

Zhao, Quanhou et al.

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Managing the risks of public infrastructure financing: Toward sustainability

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ADB Working Paper Series

**MANAGING THE RISKS OF PUBLIC
INFRASTRUCTURE FINANCING:
TOWARD SUSTAINABILITY**

Quanhou Zhao, Licheng
Zhang, Beilin Feng, Wei Liu,
Xiaoyan Long, Jiayi Sun,
Xu Chen, and Qiongqi Xiao

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Quanhou Zhao is director of the Finance Research Center of the Chinese Academy of Fiscal Science (CAFS). Licheng Zhang and Beilin Feng are deputy directors at the Finance Research Center of CAFS. Wei Liu and Xiaoyan Long are associate researchers at the Finance Research Center of CAFS. Jiayi Sun, Xu Chen, and Qionqiong Xiao are assistant researchers at the Finance Research Center of CAFS.

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Please contact the authors for information about this paper.

Email: feng_beilin@163.com

Asian Development Bank Institute
Kasumigaseki Building, 8th Floor
3-2-5 Kasumigaseki, Chiyoda-ku
Tokyo 100-6008, Japan

Tel: +81-3-3593-5500
Fax: +81-3-3593-5571
URL: www.adbi.org
E-mail: info@adbi.org

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Abstract

Infrastructure construction is one of the basic driving forces of social and economic development. Since 1978, the construction of infrastructure in the People's Republic of China (PRC) has experienced rapid development, which has given a strong impetus to the PRC's modernization. But behind the rapid growth of infrastructure there are risks of a massive and rapid buildup of infrastructure financing. How to manage the risks of infrastructure financing has always been the focus of attention of the Chinese government, as well as economic and academic circles. This paper comprehensively reviews the historical development of the PRC's infrastructure financing and concludes that: (1) the financing of the PRC's public infrastructure construction produces different financing models that are appropriate for various phases facing different real environments and major problems existing in the PRC; (2) with the transformation of the infrastructure financing model, the ways and measures of infrastructure financing risk management are also changing accordingly, and standardization, transparency, and systematization are the main trends in public infrastructure financing and risk management in the PRC; (3) promoting fine management of an infrastructure construction project to ensure the financial sustainability of such a project and then to safeguard the national macrofinancial sustainability is a significant task for the PRC in strengthening the risk management of infrastructure financing.

Keywords: infrastructure finance, risk management, government debt, fiscal sustainability

JEL Classification: H54, H63, H74

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Public infrastructure investment in the People's Republic of China (PRC) has made significant progress at a super-fast pace since the introduction of the reform and opening-up policy, resulting in not only a rapid increase in traditional infrastructure sectors, e.g., railways, roads, and airports, but also a quick improvement in urban infrastructure. The infrastructure investment, at RMB411.8 billion in 1995, had skyrocketed by nearly 27 times to RMB11.27 trillion in 2014. Increasingly better infrastructure in the PRC goes in parallel with the growth of investment. The railway mileage extended from 51,700 kilometers in 1978 to 111,800 kilometers in 2014. In particular, the construction of a high-speed rail network commenced in 2009 and soon reported 16,500 kilometers of high-speed track in operation in 2014. Moreover, the road mileage increased from 890,000 kilometers in 1978 to 4,460,000 kilometers in 2014. The investment in urban municipal public infrastructure has taken a high-speed growth track in the 21st century, soaring from RMB312.3 billion in 2002 to RMB1.6 trillion in 2014. The PRC's perfect infrastructure provides a hardware foundation for its rapid economic growth.

The massive investment has fueled the quick improvement of public infrastructure in the PRC. Since the reform and opening up, a series of problems, including "difficult financing," "expensive financing," and "unregulated financing," have successively surfaced in the PRC's financing for public infrastructure. In different periods of time, there have been different infrastructure financing models in the PRC, and the risk management models are also changing accordingly. The path of changes in public infrastructure financing models in the PRC and related risk management experience will provide a good reference for central Asian countries.

1. METHODS AND RISK MANAGEMENT PRACTICES OF FINANCING FOR PUBLIC INFRASTRUCTURE IN THE PRC SINCE REFORM AND OPENING UP

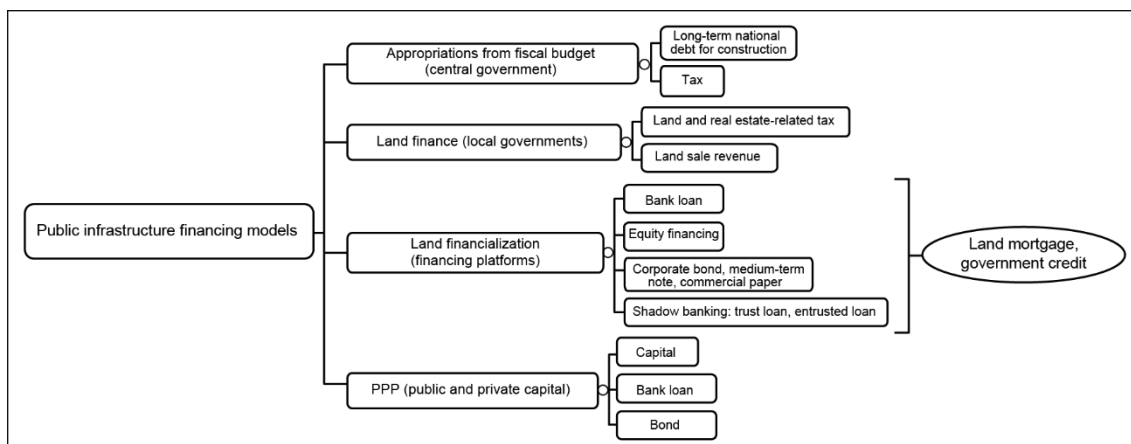
In the context of the PRC's continuous transformation from a planned economy to a market economy and the continuous implementation of its reform policies, the public infrastructure financing models have been changing as well. Because the entities of financing for public infrastructure are governments, we need to focus on the central government and local governments while streamlining the main path of changes in the PRC's infrastructure financing models. Beginning in 1978, the central government gradually decentralized the authority for infrastructure investment, and local governments gradually replaced the central government to become the main force of infrastructure investment.

This period since the reform and opening up can be divided into five stages according to the main financing model:

- In the first stage (1978–1993), infrastructure investment was mainly financed by central government finance. The central government replaced government appropriations with loans, established various construction funds, and issued long-term national debt for construction to finance infrastructure. This led firstly to an increase in the nonperforming loan (NPL) ratio and financial risk exposures of banks, and secondly resulted in uncontrollable issuance of paper money and serious inflation. Finally, only issuance of national debt and fiscal appropriation were kept in the central government's financing for infrastructure.

- In the second stage (1994–1997), local governments were given more authority in infrastructure investment. However, the tax distribution system reform weakened local governments financially, and they had to increase revenue by charging extra-budgetary fees. The levy of various extra-budgetary charges or fees in different names by local governments worsened the investment environment and aggregated economic risks, and this model was put to an end by the central government.
- In the third stage (1998–2003), along with the implementation of the land sale system and the market-oriented reform of commercial housing, local governments took in handsome funding through land finance. In the meanwhile, local governments started to play the leading role in infrastructure investment in lieu of the central government.
- In the fourth stage (2003–2014), the land financialization model and government credit financing model dominated public infrastructure financing. Figure 1 shows the four leading models of financing for public infrastructure in the period 2003–2014. However, neither the land finance model nor the land financialization model were sustainable because they pushed both land prices and housing prices increasingly higher. The government credit financing model brought a large amount of implicit debt to local governments, gathering financial risks and debt risks at an instant. Therefore, the three models were replaced by local government bonds, which were more standard.
- In the fifth stage (2015–), a period of gradually modernizing the national governance, local governments launched across-the-board investment and financing reforms in compliance with the national regulations, while the central government reasonably increased the debt volume of local governments and tried to root out their disorderly borrowing. Local governments were allowed to issue bonds and engage in Public–Private Partnerships (PPP) so as to realize the sustainable construction and operation of public infrastructure at the same time as guarding against debt risks.

Figure 1: Four Models of Financing for Public Infrastructure, 1998–2014



Source: Author Summary.

1.1 Replacement of Government Appropriations with Loans, Central Construction Funds, and National Debt Issuance (1978–1993)

Before the reform and opening up, the PRC adopted a planned economic system. The investment in public infrastructure construction was subject to the arrangement by the National Planning Commission (predecessor of the National Development and Reform Commission), and the financing was provided by a single channel, i.e., fiscal funds in which the central government dominated. During the fourth five-year planning period (1971–1975) and the fifth five-year planning period (1976–1980), central government funds comprised as much as 82.5% and 72.4% of capital construction investment, respectively. The funds used by the national finance for capital construction always took the form of fiscal appropriations, and the construction units could use them for free, which corresponded to the planned economic system and the fiscal system of unified collection and allocation of funds by the state. However, free allocation exposed more and more drawbacks with the expansion of the investment scale. The absence of constraints on the use of investment capital by enterprises and local governments, and blind and inefficient investments in particular, led to a grievous waste and inefficiency of national funding.

In the early days of reform and opening up, the central government remained a dominant investor in public infrastructure, and the construction investment authority had not been delegated to local governments yet. In order to improve the investment efficiency, the PRC launched reforms of the state budgetary capital construction investment management system. However, the financial resources of central government and related investment efficiency were dwarfed by the gigantic infrastructure investment demands. In response, the central government raised money for public infrastructure through the establishment of various construction funds, the replacement of government appropriations with loans, and the issuance of national debt.

