

BOT in China: Opportunities and Challenges for Foreign Firms

by

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ABSTRACT

The People's Republic of China (PRC) has the world's fastest growing economy, with further growth currently depending on improvement of physical infrastructure. As it enters what many predict to be one of the greatest infrastructure development booms in history, China presents numerous opportunities to international engineering, procurement and construction firms. The PRC has recognized that further economic growth depends on improved infrastructure, but it is short on cash. In order to finance and build much of the infrastructure required for continued economic growth, the Chinese government is looking to use the Build-Operate-Transfer (BOT) approach, taking advantage of the interest of foreign investors to meet China's huge infrastructure needs. As a result, while there are many tenders for conventional construction contracts, there are even greater opportunities (and potentially higher margins) for foreign firms that can supply the capital to fund construction as well as the technology and management skills to build and operate infrastructure facilities.

However, there are strings attached. The potential benefits of participating in the Chinese infrastructure boom are accompanied by correspondingly large risks. With an economy in the midst of a transition from controlled to open market, politics mired in bureaucracy and corruption, and a legal system offering little enforceability of contracts, China presents some extraordinary problems for foreign construction firms hoping to participate in the BOT boom. China is not an easy place to do business. In fact, BOT projects in the PRC are fraught with risks, from currency convertibility and inflation to government approval problems and the lack of a reliable legal system.

This paper looks at the growing infrastructure demand in China and how both China and foreign companies can benefit from working together to tackle that demand. The paper first outlines the extent of opportunities for international EPC firms in China. Next, it identifies the risks that must be considered before participating in Chinese infrastructure Build-Operate-Transfer concessions. Finally, the paper will examine methods by which international construction firms can mitigate these risks and maximize its benefits in the Chinese BOT boom.

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BOT in China: Opportunities and Challenges for Foreign Firms

INTRODUCTION

The building industry plays an important part in the development of any society and is important for social, economic and cultural progress. Therefore, in almost all industrialized countries, the formulation of a building and housing policy and the provision of an appropriate framework for construction companies' work and the performance of building projects is considered to be a government task. Inherent in this is the recognition of the importance of the building sector to the development of the economy, both as an investment of resources and during future operation.

The Chinese construction market is characterized by the public ownership of the socialist market economic system as the major component. In the construction sector, the reform of state construction enterprises has been going on in the whole country since 1984. In that year, the focus of economic reforms was officially shifted to urban industrial sectors from the rural areas. A central objective was to decentralize the decision-making from the planning authorities to enterprise management. Since then, this decentralization program has brought about many changes of the structure of China's construction industry. The monopoly ownership of state construction enterprises has been replaced by a mixed form of ownership including state-owned, collective and private.

In the past seven years, China's average growth rate has been above 10%. The construction industry is playing a leading role in this rapid economic expansion. There can be no economic activity without construction. The increase in economic activity has generated, and will continue to do so, a heavy demand for construction, a demand that cannot be satisfied by China's prevailing resources in regards to physical, technological, and managerial resources.

This huge emerging Chinese construction market has attracted the interest of consultants and contractors worldwide. The construction industry in China has suffered for many years as a result of long construction cycles, inadequate planning and programming of projects and poor quality of workmanship. Therefore, an increasing number of construction projects are promoted for international tendering. From that, not only can advanced technology be introduced, but also advanced management practices can be imported.

project procurement process similar to privatization, i.e. a sponsor (private company/companies) undertake to build and operate an item of infrastructure or a facility that would normally be procured and constructed by the government. The ownership of the facility is then transferred to the government at no cost or at a pre-agreed price after a fixed period which is called the concession period. The investment paid by the lenders such as shareholders is repaid by revenues generated from the operation of the facility. This method has a number of benefits associated with it that will be examined in more detail later in this paper.

This paper will also summarize the construction demand in China and explores the consequent opportunities for foreign construction companies. It will look at the procurement methods of joint ventures in China and compare the performance of state-owned construction firms with collective and private ones during these years of reform. This paper will outline the basic structure of a Build-Operate-Transfer strategy of procurement. It will look at the financing strategy and the risks involved and then, using the build-operate-transfer strategy as a basis, this paper will analyze the foreign participant and the problems that they have encountered in the Chinese market. Finally, it makes recommendations on future co-operations between the Chinese and foreign contractors.

MOVING TOWARDS A MARKET ECONOMY

The introduction of Deng Xiaping's economic reform and open door policy in the late 1970's in China launched a remarkable transformation in living standards and in relations with the outside world. In little more than a decade, China has seemingly moved from poverty and backwardness to being viewed as the world's next economic superpower.

With this special transition characteristic, China has been moving from the sluggish Soviet-style centrally planned economy to a more productive and flexible economy with market elements. Chinese government have replaced the old collective system with household responsibility in agriculture, given increased authority to local officials and managers in industry, established a wide variety of small-scale enterprise in the services and light manufacturing and exposed the economy to increase foreign trade and investment.

Lessons Learned from Economic Transitions in Central and Eastern European Countries

Many countries in the world have had the transition experience from planned economy to market economy. Central and Eastern European countries, for instance, have tried shock tactics to adjust rapidly by copying best practice from the market based industries of North America and Western Europe – at huge cost in terms of rising unemployment and falling domestic product, as well as amazing increase in inflation rate. GDP in 1992 in the former USSR, for instance, dropped 24% from the previous year, and the inflation rate in 1992 in former Yugoslavia accounted for 1521%. In some countries, such as Bulgaria, Poland, the average unemployment rate between 1990 and 1993 was more than 10% (Nigel, 1994).

In deciding the method of transition, China did not want to go the way of their predecessors: the Eastern and Central European examples. They had two diverging methods of bringing their country into this new market economy. The first was a "Shock Therapy" approach, similar to the ones used by the Europeans, where all the major features of a market economy are set up within a short period of time and the country learns to adjust. The other choice was a "Step by Step" approach that would be lead to the more gradual implementation of programs. Obviously, the "Shock Therapy" approach and the "Step by Step" approach both lead to different results. In their transition, the Chinese decided early on to adopt the slower "Step by Step" approach.

Since the step by step approach needs longer time in transition, state planning and government control at the macro level became more important. The Chinese government realized that planning is necessary in order to ensure that markets function more effectively. The general

strategy towards parties' responsibility is to strengthen government macro control and give more and more freedom to enterprises. Therefore, China adopted a special model which has the following features:

- Plan-based in macro level;
- Market-based in micro level;
- A mixed economy – a market economy performed under the state plan guide
- A changing proportion between plan and market base.
- A long term strategy in transition.

Transition Strategy

Facing the crisis of the reform of state enterprises, Chinese economists and the Central Government have come to recognize that the root of the question is the lack of enterprises' ownership. Referring to the Western theory of modern firm ownership, a proposal recreating state enterprise ownership system through the separation of management and ownership was formed. The principal points are that by dividing the rights of the legal owner and the ultimate owner of capital.

In 1994, the MOC decided to begin the experiment of establishing the modern firm system on a limited basis. Twenty state construction firms were selected to carry out this reform. The main ideas of this transforming strategy are to distinguish clearly the ownership relationship and grant enterprises the right of legal owner. It will separate enterprise's rights of ultimate ownership from the rights of legal ownership. It is expected to guarantee the independence of enterprises in their affairs and remove the administrative interference from the government authorities. This strategy would be implemented according to the principle that enterprises with different types and characteristics are converted into different forms of modern companies. The enterprises producing some sort of special products and subordinating some important industrial sectors are required to restructure into the state wholly-owned firm or controlled-share company, which are authorized to acquire the state assets and operate the enterprises for the state. Most large and medium state construction firms should set up the company systems, transforming into limited liability or stock corporations according to their existing operating conditions.

In practice, there are two different views on how to realize this transformation, again, the "Shock Therapy" approach and the "Step by Step" approach. The argument for the "Shock Therapy" approach would be that, if state enterprises are only reorganized into state wholly-owned companies or companies where the state holds and owns the majority of voting shares, the results of reform will remain unchanged. It is inevitable that state control over enterprises will

remain in place and enterprises' independent operation will still be constrained, because managers should represent the owners' interest in return for payment of some kind, although they are delegated some rights in operation. Thus, the decentralization program will be undermined by the ownership control imposed by the state. On the contrary, if voting shares were dispersed, the proportion shared by the state can be greatly reduced so that the state as the ultimate owner has less of a control over enterprises.¹ Under such a situation, enterprises may transform the mechanism and behavior of operation and become independent business units in the market economy. However, this idea has never been adopted because of the lack of reform experience and the widespread worries about causing social instability.

The "Step by Step" approach selected by the Chinese governments first made most of the large and medium state construction enterprises selected for experiments into state wholly-owned companies, referred to as a new form of limited liability company. It is believed that this choice will be more stable and have less social-political risks, because the process of its establishment and operation is simpler. It is not necessary to issue shares and sell them in the market, and also have lower costs of transformation. It is expected that this gradual strategy of transformation can make enterprises free from administrative intervention, aiming at the separation of government authorities and enterprises. Almost all of the state construction firms selected for testing are carrying out this model of transformation.

Macro-Planned Features in the Chinese Construction Industry

In such a huge country, with 1.2 billion people, it is imperative that the whole country moves from a planned economy to a market economy as smoothly and peacefully as possible. Therefore, a "Step by Step" is the dominating force behind the past 17 years of economic reform in China.

Because of historical reasons, the size of Chinese construction companies is usually big and has more social responsibilities than seen elsewhere. In China, it is not surprising that some big state-owned construction companies run their own schools, hospitals, and kindergartens. Most companies even run their own retirement offices and the number of retired people in a state-owned company can get quite big, up to a one to one ratio with total employees in the company. Reform of state-owned companies must therefore be accompanied by establishment of a social

¹ Wu Jiajun (1992) argues that under the precondition of dispersion of voting shares, what legal owners of enterprises hold shares mutually would generate a "mechanism," which may reduce the government (the ultimate owner) control over enterprises to a mere figurehead. For example, in Japanese large firms, each shareholder shares only very low proportion and own a minority of voting shares. Further, because they

insurance system, such as health insurance and retirement insurance. Such a special organization structure could make a full change of the enterprises' ownership a big problem. Not only would the companies suffer but their affiliated organizations would also suffer. It is yet another reason that China did not adopt a shock approach, and instead chose to change the relationship between the government and the individual companies slowly. For example, the first step was to allow the company to keep a certain amount of the profit. This means that companies became real commercial producers and it proved as an incentive for the company to improve productivity.

Even now, China still manages its economy on the basis of five-year plans. The current one is the Ninth-Five Year Plan, which runs from 1996-2000, within a Ten-Year Plan which runs from 1991-2000. The Five-Year Plans form the basis for annual plans. All central and local government organizations are required to draw up and implement plans on the basis of this national plan.

Like most every other industry, the Chinese construction industry has experienced the "Step by Step" changes as well. In the construction industry, the industry development plan is one of the key components of the national economic development plan. Therefore, the five year plan and the ten year plan for the development of the construction industry are always drawn up based on the national plans and are seen as the presiding documents in guiding the development of the construction industry. Based on these documents, the related five year plan and ten year plan will classify different construction activities and write up plans for each activities' development.

Although the actual situation in implementing the plans is different from planned, it does give the guidelines from which the industry can be improved at a pace that can be accommodated. In these plans, the details are usually given with figures, such as the percentage increase in construction output, rate of construction productivity, good quality rates on construction, design and construction product, number of cities and towns, number of urban and rural housing, and so on.

One of the most important features towards a market economy is privatization, and most Central and Eastern European countries fulfilled this transformation within a relatively short time. In China, however, reform of state-owned enterprises is a long-term action, and each step is based on central government plans with related policies and regulations. Table 1 shows the step by step change controlled by giving different policies at different periods.

hold shares mutually and partake in affairs, shareholders' intervention to the enterprise is cancelled out by each other. As a logical consequence, the autonomy of managers is enhanced.

Year	Measures	Characteristics
1980	Set up company's self rights	More Authorities, profit distribution between company and government; Changing the way of material supply, resuming profit
1983	Tax system	Changing handing-over profit to tax
1984	Contracting system, Tendering system Company qualification	More freedom in business, duties and responsibilities from companies, project based on competition; Classification with four classes
1986	General contracting	Comprehensive ability in design, construction, research and supply
1987	Three levels of contractor divided	General contractor, contractor and specialized contractor
1991	A new term contracting	More responsibilities in other aspects
1993	Stock system	Share ownership
1995	More reforms	Reform in system, organization and technique

In the past 17 years, the general tendency towards ownership of construction firms is that more and more forms of ownership, such as private, joint ventures and foreign companies, has appeared. However, the proportion of each ownership is, to some extent, still controlled by the government. Private designers have still not yet been allowed and foreign contractors should meet certain requirements in order to enter the Chinese market. This will be discussed in further detail later.



