Risk Management for Large-scale Infrastructure Projects in China

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1 INTRODUCTION

1.1 Favorable environment for infrastructure development in China

China's economy has shown remarkable growth over the past several years and many foreign economists predict a healthy growth in the near future. A private international forecasting firm predicts that China's GDP will grow at an average annual rate of about 7 per cent between 1999 and the year 2005.

China's investment reforms, rapid economic growth and social development have led to a surge in foreign direct investment (FDI), as indicated in Table 1.1. Annual utilized FDI in China grew from $636 million in 1983 to $40.7 billion in 2000, making China, in recent years, the second largest destination of FDI in the world.

A number of reasons can explain China’s attractiveness to foreign investment.

1. Relatively cheaper human resources, especially the labour.
2. Governments at all levels in all provinces are eager for funding their local economic growth and have become increasingly friendly to foreign investors.
3. A number of major international events have shown that China is more safe oasis of investment.
4. The economic and social infrastructure that used to be considered as bottlenecks has been significantly improved in recent years. Governments at various levels in have been making investment in infrastructure development to keep pace with the local and the national economic growth.
5. China's economy has shown remarkable economic growth over the past two decades at an average annual rate of about 9 per cent, it is expected that China's GDP will grow at an average annual rate of about 7 per cent in year 2002.
6. China became a member of the World Trade Organization (WTO), which enables China to play a major role the development of new international rules on trade in the WTO, gives China access to the dispute resolution process in the WTO and makes it easier for reformers in China to push liberalization policies.

Table 1.1 Utilized foreign fund (UFF) in China

Year	Total	(billion US dollar)			UFF/GDP (%)
		Foreign Loan	FDI	Other Sources	
1979-1985	21.790	15.729	4.721	1.340	
1986	7.258	5.014	1.874	0.370	2.46
1987	8.452	5.805	2.314	0.333	2.63
1988	10.226	6.487	3.194	0.545	2.55
1989	10.059	6.286	3.392	0.381	2.24
1990	10.289	6.534	3.487	0.268	2.65
1991	11.554	6.888	4.366	0.300	2.84
1992	19.202	7.911	11.007	0.284	3.97
1993	38.960	11.189	27.515	0.256	6.50
1994	43.213	9.267	33.767	0.179	7.98
1995	48.133	10.327	37.521	0.285	6.99
1996	54.804	12.669	41.725	0.410	6.82
1997	64.408	12.021	45.257	7.130	7.30
1998	58.557	11.000	45.463	2.094	6.30
1999	52.659	10.212	40.319	2.128	5.42
2000	59.356	10.000	40.715	8.641	5.50
Total	633.698	162.795	446.552	24.351	

Source: State Statistics Bureau, *China Statistical Abstract 2001*, China Statistics Press, Beijing, 2001

Inflow of foreign fund to China in recent years, especially after September 11 attack on the World Trade Center in New York that took place in 2001, has accelerated. China has been taken as one the safest place in the world for investment.

According to Ministry of Foreign Trade and Economic Cooperation (MOFTEC), 396,197 foreign firms have been licensed in China and US$763.15 billion and 405.33 billion have been committed and utilized to the foreign investment, respectively, in China up to the end of March 2002. MOFERT has also disclosed that 6,172 foreign firms were approved during the first quarter of 2002, 16.3 per cent more than the first quarter of 2001.[1]

1.2 Challenges for infrastructure development in China

The government officials as well as economists are aware, however, that the growth can be sustained only if further reforms are made to the economy.

China's banking system is regulated and controlled by the central government, which sets interest rates and attempts to allocate credit to certain Chinese firms. The central government has used the banking system to keep afloat money-losing SOEs by pressuring state banks to provide

low interest loans, without which a large share of the SOEs would likely go bankrupt.

The current financial state of the banking system prevents China's government from opening the sector to foreign competition. Corruption poses another problem for China's banking system because loans are often made on the basis of political connections. In many cases, bank branches extend loans to firms controlled by local officials, even during periods when the central government has attempted to limit credit. Such a system promotes widespread inefficiency in the economy because savings are generally not allocated on the basis of obtaining the highest possible returns. In addition, inability to control the credit policies of local and provincial banks has made it very difficult for the central government to use monetary policy to fight inflation without causing major disruptions to the economy.

Infrastructure bottlenecks, such as inadequate transportation and pollution remedial stems, pose serious challenges to China's ability to sustain rapid economic growth. China's investment in infrastructure development has failed to keep pace with its economic growth.

The unfledged rule of law in China has led to widespread government corruption, financial speculation, and misallocation of investment funds. In many cases, government "connections," not market forces, are the main determinant of successful firms in China. Many foreign firms find it difficult to do business in China because rules and regulations are generally not consistent or transparent, contracts not easily enforced, and intellectual property rights are not protected (due to the lack of an independent judicial system). The lack of effective rule of law, current ownership of land and widespread local protectionism in China limits competition and undermines the efficient allocation of goods and services in the economy.

A wide variety of social problems have kept arising from China's rapid economic growth and extensive reforms, including pollution, a widening of income disparities between the coastal and inner regions of China, and a growing number of bankruptcies and worker layoffs. This poses several challenges to the government, such as enacting regulations to control pollution, focusing resources on infrastructure development in the hinterland, and developing modern fiscal and tax systems to address various social concerns (such as poverty alleviation, health care, education, worker retraining, pensions, and social security).

All the unfavorable aspects will produce numerous uncertainties for infrastructure development in China.

At a news conference in March 1998 Premier Zhu Rongji outlined a number of major new economic initiatives and goals for reforming China's economy and maintaining healthy economic growth, including:

(1) Expand domestic demand, especially through increasing spending on infrastructure in response to the Asia financial crisis, and maintain the pace of previously planned economic reforms.

(2) Reorganize the banking system to increase the regulatory and supervisory power of the central bank and make commercial banks operate independently. Substantially reduce the size of the government and reorganize the remaining government institutions. All three goals are to be obtained within three years

The Chinese government anticipates that banking and SOE reforms will lead to widespread layoffs. Stimulating domestic demand, especially through infrastructure development, is viewed as a key mechanism to re-employ workers displaced by reforms. Chinese officials announced in February 1998 their intentions to spend $750 billion on infrastructure development over the next 3 years; in September 1998, Chinese officials indicated that $1.2 trillion would be spent. Issuance of government bonds has become a major source of finance for infrastructure. However, such policies will likely increase the size of the central government's budget deficit. It is also likely that China hopes to attract foreign investment for much of its infrastructure needs.

2 IMPACT OF INFRASTRUCTURE ON GROWTH AND DEVELOPMENT

Infrastructure is an essential determinant in economic growth and social development of a country. Good and adequate infrastructure raises productivity and lowers production costs. Although China has spent a great portion of its GDP on infrastructure since 1980s, it is still far from being adequate in amount and distributed properly geographically. On the other hand, China’s has realized that, just like other developing countries in the world, there are a great deal to do to improve the performance in provision of infrastructure services. Inadequate funding and inefficient provision, operation and maintenance of infrastructure are the major problems that China’s government faces in this sector. As one of solutions to the problems China’s governments, central, provincial and local, has already given up their monopoly in this sector and encourage private involvement, including domestic private and foreign direct investment. A bridge across Citong River in Quanzhou, Fujian province is a typical example private sponsored, financed and completed projects, while Laibin Power Station in Laibin, Guangxi province, is a typical example of foreign direct investment.

3 OPTIONS FOR THE FUTURE

The provision of infrastructure services in China is under reform. As the World Bank suggests[2], three actions are to be taken: wide application of commercial principles to service providers, broader use of competition and increased involvement of users where commercial and competitive behavior is constrained.

3.1 Applying commercial principles of operation involves giving service providers focused and explicit performance objectives, well-defined budgets based on revenues from users, and managerial and financial autonomy-while also holding them accountable for their performance. It implies that governments should refrain from *ad hoc* interventions in management but should provide explicit transfers, where needed, to meet social objectives such as public service obligations.

3.2 Broadening competition means arranging for suppliers to compete for an entire market (e.g., firms bidding for the exclusive right to operate a port for ten years), for customers within a market(telephone companies competing to serve users), and for contracts to provide inputs to a service provider (firms bidding to provide power to an electric utility).

3.3 Involving users more in project design and operation of infrastructure activities where commercial and competitive behavior is constrained provides the information needed to make suppliers more accountable to their customers. Users and other stakeholders can be involved in consultation during project planning, direct participation in operation or maintenance, and monitoring. Development programs are more successful when service users or the affected community has been involved in project formulation. User participation creates the appropriate incentives to ensure that maintenance is carried out in community-based projects.