1.1.1 Inception of Construction Fund, Central Capital Construction Funds, and Budget Regulation Fund

In 1982, the Central Committee of the Communist Party of China and the State Council issued the Circular on Collecting the Fund for Important Construction of State's Energy and Transportation, and the State Council issued the Measures for Collecting the Fund for Important Construction of State's Energy and Transportation, deciding to collect the fund for the PRC's key energy and transportation construction projects. The Fund mainly levied a percentage of 15% on the extra-budgetary funds and funds not included in the budget management, and this was shared among the central and local governments at an approximate ratio of 7:3. From coming into existence in 1983 to retirement in 1993, the Fund collected RMB181.089 billion accumulatively, which solved the urgent need for investment in the development of electricity, coal, transportation, and communications.

With the delegation of government power and constant development of the Chinese economy, investments in the PRC were diversified. However, there were two ensuing problems: First, no synergy was created in the use of funds, leading to the repetition of general constructions despite repeated attempts by the government to stamp out the practice; second, limited by its financial strength, the central government could only arrange a small and unstable amount of budgetary fund for capital construction each year. The Central Investment Fund emerged in response to the above two problems by

ensuring the funding was in place for key construction projects in the PRC and realizing the guidance on local and extra-budgetary investments. In 1988, the State Council issued the Circular on Printing and Distributing the Scheme on Recent Reform of Investment Management Mechanism and the Measures for Administration of National Capital Construction Fund, deciding to adopt the system of “Central Capital Construction Funds” for investment within the central budget in capital construction projects. The Funds came from the following five sources: (1) the portion of the fund collections on the fund for important construction of state’s energy and transportation for the central government to use; (2) the portion of the levied construction tax revenues for the central government to use; (3) the portion of the Ministry of Railway’s lump-sum revenues for budgetary capital construction; (4) the principal and interest collections from the budgetary investments under replacement of government appropriations with loans; and (5) fixed-amount fiscal appropriations.

The Chinese government established six specialized investment companies, namely the National Energy Investment Corporation, the National Transportation Investment Corporation, the National Raw Material Investment Corporation, the National Electromechanical and Textile Investment Corporation, the National Agricultural Investment Corporation, and the National Forestry Investment Corporation, to manage the Funds. The investment corporations performed the function of share-controlled companies so that the value of the Funds could be maintained and increased, and they also assumed the function of making national policy-oriented investment. After the implementation of the Fund system, although the country was financially strained, the annual national budget had retained the fund base as much as possible, so that key construction projects such as energy, transportation, and raw materials had stable funding sources. From 1989 to 1994, outstanding loans of central operating funds exceeded RMB100 billion, supporting a number of key projects. With the deepening of economic system reforms, such as changes in the objective economic conditions, the number and structure of the five Funds changed, and the Fund on Key Energy and Transportation Construction Projects was gradually reduced. In 1994, the State Council merged these six state-owned specialized investment corporations into the China Development Bank. The China Development Bank, as a policy-related financial institution, used state credit to issue policy-based financial bonds and was tasked with investing in, and financing, key infrastructure construction projects entrusted by the government. For example, it provided a loan of RMB3.0 billion each year to the Three Gorges Project from 1994 to 2003, totaling RMB30 billion for a term of 15 years.¹

In addition, in order to enhance macro control, the government set up a national budget regulation fund to address the excessive growth and improper use of extra-budgetary funds. In 1989, the State Council released the Measures for Collecting the National Budget Regulation Fund, deciding to levy a national budget regulation fund on state-owned enterprises and private enterprises at a rate of 10%, which would be shared among the central and local governments. From 1989 to 1996, RMB68.597 billion of National Budget Regulation Fund was collected to strengthen the country’s macro control, ease the country’s financial difficulties, regulate the flow of extra-budgetary funds, and finance key energy and transportation construction projects.

The centralization of funds to strengthen key energy and transportation construction projects was proven very effective. From 1983 to 1993, the PRC’s energy product output increased rapidly, with raw coal output rising by 60.8%, crude oil output by 36.9%, and power generation by 138.9%; transportation capacity was boosted rapidly, with the

¹ Hu Yunpin, “Research on Investment Control Mechanisms of Major Engineering Projects Based on the Three Gorges Project,” p. 71, 2006, PhD thesis of Wuhan University of Technology.

length of roads and that of civil air routes increasing by 18.4% and 319.4%, respectively. The improvement of transportation and energy conditions provided a good foundation for the healthy and rapid development of the entire national economy.

1.1.2 Reform of the “Replacement of Government Appropriations with Loans” and Project Capital System

In addition to the establishment of various construction funds, the central government started to reform the “Replacement of Government Appropriations with Loans” in 1979. The replacement of appropriations for budgetary investment in capital construction with loans refers to replacing free-of-charge fiscal appropriations with paid use of bank loans in order to strengthen the economic liability of the users of capital construction funds. In August 1978, the State Council forwarded the “Report on the Measures for Granting Bank Loans for Investment in Capital Construction” and the Trial Regulation on Basic Construction Loans co-released by the National Planning Commission, the National Construction Commission, and the Ministry of Finance, rolling out the pilot program of changing fiscal appropriations for infrastructure construction to bank loans granted by the China Construction Bank. In December 1984, the National Planning Commission, the Ministry of Finance, and the China Construction Bank co-released the Interim Regulation on Changing All the Investments in Capital Construction in the National Budget from Appropriations Wholly to Loans, marking the policy of “replacing government appropriations with loans” being put into implementation across the board. In consideration of the fact that some projects were for public welfare by nature and they were insolvent, the PRC introduced the “dual-track” system by allowing appropriation and investment to coexist in 1986.

The system of “replacing government appropriations with loans” helped to strengthen the responsibility of fiscal fund users, imposed constraints, caused the project supervising departments to attach importance to benefits and loan repayments, and was conducive to raising the investment efficiency; against the shortage of fiscal funds, banks acted as project managers and collectors of project earnings, which changed the characteristic of fiscal funds “getting no return from investment” and strengthened the capability of collecting investment capital and increasing income. Generally speaking, the policy of “replacing government appropriations with loans” had greater advantages over the appropriation granting policy. Subject to the constraint of paying the loan principal and interest, local governments and enterprises gave up the practice of “eating from the same big pot”—racing to apply for funding from the fiscal authority and making irresponsible investment. The efforts paid off in effectively saving money, controlling the size of infrastructure construction, and raising the investment return.

Nonetheless, the policy of “replacing government appropriations with loans” increased the PRC’s overall financial risks at a fast speed. Since investment in infrastructure had basically no cash flows or debt-servicing ability, NPLs piled up. At the end of the 1990s, the Chinese government had to strip nonperforming assets (“NPAs”) of RMB1.4 trillion from the Bank of China, the Agricultural Bank of China, the Industrial and Commercial Bank of China, and the China Construction Bank (the “big four state-owned banks”).

The concentrated outbreak of financial and fiscal risks in the late 1980s put to an end to the policy of “replacing government appropriations with loans” for infrastructure construction. The PRC carried out financial system reform in 1993. According to the Decision of the State Council on Financial System Reform (G.F. [1993] No. 91), Chinese banks were divided into policy banks and commercial banks, thereby cutting off the direct relationship between policy loan and monetary base. Policy banks, including the China Development Bank, were established, while state-owned specialized banks

such as the big four turned to commercial banking and began to engage in commercial business.

Moreover, to mitigate the risks from the practice of “replacing government appropriations with loans” for infrastructure financing, the State Council of China released the Circular on Piloting the Capital System of Fixed Asset Investment Projects (G.F. [1996] No. 35) on 23 August 1996, and required implementation of the project capital system, a kind of project management system whereby the total investment in a project would be approved only when there was a certain proportion of capital beyond the legal person’s debt fund. Project capital must be nondebt, while the investors were entitled to the owner’s equity in proportion to their contributions, and they were allowed to transfer but not allowed to withdraw their investments, in order to prevent and control risks since the practice of “replacing government appropriations with loans” could easily give rise to extremely big project risks.

1.1.3 Issuing of National Debt for Construction and Running of Fiscal Deficit by the Central Bank

After the Third Plenary Session of the 11th CPC Central Committee, the PRC unleashed a new wave of massive construction of key projects. In order to navigate through fiscal difficulties, raise funds, and prevent inflation, the State Council issued treasury bills in 1981 to make up for the central fiscal deficit, ending the history of the PRC having neither internal debt nor external debt since 1959. The medium- and long-term national debt for construction was gradually in lieu of other financing models and became an important source of budgetary funds for the central government’s infrastructure investment.

Between 1981 and 1992, the Chinese government issued a total of RMB119.943 billion in national debts in the PRC. The national debt issued in 1981 was mainly used to make up for the fiscal deficit, and that issued in other years was mainly used to increase investment in key energy and transportation construction projects. Since 1998, the PRC has practiced an expansionary fiscal policy. In the five years from 1998 to 2002, RMB660 billion of special national debt was issued in total for investment in basic industries and infrastructure, mainly infrastructure projects in agriculture, water conservancy, transportation and communications, urban infrastructure, urban and rural power grid transformation, and central reserve grain depots. And interest-subsidized funds for technological improvement were spent on some technological transformation projects in basic industries.