Figure 4 Construction Output Growth between China and UK

A series of changes have already taken place. This gradual change has led to a construction output growth unlike any other. Figure 4 shows the difference in the construction output growth between China and the UK.

Micro-Market Features

The Chinese construction is vast, the biggest in the world. Obviously then, many cautions must be taken during the transition process. During the planned economy, using an operation system based on Soviet Russian ideology, no privately owned construction organizations or design consultants were allowed. The government controlled, financed and planned all projects, and then supervised them during construction. It assigned tasks to the design institutes and construction companies and supplied the required key building materials. Construction activities had no commercial production or trade characteristics. All the market features, such as contracting, tendering, competition, construction prices and profits, did not exist and are only now slowly being formed.

A major upheaval has taken place in the past ten years in the organizations of the construction industry with the introduction of competition and incentives for people to make and share in the profits. Chinese government is withdrawing all subsidies from trade organizations, thereby forcing everybody to face the economic realities of their business. Every company, at the national and local level, will have to consider profitability in their overall business scheme.

The reform of state-owned construction companies has been very difficult and much still needs to be done, on a gradual basis, before full transition can be achieved. Nonetheless, enormous changes have already taken place. Companies have more freedom in operation, determining contract price, supplying building materials and equipment, investment, using labors, determining salaries, and so on.

Two Cases

CASE 1: WUHAN CONSTRUCTION ENGINEERING LIMITED CORPORATION

The corporation's former title was Wuhan Construction Engineering Bureau which was a political body subordinated by a number of local construction companies and associations. In 1983, the Bureau was reorganized into the general company for carrying out the decentralization reform program, and by 1992 into the Wuhan General Contracting Group (WGCG). In 1994, the Group was approved by the MOC and Wuhan Municipal Government as a selected point for setting up the modern firm system. The first stage is the transformation of the Group. The capital of the Group is assessed by the municipal state assets assessing team and the Municipal

Government authorized the rights of management and operation of the capital to the Group. Then, the Group was restructured into a state wholly-owned company according to the Company Law. All subsidiaries' assets were merged into the Group's state capital, which could be invested in the subsidiaries. The reorganized corporation shares these rights as follows:

- to appoint the chairman and vice-chairman, directors of the board to its wholly-owned subsidiaries and determine their wages and bonuses;
- to partake in decision-making and supervise the operation performance;
- to attend the meeting of shareholders as a state shareholder and share the right of voting shares according to the proportion of shareholding;
- to earn dividends and sell or buy shares of controlled-share companies and joint stock companies, even make over the ownership of wholly-owned subsidiaries;
- to have rights to restructure the wholly-owned subsidiaries when necessary to adjust the distribution of the state capital.
- At the same time, the corporation must be responsible to the authority (Wuhan Municipal Government) and;
- make sure the state capital increases its value.

The second stage is the transformation of its subsidiaries. The corporation selected three subsidiary companies – WCGC Real Estate company, WCGC Hubei Building Mechanical Factory and WCGC No. 2 Construction Company, the former two of which were converted into the controlled-share joint stock companies; the latter two into a controlled-share limited liability company. So far, all of the subsidiaries have completed the transformation program and are in the market on their own.

CASE 2: JIANGXI NO. 1 CONSTRUCTION ENGINEERING COMPANY

In the provincial level, this company was converted into a wholly-owned limited company. It is a subsidiary of Jiangxi Construction Engineering General Corporation (JCEGC) and was selected for the experiment by Jiangxi Provincial Government in early 1994. The process of transformation was more or less similar to Case 1. However, a different situation occurred after this company was reorganized. Its parent company – JCEGC has still not formally been authorized to operate with the state capital, continuously playing the dual role as representative of owner and administrator. Therefore, the status of the company as the administrative subordinate of the General Corporation was not changed. The administrative intervention from the General Corporation was not eliminated completely.

Results of Changes in Enterprise Organization

An important result of the reform of the construction industry is the emergence and evolution of collective-owned firms, which are divided into urban collective construction enterprises and rural collective construction "brigades." These companies are directly controlled by local city or town governments whilst the state construction enterprises include all those directly subordinating to the Ministry of Construction (MOC) and other ministries of the Central Government and local governments.

Before the 1980's, the construction industry in China has a typically hierarchical structure. State construction enterprises, like other industrial sectors, had held a dominant position. They produced the majority of construction output and employed 70% of the labor force (ECCBA, 1988). Private enterprises were disbanded or transferred into state enterprises through socialist remodeling in the early 1950's. From 1978, collective and private construction firms were allowed to set up. However, state firms still predominated. It indicated clearly that a diversification of ownership structure with state ownership as its core was being promoted and formulated. Under such a reform strategy, they evolved so fast that the number of urban collective firms increased to peak at 10,336 in 1988, being more than twice of that in 1980. Rural collective construction brigades peaked at 82,600 at the end of the Sixth Five-Year Plan; an increase of 62.6% of that of 1980 (DISFA, 1997). The rapid growth of the collective construction firms can be seen in the number of both firms and staff with different forms of ownership in Table 2 and 3

<i>Year</i>	<i>State-Owned</i>	<i>Urban Collective</i>	<i>Rural Collective</i>
1980	1,996	4,608	50,800
1982	2,808	5,076	53,800
1984	3,017	6,724	80,400
1986	3,608	8,977	76,186
1988	3,798	10,336	73,090
1990	4,275	9,052	60,818
1992	4,985	9,551	63,321
1994	5,324	9,892	64,117
1995	5,541	9,925	65,081

Table 2: Number of Construction Enterprises by Ownership

Source: DISFA, CSSA (1997), *China Construction Statistics 1994-1995*, China Statistic Press, Beijing; ECCBA (1997), *China Building Almanac 1994-1995*, CABP, Beijing

<i>Year</i>	<i>State-Owned</i>	<i>Urban Collective</i>	<i>Rural Collective</i>
1980	4,818	1,662	3,347
1982	5,329	2,001	4,213
1984	5,542	2,935	6,835
1986	6,173	3,764	8,069
1988	6,235	4,213	8,546
1990	6,210	3,897	7,060
1992	6,812	4,763	8,036
1994	7,023	5,172	8,215
1995	7,194	5,631	8,307

Table 3: Number of Staff and Workers (in Thousands)

Source: CSSA (1997), *China Statistics Yearbook 1995*, China Statistic Press, Beijing

The rapid change can also be seen from the comparison of performance between the state and collective construction firms. Table 4 shows that the share of industrial output produced by state construction enterprises declined steadily from 63.65% in 1980 to under 40% in 1995. On the contrary, the total share of collective construction firms grew from about 37% to over 60% in the same period. State enterprises have lost their dominant position in the construction industry.

<i>Year</i>	<i>State-Owned</i>	<i>Collective (Urban & Rural)</i>
1980	63.65	36.35
1982	57.91	42.09
1984	50.65	49.35
1986	42.59	57.41
1988	39.65	60.35
1990	48.02	51.98
1992	43.41	56.59
1994	41.28	58.72
1995	39.02	60.98

Table 4: Percentage Share of Construction Industrial Output by Ownership

Source: CSSB (1997), *China Statistic Yearbook 1995*, China Statistic Press, Beijing

Some more detailed data support such a result. For example, 240 million square meters of urban housing was built in 1992 and 54.4% of that was completed by the collective construction companies and brigades. In a few provinces such as Jiangsu and Zhejiang, the turnover of collective construction firms accounted for 90% and 84.3% of the total turnover of the provincial and lower level government owned construction companies, respectively (Wang, 1993). Rural collective construction brigades in particular are playing a more and more important role in China's construction sector. These small firms comprise mainly surplus farmers separated from agricultural production. They appear to be more productive than state firms are. In 1991, they exceeded the production of state firms by 16.7 square meters per capita (Han and Sha, et al, 1994). This is despite the fact that state construction firms have superior equipment, productive skills and manpower quality.

The majority of state construction firms have poor performance, making increasing losses every year since 1985, the first year after the reform of the whole construction sector commenced. The major quota measuring economic benefits of construction firms, such as gross profits, rate of output-profit², per capita in money value, etc., indicates an annual decline. As Table 5 shows, the output of state construction firms in 1985 was 47.45 billion Rmb yuan and the total profits were 3.16 billion Rmb yuan. Up until 1991, although the output increased to 106.25 billion Rmb yuan, the total profits declined to 1.6 billion Rmb yuan, only 50% of that in 1985. The rate of output-profit dropped from 7.4% in 1984 to 1.4% in 1994, even lower than the 6.1% in 1980, the year that reform was initially launched.

<i>Year</i>	<i>Total Profit (in billion yuan)</i>	<i>Rate of Output-Profit (%)</i>
1980	1.28	6.1
1984	2.74	7.4
1986	2.83	5.0
1988	3.18	4.1
1990	1.66	1.8
1992	1.59	1.5
1994	1.54	1.4

Table 5: Economic Profitability of State-Owned Construction Enterprises

Source: Jin and Zhang (1996), *Construction Economics*, CABP, Beijing.

² The rate of output-profit is the percentage of the total profits and the construction output in that year.

Reasons for Decline of State Construction Enterprises

Some reasons causing the poor performance of state construction enterprises may be identified as follows:

- In recent years, the Central Government carried out the policy of cutting down the investment on capital construction in order to control inflation and smooth economic growth. It caused a reduction of construction tasks. On the other hand, the evolution of construction firms and manpower are so rapid that this exceeds the growth of investment demand. As Table 2 and 3 indicate, the number of construction firms (both state and collective) and staff and workers in 1992 increased by nearly 1.4 and 2 times that of 1980, respectively. Many construction firms could not obtain enough contracts and their profits declined.
- Because of the shortage of construction work, competition amongst enterprises increased causing a buyer's market. Many firms tendered in lower prices in order to win contracts. This caused considerable financial losses in construction enterprises.
- During the transition period from a centrally-planned economy to a market-oriented economy, a mature construction market has still not been established. The old price system where the construction cost of a project is determined by the planned quota of budget has changed little. Material price inflation resulted in the price of building production being lower than its cost. Moreover, it was not until 1978 that the 2.5% legal profit rate for construction enterprises was adjusted to a 7% planned profit rate (Luo, 1995), which is still much lower than that of other industrial sectors.³ This being the case, it was difficult for state enterprises to benefit.
- The internal management of state construction enterprises became even more inefficient. Labor productivity did not improve and construction quality grew worse.

In addition, another important reasons causing state enterprises to be unsatisfactory is that they also have a social role to perform. Public enterprises are used frequently as the means of creating employment, balancing development between regions, and providing social services to their employees and citizens. Typically, a construction enterprise has to pay about 20 types of taxation. This accounts for 70% to 75% of the total profits of the enterprise (Jin 1994). In the last decade, as the retired increased, the proportion of retired to in-service staff and workers in large and medium state construction firms has risen to 1:3 and, in some cases, even 1:1 (Jin

³ In 1984, compared with other industrial sectors such as 72.55% of electric power, 21.3% of mechanical industry, 18% of coal, 16% of textile, 13.95% of chemical, 9.5% of building materials, 9.41% of food,

1994). The enterprise bears significant retirement pension costs and various expenditures on labor insurance such as health, housing rent, food subsidies, etc. This weakens the firm's competitiveness and causes low economic efficiency.

Although all reasons above strongly influence poor performance and financial losses of state construction firms, the key factor is that they have still not become independent economic entities free from administrative interference from government authorities. The ownership system and behavior of enterprises have not been transformed to suit a market-oriented economy since the reform in 1978. Compared with state construction enterprises, collective construction firms have greater autonomy in decision-making and other inherent advantages (Table 6). They have a steady growth of profits, at the annual rate of over 22%⁴ in recent years.

7.35% of metallurgical, the legal profits of the construction sector was only 2.5%, only ranking in thirteenth.

⁴ The figure is calculated by the author according to the statistical data in *China Statistics Yearbook 1995*.

