing in China? ◆ What is the specific features and mechanism of bidding, auction and listing system? ◆ What is the land leasing procedure of bidding, auction and listing system? ◆ What are the regulation combine the utilization of revenue captured from land for urban infrastructure. 	<ul style="list-style-type: none"> ◆ The provisional Regulation on the sale and transfer of urban state-owned land use rights of People Republic of China. ◆ Provision of leasing state-owned land through bidding, auction and listing mechanism ◆ Changsha Municipal state-owned land revenue Financial Management Measures
Economic	How did bidding, auction and listing system affect land price? And what are the increase changes of land value?	<ul style="list-style-type: none"> ◆ What is the land supply and demand situation in market? ◆ What is the variation of land supply and demand since the system introduced? ◆ Compare with negotiation and administrative allocation, how did bidding, auction and listing system affect the land price? ◆ What is the incremental value of land create by this system 	<ul style="list-style-type: none"> ◆ Transaction records from Changsha municipal bureau of land resource and Ministry of Land and Resource of the P. R. China ◆ Data from Hunan Province Bureau of statistics ◆ Records from SouFun Corporation and China land market website

		<ul style="list-style-type: none"> ◆ How did bidding, auction and listing system provoking government leasing behavior? ◆ What is the problematic issue or weak point for bidding, auction and listing system? 	<ul style="list-style-type: none"> ◆ Semi-structured interview from land issue experts and officials
Financial & Social	Did this approach generate adequate revenue for local government to promote the urban integration programme and financing metro system construction?	<ul style="list-style-type: none"> ◆ What is the amount and proportion of revenue generate by this mechanism? ◆ What and how many type of financing option for metro system? ◆ How metro affect the land value in the vicinity? ◆ Did that revenue generated by this mechanism adequate for metro system construction? 	<ul style="list-style-type: none"> ◆ Transactions records from Changsha municipal bureau of land resource ◆ Leasable land amount and replacement cost from Changsha municipal land banking center ◆ Financing information from Changsha metro group Co., Ltd⁸
		<ul style="list-style-type: none"> ◆ What the financing status of the current metro lines? and What is the long-term financing perspective for metro system 	<ul style="list-style-type: none"> ◆ Semi-structured interview from land issue experts and officials

3.2. Research approach and techniques

The research objective is to identify the performance of land leasing as a value capture instrument for financing infrastructure. Therefore, the research is descriptive and sketches the phenomena and situation of land leasing in China.

This research combines with qualitative and quantitative research approaches across various dimensions. Moreover, this research have two main techniques, the first is analyses base on the existing land acquisition and transaction data base, the second is a case study about metro system financing mainly support by land revenue.

3.3. Operationalization: variables, indicators

In the operationalization, the indicators and variables also divide into the four dimensions, which are listing in the following table.

⁸ All official records reports and documentary legal files are secondary data

TABLE 7. OPERATIONALIZATION VARIABLES AND INDICATORS

Dimensions	Type	Variables	Indicators
Legal	Qualitative	<ul style="list-style-type: none"> ❖ Right to leasing state owned land ❖ Regulation for leasing approaches ❖ Right to use bidding auction listing system ❖ Urban planning At national and municipality level	1) The type of land use different approaches 2) The features of land leasing approaches 3) The procedures of bidding, auction and listing
Economic	Quantitative & Qualitative	<ul style="list-style-type: none"> ❖ Land acquisition(supply) <ol style="list-style-type: none"> 1. Land supply planning 2. Land expropriation 3. Land purchase 4. Land recovery 	1) Applied land amount 2) Approved land amount 3) Ratio between applied and approved land 4) Land acquisition amount
		<ul style="list-style-type: none"> ❖ Land sale(demand) <ol style="list-style-type: none"> 1. Bidding 2. Auction 3. Listing 4. Negotiation/Agreement leasing 5. Administrative allocation method 6. Residential use 7. Industrial use 8. Commercial use 9. Urban land 10. County land 	1) Transaction quantity 2) Total area 3) Land planned use 4) Proportion
		<ul style="list-style-type: none"> ❖ Land price <ol style="list-style-type: none"> 1. Average price in different use 2. Land benchmark premium 3. Starting price 4. Traded price 5. Negotiation/Agreement price 	1) Ground lease 2) Total trading price 3) Premium rate
Financial & Social	Quantitative & Qualitative	<ul style="list-style-type: none"> ❖ Land fiscal revenue <ol style="list-style-type: none"> 1. Total land transfer fee 2. Public leasing net revenue 	1) Sum amount 2) Fiscal proportion
		<ul style="list-style-type: none"> ❖ Land fiscal expenditure <ol style="list-style-type: none"> 1. Land development fee 2. Land acquisition expenses(compensation) 3. Metro system construction financing expenses and proportion 4. Transaction cases 	1) Sum amount 2) Proportion 3) Specific transaction records 4) Maps

3.4. Sample size and selection

Changsha city is one of the major city in China. Since the bidding, auction and listing have already been introduced and implemented for decade, but the extensive use appeared in recent years. Hence, the land leasing data in Changsha city selected from 2008 to 2012(the newest information). Meanwhile, the negotiation leasing and administrative allocation relative data also selected for comparison purpose. Apart from the land leasing records, the land acquisition data and the metro system financing data associate with municipality fiscal distribution issue are take into account for analysis the performance of market-oriented public land leasing. More specifically, for the case study of metro system, the certain traded parcel will be selected for interpret the value change by metro system construction, meanwhile, comparing with selected parcel which have similar features further from metro entrances.

3.5. Validity and reliability

All the data and information from legal regulation to transaction records are originally from municipality statistic data base and official reports and certified documents. Moreover, there are same information selected from a private corporation and some from the public information online, those different data sources will show the validity and reliability. The operational variable collected entire relative information with public land leasing performance. All the secondary data use to analysis the performance of bidding auction listing mechanism statistically. In addition, the study used SPSS to test the hypotheses of land revenue create by listing leasing and SPSS conduct the statistical analysis of all the data. Moreover, the interview generates the information about performance of biding auction and listing system in the real observation and operation. This is the triangulation of data and analysis, it prove the validity and reliability of the data source.

3.6. Data collection methods

Majority of collected data is categorized under secondary data, and extracted from the official data base, which including *Changsha Municipal Bureau for Land Resource*, *Changsha Municipal Land Banking Center*, *Changsha Metro Group Co., Ltd* and *Hunan Province Bureau of Statistics*. In terms of qualitative data will collect form official policy documents and notification published by Changsha municipality and central government. For certain questions, the answer generate from the first hand data is mainly from interviews. The land issue experts are from the statistical department Changsha municipal government and Changsha municipal bureau for land resource and professor from Central South University in Changsha, respectively.

3.7. Data analysis methods

Data analysis process primarily based on two analyses, namely, descriptive statistic analysis and case study. The descriptive statistics analysis was conducted by SPSS, which using various parameters, such as mean, to analysis the feature of data base, for instance trends and variation, certain analysis summarized by excel with figures. The descriptive analysis

concentrate on the 5 years land leasing transactions and land acquisition and land price and fiscal revenue and expenditure under the implementing of bidding, auction and listing system, which demonstrated the altering of land incremental value after this market-oriented public land leasing and the government's achievement on urban development.

In terms of case study analysis, certain secondary data selected to prove the incremental land value generate by metro system, the combination of descriptive analysis and hypotheses tested by SPSS, to testing the validity of conclusion.

The information generate from interviewees interpret and prove the relationship between data and realities. Besides, those issue around bidding, auction and listing approaches and metro financing situation also be point out and explained. Generally, the perspectives of those land issue experts are collective to prove the standpoint showed in the data and make the comprehension of public land leasing issues profoundly.

◆ Chapter 4 Presentation of Data and Analysis

4.1. Introduction

According to the designed methodology before, the majority of transaction records and data were collected from *Changsha municipal bureau of land resource* and *Ministry of Land and Resource of the People's Republic of China*. Meanwhile, numerous data and records also compared and complete by *the SouFun Corporation* (a private real estate data collection and publishing platform) and *the website of China land market*. Moreover, parts of municipality fiscal data are original from *Changsha Bureau of Statistics*. Apart from this, there are some information received from semi-structured interview, there are four interviewees, from *Changsha municipal bureau of land resource* and *Changsha municipal government statistical department* and *Central South University*, respectively.

This presentation will answer the main question and four sub-question. The first section answered the questions from legal perspective, to figure out the statutory rights of authority and the process and procedures of public leasing. In the second section, it is mainly discussed the situation of land market in Changsha, including the land apply and approve situation, land reserve and expropriation. Moreover, though compare the land transaction records from various approaches in the period of 2008 to 2012. It will reflect the changes and increase from price and quantity. In the third section, it is a case study about metro financing by land revenue, it compose by two major parts, on the one hand, it illustrate the fiscal income and expenses in the field of land and metro. On the other hand, three various transaction cases are incited to demonstrate the land price increase by metro; the different land value generate by two distinct leasing method located at certain neighboring parcel; and one transaction case directly for metro financing.

In the presentation, many trends and proportion tables identified the changes in the recent five years and it also shows the primary tendencies. The data analysis by SPSS interpreted the comparison result between negotiation and listing lease and the relation with land revenue.

4.2. Legal framework of bidding, auction and listing mechanism

4.2.1. General legal documents for public land leasing in Changsha

According to the *City real estate market administrative law and the Provisional regulation of sale and transfer urban state-owned land use right in China*, Changsha municipality announced the *Provisional regulation of sale and transfer Changsha state-owned land use right* on 2003. This significant document demonstrates the definition of and fundamental conditions and procedures for public land leasing implementation, including bidding, auction and listing approaches and administrative allocation and negotiation leasing, in Changsha city. Since then, the regulation of public land leasing have promoted version by version. In 2005,

the local government announced *the Provisional regulation of sale and transfer state-owned land use right by bidding, auction and listing methods*, this document interpreted more detailed content for bidding, auction and listing mechanism. Significantly, it is the formal and legal file to introduce these methods as crucial approaches for public land leasing.

4.2.2. Legal document for land revenue fiscal administration

The *Changsha municipal provisional measures of state-owned land leasing revenue (2005)*, it clarify that the cost of supporting infrastructure is including the budget preparation of bidding, auction and listing approaches leasing revenue. In this budget preparation regulation, six type of cost listed under this category. There are land acquisition expenditures (purchase, compensation etc.); the cost of planning and evaluation; cost for collective land (farmland) transferred in to urban construction land; transaction cost (commission for auctioneers etc.); cost for infrastructure investment; pure land revenue and other fees.

4.2.3. Procedures and Features of Bidding, auction and listing

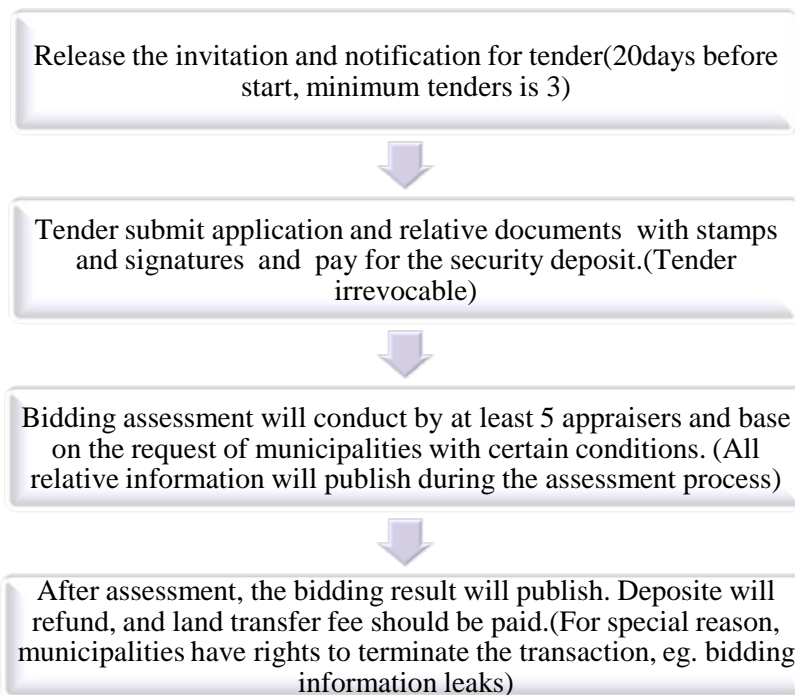
Owing to the awareness of the inefficient land distribution and local fiscal issue, the provisional regulation of sale and transfer urban state-owned land offered precondition for the establishment of a primary land market⁹ which created the relative higher effective allocation of land and land revenue for municipalities. Generally, the precondition for a plot should be utilized for business purpose will be lease though bidding auction or listing approach. More specifically, if the land planned use have been changed into business use, land leasing only can be lease by this system, for instance, a plot originally was utilizing for education use (e.g. schools), under new regulation this education used land will moving onto another block and this plot will rebuild a mall or other commercial building, for this situation, the new leasing contract should be leased by one of bidding, auction and listing approaches.

Procedures

Even though these three approaches have slight differences at operating procedures and effects for prices, it still under the same notion of public land leasing. The following figures and a table will identify those differences and summarize the characteristics of each one.

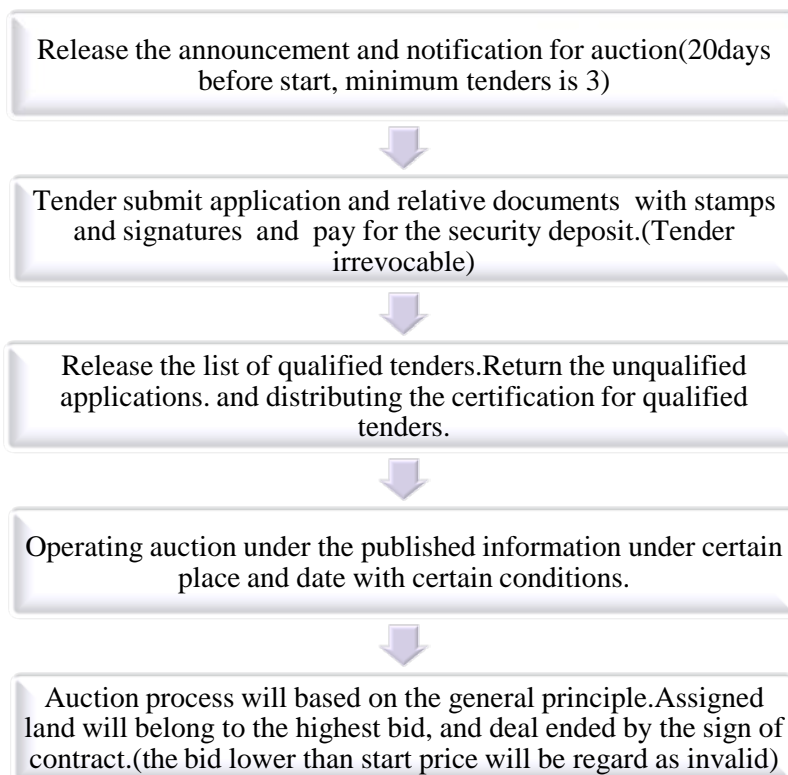
⁹ Primary land market is the land market selling land use right, generally the transfer entity is government. Moreover, the second land market is real estate land market, which developer transfer land use right and land improvements to customers.