Furthermore, in order to make up for the funding gap, the central government directly created overdrafts from commercial banks in addition to issuing national debt for construction, forming a large-scale “soft deficit.” Finally, the deficit could only be compensated for by increasing the money supply, resulting in serious inflation. Serious inflation forced the government to strictly separate the funding relationship between the finance and the central bank through reform. According to the Law of the People’s Republic of China on the People’s Bank of China adopted in 1995, the latter should not overdraw the government finance or directly subscribe to or underwrite national debt and other government bonds. Since then, the central government’s financing for making up the fiscal deficit and major public infrastructure has mainly taken the form of expanding the issuance of national debt.

This also shows that the central government-led infrastructure financing has basically adopted a standardized and transparent method of issuing national debt since 1995 and deficit monetization has been prohibited by law. Now, this method is still used by the central government as a leading approach of financing for infrastructure, and there is a relatively sound risk early warning and prevention system. At the end of 2017, the balance of central government bonds accounted for about 16.3% of GDP.

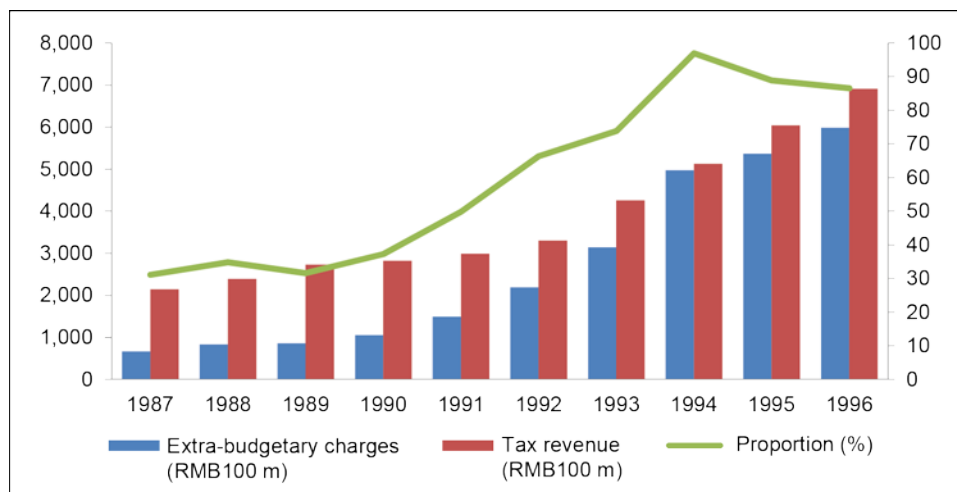
1.2 Extra-budgetary Charges of Local Governments (1994–1997)

In the early 1990s, the changes in the authority of office and the authority of finance of the central and local governments in investment and financing resulted in a significant shift of the models of financing for public infrastructure. First, the central government went into streamlining government and delegating authority, and started delegating the investment authority to local governments. The Decision of the CPC Central Committee on Some Issues Concerning the Establishment of a Socialist Market Economic System (1993) proposed deepening the reform of the investment system and defined local governments' responsibility for local infrastructure construction. Second, the tax distribution system reform reduced the proportion of budgetary fiscal revenue of local governments. Third, the central government's models of financing for infrastructure were standardized, and the financing channels were not diverse, with the financing addressed with tax revenue in the budget and issuing of long-term national debt for construction. Under these circumstances, local governments, seeing fewer fiscal sources but more investment tasks, started charging broad-based fees on a large scale in order to replenish the funding for local infrastructure and develop local economy. In this period, extra-budgetary charges of local governments dominated the infrastructure financing models, but this gave rise to unreasonable charging, arbitrary fining and unjustified apportioning, seriously affecting the social order and increasing the burden of citizens.

Extra-budgetary charges of local governments provided an important backing for public infrastructure investment in that period. For instance, in 1995, the national fiscal expenditure for capital construction was just RMB78.9 billion, a gap of RMB332.9 billion from that year's infrastructure investment (RMB411.8 billion). Correspondingly, the revenue from extra-budgetary charges was RMB536.6 billion in 1995, most of which was used to fill up the infrastructure funding gap. Evidently, the revenue from extra-budgetary charges provided the majority funding for the infrastructure investment during this period.

However, the social risks brought about by the local governments' extra-budgetary charging model were also obvious. Local governments' unreasonable charging, arbitrary fining and unjustified apportioning undermined the doing-business environment, increased the burden on the market players, and disrupted the market economic order. This was not in line with the direction of the PRC's transformation toward a market economy. Therefore, in 1996, the central government began to regulate the fee-charging practice, inspect extra-budgetary funds, and cancel unreasonable charges. It was not until 2004 that unreasonable charging, arbitrary fining and unjustified apportioning were basically eliminated. At the same time, the fee-charging model for infrastructure investment also disappeared, and local governments had to look for alternatives.

Figure 2: Tax Revenue and Revenue from Extra-Budgetary Charges in the PRC (1987–1996)



Source: He Ruojun, "Status Quo of Chinese Government's Revenue System, Issues and Countermeasures", Southwestern University of Finance and Economics, 2001.

1.3 Financing Model of Land Finance (1998–2003)

After 1998, the investment authority was further delegated to local governments with even greater force, and local governments played a more important role in infrastructure investment while the central government was responsible for a small number of significant construction projects only.

But during this period, the central government still seized the funding sources of finance, while local finance remained a payroll finance. On the one hand, according to the 1994 Budget Law, local governments were not allowed to issue bonds, the central government issued long-term construction debt, and then granted the loan to local governments; on the other hand, after the tax distribution system reform, the proportion of local governments' budgetary revenue declined, and most of local governments became payroll finance without enough tax to arrange for infrastructure investment. Local governments could only rely on a portion of the transfer payments made by the central government for infrastructure investment. In 2002, the central government's capital construction expenditure was RMB125.3 billion, and that of local governments was RMB189 billion, combining to account for 31% of the total infrastructure investment in the year.

In addition, when the central government adopted an expansionary fiscal policy and increased investment in public infrastructure, it was necessary for local governments to make supporting investments. For example, in response to the global financial crisis in 2008, the central government increased public investment by RMB1.18 trillion,² which required local governments to make a total investment of RMB2.82 trillion accordingly.

Thus, local governments were highly motivated to find new sources of funding for investment in infrastructure. Along with the reform of the land sale system and the market-oriented reform of commercial housing, local governments found that

² Including an increase in investment of RMB104 billion after October 2008, an increase of RMB487.5 billion in 2009, and an estimated increase of RMB588.5 billion in 2010.

they could obtain fiscal revenue from land sales, thereby promoting the process of urbanization.

After 1997, with the acceleration of urbanization, land sale revenue became one of the important channels for local governments to finance public infrastructure. Land is the most important resource owned by local governments. By monopolizing land supply, local governments obtained rapidly surging land sale revenue as housing and land prices continued to rise. The government's land sale revenue came in at RMB241.7 billion in 2002, and this figure hit RMB3.44 trillion in 2014. Land sale revenue, excluding land development costs, was mostly used for capital expenditures and investment in infrastructure construction. With rapid urbanization, people swarmed into cities and this lifted housing and land prices, resulting in a substantial increase in land sale revenue, and thus engendering the financing model of land finance for financing infrastructure investment.

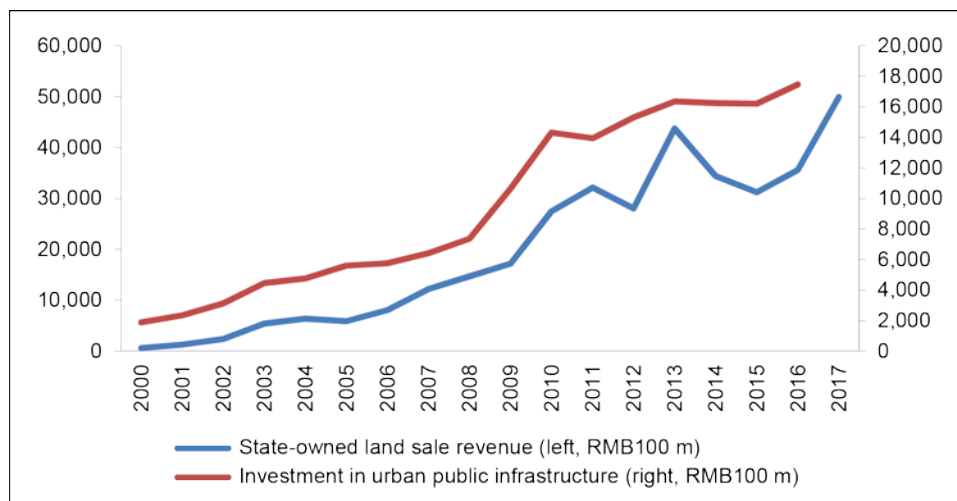
The financing model of land finance relies on the PRC's unique dual land ownership structure and land sale system. The PRC's land ownership is a dual structure under the socialist public ownership. Rural land is collectively owned, urban land is owned by the state, and the ownership of state-owned land belongs to the State Council, but the right to use state-owned land rests with the municipal and county governments. Local governments monopolize the channels for the conversion of agricultural land into state-owned land.