	<i>State-Owned</i>	<i>Collective-Owned</i>
Ownership	State	Collective
Decision-making in management and operation	Guided by the government	Independent
Investment in capital construction and supporting	Loans from bank	Self-raising
Size (number of staff per firm in average in 1992)	Large (1,366)	Small (urbank – 499, rural – 13)
Type of employment	Permanent	Temporary
Salary	Fixed	Floating according to profits & losses
Welfare (housing, health, food subsidies, etc.)	Higher	Lower
Level of labor skill and equipment	Higher	Lower
Labor productivity	Bigger & stronger	Smaller & weaker
Responsibility for losses and profits themselves	State	Staff & workers
Methods of operation	Lack of flexibility	Greater flexibility
Incentive mechanism	Non-effective	Effective
Capacity of competition	Lower	Higher

Table 6: Comparison of Two Forms of Construction Enterprises

Achievements

China is attempting a unique transition from a planned economy to a socialist market economy, without parallel in any other country. China is not rushing ahead to take onboard Western systems, but pursuing a fundamentally different path with a fragile approach to decentralization. Every sector in China is adopting a step by step change approach with strong planned base so as to gradually realize the transformation which shows an incremental, sequential and frequently experimental reform procedures. This approach does not involve large-scale privatization. Since beginning the reform process in 1978, China has experienced high rates of output growth while maintaining relatively stable prices.

Because of the totally different approach they are implementing, China is in contrast to central and eastern European countries, and high rates of output growth, relative low rates of unemployment, as well as relatively small inflation rates have been always accompanied since the beginning of reform process in 1978. Economic growth in China is about 10% faster than that of western Europe. Until the end of 1995, the GNP in China was more than 5760 billion yuan⁵, five years ahead of schedule in realizing two times of 1980's GNP. Figure 5 shows the growth and inflation of China. In the eight-five year plan period (1991 to 1995), average GDP growth accounted for 11.8%, and the highest reached 14.2% in 1992. GDP per head increased from 1864 yuan in 1980 to 4771 yuan in 1995 (in 1995 dollars).

During the past 19 years, inflation rates in China have been controlled to within 10%. Although 1994 has the highest figure (21%), in 1995 it dropped back to 15%. Unlike most central and eastern European countries, the economic reforms in China have not lead to serious problems in employment, the rates of unemployment is very low, accounting for only 2.2% to 2.9% since 1978 (Nigel, 1994). Figures 1, 2, and 3 show the differences compared with three Central European countries.

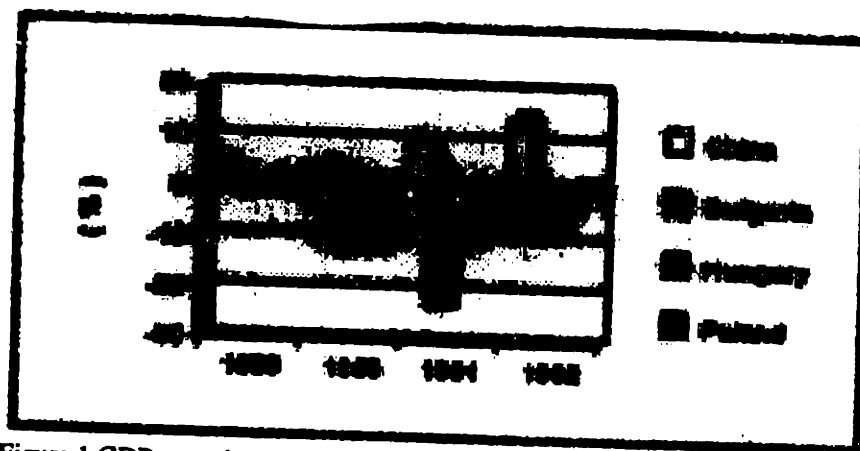


Figure 1 GDP growth

⁵ The Renminbi Yuan is not a convertible currency and the exchange rate varies greatly. The current official rate is US \$1 = 8.33 Rmb yuan.

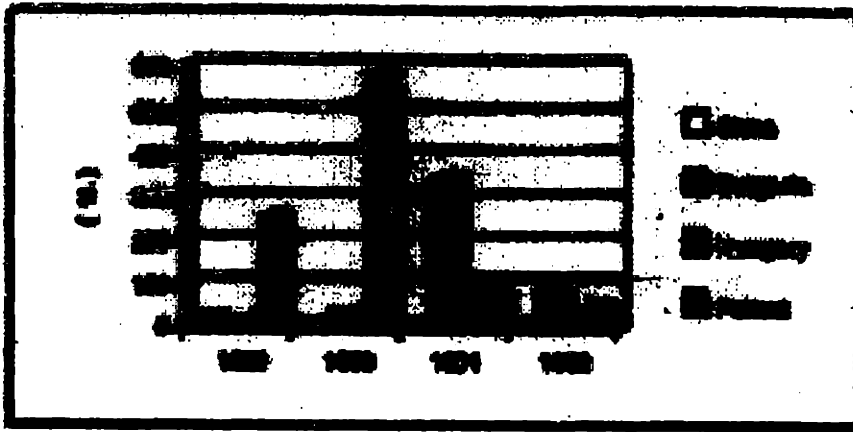


Figure 2 Inflation Growth

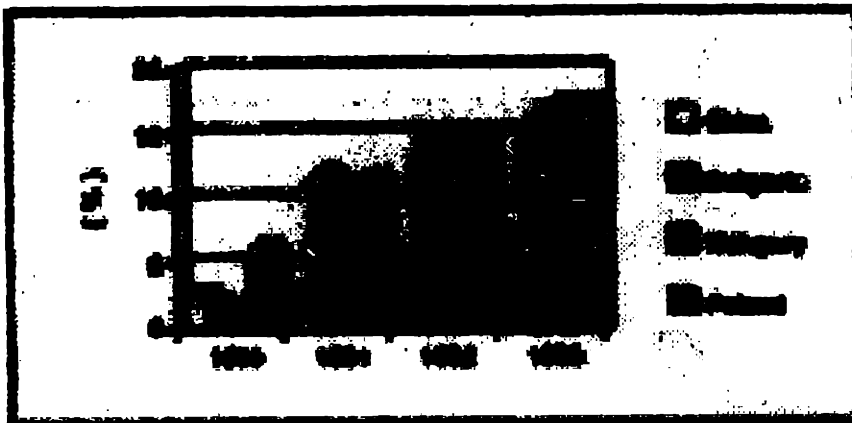


Figure 3 Unemployment Growth

Transition Goals

By the year 2010, China hopes to establish a comparatively complete socialist market, in order to realize the national plan of developing the people's economic and social development outline. A comprehensive construction market in China must therefore fulfill the following requirements:

- Firstly, it should be a common, open, modern market. "Common" means a market with a common purpose, regulations, and management. Commonness facilitates harmonized coordination, formation of the development forces, standardizing the market establishment. "Open" means the reinforcement of horizontal contact, the breaking of separatism and protectionism, and the undertaking of opening up to the world. Opening up facilitates the strengthening of one's weaknesses by exploiting one's strengths, reciprocal mutual benefit, forming a reasonable resources movement and optimal allocation. "Modernization" means the government's reinforcement of macro-regulatory measures in the market, overcoming the natural development of the market, blindness and stagnancy.
- Secondly, there should be a comprehensive market mechanism, one of which is competition mechanisms. This means that market subjects carry out transactions in terms of price, quality and date of goods delivery under the drive of benefit. Such forces will give firms pressure and motivation, thus upgrading the quality and competitiveness of all parties involved. Secondly, the price mechanism for construction products are to be sorted out on the market through the negotiations of relevant parties to arrive at a competitive market price. The price mechanism will level out and transform market information, attract and guide firms on their strategies, enhance technological progress, and eventually lower the level of social necessity in labor expenditure. Thirdly, the supply and demand mechanisms will harmonize with market demand and supply. This includes commodity markets for architectural products, construction works, intermediary organizations' requirements and supply balance. The supply and demand mechanism will lead firms to promptly adapt to market requirements. The above mechanisms should be complementary of one another, harmoniously making the construction market competitive and orderly.
- Thirdly, the development of production elements in the market, includes the material market, labor market, capital market, property market and technology markets. Their re-invigoration can support the construction products' market, forming a comprehensive market system.

- Fourthly, to establish an effective social guarantee framework. In other words, make the society responsible for the aged, medi-care, and special occupations insurance functions, letting firms get away from these responsibilities in order to equally face the competition.
- Fifth, healthy market regulations, comprehensive management strict supervision, and orderliness. The market structure should have relative investment, consulting and supervising services and other intermediaries should have to be strongly developed so as to satisfy the market requirements. The market objective (construction products) should be of quality standards, in that can go through the market exchange channels as commodities.

Current Challenges for Foreign Companies

Though the need for foreign involvement is obviously there, the Chinese government has traditionally set up strict rules about the involvement of foreign general contractors in its construction industry. Specifically, to do business in China, a foreign firm must be established as either a joint venture or a representative office, or have some sort of collaborative agreement with a Chinese design institute. Foreign firms are forbidden from becoming unrestricted wholly-owned enterprises that could then compete more readily with Chinese firms. All construction design that is handled by foreign firms must ultimately be approved by a Chinese design institute, and even in this area, foreigners are only allowed to do preliminary design work – schematic design and working drawings are outside of the purview of foreign firms.

These “physical presence” requirements are however, only one aspect of the problem that foreign firms face as they seek access to this market. The main stumbling block for foreign firms is that they are not allowed to bid on most domestic construction projects. According to Decree Number 32 issued on March. 22, 1994, and Document Number 410 issued on June 16, 1994, both by the MOC, foreign firms only have access to the following projects in China:

- Projects that are entirely foreign invested;
- Projects that are financed by international organizations that require an international tender or bidding process;
- Chinese-foreign joint venture projects that the domestic enterprise cannot manage by itself due to technology problems or lack of experience;
- Domestically invested projects for which the domestic investor cannot find a suitable designer, engineer or architect.

The result of these restrictions is that foreign firms are only able to compete for an extremely small percentage of China's numerous construction projects. While it is true that many foreign invested enterprises are contracting out new projects every year, the overwhelming majority of Chinese funded infrastructure and housing projects are not open to foreign participation.

Reasons for Limiting Foreign Involvement

It is understandable why foreign contractors are limited to certain construction markets in China. There are generally three reasons:

- China wishes to maximize and develop the use of her own labors and skills. For general building or civil engineering projects, local contractors have the expertise and ability to undertake the job. Therefore, there are some rules set up to protect the local contractors.
- Foreign contractors have a higher operating cost which, in general, results in their prices or tenders being higher than those submitted by local companies. The tender price of the local companies is also much lower due to the cost of labor and management of these local contractors being lower too. Undoubtedly, local contractors are price competitors.
- A very long approval time is needed if an overseas contractor is going to enter the Chinese construction market as an independent firm. Therefore, partnering with a local firm is the preferred route.

Because of the above reasons, the Chinese government will continue to regulate foreign involvement in the construction industry until it decides that local firms can compete with foreign firms. Until that time, foreign companies have to learn to operate within the guidelines set by the Chinese government. The following section will analyze the current status of foreign involvement, the problems encountered, and suggested solutions in the context of the build-operate-transfer construction method.

Forms of Current Foreign Participation

Foreign firms have traditionally entered the Chinese market using one of several strategies. Most commonly, companies try to win contracts through the international bidding process. To effectively compete in this process, companies will typically establish a joint venture, open a representative office, enter into a cooperative agreement with a design institute,

or in some instances, participate in an international design competition. Each of these options is briefly described below.

Joint-Venture

Chinese design engineers and construction companies will willingly establish a joint venture relationship in which the foreign company and the Chinese entity share design, documentation and administrative responsibilities from schematic design through construction. Indeed, the MOC welcomes foreign firms that are seeking to enter into a joint-venture with Chinese companies. This type of joint venture agreement can be either a contractual or equity joint venture, and will typically be staffed by both local Chinese professionals and expatriates.

The Chinese side is especially interested in what the MOC calls "technology transfer" where the joint-venture partners share their expertise with each other. The technological exchange however, is typically a one-way street with the foreign company providing advanced software/hardware and engineering techniques. While the Chinese partner may not provide technological assistance, it is nevertheless, indispensable in helping the joint-venture to win contracts, sort through Chinese building codes, regulations, and myriad government requirements. At the same time, the foreign partner stands to gain by its presence in China, and its growing familiarity with Chinese construction practice and methods.

Cooperative Agreement

A number of smaller foreign firms have marketed their services to local engineering design institutes as "design consultants" in order to build relationships and to enhance the possibility of future design collaboration, with the hopes that the Chinese institute will subcontract services out to the foreign firm as needed. The MOC's Design Department encourages foreign firms to contact them to explore possible collaborations, especially on a project-by-project basis. For example, if the Design Department is having trouble with a specific project, and an interested foreign firm has the expertise to help, some sort of agreement might be worked out for that particular project. Other Chinese ministries are also open to this sort of arrangement. Recently, the Civil Aviation Administration of China (CAAC) was seeking foreign engineering expertise to help them build airport runways in western China where sandy, shifting soil presents difficult engineering and construction challenges.