FIGURE 1. PROCEDURES OF BIDDING



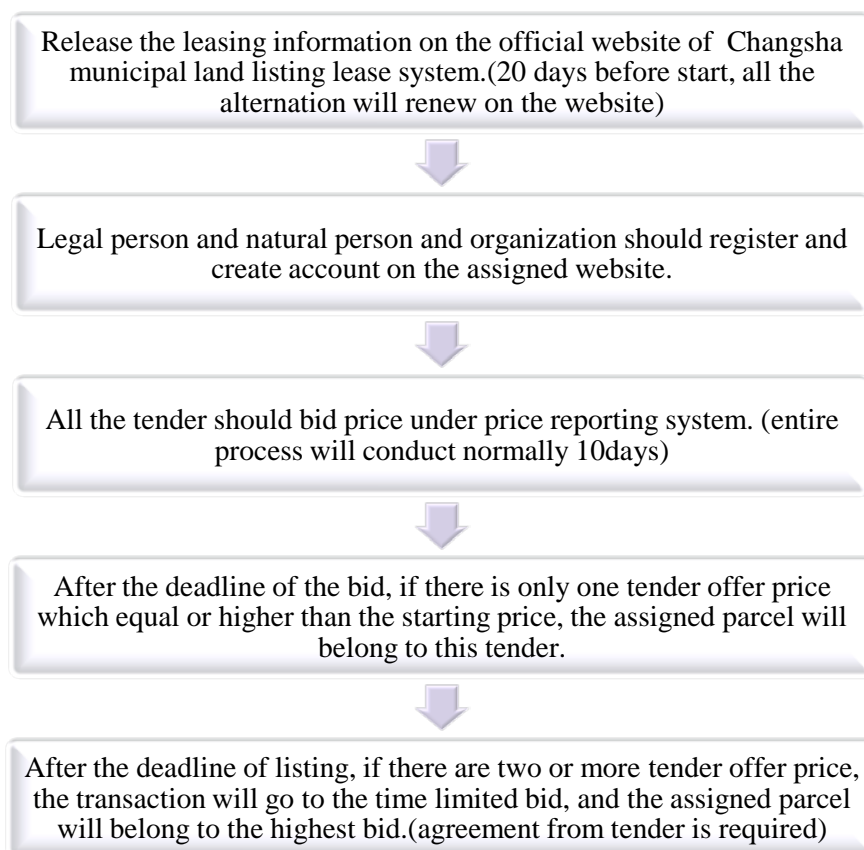
Source: *the Provisional regulation of sale and transfer Changsha state-owned land use right by bidding, auction and listing methods* (2005)

FIGURE 2. PROCEDURES OF AUCTION



Source: *the Provisional regulation of sale and transfer Changsha state-owned land use right by bidding, auction and listing methods* (2005)

FIGURE 3. PROCEDURES OF LISTING



Source: *The regulations of online listing for Changsha municipal state-owned land (2007)*

Characteristics

These three approaches influence the market price of land and even have slight different operating process and transaction results.

TABLE 8. FEATURES FOR BIDDING, AUCTION AND LISTING APPROACHES

Categories	Features
Bidding	❖ In practice, bidding have high threshold (e.g. registered capital) for small companies or individuals. Therefore, the competition always between those strength and qualified corporations. Qualified tenders are few and the competition is relatively lower.
	❖ From the aspect of trading price, the final price of certain parcel leased by bidding will not always the highest one, the lease contract should take comprehensive factors into account, for instance, the capital mobility. Besides, normally, the final bid price will close to the assessment of land value conducted by official department.
Auction	❖ Auction is a fair and transparent trade approach, compare with bidding, it have less potential for corruption of government to control the result of land distribution, which means it match the principle of market competition and reflect the relative accurate value of land.

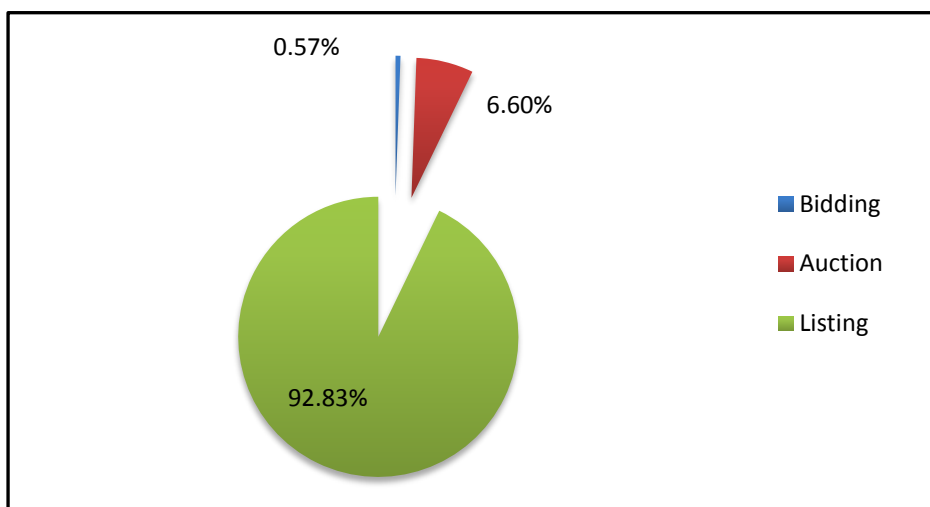
	❖ Highest bid will win the parcel will bring high competition in the auction process and generate the maximum revenue for municipality.
Listing	❖ Comparing with auction, because if only one tender participating in listing process is qualified, it increases the executed rate of transactions. Plus, the time limited rule made intensive competitions. However, tenders have more time to bid the price thoughtfully.
	❖ The listing process continuing 10 days which create more opportunities and flexibility to react for the pricing from rivals'

Source: Create by Author

In summary, each approach have its own merits, auction will reflect the actual value of land and realize the maximum profit for municipalities; bidding is fit to lease for special program; and listing can make deal with only one tender, which increase the successful transaction rate.

According to the transaction records, since the widespread implementation of online listing application and transaction, listing approach became a major method for Changsha municipality to lease the state-owned land. From the following chart, it reflected the predominate use of listing method for disposal the land, it account approximate 93%; the rest is belong to bidding and auction. Notably, in terms of bidding, it only account around 0.6%(the rate of bidding is 2% during 2002-2007), which is a very low proportion in the entire mechanism, the low percentage of bidding method attribute to the complexity and relative high time and money cost for arrangement and operation. Moreover, there are three factors attribute the high transaction amount of listing in public leasing. Those factors summarized from the characteristics of listing, first, the rule of only one participator increase the transaction rate; Second, the rule of 10 days for pricing which give adequate time for organization; Third, the implementation of online listing saved substantial cost, for instance, the commission for qualified auctioneers or other staff.

FIGURE 4. THE PROPORTION OF BIDDING, AUCTION AND LISTING IN LAND TRANSACTIONS FROM 2008 TO 2012



Source: From SouFun Corporation. Created by Author

4.3. Land Market affect by various leasing method

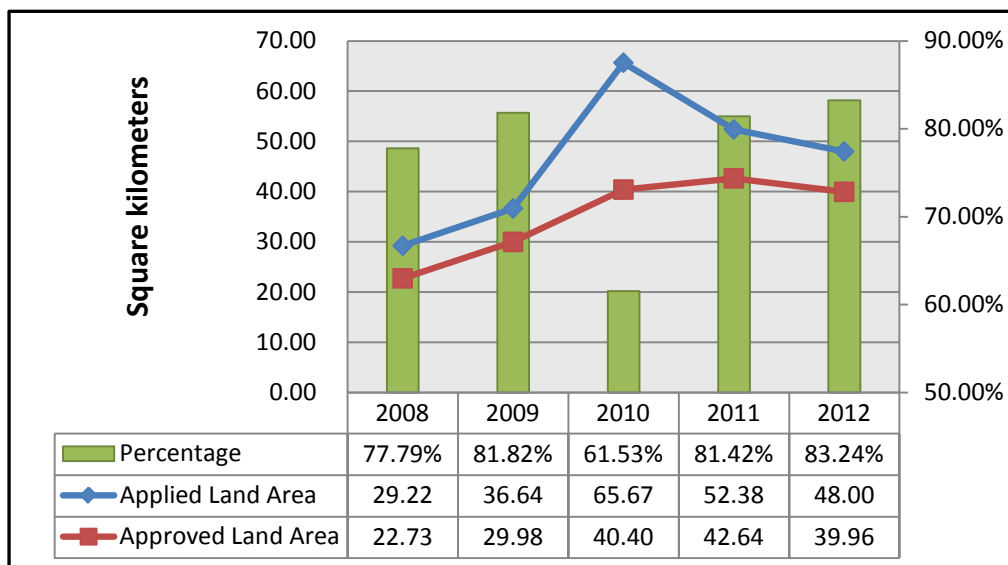
In Changsha, even though, the urban area spread dramatically during urbanization, however, land source is fixed, and population grown steadily. Based on the reports from Hunan Province Bureau of Statistics, till 2011, the population in the whole city is 7.04 million and the Land source is 11819.5 square kilometers, thus the population density is 596 people per square kilometers and the average land area own by a citizen is 1678.91 square meters.

4.3.1. Land Market Supply situation in Changsha

The tension of land use accelerating the emergency of rational land utilization. Land supply not only depend on the fixed land source that the city owned, but rely on the result of annual land approval, the municipality will apply the land area and planning to center or provincial government. Land will be distributing multiple ways.

The following chart illustrates the trends of land supply in Changsha. Generally, the annual land supply planning have a roughly increase with difference in 2010. However, compare with the supply schedule, the real supplied land have a stable increase tendency. There is an abnormal value in 2010, based on the information from Director Chen from Changsha Municipal Bureau of Land Resource and Professor Zhang from Central South university, both of them attribute is appearance to the dramatic increase real estate demand and significant new infrastructure construction needs and optimistic macroeconomic expectations. More specifically, since central government released several regulations to control overheating real estate market in coastal cities, afterwards, considerable investment transferred into certain central cities which have potential for housing price appreciation.

FIGURE 5. LAND SUPPLY INFORMATION IN CHANGSHA FROM 2008 TO 2012



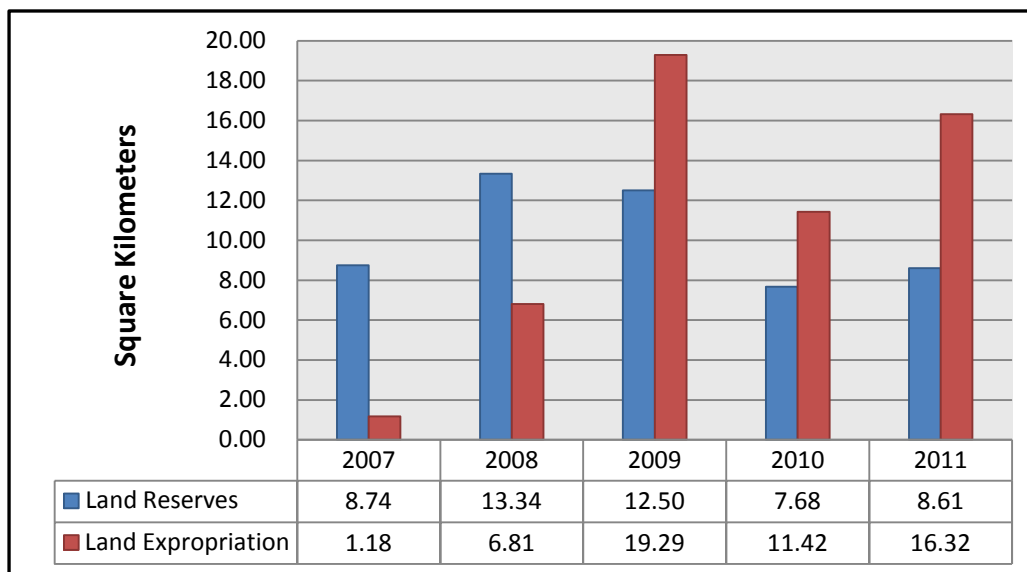
*Percentage = Approved Land Area/Applied Land Area

Source: Changsha Municipal Bureau of Land Resource. Create by Author

Apart from the supply of land, Land acquisition for local government is also a crucial work. There are three primary method for land acquisition, namely, land recovery, land purchase and land expropriation. In figure 6, apparently, in the beginning, the reserved land amount is higher than land expropriation, on the contrast, from 2009, the land obtained from recovery and purchase did not have apparent increase, however, the amount of expropriation land has considerable growth and it surpassed the amount of land get from recovery and purchase. Land purchase and recovery showed low ratio and declining process of land acquisition, the reason for this situation caused by long-term lease which create slow recovery for land. With regard of land purchase, relative high cost lead the government prefers expropriate the land.

According to the viewpoint of Interviewee¹⁰ from Changsha Municipal Bureau of Land Resource, he said that this data is real match the current land supply situation in Changsha, the demand has incredibly increase due to the development reason, especially caused by the policy impact. Hence, the unbalancing situation is inevitable and large amount of old city district adjustment and new infrastructure introduce made more requirements for the land. Because land expropriation is the effective way to acquire the land why large scale of land obtained from land expropriation.

FIGURE 6. LAND ACQUISITION INFORMATION FROM 2007-2011



*Land Reserves = Land Recovery + Land Purchase

Source: Changsha Municipal Bureau of Land Resource. Create by Author

4.3.2. Land Transaction (Demand) situation in Changsha

As introduced before, Land disposal in China divided into three categories based on the land transfer fee. More detailed, three land transfer methods have distinct requirements which create differences in price and procedures. In terms of land transfer fee(land premium), there is no payment in administrative allocation, lower-market leasing premium in negotiation lease and market-oriented leasing premium in bidding, auction and listing mechanism.

