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China's Infrastructure Funding Mechanisms: Revenue Structure and Financing Approaches

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**China's Infrastructure Funding Mechanisms:
Revenue Structure and Financing Approaches**

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Abstract

With the rapid increase in the need for urban infrastructure, the issue of infrastructure funding has become more and more essential. This paper focus on the following three issues: first, it clarifies the trend and regional pattern of infrastructure funding. Second, this paper further discusses funding mechanisms from the perspective of government and market. Third, this paper will evaluate current trend and pattern based on the five theoretical dimensions. Concerning the trends of infrastructure funding, the growth of market financing is faster than fiscal revenue; therefore, the importance of fiscal revenue has decreased. Regionally, the east has the highest reliance on fiscal revenue, which is largely due to its high land transfer fee. Municipality has the highest proportion of market financing. From the perspective of government and market, the importance of government-leading mode has decreased, while UDIC-leading and private sector involvement play more and more essential role.

China's Infrastructure Funding Mechanisms: Revenue Structure and Financing approaches

1 Introduction

Although urban infrastructure is essential both for social welfare and economic growth, it is always under provided because of insufficient funding. Therefore, urban infrastructure funding becomes a pressing and important issue for the further development of China.

1.1. Clarification of Some Concepts

Infrastructure provides “basic services to industry and household” (Martini and Lee 1996), “key inputs to the economy” (Threadgold 1996), and “a crucial input to economic activity and growth” (Department of Foreign Affairs Canberra 1998). Generally, the activities of infrastructure investment include: Energy (power generation and supply); transport (toll roads, light rail systems, bridges and tunnels); water (sewerage, waste water treatment and water supply); telecommunications (telephones); social infrastructure (hospitals, prisons, courts, museums, schools and government accommodation) (Grimsey and Lewis 2000). The narrow definition, according to the one given by Ministry of Housing and Urban-Rural Development of China, which is also the authority for administrating urban infrastructure finance, includes public utilities (water supply and drainage, residential gas and heating supply, and public transportation), municipal works (roads, bridges, tunnels, dock, and sewerage), parks, sanitation and waste management, and flood control. Power, telecommunications and other transportation sectors (ports, airports and railway) are not counted as a part of urban maintenance and construction in China (Wu 1999).

This paper will mainly talk about the urban infrastructure funding mechanisms; to be more specific, the urban maintenance and construction revenue, which is used for expenditure on fixed assets investment, maintenance, payment for domestic and international loans, tax and fees, and other expenditures. First, this revenue includes part of the funds for rural construction. In central budgetary allocation, New Rural Construction (*xin nongcun jianshe*) funds are included. Also, Urban Maintenance and Construction Tax charges 5% in counties and towns (*xian, xiang*) and 1% for lower administrative units on the combined value of Value-Added Tax, product tax, and business tax, which also includes part of the funds coming from rural sectors. Second, funds for major projects are not included in the Urban Maintenance and Construction revenue. Actually, they are always listed in the general fiscal expenditures rather than urban construction funds (Wang and Zhang 2009). In addition, funds for national-level major project are not included, for example, the Three Gorges Project is not listed in the Urban Maintenance and Construction revenue. Urban Maintenance and Construction revenue includes central and local budgetary allocation (*zhongyang he difang caizheng bokuan*), Urban Maintenance and Construction Tax (*chengshi weihu jianshe shui*), Public

Utility Surcharge (*gongyong shiye fujia fei*), water resource fee (*shui ziyuan fei*), Infrastructure connection fee (*shizheng gongyong sheshi zengrong peitao fei*), user charges (*shizheng gongyong sheshi youchang shiyong fei*), land transfer fee (*tudi churang zhuanrang jin*), assets exchange revenue (*zichan zhihuan shouru*), domestic loans, foreign capital, bonds, stock financing, and self-raised funds (*qishiye danwei zichou zijin*).

In this paper, infrastructure funding includes fiscal revenue and market financing. “Fiscal revenue” in this paper is more general, with includes not only budgetary funds, but also extra budget, and land transfer fee. Therefore, fiscal revenue includes budgetary allocation, local earmarked taxes, fees and user charges, and land transfer fee. Market financing includes domestic loans, security market financing, self-raised funds, and foreign capital.

1.2. The Importance of Urban Infrastructure Funding

With the rapid growth of urbanization and China’s economy, more high quality urban infrastructure has become increasingly important. Not only does it affect the welfare of the citizens but it also influences the progress of the society as a whole. Much literature has proved the positive relationship between economic growth and urban infrastructure. Cities in particular are investing more in infrastructure and tend to experience higher rates of economic growth (Wu 2008). The core rationale that emerges from the theoretical literature is that urban infrastructure raises the marginal product of other capital used in production (Fedderkea et al. 2006).

However, compared to the high growth rate of the economy and population, the provision of urban infrastructure is seemingly insufficient. Several major infrastructure projects in China grew at a much slower pace after the economic reform (1978) as opposed to before the economic reform (1952-1978). Generally speaking, infrastructure that is a private good, such as telephone services, have grown faster during the reform period, while infrastructure that is a public good, such as paved local roads and streets, has grown more slowly during the reform period (Lin, 2001). One of the most important reasons for the slower infrastructure growth is low government spending on infrastructure, which is caused by limited resources of urban infrastructure funding (Lin, 2001). Therefore, innovative mechanisms of funding are needed to provide a solid foundation for economic growth.

1.3. Research Questions

Since urban infrastructure funding issue is very important, this paper concentrates on the following three research questions. First, it clarifies the trend and regional pattern of infrastructure funding from 1990 to 2007. Second, this paper further discusses funding mechanisms from the perspective of government and market. Third, this paper will evaluate current trend and pattern based on the five theoretical dimensions.

1.4. How this Report is Organized

This paper is composed of 5 sections. The first section above has introduced some background information, including the definition of urban infrastructure funding, and stated the main research questions. The second section will clarify the five theoretical dimensions, which will provide theoretical framework for the following analysis. The third section will describe the history of the development of urban infrastructure finance in detail within the context of fiscal decentralization. The fourth section—literature review—illustrates current research progresses as well as their limitations. The main body is the fifth section, which uses updated data to describe and explain trends and patterns of each item of Urban Maintenance and Construction revenue. The sixth part further discusses the trend and patterns based on the theoretical framework and draw a conclusion.

2 Theoretical Framework

In the research area of urban infrastructure funding, there are five theoretical issues that are essential to efficient intergovernmental relationship, funding mechanisms, and resource allocation. The first issue is who should provide urban infrastructure, government or market. The second one is about the rationales for central or local government's provision of urban infrastructure. The third one is about the choices among general revenue, special funds, and fees when it comes to urban infrastructure funding. The fourth one concentrates on the pros and cons of pay-as-you-go and pay-as-you-use, respectively. Last but not least, the fifth one is about the desirable pricing level of user charges.

The first question is about the role of government and market in infrastructure provision. There are two theoretical reasons for the government's provision of urban infrastructure. First, the production of some urban utilities exhibits increasing returns to scale, which is also deemed as natural monopoly. Under this circumstance, it is impossible to have a single price equal to marginal cost (which is required for efficiency) and have the producer earn a profit (Fisher 2007). The property of natural monopoly would give the company who provides the goods and services the market power to charge higher price and provide low quantity than the efficient level. Therefore, the government can resolve this difficulty either by becoming the producer or by regulating monopoly production (Fisher 2007). Second, some urban infrastructures are public goods, which bear the property of being *nonrival* and *nonexclusive*. Public goods are nonrival, meaning that one additional person can consume the good without reducing any other consumer's benefit; after the good or service is produced, the marginal cost of an additional consumer is zero. Public goods often are also said to be nonexcludable, meaning that it is not possible (at least at reasonable cost) to exclude consumers who do not pay the price from consuming the goods or services (Fisher 2007). For nonrival goods, the price should be set at zero because the marginal social cost of adding another consumer is zero, which obviously does not provide revenue to cover any fixed costs (Fisher 2007). Therefore, these goods could not be efficiently provided by private firms (Fisher 2007). Also, private firms also are unable to collect revenue to cover costs for nonexclusive goods and services because

it is not feasible to charge a price for the consumption (Fisher 2007). Therefore, projects like water supply and drainage, residential gas and heating supply, and public transportation, which exhibit property of natural monopoly, should be provided or at least price-regulated by government. Nonrival or nonexclusive goods and services as basic level roads, sanitation and waste management, and flood control would also be more efficiently provided by government than private sectors. Besides these projects, other profitable ones could be efficiently provided by private sectors, the involvement of which would help alleviate the financial burden of government, decrease administrative cost and transaction cost in the political negotiation process, and also introduce competition to create higher-quality project.