This market strategy can help foreign companies gain access to this market and make useful connections, but whether a firm can actually profit from this type of collaboration is not clear. Chinese entities usually do a good job of striking agreements with foreign companies on

their own terms, and because most firms are eager to gain access to the market, they may hastily enter into a deal that never develops into a profitable venture. Another problem that foreign companies should be aware of is that Chinese companies in virtually all industries routinely seek sophisticated technology and hardware from foreign companies. Accordingly, the inherent risk in this type of cooperative strategy is that Chinese design institutes will learn quickly from a collaborative agreement, and will in a short time become capable and inexpensive competitors that use their new found expertise with great success.

Representative Office

In general, representative offices are the easiest type of office for foreign firms to set up in China, but these offices are limited by Chinese law to performing "liaison activities." As such, they cannot sign sales contracts, directly bill customers or supply parts and after-sale services to customers. Despite these limitations, engineering firms, relying on modern computer applications can easily move design work back and forth to their home countries. Representative offices have enjoyed substantial success in China because the business is completely controlled by the foreign company, unlike a joint-venture where many management decisions must be jointly agreed upon.

Establishing a representative office allows a company to utilize its specialized technical expertise, and most importantly gives the company a way in which to build its presence in the market. Such an office however is a considerable expense. The cost of supporting a modest representative office ranges from \$250,000 to \$500,000 per year depending on its size and staff. The greatest expense are rent for office space and housing, and expatriate salaries and benefits.

Design Competitions

For over ten years, the State Planning Commission has encouraged local governments to sponsor design competitions in order to achieve a higher level of design and construction in projects that require significant investment. As a result, overseas firms can receive commissions through winning various design competitions.

Typically, local governments will arrange a design competition for high-profile projects such as airports, prestigious office towers, theaters, etc. Usually, several foreign firms will enter the competition, although the winner will be required to work with a Chinese design institute when and if it is awarded the job. Invitations to these types of competitions are normally limited to large foreign companies with an established international reputation. Winning a design competition does not however guarantee that the winning firm will receive the big contract. In the case of the new Shanghai Airport, the U.S. company that won the design competition, and

hoped to be named the project manager, was passed over when a French firm was awarded the contract.

Quantifying the Market

The World Bank figures it will require over \$700 billion in new infrastructure in the decade through 2004. The central government wants 16,000 megawatts a year of new electric generating capacity alone through the year 2000, which will require \$20 billion in foreign capital. The Communist Party leadership is backing away from its early 1990s position that controlled electricity prices and kept investors' returns at low levels—and stalemated deals. After virtually no approvals for several years, China granted permission for over half a dozen private power projects in 1996.

Beijing is also showing signs of being willing to experiment with market-oriented financial and regulatory formulas. Electricite de France and GEC Alstom received approval in November of 1996 to develop Laibin B, a \$650 million, 700-megawatt project in Guangxi Province. It will be China's first 100% foreign-owned power plant.

Unlike most earlier projects, the contract was negotiated not on rates of return but on cost per kilowatt-hour of supply. In essence, prices for the electricity are capped, but the developers are free to hike their profits by boosting their plants' efficiency. Rauf Diwan, manager of the power division at the World Bank's International Finance Corp., thinks this sort of deal will become common for power stations, toll roads and other private infrastructure projects all over China.

Since nearly the entire piece of this market that is available to foreign companies is driven by foreign direct investment (FDI), a look at this investment is useful. In 1996 alone, nearly \$42 billion of FDI flowed into China, and by the end of 1996, there were approximately 270,000 foreign-invested enterprises (FIE) in China. When these FIEs build sophisticated manufacturing plants and facilities, they will almost always look for a foreign company that has the necessary expertise to handle such a project.

According to statistics published in the "1996 China Statistical Yearbook," FDI in the construction industry in China in 1995 amounted to nearly \$800 million, with slightly more than half of this coming from Hong Kong, Macao and Taiwan. Assuming that FDI in the construction industry continues to grow at a modest five percent a year, FDI investment alone could result in nearly \$5 billion worth of new investment.

Infrastructure investment is a key element of China's Ninth Five-Year-Plan, with a focus on the road, railway, port, power, oil and gas, and coal sectors. Based on an analysis of a number

of estimates, some of which vary substantially, investment totals in key sectors during the 1996-2000 plan period are as follows:

Power	\$60-100 billion
Rail	\$45-45 billion
Oil/Gas Prod.	\$35-45 billion
Roads	\$30-40 billion
Ports	\$10 billion
Airports	\$5 billion
Refinery Capacity	\$35-40 billion

If foreign expertise is needed for just five percent of these projects, \$10.75-13.5 billion worth of contracts could potentially be available to foreign companies. Foreign companies active in this market agree that \$2 to \$3 billion a year of potential business is a reasonable estimate.

China's Current Infrastructure Needs

China represents the world's fastest growing economy, with further growth bottle-necked at inadequate infrastructure. From ports to handle booming international trade to water treatment facilities to deal with huge urban populations... airports, highways, railways, power stations, telecommunications: you name it, China needs it. The Chinese infrastructure construction boom is still in its early stages, and promises to keep booming for many years to come as the biggest Asian economic "Dragon" of all comes of age.

Since the start of the Chinese economic reform in 1978, the rapid economic growth and the increasing construction market in China have received worldwide attention. The cooperation between the international and Chinese contractors have increased dramatically. According to an Engineering News Record (ENR) report (August 28, 1995), the international construction market continues to be hotly contested and the hottest spot is in the Asian region. Average annual revenues of international contractors in Asia during the past three years was 41.67 billion dollars. China, with its vast economy, is an important part of the Asian market. The ENR reports that 71 out of the top 225 international construction companies already have branch offices in China.

To grasp the scale of China's infrastructure demand, it is useful to consider the development targets in the China's Ninth Five-Year Plan (1996-2000). The plan calls for roughly \$500 billion to be invested in energy, transportation, telecommunications and the environment. The planned infrastructure expenditures include: \$84 billion in energy investment, to increase China's power generation capacity by 100,000 MW; \$110 billion for transportation infrastructure including roads, railways, waterways, ports and airports; and billions of dollars of investment in

water supply and treatment facilities, telecommunications systems and other essential infrastructure needed to push the PRC along the road to development.

The development of the construction industry has ambitious targets to meet by the year 2000. The main areas where construction is continuing to increase substantially in China are in infrastructure, rural and urban housing, and tourism. Most of the key construction projects, which involve infrastructure construction, are located either in the major cities along the eastern coast or in the inland cities that are of importance to transport and resource development. Another important kind of construction activity involves property development such as rural and urban housing which was principally located in the Special Economic Zones, such as Shanghai, and is now spreading into the coastal areas.

In the beginning of the Ninth-Five-Year-Plan (1996-2000), the Chinese government designated the construction industry as a "pillar industry," which means that the government will invest substantial time and money supporting construction projects. According to the MOC, in 1996, investment in construction projects by the Chinese Government nationwide reached approximately \$120 billion. The Ninth-Five-Year-Plan includes plans for the construction of approximately 230 new cities, and 500 market towns throughout China, all scheduled to be completed by 2000. Quantifying construction investment and the subsequent need for engineering and construction services in China is extremely difficult. Foreign companies, Chinese construction officials and other Embassy sources agree that any attempt to meaningfully quantify just how big this market is in dollar terms can only be an educated guess. In lieu of such a guess, to give the reader an idea of market size, a handful of examples are illustrative.

Power Generation

HYDROELECTRIC STATIONS

Hydroelectricity will be one of the key areas of growth. Western private capital and World Bank assistance are expected in the development. The largest currently operating station is at Gezhouba on the Yangtze river, with a capacity of about 2700 MW. Flooding in 1991 gave new impetus to the long debated and highly controversial plan to build the world's largest dam and hydroelectric station at the scenic Three Gorges area of the Yangtze River. The scheme would have a capacity of 17,000 MW of electricity and would bring large benefits in flood control and navigation. Most of the hydro potential is located away from the main industrial centers, necessitating heavy investment in transmission lines and systems. The published estimate for China's investment requirements in Water from 1995-2004 amounted to \$101 billion. (World Bank, 1996, *Infrastructure Development in East Asia and Pacific*).

NUCLEAR PLANTS

Developing nuclear energy is also prominent. The first nuclear power plant, using a Chinese-designed 300 MW pressurized water reactor, at Qinshan in Zhejiang, was commissioned in 1992. A second phase to add 1200 MW is planned. Construction of a similar reactor (a 900 MW plant, later to be doubled to 1800 MW) at Daya Bay in Guangdong province has been completed. A further 2400 MW plant is also planned for Guangdong and assistance from western companies is sought.

ENERGY DEVELOPMENT

Foreign investment has been sought to develop coal mining. Major investment is planned which, together with imported plant and technology, is aimed to bring about the required expansion in generating capacity. For example, an agreement for the planning and design of coal projects was signed with Bechtel, a US based company. It required the contribution of US \$600 million from Occidental and is now in operation at the Antaibao mine at Pingshuo in the Shandong province. The published estimate for China's investment requirements in Power from 1995-2004 amounted to \$200 billion. The average annual energy growth rate, from 1980-1993, is 5.1%. (World Bank, 1996, *Infrastructure Development in East Asia and Pacific*).

Transport

The published estimate for China's investment requirements in Transport from 1995-2004 amounted to \$302 billion. (World Bank, 1996, *Infrastructure Development in East Asia and Pacific*).

RAILWAY AND ROADWAY

As far as railway transportation is concerned, extension, further electrification and double tracking the system are all investment priorities. This include a new north-south link connecting Beijing to Guangdong, bisecting the existing coastal (via Shanghai) and central (via Wuhan) routes. Foreign technology and consulting services are sought for these projects. The growth in border trade makes the expansion of rail lines an even more pressing issue and the improvement in relations with Vietnam in recent years has led to reconstruction work on the rail link between Hanoi and Nanning in the Guangdong province. Several major expressways, such as the Guangzhou-Shenzhen-Zhuhai expressway, involving 240 kilometers of road with a bridge at the mouth of the Zhujiang river, are under construction.

PORTS AND AIRPORTS

Because of the major river systems that flow from west to east and north to south, traffic in the past has been limited to these coastal routes. But as part of the modernization program, China has an ambitious plan to link the five major waterways – the Yangtze, Pearl, Huai, Yellow and Han rivers – which, in turn, will be linked with the expansion of major ports. A major investment program is under way to improve facilities at the principal coastal ports of Qinhuangdao, Tianjin and Shanghai and new harbors for ocean-going vessels will be built in various other coastal cities in anticipation of the opening of direct shipping links with Taiwan. Besides the main airports in Beijing, Shanghai and Guangzhou, other major cities in the eastern coastal areas and the inland, such as Tianjin, Urumqi, Kunming, Harbin are also expanding both domestic and international airports.

Telecommunications

As part of the modernization drive, priority has also been given to expanding and renovating the telecommunications system. The Chinese hope to replace urban crossbar switching with stored program control systems in the near future. The Chinese government also announced, in 1995, to end phone monopoly. Private investment has started setting up telephone networks and to run services. The published estimate for China's investment requirements in Telecommunications from 1995-2004 amounted to \$141 billion. (World Bank, 1996, *Infrastructure Development in East Asia and Pacific*).

Housing

HOTEL AND OFFICE BUILDINGS

At the end of the 1980's, China started to develop its commercial real estate industry, and at the same time private individuals were permitted to enter this industry. At the beginning of 1992, Deng Xiaoping made a speech during his tour of South China encouraging more daring reform steps. As a consequence of this, increased expectations prevailed amongst domestic and foreign investors, and the real estate industry expanded at increasing rates. The high growth was forced to slow down in the fourth quarter of 1993 after the government announced a tighter monetary policy. The annual growth rate of investment in the industry in 1995 was announced as 125%. It is estimated that, in 1995, over one third of total foreign capital in China flowed into the development of real estate, and in some areas, the proportion was higher (Chang 1997).

In addition to this rapid growing real estate industry, tourist arrivals have been increasing greatly. China has opened more than 150 cities to overseas visitors. In 1995, there were 60

million foreign tourists visiting China (The State Statistical Bureau of China 1996). International standard hotels have sprung up in most major cities, many with foreign equity participant and management. Furthermore, many foreign contractors have been involved in the interior decoration for major hotels and restaurants because the general finishing work undertaken by the Chinese cannot meet international standards.

