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# Mobilizing Domestic Capital Markets for Infrastructure Financing

*International Experience and Lessons for China*

*Anjali Kumar  
R. David Gray  
Mangesh Hoskote  
Stephan von Klaudy  
Jeff Ruster*

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*The World Bank  
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## FOREWORD

At the request of the Government of China, the World Bank's China Department organized and hosted a one-day seminar focused on issues of mobilizing domestic capital markets resources for infrastructure financing, in Beijing, on November 12, 1996. The following report summarizes key elements of the papers presented at the seminar, drawing largely upon the background papers prepared by World Bank staff, and additionally incorporating material presented by both Chinese and international participants. Special emphasis, as reflected in some of the case studies presented, was given to the financing of hydro-electric dam projects, as these represent an area where local costs are large, gestation periods are long, and expanded domestic financing would be particularly valuable. An emphasis was also given to the tapping of bond markets as this is a relatively neglected potential source of financing, for China today. However, a discussion of equity markets is also included.

The World Bank brought together participants representing a broad spectrum of interests. They included Chinese government representatives from power companies and utilities, as well as those government agencies involved in the planning, approval and regulatory process. Overseas experts in the area of project financing were also represented, together with persons from companies with substantial investment interests in China, and representatives of prominent investment banks.

The papers presented demonstrate how a range of mature as well as emerging economies are developing innovative domestic capabilities in financing infrastructure, through domestic capital market development. Policy conditions required to enable domestic markets to equip themselves for such a role are discussed, and potential for government encouragement through credit enhancement mechanisms is detailed. Finally, the papers analyze the extent to which China's domestic capital markets today can play such a role, identify areas which would benefit from strengthening, and recommend specific steps to launch the process.



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## ABSTRACT

China, like other developing countries, faces the challenge of upgrading and expanding its infrastructure facilities so that economic growth will not be jeopardized by infrastructure-related constraints. Exclusive dependence on external funding presents risks, for example if domestic costs are met by incurring foreign currency obligations. Increasingly, governments in emerging market economies are looking to domestic markets to help fund these massive infrastructure requirements. The domestic banking system is often unable to cope with the demand for long-term funds which such projects generate. Capital markets provide an opportunity for raising long term resources and channeling them to such projects.

The present report draws on experience from industrialized and developing countries in terms of capital market financing of domestic infrastructure projects, and discusses the applicability of these lessons in the Chinese context. It also describes the strategies these economies have adopted to foster capital market development conducive to infrastructure financing, and discusses the role of the government in supporting the development of such financial markets. Mechanisms for credit enhancement, such as guarantee schemes, and pooling arrangements for infrastructure financing, are also discussed. Finally, the report investigates China's present stage of development with regard to capital market development for infrastructure financing, and comments on how the fledgling domestic market could be strengthened.

## ACKNOWLEDGMENTS

The present report summarizes presentations at a seminar held in Beijing, China, in November 1996. Presentations were made by persons from the World Bank, representatives from the Government of China, and overseas expert discussants. Appreciation is expressed for the Government of China participants who presented papers, in particular Mr. Zhu Xian, Acting Director of the World Bank Department, Ministry of Finance, Mr. Tan Aixing, Director of the Ministry of Electric Power and Mr. Xie Ping, Deputy Director, People's Bank of China. Invaluable contributions were made by overseas experts, including Mr. Kevin Wills, Comptroller, Tennessee Valley Authority; Mr. Mitchell Rothman of Ontario Hydro; Mr. Gavin Warnock, formerly associated with the North of Scotland Hydro-Electric Board, and Mr. Philip Sherman of CapMAC, ASIA. Presentations by the World Bank were based on papers prepared by Anjali Kumar (EA2CO), Stephan von Klaudy (LASLG), Jeff Ruster (PSD), Mangesh Hoskote (IENPD) and R. David Gray (PSD).