These elements apply whether infrastructure services are provided by the public sector, the private sector, or a public-private partnership. To this extent, they are indifferent to ownership. However, numerous examples of past failures in public provision, combined with growing evidence of more efficient and user-responsive private provision, argue for a significant increase in private involvement in financing, operation, and-in many cases-ownership.

The World Bank sets a menu of four main options for ownership and provision[2]:

Option A. Public ownership and operation by enterprise or department
Option B. Public ownership with operation contracted to the private sector
Option C. Private ownership and operation, often with regulation
Option D. Community and user provision

4 FINANCING NEEDED INVESTMENT

4.1 Overview

“Innovative and diverse financing techniques are being employed to support an accelerating transition from public to private sector risk bearing in infrastructure provision. Mechanisms for

financing specific stand-alone projects are contributing to the learning process as governments shift from being infrastructure providers to becoming facilitators, and as private entrepreneurs and lenders take a more direct role. But if there is to be sustained private risk bearing and investment in infrastructure, parallel and far-reaching actions are required to reform legal and financial institutions and to develop capital markets that efficiently intermediate savings into investment."[2]

"Governments at present provide or broker the bulk of infrastructure financing: about 90 per cent of financial flows for infrastructure are channeled through a government sponsor, which bears almost all project risks. Private financing is needed to ease the burden on government finances, but, more important, it will encourage better risk sharing, accountability, monitoring and management in infrastructure provision. In some sectors, such as power or telecommunications, the scope for private financing is great. In others, such as road networks, and in some low-income regions, the opportunities are more limited, although even there increasing room for financial market discipline exists." [2]

"The challenge for the future is to route private savings directly to private risk bearers who make long-term investments in infrastructure projects. Doing so will require institutions and financing instruments adapted to the varying needs of investors in different types of projects and at thus different stages in a project's life. The benefits of thus financing private initiatives in infrastructure go beyond the projects involved. Because infrastructure investments command such a large part of total financial flows, improving the efficiency of infrastructure financing will spur the general development of capital markets. And as governments focus more on being facilitators rather than financiers, international development banks – long the partners of governments in supporting traditional financing systems – will need to experiment with new ways of doing business." [2]

4.2 Project financing

"Many new infrastructure projects in private sector are built by "special-purpose corporations" that bring together private sponsors and other equity holders. Despite their lack of credit history, several such ventures have successfully attracted equity and loan finance -- and a huge pipeline of such projects bears the promise of decisively shifting the channels and instruments of infrastructure financing in the future.

Project financing, which permits sponsors to raise funds secured by the revenues and assets of a particular project, is often used to in new ventures that have no track records. This technique requires a clearer delineation of risk than is the case with traditional public projects. Allocating risk among participants has often been a difficult and time-consuming process, but new safeguards and conventions are evolving to deal with project risks and complexities.

Providing funds to a project is an important objective in itself, but the financing process also serves another important end. Monitoring by financial markets and institutions complements regulation and competition in service delivery. As such, it provides another mechanism for investors to impose discipline. Norms for devising incentive and penalty mechanism to ensure performance by private-sector interests are becoming clearer. Privately sponsored and financed projects measure their success against contractually agreed targets for new capacity, construction costs, and time overruns and against indicators of service quality.

The continuing role of the government lies in insuring the private investor against policy-induced risks. Moreover, certain types of infrastructure--rural roads and, to a lesser extent, sewage and sanitation--may be unable to finance themselves through user charges. Thus the need for government support does not disappear. One-time grants, of either capital or land, are the preferred mechanism for ensuring efficient operation." [2]

As Peter K. Nevitt writes, "private commercial banks have traditionally been a major source of funds for project financings. New banks entering the field of project financing and being anxious to carve out new relationships have been particularly aggressive in seeking loans. This is especially true in the case of quasi-governmental banks that are sometimes willing to accept greater risks than private commercial banks. This competition has led to erosion of pricing, lowering of collateral requirements, extension of maturities, and to lenders assuming greater credit risks. This trend towards easier terms is not necessarily good for long-range, orderly availability of funds from private sources. Substantial losses by the private banking sector will result in a drying up of funds and stiffening of terms, which will make future projects much more difficult to finance. Some balance is needed. Lenders must be adequately compensated for use of their funds on a fairly risk free basis if they are to continue in business." [3]

5 INSTITUTIONNAL REFORMS HELPFUL TO PROJECT RISK MANAGEMENT

5.1 Overview

The capital investment in China was as inefficient as the centrally planned economy itself prior to 1984. During that period of time only the governments made expenditure on capital projects and handed them, when completed, over to the state owned enterprises (SOE) or other public organizations. SOE and other entities had to apply to their supervisory authorities for land, money and other inputs needed to build new and/or rehabilitate existing facilities, because they had already remitted most of their profit to the governments and there were no sufficient financial resources available to them. The decisions were made at the central and/or provincial level. The applicants had to complete a series of complicated and time-consuming formalities before they became able to proceed with their badly needed facilities. On the other hand, however, once the

public money was given, repayment was not required. The poor performance of the institutional arrangement became obvious as time went on. Nobody really cared about the efficiency and effectiveness of the public investment. In consequence, the capital projects were often behind schedule, of poor quality and cost overrun. It was not uncommon that the completed projects were not operational as expected. Nevertheless, SOE, local and even central government agencies always competed against each other for more public money, which resulted unnecessarily in redundant productive or other facilities.

This institutional arrangement did not have incentive to make optimal use of the public funds. The drawbacks reminded the central government of changing the defective institutions and several major reform measures have been indeed taken since 1979.

5.2 Changes in institutions in connection with capital investment

The State Council, in 1979, approved a proposal to cease the practice and to require repayment of the public money for certain types of capital projects in over 10 sectors and 28 provinces. The new policy aimed at more efficient and effective use of public money.

A number of changes have occurred in connection with capital investment following the initial step. The principal objectives of the changes are to have public fund used more wisely through combination of market mechanism and government regulation.

For example, the State Planning Commission issued the *Tentative provisions on employer/promoter's responsibilities for capital projects* in November 1992. According to the provisions SOE, government agencies and other public organizations are allowed to make investment in capital projects they need, subject to responsibilities for all aspects of their capital projects at their own risks. The entities other than SOE, government agencies and other public units, such as collective, private, joint venture and foreign businesses, are also allowed to make investment in capital projects, subject to approval or consent of the governments.

The State Planning Commission, in 1993, approved a number of infrastructure projects to implement the provisions. The projects include Shanghai-Nanjing Expressway in Jiangsu, Hangzhou-Ningbo Expressway in Zhejiang, Luoyang-Kaifeng Expressway in Henan, the East Ring Expressway in Hainan, Xi'an-Baoji Expressway in Shanxi, Huangshi Yangtze River Highway Bridge in Hubei, Tongling Yangtze River Highway Bridge in Anhui, Capital Airport Expressway in Beijing and Guiyang-Zhunyi Expressway in Guizhou.

At present the capital projects in China are classified into three major categories, that is, competitive, basic and social projects. The central and local governments agencies are required cease direct involvement in capital investment. Most of capital projects will be open to foreigners.

(a) Competitive projects

These are profitable commercial projects and shall mainly be financed through borrowing from commercial banks, but also allowed to raise fund directly from the public by placing stocks and bonds or be financed by joint venture subject to the government regulations.

(b) Basic projects

The projects that provide public goods such as infrastructure fall into this category. Most basic projects have to be financed by public money, mainly by policy lending. The governments will make financial and physical resources available for the projects that have nationwide implications. The local governments, enterprises and foreign investors are encouraged to make investment in basic capital projects.

(c) Social projects

These are the non-profitable projects in the sectors such as science, education, culture, public health, sports, environment, public security, justice, government agencies, social bodies, national defense facilities and so on. The social projects are to be financed by public money. Only the social projects that are of national importance or otherwise cannot be financed shall be covered by central budget. The remainder shall be financed by local government and other beneficiaries.

5.3 Decision maker shall take risk

The institutional changes have made the Chinese top government officials realize that public money will never be used efficiently and effectively unless the promoter of a capital project bears the risks associated with it. As one of the new institutions in connection with capital projects the project promoter is required to provide sufficient amount of their own money as equity of the project.