Unlike most Western countries, commercial buildings are not very common in China. Most foreign companies operating in China set up their offices in hotel rooms. Notwithstanding, as China's outside contacts grow and more people are coming to China for business, the need for office space is increasing. Therefore, office buildings are also a major source of construction projects for foreign contractors because these projects usually require advanced techniques which the Chinese construction enterprises are not familiar with, such as construction of curtain walls and structural steel frames.

RESIDENTIAL BUILDINGS

Construction of residential buildings for overseas Chinese and expatriates stationed in China has also been a key area of the construction market in which foreign contractors have penetrated. The housing shortage in China has been very serious, especially in urban areas. The floor space per capita in urban area was only 4 square meters in 1996, and almost 25% of families in urban areas have too few rooms (Department of the Environment 1997). Hence, people are very eager to improve their living conditions. Moreover, some of their overseas relatives have given monetary support in home purchasing. The Chinese Ministry of Construction (MOC) officials report that China has spent approximately \$25 billion annually on residential housing, and will continue to do so at least through 2000. The Ministry also reports that three billion square meters of new housing will be needed nationwide every year for at least the next five to seven years.

Limitations of the Chinese Construction Enterprises

Though the Chinese government has gone a long way towards modernization and reformation, the construction enterprises set up still have limitations within themselves. These companies are not yet prepared to compete with other more established international companies for the following reasons:

- **Capital Shortage and Financial Difficulty** – In 1994, the six largest Chinese construction corporations only had a 210-million-dollar working capital average. In comparison, the six largest Japanese corporations had 745 million, 3.5 times more

(Miu 1996). This small working capital limits the Chinese companies' ability to take on projects requiring large amounts of equity or moving capital.

- **Backwardness of the Construction Consultation Industry – Few of the Chinese construction companies have personnel that understands the standard, criterion and relative knowledge well enough to compete with the foreign construction consultation companies operating in China. The central point of market competition is the competition of human resources. The training of this basic productive force is critical to China's success. While China has made great progress in education since 1949, education in developed countries and developing countries have been going forward faster than China. In 1991, China government just put in Rmb 9,452 million, only 0.39% of its GNP. The full-time students in Chinese colleges and universities totaled 2,047 million, only 17 college students out of every 10,000 people. In comparison, American invested \$164,000 million (2.9% of its GDP) in education in the same year and they averaged 564 college students per 10,000 people. (Lu, 1995) This is 33 times higher than that of China.**

Also, after over twenty years of economic reforms, state-owned enterprises have reached a crossroads. It is reported that many of the state firms are running into great difficulties, facing financial losses and developing external debt. Case studies have shown that state construction firms' performance has been in stagnation. The number of state construction firms running into losses increased to 1227 in the mid-1990, that is 22.8% of the total! This is compared to 131 firms in 1985. (MOC, 1991) It is apparent that the Chinese firms are still undergoing a crisis of their own.

Finally, it should be noted that the MOC welcomes assistance from foreign firms. A report published by the MOC entitled "Overview of the Construction Industry in China," states that foreign involvement in the Chinese construction industry is advantageous because:

- It is beneficial for acquiring capital from abroad ... for the sake of solving the problem of capital insufficiency.
- It is beneficial for acquiring advanced management experience and technology to train a new generation of management talents for the sake of spreading more rapidly the international management experience so that the construction industry in China is capable of getting abreast of the world.
- It is beneficial ... for enhancing China's competitiveness on the international construction market.

Based on numerous interviews with Chinese construction and design institutes, it is believed that these excerpts are an accurate representation of why China seeks foreign help in this industry. More than forty-five years of a planned economy with little interaction with the outside world, has left the Chinese engineering and construction sectors in dire need of modern technology, advanced design ideas, design hardware, software and critical expertise that takes years to develop. Obtaining such expertise from foreign companies is a quick way for the Chinese industry to rapidly increase its capabilities.

Entry into the Market

Many foreign firms are coming to China, seeing construction cranes on every corner, and consequently looking for the best way to enter this market. They see that China requires extensive cooperation from foreign investors and builders to both finance and construct much of the planned infrastructure. The opportunities for international EPC firms in China's infrastructure development effort, in markets from power and water to transportation and telecoms, are enormous.

However, before jumping in, foreign companies should carefully analyze and respond to the question: "What can we offer that the local design institutes and construction enterprises cannot?" Unlike some other developing countries where there is a real shortage of experienced construction engineers, the Chinese enterprises have literally thousands of entities that can handle almost any type of project. While the quality of the work may not be up to world standards, it is sufficient for China's needs, and it is considerably less expensive than services that are provided by foreign firms.

Finding out what the foreign firm can do that a local firm cannot will be the key to entry into the Chinese market. New management techniques may be one way. In this paper, one new method of construction procurement, BOT, will be analyzed in terms of breaking into the market: the problems and solutions for foreign firms.

THE USE OF BOT IN CHINA

Governments have traditionally seen the provision of infrastructure services as their sole responsibility. This has been true for governments in both market and central-command economies. However, this paradigm is now changing in many industrialized countries. Many governments in the industrialized nations have simply run out of capital to fund all necessary infrastructure and are now forced by circumstances to look to the resources from private sector. These governments are now using an innovative contracting method called Build-Operate-and-Transfer (BOT) to attract private investment in large-scale infrastructure projects. Under a BOT scheme, the government authorizes investors to finance and build a project, own and operate it for a certain period, then transfer it to the government without capital charge. During the concession period of a BOT project, the government granting the concession acts more like a facilitator and customer than the traditional provider of that infrastructure facility.

As many governments in industrialized countries have already discovered, governments in some developing countries in Asia Pacific including China and elsewhere are now finding their ability to fund large-scale infrastructure projects increasingly diminished in the face of growing demand. It is anticipated that this new type of contracting method will be imported and applied in the near future to infrastructure projects of these developing countries. Power, transit and rail projects of these countries have especially high potential for BOT schemes to develop into reality. A 1995 study by the World Bank indicates that there is an increasing need for public-private partnerships to develop a massive number of infrastructure projects in East Asian developing economies (ENR 1995). The bank claims that over the next decade the developing nations will need to invest between \$1.2 trillion and \$1.5 trillion, about 7% of Gross Domestic Product (GDP) and a 2% increase over current investment levels, to sustain their phenomenal economic growth. The public sector, the bank concludes, has neither the finances nor the managerial resources to meet these needs.

According to the World Bank figures, nearly three-quarters of the world's nations are classified as developing countries (Beamish 1988). Examples of developing countries include Brazil, Nigeria, Mexico, Vietnam, China, Malaysia, India and Thailand. Most of these developing countries are undergoing massive economic development. Rapid economic growth in these countries inevitably leads to a vast need for infrastructure such as power generation projects, toll roads/bridges, urban rail systems, telecommunications, airports, water supply, etc. Many of these infrastructure projects are financed through government borrowing and also require large capital investment. Traditionally, infrastructure projects are financed through government borrowing and/or direct expenditure which are then recovered through charges from

users of the facility. However, most governments in developing countries may face a limited capital budget for infrastructure projects and the revenue generated from the existing infrastructure may also be insufficient to fund the sustainable development of future infrastructure projects. As the demand for infrastructure is far greater than the supply of funds available to provide new infrastructure, these governments have to rely on the private sector's participation in order to accelerate the development program. Build-operate-transfer (BOT) is one of the most popular approaches for temporary privatization of infrastructure. This is only for projects that are sound. If the project could not raise funding for whatever reason, it would not likely be able to attract the private sector's participation. Until recently, BOT is one method that China had refused to consider. Now, with the advocates of BOT brandishing it as the solution to China's infrastructure problems, China is forced to take a closer look at this method of construction procurement.

Structure of BOT Infrastructure Projects

A BOT infrastructure project is typically based on a concession agreement between a government (or a government agency) and a limited liability project company established by the sponsor. Under the concession agreement, the project sponsor is required to design, build, finance and operate the facility according to the stipulated performance for a specified concession period. As such, the sponsor is required to provide all funding and to undertake all risks associated with the project. At the end of the concession period, the facility is transferred free of charge and in good condition to the host government which may then choose either to grant a new concession to the existing or new operator or to operate the facility itself.

The project risks in most developing countries are relatively high, although it may vary from country to country. In those high risk countries, most BOT infrastructure projects would require financial support from the host government either in terms of direct financial involvement through equity or debt or indirectly through such mechanisms as resources supply contracts, currency exchange guarantees and/or offtake contract (Schell 1995). Thus, a BOT project in developing countries may have differences from those modeled in developed countries.

China's Motivations

There are many reasons for the Chinese government to adopt the BOT approach for development of its infrastructure projects:

- China's economic system is based on public ownership. With a view to the important role that the infrastructure plays in the national economy, the state has been being

very cautious in the introduction of foreign money for infrastructure. The major share of foreign capital had been limited to the investment of infrastructure. As BOT project doesn't essentially involve the problem of ownership, and the rights of use and operation will be transferred to the government in certain time, in this sense, BOT can also be used to transfer the private capital to public ownership.

- Like most other developing countries, China is facing high inflation and a heavy debt burden. Demands upon governments for infrastructure far outstrip the willingness of taxpayer to pay for them. This has compelled China to the private sector for investments which in the past would have been public. Until recently, governments have had to resist the demands or increase taxes, thereby courting unpopularity either way. BOT provides a third option. The private sector is prepared to provide infrastructure employing its own capital in return for the right to exploit the completed facility for a sufficient period of time and on such terms that it can recoup its costs and make a profit. In other words, the facility will be built privately in return for a concession. The BOT approach minimizes the impact on the government's capital budget and can also enable the government to implement the required infrastructure projects at a time when it could not itself provide the requisite funds. Alternatively, it can leave the government free to use its financial resources for other schemes which may be of less interest to the private sector. In this way, governments are able to provide additional infrastructure that would not otherwise have been affordable or to substitute private expenditure for budgeted spending which could then be used for other purposes. Instead of taxpayers paying through general taxation, they pay as users of the facility.
- Both pragmatic and ideological forces in China agree that the state-led development programs have simply not worked and, in fact, state-owned enterprises are often a major cause of fiscal deficit. (Haley 1992) the BOT approach can introduce increased efficiency from the private sector. The government can then try to tap the activity and creativeness of the private sectors by means of BOT, improve efficiency and productive forces by interest drive and settle the ubiquitous problems of the inefficiency in the operation of infrastructure.
- Private firms can be even more efficient than public entities to the extent that they are better able to resist nefarious political interference. Government ownership almost certainly blurs the line between the firm's finances and the general budget. Typically, firms getting budget subsidies have trouble maintaining quality operations

when fiscal problems arise. Or governments may be tempted to dip into the firms' treasuries in times of fiscal distress. The cost of this blurring of lines can be measured by the rapid system expansion after privatization, when corporate finances were freed from the public purse. With this separation, shareholders and debtors have some confidence that the firm's financial integrity will no longer be in danger.

- Where the infrastructure project is participated by multinational sponsors, China can benefit from the technology transfer.
- Lastly, public works and public facilities could be shifted to the track of private-ownership by means of BOT thereby accelerating the move towards a market economy.

Project Sponsor's Motivations

On the other hand, whether a project sponsor will participate in a BOT infrastructure project primarily depends upon its anticipated financial return. From a sponsor's viewpoint, it should be sufficiently high in consideration of two major factors; namely, the equity/debt requirements and project risks. As most infrastructure projects typically involve a large amount of capitals, a sponsor inevitably has to rely on borrowing from a lender. Without the lender's support on financing, most projects would not likely be feasible. From a business point of view, a sponsor would also look for low capital commitment and higher gearing in order to provide a higher internal rate of return. Therefore, a sponsor would only participate in a BOT project if the project itself could raise substantial amounts of funding.

In addition, a project sponsor would also look for a higher return for a higher risk project. The project risk in a developing country such as China are relatively high. While some sponsors may accept a high risk project due to its high return, the lender may not accept the same high risk. In order to obtain the lender's support, it is important that the overall project risk could be reduced to an acceptable level by proper risk allocation among various participants.

The Concession

The purpose of the concession is:

- To provide the promoter with the prospect of a return on his investment.
- To ensure that the public receives the desired quality of facility and service.
- To establish and regulate the fee payable by users.
- To grant the right to build and operate the facility.
- To provide for the return of the facility at the expiry of the concession.

During the concession period stipulated, the promoter has the obligation to build the facility and to operate it to specified standards. He also has the right to exploit the facility and to use the income from such exploitation to pay his capital and operating costs and to reward investors.