After the introduction of the land sale system and the market-oriented reform of commercial housing, local governments were committed to promoting urbanization, land finance, and public infrastructure investment with the concept of managing cities on the basis of land. In this process, local governments should regulate the land market, control land supply, maintain the upward trend of land prices, and encourage the development of the real estate market. Higher land prices brought more land sale revenue to local governments and improved public infrastructure investment, thereby increasing the attractiveness of cities, which would in turn accelerate urbanization. This was a virtuous circle.

According to the data from 2000 to 2014, the degree of urbanization increased significantly, housing and land prices showed a high-speed upward trend, land sale revenue rose at a fast speed, and urban infrastructure was improved rapidly. In 12 years, the urbanization rate increased by 15.8 percentage points, while the average price of commercial housing and land grew from RMB2,250 and RMB998 in 2002 to RMB6,324 and RMB5,216.5 in 2014, respectively, with land price growth outpacing that of housing. At the same time, local governments saw their state-owned land sale revenue increase by nearly 14 times from RMB241.679 billion in 2002 to RMB3.44 trillion in 2014. During this period, urban infrastructure investment also increased by leaps and bounds, from RMB312.3 billion in 2002 to RMB1.6 trillion in 2014. Local governments spent most of the land sale revenue on urban infrastructure construction, thereby improving urban competitiveness and attracting population inflows.

In addition, the development of the real estate market and the rise of land prices also helped local governments increase their budgetary fiscal revenue, thereby providing a funding basis for public infrastructure investment. After the tax distribution system reform, taxes and nontaxes related to land and real estate became the backbone of local taxation.

Figure 3: State-owned Land Sale Revenue and Urban Public Infrastructure Investment



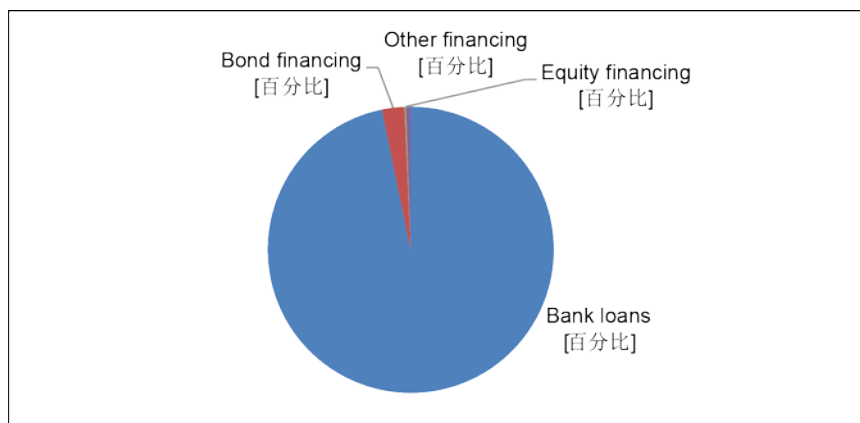
Source: Wind Economic Database.

1.4 Land Financial and Government Credit Financing Model (2003–2014)

In 2003, the China Development Bank commenced the third round of lending. It granted credit to financing platforms across the board, and the financing platforms obtained loans with land as collateral. In this case, local governments set up financing platforms as their financing vehicle. They transferred land to financing platform companies for loans. And the refinancing platforms, after obtaining the land assets, improved their balance sheet, and could raise money from the issuing of municipal bonds in the financial markets. In this way, local governments explored a model of financing with land financialization via the financing platforms.

But the full-amount inclusion of land sale revenue in budget management from 2007 imposed constraints upon the local governments' practice of injecting land into financing platforms, and it also weakened the land financialization model. Local governments began to help financing platform companies finance with their own credit, typically by issuing a letter of commitment/guarantee or guaranteeing with the future sale revenue from reserved land.

The main business of financing platform companies is infrastructure construction, and their main asset is the land injected by local governments. Financing of financing platforms through bank loans and bond issuance is actually a process in which local governments finance and leverage land. Like other market players, financing platform companies finance through bank loans, bond issuance, equity financing, and other financing channels. From the financing structure perspective, bank loans dominated, accounting for 96.8%, followed by the issuance of bonds such as corporate bonds, commercial papers, and medium-term notes, accounting for 2.5%. Equity financing and other financing activities make up a small part of less than 1% together (Figure 4).

Figure 4: 2017 Financing Structure of a Sample Financing Platform Company

Source: Cost reduction data of the Chinese Academy of Fiscal Sciences.

During the period from 1997 to 2014, infrastructure investment expanded rapidly, and various financing models achieved “barbaric” development, although accompanied by quick accumulation of risks as outlined below:

1. Although infrastructure financing models relied heavily on land and real estate, they were not sustainable over a long period of time.
2. Local governments saw the pileup of implicit debts and were exposed to debt risks.
3. Large amounts of money poured into financing vehicles from shadow banking and gave rise to financial risks. Shadow banking derived money mostly from wealth management products with a short term in general. The money after many levels of nesting, e.g., interbank market and trust funds, was invested in long-cycle infrastructure investment. So, there was a serious maturity mismatch.

2. GOVERNANCE-ORIENTED MANAGEMENT OF THE RISKS OF FINANCING FOR PUBLIC INFRASTRUCTURE IN THE PRC

The large-scale strengthening of local governments’ public infrastructure financing risk management in the PRC began with the local government debt risks triggered by the RMB4 trillion investment stimulus package in 2009. In November 2013, the PRC proposed that “finance is the foundation and important pillar of national governance.” The PRC revised the Budget Law that had been in force for 20 years in August 2014, and implemented the new Budget Law on 1 January 2015 as a symbol that the positioning of the PRC’s public infrastructure financing risk management had been upgraded to the “national governance” level, and the prevention of systemic risks had become one of the tough battles. Specifically, it mainly includes project management, financing method management, fiscal risk management, and institutional reform to build a long-term and effective mechanism.

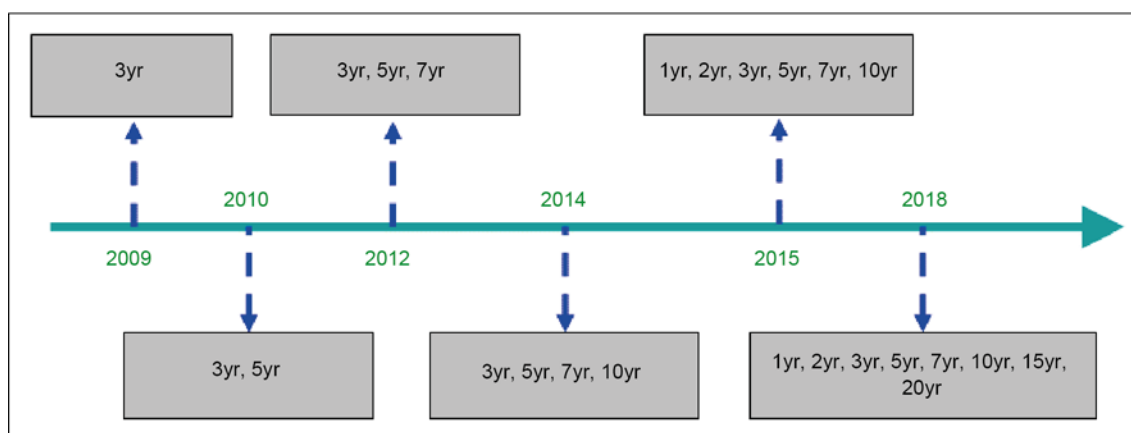
2.1 Project Sustainability

A “project” is a basic unit of public infrastructure construction, and the government’s standardized management of public projects should lead to the sustainability of public infrastructure construction. Objectively speaking, a sustainable project cannot definitely ensure that the public infrastructure construction is sustainable. However, a lack of support at the project level will surely make it impossible to sustain as a whole. The government has strengthened the standardized management of public infrastructure projects in the following four aspects since 2015:

2.1.1 Control of Project Implementation Cycle

Public infrastructure construction and operation involves a long cycle. The long time span will inevitably lead to greater uncertainty in financing management. Therefore, the government strictly controls the project implementation cycle in terms of preventing financing risks. At the central level, the Circular on Strengthening and Improving the Budget Management of Central Departments’ Project Expenditures issued by the Ministry of Finance in 2015 makes it clear that if the project expenditures are arranged by the central departments, the project implementation cycle should not exceed five years generally, except those whose implementation cycle has been clearly approved by the competent business departments. In the case of continuing to arrange expenditure after expiration of a project, project re-establishment should be gone through according to the procedures. The project cycle, once determined, should not be adjusted in principle. At the local level, it was defined in 2015 that when local governments finance public investment projects through the issuing of government bonds, the bond terms should be generally one year, three years, five years, seven years, and ten years, while special bonds should mature in one year, two years, three years, five years, seven years, and ten years. Although the bond terms have been lengthening since the issuing of local government bonds in 2009, and the ten-year bond product was offered for the first time in 2014, it was made clear in 2015 that the issuance of single-term local government bonds should not exceed 30% of the general bonds issued in that year.³

Figure 5: Evolution of Maturities of Bonds Issued by Local Governments



³ In 2018, local government bonds introduced the 15-year and 20-year products on the original basis.

2.1.2 Delicacy Management of Projects

In the planned economy period, the government's funds for public infrastructure project construction basically came from finance, and project management was basically a matter within the government. In the process of marketization, urbanization, and industrialization, public investment project financing gradually expanded to social capital, government debt, and other channels. The closed and extensive management of public investment projects within the government was not conducive to external financing of the projects. The government gradually walked onto the track of delicacy management of public investment projects after 2015, shifting from the "packaging and bundling" of projects in the past to "decomposition and separate establishment" of projects, and breaking the responsibilities for financing risks of public investment into specific projects.