Many interesting comments were also made during the one-day seminar and discussion, by participants, who also included representatives of a number of Chinese agencies concerned with infrastructure financing, including provincial power utilities, the State Planning Commission, the Securities Committee of the State Council, leading Chinese insurance companies, securities companies, the securities exchanges of Shanghai and Shenzhen, and representatives from the Finance and Planning departments of a number of provinces. Thanks are also extended to overseas participants who were able to attend and participate in the discussions, including representatives from Goldman Sachs, J.P. Morgan, Salomon Brothers, CS First Boston, Bank of America, Merrill Lynch and Morgan Stanley; the Yasuda Fire and Marine Insurance Company, as well as companies with substantial investments in China, such as the Motorola company. Anjali Kumar (EA2CO) was the principal organizer of the seminar, together with Elaine Sun and Barry Trembath (EA2IN) and Zhou Xiaobing at the World Bank's Beijing office. The task reflects a pooling of resources and staff from the China department's Infrastructure Division (EA2IN; Manager, Richard Scurfield) and Country Operations Division (EA2CO; Manager, Klaus Rohland). Invaluable support was provided by Norma Leon (EA2IN) and Adelma Bowrin (EA2CO). The report has been prepared by R. David Gray (PSD) and Anjali Kumar (EA2CO).

## ABBREVIATIONS, ACRONYMS AND UNITS

ADB	Asian Development Bank
ADR	American Depository Receipt
ADS	American Depository Share
AFP	Administradoras de Fondos de Pension (Chile)
ANDE	Administracion Nacional de Electricidad (Paraguay)
AyEE	Agua y Energia Electrica (Argentina)
BICE	Banco de Inversion y Comercio Exterior S.A. (Argentina)
BOT	Build-Operate-Transfer
bp	basis point
CEC	California Energy Company, Inc.
CSRC	China Securities Regulatory Commission
CTC	Compania de Telefonos de Chile
EBY	Entidad Binacional Yacyreta
EdF	Electricité de France
EGAT	Energy Generating Authority of Thailand
EGCO	Electric Generating Company (Thailand)
ELECTROBRAS	Centralis Elétricas Brasileiras S.A.
ENDESA	Empresa Nacional de Electricidad S.A. (Chile)
EPF	Employee Provident Fund (Malaysia)
ESKOM	Electricity Supply Company (South Africa)
FRN	Floating Rate Note
GDP	Gross Domestic Product
GWh	Gigawatt-hour
IDB	Inter-American Development Bank
IDF	Infrastructure Development Fund
IFC	International Finance Corporation
IJC	International Joint Commission (US-Canada)
IMF	International Monetary Fund
IPP	Independent Power Project
JEXIM	Export-Import Bank of Japan
KEPC	Korea Electric Power Corporation
km	Kilometer
kWh	Kilowatt-hour
LIBOR	London Interbank Offered Rate
LOC	Line of Credit
MLA	Multilateral Agency
MOEP	Ministry of Energy and Power (China)
MOF	Ministry of Finance (China)
MW	Megawatt
NIBJ	National Investment Bank of Jamaica
NSHEB	North of Scotland Hydro-Electric Board
OSN	Obras Sanitarias de la Nación (Argentina)
OTC	Over the Counter
PBC	People's Bank of China
PDR	People's Democratic Republic (of Laos)
PICC	People's Insurance Company of China
PLUS	Project Lebuhraya Utara-Selatan

PSEDF	Private Sector Energy Development Fund (Pakistan)
RAM	Rating Agency of Malaysia
SAESA	Sociedad Austral de Electricidad S.A. (Chile)
SCSC	State Council Securities Committee (China)
SDB	State Development Bank (China)
SEEC	Securities Exchange Executive Council (China)
SET	Stock Exchange of Thailand
SOE	State-owned Enterprise
SPC	State Planning Commission (China)
TIC	Trust and Investment Company (China)
TVA	Tennessee Valley Authority
UCS/VSE	Union of Swiss Power Plants
USAID	United States Agency for International Development

## **CURRENCY EQUIVALENTS**

(as of December 31, 1996)