Case: Shanghai Urban Development Investment Corporation

In early 1992s Shanghai was encouraged by Deng Xiaoping to speed up its urban development, but impeded by the limited financial resources. In order to raise sufficient funds and make best use Shanghai Urban Development Investment Corporation was formed in July 1992. The equity came from the original urban development fund earmarked by Shanghai People‘s Government. The registered capital is RMB1.02 billion. The corporation operates independently as a commercial body. It successfully raised RMB6 billion in 1992 and RMB9.5 billion in 1993 by borrowing. A portion of the money was used to build Yangpu Bridge across Huangpu River in Shanghai. The total cost of bridge is RMB1.33 billion and will be recovered by charging the users. The average daily revenue is about RMB200,000.

5.4 Policy in connection with foreign investment in infrastructure in China

The major changes in this connection that have occurred since 1996 include:

China has simplified the approval procedure of foreign-invested projects and tends to adopt international custom and practice for BOT projects. For example, arrangements have been made to prepare standard contract documents for various types of infrastructure projects.

China is actively seeking new financing methods and has accepted BOT as an important new means to meet the special needs of the country and to be attractive to foreign investors and lenders. The advent of concession agreements, backed by the new BOT regulations, will be a positive move forwards to achieving project-financed infrastructure projects throughout China.

The central government and especially the local government encourage foreigner to make investment in infrastructure and will share the risks by making some guarantees and providing incentives to help reduce and mitigate many risks that foreign investors may bear. In general, the sector policy induced risks are assumed by the local governments, the construction, operating, technical and financial risks go to the sponsor, while *force majeure* risks are shared by the parties. In addition, if the operating company makes substantial loss due to changes in legislation in China, it shall be entitled to extend the concession period or raise electricity toll.

5.5 Major challenges to foreign investors

In spite of the accelerated flow of the international money into China there are still some uncertain factors that make foreigners hesitate before they make investment in China. Major challenges facing foreign investment are identified as follow.

1. Language and culture barriers
2. Relatively backward infrastructure and other facilities in hinder land, especially the remote areas.
3. Ignorant local officials
4. Lack of and difficult access to statistics data
5. Lack of the rule of law in China has led to widespread government corruption, financial speculation, and misallocation of funds. In many cases government "connections," not market forces, determines which firms shall be successful in China. Many foreign firms find it difficult to do business in China because rules and regulations are generally not consistent or transparent, contracts not easily enforced, and intellectual property rights not protected (due to the lack of an independent judicial system).

6. In addition, China's government does not accept private ownership of land and assets in China.
7. High trade barriers are maintained by the government in large part to protect domestic firms from foreign competition. Such policies have two main negative effects: First, they give domestic firms less incentive to improve productivity and efficiency. Second, restricting competition raises prices and product choices for Chinese consumers of both domestic and imported goods.

6 RISKS THAT INVESTOR/SPONSOR/EMPLOYER MAY ASSUME

6.1 Risks associated with infrastructure projects

The risks for infrastructure projects have a wide range of sources and can be classified into the following broad categories:

a. Technical, quality or performance risk--such as employment of inexperienced designers, changes to the technology used or to industry standards during the project.
b. Organizational risks--such as cost, time and scope objectives that are internally inconsistent, lack of prioritization of projects, inadequacy or interruption of funding, and resource conflicts with other projects in the organization.
c. External risks--such as shifting legal or regulatory environment (including institutional changes), poor geological conditions and weather, *force majeure* risks such as earthquake and floods.
d. Project management risks--such as poor allocation of time and resources, inadequate quality of the project plan, poor use of project management disciplines.

The experience of private investment in infrastructure in China over past years indicates that risks and pitfalls go together with opportunities. Proper identification, therefore, of the risks associated with investment in infrastructure in China and planning for effective responses thereto are essential for the private investors to be successful.

In general, in order to be successful all capital projects shall meet the criteria and have the characteristics as listed below.

1. A credit risk rather than an equity risk is involved.
2. A satisfactory feasibility study and financial plan have been prepared.
3. The cost of product or raw material to be used by the project is assured.
4. A supply of energy at reasonable cost has been assured.
5. A market exists for the product, commodity or service to be produced.

The best way to appreciate the concerns of investors in infrastructure in China is to review and consider some of the common causes for their failures as shown below.

1. delay in completion, with consequential increase in the interest expense on construction financing and delay in the contemplated revenue flow.
2. capital cost overrun.
3. technical failure.
4. financial failure of the contractor.
5. government interference, inactions.
6. uninsured casualty losses.
7. increased price or shortages of raw materials.
8. technical obsolescence of the plant.
9. loss of competitive position in the market place.
10. expropriation.
11. poor management.
12. overly optimistic appraisals of the value of pledged security, such as oil and gas reserves.
13. financial insolvency of the host government.

In particular, for private investors to be successful in their infrastructure projects, these risks must be properly considered, monitored and avoided throughout the life of the projects.

6.2 Risks associated with project financing

According to P.K. Nevitt the risks that the lenders may take in project financing may include: [3]

Country risk. Such country risk consists of a politically-motivated embargo or boycott of a project, debt repayments or shipment of product which may reflect the foreign policy of the country. Country risk also considers circumstances where the host country cannot permit transfer of funds for debt service because of its own economic problems.

Sovereign risk. Lenders used to making credit judgments for loans to countries are in a position to make lending decisions where the project is owned entirely or in part by an agency of a country.

Political risk. Political and regulatory risks are inherent in doing business. They affect all aspects of a project, from site selection and construction through completion, operations and marketing. They are difficult to evaluate. Where possible, these risks are assumed by sponsors. Where this is not possible, lenders sometimes assume such risks. The ultimate political risk is expatriation. It is

often difficult to distinct this risk from country risk.

Foreign exchange risk. Where capital expenditures, operating expenses, revenues and borrowings are not in the same currency, the lender may be asked to assume some of the risk through multicurrency loans which give the borrower an option, based upon a fixed exchange rate, of repaying in different currencies. Lenders can sometimes hedge this risk.

Inflation risk. The lender must ultimately rely on projections of the cost of construction of the project, and the cost of operations. Use of correct inflation factors in figuring out these future costs is an area in which the lender usually has more espertise than the project company or its promoters.

Interest rate. Loans with floating interest rates may be used for construction loans and long-term financing, as well as for working capital and short-term needs Forecasts of future interest rates used to or project capitalized construction costs and future debt service requirements are dependent upon realistic interest rate assumptions.

Appraisals. This can be self explained

Availability of permits and licenses. Where permits and licenses must be obtained and renewed before the plant will operate, the lenders, in effect, assume the risk that such permits and licenses will be obtained in a reasonable time in the absence of any provision by the sponsors to pay these costs.

Operating performance risk. Once the project is complete and operating to specifications, the project begins to assume the characteristics of an established operating company. As the completion guarantees drops away, the lenders in many project financings become dependent on the continued uninterrupted operation of the project and sale of its products or services to provide the revenues necessary to repay the project loans.

Price of product. The lender must appraise the future market for the commodity and make judgments as to whether such price projections are realistic.

Enforceability of contracts for product. Even if a project is supported by take-or-pay contracts with adequate escalation clauses, a question still arises as to whether the contract is enforceable, and whether the contracting party is a reliable party who will live up to its contractual obligations. Possible force majeure defences to performance must be considered. Should a loan be made, for example, on the basis of a long-term contract to sell coal to a public utility, is it possible that the responsible public utility commission might declare the contract unenforceable at a later date? A credit judgment has also to be made on the financial ability and integrity of the contracting party to live up to its contractual obligation.

Price of raw materials and energy. This can be self explained.

Enforceability of contracts for raw materials. If a project has long-term contracts for raw material at attractive prices, which are used in the underlying financial projections, a question still arises as to their enforceability and as to whether the contracting party is reliable and will

live up to the commitments. If the raw material is imported, the risk of import restriction or force majeure events in the exporting country must be considered. Lenders sometimes assume these risks by advancing additional loans.

Refinancing risk. If the project is arranged on a basis whereby the construction financing is to be provided by one group of lenders, and the long-term financing after completion of construction is to be provided by another set of lenders, the construction lenders run the risk of not being taken out by the long-term lenders. Construction lenders prefer long-term financing to be arranged at the time of the construction loan. However, this is not always possible because of long lead time. Construction lenders can protect themselves by providing incentives to sponsors to arrange the long-term debt. This may be achieved, for example, by gradually escalating interest rates, by triggering additional sponsor guarantees, or by requiring a take-out by the sponsor. Project financing tend to have the same group of lenders for both construction lending and long-term lending.