Upon expiry of the concession period, the agreement generally provides that the facility is to be returned to the government free of charge and in good repair. For governments having no wish to become the operator of such a facility, the expiry of the concession period will be the opportunity to sell a further concession or to sell the facility outright, whether to the promoter or others.

Revenue is Key

The key to the success of a BOT scheme is its revenue. Whether a scheme is “bankable” depends on the confidence of banks and investors in the certainty of the revenue stream over a lengthy period and its ability after operating costs to repay capital costs, loans, equity, and interest. The amount of revenue will be governed by the concession and, generally, the demand for the facility. There are three typical alternatives:

- User fees, such as tolls on roads or bridges. The level of fee is governed by the concession with some form of indexation or other adjustment formula.
- Public/private partnerships, where the government is in effect the user. With prisons and hospitals, the promoter is typically paid per cell or bed available provided that the facility is operated and maintained at the required period.
- Off-take agreements, where the facility is provided for a single customer such as a power or water utility. The contract will generally stipulate a guaranteed minimum payment with payment per unit of power or water thereafter depending on demand.

Financing of BOT has followed the limited-recourse project finance model, which means that before providing debt finance, lenders appraise a project's ability to generate cash flow rather than the sponsor's balance sheet. The key mechanisms for attracting private capital are the underlying contracts and security agreements that identify a potentially secure revenue stream. The financial structure, sources of financing, and terms of lending for projects depend primarily on the risk and cash profiles of the project (Table 2).

The cash flows for BOT projects are contractually predetermined, often with government backing. Though construction risk exists, the absence of market risk – and, hence, the relative certainty of payment – means that BOTs can be financially attractive and structured with more debt than full-utility concessions, whose cash flows may be less predictable. Also, construction

risks can be mitigated when a discrete facility already generating cash flows is taken over for expansion by the private sector. This was the case of the 20-year BOT contract in Johor, Malaysia that covers responsibility for operating an existing treatment water plant and financing its expansion. As a result of the attractive cash flow profile of the project, the state government's strong commitment to privatization, and the availability of long-term local finance at reasonable rates, financing for the \$284 million project was raised in record time – three months after the concession was signed.

Governments in developing countries have a vast need for infrastructure and have to rely on the private sector' participation in order to accelerate their development program. However, it would not likely be able to attract the private sector' participation in a BOT project if it could not raise substantial amount of funding. Most lenders would normally not provide funding for high risk projects. In order to reduce the overall project risk, all participants may have to share certain degree of risks according to their anticipated return. A project financing structure can be used to allocate the project risks among various participants.

The term 'project finance' generally refers to the arrangement of debt and equity for the construction of a specific revenue-generating facility in a capital-intensive venture (Tiong 1993). Most BOT infrastructure projects are funded by the project financing methods, which may be categorized as non-, limited or full recourse financing. A pure project financing provides no recourse; if project revenues are insufficient to cover debt service, lenders have no claim against the project sponsors beyond the assets of the project. There are no guarantees that loans can be repaid, as the loan service depends on product price, sale volume and the generated cash flow. Without cash flow, loans cannot be repaid, leaving the lenders holding the bag. This is especially true for lenders in developing countries, nothing beats cash up front (Carnevale 1988).

In many cases, the sponsor is required to provide certain limited recourse either in the form of direct guarantees in the case of some specified defaults (e.g. non-completion) or by entering into some approved agreements with other project participants such as resources supply contract, offtake or commodity contract and/or operation and maintenance contract to minimize the project risks.

In reality, many BOT infrastructure projects in developing countries are financed by full recourse project financing. The sponsor is required to provide full guarantees and takes the full project's risks. The ultimate credit risk is that of the sponsor. Obviously, the sponsor would seek to structure the project financing with as little recourse as possible to themselves, while providing sufficient credit support through guarantees and undertakings to satisfy lenders that the project's credit risk is acceptable (Schell 1995).

In any project financing method, the project sponsor must demonstrate the financial and technical feasibility of the project. In satisfying the financial feasibility, it must show that on the basis of cash flow projections, sufficient cash will be generated by the project to pay for all operating expenses, debt service, taxes, royalties and other expenses (with an ample cushion for contingencies such as changes in exchange and interest rates, taxes, inflation and market demand) and to leave sufficient surplus for the project company to meet its target for return on equity. In respect of the technical feasibility, a lender commonly relies on a feasibility study put together by independent experts. Some major banks have in-house technical experts who assess and monitor the project as well. In all circumstances, the lender will require substantial capital contributions by the sponsor to ensure a high degree of commitment to the project.

Equity and Debt

Project finance will be raised in the form of equity and debt. The return on equity investment will depend on the success of the project. Interest payable on debt is fixed by reference to a rate or formula.

Equity will be raised by the consortium members, who raise normally between 20 and 30% of the capital required. Equity may also be available from institutional investors, capital markets or the increasing number of specialized infrastructure funds.

Debt will be raised by the promoter from commercial lenders, institutions, export credit agencies and bilateral or multilateral agencies. It will often be divided between senior debt and subordinated or "mezzanine" finance, the latter at higher interest for taking greater risk. This lending will be non-recourse as far as the consortium members are concerned but limited recourse in fact.

The lenders will take elaborate security over the assets and rights of the promoter, primarily the rights under the concession itself including the land, the facility, the benefit of all contracts and bonds, guarantees and policies all in order to secure control over the income stream necessary to repay the loans.

Lenders to the project usually insist on "step-in" rights so that if termination for the promoter's fault becomes a possibility, the lenders may step in and take over the management of the project so as to avert the disastrous consequences that would otherwise follow.

Major Sources of Financing

The major sources of finance for infrastructure projects in developing countries are identified as follows:

- **Commercial and Investment Banks** – The commercial and investment banks usually act as financial advisors and lenders. However, in many developing countries, the political, legal, interest rate and currency risks are relatively high. Commercial and investment banks are thus less enthusiastic in their support for infrastructure projects unless the overall project risk can be reduced to an acceptable level.
- **Export Finance Bodies** – National agencies such as the Export Credit Guarantee Department (UK), COFRCE (France), SACE (Italy), US Eximbank and Japan Eximbank offer direct loans and loan guarantees at slightly concessionary rates. Export credits may be available up to 85% of the equipment costs and for a term of up to 15 years. For certain infrastructure projects (e.g. power generation), export credits may constitute one of the most important sources of the overall financial structure.
- **Contractors and Equipment Suppliers** -- Some large international contractors and equipment suppliers participate in project finance as a means of selling services and equipment. Investment by a contractor or equipment supplier may be limited to the services or equipment provided to a project (Beidleman 1991). Obviously, only those contractors and equipment suppliers with strong financial capacity can provide funding in such a way unless they can get export credits from their home country.
- **Multilateral Funding Institutions** – Multilateral funding institutions like the Asian Development Bank (ADB) and International Finance Corporation (IFC) offer loans, loans guarantees and co-financing for various infrastructure projects in developing countries. In addition, the World Bank also provides a guaranteed offshore debt facility designed to allow those of a similar project in a country with low political risk. This is known as the Expanded Co-financing Arrangement.
- **Stock Markets** – Some well established companies can raise capitals in stock markets for its infrastructure projects. The stock markets in most developing countries are yet to be matured and therefore, offshore listing is important to attract foreign capitals. Generally, investors are less enthusiastic in infrastructure-related shares in most developing countries, many of which are trading well below its offer prices.
- **Bond Markets** – Pension funds and institutional investors are particularly interested in bonds. However, investors are also generally less enthusiastic about those infrastructure bonds without backing by government guarantees. Even some governments in developing countries may provide guarantees, how robust these

guarantees may not be certain at all, particularly for those countries where their credit ratings are low.

Among the various sources of finance as identified above, most project sponsors would normally look for export credits for major plant and equipment and the remaining fund from multilateral funding institutions first and then commercial and investment banks.

An innovative financing in the transportation sector recently emerged in the Zhuhai Special Economic Zone, Guangdong Province, China. The Zhuhai Highway Corporation, Ltd. (the Company) sold US\$85 million of 10-year, 9.125% Senior Notes and US\$115 million of 11.5%, 12-year Subordinated Notes in the Euromarket. The structure of the financing is similar to a US municipal toll road revenue bond with features unique to circumstances in China. The notes are primarily secured by annual usage fees paid by vehicle owners traveling on Company roads, bridges and tunnels, and non-locally registered vehicles that pay a toll upon entering the City (Vehicle Charges). The Company is also required to maintain a 1.25 net debt service coverage ratio. There are annual usage fees and entry toll mandatory increases; quarterly debt service coverage ratio tests and increases in Vehicle Charges in the even the coverage ratio falls below 1.25%; a Debt Service Support Agreement to insure the convertibility of Renminbi into US dollars; a pledge of all outstanding shares of the Company as collateral; and a US\$ Debt Service Reserve. These features enabled the notes to secure an investment grade rating from both Moodys and Standard and Poors. Another Eurobond financing for a toll road in the Beijing metropolitan area was almost completed last year but was delayed because of a lack of central government approval.

Allocation of Risks in Project Finance

The considerable uncertainty regarding the asset value and the costs of rehabilitation and expansion in the water sector indicates that the regulatory risks faced by lenders and investors can be significant. Where the contractual and payment responsibility falls on financially weak municipal governments rather than on sovereign governments, political and regulatory risks are accentuated, and credit risks are created. Also, because water and sanitation projects rarely generate foreign exchange, financing projects with foreign-currency-denominated debt exposes lenders to foreign exchange risk – the risk that exchange rate depreciation may prevent the timely repayment of hard currency debt. Consequently, finding long-term debt at reasonable interest rates can be especially difficult for water and sanitation projects.

Project risks have been managed or mitigated in different ways. First, to address sovereign risks, debt for privately financed water projects has tended to originate from

commercial banks, export credit agencies (ECAs), and multilateral institutions (for example, the IFC was a source of direct loans and syndicated lending in Buenos Aires) owing to their ability to assess and mitigate these types of risks. Investors participating in capital markets are generally not able to do this, although established sewer and water projects should soon be able to tap capital markets. Second, lenders, as well as the government, gain comfort from the fact that equity is provided by experienced operators.

Finally, third-party and sovereign government credit support has been used to address municipal nonpayment risks. In Chihuahua and Puerto Vallarta, Mexico, credit enhancement provided by the federal development bank BANOBRAS was instrumental in the successful financing of two BOT wastewater treatment plants. Similarly, in the \$800 million BOT project in Izmit, Turkey, the weak credit position of the city required the Turkish government to stand behind the local government's obligation to purchase water from the private bulk water producing company. And in Buenos Aires, the government of Argentina's guarantee to pay compensation if the concession should be terminated early was the chief form of security for lenders.

Sound due diligence, effective incentives, and credit enhancements are not sufficient. Ongoing mitigation of risk requires clear, predictable, and fair rules to secure long-term private capital at reasonable rates. For BOT contracts, the rules governing private participation are embedded in the concession agreement. This document acts as security for the significant amounts of capital and effort that project developers and lenders put at risk. Consequently, the credibility of this document – whether it can uphold the expectations of both parties – turns on the ability of a country's legal institutions to enforce contracts and arbitrate disputes fairly.

Successfully attracting and securing long-term private capital in developing countries' water and sanitation sectors depends on the simultaneous development of a number of institutions, including creditworthy local governments, independent regulatory agencies, and deeper and broader local capital markets. Nevertheless, depending on the political and economic realities facing a given water or sewage system, a variety of approaches are available to help it become an operationally efficient and financially self-sustaining commercial enterprise.

A few broad conclusions can be drawn from the limited but growing number of projects that have been structured with private capital:

- Government political and financial commitment are essential;
- A contractual and regulatory structure that minimizes uncertainty and provides flexibility in renegotiation and operational autonomy is required;
- Transparent competitive tendering is an important tool with which to generate information on asset values, tariff levels, and qualified operators;

- Full-utility concessions and asset sales provide the broadest scope for operational and financial improvements; and
- Where concessions and asset sales are not possible, utilities can be corporatized or operations and management contracts awarded to improve services and revenue streams in preparation for privatization.

Due to the relatively high risks in most developing countries, these governments may have to share or accept certain risks inherent in a project in order to ensure its viability. Under such circumstances, it may be necessary for them to provide certain subsidizations through such mechanisms as a shareholder, as a financier, as a guarantors, as a resources supplier, as a product offtaker, with protection from competition, or with guaranteed return on investor's equity investment.