*Units of Currency per United States Dollar (US\$)*

Argentine Peso (ARS)	1.00
British Pounds Sterling (£)	0.59
Canadian Dollar (C\$)	1.37
Chilean Peso (CLP)	466.86
Chinese Renminbi Yuan (Rmb)	8.28
French Franc (Ffr)	5.25
Hong Kong Dollar (HK\$)	7.74
Indonesian Rupiah (IDR)	2348
Lesotho Maloti (M)	4.68
Malaysian Ringgit (RM)	2.53
Netherland Guilder (NLG)	1.75
Pakistan Rupees (Rs)	40.22
Swiss Franc (Sfr)	1.35
Thai Baht (Bt)	25.59



## EXECUTIVE SUMMARY

### INTRODUCTION: DEVELOPING CHINA'S INFRASTRUCTURE

Sustaining rapid growth into the twenty first century will pose enormous challenges for China in terms of the provision of infrastructure. World Bank estimates indicate that although the present level of investment in infrastructure, at 7.5 percent of GDP, represent a significant increase from 4.4 percent of GDP in 1984, a further increase to 8-9 percent of GDP between 1995 and 2004 will be required if GDP growth is to be maintained. Infrastructure requirements are the greatest in the poorer and relatively less developed central and western provinces of China, as recognized in the Ninth Five-year Plan document, passed in 1996. The deficiency is most acute for projects which have long construction periods and gestation lags, and hence, relatively high risks, such as hydro-electric power or toll highways.

Financing such projects from the budget of the central government is growing increasingly difficult, and the poorer provinces lack resources to fund such projects from their own provincial resources. Financing through bank loans is an option, but the State Development Bank has limited total resources and the newly commercializing specialized banks cannot provide very long term loans, as their deposits generally are not of sufficiently long maturities. The large volume of loans required for such investments adds to their risk, and commercial banks are often unwilling to lend in such situations without guarantees from some state entity.

Capital markets represent an attractive and potentially important source of financing. Many advanced countries and emerging economies have made use of capital markets for the financing of their infrastructure requirements, through both bond and equity issues. China too has begun to turn to *international capital markets* for raising infrastructure investment funds. The greater challenge for China lies in *tapping domestic capital markets*, for infrastructure projects which have large local construction cost components, thus channeling its exceptionally high savings rate, of 44% of GDP, into needed and profitable infrastructure investments. A growing number of developing countries have developed their securities markets and long-term savings institutions, allowing them to tap domestic markets for infrastructure finance. If China is to finance the tremendous infrastructure needs required to maintain GDP growth, it will also have to develop the institutions necessary to channel domestic savings into infrastructure investment. Lessons of developed and developing countries that have been successful in this area can help China to develop such institutions.

Accordingly, this report focuses on international experience in mobilizing domestic capital market financing for infrastructure projects, and the applicability of such experience to China. Chapter 2 reviews experience in both industrialized and developing countries, in terms of financing infrastructure through domestic capital markets. Chapter 3 outlines the enabling conditions and institutions critical to the growth of local capital markets and their role as providers of infrastructure finance. Chapter 4 describes other mechanisms, including guarantees and development funds, which can be used to mitigate risks for investors in order to encourage domestic resource mobilization. Finally, Chapter 5 analyzes China's capital markets and the current state of infrastructure finance, and sets out practical recommendations on next steps to enhance domestic financial flows to infrastructure.

### INFRASTRUCTURE FINANCING AND DOMESTIC CAPITAL MARKETS: OTHER COUNTRIES

Many other countries have been able to successfully tap domestic capital markets to finance infrastructure projects, both through *corporate* or *balance sheet* financing, and increasingly, through *limited recourse* or *project financing*. Examples of *balance sheet* or *corporate* financing from *mature*

*market economies* include Canada, which successfully financed much of its hydro-project development through domestic bond issues, despite relatively low household savings rates, ranging between 6% to 12% of GDP. Investments were undertaken largely by utilities owned by the provincial governments, with debt fully guaranteed both in terms of principal and interest. The Tennessee Valley Authority of the USA is another example. Although initially funded entirely by the Federal government, the US Congress later required it to be fully financially independent, and asked it to repay government grants received with interest. Initially much of TVA's borrowing was from the Federal Financing Bank, but later TVA found it cheaper to turn to the market and issue its own debt through bonds. Today capital markets provide over eighty percent of the TVA's funding requirements.