Force majeur risk. *Force majeure* risks are those types of risks which result form events beyond the control of the parties to the project financing. The objective of lenders is to shift the various *force majeure* risks to the sponsor, or to the sponsor's suppliers and purchasers through contractual obligations or insurance protection. To the extent that those risks are not shifted, the lenders have assumed *force majeure* risk.

Completion. The completion risk sometimes assumed by a lender arises in circumstances where for all practical purposes it is impossible to complete the project or facility so that it operates to the full capacity and/or specifications originally envisaged. Sponsors do not want to be in a position of having to provide funds to attempt to complete a facility to specifications that require expenditures out of proportion to the benefit to be realized, or which seem impossible to achieve. Usually this risk can be handled with little exposure to the lender, but the loan may have to be extended for a longer term due to lower production than anticipated in the financial projections.

Risks associated with a project may arise in three major periods during the project life cycle:

(1) Engineering and construction phase
(2) Start-up phase
(3) Operations according to specification

6.3 Risk-sharing: the lessons learned[2]

At the heart of project financing is a contract that allocates risks associated with a project and defines the claims on rewards. While often the cause of delay and heavy legal costs, efficient risk allocation has been central to making it possible to finance projects and has been critical to maintaining incentives to perform. Risks are divided not only between public and private entities

but also among various private parties. Four kinds of risks can be distinguished --- currency, commercial, policy-induced, and country --- although the distinctions among them are not always clear-cut.

Currency risk. Much recent, privately financed infrastructure has drawn on foreign capital and therefore faces the risk of local currency devaluation. International lenders rarely assume such risk, preferring instead to denominate their repayments in foreign currency terms. In the past, public enterprises or governments have borne the currency risk, but in the growing move to private finance, the risk of currency depreciation falls on the project sponsor, and ultimately on the consumers of the service. In many recent private projects, service prices have been linked to an international currency.

Market (commercial) risk. Two types of commercial risk may be distinguished, those relating to costs of production and those arising from uncertainties in demand for services. Substantial progress has been made in shifting cost-related risks onto private sponsors and other private parties. Typically, contracts include bonuses for early commissioning of the project and penalties for late completion. A contract may also specify operational obligations, such as maintenance or the availability of capacity. In the case of utilities, a power or water supplier is sometimes penalized for capacity availability below pre-specified level. Or the contract may require that a plant be available in effective working order for a specified period of time.

Project sponsors are able to transfer some of these risks to other private parties. It is common, for example, to transfer construction risk to specialized construction companies through turnkey contracts. Also, sponsors may enter into long-term contracts with input suppliers.

Where sector policy concerns are unimportant, investors also accept market risk, but progress in this regard has been slower. Tariffs in line with costs, sector unbundling to permit new entry, and access to transmission networks are required in order to enable private sponsors to assume all market risks. In telecommunications project, the market risk is typically borne by the sponsor. In the electric power and water sector, on the other hand, limitations on assumption of market risk arise because payments to cover costs are not assured. Also, governments need to decisively eliminate the prospect that investors will be bailed out if circumstances are unfavorable.

Assumption by private parties of even cost-related risks creates incentives for good performance. Not only do sponsors have equity holdings in the project, but also lenders are central to the monitoring process. As part of the contract, several financial covenants are made. In such situations, commercial banks have a much greater incentive for supervising projects than do

lenders backed by sovereign guarantees.

The evidence, although limited, shows that the assumption of cost-related risks by private sponsors and the monitoring of performance by banks are effective. Evidence, for example, on private construction is very favorable and reflects the tight contractual conditions and severe penalties for cost and time overruns. A preliminary review of the IFC's infrastructure projects shows that time overruns in construction have been only seven months on average, and cost performance has been about on target. Such performance, however, is possible only when commercial risks are truly transferred to private sponsors.

Private investors may wish to insure themselves against commercial risks. The provision of such insurance is best left to the private sector, although governments have a role in stimulating domestic guaranty facilities, possibly by taking an initial stake in guaranty funds. The private market for risk insurance for international transactions is small. While short-term insurance for trade credit is available, private insurance for infrastructure projects is uncommon.

Sector policy induced risk. Especially important issues arise in the power sector because project sponsors focus on the credibility and solvency of their buyer, typically a government utility that transmits and distributes power. The instrument that projects the power supplier is the "take-or-pay" contract, or power purchase agreement. Under such a contract, the buyer agrees to pay a specified amount regardless of whether the service is used. The government thus provides a contract compliance guarantee – a useful transitional measure while the long-term goal of sector reform is being addressed.

Similar concerns arise with water and other environmental infrastructure projects (such as water supply, wastewater treatment, and solid water disposal operations that are typically carried out at the municipal level by a local monopoly). Here government agencies (or municipal authorities) are not the direct purchasers of the service. But they can and do influence the ability of the service provider to meter, bill, and collect. Where the municipal authorities cannot deliver, collection guarantees from the central government are required.

Thus, in such projects, the "market" risk, or the risk arising from fluctuations in demand, is effectively transferred to the government through the take-or-pay formula. This becomes necessary because market risk is intermingled with the danger that financially troubled power purchasers (transmission utilities) or water users may not honor their commitments. Overall sector reform is required to eliminate policy-induced risks and thus reveal the market risk.

Country risk. Where governments do provide guarantees against policy or even commercial risks, these may not always be acceptable to private international lenders, who may look instead for guarantees from creditor countries or from multilateral banks to insure against “country” risks. The role of the borrower government does not disappear in such situations, since counter-guarantees are typically required.

7 PROJECT RISK MANAGMENT

Project risk management had been implemented for many years in China prior to the term “project risk management” becoming known to most of Chinese project managers and government officials in early 1990s.

7.1 Risk identification and analysis

The long lasting implementation of project risk management in China can best be evidenced by the construction project procedure that has been in use for over 4 decades in China. The procedure is shown in Figure 1. The feasibility study was formally introduced into the procedure in 1992.

A capital project (including infrastructure projects) must follow the procedure.

When an organization has identified its need for a new facility, it must submit a project proposal defining the purpose, requirements and general aspects of the project, such as location, performance criteria, scope, layout, equipment, services and other requirements. The definition and planning of the project shall be carried out in coordination with agencies in charge such as provincial, municipal, autonomous region governments, central ministries or commissions. The project proposals of a medium or large sized project must be submitted to the agencies in charge for review and comments. The priority projects are subject to review and approval by the State Council.