The second question is which government is more efficient for offering urban infrastructure, central or local. Wallace Oates's *Correspondence Principle* could help answer this question: each public good is provided in the smallest (that is, lowest level) government consistent with no externality (Fisher 2007). There are two dimensions in this principle: the first one is variance in demand while the second one is spatial externality. The greater the variations in what individual consumers want from government and the more consumers with similar wants are grouped together, the stronger is the case for decentralized provision (Fisher 2007). However, spatial externality is another factor that supports more centralized government. It occurs when the spatial distribution of the costs and benefits of government services is not confined to the jurisdiction boundaries of the providing government, the problem of which would be solved by internalizing the externalities—that is, bigger government jurisdictions (Fisher 2007). Therefore, it would be desirable to provide public goods and services by the smallest government consistent with no externality. In urban infrastructure provision, this principle fits very well. First, those projects that are almost only beneficial to residents in the municipality like urban utilities (for example, water supply and drainage) and municipal works (roads, bridges etc.) should be financed and provided by local government (municipal jurisdiction). Second, upper-level governments are considered better to initiate projects that have externality problems in municipal level. For example, provincial rather than municipal government should provide provincial-level roads and flood control project to avoid municipal externality. Also, when it comes to projects that could benefit several provinces, central government provision is considered more efficient, as Three Gorge Project and national-level roads.

The third issue focuses on the best choice among general revenue, special funds, and fees. The criterion of this choice is the user-pay-and-benefit principle (or benefit-received principle), which examines the extent to which users pay in proportion to their amount of use and to the costs they impose on the system. Apparently, this criterion is based on the recognition of consumers and the extent of difficulty to collect user charges. On one hand, urban infrastructure for which consumers could not be recognized or charged is only possible supported by general revenue. For instance, the nonexclusive projects mentioned above, as basic level roads, sanitation and waste management, and flood control could not be supported by user charges because “users” are incredibly costly to identify or all residents and nonresidents are potential beneficiaries, however, who are always reluctant to uncover their demand. On the other hand, to the projects for which user charges could

be collected (the cost of doing that is reasonable), user charges are more attractive: the greater is the share of marginal benefits that accrues to direct users, the greater the percentage of the benefits of a service or facility that go to direct users, the more easily users can be identified and excluded (at reasonable cost) from consuming the service unless the charge is paid, and the more price elastic is demand (Fisher 2007). Two other potential advantages of user charges are that they are one way to have nonresidents pay for benefits they enjoy, and the perception of fairness from users paying may result in more public acceptance of state and local government provision of certain services (Fisher 2007). Also, user fees could help better allocating scarce resource among competing demands (when congestion costs are imposed to current users from additional consumer) and providing a measure of the demand for new capital investment (Fisher 2007). However, there are also cons for user charges. Objection is raised on the grounds that they are a disadvantage for consumers with lower incomes and that the administration costs (to the government) and compliance costs (to the consumers) of collecting the charge may offset any expected efficiency gains (Fisher 2007).

The fourth issue concentrates on the pros and cons for pay-as-you-go and pay-as-you-use, or budgetary funding and debt financing. Pay-as-you-go means building up a reserve of funds from taxes over several years, while pay-as-you-use refers to borrowing the funds to be repaid with interest from taxes in future years (Fisher 2007). The first rationale supporting pay-as-you-use is the key economic characteristic of capital goods, which is that a relatively large initial expenditure is required to purchase facilities that then generate benefits over a number of years (Fisher 2007). That is the case in a lot of projects of urban infrastructure. The initial investment of public utilities (water supply and drainage, ect.) and capital spending in municipal works (roads and bridges etc.) are always debt-financed, while budgetary funding is always applied to urban infrastructure maintenance and basic level roads construction. The second rationale is the consideration of intergenerational equity. As a matter of fact, pay-as-you-go tends to put the tax burden on contemporary generation for benefiting future ones, who are the final beneficiaries of the current capital spending. In comparison, by borrowing the cash for the facility now but effectively paying for the facility with future taxes, those who receive the services from the facility will be paying for them (Fisher 2007). However, there are also some cons of pay-as-you-use. It is criticized sometimes as creating an incentive for overcapitalization by subnational governments if the individual voters who approve projects do not perceive their future costs (Fisher 2007). Such an incentive may be larger in jurisdictions where a greater fraction of the voters are temporary residents (Fisher 2007).

The fifth issue is about the desirable pricing level of user charges, which is an important signal to both consumers and investors. Too low user charges will lead to excessive consumption and insufficient investment and vice versa. Thus, the pricing level of user charges is essential for efficient resource allocation. The same as other goods and services, setting the price at marginal cost is always Pareto efficient. However, more complexity is caused by the problem of public goods and natural monopoly when setting price level for using urban infrastructures. When government regulates prices for public goods (especially as producer), not only private but also social marginal cost/benefits

should be considered. For natural monopoly industries, in which the production exhibits increasing returns to scale, it is impossible to have a single price equal to marginal cost and have the producer earn a profit. Government has to subsidize the production, especially for the initial investment (Fisher 2007). In addition, setting user charges at marginal cost level, which means charging higher to consumers far away from existing services and hence costly to serve and lower to those who are closer, would encourage more efficient land use because if average costs are charged, urban sprawl would be encouraged by subsidizing people in outlying areas (Bird 2005). Therefore, even more complexity arises, marginal-cost pricing mechanism is still a direct and effective way to efficiency.

3 The History of Urban Infrastructure Funding

The history of urban infrastructure funding is marked by a series of turns, from negligence to targeted expansion to a general loosening of control. There was originally very little investment by the central government in urban infrastructure, relegated as peripheral to industrial growth. With economic growth and development, investments in urban infrastructure grew in importance as a supplement to the improving quality of life. In more recent years, much of the increase in urban infrastructure funding, aided and directed by central authority, has been provided a more autonomous expansion as support from the central government became less critical.

3.1 Before 1978

Before the economic reform in 1979, China's infrastructure funding was typically characterized as centrally planned. In fact, the whole fiscal system was characterized by the centralized revenue collection and fiscal transfers. All taxes and profits were collected by local governments, remitted to the central government and then transferred back to the provinces and municipalities according to their expenditure needs approved by Beijing (Wu 1999). For urban infrastructure, the central government, the Ministry of Construction in particular, had the authority to set investment goals, devise development strategies, review long-term plans, approve projects with foreign investment and limit the scope of operation of certain infrastructure facilities. Large infrastructure projects, such as the Beijing, Shanghai and Guangzhou subway systems, still needed to be incorporated into provincial plans or plans of the central government. All infrastructure projects of national importance were reviewed by the Ministry of Construction, while those of regional importance were reviewed and approved by provincial Departments of Construction. Projects exceeding 200 million yuan were required to be approved by the State Planning Commission, and those involving foreign capital were approved by both the State Planning Commission and the State Council at the central level. But neither the central nor the provincial governments were required to fund such projects partially or fully. Most other urban infrastructure projects were approved by municipal authorities (Wu 1999).

Under this central-local fiscal relationship, urban infrastructure construction was not sufficiently supported and developed. Between the 1950s through the 1970s, investment in urban construction totaled 12 billion RMB, about 1.43% of nation's total fixed investment and 0.23% of GDP, which was far lower than other countries (Chan 1998). The first reason for that was that during that period of time, urban infrastructure was not the priority of the central government. Consumption and infrastructure investment were deemed as "non-productive", compared to industrial investment. Therefore, for many years, the retention rates for municipal authorities was set very low by the central government and capital expenditure funding either in the form of grants or credit was largely unavailable to the service sector and directed mainly to the production sectors (World Bank 1997b; Wu 1999). The second reason was that the resources of local governments for urban infrastructure funding were very limited. The major source of funding for urban construction, the Urban Maintenance and Construction Funds ("UMCF"), depended heavily on central budgetary allocations and a number of changing levies and fees determined by the central government (such as the Public Utility Surcharge ("PUS") established in 1963).