Examples of *project* financing for infrastructure, tapping domestic capital markets, are more rare, but there have been some notable examples in Europe; including the Dartford and Severn river crossings in the UK and the Wijkertunnel in the Netherlands. One reason for the success of these issues is the relatively well developed institutional investor base in these countries.

Among *developing economies and emerging markets*, too, there are some notable recent examples of domestic capital market financing. In South Korea, the electric power, telecommunications and gas corporations all have periodic bonds issues for the purpose of raising funds to expand facilities. These bonds have three to five year maturities, and their terms are similar to corporate bonds. Similarly in Thailand, both the Metropolitan Waterworks and the Rapid Transit Authority raise funds from the domestic bond market. Malaysia also has examples of the financing of greenfield projects through domestic capital markets. Its YTL power generation project was financed in its entirety in local capital markets including a 10-year bond and a floating rate term loan. Other examples in Malaysia are the Lumut Power Project, which also included a combination of domestic bonds, a floating rate note, shareholder subordinated loans and internally generated funds; and the North-South Expressway toll road, which issued convertible bonds. In Indonesia, PT Jasa Marga, the state-owned, toll-road operator, which had limited access to foreign investment funds due to legal restrictions, was able to raise 688.7 billion rupiah in local markets (US\$294.2 million) for nine road projects. Several other examples are presented and discussed.

It is to be noted that both domestic equity and bond markets can be approached. Often, a blend of the two is desirable. Investors may in some circumstances prefer the lower risk of a fixed-income instrument. Issues aim to achieve appropriately leveraged overall financing for their projects.

## MEASURES FOR DEVELOPING DOMESTIC CAPITAL MARKETS

Countries which have been able to successfully finance infrastructure projects through domestic capital markets have taken a number of specific measures to support their development. A first imperative for domestic capital market development is the accumulation of *contractual savings pools*, which channel savings towards securities, through *institutional investors*. The most important such pools, from the point of view of investments in long term instruments, as required for infrastructure, are pension funds and life insurance funds. Moreover, the rules governing such funds should permit them the flexibility to invest in corporate bonds and equities. The regulations should also permit strong protection for investors to inspire confidence in such savings instruments. In Malaysia, the Employer's Provident Fund (EPF), created in 1991, has become the single largest institutional investor. The *liberalization of investment restrictions* on the EPF was critical to its participation in infrastructure investments. In Chile, the system of pension funds created in the 1980s, together with the establishment of specialized pension funds management companies known as Administradoras de Fondos de Pension (AFP), provided a pool of well-managed investible resources. Today, AFPs manage assets of US\$26 billion (equal to around 40

percent of GDP) and are commonly credited with playing a central role in more than doubling domestic savings from around 14 percent at the beginning of the 1980s to 27 percent of GDP in 1995.

Second, direct measures are required to strengthen domestic securities markets. These include the establishing of a legal framework for securities issue and trading, and for the supervision of such processes by competent authorities. Appropriate regulations are also required for underwriters, brokers, dealers and other entities providing supporting services for the securities markets. Adequate disclosure for shareholders and a capacity for enforcement of the law in the event of misdeeds is also required. In addition, the government can help the process of securities pricing by liberalizing interest rates, auctioning government debt and establishing regular, benchmark issues. The government can also help the establishment of rating agencies and sometimes permitting, in an early phase, selective tax exemptions on income from privately held securities. Finally, it is the government that can provide a healthy infrastructure for financial trading, through the setting up of a sound payments system which can help reduce the risks of securities trading.