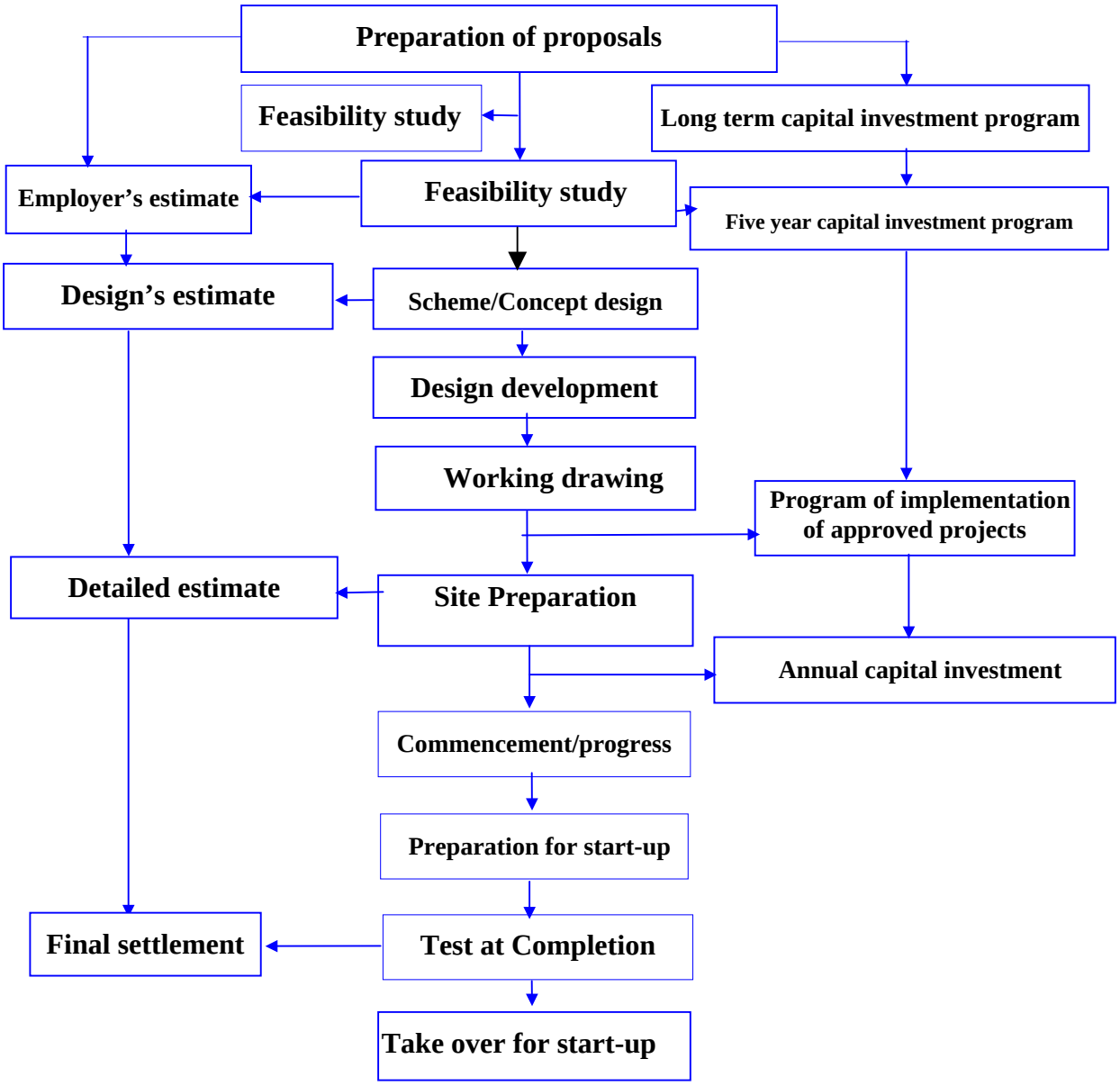

Figure 1 Construction Project Procedure in China

The review and approval procedure makes sure that the project complies with the national economic and social development programs and there are sufficient resources available to the project.

Once the proposal is approved site selection and feasibility study shall follow. The feasibility study involves the process of risk identification and analysis. Various matters should be

considered when selecting the site for the proposed project and feasibility study is made, such as climate, topographical and geological conditions, resources, transportation, potential natural calamities, environment conservation, available services, utilities and so on. Usually, several alternative sites and proposals should be considered and compared with each other in terms of the various factors influencing the project. All the potential sites need to be investigated to determine their suitability for the project and must meet the local planning requirements. A site choice report and a feasibility study report are usually required and submitted to the appropriate planning authority, or the State Council in the case of a priority project for review and approval.

7.2 Risk response strategies

China's government officials and project managers use the risk response strategies that are available to them.

Avoidance. Risk avoidance is changing the project plan to eliminate the risk or condition or to protect the project objectives from its impact. Some risk events that arise early in the project can be dealt with by clarifying requirements, obtaining information, improving communication, or acquiring expertise. Reducing scope to avoid high-risk activities, adding resources or time, adopting a familiar approach instead of an innovative one, or avoiding an unfamiliar subcontractor may be examples of avoidance.

Transference. Risk transfer is seeking to shift the consequence of a risk to a third party together with ownership of the response. Transferring the risk simply gives another party responsibility for its management; it does not eliminate it. Transferring liability for risk is most effective in dealing with financial risk exposure. Risk transfer nearly always involves payment of a risk premium to the party taking on the risk. It includes the use of insurance, performance bonds, warranties, and guarantees. Contracts may be used to transfer liability for specified risks to another party. Use of a fixed-price contract may transfer risk to the seller if the project's design is stable. Although a cost-reimbursable contract leaves more of the risk with the customer or sponsor, it may help reduce cost if there are mid-project changes.

Mitigation. Mitigation seeks to reduce the probability and/or consequences of an adverse risk event to an acceptable threshold. Taking early action to reduce the probability of a risk's occurring or its impact on the project is more effective than trying to repair the consequences after it has occurred. Mitigation costs should be appropriate, given the likely probability of the risk and its consequences.. Risk mitigation may take the form of implementing a new course of action that will reduce the problem—e.g., adopting less complex processes, conducting more seismic or engineering tests, or choosing a more stable seller. It may involve changing conditions so that the probability of the risk occurring is reduced—e.g., adding resources or time to the

schedule. It may require prototype development to reduce the risk of scaling up from a bench-scale model. Where it is not possible to reduce probability, a mitigation response might address the risk impact by targeting linkages that determine the severity. For example, designing redundancy into a subsystem may reduce the impact that results from a failure of the original component.

Acceptance. This technique indicates that the project team has decided not to change the project plan to deal with a risk or is unable to identify any other suitable response strategy. Active acceptance may include developing a contingency plan to execute, should a risk occur. Passive acceptance requires no action, leaving the project team to deal with the risks as they occur.

A *contingency plan* is applied to identified risks that arise during the project. Developing a contingency plan in advance can greatly reduce the cost of an action should the risk occur. Risk triggers, such as missing intermediate milestones, should be defined and tracked. A *fallback plan* is developed if the risk has a high impact, or if the selected strategy may not be fully effective. This might include allocation of a contingency amount, development of alternative options, or changing project scope.

The most usual risk acceptance response is to establish a *contingency allowanc*e, or reserve, including amounts of time, money, or resources to account for known risks. The allowance should be determined by the impacts, computed at an acceptable level of risk exposure, for the risks that have been accepted.

8 CASE STUDIES

8.1 Enforceability of contracts for product

Case 1 Ertan Hydropower Station in Sichuan is the biggest borrower of IBRD loans in China. In 1980s power in Sichuan province was in short supply and Sichuan Provincial Government complained to the central government about the situation for money. The central government borrowed US$1.2 billion in total from the World Bank to finance the power station. The first generating unit was put into operation in 1998 and all the six units in 2000. The project was completed successfully and the project promoter, Ertan Hydropower Development Co., Ltd urged the local governments to enter into contracts for purchase of the electricity as they urgently needed in 1980s.Unfortunately, however, a number of cities in Sichuan province refused to do so. They argued that there had already abundant electricity available from their local coal fired power stations. The fact is that during the progress of Ertan Hydropower Project a few entities took advantage of the situation and built a number of coal fired power stations in the province. As a result Ertan Hydropower Development Co., Ltd could not sell the electricity as planned and the cash inflow was much lower than expected.

8.2 Institutional risk (Country risk, political risk)

Case 1 In 1999 a wastewater treatment plant had been built a couple of years ago in a major city in Liaoning province, northeast China. This plant had never been put into operation because of lack of fund necessary to keep it in operation. As originally contemplated the plant should be operated, maintained and initial capital recovered on the tariffs to be collected from domestic and industrial users. Unfortunately, it could not collect adequate tariff due to the absence of a well-designed institutional arrangement for it to do so. As a result the plant had become idle and had to pay a group of personnel for its care.

Case 2 Local residents claim for more compensation. As well known a hydropower project in China usually involves acquisition of extensive land and relocation of many people, usually the farmers. For example, as many as 1.1 million people have been or are being relocated for Yangtze Three Gorges Project. The regulations and by-laws in China provide for compensating the deprived people for their loss to their satisfaction. Sometimes, however, a part of the original residents claim that they have not been compensated enough and/or treated fairly and push pressure on the project sponsor, contractor or other organizations that they consider able to satisfy their request for more compensation. The causes behind vary widely. Their actions, however, invariably causes delay in progress of the project. Xiaolangdi water conservancy, flood control and hydropower project on Yellow River, financed by a loan from the IBRD has experienced such an event. The actions of the local farmers seriously interfered with the progress of the project.

Case 3 Changes in tax legislation. China's government implemented a tax reform in January 1994, removed the original product tax, value added tax, business tax and consolidated industry and commerce tax and combined them into value added tax, consumer tax and sales tax. Both domestic and foreign enterprises were equally required to pay the taxes at increased rates. This change justified claims by the international contractors employed by Xiaolangdi Development Administration Bureau, the employer of Xiaolangdi Project on Yellow River, for additional payment, which increased the cost to the employer of the project.

Case 4 Changes in measurement and pricing method.