3.2 1978 to 1994

The central-local government relationship began to change after 1978, when fiscal decentralization was introduced and local government began to retain higher rates of revenue and allocated funds more freely (Wu 1999). In this new system, participating provinces and municipalities were allowed a share of the revenue and they retained all income collected in excess of the share. In exchange for being given a bigger proportion of revenue, they also were required to accept responsibility for most items of expenditure (Wu 1999).

Additionally, during this period, the central government began to recognize the importance of urban infrastructure construction and tried to support faster urban development by a utilizing an improved funding system. The National Conference on Urban Planning in 1980 reiterated the national policy of developing urban settlements and signified the government's continuing intent to "control the growth of large cities, rationally develop medium cities and actively promote the development of small cities." Also, starting from the 1980s, China began to build the legislative-administrative framework for urban construction. The Law of Urban Planning served as a major milestone in formalizing city planning legislation in China, which was approved by National People's Congress in 1989. Later, in 1991, the first national urban land-use classification and planning standards were issued. Consequently, the resources of funding urban infrastructure were broadened. Until 1979, an urban construction levy of 5 percent of industrial and commercial profits of domestic enterprises was introduced to 57 cities, later expanded to 150 cities in 1984 (Chan 1998). Following the conversion of enterprise profits to taxes (*ligaishui* reform), the levy was replaced by the Urban Maintenance and Construction Tax (UMCT) in 1985 (Chan 1998). The UMCT was the only earmarked tax in the fiscal system and became an important tool for infrastructure funding.

Additionally in the 1980s, local governments of some cities tried user charges on urban infrastructure. “Infrastructure connection” fees on new construction and new in-migrants (the so-called *zengrong fei*, or fees for expanding capacity) were also allowed by the State Council in some cities in 1984. Another important resource of urban infrastructure funding--land-use fees--began to arise in 1981, which was first tried out in Shenzhen on projects funded by foreign sources. In 1988 the transfer of land-use rights was legalized and written into the revised Chinese Constitution. By the end of 1993, about 44,000 land sales had been transacted and 79,000 hectares of land had changed hands, which became a significant source of public revenue.

3.3 After 1994

Various taxes such as the UMCT and a Public Utility Surcharge (PUS) were instrumental in the controlled expansion of urban infrastructure funding. However, such approaches as the earmarked local taxes declined in importance in the 1990s. After the fiscal reform of 1994, fiscal decentralization was further improved. Taxes were reassigned between the central and local governments, with a shift from a negotiated system of general revenue sharing to a mix of tax assignments and tax sharing (Wong and Bird 2004). For the first time, local governments were assigned some taxes with significant revenue-generation capacity as local taxes. Related to urban construction, an urban land use tax, a real estate tax, and an urban maintenance and construction tax are now among the local taxes (Wu 2008). In 1994, the urban land use tax was renamed “land use tax” and changed into a local tax to stimulate local tax efforts (Chan 1998).

4 Previous Research Concerning Infrastructure Provision and Funding

There are four streams concerning current literatures. The first one is the history of urban infrastructure finance. The second one is about the quantity and quality of urban infrastructure provision. The third one is the positive relationship between urban infrastructure and economic growth. The fourth is about major trends and patterns of urban infrastructure funding mechanisms.

The first topic that current literatures concentrate on is the history of urban infrastructure finance. In the process of fiscal decentralization, local government has gained more and more autonomy in urban infrastructure finance; and resources of funds have been diversified (Wu 1999; Wu 2008; Chan 1998). In addition, the importance of government as a provider of urban infrastructure funds has decreased, while marketalization, including funds from land leasing and borrowing, plays a more and more essential role (Wang and Zhang 2009).

The second topic of some literatures is the quantity and quality of urban infrastructure provision. Traditional infrastructures grew slower after the economic reform of 1978; while the high-tech infrastructures developed more rapidly after 1978 than before, the

reason of which includes low government infrastructure spending, decreased incentives of investment of state enterprise, and diminished power of government in mobilizing rural resources (Lin 2001). In addition, the problems of unmet demand, deficiencies in cost recovery and inadequate maintenance are revealed. As examples of unmet demand, wastewater treatment and sewage were not sufficient in late 1990s; recycling program is not initiated. Also, the user charges are too low to fund the proper maintenance. For instance, low water price led to excessive demand; also because of the low price, sewerage and wastewater management contributed to insufficient revenue for the infrastructure sector (World Bank 1995; Wu 1999). Another problem of urban infrastructure provision is increasing provincial disparity (Lin 2001). Cities in the eastern region uniformly enjoy higher levels of services in all sectors, while in inland provinces, public transportation, roads, streets, water supply, waste treatment are in poor condition (Wu 2008).

The third topic is about urban infrastructure—economic growth relationship. The direct negative effect of insufficient infrastructure provision is obstructing economic growth. Munnell (1990) studied the impact of stock of public capital on economic growth in US and indicates that those states that have invested in infrastructure tend to have greater output, more private investment, and higher employment growth. Similar conclusion is drawn in the study of Spanish regions (Cutanda and Paricio 1994). The theoretical basis for this positive infrastructure-economic growth relationship is that infrastructural investment would increase the marginal product of other production factors (Fedderkea et al. 2006). As evidence from China, Wu (2008) found out that cities investing more in infrastructure tend to experience higher rates of economic growth.

Another issue that much of the current literature has concentrates on is the categorization of urban infrastructure funding. The most common categorization is done according to the nature of the funding. The resource of urban infrastructure revenue includes central and local budgetary allocation, local earmarked taxes, fees and user charges, borrowing, and self-raised funds (Wu 1999; Wu 2008). Most commonly, a land-transfer fee is listed under “fees and user charges” because it is viewed as a significant source of local governmental revenue. However, some literature has made adjustments as they list the land-transfer fee in a separate category (Wang and Zhang 2009). Another categorization emphasizes more on the entity that provides urban infrastructure funding. However, this categorization generally seems misleading and ambiguous. For example, projects sorted as direct budget, debt financing, and marketarization were supported by urban development and investment companies (Su 2006). However, the entities that provide the funds are not clear under this classification. “Within “debt financing”, the entity for those projects which are supported by the funds borrowed from nationally issued bonds is actually the central government because the repayment of these borrowings is always waived in the process of political negotiation.” (Su 2006) Also, borrowing from commercial banks, bonds and foreign capital should be separated.

Concerning the patterns and trends of urban infrastructure funding, almost all the literatures have observed the same ones. To be specific, the urban maintenance and construction tax has accounted for a declining share of urban maintenance and

construction revenue, from about 36.7% in 1985 to 18.6% in 1996 (Hou 1998). The importance of the collection of fees and user charges has increased, counts for 15-25% now. Also, borrowing and self-raised funds become significant sources of urban maintenance and construction revenue (Wu 2008).

Although current literatures in some extent have clarified the main sources of urban infrastructure funds, they still have the following deficiencies. First, the categorization is not unified and clear enough. Second, the data used in these papers are not up-to-date. Some papers only managed to describe the trends and pattern of urban infrastructure revenue before 2000; or even if data after 2000 are included, they only tried to compare the proportion of each item with that in 1990s and failed to clarify the trends of recent 10 years. In order to improve the research, I tend to clarify both the trends and pattern after 1999 in this paper. Third, almost all literatures ignored regional analysis.

5 Data Analysis: Infrastructure Funding Mechanisms

This paper tries to systematically describe the trends and patterns of each item of urban maintenance and construction revenue under a clearly defined categorization. In order to do that, this paper is interested in the following questions: which categorization should be used? Under this categorization, how should we clearly define each item? Given the range of each item, what is the difference between the role each of them plays in 1980s, 1990s and after 2000? What is the trend after 2000?