Examples of emerging markets taking such proactive measures include Thailand, where the takeoff of domestic capital markets followed the ushering in of new legislation in the early 1990s; notably the Stock Exchange Act, laws governing the business of securities companies, a Civil and Commercial Code for the setting up of limited companies and a Public Company Act. Supervisory agencies were also clearly defined. Malaysia, which already had a basic legal framework, undertook additional measures, including the creation of a liquidity facility (Cagamas Berhad, 1986) for financial institutions, thereby permitting them to hold a portfolio of securities, the creation of dealer networks to underwrite primary issues of government auctioned securities, the introduction of SPEEDS, a computerized securities trading system, to promote secondary market development, and the establishment of the Rating Agency of Malaysia (RAM), in 1990.

In addition, a major boost to domestic capital market development in many emerging markets has been provided through the divestiture programs of their governments, especially when carefully screened to lower investment risk by maintaining important residual government shareholding, by floating companies with bright future prospects, and by offering new shares at competitive prices. Malaysia in the early 1980s launched such a divestiture program, aiming also to reduce budgetary and management obligations and promote competition. Today infrastructure stock as a percentage of total stock market capitalization is approximately 30 percent. In Thailand, the rapid rise in investment requirements by major public utilities prompted the government to embark on an active program of local share offerings in the 14 largest public utilities, as well as other state enterprises. By 1993, these 14 public utilities held combined assets amounting to over 20 percent of the total capitalization of the Thailand Stock Exchange.

#### **OTHER SUPPORTING MECHANISMS: GUARANTEES AND POOLS**

Governments have further helped the development of such new instruments for infrastructure financing by increasing the attractiveness of securities issues through *mechanisms for credit enhancement*, sometimes for a transition period. These range from the minimal level of policy guarantees, which require only that the policy framework remains stable; and escalate up to include back-up guarantees (coordinated with and provided by multilateral financial institutions), refinancing and maturity extensions, performance based grants and contingent lines of credit.

Funding of more than one transaction at a time through securitization arrangements has entailed significant benefits in terms of enhanced credit ratings and market liquidity for infrastructure projects. Infrastructure Development Funds (IDFs), capture these benefits by bundling securities (debt and equity) issued by a pool of infrastructure projects. Governments in both developed and emerging market

economies have supported the development of infrastructure financing through such funds. Such funds can issue bonds to private investors, guaranteed by the government, to raise core capital. The government can also contribute directly with a part of the seed money. In the United States, more than 18 states have established Municipal Bond Banks, which are construction revolving funds, with government guarantees.

### **CHINA'S DOMESTIC BOND MARKETS AND INFRASTRUCTURE FINANCING**

So far, China has made only limited use of its domestic capital markets for financing investment. The *stock of bonds outstanding* as a ratio to GDP has remained virtually unchanged over the last decade. Despite rapid overall growth and increased investment in the economy, there has been no deepening of China's bond markets over this period.

The limited contributions of China's bond market, so far, to its infrastructure investment requirements can be attributed to (i) the role of the Credit Plan in controlling primary issues and the constraints on both local governments and local enterprises in raising funds through bond issues; (ii) the increasing domination of the domestic bond market by Treasury issues, relative to enterprise bonds; (iii) the relatively low levels of liquidity, the limited range of maturities, and difficulties in pricing, within the bond market due to the lack of well-defined 'benchmark' issues, which identify interest rates for different maturities and levels of risk. (iv) The absence of strong professional or institutional investors, who would provide buyers for domestic bond issues, poses a constraint on the demand side. In China, contractual savings are only around 3 percent of GDP, in contrast to much higher ratios in other emerging East Asian markets - for example, 18 percent in Korea; 48 percent in Malaysia and 78 percent in Singapore. (v) Weak market infrastructure, due to the limited role of credit rating agencies, the limited and variable disclosure provided through corporate financial statements, and variable standards of corporate governance, is an additional constraint.