Nevertheless, in addition to the project sponsors and lenders, equipment suppliers, contractors, operators, raw material suppliers and product purchaser may also have to accept risks to a greater or lesser extent in order to participate in a project. The extent of the willingness of any party to shoulder project risks will vary with the anticipated return it will receive. The objective of a project financing structure is to allocate the project risks among various participants, reflecting their strengths and risk-bearing abilities in the project and thus reducing the overall project risk. The major types of risk associated with a BOT infrastructure project and the possible mitigation measures are identified below:-

- **Completion Risk, Cost Over-run Risk and Performance Risk** – This is collectively called as development or construction risk which is concerned with the possibility that the project cannot be completed on time, within budget or to required standard and performance, resulting in an additional development cost and/or loss of revenue. These risks may be protected by a turnkey construction contract, in which a turnkey contractor is wholly responsible for the design and construction of the facility at a fixed price, within a specified completion date and according to the performance specifications. The contractor is liable to pay liquidated damages for any late completion. In addition, the contractor is also usually required to provide a surety bond underwritten by a bank or insurance company for non-performance. Similarly, separate equipment suppliers are also usually required to provide independent warranties to guarantee the performance of their equipment.
- **Operation and Maintenance Risk** – This is concerned with the possibility that the completed facility cannot be effectively operated and/or maintained to produce the expected capacity, output or efficiency, leading to loss of revenue and/or increased

operating cost. This risk may be minimized by an operation and maintenance contract between the project company and an operating company, in which the facility operator undertakes to achieve the required output.

- **Market Demand and Price Risk** – This is concerned with the possibility that the facility operation cannot generate the projected revenues because of changes in market prices or demand for the product. For some infrastructure projects (e.g. power generation), this risk may be protected by means of long-term offtake or commodity agreements which guarantee a market for the product at an agreed price. Payments are usually subject to escalation or indexing in order to protect the real value of revenues from the increased costs of operating an aging facility. On the other hand, the debt service and repayment profile can also be formulated by reference to a matrix of factors including market prices, inflation rates, raw material costs, and tax rates, etc. as determining the dedicated percentage of revenues for the lenders.
- **Resource Supply Risk** – This is concerned with the possibility that the required resources for the facility operation cannot be available or can only be available at a higher price, resulting in loss of output and/or increase in operating costs. This risk may be minimized by a long-term supply contract which assures to the project sponsor and lender that the inputs needed to operate the facility will be available or lost revenue will be compensated. This is particularly important when the raw material prices depend on the world markets, while revenue is determined by the local market.
- **Interest Rate Risk** – This is concerned with the possibility that interest rates increase, forcing the project to bear additional financing costs (Beidleman 1991). Where necessary, the debt can be raised at a fixed rate of interest (e.g. fixed rate bonds) to reduce the interest rate risk. In addition, the finance package may include hedging facilities against interest rate risks by way of interest rate swaps and/or interest rate caps, collars and floors. However, many developing countries have no such swap markets.
- **Currency Risk** – This is concerned with the possibility that changes in foreign exchange rates alter the home currency value of cash flows from the project (Beidleman 1991). Exchange rates are particularly unstable in many developing countries. Same as the interest rate, this risk may also be mitigated by hedging facilities by way of currency rate swaps where there is such a swap market. If the local currency earning does not match with foreign currency debt service,

government and central bank's support should be obtained, particularly in those countries where its currency cannot be freely exchanged with foreign currency.

- **Political Risk** – This is concerned with the possibility that a collapse of the existing political order in the host country or the imposition of new taxes, exchange transfer restrictions, nationalization or other laws may jeopardize the prospects of repayment and recovery. Political risk may be mitigated in a number of ways
 1. Project sponsors and lenders should familiarize themselves with the tax and tariff laws of the host country and structure the project and its financing in such a way as to take advantage of double taxation treaties, bilateral or international trade agreements.
 2. Central bank undertakings to ensure the continuing availability of foreign exchange should be obtained if possible.
 3. Assurances against expropriation or nationalization may be sought, with guarantees that proper compensation will be payable in that event.
 4. Insurance against political risk may be taken out either on a commercial basis or with official bodies such as export credit departments or multilateral development agencies (Woody 1992). Some of these agencies include the Overseas Private Insurance Company (OPIC) in USA, the Export Credit Guarantee Department (ECGD) in UK, Compagnie Francaise d'Assurance pour le Commerce Exterieur (COFACE) in France, Treuarbeit Aktiengesellschaft (TREUARBEIT) in Germany, Export Insurance Division, Ministry of International Trade and Industry (EID/MTI) in Japan and the Export-Import Bank of Korea (EIBK) in Korea. Whilst the support available differs from country to country, the project sponsors and lenders can apply for some degree of protection against war, insurrection or revolution; expropriation, nationalization or requisition of assets; and non-conversion of currency and imposition of discriminatory exchange rates.
 5. If the financing is arranged in parallel with organizations such as the World Bank, International Finance Corporation, and regional development banks (e.g. the European Investment Bank and the Asian Development Bank), commercial lenders might reduce the risk that the host government will interfere with their interests. Similarly, if the financing is arranged with a syndicate of lenders from a wide range of friendly countries including a

number of local banks, the risk of jeopardizing its trade and other relations with those countries may deter the host government from taking action.

- **Legal Risk** – This is concerned with the possibility that the BOT project throughout the whole concession period cannot be properly protected by the less sophisticated legal systems in many developing countries. For examples, dispute resolution may be problematic; foreign parties may not have equal access to the courts; choice of foreign law may not be recognized; foreign judgments may not be enforceable; the ability to refer disputes to arbitration might be restricted. Laws on the taking and enforcement of security particularly in the case of movable assets, cash flows and contractual rights may be less than ideal and existing laws may preclude the ownership of real property. The concept of a trust may not be recognized, posing problems for security sharing and transferability of lenders' interest. It is crucial for the project sponsor and lender to undertake a thorough review of the legal risks at an early stage by taking the advice of their own local lawyers.

Cost

The basic elements of service pricing include construction cost and operation cost. Owing to the specific characteristics of the infrastructure industry, the construction cost usually takes a rather large proportion in cost because it should be input at one time. Thus, the average cost and marginal cost curves tend to slope downward on the right. See the following diagram:

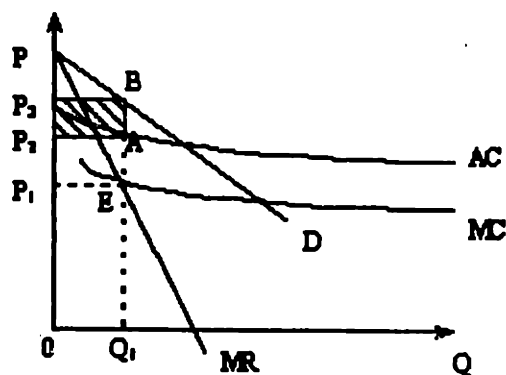


Diagram 1

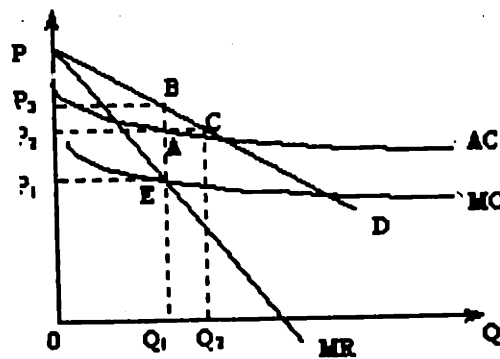


Diagram 2

In diagram 1, marginal cost and marginal returns cross at point E, at which the output is Q_1 , the price is P_1 and the returns they obtained can only cover the operating cost. When the price rises to P_2 , the returns can only compensate the operating cost and construction cost. The Chinese infrastructure have been operating at a loss or minor profit because the price controlled by the government, the price usually being at P_2 or even around P_1 . As infrastructure is public products, the loss means the subsidy to the users, while the foreign investors are pursuing at least the average profits when entering the Chinese BOT project. So it can be easily seen that the private capital will never enter the market at P_1 or P_2 unless the government give the extra subsidies. When the marginal cost is equal to the marginal return, in accordance with the demand curve, the price is P_3 , at which the investors can obtain the monopolistic profit indicated in the shadow. And this price is surely acceptable, but it won't mean that it can bring about the maximum of public interest because at this point, the quantity of the affordable enterprises might decrease and the investment capacity may be left idle. If the price is set at P_2 by the government (diagram 2), then the investors can regain their capital and acquire more profit only by reducing operating cost. However, the output increases from Q_1 to Q_2 and the public interest of the project increases accordingly.

Diagram 2 illustrates that higher public interest can be achieved with lower price on condition that the marginal cost curve and the average cost curve remain sloping downward. In

this case, the government should offer an extra subsidy in order to enable the investors to gain the average profit at least.

If the cost decline, the marginal cost curves and the average cost curve will shift downward. In this case, the project may provide more products for the society and more monopolistic profit for the investors if the rate of marginal return and the demand curve remain constant. Obviously, the decrease of cost can result in the increase of the investors' return and the public interest. So it is important to determinate the construction cost and operating cost correctly for service pricing. (See diagram 3)

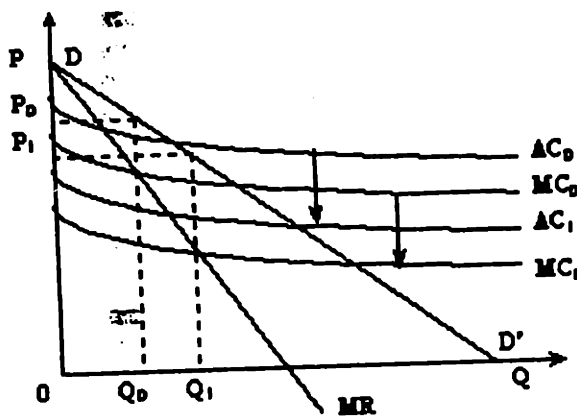


Diagram 3

Risks

Usually the risks in operation stage include political risk; market risk concerning competition, overdraft and the emergence of new technology; financial risk on the fluctuation of exchange rate, inflation and the increase of interest rate; legislative risk and environment risk. Among these risks, exchange risk and inflation risk should be given more attention in China.

Now RMB is inconvertible under the capital item, the government should permit them to remit their return abroad on consulting exchange rate. In some cases, only by government subsidy can investors maintain their anticipated profit when RMB depreciates greatly.

In recent years, China is confronted with continuous high inflation. The overheads of enterprises, especially the purchase price of raw materials has risen quickly during inflation but the price of infrastructure often is difficult to regulate because of the government's control, this adds to the risk of BOT projects. In this case, the government must subsidize the investors or allow them to make a corresponding adjustment to service pricing in line with the inflation index. For price adjustment, there are two aspects we should pay more attention to. First, the price increase will often end in Domino Effect which may increase the price further. Second, the risks are difficult to be reduced by service re-pricing in case the price level affects the demand, because the increase of price may lead to the decrease in demand and then in the total return of the project.

In addition, the preferential policies in the cooperation will also exert an influence on service pricing. For instance, the control over the market demand can be an important element in service pricing, when the government assures the investors of a certain volume of demand, the former will inevitably adopt the limiting pricing policies. For example, the Australian government guaranteed the minimum traffic for the cross-sea tunnel of Sydney, under which the government would give subsidies and above which the return be jointly shared by the government and the investors. In case of subsidies, it is natural that the change of demand won't be taken into account in service pricing. For another instance, the government can enable the investors to obtain the monopolistic profit by maintaining the natural monopoly of BOT project and restraining competitions. There are lots of such cases abroad. For examples, the British government pledged that another tunnel wouldn't be built in 30 years for the submarine tunnel project; the Scottish government promised that ferry service no longer exists for the bridge project. When the government had offered other preferences, rigorous control should be enforced over service pricing. Conversely, the investors should be given more freedom in pricing when the degree of monopoly is lower and the preferences are rather few. As a matter of fact, service pricing is influenced by the government's macro-regulation and market force even if the investors are allowed to price freely.

CONSTRAINTS FACING FOREIGN FIRMS IN CHINA'S BOT MARKET

The inadequacies of China's infrastructure investment system were recognized years ago. Although the needs and the potential were vast, investors stayed away in droves. The problem was that risks were perceived to be greater than elsewhere in Asia, while rewards were lower. There were several reasons for this:

- The government's refusal in principle to provide sovereign guarantees against any of the project risks. Local governments are formally prohibited from giving financial guarantees of any kind, although dispensations can be granted by the State Council. China also prohibits domestic financial institutions from giving guarantees.
- Inadequate assurances over currency convertibility.
- Projects are usually undertaken by special-purpose companies rather than established utilities.
- The vagaries of the court system. In particular, the arcane system of Chinese "land-use rights" makes the prospect of taking security over land fraught with difficulty.
- Low rates of return. Private investors in infrastructure projects in developing countries generally look for returns of 20-25%. In China, the rate was capped at 15%.