In order to answer these questions, this paper is going to use the data from *Zhongguo chengshi jianshe tongji nianjian, 2000-2008* to update the information we have already had, while the data before 1999 comes from Wu (2008). First, the part describes the national trends and patterns by analyzing per capita level of each item in fiscal revenue and market financing. In order to remove the influence of inflation, the paper adjusts the urban maintenance and construction revenue each year¹ using price index of fixed assets (constant 2000 RMB). Besides the national trends, it also clarifies regional patterns by analyzing per capita funding and the proportion of each item in total funding in municipality, east, central and west (year 2005). Because of the missing data problem in Xizang and Beijing, they are excluded from the west and municipality.

The total amount of urban maintenance and construction revenue has increased dramatically in the past two decades. It increased 13 fold from 1990 to 2005 (constant 2000 RMB). Per capita funding increased from 33 yuan in 1990 to 372 yuan in year 2005; also, urban maintenance and construction revenue as a percentage of GDP increased from 1.8% in 1999 to 2.9% in 2005.

¹ Because the price index of fixed assets for 1990 is not accessible, we use the price index of 1991 instead for calculating the adjusted urban maintenance and construction revenue of 1990. Assume the price index of 1999 equals 100.

This section will first describe the trend and pattern of each item in fiscal revenue and market financing. Fiscal revenue includes central and local budgetary allocation, local earmarked taxes (“two-item fee”), fees and user charges (water resource fee, infrastructure connection fee, and user charges), and land transfer fee. Market financing includes domestic loan, security market financing, self-raised funds, and foreign capital. Central and local budgetary allocation come from general funds, while local earmarked taxes include Urban Maintenance and Construction Tax and Public Utility Surcharge, which is the only earmarked fiscal revenue for urban construction.

The average annual growth rate of fiscal revenue from 1990 to 2005 is 12.8%, while 17.1% for market financing; therefore, market financing grew faster than fiscal revenue. Thus, the proportion of market financing in total funding has been increasing in the past two decades, from 18% in 1990 to 51% in 2005, when fiscal revenue accounts for 44%. Regionally, the proportion of fiscal revenue is highest in the east, which is approximately 50% (the main reason for this is that land transfer fee in the east is much higher than other regions); municipality has the highest proportion of market financing (64%). However, both per capita and proportion of fiscal revenue and market financing in municipality are much higher other regions.

5.1 Urban Infrastructure Funding Mechanism 1 — Fiscal Revenue

5.1.1 Central and Local Budgetary Allocation

Central budgetary allocation refers to the earmarked grants from the central government for urban maintenance and construction, which takes the form of fiscal transfer and special funds, namely irrigation works funds (*Shuili jianshe jijin*), road funds (*Gonglu jijin*), and rural construction funds (*Xin nongcun jianshe*); while local budgetary allocation always targets on big projects and major programs (*Zhongda xiangmu*), which takes the form of special grants (Wang and Zhang 2009).

The amount of central budgetary allocation is very limited compared to other resources. In 2007, it is 3 billion RMB (constant 2000 RMB), while the local budgetary allocation is 128.6 billion. Central budgetary allocation had increased from 1990 to 2000; per capita level increased 5 folds. However, it started to decrease from 2000. Per capita central budgetary allocation in 2007 was only 32% of 2001. In comparison, local budgetary allocation had dramatically increased 1990-2007 with an average annual growth rate of 17.3%, which is higher than fiscal revenue (15.3%). Therefore, local budgetary allocation is one source of the growth in fiscal revenue.

Regionally, per capita budgetary allocation in municipality is much higher than other regions; the east and west are lower; the central is the lowest. However, the west has the highest proportion in total infrastructure funding (20%), which indicates the highest reliance in the west on budgetary allocation. In addition, the central is lowest in both per capita and proportion.

5.1.2 Local Earmarked Taxes—Two-item Funds

The two-item funds play an important role in urban infrastructure funding. Urban Maintenance and Construction Tax (UMCT) is collected by local government as a surcharge on the combined value of Value-Added Tax, product tax, and business tax-7 percent in cities, 5 percent in towns and 1 percent elsewhere. A Public Utility Surcharge is a surcharge fee which is collected by local governments for such goods and services, including industry and domestic uses, as electricity, water, natural gas supplies, public transportation, and local telephone service (Ministry of Housing and Urban-Rural Development of PRC 2001).

The UMCT was launched at 1985, since when it has become a main source for urban infrastructure finance (The State Council 1985). Before implementing the UMCT, an urban construction levy of 5 percent of the industrial and commercial profits of domestic enterprises was introduced in 57 cities in 1979 and applied to total of 150 cities in 1984. Then, following the conversion of enterprise profits to taxes (*ligaishui* reform), the levy was replaced by the Urban Maintenance and Construction Tax in 1985 (Chan 1998).

Although the earmarked local taxes played an essential role before 1990 (it accounted for 42% of total urban maintenance and construction funds in 1990), the importance has been decreasing after that. Per capita local earmarked taxes increased from 13.8 in 1990 to 45.0 in 2007 with an average annual growth rate of 5.4%, which is much smaller than fiscal revenue (15.3%) and market financing (17.1%). Therefore, the proportion of local earmarked taxes in total funding had been decreasing. Regionally (year 2005), zhixishi has the highest per capita local earmarked taxes, while the west has the lowest. In addition, the central has the highest reliance (13%, year 2005).

In addition, the two-item funds also have some problems. The rate is set by the central government and is low relatively to the need of many cities. The former is collected as a surcharge on three taxes levied on the output of industrial and commercial enterprises and incomes of enterprises in transportation, hotel, catering, and other service sectors. Therefore, it fluctuates with output levels of these enterprises and does not apply to public institutions (or *shiye danwei*), which is not desirable as a revenue source for infrastructure.

5.1.3 Fees and User Charges

Fees and user charges include water resource fee, infrastructure connection fee, and user charges. In our data, before 2001, infrastructure connection fee and land transfer fee are included in other sources rather than fees and user charges, which explains the huge gap of the amount of fees and user charges between years before 2001 and after. Also, it gives the reason for the dramatic decrease of other sources after 2001. For the same reason, the percentage of each item in fees and user charges are not listed before 2001.

Water resource fee refers to the fees that are charged to enterprises and public institutions (*shiye danwei*) for exploiting underground water resources in a programming zone of the city (*chengshi guihua qu*) (Ministry of Housing and Urban-Rural Development of PRC 2001). The infrastructure connection fee (*shizheng gongyong sheshi zengrong peitao fei*)

refers to the fees charged to enterprises, institutions or individuals who engage in construction projects (including construction and expansion of land use) in the programming zone of the city. The charges are levied according to the building area (*jianzhu mianji*) or amount of the investment, which would be used for urban infrastructure including roads, water, sewerage, gases, heating, public transportation, sanitation and parks (Ministry of Housing and Urban-Rural Development of PRC 2001). This fee (the so-called *zengrong fei*) was launched by the State Council in some cities in 1984 and became popular almost in all cities by the early 1990s. By early 1990s, the infrastructure connection fee was charged on permanent migrants and new development by local governments (Chan 1998). In many places, this was combined with the sale of hukou, or urban residency rights. For instance, Anhui had sold 500 hukou since it started selling them in 1993, and most of the 1.5 million RMB raised was to be used to finance urban construction (Chan 1998). By early 1994, 3 million urban resident household registration books had been sold to peasants throughout the country, generating revenue of 25 billion RMB (Chan 1998).

User charges include toll on roads and bridges, wastewater treatment fee, garbage treatment fee, and sewerage fee. During the 1980s, local governments of some cities began to implement user charges for promoting urban infrastructure revenues. For instance, wastewater treatment charges began to be collected in more than 30 cities in 1984 (Chan 1998). In the mid-1980s, Guangzhou and Foshan started requiring toll payment for vehicular use of their bridges (Chan 1998).

The average annual growth rate of fees and user charges is 21.7%, which is higher than fiscal revenue and market financing. Furthermore, user charges are the one that increased the fastest. However, compare to other items, the amount of user charges is very small: per capital user charges were 19 yuan in 2007, while total fiscal revenue was 293 yuan. The east has the highest reliance on fees and user charges; however, it is only 7% in total funding in 2005 (user charges: 3%). The low proportion of user charges becomes an obstacle for improving resource allocation; therefore, local government should concentrate on further developing it. Also, these fees and user charges have some problems: some municipal authorities have included a multitude of infrastructure services in the fee collection and often have asked for exorbitant amounts of money (Wu 1999; Wu 2008). This is shown in the case of some 28 different fees imposed on various aspects of real estate development in Shanghai (Bird 2004).