### **A SUGGESTED BEGINNING**

The government can help to develop domestic capital markets for infrastructure financing by supporting, in the first instance, a limited number of suitable pilot projects which can issue securities for raising investment finance. In addition, the government can help by developing the preconditions required for successful issues of corporate securities, through: (i) establishing a set of technical prerequisites and minimum criteria for the issuing firm, regarding capital structure, financial position, corporate governance and management teams; (ii) requiring mandatory ratings of debt issues by reputable and reliable credit rating agencies. Although China's credit rating agencies themselves require strengthening and consolidation, a beginning can be made with agencies which have already been accredited. (iii) Encouraging institutional investors, by passing the laws and regulations required, especially for pension funds and mutual funds. Insurance companies and other institutional investors should be allowed to invest in low risk corporate securities, which meet specified criteria, up to specified limits, in a pilot program. (iv) Further strengthening the domestic government bond market, by approaching full tradability of all issues, dematerializing new issues (i.e., making all issues scripless, with book entry issue and trading), undertaking wholesale sales to financial institutions, adopting auctions for all issues and further increasing the range of maturities; and (v) exempting the bond issues under these pilots from the Credit Plan. Furthermore, to jump-start certain issues of corporate bonds, special features could be considered, such as the provision of partial guarantees or other assurances for debt repayment.



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## **1. THE ROLE OF CAPITAL MARKETS IN INFRASTRUCTURE FINANCING**

China's growth in the last decade of the twentieth century has been truly spectacular. Sustaining rapid growth into the twenty first century will pose enormous challenges for China. One key area of challenge is the provision of strong infrastructure for the growth of the real sector. World Bank estimates indicate that although the present level of investment in infrastructure, at 7.5 percent of GDP, represents a significant increase from 4.4 percent of GDP in 1984, a further increase to 8-9 percent of GDP between 1995 and 2004 will be required if GDP growth rates are to be maintained. Bottlenecks in the provision of electrical energy, transport and telecommunications can severely retard growth in all productive sectors. The Government of China is interested in considerably expanding the level of financing and development of infrastructure. Investment required over the next ten years is expected to amount to over US\$740 billion, with US\$200 billion in the power sector alone.