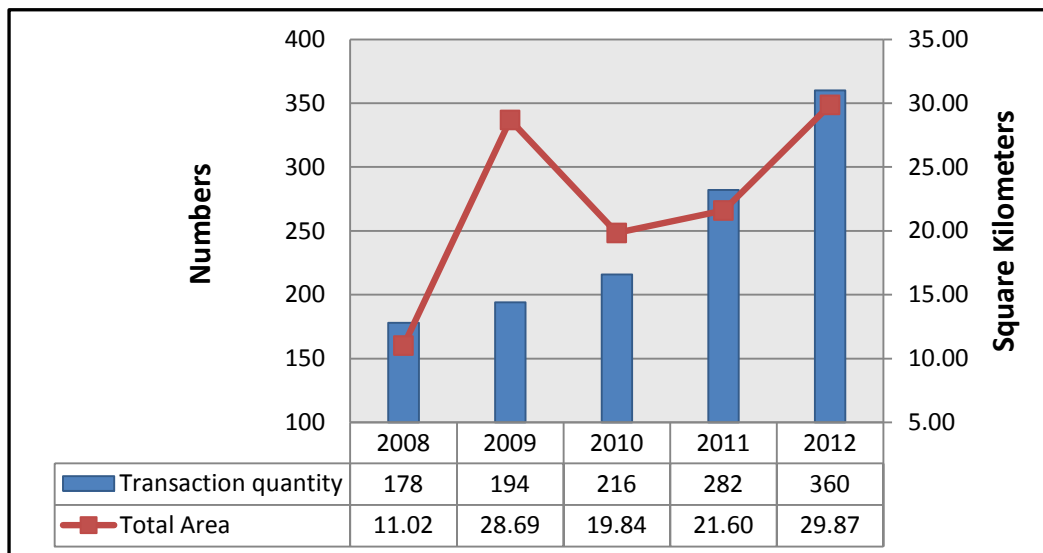
¹⁰ Interviewee: Director Chen from Changsha Municipal Bureau of Land Resource

Administrative allocation

According to the transaction records, there are no land transfer fees including in the contract. Therefore, the following figure merely showed the trends of transaction quantity and area. Apparently, bars and line are both demonstrated the message that accelerating needs of land disposed by administrative allocation. In the past five years, transaction quantity almost doubled, and leasing area almost tripled. Notably, there is a peak in 2009, which have a higher average disposed land area than others. The reason is that, in 2009, approximately 40% of transactions are going for road construction, it occupied huge area.

According to the perspective of Interviewee¹¹ from Changsha Municipal Bureau of Land Resource, administrative allocation has been implemented for many years; even though it cannot generate land revenue, but it has the necessity for existing, for instance, distribute land resources for public good use.

FIGURE 7. TRANSACTION SITUATION THROUGH ADMINISTRATIVE ALLOCATION FROM 2008-2012

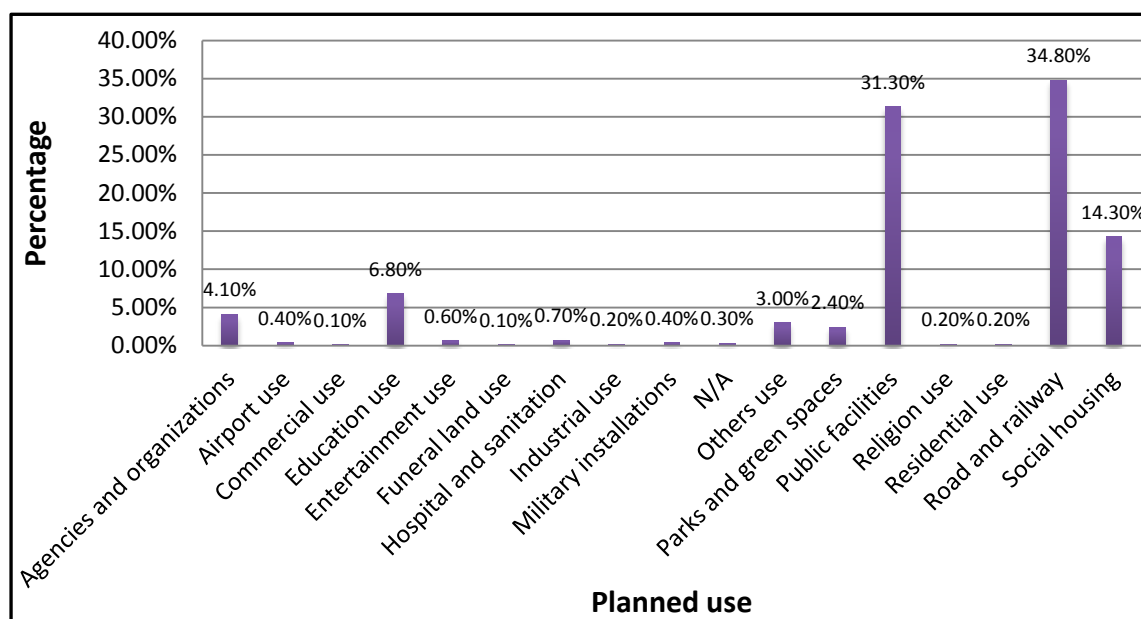


Source: Changsha Municipal Bureau of Land Resource. Create by Author

As shown in the Figure 8, public facilities (around 30% at average rate) and road and railway construction (around 35% at average rate) account high proportions of administrative allocation transfer cases. Moreover, local government have also focused on the social housing issue, from 2008 to 2012, the transaction quantity of social housing have almost doubled from 7% to 14%. Besides, in recent years, education institutions have become a significant livelihood issue, approximately 7% of land transfer cases planned for public schools, to promoting especially primary education. In summary, land disposed by administrative allocation is mainly planned for public goods establishment. Additionally, land planned for agencies and organizations are generally serves for authorities, such as government office building etc. That is usually criticized by public that government takes the advantages for land distribution.

¹¹ Interviewee: Director Chen from Changsha Municipal Bureau of Land Resource

FIGURE 8. THE PROPORTION OF LAND PLANNED USE THROUGH ADMINISTRATIVE ALLOCATION DURING 2008-2012



Source: Changsha Municipal Bureau of Land Resource. Create by Author

Negotiation

In terms of negotiation leasing (as known as agreement leasing), the transaction situation have not reveal visible trends. According to the following chart, peak value appeared in 2010. There 262 deals in this year; meanwhile, the total leasing area exceeds 10 square kilometers which almost twice amount in 2012. Combining with the information of applied land at the same time, it is not hard to find that booming investment in real estate have diverted into central cities which attribute to bunch of regulatory policies. In addition, negotiation lease have payment for land and it generate revenue for municipalities, however, it cannot fully reflect the market requirement, but it showed the readjustment based on market and conducted by local government. In contrast with bidding, auction and listing approaches, negotiation is not a transparent leasing in some extent. In practice, certain parcel disposed by negotiation can be utilized for business purposes, which means if some developer can acquire land in a lower price and obtained more profit. Thus, these opportunities enable the bribe and unfair competition etc. Overall, negotiation leasing has implemented extensively and it is an essential lever for government to intervene land market, but it still has low revenue and corruption issues.

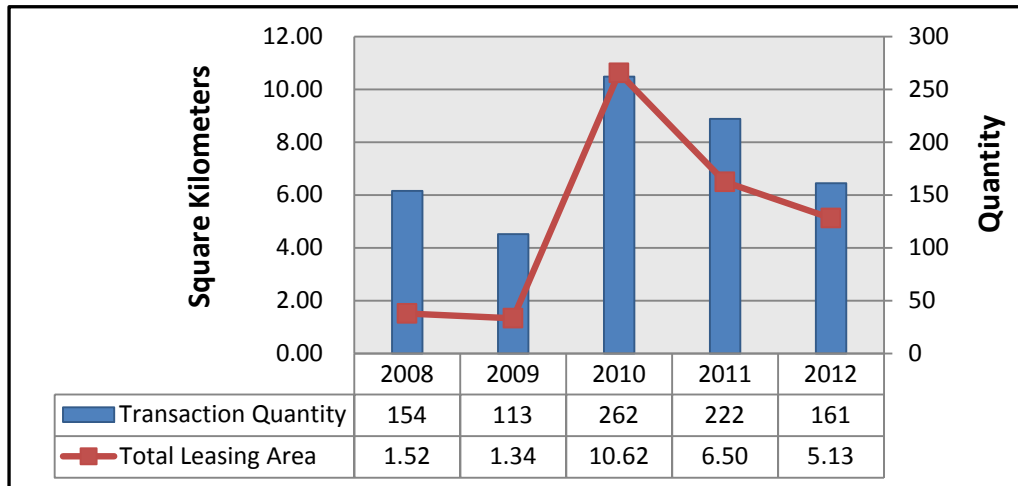
From the perspective of interviewee¹² from Central South University, he point out that negotiation lease has created the opportunities for officials to accept bribes. In recent years it is true that many real estate firms get benefit from it, and he severely believe that negotiation lease cannot really promote the balance of market and to achieve the intervene purpose, he also said that the clauses in the regulation did not made the explicit condition for negotiation lease. However, from the perspective of Interviewee¹³ from Changsha Municipal Bureau of

¹² Interviewee: Professor Zhang from Central South University, Changsha, Hunan, China

¹³ Interviewee: Director Chen from Changsha Municipal Bureau of Land Resource

Land Resource, he did not respond the negative issues around negotiation leasing directly, but indicated that the government try to utilizing bidding, auction and listing mechanism gradually replace the negotiation lease for the business land use.

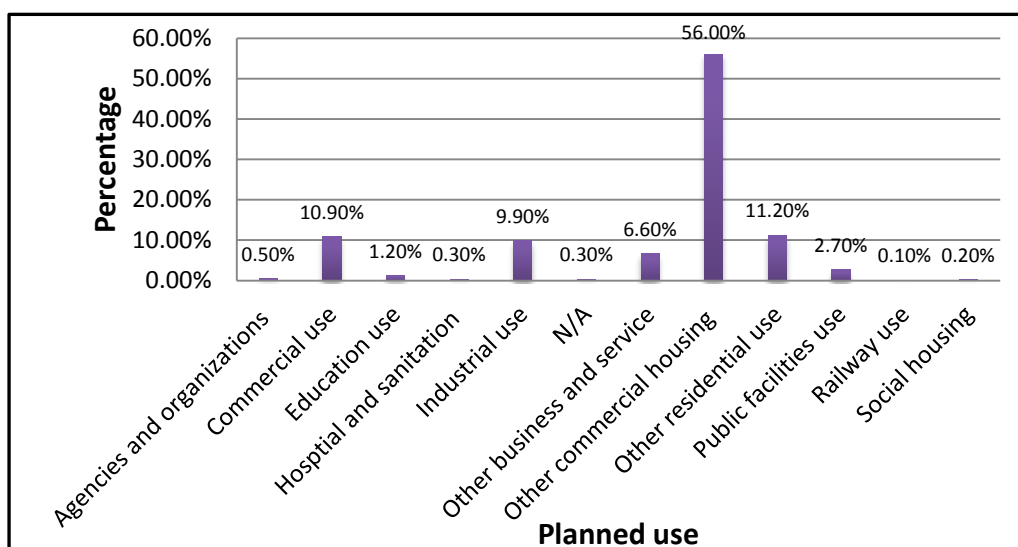
FIGURE 9. TRANSACTION SITUATION THROUGH NEGOTIATION LEASING FROM 2008-2012



Source: Changsha Municipal Bureau of Land Resource. Create by Author

As shown in the bar chart, various planned use of land disposed by negotiation illustrate high proportion for housing and residential categories, over half of cases belonging to other commercial housing and around 11% goes to other residential use. The 'other' term represented here describe the difference of land planned use with normal residential area. In this chart, apparently, negotiation lease land also scheduled for public good (e.g. public facilities, social housing), however, in recent years, the soaring real estate create the possibility for power rent seeking. Thus, negotiation leasing for commercial houses became a mainstream. Explicitly, majority leasing cases distributed mainly for business purpose, namely, 10.9% for commercial use; 9.9% for industrial use; 6.6% for other business and service.

FIGURE 10. THE PROPORTION OF LAND PLANNED USE THROUGH NEGOTIATION DURING 2008-2012



*Other commercial housing and other residential use are having certain limitation (e.g. Floor ratio area or area per household is relatively lower than normal housing).

Source: Changsha Municipal Bureau of Land Resource. Create by Author

Bidding, auction and listing mechanism

With aspect of bidding, auction and listing mechanism, owing to the predominate implementation of listing approach, the land traded by listing representing the rough land demand situation. Thus, the trading trends of listing approach mainly utilized to interpret the transaction situation.

As shown in the following line graph, both transaction quantity and total leasing area have grown dramatically. Meanwhile, comparing with negotiation and administrative allocation, it reflects steady growing needs of land. The seeming contrast is explained as follows: on the one hand, it has a manifest ascending process from 2009 to 2011, in this period the total leasing area have doubled from 8 square kilometers to 16.8 square kilometers and transaction amount almost have tripled from 127 to 417. On the other hand, both transaction amount and leasing area are barely slight increase from 2011 to 2012, even it remain high.

Contrasting growing trends of land transfer with negotiation leasing, the land demand for market shows immense require of land with the urbanization and economic growth circumstance. For negotiation leasing it also reflect the urgent need of land, notably, in 2010, the soaring growth of local real estate investment which transferred from those costal region with high housing price generated more leases by negotiation. However, in overall, the negotiation lease have non-obvious pattern, it's more like a compromising and combining way to deal with certain land have both nature of market and government. For example, the scenario that a state-owned firm have request of land for commercial use, generally, it match public leasing rules, but still have support from government which means it will have lower market price for a plot. It also applied to some government supported projects. In conclusion, the bidding, auction and listing approaches demonstrating the real market needs; administrative allocation reflecting the land needs for welfare and enhancement of city; negotiation showing the government intervene of market.

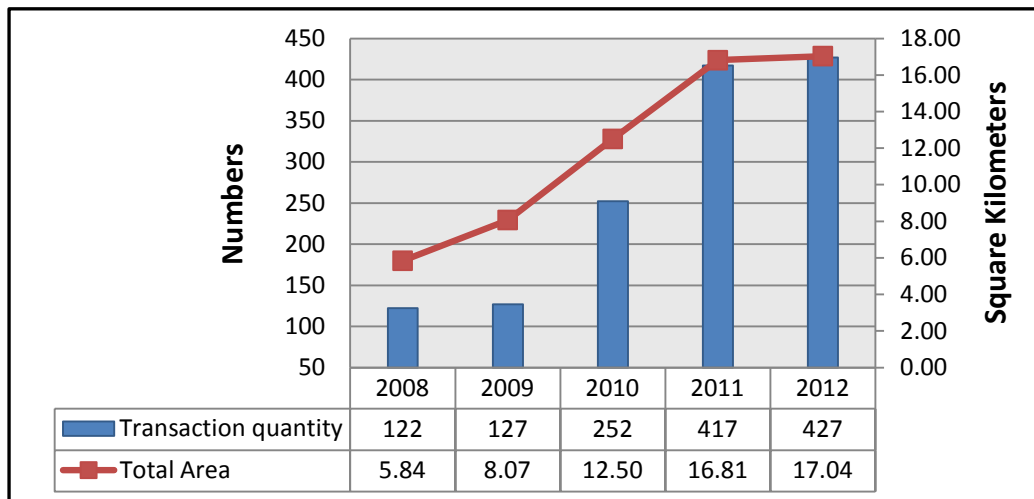
From the explanations of Interviewee¹⁴ from Changsha Municipal Bureau of Land Resource, he confirmed that since the municipality has started the online state-owned construction land use right transfer listing system, the transaction made more transparent, low transaction cost and easy to operate. Additionally, he also confirmed that this drastically increase of land listing, it is not only reflect development of Changsha city which attracted large amount of investment, but also reflects substantial ambitious of city transformation though urban planning. From the perspective of Interviewee¹⁵ from Central South University, he believe that in recent years, the high profit generate from real estate made more developer participate in land listing competition, and the development of real estate can improve various enhancement of industries and economy growth, which is the good result that government

¹⁴ Interviewee: Director Chen from Changsha Municipal Bureau of Land Resource

¹⁵ Interviewee: Professor Zhang from Central South University, Changsha, Hunan, China

like to see. Even though, this kind of prosperity has high risk for bubble economy, however, majority of municipalities have done such strategies. With the statutory control of housing price, this kind of irrational land price bids have been contained in some extent. Moreover, transaction rate has slight growth from 2011 to 2012, but generally, listing leasing still showed an ascending trend. Apart from this, even central government attempt to slowdown the overheat real estate, but it indeed will affect entire economic operation. It is a dilemma need to deal with. From the latest research, the land market in 2011 to 2012 is relatively weak. But, at beginning of 2013, land trade showed a favorable situation.