5.1.4 Land Transfer Fee

Land transfer fee is the most important source of urban infrastructure funding, which began to provide funds for urban infrastructure in 1980s. In this paper, land transfer fee refers to revenues from leasing land use rights and charging land use fees. From 1980s, Chinese government began to realize the inefficiency in land use and gradually develop an urban land market by charging for the use of land. Land-use fees were first tried out in 1981 in Shenzhen on projects funded by foreign sources. In 1987 the sale of land-use rights first appeared in Shenzhen and later in Shanghai, Tianjin, Guangzhou, Xiamen and Fuzhou (Chan 1998). Then, two laws (The State Council 1988; The State Council 1990)

were launched in 1988 and 1990, respectively, which have provided the legal foundation for land leasing as infrastructure funding tool by Chinese municipalities. By 1992, sale of land use rights had extended to individuals, foreign joint ventures, and domestic companies and also cover many cities (Chan 1998). By 1994, land-use right had been sold in all provincial units except Tibet (Chan 1998).

After introducing land leasing, it has gradually become one of the most important revenue items for urban infrastructure for local government. Originally, the central government's share of land-leasing revenues was set at 60 percent. The split subsequently was modified to 40:60 for central and local government, respectively, then to 32:68 and 5:95. And by 1994, all land-leasing revenues were assigned to municipal governments (Peterson 2006; Chan 1997). Land leasing is an important step towards fiscal decentralization because after the initiation local governments have found a revenue resource which is totally under their control.

As table 2 has shown, the data of land transfer fee starts from 2001. That is because this item is included in other sources before 2001. First, land transfer fee is the engine for the growth of fiscal revenue. It has a annual average growth rate of 54.3%, which is much higher than the one of fiscal revenue. Second, land transfer fee fluctuated a lot in the past ten year. It increased dramatically starting from 2001; then experienced the bottom point at 2005 and increased again after that. Regionally, the east has the highest reliance on land transfer fee, the proportion of which is 16%, the central 10%, the west and municipality even lower. Further, per capita land transfer fee in the east is higher than in municipality — the only item that the east has a higher per capita level than municipality.

5.2 Urban Infrastructure Funding Mechanism 2--- Market Financing

5.2.1 Domestic Loans

Domestic loans include nationally issued bonds and bank loans. From 1998, Ministry of Finance began to increase nationally issued bonds and grant loans to provincial governments from that for the purpose of local economic and social development. The local governments are responsible for repaying capital with interests. Actually, borrowing from national bonds should have been used on environmental and other social projects unable to generate sufficient economic return; however, they are always invested to other economic development projects that preferred by the local governments. In addition, the repayment of these loans is always waived in the process of political negotiation with central government (Su 2006).

The most important part of domestic loans is bank loans, which account for over 80% of domestic loans. Because local governments are not allowed to borrow money directly from commercial banks, Urban Development and Investment Companies are established to justify this way of financing urban infrastructure. However, because the maturity period of commercial bank loans does not exceed 5-8 years during which the infrastructure investment projects cannot recover cost, local government chooses to roll over the loans rather than repay them. After the implementation of higher credit standards

for commercial banks, local governments' political control over commercial banks has weakened and it becomes harder to gain loans from these banks (Su 2006).

Domestic loan is the source of growth in market financing: it accounts for majority of market financing (50-60%); the average annual growth rate from 1990-2005 is 24.0% while the growth rate of market financing is 17.1%. regionally, the west has the highest proportion of domestic loans in total infrastructure funding (2005). Municipality has the highest per capita domestic loan. Obviously, majority nationally issued bonds flowed into municipality; municipality has a per capita value at 171.1 yuan, while 1.9 for the west.

5.2.2 Self-raised Funds

Self-raised funds refer to those come from the accumulated capital of enterprises and public institutions for the purposes of expanded reproduction (Ministry of Housing and Urban-Rural Development of PRC 2001). Self-raised funds are not specifically authorized as a fee or fund (Wu 2008; Wong and Bird 2004). However, enterprises sectors are forced to take the fiscal burdens to finance public services (Wu 2008). For example, in Dongguan, Guangdong province, the local government created an energy and communications company to raise money from state, collective and private sources for the construction of roads and power plant. This company also is responsible for paying interests and repaying the capital by collecting user fees and tolls (Wu 2008; Harral 1992). Another example of privately funded infrastructure is the small-scale secondary pipe networks for purified drinking water established in some cities in mid-1990s (Wu 2008; Boland 2007).

The average annual growth rate of self-raised fund is 14.3%, which is low than the 17.1% of market financing. Estimated by Wang and Zhang (2009), in self-raised funds, about 2/3 of them come from the direct investment of private enterprises. Municipality has the highest reliance on self-raised fund, the proportion of which is about 28% in 2005.

5.2.3 Foreign Capital

Foreign capital includes FDI, foreign loans, and other foreign investment. After the economic reform and the implementation of opening policy in 1978, China has attracted investments from foreign companies. In order to encourage these investments, the central government offers a series of incentives to prospective investors, including tax advantages, customs duty exemptions, a wider variety of permitted activities, and relative operational autonomy (Wu 1999). Foreign investment usually takes the form of public-private partnerships, in which Chinese government provides the land and foreign companies provide the funds needed (Bird 2004; Bellier and Zhou 2003). Foreign capital has a relatively low proportion in total infrastructure funding, about 1-2%. The average annual growth rate 15.3% is also lower than 17.1% for market financing.

5.3 The Urban Infrastructure Funding Mechanism: From the Perspective of Government and Market

The previous description illustrates the resources of urban infrastructure funding from the angle of funding resources. However, there is another angle of considering this issue, which might make it clearer—the operating agent. According to the agent who operates and manages the financing process, the modes of urban infrastructure funding could be categorized as government-leading, UDIC-leading, and private involvement mode.

The government-leading mode refers to the one in which the government are in charge of collecting, managing, and expending urban infrastructure funds. These funds include central and local budgetary allocation, two-item funds, fees and user charges; land transfer fee is not included because it is considered UDIC-leading mode. In these funds, one part of them is granted to Bureau of Housing and Construction as annual construction funds for daily maintenance and management, and normal road construction. The main sources of this part are two-item funds. Another part targets on major municipal projects, which are managed by Bureau of Housing and Construction, while costs are split by related enterprises and public institutions. In fact, normally, these funds come from general budget of government instead of being listed in urban construction expenditures (Wang and Zhang 2009).

Urban Development and Investment Company (UDIC) was established in most cities at the end of the 1990s or even later when central government required that responsibility for asset and liability management should be taken away from municipal governments and placed in the hands of specialized local enterprises (Su 2006). In addition, UDIC has to collect funds for the projects from the society, take the risk independently and recover the costs individually (Wang and Zhang 2009). In urban infrastructure provision, the UDIC mode has become more and more important. The main resources of UDIC funding come from domestic loans (which include nationally issued bonds and bank loans) and land transfer fee. UDIC acts on behalf of the government to borrow funds from banks and other sources, issue bonds when allowed, enter into joint ventures with private companies for infrastructure development, sell local infrastructure assets, etc. Usually, the bank loans are guaranteed by local fiscal revenue, land revenue, or other fees and user charges. The loans are repaid by local fiscal revenue or operating revenue of the projects. The problem of bank loans as a way of financing urban infrastructure is that they are always constrained by credit policies implemented by central government (Wang and Zhang 2009; 21 Century Economic Report 2006). Also, urban infrastructure projects always need a relatively longer period to recover costs, which make local governments choose to roll over debts instead of repaying them. Consequently, the excessive debt ratio of local governments has become a public concern.