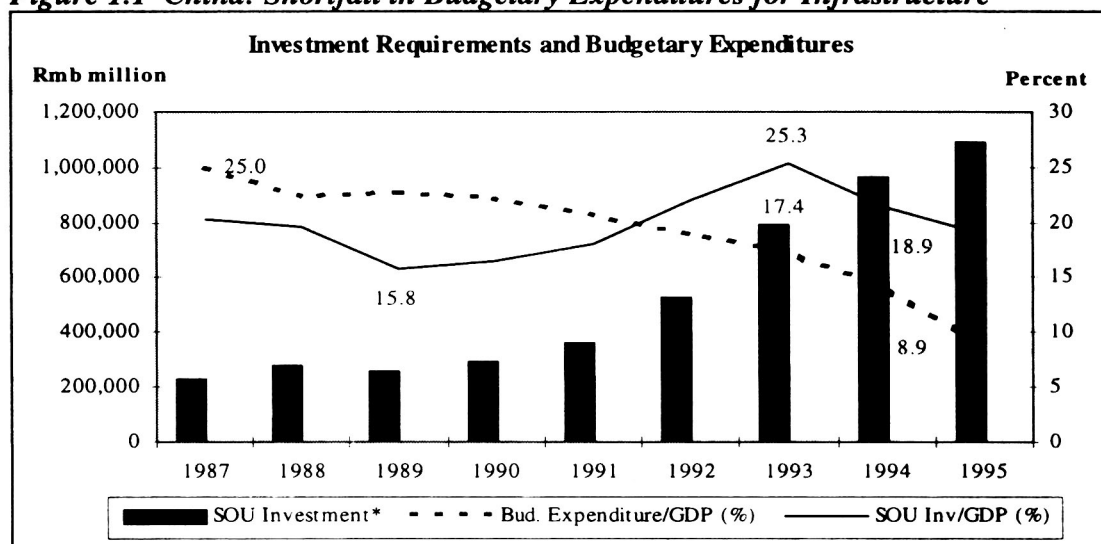
### **CHINA'S INFRASTRUCTURE REQUIREMENTS AND FINANCING RESOURCES**

Today China still has huge requirements—and untapped potential—for the development of its infrastructure. An important example is the harnessing of energy from the many rivers of southern China for the provision of hydro-electric power. Many provinces which are poor today, such as Yunnan, Guaxi, Guizhou or Sichuan have enormous and valuable water resources. A key question which confronts China is how such infrastructure developments can be financed. Financial resources of these provincial governments are limited. Financing such projects from the budget of the central government is nearly impossible. Expenditures of the government have not been able to keep pace with GDP growth, as Figure 1.1 shows. Over the last decade, budgetary expenditures as a percentage of GDP have fallen steadily, from 25 percent in 1987 to 8.9 percent in 1995. But meanwhile, investment needs have accelerated, not only in absolute terms but also as a percentage of GDP. Between 1989 and 1993, investment in state-owned units relative to GDP grew by almost ten percentage points, from 15.8 percent of GDP to 25.3 percent of GDP.

Clearly, dependence on the budget for financing is not an option, if present fiscal trends are maintained. In the absence of substantial direct budgetary financing, infrastructure developers must turn to financing through the banking system, or financing through capital markets. Financing through bank loans is an option to consider. In 1994 China established a State Development Bank which has access to medium to long-term funding, and is largely responsible for financing infrastructure and other priority projects, based on criteria enunciated by the government. However, the resources of this single institution are limited. China also has four major state commercial banks and a number of smaller commercial banks which rely mainly on deposits for their funding. In principle, such institutions could also finance infrastructure projects, subject to, of course, the profitability of the project (as these banks are now intended to operate strictly on commercial principles). But there are numerous difficulties in depending on commercial banks as a major source of financing. These include: (a) limitations on their ability to provide long-term loans, as for prudential reasons they are advised to maintain a match between the duration of their assets and liabilities. Commercial banks are funded largely by deposits, which generally are not of sufficiently long maturities to provide such financing. (b) Risks associated with very large volume loans, which require large exposures to single borrowers. Commercial banks are often unwilling to lend in such situations without guarantees from some state entity. (c) Limitations on the ability of



**Figure 1.1 China: Shortfall in Budgetary Expenditures for Infrastructure**



Source: World Bank data.

commercial banks to finely price risk, through interest rate variations. While this is particularly true of China today in the financial environment of controlled interest rates, even in the absence of such controls banks rarely vary interest rates for each loan they make in a given category. (d) Credit quotas on China's major state commercial banks which still have a bearing on their lending. Such credit ceilings imply that lending for large infrastructure projects are usually only accepted if they are within the state's investment plan.

The implication is that China must turn to newer and more innovative sources of financing for infrastructure projects. Capital markets represent a major potential source of financing. Capital market instruments help to allocate resources to their most profitable uses, and provide a mechanism for the pricing of risk in situations where this may be important and potentially difficult. Many advanced countries have made use of capital markets for the financing of their infrastructure requirements, through both bond and equity issues. China too has begun to turn to such instruments, and over the last year has successfully tapped international capital markets through a variety of instruments for raising infrastructure investment funds.

The greater challenge for China lies in tapping domestic capital markets. The participation of experienced international direct investors and promoters is desirable, and the ability to successfully package offers for international capital markets, which can fill important gaps in funding, is important. But it will be difficult for China to rely exclusively on foreign funding for its massive financing requirements. Moreover, many infrastructure projects (such as road construction, or the building of dams for hydro-electric projects) have large cost components in local currency which could potentially be raised in the domestic markets without the exposure to exchange rate and convertibility risks faced by international investors. China is fortunate to enjoy one of the world's highest savings rates, at 44 percent of GDP in 1994. The challenge is to channel these savings into needed, and profitable, infrastructure investments.