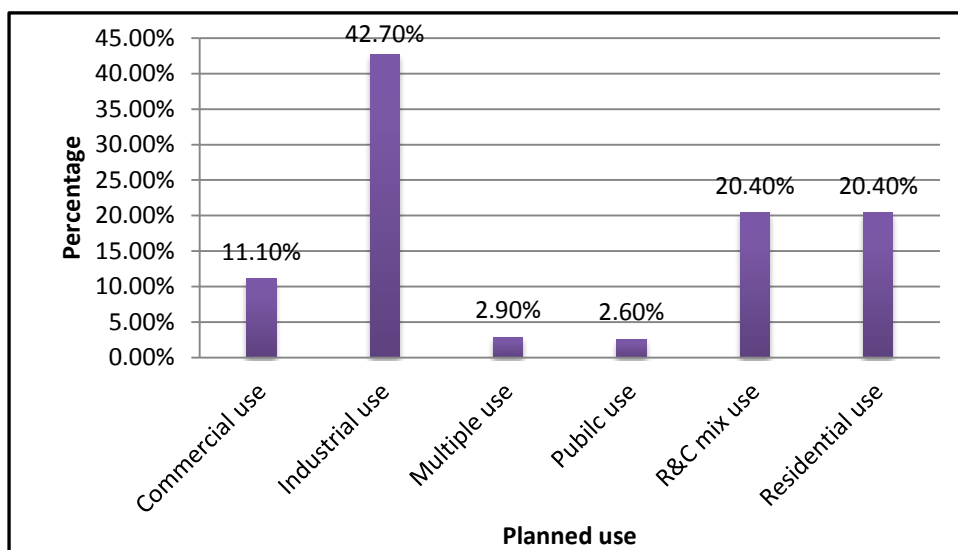
FIGURE 11. TRANSACTION SITUATION THROUGH LISTING APPROACH FROM 2008-2012



Source: Changsha Municipal Bureau of Land Resource. Create by Author

With respect of land planned use disposed by listing, 42.7% of deals go for industrial use, which occupied the highest part. Then followed by residential as well as residential and commercial mixed use, both are accounting for approximately 20%. Moreover, over one tenth of land planned for commercial use. This data demonstrate the rough real market needs of land in the past half decade. High proportion for industrial land use situation owing to the industrial development orientation of Changsha city. Besides, the national policies have reinforced the development of industry. Moreover, relatively lower housing price (compare with other central capital cities and costal capital cities) showing a huge potential for appreciation and the investment flowing into central cities which pushed by regulatory policies are accelerate promotion of real estate. Hence, substantial land utilized for real estate development. In terms of commercial use, the proportion maintained at a rational level, the trading price show more meaningful information than transaction area and quantity.

FIGURE 12. THE PROPORTION OF LAND PLANNED USE THROUGH LISTING DURING 2008-2012



*R&C mix use represent residential and commercial mix use

*Multiple use represent a certain parcel has at least 2 distinct land use but differ than R&C mix use. E.g. residential use combines with education use.

Source: Changsha Municipal Bureau of Land Resource. Create by Author

Allocation

Allocation is a crucial factor to determining the value of land in large extent.

From the observation for table 9, majority of land located in urban area disposed by administrative allocation and negotiation leasing, both percentages are in the vicinity of 70%. In one hand, combining with the information demonstrated in Figure 8, which showed the land planned use status of administrative allocation, as defined as administrative allocation, most of land planned for the city's enhancement. Hence, as illustrated in table 9, urban area has obtained more improvements from infrastructures to green space, which is normal principle of development priority to some extent. Moreover, negotiation leasing have high percentage of deals in urban area rely on government intervene as mentioned before. On the other hand, the situation of listing leasing is on the converse, only 30.3% of traded land allocated in urban area. There are two major reasons for this phenomenon. Firstly, since the municipalities utilized land leasing as one of major method to address fiscal issue, considerable land have been leased or the original contract does not expired (e.g. negotiation lease). Hence, the land supply and demand in the central urban is intense. In addition, majority of land leased by bidding, auction and listing mechanism before, there is no adequate land for this large amount needs for urban area. Secondly, based on the information from Figure 12, over 40% of transaction goes to industrial use, and those industrial development zones mainly located at suburban and county region. Therefore, in the respect of listing, predominate traded land are situated in county or suburban area.

TABLE 9. THE PROPORTION AND FREQUENCY OF LEASING LAND ALLOCATION CONDUCTED BY VARIOUS LEASING METHODS DURING 2008-2012

			Region			
Leasing Methods			Frequency	Percent	Valid Percent	Cumulative Percent
Administrative allocation	Valid	County	378	30.7	30.7	30.7
		Urban	852	69.3	69.3	100.0
		Total	1230	100.0	100.0	
Listing	Valid	County	937	69.7	69.7	69.7
		Urban	408	30.3	30.3	100.0
		Total	1345	100.0	100.0	
Negotiation	Valid	County	276	30.3	30.3	30.3
		Urban	636	69.7	69.7	100.0
		Total	912	100.0	100.0	

Source: Changsha Municipal Bureau of Land Resource. Create by Author

4.3.3. Land price formed by different land leasing approaches

Benchmark price

Land benchmark premium is an average land price which evaluated depends on level factors and land use factor and announced by local governments. This price is a legal payment for land use right in regulatory context. Land benchmark price assessed under market conditions, however, municipalities have right to alter for land price control purpose, even though this is not a frequent actions. For public land leasing, benchmark premium is a vital reference standards, generally, the leasing starting price cannot lower than this criteria.

From the information of table 10 and 11, land level has divided into 6 groups in 2005, and in 2009, there two subgroups in level six. Commercial land use has highest premium rate and industrial land use has the lowest rate. More precisely, based on the data below, comparing with the benchmark price in two tables, the calculation of premium growth rate illustrate that the average growth rate of commercial use is 95%, and it is noteworthy that for level 1 and 2 the growth rate are around 45%, however, the lower the level of land the high increase rate of its benchmark price (around 110% for level 3, 4 and 5). The similar situation happened for residential and industrial land use. This phenomenon demonstrate that land value increased in large extent in general which improved by the marketable leasing methods and economic growth (consider inflation). Moreover, in the one hand, municipality still control the high land price in city central area and keep the growth in certain extent. On the other hand, with the substantial leasing conducted in suburban or county region, the benchmark premium increased dramatically, which enhance the land revenue. This regulatory intervene can be seen as a deliberate behavior.

TABLE 10. LAND BENCHMARK PREMIUM IN URBAN AREA OF CHANGSHA (ISSUED IN 1ST JUL. 2005)

Land level	Commercial use (USD/m ²)	Residential use (USD/m ²)	Industrial use (USD/m ²)
I	870.26	660.25	346.83
II	595.02	480.47	283.19
III	319.78	256.15	192.51
IV	210.01	178.19	146.37
V	141.60	127.28	112.96
VI	100.23	93.87	81.14

*There is general land benchmark premium; the specific land planned use will make modification based on this¹⁶.

Source: Changsha Municipal Bureau of Land Resource.

TABLE 11. LAND BENCHMARK PREMIUM IN URBAN AREA OF CHANGSHA (ISSUED IN 1ST JUL. 2009)

Land level	Commercial use (USD/m ²)	Residential use (USD/m ²)	Industrial use (USD/m ²)
I	1247.32	968.90	380.24
II	890.94	693.66	316.60
III	636.39	509.11	264.10
IV	455.02	356.38	219.55
V	324.56	251.37	167.05
VI-1	232.28	179.78	114.55
VI-2	159.10	140.00	101.82

* The present land benchmark premium is based on this documents issued in 2009.

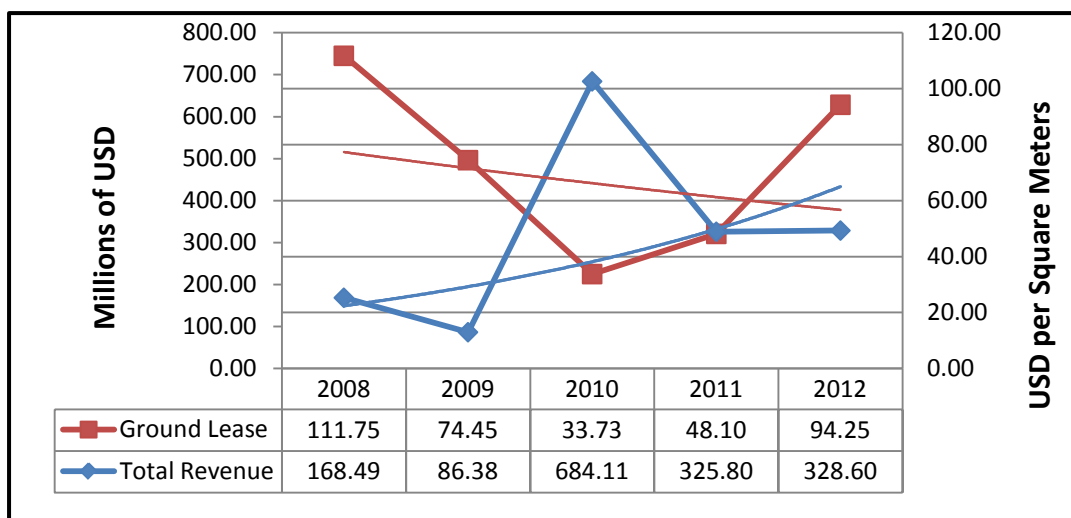
Source: Changsha Municipal Bureau of Land Resource.

Revenue from Negotiation leasing

During 2008 to 2012, the average ground lease showed the U-shaped transformation, which represents a converse situation with total profit. Despite with the high profit and low average ground lease in 2010, the slim red and blue trend lines reflect the general changes. The trend lines illustrate that the sum revenue generate by negotiation lease have slight ascended (from 169 million dollars to 329 million dollars approximately), on the contrary, the average square meter of land have slightly descended (from 112 dollars per square meter to 94 dollars per square meter). The abnormal value in 2010 also contributes to considerable investment from coastal cities as mentioned before. Moreover, high revenue generate in 2010 due to large amount of land area not ground lease (34 dollars per square meter in 2010, which is the lowest rate in this period).

¹⁶ Land level is the grading result of assessment, it depends on the allocation.

FIGURE 13. NEGOTIATION LEASING REVENUE INFORMATION DURING 2008-2012



*The slim red line and blue represent the trend lines form by the excel table.

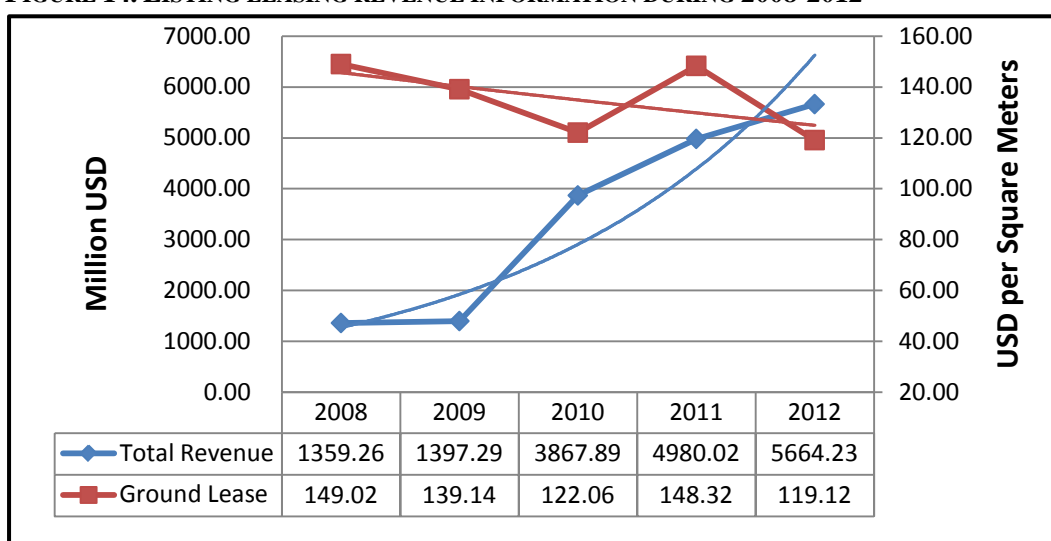
Source: Changsha Municipal Bureau of Land Resource. Create by Author

Revenue from listing leasing

With respect of Listing, as represent in the table below, from 2008 to 2012 the total profit has increased drastically, the data shown in 2012 (around 1360 million dollars) almost quadrupled in 2008 (around 566 million dollars). In the past five years, the revenue from land disposed by Listing demonstrates the high potential of land appreciation from market. In terms of average ground lease, it has slight fluctuate changes, and till 2012, it has decrease compare with 2008, from approximate 150USD/m² to 120USD/m², but still maintain a high standard.

Moreover, the land price has restrain the by central government policy, which create the appearance of fluctuation.

FIGURE 14. LISTING LEASING REVENUE INFORMATION DURING 2008-2012



*The slim red line and blue represent the trend lines form by the excel table.

Source: Changsha Municipal Bureau of Land Resource. Create by Author

According to the analysis given by Interviewee¹⁷ from Central South University, he believe that the average ground lease have slight decrease that only illustrate the overall situation, cause with the listing lease area spread into suburban and county area due to the limitation of urban land, it is lower the average ground lease, certain plot still have dramatic land incremental value. Moreover, it is obvious to find that ground leases have fluctuate trend, which is affect by the policy factor and the rebound attribute to the decent progress of real estate development in Changsha.

Value affect by land planned use

According to table 12, it demonstrates the T-test result analyzed based on land planned use.