At the end of 1992 China's government deregulated the prices of major building materials, i.e. steel reinforcing bars, cement and timber. In consequence their prices soared. In middle 1993 reinforcing bars sold at ¥3,400/t on average, nearly twice as high as that average of ¥1,800/t at

the end of 1992. The price escalation challenged the norm system having been in use for over three decades in China. The norms specify and provide for everything, including quantities and amounts of building materials, labor, constructional plants used in unit work etc except the market forces. The norms always lag behind the market. MOC proposed in 1992 that bid prices should be prepared by bidders based on their own costs rather than following the norms. The quantities and amounts will be treated separately. The unit quantities of labor, materials and constructional plants for itemized works set in the norms would still be used as a basis for estimating quantities. The costs of labor, materials and constructional plants, however, should be estimated by bidder based on market information, which is called "Separation of Price from Quantities" and is described as follow. The standard unit rates of itemized works set by the local construction commissions would not be mandatory any longer, but just used as a starting point for estimating, on one hand. On the other hand, the standard unit quantities should still be used in estimating resources needed for a construction project and subject to the authorities' control.

According to the reform proposal, the costs of labor, materials and plant should reflect the market fluctuation. The government agencies in charge of construction cost administration should publish various direct and indirect cost indices and/or standards regularly. The central construction cost administration agency should set and enforce standard methods of measurement of quantities. A newly issued "*National Unified Rules of Measurement of Quantities of Construction Works*" is a starting point of this reform.

The new norms incorporating the above idea and proposals did not come out in Beijing until 12 March 2002.

When estimated with reference to the new norms the cost of a construction project will be 8-10 per cent lower than that with those norms that have been just discarded.

It is certainly good news to the employer/sponsor of the construction project. The contractors, however, have been so disappointed as a friend of the author, the CEO of a contractor in Beijing, complained.

8.3 Market risks

Case 1 Zhuhai International Airport

Zhuhai International Airport was completed and put into operation in April 1997, one month or tow earlier than the Hong Kong New Airport at Chi Lap Kok. The spending is as huge as

US$240 million. The modern well-equipped facilities have not, however, been used as fully as planned. Only a few flights arrive and/or depart a day. There have not been many people or cargo use it. Only less than 10 per cent of the capacity has been used. According to a prediction the situation will not improve until the year 2005. The reasons behind the situation are many. One of apparent reasons is the potential competition from the Huangtian International Airport, the Hong Kong New Airport and Macao International Airport in its vicinity of less than 300 km in diameter.

There are numerous stories same as Zhuhai International Airport in China, to the author's knowledge. For example, many cities in the Yangtze delta have built their own airports for such jumbo jets as Boein 747 and/or Airbus 300. As a result they have not been used to their capacity and made a huge loss. Some other factors have made thing worse. For example, the ticket agents of airlines in Shanghai compete for passengers by offering discounted air tickets while those in Nanjing do not. As a result, many passengers from Nanjing instead of taking flight available to them in Nanjing take bus to Shanghai before take flight at the airports in Shanghai. The bus fare is much smaller than the discount offered by the agents of airlines in Shanghai. In consequence the Nanjing airport loses a lot of money. The same thing happens with Nantong Airport.

As far as the real reason behind the redundancy of airports in China is concerned there is a number of plausible explanation. One of them is like this: the local government officials are eager to improve their transport infrastructure and to make more spending aiming at fast growth of their local economy. The more convincing explanation, however, is that they are eager to make an impression on the top leaders that they perform their office very well in terms of local economic growth and social development and get a quick promotion or at least avoid being criticized by the central government officials. It follows that in the case of China some market risks are actually institutional risks. With sea and river ports we have the same stories as airports.

There have emerged, in China, a number of unexpected undesirable behaviors in doing business, obtaining construction contracts, and making payment due etc in recent years due to various causes including deregulation by the government although the market mechanism has played an important role in reallocating resources for best use.

The undesirable behaviors, as enumerated in the *Decision on Rectification and Regulation of Market Orders* issued by the State Council on 27 April 2001, include but not limited to fake and shoddy products, evasion of taxes, smuggling, frauds and cheating in foreign exchange control and export tax rebate, abuse of credits, breach of contract, commercial frauds, evasion of debts, violation of financial and accounting regulations, frauds in the tendering processes for

construction projects, and violation of safety regulations in productions.

It is obvious that the behaviors have increased the uncertainties in initiating, planning, design, procurement, construction, operation and maintenance of infrastructure projects in China and will cause loss of and/or damage to the participants in large infrastructure projects.

On 27 April 2001 the State Council formally issued the *Decision on Rectification and Regulation of Market Orders.* The Decision identifies the behaviors as above mentioned as the most urgent and serious problems in relation to upholding a desired market order and confirms the following as the main targets for strengthening market regulation during the 10th Five-Year Plan period (2001-2005):

a. preventing and imposing punishment on activities involving the production of fake and substandard products, tax evasion, frauds in foreign exchange control and smuggling;
b. rectification on the construction market, in particular the projects tendering processes;
c. rectification and further regulation of the financial market;
d. strengthening of financial disciplines and improving financial auditing;
e. regulation of activities by intermediaries;
f. promotion of a healthy development of the cultural and tourism markets, including the strengthening of supervision over various electronic gaming ventures and Internet cafés;
g. strengthening of the administration of and supervision over production safety; and
h. elimination of local, regional, industrial and departmental protectionism.

As part of the efforts in the campaign for market order, the State Council issued the *Provisions on the Prohibition of Regional Blockade in Market and Economic Activities on 21 April 2001*. The Provisions became effective on promulgation.

The provisions, consisting of 28 articles in total, uphold a uniform national market in which fair competition is encouraged. They prohibit all forms of regional blockade/protectionism. Under the Provisions, no unit or person is allowed to block or interfere with entry into the local market of outside products or services, nor shall anyone or any unit be allowed to encourage or support such regional blockade. Regional blockade in not defined, but refers to the following conduct by local governments and their departments under Article 4 of the Provisions:

a. any restriction which only allows the dealing in, purchase or use of local products or services;
b. erecting transport (road, railway, harbour, or airport) barriers to block the entry into local markets of outside products or the outgoing of local products;
c. imposing discriminative standards on technical requirements or inspection;
d. establishing monopoly, examination and approval or license requirement, particularly aimed

at outside products or services;

e. imposing different qualification requirements and restricting information flow so as to block outside units or persons from local tendering processes;
f. imposing discriminative treatment so as to restrict or block outside enterprises or persons from establishing branches or subsidiaries; and
g. any other activities of a regional blockade nature.

The Provisions also render all local regulations, local government roles, and local measures ineffective if they conflict with the State Council Provisions.

8.4 Foreign exchange rate risk

Case 1 Loss due to devaluation of Renminbi

A water conservancy and hydropower project in southern China was financed by a loan borrowed in late 1980s from the World Bank. The amount of loan was US$92 million and the exchange rate was 1 US dollar for RMB2.8 when the loan agreement was entered into. During the project Renminbi was devaluated sharply down to 1 US dollar for RMB8.3 at the beginning of 1993. The total amount withdrawn from the bank is US$115.65 million, an equivalent of RMB480 million at then exchange rate. The principal and the interest compounded thereon in subsequent 15 years added up to RMB1,450 million. The loss in consequence of the devaluation of Renminbi and the additional interest payment resulting from the loss amount to RMB724 million, 71 per cent more than the actual proceeds of the loan.[4]

8.5 Interest rate risk

Case 1 Changes in financial costs. It is not uncommon that changes in interest rates reduce costs to the sponsor/promoter of a project. According to Mr. Lu Youmei[5], the CEO of China Yangtze River Three Gorges Development Corporation, the authorized representative of the project sponsor, lowering of interest rates in seven successive steps by the People's Bank of China, the central bank of China, since 1998, combined with national competitive procurement of works for the mega-project has reduced the estimate at completion of the costs to the corporation from RMB20.19 billion to RMB18.00 billion.

8.6 Organizational risk

Potential advantages of joint ventures

Reasons for enterprises to enter into a joint venture vary, but there are a certain number of aspects in common:

a. To combine partners' technical, financial, managerial and other resources.
b. To share the costs and spread the risks of a project, contract, new market or development work.
c. To meet an employer or promoter's desire to deal with a single source of service, or to demonstrate to an employer or promoter that the enterprises concerned are seriously committed to cooperating with each other in carrying out a project and in accepting a proper share of the risks involved.
d. To gain access to a market.
e. To share partners' licenses, agencies, commercial or technical know-how etc.
f. To utilize international partners' credit advantages or lessen escalation risks
g. To form a more powerful basis for negotiations with employers, government, bankers, suppliers or others.
h. To by-pass own organization's lack of flexibility or interest.
i. To develop interdisciplinary teams with new skills.
j. To cooperate as a step towards amalgamation.