2.1.3 Project Library Building

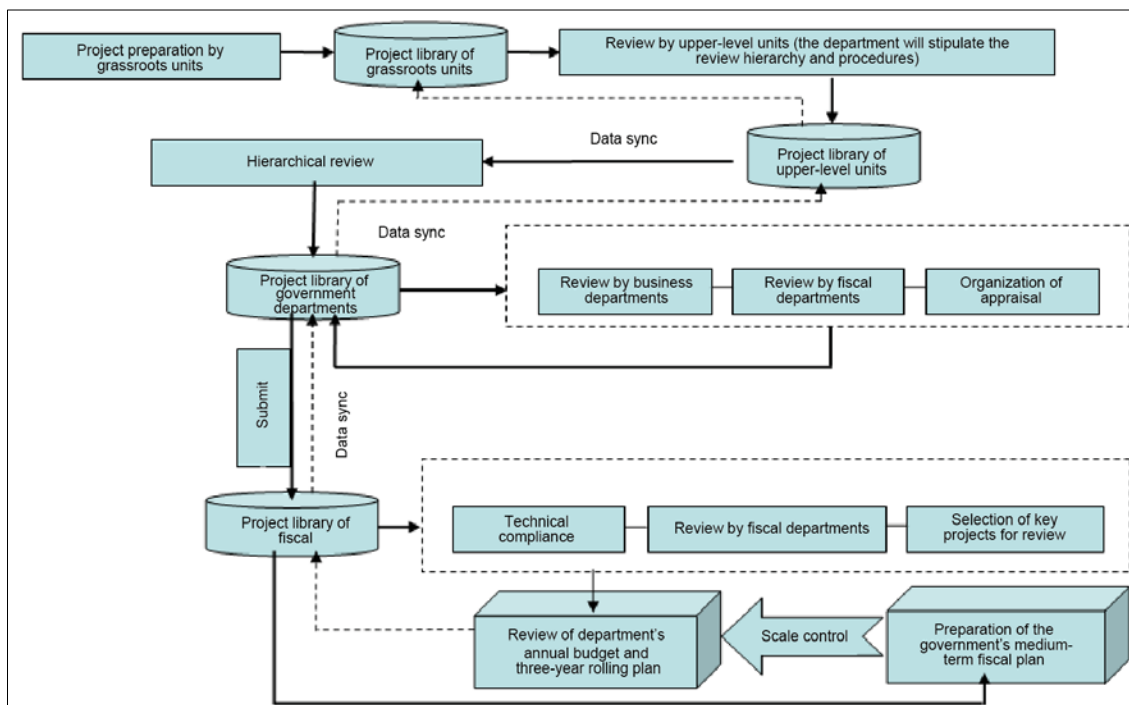
Since 2015, governments at all levels have strengthened the building of public investment project libraries, and put them under tier-by-tier establishment, separate maintenance, and hierarchical management. With a three-tier architecture, the project libraries contain the project library of the fiscal department (consisting of the projects filed by the same-level government department), the project library of the government department (consisting of the projects filed by the same-level department and the subordinate units), and the project library of the grassroots unit (consisting of the projects initiated and implemented by this grassroots unit). All tiers of public investment project libraries are subject to open management (Figure 6). The management unit of the project library department can set up secondary projects as per working needs, file them in real time or on a regular basis, and report the summary to the fiscal department as alternative projects for the department's public infrastructure budget. Full-cycle rolling management of public infrastructure investment projects is performed with the project libraries as the carrier, with the project implementation department organizing the normative documentation of the projects in the libraries, including the basis of project initiation, implementer, range of expenditure, implementation cycle, budget demand, feasibility study, and evaluation results, which will serve as the basis for project review and management. The fiscal department, government administration department, and project implementation unit share dynamic information on project implementation, transfer and carryover, etc., and maintain and update the government's public infrastructure project libraries across different tiers.

2.1.4 Enhanced Management of Project Performance

Performance management has always been an important part of government's public investment project management. The government has been attaching more importance to debt and financing risks since 2015, so it is an inevitable choice for the government to raise the efficiency of its public investment by enhancing the management of project performance. Specifically, the performance management of public investment projects includes five steps. First, in 2015, the PRC released the expenditure quota standard system for projects at the central government level, making it clear that more than 80% of the projects that are suitable for standard management will have standards to follow, and are approved according to standards before 2018. Second, the PRC actively promotes the project expenditure budget review, and makes it clear that the secondary projects filed by the departments must be subject to budget review before they are put into the project library. Third, performance targets must be set for projects that are put into the project library for management. Fourth, since 2016, the Ministry of Finance has selected the central government departments such as the Ministry of Land and Resources to carry out pilot monitoring of how project expenditure performance targets

are implemented. The pilot was expected to cover all the projects in 2018. Fifth, the results of project performance evaluation should be combined organically with the project library building and budget arrangement, and the project exit mechanism should be improved.

Figure 6: Process for Preparation and Review of Government’s Public Investment Budget Items



2.2 Financing Sustainability

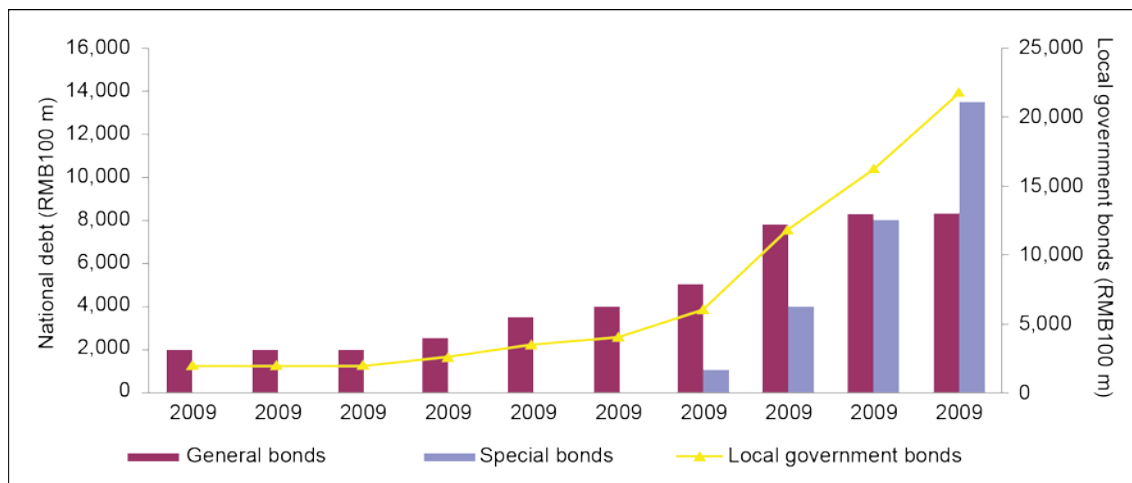
Since the beginning of the new century, the PRC has basically maintained an annual urbanization rate of more than one percentage point. However, the PRC’s urban-rural dual economic structure and social structural characteristics are still evident. The PRC’s public infrastructure construction always has financing demands and is even under financing pressure at certain times. Sustainable financing is key to governments at all levels complying with the overall national strategy of urbanization and rural revitalization and effectively carrying out public investment.

2.2.1 Government Bonds

The issuing of local government bonds has become the main financing channel for governments to increase public investment in recent years. According to Article 35 of Chapter IV of the Budget Law, which came into force on 1 January 2015, partial funds for construction investment indispensable to the budgets of provinces, autonomous regions, and municipalities directly under the central government may be raised from the issuing of local government bonds, provided that loans are within the limits set by the State Council. Local governments and the departments managed by them are forbidden to borrow in other ways than what is mentioned above. Under the new Budget Law, local government bonds have explored three aspects in improving the sustainability of public infrastructure financing.

The first is greatly scaling up government bond issuance. The amount of approved local government bond issuances from 2015 to 2018 reached RMB5.59 trillion (Figure 7).

Figure 7: Amount of Bonds Issued by Local Governments, 2009–2018



Source: Ministry of Finance, PRC.

The second is slashing the financing costs of local governments.

At the end of 2014, fiscal and audit departments cleaned up local government liabilities, reidentified the debt that local governments were obligated to repay, and decided to issue local government bonds to replace debt over four years from 2015. Replacement bonds issued by the end of 2017 amounted to RMB12 trillion accumulatively. This bond issuance is used to replace the past borrowing via financing platforms, built transfers (BTs), and trusts (costly financing based on government credit) with government debt, thereby reducing the financing costs. For example, replacement bonds issued in 2015 totaled RMB3.2 trillion, and with a term from one year to ten years they had a coupon rate of 2.81%–3.86%, saving interest expenses of RMB200 billion for local governments.

The third is diversifying the financing entities.

Buyers of local government bonds have gradually expanded from commercial banks at the beginning to foreign institutional and individual investors, and from the interbank bond market to the stock exchanges.

The fourth is issuing refinancing bonds.