TABLE 12. ONE SAMPLE T-TEST FOR DIFFERENT LAND USE FROM LISTING TRANSACTIONS

Planned use		One-Sample Test					
		Test Value = 0					
		t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
Lower	Upper						
Commercial use	Trading Price	2.994	148	.003	18.5183326	6.293822	30.742843
	Premium Rate	5.267	147	.000	24.29065%	15.1766%	33.4047%
	Ground Lease	7.298	147	.000	356.28692	259.8097	452.7642
Industrial use	Trading Price	9.164	573	.000	3.5296186	2.773130	4.286107
	Premium Rate	5.883	569	.000	3.44268%	2.2932%	4.5921%
	Ground Lease	47.371	571	.000	57.08296	54.7161	59.4498
Multiple use	Trading Price	4.213	38	.000	21.2905159	11.059482	31.521550
	Premium Rate	2.880	38	.006	26.21808%	7.7916%	44.6445%
	Ground Lease	6.598	35	.000	151.53356	104.9073	198.1598
Public use	Trading Price	2.409	34	.022	3.4045251	.532926	6.276124
	Premium Rate	1.941	34	.061	1.50185%	-.0707%	3.0744%
	Ground Lease	11.565	34	.000	140.21701	115.5785	164.8556
Residential and commercial mix	Trading Price	8.580	273	.000	25.2321850	19.442557	31.021813
	Premium Rate	7.861	273	.000	26.19608%	19.6357%	32.7565%
	Ground Lease	17.260	271	.000	159.53062	141.3338	177.7274
Residential use	Trading Price	10.566	273	.000	16.8625680	13.720607	20.004529
	Premium Rate	5.143	269	.000	10.45213%	6.4507%	14.4535%
	Ground Lease	15.340	272	.000	142.83073	124.5004	161.1611

*Premium rate= Starting price/Trading price

Source: Changsha Municipal Bureau of Land Resource. Create by Author

Apparently, commercial land use has the highest ground lease which approached 356 dollar per square meter separately. In addition, industrial land use has the lowest ground lease (57

¹⁷ Interviewee: Professor Zhang from Central South University, Changsha, Hunan, China

dollar per square meter) and public use has the lowest average trading price (3.4 million dollar per transaction). With aspect of premium rate, parcel has multiple use and commercial use are have high level of premium rate(around 24% to 26%), which means that those parcel have high expectation for development to obtain land residual value and generate more profit. Both public use and industrial use are having low premium rate, 1.5% and 3.5% respectively. In recent year, the most of land are goes to industrial use; it is match the urban master planning base on the national policies and the economic pillar functions of heavy industrial. In terms of residential use, both multiply use and residential and commercial mix use is more favor to the developers, they are having higher ground lease and premium rate than merely residential use. From the perspective of Interviewee¹⁸ from Central South University, he indicated that the data illustrated in the following table reflect the normality of land price determine by land use from the market.

Revenue Comparison

Since the bidding, auction and listing approaches has been introduced, this marketable land leasing methods brought more revenue for Changsha municipality than other means. Certain plots disposed by administrative allocation cannot generate income for local government. Apart from, in table 13, it compare listing with negotiation lease, the confidence interval showed that majority of transaction through listing from 98 to 120 dollar per square meter and the data of negotiation is from 54 to 78 dollars per square meter; for trading price, the range of listing is from 89 to 122 million dollars and range of negotiation is from 1.37 to 2.12 million dollars. Moreover, the average trading price per deal of listing leasing is 106 million dollar, which is 61 times of negotiation trading price. In terms of average ground lease, listing leasing have much higher than negotiation, about 110 dollar per square meter and 66 dollar per square meter respectively.

TABLE 13. ONE SAMPLE T-TEST OF LISTING AND NEGOTIATION FOR LEASING REVENUE AND GROUND LEASE

Leasing method		One-Sample Test					
		Test Value = 0					
		t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
Lower	Upper						
Listing	Trading Price(Million USD)	12.471	1631	.000	105.8130108	89.170519	122.455503
	Ground Lease(USD/m ²)	19.785	1622	.000	109.75345	98.8730	120.6339
Negotiation	Trading Price(Million USD)	9.186	911	.000	1.7471377	1.373869	2.120407
	Ground Lease(USD/m ²)	10.798	911	.000	66.13003	54.1107	78.1494

Regression for land revenue

According to the data, SPSS will make the regression equation of land revenue formulate by

¹⁸ Interviewee: Professor Zhang from Central South University, Changsha, Hunan, China

negotiation revenue and listing revenue.

TABLE 14. HYPOTHESIS OF LAND REVENUE WITH DIFFERENT LEASING REVENUE

Null hypothesis:	Alternative hypothesis:
❖ The negotiation trading price is highly related to land revenue	❖ The negotiation trading price is not highly related to land revenue.
❖ The listing trading price is highly related to land revenue	❖ The listing trading price is not highly related to land revenue.

TABLE 15. REGRESSION RESULT CONDUCTED BY SPSS

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.880 ^a	.775	.700	1006.6062994

a. Predictors: (Constant), Listing

ANOVA^b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10448561.002	1	10448561.002	10.312	.049 ^a
	Residual	3039768.726	3	1013256.242		
	Total	13488329.727	4			

a. Predictors: (Constant), Listing

b. Dependent Variable: Land Revenue

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	232.015	978.726		.237	.828
	Listing	.808	.252	.880	3.211	.049

a. Dependent Variable: Land Revenue

Excluded Variables^b

Model		Beta In	t	Sig.	Partial Correlation	Collinearity Statistics
						Tolerance
1	Negotiation Profit	-.463 ^a	-2.068	.175	-.825	.717

a. Predictors in the Model: (Constant), Listing

b. Dependent Variable: Land Revenue

The regression result derived from stepwise method, which means it will take out the insignificant variables. According to the tables, the value of R and R Square showed the reliability of this result, it showed that 88% of reliability. Moreover, assuming that a probability value of $p < 0.05$ is significant, the significant of Listing is 0.049, and $0.049 < 0.05$, the null hypothesis is received, in other words, there are high significant and positive relationship between land revenue and listing leasing profit. On the other hand the variable Negotiation has been excluded, the significant of Negotiation is 0.212, and $0.175 > 0.05$, the null hypothesis is rejected, there no significant between land revenue and negotiation leasing profit. The significant of regression is $0.049 < 0.05$, which showed that the assumed equation is correct.

Y= Land revenue

c= constant

b=0.808

X= Listing leasing profit

The equation comes to: Land Revenue = 232.015 + 0.808 Listing leasing profit

4.4. Public Leasing financing Metro system

Based on the theory of land value capture, the incremental land value improve by government infrastructure implementation should feedback to the public goods. In the case of Changsha, the current remarkable mission is metro system implementation. Precisely because of accessibility and economy growth considerations, this project has a long-term planning, in terms of financing issue, land revenue play a significant role here. The next section will illustrate the municipality income and cost with the aspect of land. Moreover, the composing of financing means will demonstrate the status of land revenue in the financing process. Besides, three typical cases will show the land value appreciated by metro system.

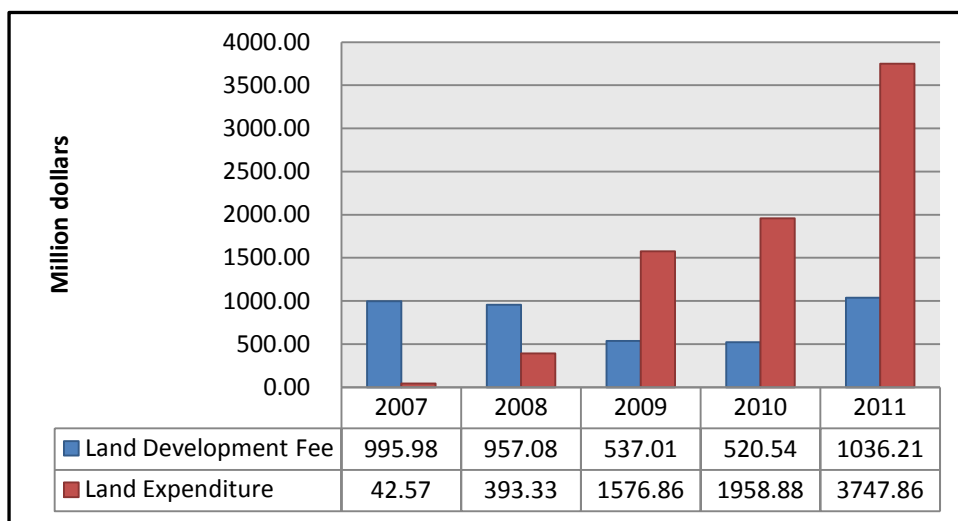
4.4.1. Land expenditure and revenue

Land expense

According to the annual statistic report, the figure 15 shows the primary cost land acquisition and land development spend by Changsha municipality. As seen in the table which composes by two major categories, namely land development fee and general land expenditure. More detailed that land development fee is not always responded by municipality, sometimes is also charged by developers, the distinction is identified by the specific leasing conditions, if this plot without basic service, for instance, connection of water and electricity and natural gas etc., it called as raw land, to conducting real estate development the basic services is necessity. Generally, this kind of fees is responded to municipality and the leasing contract will identified this category. Moreover, the data showed below is the cost for local government. In terms of the land expenditure, it is including the compensation for land

expropriation and the cost for land purchase. From the information in table, the land development fees have not obvious fluctuate, which means local government sells massive of plot but with relatively low cost for it, and maximize the land net profit. With respect of land expense to obtain the parcels, this payment did not calculated into the land settlement, cause not all the acquired land will be sell in the same year, it calculated into municipality fiscal balance account. However, the expenditure for compensation and purchase account numerous costs for local government. More significantly, for land leasing purpose and old city district transformation, this expending has ascended geometrically. Till 2010, local authority spend roughly 3750 million dollars for land, this cost is almost four times of land development fee. It is notably that with the growth of land price and housing price, the compensation also has a high speed growth.

FIGURE 15. THE COST OF LAND ACQUISITION AND DEVELOPMENT DURING 2007-2011



*Land Expenditure= Expropriation compensation+ Land Purchase cost

Source: Annual Statistic Report of Changsha City (2012), Edit by Author¹⁹

Land income

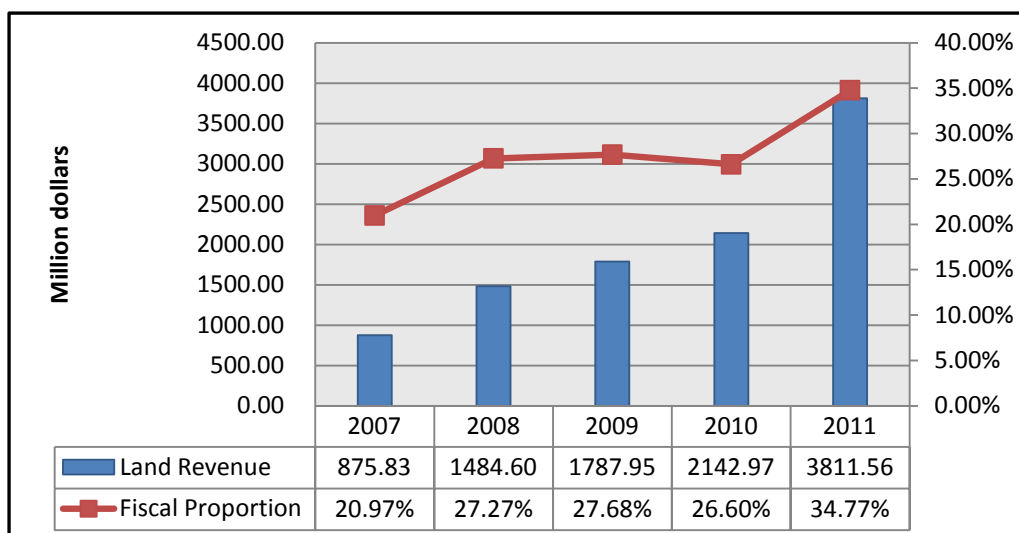
On the other hand, from 2007 to 2011, the land revenue have ascend four times, in 2007, the land revenue approximate 875 million dollar, till 2011, this data approached over 3800 million dollar. Even through the fiscal income also has considerable growth due to favorable economic performance, but the ratio between land revenue and entire fiscal income reveal the phenomenon that the proportions of land revenue present a large scale increase in the fiscal income. In 2007, this number shown as 21%, it increase to around 27% and maintained, till 2011, land revenue has already account 35% of fiscal revenue. For local government, two major approaches generate income, namely, taxation and land revenue. But municipality can keep 95% of land revenue, merely 5 % (this ratio is debate for its low level) turn over to central government. In terms of taxation, generally keep for local budget, individual income tax and corporate income tax (CIT) should turn 60% over to central government, which is substantial amount of revenue.

¹⁹ Till 2012, the report only shows the data one year before, thus, the updated data record only till 2011.

Recent years, Changsha municipality have leased considerable parcel for fiscal income, and this is ubiquitous in the whole country, suffering from the worldwide financial crisis, the economic data did not reach to the expectation, and it heavily impact to export sector, the central government announce policy and funds for consumption sector enhancement. But in reality, current economic operation is heavily depend on government investment, cause in the period of economic slowdown, government is the largest institution to undertake investment and bear debt. Once, government investment is the trick for high speed economy growth in China. Therefore, government tries to generate more revenue, which is the crucial reason to promote the land economy. This opinion is point out by The interviewee²⁰ from Central South University.

From the view of Interviewee²¹ from Central South University, base on his research, land finance is mainly contributed by the taxation distribution between local and central government. From the national data, in 2011, approximately 52% of taxation turnover to central government, for instance, entire consumption tax, tariff and import VAT(value added tax) etc goes to central government; 75% domestic VAT, 60% CIT(corporate income tax) and 60% individual income tax etc goes to central government, then municipalities keep the rest. Since 1994, the tax system separated, and this create huge disparity of tax income between local and central government. This approach originally try to solve the central authority financial constraints, however, this regulation finally lead to the fiscal scarcity of local government. Therefore, local government starts immensely leasing the land with marketable leasing approach, namely, bidding, auction and listing system. High housing price in certain cities are precisely create by this action (market-oriented lease create higher cost for developer which formed high housing price on real estate market).