Organizational risks of joint ventures

The aim of a joint venture is partnership. The special risks to the partners in a joint venture are in foreseeing and agreeing what relationship and commitments between them are needed to control and carry out their external commitments to others. A joint venture generally involves more sources of risk than other types of project or business organization, depending on whether the partners really are willing and able to collaborate with each other in sharing the problems and risks involved, and whether they have made realistic arrangements which will enable them to do so in practice. The risks are identified as follow.

a. Differences in objectives. The partners may differ in their understanding or interpretation of the objectives of a joint venture, and this may not be apparent before the joint venture has entered into commitments to others.
b. Changes in demands. The needs and risks change during projects. Simple collaboration between the partners' responsible managers may be sufficient to decide to start a joint venture project. More complex relationships between them may be needed to complete it.
c. Divergence of interests. It is easier to start a cooperative venture than to sustain it. The risk of divergence of interests between partners is greater if a joint venture is formed to share risks plus any of the others listed. At the start of a project the need for central may not be apparent.
d. Provisions for risks. Partners may fail to make budget provisions for the greater risks in a

joint venture. Their liabilities may be greater than in normal business, but inexperienced partners may greatly under-estimate or greatly over-estimate them.

e. Balance of interests in a joint venture. Joint venture work is only a part of the interests of each partner. They may have unequal interests in a joint venture, relative to total business. Some or all of the partners; interests may change, for instance when they see now opportunities in other markets, and more so in a BOT contract.
f. Project attitudes. Partners can vary in their experience of joint venture projects and joint venture risks, particularly manufacturers compared to contractors, resulting in differences in the real authority and attitudes of their representatives.
g. Contracting authority. Joint venture dedicated staff have an interest in negotiating contracts which will bring the joint venture work.
h. Control in default of planning. The need for control of a joint venture project or contract may become accepted only when policies are not proceeding as intended, as occurs in many organizations. This is a common risk in 'internal' joint ventures formed between subsidiaries of one enterprise.
i. Collective management of problems. As noted earlier, joint activities and risks may need management styles and systems different to those used by partners in their normal business. As in any committee, the partners' representatives on a steering group may run the risks of discontinuity in their knowledge and attitudes on the joint venture business, and tend to 'group think' or be over-cooperative in relation to their parent enterprises' interests and commitments to the joint venture.
j. Management quality and motivation. A joint venture needs to attract managers comparable in ability to their opposite numbers in the partner enterprises. There can be conflicts between joint venture and partner managers, not least because of their different roles, objectives and accountability.
k. Risk awareness. Few individuals work in more than one joint venture in their career and can take the experience to another, so many managers new to a joint venture may not be aware of the risks.

Case 1 A joint venture for safety monitoring component of Three Gorges Project[6]

The joint venture is formed to undertake the contract of monitoring of stress-strain, seepage and dynamic performance of the dam works in progress. The partners are a university (Party A), a major construction company (Party B) and a research institute for water conservancy and hydropower engineering.

As agreed between the three partners Party A is technically strong in development of MIS and is responsible for development and operation of an information system specially designed for the

contract. Party B provides all the equipment and instruments needed for measurement and testing and carry out routine stress-strain and seepage measurement and test on behalf of Party A. Party C gives technical guidance and advice, leads the joint venture, submits monthly technical report and statement for payment to the employer, Yangtze River Three Gorges Engineering Development Co., Ltd.
A board of three directors and a project team of six persons have been formed of the representatives from the three partners.

Problems have kept arising though the joint venture has become much stronger than other competitors in tendering for and as a result won the contract because of combination of their technical, financial, managerial and other resources that would have not become available to any single partner. The typical examples are given as follow.

a. Coordination is difficult. For example, the JV leader feels difficulty preparing the monthly statement for payment from the employer because the partners could not submit their components of the statement on time.
b. Finger pointing. Because of defective provisions of the joint venture agreement, some duties have not been defined and assigned and the partners tend to seek excuses for their default and sometimes point finger at other partners.
c. Distribution of income is difficult. In many cased it is difficult to difficult to distribute the payment from the employer among the partners properly because it is difficult to figure out their actual contributions accurately.
d. It is difficult for the leader to act impartially. The other partners will complain if the leader cannot act impartially.

8.7 Cost risks associated with hydropower projects in China[7]

Hydropower projects are unique, compared to those in other sectors, in that they need huge amount of money, have long time span and involve a great number of uncertainties or risks. The risks for the hydropower projects have a wide range of sources.

The risks have significant negative effect on the cost objectives of the hydropower projects. Song Xusheng and Qiang Maoshan have made a survey on 21 hydropower stations that have been completed in China since 1970s, as shown in Table 8.1. Table8.1 shows that the cost performance of the projects is so disappointing that the overrun is as severe as 85.6 per cent on average, with 553.5 per cent being extreme, and much higher than the contingency allowance of 6-8 per cent of cost budgets. In consequence their costs had to be revised again and again during

the projects.

Table 8.1 Comparison of final approved spending to original estimate of 23 hydropower projects in China

Project title	Original approved estimate		Final approved spending		Overrun %
	Year of estimate	Amount Million yuan	Year of final adjustment	Amount Million yuan	
Baozhushi	1984	4,703.85	1998	6,026.97	28.13
Xiaodongjiang	1985	69.20	1990	103.71	49.87
Aankang	1972	450.00	1982	1,452.00	222.67
Daguangba	1992	1,628.67	1995	2,367.37	45.36
Geheyan	1991	4,988.19	1994	6,700.12	34.32
Wuqiangxi	1991	6,339.92	1995	8,332.48	31.43
Yantan, Hongshuihe	1985	1,631.96	1995	3,563.06	118.33
Jinshuitan	1982	410.00	1988	553.65	35.04
Dashankou, Kaiduhe	1985	164.00	1990	206.61	25.98
Manwan, phase I	1986	1,013.08	1995	3,253.82	221.18
Ertan	1991	17,983.51	1999	25,465.83	41.61
Shisanling	1990	930.00	1993	2,739.24	194.54
Daxia	1991	1,261.00	1996	2,599.46	106.14
Yanghu, Tibet	1993	1,357.93	1997	1,868.12	37.57
Dongfeng, Wujiang	1991	1,798.78	1997	2,648.85	47.26
Tianshengqiao , second stage	1985	1,587.40	1995	10,374.05	553.52
Tianshengqiao , first stage	1989	3,547.35	1993	8,484.87	139.19
Tianhuangping	1990	2,045.40	1993	7,118.41	251.46
Lianhua	1991	2,806.48	1996	4,702.32	67.55
Wan’an	1978	784.63	1993	1,664.87	112.19
Shuikou	1984	1,818.00	1991	5,713.70	214.28
Total		57,299.35		105,939.51	84.89

Song Xusheng and Qiang have also made a survey and identified inflation, changes in legislation

(including land use charges, authorized contingency allowance), changes in financial cost (including interest rates and exchange rates), changes in design etc as major cost overrun risks for the hydropower projects. They have also made a quantitative analysis of how the causes contribute to the cost overrun in 1970s, 1980s and 1990s, respectively. The result is shown in Table 8.2.

Table 8.2 Contributions of various risks to cost overrun of hydropower projects(%)

	1970s	1980s	1990s
Inflation	29.06	39.23	27.11
Changes in legislation	26.07	15.00	8.31
Adjustment in land use charges	18.32	3.37	6.30
Increase in interest payment	7.26	15.05	25.55
Price contingencies	6.75	8.26	11.56
Other changes	5.42	10.85	5.50
Changes in design	4.7	4.04	4.72
General contingencies	2.23	3.26	1.98
Changes in exchange rates	0	0.37	11.28
	100	100	100

8.8 Risks associated with project financing/BOT approach

China introduced Build-Operate-Transfer (BOT) approach, an internationally recognized way of financing infrastructure projects in early 1990s.

The Ministry of Power Industry (MOP) issued the *Tentative Provisions for the Use of Foreign Investment for Power Project Construction* (the "MOP Guidelines") in March 1994 setting out guidelines for foreign organizations and individuals to make investment in various ways in power projects in China. Foreign investors may construct and operate new power plants, extend and upgrade or purchase the existing power plants. The foreigners are not permitted to share more than 30 per cent of the equity. They may, however, apply to the State Planning Commission (SPC) to build a new power plant owned and operated entirely by themselves.

The Tentative Provisions limit the entitlement to own and operate to 20 years for thermal power plants and 30 years for hydroelectric power plants, exclusive of the construction period. The situation has however changed a little since late 1996.