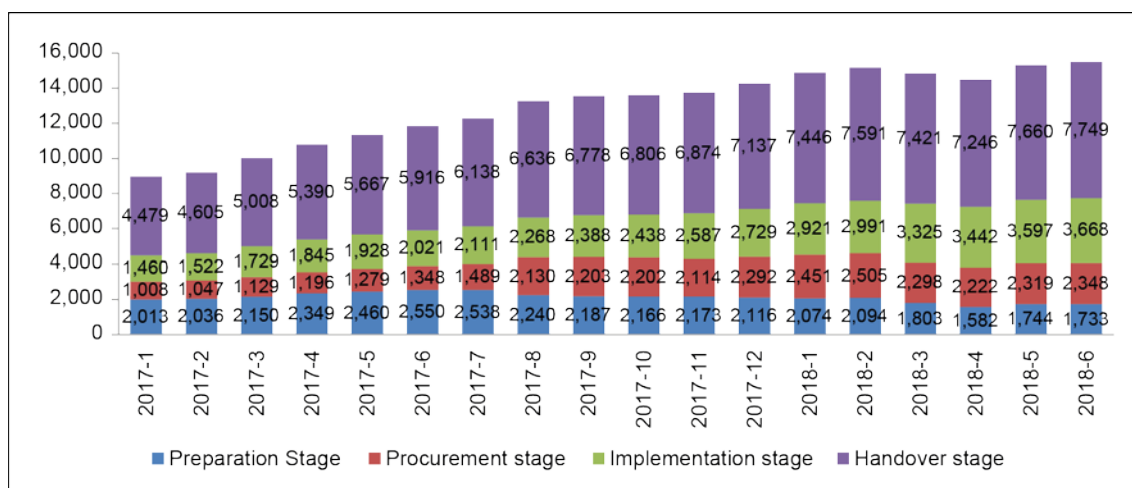
The Ministry of Finance proposed issuing local government refinancing bonds in the Opinion on Local Government Bond Issuing in 2018 (C.K. [2018] No. 61) for the first time in 2018, specifying that such bonds are used to repay the principal of part of the matured local government bonds. The issuing of refinancing bonds was aimed at alleviating the debt-servicing pressure of local governments' stock bonds. Local government bonds will be mainly new bonds and refinancing bonds in the future.

2.2.2 Public–Private Partnership (PPP)

Since the introduction of the PPP model in 2014, social capital has played an active role in investment in public infrastructure and public services. However, under the constraints of strict supervision of local government financing risks, some local PPP projects went in for large scale and fast speed, and sought quick success and instant benefits, and some

PPP projects became a disguised method of financing by local governments. Consequently, fiscal risks, financial risks, and project risks were interwoven, typically manifested as PPP financing risks. In July 2017, the Ministry of Finance proposed the following “four don’ts” in the development of a PPP: do not solidify expenditure obligations, do not blur the utmost tolerance of finance, do not dilute the operational content, and do not generalize the scope of application. In November 2017, the Ministry of Finance issued the Circular on Regulating the Management of the Project Library of the PPP Integrated Information Platform, starting the campaign of cleaning up PPP projects. First, rigorous standards was being formulated for putting new projects into the library, prudently carrying out government-paid projects, and strictly controlling the three types of projects, i.e., projects that are not suitable for adopting the PPP model, projects whose preparatory work in the early stage is not in place, and projects whose effective payment mechanism has not been established. Second, the projects already in the library was being cleaned up, comprehensively verifying the information on the projects in the library, their implementation plan, value-for-money evaluation report, financial tolerance justification report, procurement documents, PPP project contracts, etc., and withdrawing projects that did not meet the requirements. There were 84 projects in the first three batches of demonstration projects of the Ministry of Finance that were canceled from the demonstration list, and 89 projects were required to be rectified within a time limit. As of April 2018, 1,695 projects had been made out of the library nationwide, involving an investment of RMB1.8 trillion, and 2,005 projects had been filed for rectification, involving an investment of RMB3.1 trillion, totaling RMB4.9 trillion.

Figure 8: Monthly Changes in the Number of Projects in the Management Library at Each Stage



Source: Quarterly Update on the Project Management Library of the PPP Integrated Information Platform, Issue 2 in 2018.

2.2.3 Bonds of Local Urban Construction Investment Enterprises

Corporate bonds are issued mainly via local government financing platform companies. Local government financing platform companies are wholly or partially controlled by local governments primarily, and are implementers of some public infrastructure projects launched by local governments. Both the nominal borrower and payer of corporate bonds are financing platform companies, which sets them apart from local government bonds. But the enterprises carry out a large number of public investment projects in such sectors as municipal, transport, environmental protection, and

land development for local governments in the process of urbanization. Since the Budget Law was released in 2015, special bonds of local governments and bonds of urban construction investment enterprises have been in a state of coexistence and co-development under the new local government debt regulatory framework, but co-governance has not been fully realized. Local government bonds are supervised by fiscal departments, while corporate bonds are supervised by the National Development and Reform Commission. Before 2015, local government bonds and corporate bonds each raised similar amounts of money, but after 2015, the issuing scale of local government bonds obviously outstripped that of corporate bonds. This reflects the fact that after the new Budget Law became effective, the channel whereby local governments issued bonds via financing platform companies was tightened by the regulator, and the financing of local governments for public infrastructure gradually returned to the fiscal channel.

Table 1: Issuing of Local Government Bonds Vs. Issuing of Corporate Bonds

	Issuing Scale (RMB100 m)		Number Issued	
	Local Government Bonds	Corporate Bonds	Local Government Bonds	Corporate Bonds
2013	3,500	4,752	24	374
2014	4,000	6,971	43	584
2015	38,350	3,421	1,035	302
2016	60,458	5,925	1,159	498
2017	43,580	3,730	1,134	382

Source: Wind Economic Database.

2.3 Fiscal Sustainability

The discussion on fiscal sustainability highlights a comprehensive review of fiscal operation stability from the medium- and long-term perspective instead of focusing on the impact of “revenue in a given fiscal year coming below expenditure.” Since 2015, regulatory constraints have been heightened upon local government debt at the core, propelling the sustained, stable, and healthy operation of public finance.

2.3.1 Bringing Government’s Explicit Debt Financing into Budget

The Chinese government’s budget management has experienced three expansions of budgetary revenue and expenditure, including the inclusion of extra-budgetary revenue and expenditure, land sale revenue, and government financing into budget. The third expansion that took place in 2015 was different from the prior two expansions in that it was based on legal constraints. Prior to 2015, local governments could launch debt financing through multiple channels and in various forms. In 2015, the revised Budget Law was implemented. Accordingly, local government’s explicit debt is strictly defined as a local government bond, and the income from this local government bond should be included in the general public budget and the government fund budget. This change is of epoch-making significance, which means that local government’s explicit debt financing has taken a solid step toward openness and transparency in terms of both stock and increment, and the debt repayment plan and the source of repayment funds under budget management have become more clear and pragmatic.

2.3.2 Defining the Reflection of Debt Interest Expenses in Budget Line Items

When all explicit debt of local governments was included in the budget in 2015, the central finance released a specific policy to urge that the central government and local governments would seek a common ground in preventing debt risks, including defining that the debt's interest expenses should be reflected in the budget line items. In contrast to the repayment of bond principal, interest payments must be recognized as expenses in the budget line items, and in doing so the government must arrange the funding for interest payment in the budget beforehand instead of paying the interest via "refinancing." Thus, local governments must make arrangements for paying interest expenses just like for spending on education, medical care, agriculture, and administration in their budget in advance.

2.3.3 Changing Main Funding Source of Debt Repayment from Tax Revenue to Project Income

After 2015, the issuing structure of local government bonds changed significantly, with the issuing amount of local governments' special bonds climbing from zero in 2014 to RMB1.35 trillion in 2018, accounting for 61.93% of the amount of new bonds in the year. The amount of new bond issuance by local governments in 2018 outnumbered that in 2014 by RMB1.78 trillion or 545%, of which the contribution rate of special bond growth was as high as 75.8%. The sharp increase in the proportion of special bonds has shifted the local governments' reliance for debt repayment from tax revenue in the general public budget to the operating income of projects. In 2017, the Ministry of Finance introduced project income bonds into the series of local government special bonds, guiding public infrastructure financing, operating costs, and project income to achieve self-balance within the projects and reduce reliance on repayment with budgetary funds. After the launch of project income bonds, the number of issued products grew rapidly from three in 2017 to more than 20 in 2018, making it the most promising bond variety among new local government bonds.

2.3.4 Making Clear Fiscal Expenditure Responsibilities

Fiscal expenditure responsibility refers to fiscal commitment to future expenditure. Under the traditional budget management system, the government budget is mainly prepared on an annual basis. The fiscal expenditure responsibility is more reflected in legally linking the key spending on education, science and technology, agriculture, culture, etc. with fiscal revenue and expenditure, or the scale of GDP, thereby forming a rigid segmentation of budget expenditure in the future. In recent years, with the introduction of PPP, government investment funds, and other public infrastructure investment and financing models, fiscal expenditure responsibilities have seen the addition of expenditure commitment for cross-year public investment projects. From a regulatory perspective, although the expenditure committed under PPP or the loss arising from external investment is unequal to government debt, the rapid expansion of fiscal expenditure responsibilities will undoubtedly increase the government's payment pressure, and eventually lead to the government's default or indebtedness, making the government's public infrastructure investment unsustainable. This is the internal logic that regulators have paid close attention to government's expenditure responsibility in recent years.