FIGURE 16. LAND REVENUE AND PROPORTION IN TOTAL MUNICIPALITY FISCAL REVENUE DURING 2007-2011



Source: Annual Statistic Report of Changsha City (2012), Edit by Author²²

²⁰ Interviewee: Professor Zhang from Central South University, Changsha, Hunan, China

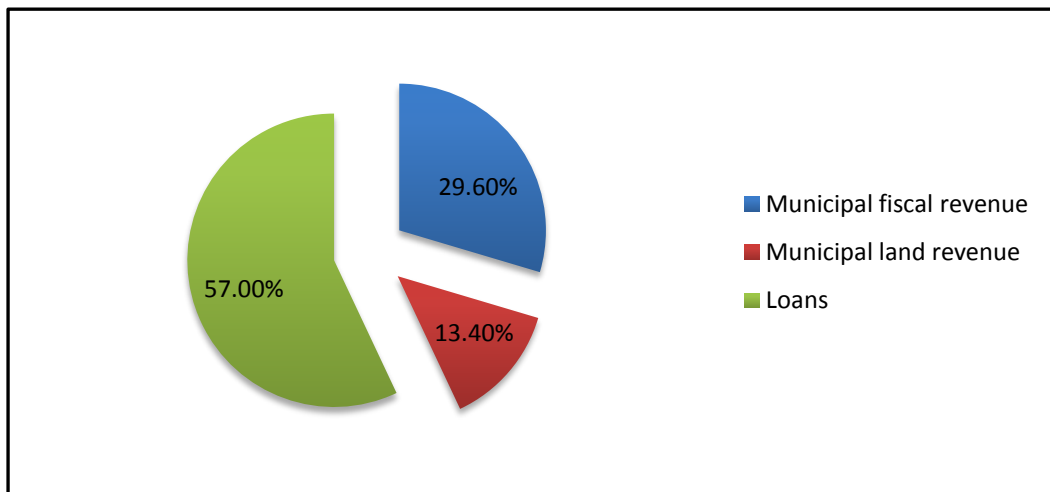
²¹ Interviewee: Professor Zhang from Central South University, Changsha, Hunan, China

²² Till 2012, the report only shows the data one year before, thus, the updated data record only till 2011.

Metro financing pattern

The metro project was approved at 9th February 2009. The initial construction started at September 2009. From 2009 to now the route No.1 and No.2 is under construction, route No.3 and No.4 is integrated into schedule. From Changsha Metro Group Co., Ltd report, the sum assessed investment for the construction of No.1 and No.2 lines cost 3527.3248 million dollars. Apart from this, based on the approved scheme of Changsha municipality, the capital from government take 43%, which is 1516.6653 million dollars, and 472.5161million dollars(account 31.15% government investment) from the land leasing revenue, 1044.1492 million dollars(account 68.85% government investment) from the municipal fiscal budget, and rest of 2010.6595 million dollars will come from domestic banks' loans. As shown in the following pie chart, it illustrates the proportion of each investment. Land revenue occupied 13.4% of financing funds for the construction of metro, which is not the highest rate but worked as a critical part.

FIGURE 17. THE PROPORTION OF METRO CONSTRUCTION INVESTMENT AND FINANCE



Source: Changsha Metro Group Co., Ltd, Create by Author

According to the information from Interviewee²³ from Changsha Municipal Bureau of Statistics, she said the initial investment of metro project for route No. 1 and No. 2 are basically completed. She said that construction cost for one kilometer of metro line approximately 480 million Yuan (around 76.37 million dollars), which is little bit lower than the average cost in other city, like Beijing and Guangzhou. However, it stills a lot of money. Besides, considering the large amount of subsidy for ticket, the in the maintenance and operation period, Metro system will bring huge pressure for government budget. Currently, Changsha Metro Group Co., Ltd has attempted to address this issue by PPP financing (Public and Private Partnership).

In addition, in the long-term planning, there are 12 lines including in the metro project, which connect the county regions, the No.3 and No.4 lines will start in 2014, and intercity railways

²³ Interviewee: Director Chen from Changsha Municipal Bureau of Land Resource

are also waiting in line. Another interviewee²⁴ from Changsha Municipal Bureau of Statistics, she point out that the long-term financing issue is the essential part for metro programme. She said that in this year, Changsha Metro Group released 2.5 billion Yuan (about 397.74 million dollars) corporate bonds to address the pressing needs. She said that municipality hope to attract more private investment and local government are researching on how to utilize the development of business circle around metro entrance to attract private investment. She also confirms that large amount of land development is on the right track, and numerous land revenue generate from certain parcel attribute to the huge business opportunities around metro. This is a major way to attract investment, not only for financial issue but for economic growth. Apart from this, local government prepare certain business project (e.g. advertisement, selling the franchise in underground stations) to attract direct investment and corporation with Changsha Metro Group Co., Ltd.

4.4.2. Land value affects by and finance for Metro system

According to the theory of land value capture, local government sharing land value appreciation is rely on the government intervene, especially the infrastructure implementation. In practice, particularly in the circumstance of China, even though, national authority through fiscal decentralization that local government leasing the land to tackle fiscal issue, however, for many immense project, investment scarcity and non-diversified reasons lead to the phenomenon that the land value improved by certain public goods will feedback for the implementation of this public goods and so as the revenue from other plots. More precisely, large-scale project not only benefit the plot which in the vicinity, but also enhance the welfare for the entire city. In the case of metro system, this reason is more reasonable to interpret, the establishment of subways will considerably increase the accessibility and alleviate the congestion and even more it will drive the business development. Hence, the metro system should and have been financed by the land revenue generate from the appreciated parcel near metro entrance and also will from other land have indirect interest from metro.

However, there are huge distinctions between land values. According to the observation from interviewee²⁵ from Central South University and much other news²⁶, the planning of the metro routes has been modified for land sale purpose. The No.1 route originally planned to pass through the Furong north road which is a frequent create congestion during commuting time, but it change to the Xiangjiang road(in the vicinity of Xiangjiang river). Moreover, the final destination of No.2 line has changed from Lugu high-tech zone to Meixi lake region. This modification made considerable debate; the opponent claimed that this change did not match purpose of city traffic enhancement. The interviewee from Central South University point out that, this variation largely attribute to the revenue from those land, cause in the original plan there are barely parcels can be sell, on the contrary, the new plan made more leasable parcel around. Moreover, similar situation also happened in the planning of No.3 and No.4 lines.

²⁴ Interviewee: Deputy Director Zhang from Changsha Municipal Bureau of Statistics

²⁵ Interviewee: Professor Zhang from Central South University, Changsha, Hunan, China

²⁶ <http://finance.eastmoney.com/news/1365,20110625144556985.html>

There is an independent T-test for the parcel traded by listing method which is in the urban area, the test will show that if there are difference and relationship between metro impact with premium rate and ground lease. In terms of data selection, parcel located in urban area and planned for commercial and residential transaction from 2010 to 2012 have been selected. To determining the metro impact which defined as 'metro factor' in the following test, based on researches, the parcel within about one kilometer radius of metro entrance has significant land appreciation. In the opposite, value of parcels outside of this circle has progressively descending. Hence, those parcels located in the vicinity of one kilometer radius (maximum to 1.5 kilometers) of metro entrance have 'metro factor' for land value.

TABLE 16. HYPOTHESIS OF LEASING REVENUE WITH METRO FACTOR

Null hypothesis:	Alternative hypothesis:
❖ Premium rate and ground lease are highly related to metro factor	❖ Premium rate and ground lease are highly related to metro factor

The test table showed that there are huge difference between parcels have metro factor and not. For both premium rate and ground lease, obviously, the value of mean with metro impact are much higher than without metro factor. More specifically, the average premium rate with metro factor is about 42%, and without is 26%, with aspect of ground lease this average number showed a significant difference, parcel with metro factor almost 500 dollars per square meter, but merely 275 dollars per square meter for those parcel without metro factor.

According to the second T-test table, assuming probability value of $p < 0.05$ is significant.

The significant of premium rate is 0.046, and $0.046 < 0.05$, the null hypothesis is received, in other words, there are high significant and positive relationship between premium rate and the location which nearby metro entrance. The significant of ground lease is 0.008, and $0.008 < 0.05$, the null hypothesis is received, in other words, there are high significant and positive relationship between ground lease and the location which nearby metro entrance. In summary, the location factor of metro is a crucial element to determine the land value. Additionally, the parcel near to the metro entrance has much higher leasing price and leasing revenue than parcel without this condition

TABLE 17. INDEPENDENT T-TEST FOR PLOT NEARBY THE METRO ENTRANCE OR NOT

Group Statistics					
	Metro factor	N	Mean	Std. Deviation	Std. Error Mean
Premium Rate	yes	52	41.8527%	80.35834%	11.14370%
	no	83	26.3553%	57.41197%	6.30178%
Ground Lease	yes	52	499.2367	711.63138	98.68552
	no	83	275.5152	161.48326	17.72509

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Premium Rate	Equal variances assumed	4.074	.046	1.305	133	.194	15.49733%	11.87507%	-7.99110%	38.98575%
	Equal variances not assumed			1.211	83.522	.229	15.49733%	12.80213%	-9.96323%	40.95789%
Ground Lease	Equal variances assumed	7.278	.008	2.759	133	.007	223.72151	81.09854	63.31173	384.13128
	Equal variances not assumed			2.231	54.308	.030	223.72151	100.26470	22.72904	424.71398

The analysis of Metro system financing by land lease is interpret by the case study. More specifically, the comparison of certain parcels with similar condition but different distance to metro entrance will illustrate land value appreciation affect by metro system and reflect the concept of land value capture process. In addition, there is a special and typical transaction which planned for direct land revenue finance for metro. Specifically, Changsha metro group Co., Ltd has sell a particular parcel with high development potential on to market as a significant financing method.

In terms of case study of metro system, the following two cases demonstrate the land value affect by metro system, moreover, the location factor showed the land value disparity by distance to metro entrance. Owing to the metro it will create different market reaction, it will prove the rationality and priority to introduce this public facilities.

Commercial use land Case

In 2012, there are two highly concerned land transaction disposed by listing leasing. Both lands are planned for commercial particularly for business finance. Parcels located on the junction of Furong Middle Road and Xiangya Road, this land is original serve as the north railway station which was officially abandoned in the early of 2012. Cause around the Furong Middle Road, there are numerous banks and security companies and other financial firms, the municipality start a programme to build a Financial Ecological Zone, and these two plots is integrate in the project.

Depending on the data showed below, two plot have similar conditions, for instance, except the land use and listing duration, the leasing area is roughly close and the FAR are lower or equal 9, besides, the assessed average leasing price did not have a large gap (No.063 is 663.85 dollars per square meter and No.064 is 541.41 per square meter), both plot are nearby.

However, according to the result of transaction, No.063 parcel have apparent more attraction for tender, expect the reason that it located at a T-crossed road, the crucial reason for this difference because that parcel more close to the metro entrance(Xiangya Road station). As we seem in the tables, the plot of No.63 have traded for approximately 149 million dollars, moreover, the ground lease surpassed 800 dollars per square meter, this number is the highest single plot land price in the entire year, and the premium rate is around 30%. on the other hand, the plot No.64 did not have a remarkable data as No.063, approximately valued 115 million dollars, the ground lease is 552.14 dollars per square meter which is only 1.98% higher than expectation.

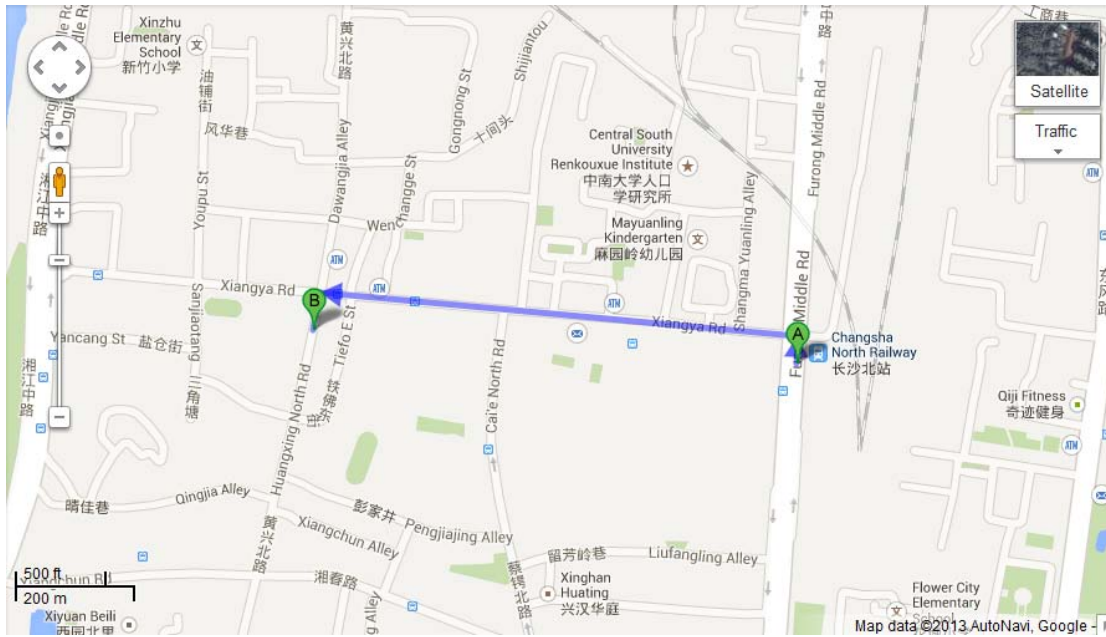
The distance and route showed in the maps interpreting the land value affected by the distances to the metro entrance. Based on the information searched on Google Map, the parcel No.063 is about 900 meter to the metro entrance, besides, when people get out of this entrance there is no visual obstructions, and they will directly found it, which is crucial for business attraction and make it like a landmark building. With respect of parcel No. 064, which is a litter bit far to the entrance, around 1300 meters to the station, Moreover, comparing with parcel No.063, it also located near a crossed road but far to metro station and have no direct view from the station. Those distinctions made the difference reactions from tenders. According to the pricing record, parcel No.063 have 30 bids, but parcel only have 3 bids, which reflect more competition for parcel No.063.