SPC, MOP and the Ministry of Transport promulgated *Regulations for Granting Concession to Foreign Investors* in August 1995.

Under the new institutional arrangement foreigners are allowed to make investment in infrastructure such as power plant, railway, highway, port and postal service. They can be given concessionary right to undertake construction and also provide funds, technology, equipment and managerial personnel. As infrastructure projects usually do not make a big profit, China's governments are considering allowing foreigners to invest in such projects as expressways, commercial and high-speed railways. It is also learned that the BOT will be widely used in Yangtze River valley, where China has decided to carry out large-scale construction involving a total investment of 1,000 billion and to attract foreign investment totaling US$10 billion. As a matter of fact, there are already certain BOT projects in place in China. For example, Shajiao Power Plant in Shenzhen and Guangzhou - Shenzhen Expressway are BOT projects and Laibin B as is to be presented below.

Case study 1 Laibin B Power Plant[8]

Laibin B is the Phase II of Laibin Power Plant and was awarded in 1996, as a state-approved pilot build-operate-transfer (BOT) project. The project involves financing, design, construction, procurement, operation and maintenance and transfer of a 2x360 MW coal-fired power plant with cost being estimated at US$600 million (RMB5 billion) to be located at Laibin County in the Guangxi Zhuang Autonomous Region. The consortium made of Electricite de France (EDF) and GEC Alsthom won the concession from with a very competitive tender and the backing of France's export-credit agency, Coface.

Laibin B is specified in three contracts, i.e. CA, PPA and FSTA with CA overriding and defining major duties and obligations of the project company (the consortium) and Guangxi Government in relation to financing, design, construction, procurement, operation and maintenance of the project. The Project Company representing EDFI and GEC Alsthom. EDFI is a subsidiary wholly owned by EDF entirely owned in turn by French Government. GEC Alsthom is a subsidiary wholly owned by GEC Alsthom N.V. shared by The General Electric Company, p.l.c. of U.K. and Alcatel Alsthom of France. The construction services contractor is an *ad hoc* joint venture between Alsthom Export and Compagnie Financiere de Valorisation pour L'Ingenierie. The plant supplier/contractor is a consortium made up of GEC Alsthom Centrales Energetiques SA and EDF, represented by its division CNET. The operator is a subsidiary 85% owned by EDFI and

shares ownership with Guangxi Power Bureau (GPB) and Guangxi Development and Investment Co. Ltd. (GDIC). GPB and GCFC, as authorized by Guangxi Government, enter into the PPA and FSTA with the consortium, respectively.

The risks associated with the project and their allocation is briefly described as follow.

Government guarantees and preference for consortium

(1) Exclusive concession

The consortium is exclusively allowed to design, construct, test, operate and maintain Laibin B project. Guangxi Government provides a plot of land for the project and buys the net output up to full generating capacity during the concession period. The concession period is 18 years, calculated from 3 September 1997. The operating period is approximately 15 years following the commissioning of the plant based on an estimated construction period of 33 month. On expiration of the concession agreement the consortium will transfer the plant to Guangxi Government in good condition.

(2) Power purchase guarantee

As the PPA provides Government guarantees to purchase, through GPIB, the minimum net electrical output of 3,500 million kWh (approximately 63% of plant load factor) each operating year from Laibin B.

(2) Fuel supply guarantee

The Government guarantees to supply, through its subsidiary Guangxi Construction and Fuel Corp. Ltd. (GCFC), the fuel (coal and/or oil) required by and paid for by the Consortium in accordance with the FSTA

(3) Force majeure guarantee

If any circumstance outside the control of both parties arises, such as natural disasters, outbreak of war, hostilities, embargo, import or export restrictions and change in legislation, which renders impossible for either or both parties to fulfill his or their contractual obligations, then either party shall be entitled to terminate the CA.

(4) Foreign exchange guarantee

The foreign exchange and convertibility are also guaranteed as Guangxi Government promises to assist in conversion and remittance of RMB-denominated profits. This will cover debt service, payment of dividend and repatriation of capital and thus greatly reduces the foreign currency exchange and conversion risks.

(5) Compensation for default of Government and political risks

If completion of the construction work is delayed or the cost of construction or financing is

increased due to action or inaction of Guangxi Government in connection with its obligations, it may, at its sole discretion, either extend the concession period as appropriate or compensate the consortium by adjusting the tariff in a manner so that all additional costs of construction and/or any additional amount that may become payable under the financing documents after the completion date of the power plant, as a result of such delay shall be reimbursed to the consortium in equal amounts in the monthly payments of electricity purchase charge paid. In any event, if financing documents becoming due and payable prior to the completion date of the power plant, Guangxi Government would commence payment to the consortium of the relevant amount so as to allow the consortium to cover its debt.

(6) Preference in taxation

In addition, Guangxi Government will also ensure that the consortium receive as much margin of preference in taxation as permit the laws and regulations in China. The Government also agrees to assist the consortium in obtaining permissions for other preference in taxation in relation to the performance of the CA to the extent permitted then by China’s laws and regulations on taxation.

(7) Guarantee of Lenders' Right

From and after financial closing and for so long as the financing documents remain in effect, Guangxi Government agrees not to terminate the CA without first providing the lenders with an opportunity to cure the event of default of the consortium and affording the lenders the other rights provided in the CA. The lenders or lender's nominee may make any payment or perform any act required to be made or performed by the Consortium with the same effect as if made or performed by the Consortium.

This guarantee protects the lenders from the risks of the Consortium's default and Force Majeure.

(8) Land and utilities and other support measures

Guangxi Government will acquire the land and access thereto and prepare the site for commencement and give possession of it to the consortium for the concession period.

The Government has also made connections to all the utilities, such as electricity, water and telecommunication, necessary for the construction, O&M of Laibin B to the satisfaction of the consortium. The existing facilities will remain available to the consortium for use during the concession period. To ensure that the consortium have reasonable access to the facilities during the construction and operation of the project, Guangxi Government will maintain them at its own cost during the concession period, unless the existing facilities are damaged as a result of the negligence or misconduct by the consortium.

Other risk response strategies

(1) Insurance

The risks other than those covered by the above guarantees and incentives are to be responded to by the consortium using insurance.

As provided in CA the consortium shall effect and keep in effect for specified length of time at its own cost following insurances: (a) cargo transportation; (b) Contractor's All Risks; (c) Third Party Liability; (d) Property All Risks Insurance; (e) Consequential Loss Following All Risks; (f) Machinery Breakdown and (g) Miscellaneous.

(2) Right to select contractors

To fulfill the obligations under the CA, the consortium shall be entitled to select contractor who has rich experience and expertise in the construction of a 350 MW unit to perform the construction work. The Consortium and the Construction Contractor were also given the right to award contracts to suppliers of equipment, material and services. The selection of the Construction Contractor was to be done through competitive bidding or by direct nomination, subject to the approval of Guangxi Government.

(3) Dispute settlement

To resolve disputes properly as soon as it arises during the concession period, some procedures are agreed upon by the parties.

8.9 Availability of permits and licenses

Where permits and licenses must be obtained and renewed before the times as specified, the sponsor/employer/lenders, in effect, assume the risk that such permits and licenses will be obtained in a reasonable time in the absence of any provision by the sponsors to pay these costs.

As well known Chinese central government and even provincial governments have decentralized its public administration for over fifteen years. The central and provincial governments have limited their role to policy setters and ceased to involve themselves direct in lower level matters such as approval and/or coordination of capital projects.
In spite of obvious advantages there are a few major disadvantages.

In the case of water and wastewater infrastructure projects there are usually eight provincial agencies who has regulatory authority over and/or interests in such projects, i.e. (a) construction departments (commissions or bureaus), (b) water resources departments (bureaus or offices), (c) environmental protection agencies (bureaus), (d) geology and minerals bureaus, (e) development planning commissions, (f) urban planning departments (bureaus, institutes), (g) finance departments (bureaus) and (h) public health departments (offices). There exists no inter-agency coordination mechanism. Inter-agency coordination and information sharing is rare.

Under the current institutional arrangement it is not easy to obtain the permits and/or licenses necessary for the project to proceed as scheduled by the sponsor/employer.

8.10 *Force majeure* risks

China is well known to be a country prone to natural disasters and rich in defective geological features, such as floods, draughts, landslide, earthquake, debris flow, karst, tundra, frost-heaving soil, soft soil, fault etc. The disasters and defective geological features make it difficult to build highways, railways, dams and other civil engineering works.

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