2.4 Institutional Sustainability

The risk factors affecting the government's public infrastructure financing are multidimensional. Policies and institutions can be leveraged to manage the risks of financing, with the former often focusing on resolving specific issues and their effects more directly and concretely, and the latter often emphasizing resolving fundamental issues, with their influence being more substantial and far-reaching. Over the past few years, the PRC has adopted a "two-pronged" approach to risk management of public infrastructure financing: firstly, releasing risk prevention and control policies to address outstanding and emerging issues; and secondly, streamlining deep-seated institutional and mechanical issues on the basis of such outstanding and emerging issues, and exploring the top-level designs of some basic institutions in a top-down manner in order to enhance the capability of preventing public investment and financing risks.

2.4.1 Reforming Fiscal System

As shown from the early and middle stage of government's management of public infrastructure financing risks, public infrastructure construction demand drove government financing, and under financing pressure local governments had to try every means possible to finance. Consequently, frequent problems were seen in government financing, and almost all financing tools had their weaknesses. As a Chinese saying goes, solve one problem only to find another cropping up. Under such circumstances, the government has to solve the deep-seated problems. Talking about risk management of financing is too narrow, but the fiscal system reform marks the breakthrough in the attempt to resolve relevant problems. In 2016, the State Council issued the Guiding Opinions on Advancing the Reform of the Division of Financial Powers and Expenditure Responsibilities between the Central and the Local Governments, deciding to firstly launch such division in national defense and foreign affairs fields in 2016, to break the ground in basic public service fields such as education, health care, environmental protection, and transportation in 2017–2018, and to basically complete such division in major fields, streamline the contents that needed to be incorporated into laws and regulations, and advance the formation of a legal system that ensured a scientific and reasonable division of financial powers and expenditure responsibilities in 2019–2020. The PRC's current fiscal system reform is underway. It is playing an increasingly important role in rationalizing the relationship between the government and the market, the government and the society, and the central and local governments. The government's public investment and financing functions will be embedded in this round of reform for systematic rebuilding.

2.4.2 Balancing Urban and Rural Development

The PRC's development features the typical urban-rural dichotomy, with public services tied to the household registration system and public infrastructure varying in urban and rural areas. Administering urban and rural areas separately for a long period of time has separated their economic and social structures. In the process of urbanization, the PRC strives to promote profound and all-round institutional changes, and to narrow urban-rural gaps, group gaps, and regional gaps. The first of these is integration, which includes the integration of all public policies on fiscal fund allocation, resource and income distribution, public service supply, household registration system management, and others that are administered separately for urban and rural areas, as well as the cleanup and adjustment of all public policies based on the consensus of urban and rural balanced development among different departments and different levels of the government. The second is skewing the priority of public investment to the countryside

and pooling efforts to make up for the shortcomings of rural infrastructure and public services by making good use of all investment increase opportunities in the process of implementing the rural revitalization strategy. The third is harmonization. Through top-level institutional design, the public service supply targets are transferred from citizens to permanent residents, while the central and local fiscal transfer payment methods are adjusted and improved by shifting the focus from the rural and central-western poor to the migrant population so that the transfer payment is “following things” and public service is “following people.”

2.4.3 Reforming Administrative System

Public investment in, and financing of, infrastructure depends on government decision-making, and government decision-making efficiency stems from the administrative system. The PRC’s administrative system has traces of a planned economy. The reform of the administrative system has always been aimed at building an efficient government. Under the downward pressure of the economy, the government has a stronger sense of crisis for “self-revolution.” In recent years, the PRC has carried out a series of reforms of its administrative system for the central purpose of making it “capable, efficient, and clean,” and the government has also been exploring how to improve its decision-making mechanism amid the twists and turns. “Capable” is highlighted by the government’s downsizing initiative through institutional reforms. Since the reform and opening up, the PRC has wrapped up seven large-scale reforms of government institutions in the past 40 years. After the eighth reorganization in 2018, the number of ministerial-level organizations under the State Council was reduced by eight and the number of vice-ministerial-level organizations by seven, and the State Council consists altogether of 26 ministries and commissions (excluding the General Office of the State Council). The institutions of the ruling party were also adjusted and perfected in line with the requirements of the times. Deepening the institutional reforms of the Party and the country is a profound change in advancing the modernization of the national governance system and governance capacity. “Efficient” is another focus of the administrative reform. The “administrative streamlining, power delegation, regulation improvement, and service optimization” reform has reshaped the relationship between the government and the market, stimulated the vitality of the market and the creativity of the society, and demonstrated the responsibility of the government for public investment through relaxing the restrictions upon nongovernment investment.

3. CONCLUSION: ACHIEVEMENTS AND EXPERIENCE OF THE PRC’S PUBLIC INFRASTRUCTURE INVESTMENT AND FINANCING

The PRC’s public infrastructure construction has proceeded with galloping progress since 1978: infrastructure investment increasing exponentially year by year, railway network and road network expanding rapidly, and telecommunications, water conservancy, and urban infrastructure being gradually improved. Figure 9-14 show data on the PRC’s public infrastructure investment and financing. Infrastructure investment, after three rounds of rapid growth, hit RMB17.3 trillion in 2017 from RMB411.8 billion in 1995. The mileage of railway in operation increased handsomely after 1997. It is worth noting that the high-speed rail has forged a strategic development trend with rapid growth. In 2016, the high-speed track in operation reached 22,000 kilometers, accounting for 18% of the railway in operation. The mileage of roads also expanded very quickly, increasing from 890,000 kilometers in 1978

to 4.7 million kilometers in 2016, of which the expressways in operation spanned 131,000 kilometers. The PRC has now built a transportation network extending in all directions. After the reform and opening up, the PRC's urbanization rate grew rapidly, the rural population moved quickly to cities at, and urban infrastructure was also rapidly improved, thereby increasing the attractiveness to the population. The PRC's urbanization rate increased from 17.9% in 1978 to 59% in 2018. Infrastructure investment causes a spillover effect on the PRC's economic growth, and infrastructure modernization is boosting the PRC's industrialization and urbanization.

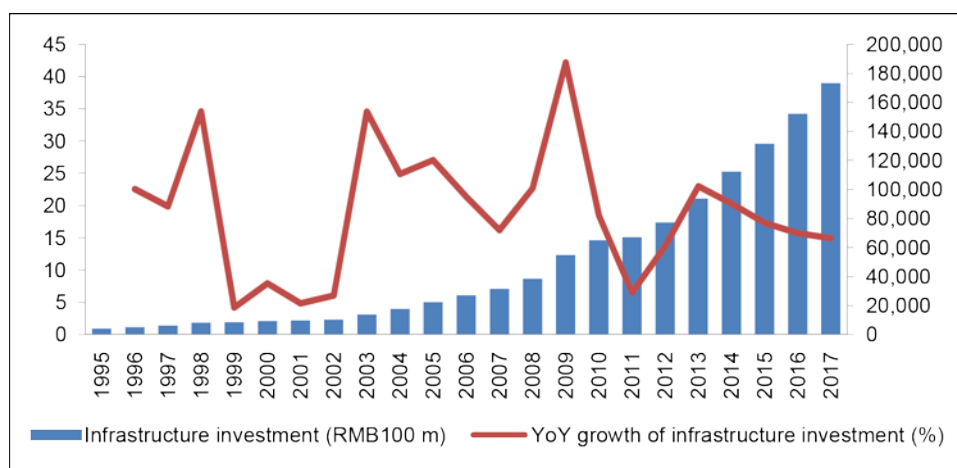
By summarizing the public infrastructure financing models and risk management process of the PRC since the reform and opening up, we can extract the following:

1. The PRC's public infrastructure financing models are specific to each stage because major problems and the environment are varied in different stages. Financing models are shifting, and risk management is continuously standardized in line with the change in economic situation and adjustment of policy objectives. At the start of the reform and opening up, infrastructure financing was troubled mainly by "inaccessibility to financing." The central government financed infrastructure through replacing government appropriations with loans, establishing various construction funds, issuing national debt for construction, and financing fiscal deficit from banks in an attempt to make up for the shortage of budget and stimulate the growth of investment in infrastructure. But these efforts brought about lots of negative consequences, and resulted in huge deficits (including explicit and implicit deficits) and nonperforming bank loans. Moreover, they also imposed uneven burdens on enterprises, thereby incurring inflation and NPL risks. With the release of the Budget Law in 1994 and the reform of the financial system, infrastructure financing channels at the central government level were standardized, and national debt for construction became popular. With respect to local governments, extra-budgetary charges became prevailing for financing during the period from 1994 to 1997, which improved the fiscal strength of local governments and offered another important funding source for infrastructure investment. However, the resulting social risks were exposed rapidly, making the burden on farmers and enterprises heavier. During this period, the central government stressed the standardization of fee charging and cleanup of extra-budgetary funds in its risk management practice. The model of financing for infrastructure with fee incomes disappeared when the random and unregulated charging of fees was put to an end. Land finance, land financial, and government credit came into being instead for financing, but they relied heavily on land and real estate while piling up implicit debt and gathering financial risks for local governments. After 2015, decision-makers were more concerned about risk prevention. Therefore, more standard local government bonds and PPP have dominated financing for public infrastructure.
2. The PRC's public infrastructure financing and its risk management are tending to be increasingly standard, transparent, and open. The establishment of a construction fund, and the replacement of fiscal appropriations with loans and overdrafts from the central bank for financing by the central government were not standard and transparent enough. In spite of the big leeway in the financial policy, the central government was incapable of identifying, controlling, and managing risks. Issuing long-term national debt for construction as a financing alternative involved standard and open operating procedures, thereby significantly increasing the financing transparency and rapidly enhancing the risk control capability. At the local government level, some of the fee items were

standardized, and the others were included in the government fund budget, which was transparent and open. Land finance, land financial, and government credit-based financing, by hiding debt risks, accumulated a large amount of implicit debt for local governments. After 2015, while pursuing governance-oriented risk management of public infrastructure investment, the central government reasonably increased the debt volume of local governments and tried to root out their disorderly borrowing, and thus discovered a more standard, transparent, and open financing model – local government bond issuing and PPP.