TABLE 18. LISTING TRANSACTION NO.063 [2012]

No.	Listing[2012] 063
Location	Furong Road(M), Kaifu District
Date	07-12-2012
Planned Use	Commercial Use
Leasing Duration	40 Years
Total Area(Square meter)	19221.29
Planned Gross Area(Square meter)	172991.61
Floor Area Ratio(FAR)	9
Maximum Height(Meter)	200
Trading Price(USD)	149205313.82
Ground Lease(USD per Square meter)	862.50
Base Price(USD per Square meter)	663.85
Premium Rate	29.92%

Source: <http://www.csland.gov.cn> (Changsha State-owned construction land use right online listing system) and <http://land.soufun.com/> (SouFun Corporation), Create by Author

MAP 2. DISTANCE AND ROUTE BETWEEN XIANGYA ROAD STATION WITH PARCEL NO.63 [2012]



*Scale: 1cm=200m

*Mark B is the Xiangya Road station, Mark A is the location of parcel No.063²⁷

Source: Search on Google Map with accurate location in Listing Announcement

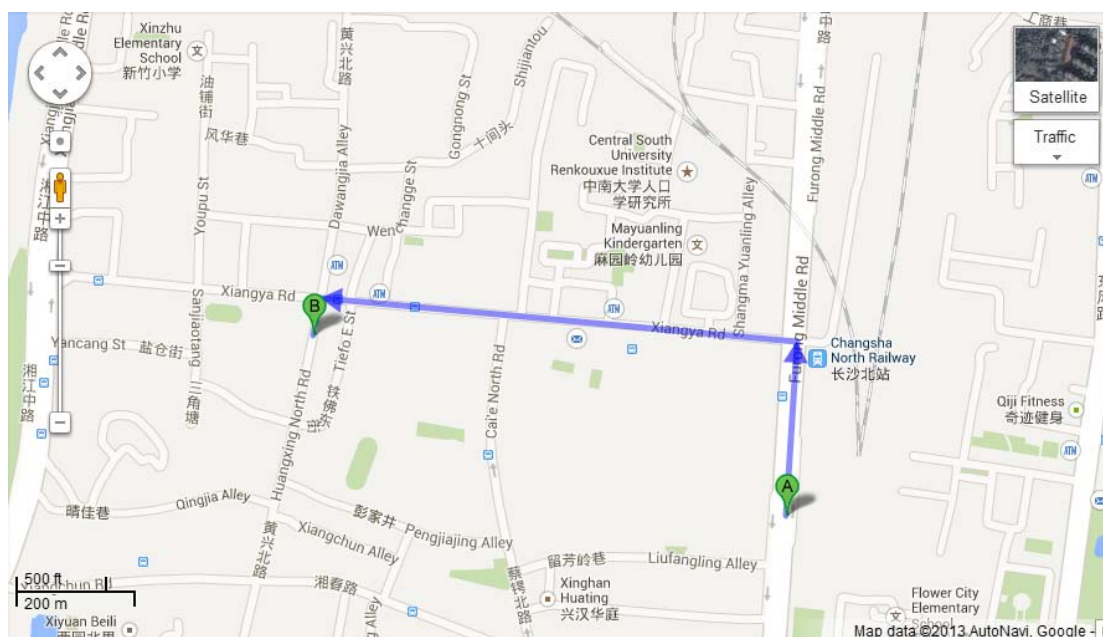
TABLE 19. LISTING TRANSACTION NO.064 [2012]

No.	Listing[2012] 064
Location	Furong Road(M), Kaifu District
Date	07-12-2012
Planned Use	Commercial Use
Leasing Duration	40 Years
Total Area(Square meter)	23070.85
Planned Gross Area(Square meter)	207637.65
Floor Area Ratio(FAR)	9
Maximum Height(Meter)	200
Trading Price(USD)	114644817.44
Ground Lease(USD per Square meter)	552.14
Base Price(USD per Square meter)	541.41
Premium Rate	1.98%

Source: <http://www.csland.gov.cn> (Changsha State-owned construction land use right online listing system) and <http://land.soufun.com/> (SouFun Corporation), Create by Author

²⁷ The railway station showed on map is already been changed. Metro station has several entrances and there certain distance between those entrances, Mark B in the map only identified rough location.

MAP 3. DISTANCE AND ROUTE BETWEEN XIANGYA ROAD STATION WITH PARCEL NO.64 [2012]



*Scale: 1cm=200m

*Mark B is the Xiangya Road station, Mark A is the location of parcel No.064

Source: Search on Google Map with accurate location in Listing Announcement

Residential use land Case

In terms of the cases for residential land, the following three transactions are located neighboring around the Railway Campus station (Railway Campus is one of the campus belong to the Central South University in Changsha). One scenario is negotiation lease in three deals, which will show low profit from negotiation lease. This district situated nearby the one of major road (Furong South Road), and relatively distant to downtown (Generally the downtown area is inside the second ring road, this location is just outside this ring road). This area relatively compete facilities and service (e.g. University campus, hospital, police station etc.), which is an ideal living place (there are numerous properties here).

As illustrate in the following listing transaction tables, in spite of distinct FAR, the planned gross area is almost close, and the assessed land price did not have a big difference. But the trading result showed the distinction. The parcel No.032 traded with 6.8 million dollar and parcel have litter bit high price around 7.2 million dollars. Notably, in terms of ground lease, parcel No.032 traded with the minimum price and has no appreciation; however, for parcel No.29, although, the base price is lower than No.032, the ground lease is 45 dollars higher than No.32. Moreover, the premium rate reached at 24.24%. Therefore, the conclusion of the transaction records is that parcel No.029 has higher market value than parcel No.032. This conclusion can also proved by the pricing process, for parcel No.032 have only one tender, according to the listing rules, it will not proceed into time limited bid and directly traded by the only offered price. In contrast, parcel No.029 have 25 bids which is more fierce competition.

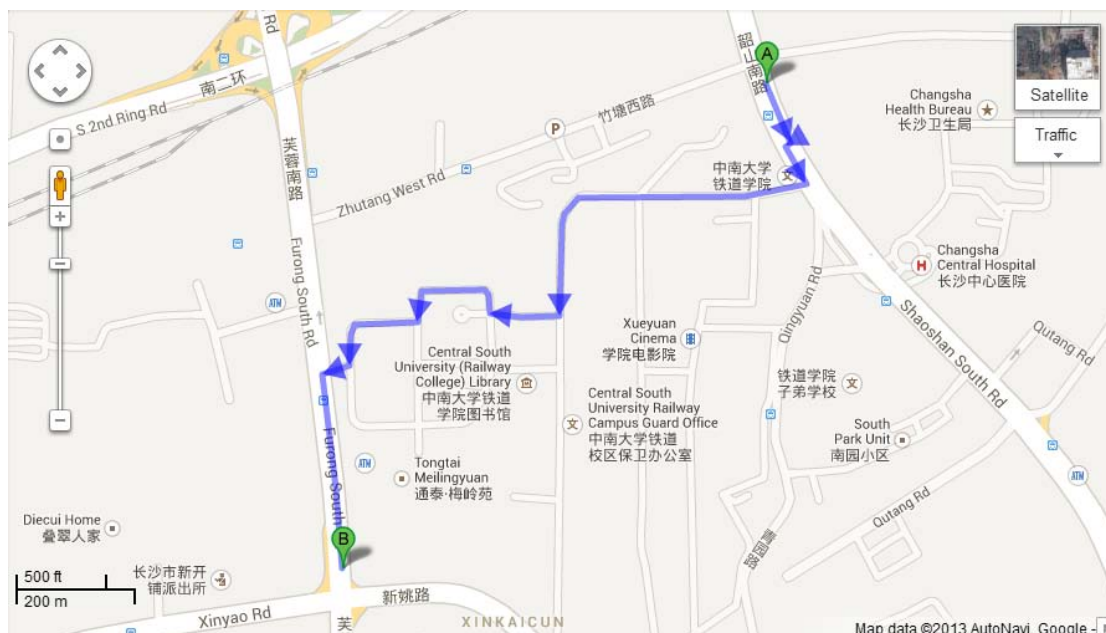
As shown in the maps, parcel No.029 close to the metro entrance with both direct and walking distance, which are 1000 meters and 1400 meters respectively. In terms of parcel No.032, the same parameter showed with 1300 meters and 1700 meters. Actually, parcel is located at the corner of a cross road, however, tender more attracted by the metro factors, which create relatively high price for parcel No.029.

TABLE 20. LISTING TRANSACTION NO.032 [2012]

No.	Listing[2012] 032
Location	No.73 Shaoshan South Road, Yuhua District
Date	05-09-2012
Planned Use	Residential Use
Leasing Duration	70 Years
Total Area(Square meter)	3909.99
Planned Gross Area(Square meter)	19549.95
Floor Area Ratio(FAR)	5.5
Trading Price(USD)	6842733.27
Ground Lease(USD per Square meter)	350.01
Base Price(USD per Square meter)	350.01
Premium Rate	0%

Source: <http://www.csland.gov.cn> (Changsha State-owned construction land use right online listing system) and <http://land.soufun.com/> (SouFun Corporation), Create by Author

MAP 4. DISTANCE AND ROUTE BETWEEN RAILWAY CAMPUS STATION WITH PARCEL NO.032 [2012]



*Scale: 1cm=200m

*Mark B is the Railway Campus station, Mark A is the location of parcel No.032²⁸

Source: Search on Google Map with accurate location in Listing Announcement

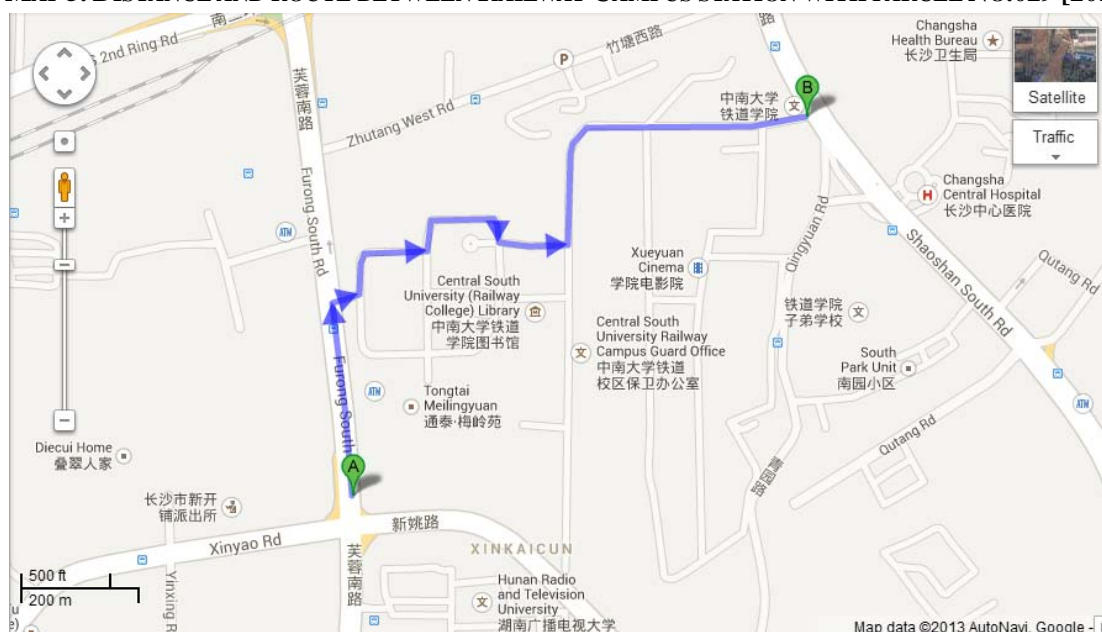
²⁸ Metro station has several entrances and there certain distance between those entrances, Mark B in the map only identified rough location.

TABLE 21. LISTING TRANSACTION No.029 [2013]

No.	Listing[2013] 029(Revision)
Location	No.141 Shaoshan South Road, Yuhua District
Date	18-07-2013
Planned Use	Residential Use
Leasing Duration	70 Years
Total Area (Square meter)	5233.17
Planned Gross Area Square meter)	18316.10
Floor Area Ratio(FAR)	3.5
Trading Price(USD)	7242065.07
Ground Lease(USD per Square meter)	395.39
Base Price(USD per Square meter)	318.26
Premium Rate	24.24%

Source: <http://www.csland.gov.cn> (Changsha State-owned construction land use right online listing system) and <http://land.soufun.com/> (SouFun Corporation), Create by Author

MAP 5. DISTANCE AND ROUTE BETWEEN RAILWAY CAMPUS STATION WITH PARCEL No.029 [2013]



*Scale: 1cm=200m

*Mark B is the Railway Campus station, Mark A is the location of parcel No.029

Source: Search on Google Map with accurate location in Listing Announcement

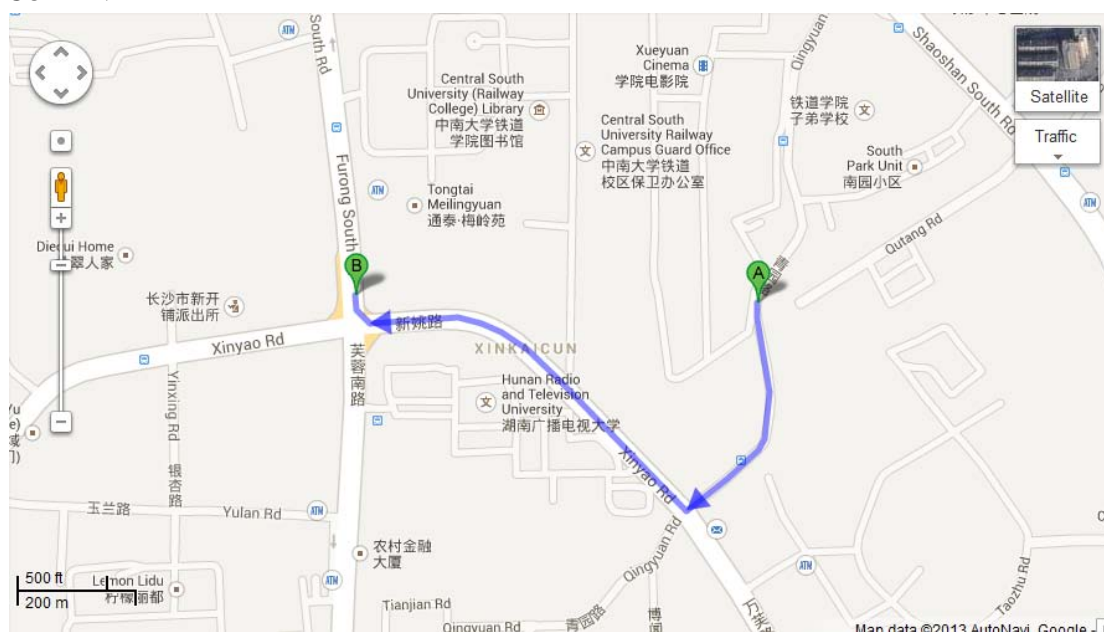
In terms of the negotiation lease, the programme conducted by Hunan LongXiang Real Estate Development Co., Ltd has signed a contract for the parcel in the vicinity of Railway Campus metro station. It is located at the middle of the Qingyuan Road, approximately 800 meters direct to the entrance and 1100 meters for walking route. Base on this information which create the high expectation for land value, however, this parcel disposed by negotiation, land value is not reflect from the market and highly underestimate.

TABLE 22. NEGOTIATION TRANSACTION PROGRAMME FOR LONGXIANG COMPANY

Name	Hunan LongXiang Real Estate Development Co., Ltd. Programme
Location	Qingyuan Road, Tianxin District
Date	28-04-2012
Planned use	Residential Use
Leasing Duration	70 Years
Total area(Square meter)	9747.76
Floor Area Ratio(FAR)	3
Planned gross area(Square meter)	29243.28
Trading Price(USD)	1137429.64
Ground lease(USD per Square meter)	38.90

Source: <http://www.csland.gov.cn> (Changsha State-owned construction land use right online listing system) and <http://land.soufun.com/> (SouFun Corporation), Create by Author

MAP 6. DISTANCE AND ROUTE BETWEEN RAILWAY CAMPUS STATION WITH PARCEL FOR LONGXIANG COMPANY



*Scale: 1cm=200m

*Mark B is the Railway Campus station, Mark A is the location of parcel for LongXiang Company

Source: Search on Google Map with accurate location in Negotiation Announcement

From the information of transaction, even this plot situated in the neighboring place with the No.029 and No.032 plots, the trading price only 1.13 million dollars and ground lease is also at a low rate, around 39 dollars per square meter, which is merely one tenth of parcel No.029. This transaction demonstrate that negotiation lease cannot generate as much revenue as listing leasing did, even it have high appreciate potential. In summary, according to the front data, negotiation leasing have slight increase(except 2010) during recent five years, but from legal perspective, authority have improved gradually on regulation to make sure land use for business purpose must disposed by listing leasing and maximize the land revenue.