Another main revenue resource for UDIC is land revenue. As a matter of fact, not all the lands could provide funds for urban infrastructure construction. Vast majority of land revenue come from the lands of commercial and living purpose because the cost of industrial land is close to or even higher than the price of the land, which makes industrial land leasing ceases being beneficial. The main way of local governments operating land is land expropriating -- infrastructure construction -- waiting for appreciation -- land leasing -- gaining the benefits. After leasing the land, part of revenue

would be transferred to UDIC as funds for urban infrastructure construction (Wang and Zhang 2009).

In the private sector involvement mode, the most common ways of private sector involvement in China are BOT (Build—operate--transfer) and BT (build--transfer). The BOT mode has the following advantages: first, local government does not bear the risk during the franchising period. Second, the funding provision problem of urban infrastructure construction is easily solved for the local government. Third, BOT would help introduce advanced technology and managing technique, which are essential for economic and social development (Wang 2009). The main areas of private sector investment include profitable major project of public utilities (Water Company, Wastewater Treatment Factory, and Electricity Company), key bridges and tunnels, major road and other transportation projects (Wang and Zhang 2009). In the private sector involvement mode, the funding of urban construction mostly comes from foreign capital, private capitals, and bank loans (as shown in chart 2, besides funds for UDIC, the category of bank loans also includes loans for privately owned infrastructure projects). According to our categorization in the revenue structure section, funds for private sector involvement mode mainly come from three categories: domestic loans, foreign capital, and self-raised funds. Estimated by Wang and Zhang (2009), about 1/3 of *foreign capital* is foreign direct investment, and 2/3 of *self-raised funds* are direct investment of private enterprises.

6 Conclusion

During the process of decentralization, local government has increased its ability in funding urban infrastructure both from widening revenue resources and diversifying financing approaches. Although budgetary allocation and two-item funds used to provide majority of urban infrastructure funds, the importance of domestic loans, land transfer fee has dramatically increased. Also, the funding approach has transited from government-leading mode dominated to diversified modes, which also include UDIC-leading and private sector involvement mode. Although in some areas Urban Development and Investment Companies are only representatives of the government in order to justify borrowing from domestic loans, UDIC-leading and private sector involvement modes are the trends in the future, which in a large extent could solve the problem of inadequate funds for urban infrastructure investment.

However, are these trends theoretically reasonable; or future mechanism predicted a theoretically more efficient one? To answer these questions, we will evaluate current infrastructure funding trends in all five theoretical dimensions.

- It is very obvious that the current trend exhibits the characteristic that market is gradually substituting government provision. Theoretically, only pure public goods, which are nonrival and nonexclusive, as basic level roads, sanitation, urban infrastructure maintenance, and flood control should be provided by government.

Apparently, local governments are involved much more than the projects mentioned above. Especially in some areas, UDIC acts like a political institution attached to local governments rather than a real market approach to provide funding for infrastructure. In this sense, the current trend is theoretically reasonable and correct.

- The role of local government is much more important than central government in infrastructure provision, which is consistent with the *Correspondence Principle*. The main reason why almost all projects are supported by local jurisdiction (which is reflected by our data) is that those which have significant spatial externalities at municipal and provincial levels are not included in Urban Maintenance and Construction revenue. For example, spending on Three Gorge Project and national-level roads, which should be and are provided by central government, are separately listed or financed by other resources. Therefore, the importance of central government is underestimated by our data.
- The proportion of budgetary allocation > local earmarked taxes > fees and user charges. Also, the proportion of fees and user charges is very low. Therefore, fees and user charges are not sufficiently used as a source of infrastructure funding. Especially in the central and west, fees and user charges should be further developed considering inadequate funding sources. Also, the trend of fees and user charges is not consistent with its effect on more efficient resource allocation. Furthermore, the growth rate of user charges is higher than the other two. Therefore, the trend in the future is that user charges are going to have a larger proportion in total fees and user charges.
- The basic trend for pay-as-you-go and pay-as-you-use is apparently the decrease in the proportion of the former one and increase in the latter one. That means debt-financing is becoming more and more significant. From this perspective, the trend is theoretically feasible. However, there is more complexity in the funding mechanisms in China. Nowadays, another funding source is almost as important as debts—land leasing revenue, which is considered unstable and non-lasting. From the perspective of generational equity, the high price of real estate and land which is encouraged by local governments is the cost current generation are paying for future ones. Also, frequent ups and downs of land leasing revenue are deemed as a factor that causes dramatic economic fluctuation. Therefore, how to substitute land leasing revenue by debt financing is still a big concern.
- It is really hard to say whether the level of user charges now DOES or DOES NOT equal to the marginal cost. However, some phenomenon we observed might point out some problems. The shortage of electricity happened during electricity-using summit might be better solved by adjusting the level of user charges—electricity fees rather than black-out in certain areas. Also, Beijing fails to follow the marginal cost principle when it decided to subsidize the public transport system. In addition, setting the user charges at marginal cost level relies on the fact that the producer is facing a monopolistic competitive market, which would drive the price down (or quantity up) close to the efficient level, or the price is regulated by the government. However, although UDIC-leading mode is deemed as a marketized approach, the mere fact that UDIC is attached to or even only an agent of the government makes it inevitable that UDIC has become a monopoly, who has no incentive to provide public goods and services at marginal cost level.

One of the limitations of this paper is the lack of data analysis while clarifying urban infrastructure funding mechanisms from the government and market perspective. That is because in the data of *domestic loans*, loans for private sectors are not separated from those provided to local government or UDIC. For this reason, we failed to illustrate the trends and pattern of the three different modes. In addition, because of the missing data problem for Beijing and Xizang, they are excluded from municipality and the west. However, they are considered representative in each region; therefore, some information is omitted due to the above reason mentioned. Based on the description provided by this paper, future research should concentrate on the reason of the distribution of funding mechanisms in different areas. Also, whether there is a correlation between the funding mechanism and expenditure mode is another question worth further research.

Table 1: Urban Maintenance and Construction Revenue, 1990-2007 (Billion RMB)

	1990	1993	1996	1999	2000	2001	2002	2003	2004	2005	2006	2007
Fiscal Revenue	22.0	27.6	32.3	57.3	62.5	105.0	129.8	171.3	237.1	215.2	278.3	387.2
Budgetary allocation	5.6	10.7	9.9	28.0	32.3	41.2	46.6	59.3	66.2	77.8	101.1	131.6
Central budgetary allocation	2.0	3.4	1.1	10.6	11.5	8.9	7.5	7.5	4.8	5.6	5.1	3.0
Local budgetary allocation	3.6	7.4	8.8	17.3	20.8	32.3	39.0	51.8	61.3	72.2	96.0	128.6
Local earmarked taxes	15.9	16.3	21.8	28.6	29.1	31.9	36.4	41.6	46.6	55.0	57.5	60.2
Maintenance and Construction Tax	11.8	12.2	16.1	22.2	23.7	27.0	31.4	36.2	41.1	50.0	50.6	53.1
Public Utility Surcharge	4.1	4.1	5.7	6.4	5.4	4.9	5.0	5.4	5.4	5.0	6.8	7.1
Fees and user charges	0.5	0.6	0.6	0.8	1.0	15.3	18.7	21.1	23.0	28.4	38.6	50.5
Water resource fee	0.5	0.6	0.6	0.8	1.0	1.1	1.2	1.6	1.9	2.3	2.2	2.4
Infrastructure connection fee	**	**	**	**	**	7.2	8.6	9.2	9.8	13.0	18.8	23.1
User charges ^b	**	**	**	**	**	7.0	8.9	10.3	11.3	13.2	17.6	25.1
Land transfer fee ^c	**	**	**	**	**	16.7	28.1	49.3	101.3	53.9	81.2	144.9
Market Financing	6.7	13.0	27.7	66.8	83.3	121.1	153.6	212.6	223.3	248.9	**	**
Domestic loans	1.6	5.5	9.8	37.8	41.5	73.9	86.9	129.5	133.2	151.5	**	**
Nationally issued bonds	**	**	**	**	**	12.7	6.6	3.6	3.2	13.9	**	**
Bank loans	**	**	**	**	**	61.2	80.3	126.0	130.0	137.6	**	**
Security market financing (including bonds and stock financing)	**	**	**	**	**	0.8	1.0	1.6	0.3	3.2	**	**
Self-raised funds	4.7	5.7	12.2	24.0	33.3	40.8	59.7	74.9	82.9	85.8	**	**
Foreign capital	0.5	1.7	5.7	5.0	8.5	5.6	6.1	6.6	6.8	8.4	**	**
Other sources^a	9.4	31.6	26.6	40.4	53.2	25.5	30.3	32.1	24.0	27.7	38.0	22.3
Total	38.1	72.2	86.6	164.5	198.9	251.7	313.7	415.9	484.4	491.8	316.4	409.5

Data source: Wu (2008) , China's urban construction yearbook (Zhongguo chengshi jianshe tong ji nianjian), 2000-2008

Note: ** for missing data.