3. The PRC’s public infrastructure financing risk management has become systematic. From individual infrastructure projects to financing platform companies, and from local governments to the central government, risk management focuses on multilevel financing sustainability. At the single-project level, the capability of controlling financing risks of single projects is strengthened through control of the project implementation cycle, delicacy management, project library development, and performance management enhancement. At the financing platform company level, efforts are made to standardize high-risk financing channels such as shadow banking and promote market-oriented transformation in order to prevent and control financing risks and ensure the sustainability of financing. At the level of local and central governments, financing risk management is carried out through the issuance of government bonds, reduction of financing costs, and diversification of financing entities toward fiscal sustainability. In addition, at the institutional level, the sustainability of infrastructure financing all over the PRC is further guaranteed through fiscal system reform, the balancing of urban and rural reform, and administrative system reform.

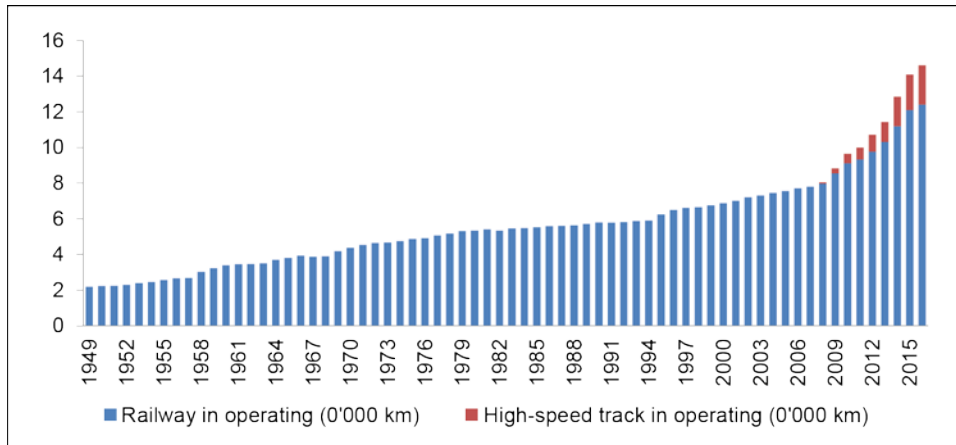
Figure 9: Trends in the PRC’s Infrastructure Investment⁴



Source: Wind Economic Database.

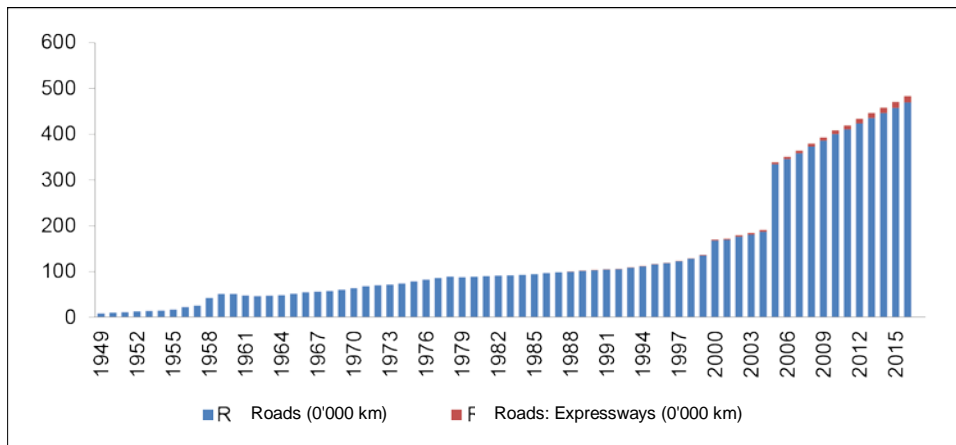
⁴ According to the statistical approach of the National Bureau of Statistics, infrastructure investment should cover the following three industries: transportation, storage, and postal services; water, environment, and public utility management; and production and supply of electricity, heating, gas, and water.

Figure 10: Changes in Mileage of Chinese Railway in Operation



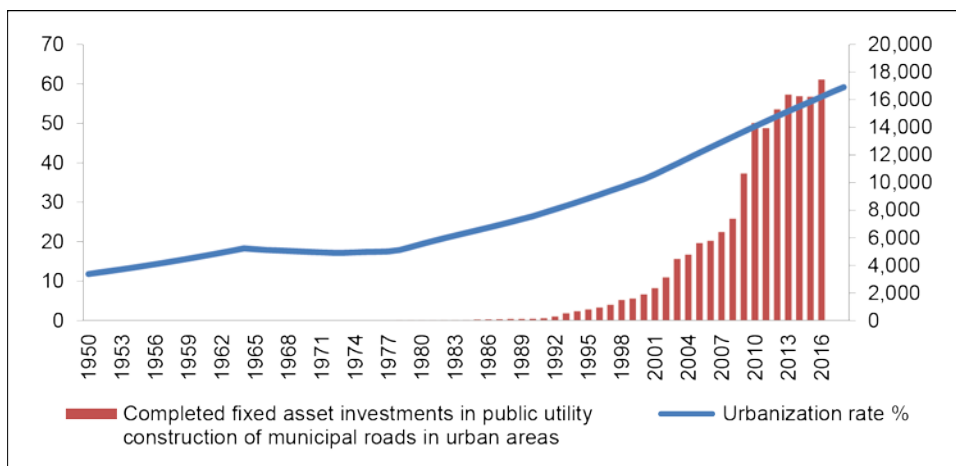
Source: Wind Economic Database.

Figure 11: Changes in Mileage of Chinese Roads in Operation



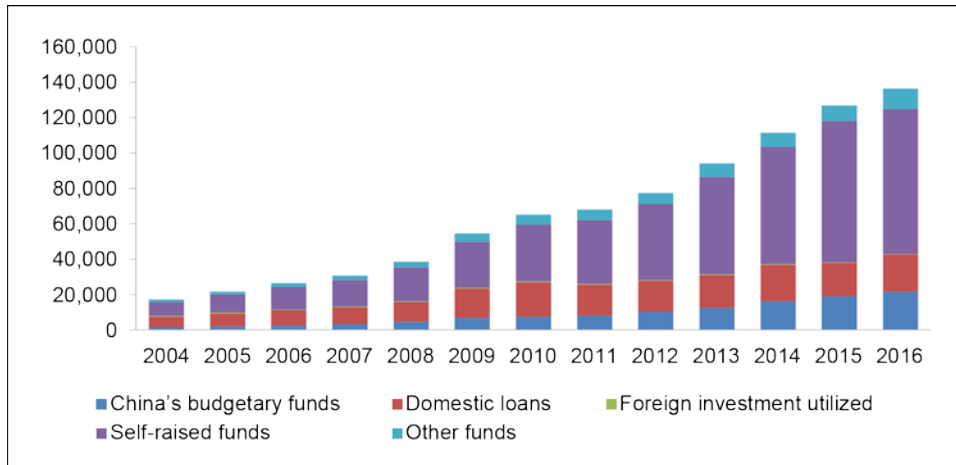
Source: Wind Economic Database.

Figure 12: The PRC's Urbanization Rate and Urban Municipal Infrastructure Investment



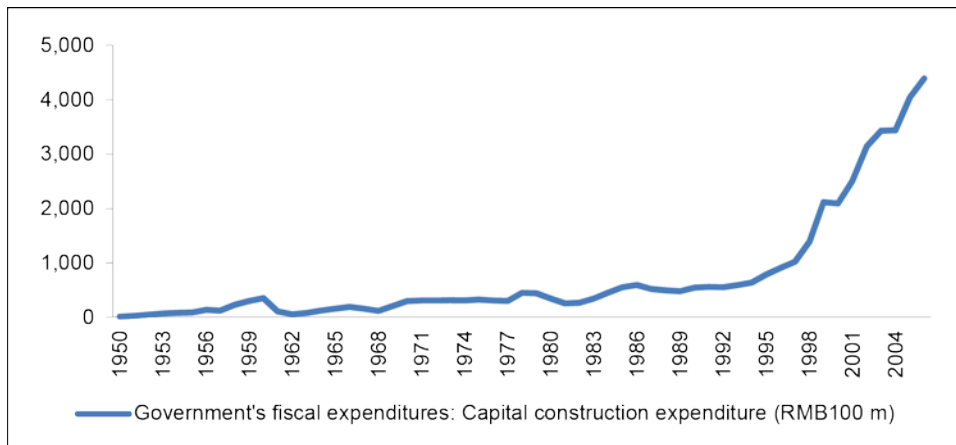
Source: Wind Economic Database.

Figure 13: Sources of Funding for the PRC's Infrastructure Investment



Source: Wind Economic Database.

Figure 14: The PRC's Fiscal Expenditure for Capital Construction



Source: Wind Economic Database.

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