4.4.3. Land serves as an instrument for Metro financing

Apart from the financing source for land incremental value, Changsha metro group also utilize land as a financing instrument. In 2012, Changsha metro group released the listing announcement, this parcel belong to the WuGuang New City development Co., Ltd, which is originally disposed by administrative allocation for railway or road construction use. This parcel now recovered by the municipality and leased for commercial use. This parcel No.025 located at vicinity of Changsha South Railway Station and the coming metro station. This project tries to utilize this transportation hub to formulate a new attractive CBD and change the existing pattern of business circle and bring economic benefits with balance development. Parcel No .025 has massive human traffic which is crucial for business operations. This plot is about 750 walking meters from the railway station; this is a perfect location factor for commercial operation. The transaction information is listed below.

According to the data, Parcel No.025 traded at 115 million dollars, and the entire revenue is directly goes to the Changsha Metro group company as the capital for metro construction. Comparing with the investment from municipality, leasing this plot is for metro financing purpose and the profit is straight for metro construction. From the table, the average land price is 350 dollars per square meter which is not high as a commercial land, however, this place is situated far from downtown, hence, the benchmark premium is relatively low, and this transaction is traded at base price which means no value increment, and low competition. It is because of the high standard development conditions and this land price and project is not undertaken by many real estate firms. In summary, this case is not common experience, in practice; it is true that many state-owned company, especially infrastructure construction firms, have obtained land from administrative allocation for public facilities use. But it changed the land use and made profit from it and financing the infrastructures.

TABLE 23. LISTING TRANSACTION NO.025 [2013]

No.	Listing[2013] 025(Revision)
Location	Furong Road(M), Kaifu District
Date	18-07-2013
Planned Use	Commercial Use
Leasing Duration	40 Years
Total Area(Square meter)	59653.10
Planned Gross Area(Square meter)	328092.05
Floor Area Ratio(FAR)	5.5
Maximum Height(Meter)	150
Trading Price(USD)	114837324.00
Ground Lease(USD per Square meter)	350.02
Base Price(USD per Square meter)	350.02

Source: <http://www.csland.gov.cn> (Changsha State-owned construction land use right online listing system) and <http://land.soufun.com/> (SouFun Corporation), Create by Author

MAP 7. DISTANCE AND ROUTE BETWEEN SOUTH RAILWAY AND METRO STATION WITH PARCEL NO.025 [2013]



*Scale: 1cm=200m

*Mark B is the South railway station and metro entrance, Mark A is the location of parcel No.029

Source: Search on Google Map with accurate location in Listing Announcement

◆ Chapter 5. Conclusions

According to the data analysis process present in chapter 4, the revised questions can be answered. The data presentation solved the main question of public land leasing performance in Changsha city and especially this land value capture for metro construction financing. To answer the main question that **how did market-oriented public land leasing performed as a land value capture instrument to financing metro construction?** The following sub-question should be answer first.

Sub-questions:

5.1. What is the legal framework of Public land leasing under bidding, auction and listing system?

There are four specific questions raised in chapter 3, these question put the right order to illustrate the pattern of bidding, auction and listing mechanism.

Firstly, under the legal framework, the definition of bidding, auction and listing system demonstrated that this system concluding 3 similar land disposal approaches with they own characteristics, the similarity of these three approaches means that they have identical nature, precisely, the leases determined by market value. Besides, the distinct characteristics rely on difference preconditions and procedures. Moreover, the root causes to introduce this mechanism owing to the local municipality fiscal scarcity issue and dysfunction of administrative land location and negotiation lease to address this fiscal scarcity. In 2003, Changsha municipality announced *the Provisional regulation of sale and transfer Changsha state-owned land use right*, which officially proved the legal right for local government to generate revenue from public land leasing. In 2005, *the Provisional regulation of sale and transfer state-owned land use right by bidding, auction and listing methods* illustrated all the conditions and rules to utilize this land dispose approach to generate revenue.

Secondly, the different characteristics create different implementation decisions by local government. More detailed, in terms of leasing price, bidding lease take many elements from tender not only price; auction lead to the highest land price; listing add time limited bids which made fierce competition. With respect of transaction cost, listing leasing have relative lower cost than bidding and auction; in addition, listing has more flexibility for tenders strategies and the rule of one tender and one bid can successfully achieve a deal make higher trade rate. Therefore, in practice, listing method had high utilization.

Finally, according to *Changsha municipal provisional measures of state-owned land leasing revenue (2005)*, it identified the utilization land revenue generate by bidding, auction and listing approaches. Specifically, it demonstrated that urban infrastructures are including in the budget. This is legally defined the obligation and utilization of land revenue to financing infrastructures.

5.2. How did bidding, auction and listing system affect land price? And what are the increase changes of land value?

There are six specific questions to illustrate land value variation in economic perspective step by step. For this sub-question considerable historical data have been introduced to interpret the land market situation and leasing methods comparisons. This specific questions can be classified into three perspectives, namely, the land market situation in Changsha, land value determined by different approaches, and the incremental value create by bidding, auction and listing approaches.

Firstly, both land supply and demand in Changsha city showed ascending trends. However, land is a limited source, the land acquisition status did not reflect stable change but random, no matter what land acquisition means, it all have limitation. The expropriation have collected many area, it still restrict by legal provisions (e.g. land planned for public good in large extent, need compensation); land purchase will definitely increase the cost for parcels. Precisely because of the fix amount of land resource and large amount requirements of land attribute to urbanization and development, however, the authority still control land supply prudentially, which in the figure show a relatively moderate growth. Regard with land demand, the transaction conducted by various approaches showed the entire land supply with distinct patterns. In terms of administrative allocation and listing leasing, both represent the accelerating requirement of land for different purpose, public goods and business purpose respectively. On the other hand, negotiation leasing did not present an obvious regulation. Before the using bidding, auction and listing mechanism the only way can generate land revenue did not reflect the truly market needs, which cannot identify the real land demand. However, based on the transaction land amount and quantity, it clearly illustrates drastic land demand.

Secondly, after an explicit analysis of land market in Changsha city, it is easy to find out that land price will inevitable increasing owing to the controlling land supply with swelling land demand. More significantly, distinct land transfer methods made different land value.

Explicitly, administrative allocation is a significant land dispose approach, but it is not a public leasing, cause land transferred by this method has no payment and no time limited and no complete land rights; Negotiation leasing has leasing for certain programme supporting by government which transferred far lower than market value; Only listing leasing records represent high average land price but still not reflect a huge land price increase as expected. Cause land value did not only determined by demand and supply, location is another crucial reason for this phenomenon, which means that many traded land are location in suburban or county area owing to considerable urban land have already been leasing and those lease cannot recovered in short-term. Three different approaches have they own duty and they selected under certain conditions, especially the land use. There are many value variation contribute to the land use. From the analysis it showed that administrative allocation did not need payment cause majority of land use for public goods; listing leasing has apparent

distinction between different land use, for instance commercial use apparent higher than residential etc.

Additionally, the incremental land value create by bidding, auction and listing mechanism manifested through ground lease and trading price comparison between negotiation lease and listing lease. According to the results of SPSS, the revenue generate by negotiation leasing is far lower than listing lease. Moreover, to analysis the significant factors for land revenue, the regression exclude the negotiation variables, which means the revenue from negotiation does not play a pivotal role for land value production. On the opposite, listing revenue take the predominate part of the entire land income.

Thirdly, owing to the substantial land revenue generate by bidding, auction and listing system, local government optimized this fiscal revenue through bunch of intervenes. Both information from transaction records and interviewees are told the same phenomenon and aspiration that maximize the using of bidding action and listing approaches and progressively decrease the using of negotiation lease. Apart from this, the adjustment of benchmark premium is another significant variation. Especially, benchmark premium increased with different extent rely on different land level, and suburban area have higher increase rate then central of the city, which attribute to considerable leasable land in suburban region than central. In terms of metro case, for more leasable parcel, local government even made modification of metro routes. Since the introduction of these market-oriented leasing approaches, it is evidently give the opportunity for municipality to chasing fiscal revenue. As a dominant stakeholder in public land leasing, local government optimizing those controlling factors for self-interest that is how this leasing mechanism affect the government's actions.

Precisely because of this quick success of land revenue production by bidding auction and leasing mechanism, the corresponding demerits appeared. Housing price is the first issue rapidly revealed; bidding, auction and listing leasing push the land price which directly increase the cost for developer and transferred to property buyers. Although land price is not the only factor for high housing price, but it is no doubt that government conniving the soaring housing price. In addition, municipality tackle the fiscal issue through selling the land did not made sustainable revenue for them. According to the data, municipality leasing the land expand from urban to county area, the land leasing in a large-scale and fast speed makes few land revenue for future. This two manifest disadvantages which brought by government intervention are the highly concerned problematic issues aroused by this leasing approaches.

5.3. Did this approach generate adequate revenue for local government to promote the urban integration and financing metro system construction?

There are five specific questions to figure out this sub-question in the right track. Generally, those questions can be divided into three directions, namely, the categories and proportion of financial means, the impact of metro to land value and revenue, sufficiency and sustainability of metro lines constructions for now and in the future.

Firstly, according to the data, merely two major measures financed the No.1 and No.2 metro lines construction, namely, debt from banks and government revenue, respectively. In terms of government revenue, besides the taxation, land revenue served as an important role. Apart from, according to the feedback from interviewees, the officials claimed that municipality put considerable effort on financing diversification. PPP model will be the optimal plan for metro operation and maintenance and future finance. There are many programmes take into account, advertisements and franchises are valuable means to attract investment. Meanwhile, they also confirmed that land revenue is key point to metro financing issue, cause tax cannot easily being adjust and large amount of tax income should turn over to central government, thus land revenue have huge potential to generate for infrastructure investment in status quo.

Secondly, there are two main methods to prove the land value affect by metro. At the beginning, based on the location factor, utilizing SPSS to analyze the difference between parcels nearby metro entrance with parcel without this condition. According to the data, metro has positive effects for land value. Explicitly, first, land nearby the metro entrance(around 1kilometer) higher premium rate(42% with and 26% without metro) and higher ground lease (500USD/m² with and 276 USD/m² without metro)than those far from metro; second, metro factor showed a significant and positive effect for land value determined by P-value in the table. Then, the specific leasing transactions also prove the same conclusion about land value affect by metro. More detailed, in those cases, each transaction in the comparison groups has similar conditions. Plot in the first group, all planned for commercial use with neighboring location; the second group, plots planned for residential use with neighboring location. Both cases are selected typical transaction for horizontal comparison. Furthermore, those cases illustrate that metro create positive effect for land value appreciation from whole to specific. Additionally, there also a particular case that generates revenue directly financing for metro construction. Hence, land value capture process can be exactly complete by this public land leasing instrument. Municipality using incremental land value which creating by metro implementation and realizing by bidding, auction and listing leasing to financing metro construction.

Thirdly, based on the data and feedback from officials, the financial investment is adequate for the construction of No.1 and No.2 lines. The future funds for operation and maintenance are uncertain. For this cost, PPP model will be the optimal choice for local governments and not put full respond on fiscal budget. However, in long-term perspective, there are ten lines on the schedule, this expenditure cannot generate in the short time. Moreover, even municipality attempt to modify metro route for more leasable land with high leasing price, which is a feasible approach in temporary. But land sources are limited and lease contract cannot recover in short period, thus public land leasing cannot become a sustainable revenue source for metro financing in long run.

5.4. Summary

In conclusion, the main question can be answered. First, bidding, auction and listing system served as a market-oriented public land leasing methods utilizing market competition mechanism effectively to maximize the potential land value and benefit for local government,

which means these leasing approaches successfully complete the deliberate goal of revenue growth. Second, land value capture circulation can be interpreted by the relationship between metro with land value appreciation. Hence, metro increases the land value of parcels in the vicinity of metro entrances, municipality utilizing bidding, auction and listing leasing methods to capture the incremental value and facilitated the construction of metro system, which illustrate the explicit process of land value capture and realization. Generally, although bidding, auction and listing are not perfect instrument, in that they have negative impacts or externalities and have sustainable issue, this public land leasing mechanism fulfill the objective of generating incremental land value for infrastructure and achieve a win-win situation.

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Appendixes

1. Guideline of Semi-structured Interview

Issue	Variable	Questions	Interviewees
Land use transfer	Land Supply	<ul style="list-style-type: none"> ❖ What is land supply regulation and planning in Changsha? ❖ Did land supply match the market needs or real situation? ❖ What are the reasons for land supply situation in 2010? 	<ul style="list-style-type: none"> ➤ Professor Zhang from Central South University ➤ Director Chen from Municipal Bureau of Land Resource
	Land Demand	<ul style="list-style-type: none"> ❖ Did the land transaction data match the market needs in reality? ❖ What are the patterns reflect from different land use right transfer quantities? 	<ul style="list-style-type: none"> ➤ Professor Zhang ➤ Director Chen
	Administrative allocation	<ul style="list-style-type: none"> ❖ What is the advantage or meaning for using administrative allocation? 	<ul style="list-style-type: none"> ➤ Professor Zhang ➤ Director Chen
	Negotiation leasing	<ul style="list-style-type: none"> ❖ ❖ What is the problematic issue of negotiation leasing? ❖ The future prospect of negotiation leasing? Abandon or keep small scale? 	<ul style="list-style-type: none"> ➤ Professor Zhang ➤ Director Chen
	Listing leasing method	<ul style="list-style-type: none"> ❖ What are the features of listing leasing conducted currently? In terms of land locations and planned use? ❖ What are the merits and demerits of listing leasing method? ❖ How did listing leasing impact the government's actions? 	<ul style="list-style-type: none"> ➤ Professor Zhang ➤ Director Chen
Metro finance	Land revenue and expense	<ul style="list-style-type: none"> ❖ What the situation of land purchase and expropriation recently? ❖ Did government increasingly rely on land revenue? 	<ul style="list-style-type: none"> ➤ Director Yao from Changsha Municipal Bureau of Statistics ➤ Deputy director Zhang from Changsha Municipal Bureau of Statistics ➤ Professor Zhang

	Metro finance status	<ul style="list-style-type: none"> ❖ What are the metro financing status for now and the expectation in future? ❖ Did revenue generate from appreciate land adequate for metro construction? ❖ What is the government preparation to diverse financing means? 	<ul style="list-style-type: none"> ➤ Director Yao ➤ Deputy director Zhang
	Land price affected by metro	<ul style="list-style-type: none"> ❖ How did metro affect land price? ❖ What the pattern and principle for metro affect land price? ❖ What are the typical cases? ❖ Did government intended to modify metro planning due to increase land revenue? 	<ul style="list-style-type: none"> ➤ Professor Zhang