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

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

b. User charges include primarily toll on roads and bridges, water treatment fee, and garbage treatment fee.

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

Table 2: Urban Maintenance and Construction Revenue, per capita, 1990-2007 (Yuan/person)

	1990	1993	1996	1999	2000	2001	2002	2003	2004	2005	2006	2007
Fiscal Revenue	19.2	23.3	26.4	45.5	49.4	82.3	101.1	132.5	182.4	164.6	211.7	293.0
Budgetary allocation	4.9	9.1	8.1	22.2	25.5	32.3	36.3	45.9	50.9	59.5	76.9	99.6
Central budgetary allocation	1.7	2.8	0.9	8.4	9.1	7.0	5.9	5.8	3.7	4.3	3.9	2.3
Local budgetary allocation	3.1	6.2	7.2	13.8	16.4	25.3	30.4	40.1	47.2	55.2	73.1	97.3
Local earmarked taxes	13.9	13.7	17.8	22.7	23.0	25.0	28.3	32.2	35.8	42.1	43.7	45.5
Maintenance and Construction Tax	10.3	10.3	13.2	17.6	18.7	21.1	24.5	28.0	31.6	38.2	38.5	40.2
Public Utility Surcharge	3.6	3.5	4.6	5.1	4.3	3.8	3.9	4.2	4.2	3.8	5.2	5.4
Fees and user charges	0.4	0.5	0.5	0.6	0.8	12.0	14.6	16.3	17.7	21.7	29.3	38.3
Water resource fee	0.4	0.5	0.5	0.6	0.8	0.9	1.0	1.2	1.5	1.7	1.7	1.8
Infrastructure connection fee	**	**	**	**	**	5.6	6.7	7.1	7.6	9.9	14.3	17.5
User charges ^b	**	**	**	**	**	5.5	6.9	8.0	8.7	10.1	13.4	19.0
Land transfer fee ^c	**	**	**	**	**	13.1	21.9	38.1	77.9	41.2	61.8	109.7
Market Financing	5.9	10.9	22.6	53.1	65.8	94.9	119.6	164.5	171.8	190.3	**	**
Domestic loans	1.4	4.7	8.0	30.1	32.8	57.9	67.6	100.2	102.4	115.8	**	**
Nationally issued bonds	**	**	**	**	**	9.9	5.1	2.8	2.4	10.6	**	**
Bank loans	**	**	**	**	**	47.9	62.5	97.5	100.0	105.2	**	**
Security market financing (including bonds and stock financing)	**	**	**	**	**	0.6	0.8	1.2	0.3	2.4	**	**
Self-raised funds	4.1	4.8	10.0	19.1	26.3	32.0	46.5	57.9	63.8	65.6	**	**
Foreign capital	0.4	1.4	4.7	4.0	6.7	4.4	4.7	5.1	5.3	6.4	**	**
Other sources ^a	8.3	26.7	21.8	32.1	42.0	20.0	23.6	24.8	18.5	21.2	28.9	16.9
Total	33.4	60.9	70.8	130.7	157.1	197.2	244.2	321.9	372.6	376.1	240.7	310.0

Data source: Wu (2008), China's urban construction yearbook (Zhongguo chengshi jianshe tong ji nianjian), 2000-2008

Note: ** for missing data.

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

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

b. User charges include primarily toll on roads and bridges, water treatment fee, and garbage treatment fee.

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

Table 3: Urban Maintenance and Construction Revenue, municipality, east, central, and west, 2005

	Municipality			East			Central			West		
	Per capita	Proportion	Growth rate	Per capita	Proportion	Growth rate	Per capita	Proportion	Growth rate	Per capita	Proportion	Growth rate
Fiscal Revenue	547.9	34%	25%	291.6	50%	22%	82.7	39%	1%	96.4	37%	6%
Budgetary allocation	235.4	15%	48%	99.6	17%	24%	21.9	10%	-18%	52.7	20%	18%
Central budgetary allocation	30.9	2%	128%	2.5	0%	35%	2.5	1%	-13%	7.0	3%	-7%
Local budgetary allocation	204.5	13%	40%	97.1	17%	24%	19.4	9%	-19%	45.7	17%	24%
Local earmarked taxes	174.8	11%	44%	60.0	10%	31%	28.5	13%	9%	22.3	8%	5%
Maintenance and Construction Tax	173.3	11%	46%	52.6	9%	31%	25.2	12%	9%	20.3	8%	7%
Public Utility Surcharge	1.5	0%	-46%	7.4	1%	31%	3.3	2%	9%	2.0	1%	-10%
Fees and user charges	54.7	3%	-13%	39.4	7%	31%	11.8	6%	24%	11.0	4%	48%
Water resource fee	0.2	0%	398%	1.6	0%	4%	0.9	0%	84%	0.3	0%	-30%
Infrastructure connection fee	34.0	2%	12%	17.7	3%	29%	5.0	2%	38%	6.5	2%	89%
User charges ^b	20.5	1%	-37%	20.2	3%	37%	6.0	3%	10%	4.3	2%	18%
Land transfer fee	82.9	5%	-11%	92.6	16%	12%	20.5	10%	3%	10.4	4%	-42%
Market Financing	1,029.4	64%	0%	255.9	44%	13%	113.5	53%	27%	154.5	58%	21%
Domestic loans	482.5	30%	-12%	164.9	28%	26%	68.4	32%	32%	106.5	40%	11%
Nationally issued bonds	171.7	11%	3903%	9.1	2%	200%	1.9	1%	-22%	2.0	1%	-15%
Bank loans	310.8	19%	-43%	155.8	27%	22%	66.6	31%	35%	104.5	40%	12%
Security market financing (including bonds and stock financing)	59.4	4%		0.1	0%	-87%	0.3	0%	56%	0.1	0%	94%
Self-raised funds	456.9	28%	1%	82.3	14%	-9%	39.4	18%	25%	43.8	17%	47%
Foreign capital	30.6	2%	-5%	8.6	1%	76%	5.3	2%	-14%	4.1	2%	76%
Other sources ^a	37.3	2%	-37%	35.5	6%	28%	18.4	9%	26%	13.3	5%	15%
Total	1614.6	100%	6%	583.0	100%	18%	214.6	100%	15%	264.2	100%	15%

Data source: China's urban construction yearbook (Zhongguo chengshi jianshe tong ji nianjian), 2006

Note: a. Other sources primarily include fees for temporary occupation of roads, roads destroying fee, compensation fee for cutting down trees.

b. User charges include primarily toll on roads and bridges, water treatment fee, and garbage treatment fee.

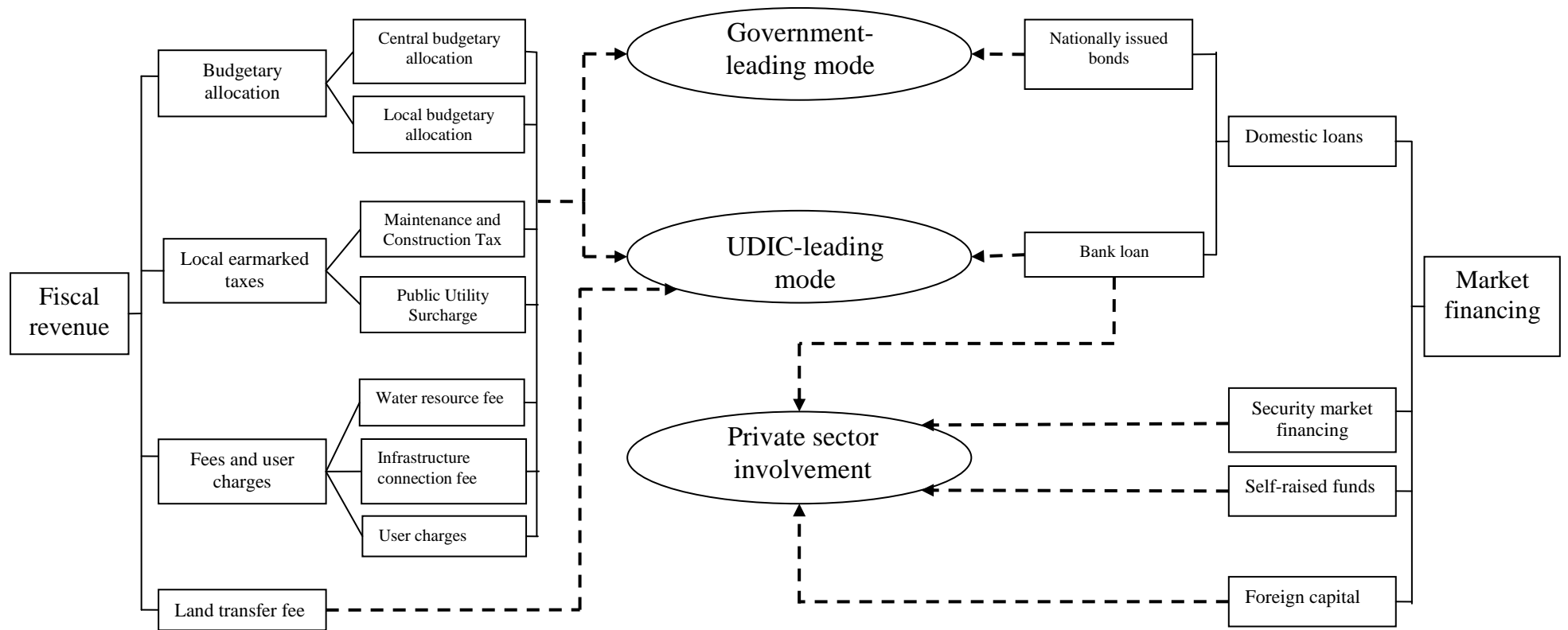


Figure 1: Urban maintenance and construction revenue

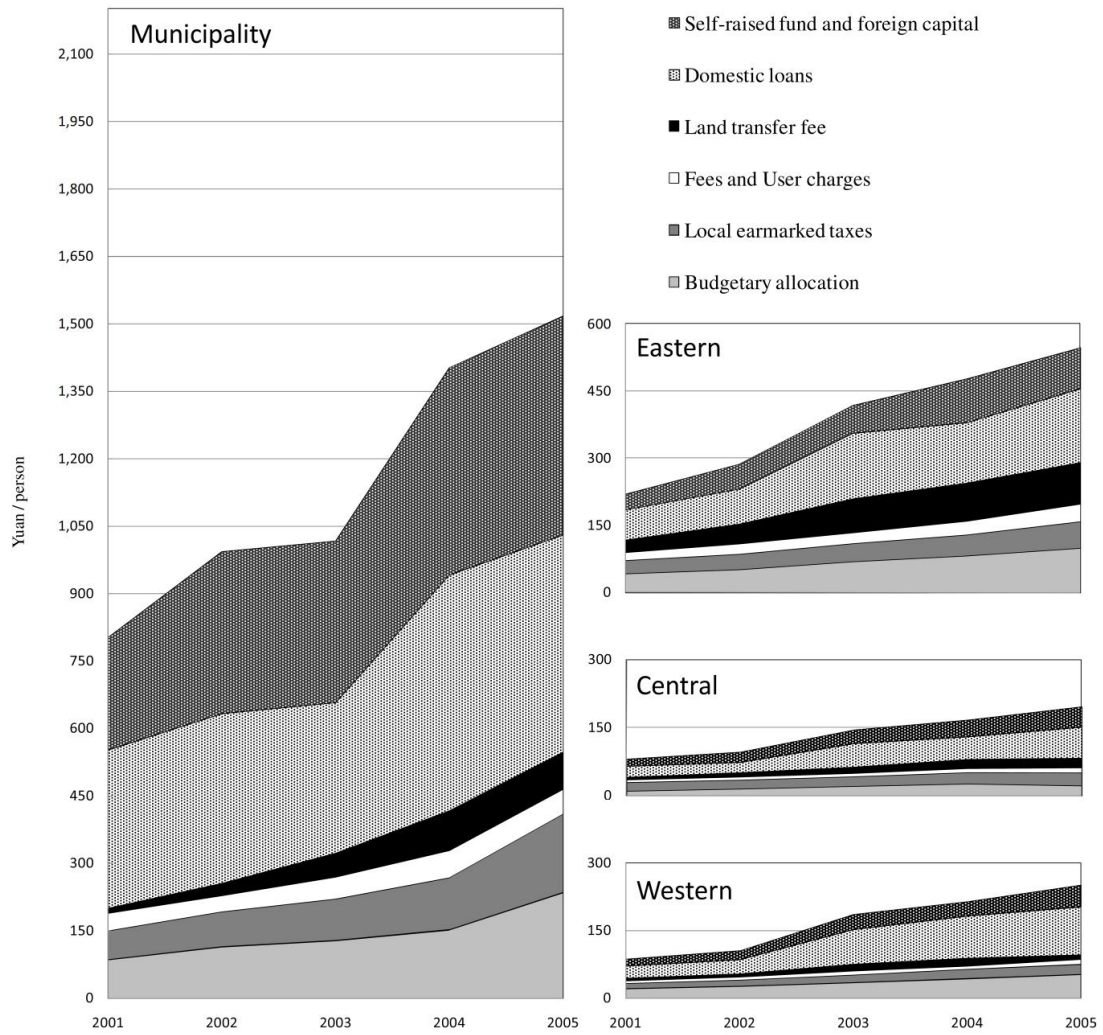


Figure 2: Regional patterns of urban maintenance and construction revenue, 2001-2005

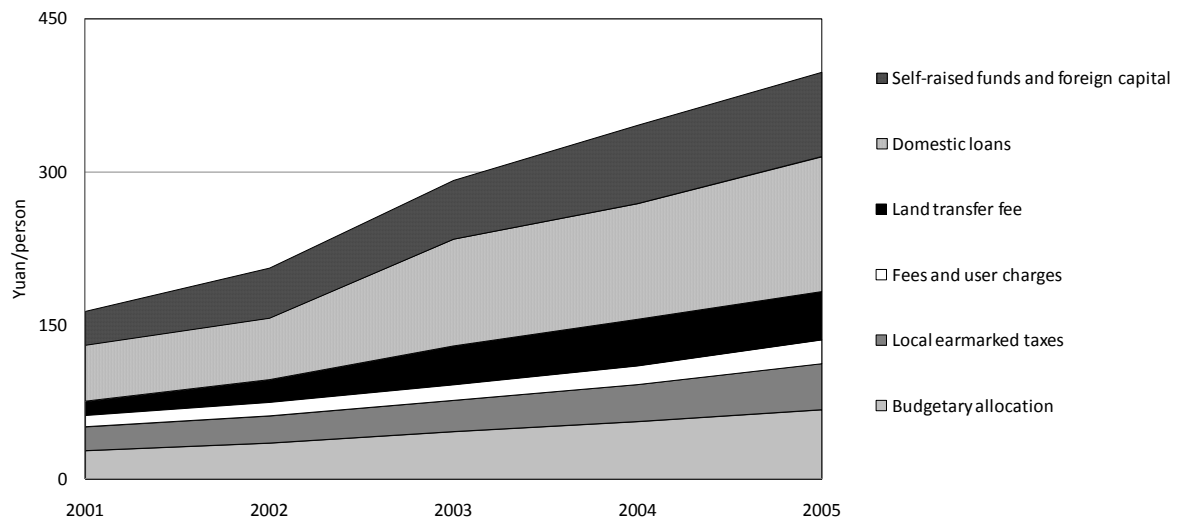


Figure 3: National trends and patterns of urban maintenance and construction revenue, 2001-2005

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