The government's solution was to introduce a new regulatory environment based on BOT principles. BOT rules were introduced in August 1995, and first implemented in Guangxi's much-hyped Laibin B power project. Laibin B was awarded to a French-English consortium in November 1996. The 2 350MW Laibin B plant, costing about \$560 million, is the first power project wholly funded by foreign investors without a government guarantee. It will be built and owned by a 60-to-40 joint venture of Electricit- de France and GEC Alsthom. The two units are scheduled to be operational in 1999 and handed over after an 18-year concession period. Of the total amount, French export credits will cover \$290 million of the financing costs while the consortium will provide \$140 million in equity. The provincial government has guaranteed offtake and coal supply. On the positive side, BOT provides a number of advantages over the traditional model:

- The project company is chosen by a bidding process in accordance with international practice. This is quicker and more efficient, tending to encourage selection of the most cost-effective bid.
- The project company retains ownership and control over both construction and operation of the plant during the term of the concession. Although in some ways this

actually increases overall risk from the lender's point of view, it also provides the opportunity to create a more attractive payment structure.

- Lenders have additional security in that they have the right to replace the project company should this be necessary.
- By relieving the local utility of responsibility for construction and operation, extra profit can be made by the project company by keeping construction and operating costs at lower than projected levels.

Since Laibin B, non-recourse financing has been widely touted as the cure to China's infrastructure malaise. Several other BOT projects have been lined up, including a 400,000-tonne-per day water treatment plant in Chengdu, Sichuan province, and a power plant in Changsha, Hunan province, which closed for tendering in September 1997. But the only significant development on the BOT front since Laibin B involved attempts to finance the second phase Waigaoqiao power project, a massive coal-fired plant (China's biggest) under construction in Shanghai's Pudong district. These negotiations died a quiet death in November 1997. Although BOT financing was dropped, reportedly on the grounds that it was "too complicated", a more likely reason, raised obliquely by a Shanghai Electric Power Bureau official at the time, was that the regulatory regime was inadequate to satisfy concerns of foreign financiers. That such a large, high-profile project like the Waigaoqiao power plant should fail to measure up does not bode well for the future of BOT. The Waigaoqiao deal fell through despite being backed by the World Bank.

What are the roadblocks that hinder the development of BOT schemes in the developing economies? Answers to this question are keys for breaking the various barriers blocking the growth of foreign investor/host country government partnership, and they can be found by comparing some of the BOT schemes, in China and other Asian countries, that have run into difficulty now or in the recent past.

Application of Qualifications Certificate

The provisions require that all foreign contractors who intend to undertake construction or decoration of building or civil engineering works, or installation of pipelines or equipment should apply for pre-qualification and a Qualifications Certificate to the Ministry of Construction or the local construction administration authorities.

The foreign contractors who have operations in more than two provinces, autonomous regions or municipalities (cities directly under the central government) should apply for the Qualifications Certificate to the Ministry of Construction. The foreign contractors who intend to

bid for construction contracts in the special economic zones (i.e. Shenzhen, Zhuhai, Shantou and Xiamen) and the cities open to foreigners (i.e. Dalian, Qinhuangdao, Yantai, Qingdao, Lianyungang, Nantong, Ningbo, Wenzhou, Fuzhou, Guangzhou, Zhanjiang, Beihai, etc.) should apply for the certificate to the local authorities of the zones or cities. Otherwise, they should apply for the certificate to the province-level construction authority in charge of administration over the construction works to be carried out by them.

The licensed foreign contractors are then still restricted to bidding for construction works which are financed:

- Directly by foreigners
- By loans made entirely by foreign financial institutions and obtained through open competitive bidding
- By joint-ventures between Chinese and foreign investors, but the local contractors can not execute on their own for technological reason
- By local entities but the local contractors for some reasons are not capable of executing on their own.

Tendering Practices

The process of selecting, either on a competitive or a negotiated basis, a contractor of construction, geological survey or design services or a supplier of building material and/or equipment is referred to as the tendering procedure. Now in China, this process and related regulations are also referred to as the tendering system.

Tendering has been used in western countries to select a contractor or supplier for more than 200 years. In China, the practice of obtaining building and civil engineering works by way of tendering dates only back to the turn of the last century. Following the Opium War (1839-1842), China was forced open to western countries and the tendering procedure was brought into the country and had been used in the coastal areas and major urban centers prior to 1949 when the People's Republic of China was established in Beijing. During the period from 1949 to 1957, a major portion of construction works was allocated to construction enterprises by governments through a contracting system in which a contract was entered into between a government agency and a construction company providing for obligations and liabilities of the parties to the contract. The contracting system worked quite well during the period. However, in the subsequent years the contract system was condemned as a capitalist practice and was abandoned. The drawbacks suffered due to the lack of a contract system gave lessons to the government. The 3rd Plenary Session of the 11th Central Committee of the Communist Party of China in 1978 declared China's

reform and open door policies and then the State Construction Commission of the Communist Party of China in 1978 declared China's reform and open door policies issuing "The Recommendation on Contracting Capital Construction Projects" in April 1979. The document required that a contract be entered into between client and construction company to bind the parties so that they join their efforts to accomplish the state capital project. Soon after the issuance of the document, tendering system was adopted formally in Shenzhen Special Economic Zone for allocation of the construction works in the early of 1980's. The tendering system was proved effective in shortening completion time, improving quality and lowering costs of construction works. This practice caught the attention of the central government and became one of the moves for reforming Chinese construction industry which were written in the documents of the 2nd Plenary Session of the 6th National People's Congress held in May 1984. In September of the same year, the State Council promulgated a document related to construction industry reform requiring that the tendering system should be used for allocating construction work. Since then, the tendering system has become increasingly popular in China. Therefore, a construction market for construction enterprise to compete with each other has taken shape, which in turn has facilitated the development of the construction industry in China.

Tendering is relatively new to the Chinese construction industry – just twelve years old. In 1984, only 4.8% of construction projects were put out to tender, but by 1994, this number had grown to about 40.6%. The development of the tendering system varies from region to region. In practice, most tendering work is limited selected contractors for construction. Very little is for planning, design or material supply. In 1993, for instance, of the 3890 construction projects put out to tender in Shanghai, only 182 were for prospecting and 185 for design. The rest, 3528, were all for construction only.

Many think that China lacks a real competition environment and the tendering process is entirely different compared with international practice. The ideology has been introduced into the Chinese construction market. But reality differs from ideology. Although an adjusted price system is adopted, it still needs further reform. However, one should realize that China is adopting a step by step approach to change and any movement towards a market economy can only be taken after a series of related conditions have been set up. This is the fundamental approach needed to minimize problems or unrest. Also, the implementation of these systems is improving although the real circumstance has not yet been formed. Formal government guidelines and macro adjustments are very important factors to assist in the formation of a fair competition surrounding.

The Characteristics of Tendering System in China

Now the economic system of China is in transition from a planned economy and the tendering system in China can be characterized by the following:

- The bidders competing for construction works are all from public-owned enterprises. Thus, it does not make a difference winning or losing the contract since, theoretically, all the participants work for the State's benefit
- The tendering competition is limited and guided by the governments. The construction works to bid for are all included in the State's capital construction plan. The clients and contractors are required to be pre-qualified by governments. The bid prices must be calculated based on the State's standard norms with just a limited price spread allowed. The governments have their own agencies in charge of preparing the norms and forcing the bidders to use in their preparation of bids.
- The bidding process is to be carried out under the administration and supervision of a government agency in charge.

Political Force Majeure

Political Force Majeure describes the risk of government actions endangering a project. Actions can occur at the central (federal), provincial, or local levels of government, and can have disastrous impacts on a project.

The risk of government action or policy changes is ever-present on Chinese infrastructure projects. The legal system in the PRC is still in its infant stages, and its independence from the ruling government bodies is dubious. This gives foreign firms very little legal protection from government actions that can range from breaches of contract to outright expropriation. More specifically, primary political risks can be broken down into:

- Difficulties / delays due to government licensing and approvals;
- Corruption at various levels of government;
- Expropriation of project assets

Bureaucracy

The negotiation and approval period for doing business in China is usually long and the feedback from the Chinese is slow due to bureaucracy. Thus, the approval period for a business contract may be delayed for months without reason. Indeed, local bureaucracy affects the whole construction process from its early stages, such as feasibility studies, to the latter stages or even

after completion of construction works. Foreign contractors generally have to be prepared to make allowances for delays caused by local bureaucracy.

Uncertainties in law-related aspects remain serious obstacles. Although China has made great efforts to enact appropriate laws since the economic reform, a number of fundamental and important laws still need to be enacted and enforced. Also, there is a lack of a substantial official organization to implement commercial laws. Because of the lack of a contract law and a complete legal system, contracts are workable in China only because the negotiation compensates for the incompleteness of the contract. Such practice is only suitable for simple contracts, however, and is not adequate for major international building projects in which foreign and Chinese developers, consultants, contractors and specialist contractors are involved. Due to the lack of a complete legal system and different contractual practices, a foreign contractor may be unable to apply the essence of a contract which specifies his obligations and rights in managing his subordinates in the mainland. Apart from the incomplete legal system which affects the enforcement of a contract, many internal regulations are confidential and are not disclosed to foreigners.

Obtaining approvals for a project from a complex web of government agencies and departments, from municipal to provincial to central government levels, can be an extremely time-consuming process, delaying entire projects and hurting their financial viability. The State Planning Commission in Beijing, which must approve any infrastructure above a certain investment threshold, is notoriously slow in its review process.

Corruption

While the use of money or gifts in exchange for establishing a business connection is considered a bribe and is illegal in the US and most other developed countries, it is considered standard business procedure in China and is used as a way of establishing connections or "guanxi." Traditionally, Chinese people prefer to do business with friends who can be trusted. Thus, establishing a better relationship and mutual understanding with the personnel involved is critical. In order to do business in China, most businessmen know that they must first establish the right type of connections or "guanxi" with Chinese government officials and other locals. In addition to the normal business operation expenses, it is expected that a certain additional amount will go to establishing connections and curing favors. A good relationship between the top management of a contractor and important officials will be invaluable to that contractor in solving problems.

Corruption is widespread at all levels of government, and is regarded by many firms as an unavoidable fact of life on Chinese projects. This presents risks of spending either too much money on corrupt officials, or spending money in the wrong places, or at the wrong times... all at the risk of having a government agency turn against you and your project. One example is the Chinese army, which is powerful not just in military might but also in terms of politics and commerce. On a toll road developed by a Hong Kong's builder/operator, the army was allotted free passes to use the road; however, military officers have started to sell the passes on the black market to civilians and in many cases - free pass or no free pass - simply refuse to pay at the toll booths!

Expropriation of Project Assets

Finally, there is the risk of expropriation of project assets by the government. This can take the form of nationalization of a facility wholesale (rare) or "creeping" expropriation whereby the government changes regulations, taxes or tariffs after a project is complete to gradually take over the facility and its operating profits (common). Further, there have been many where the government has simply taken over ownership of construction equipment at the end of a project.

The above examples show that political force majeure is a potent risk that cannot be ignored by foreign EPC firms pursuing BOT projects in China. China is still a developing country, although its economy has been growing rapidly in recent years. There is a plenty of opportunities for foreign contractors to step on the construction market in China. However, China's unique culture and social system which are not familiar to many foreign contractors make the tendering system in China different from that of western countries. As a result, the administrative procedures and regulations which the foreigners have to follow are also different and sometimes a little confusing. It takes time and patience to get familiar with all this. Only those foreign contractors who have fully understood the system and feel comfortable about it can survive and succeed in bidding for construction contracts in China.

Tariff Adjustment

While improvements in currency convertibility help to stabilize revenue forecasts for foreign firms in China, the China's approach to tariff-setting on privatized projects has the opposite effect. To control inflation, Beijing insists on renegotiating tariffs each year, rendering overall project revenues and rates of return unpredictable.

In addition to the Chinese government's insistence on renegotiation of tariffs, there is confusion in the international investment community with regards to perceived "price caps"

imposed by Chinese authorities. While the Chinese government's State Planning Commission has declared that there are no such policies, several developers have complained about 15% caps on project rate of return. If such caps do, in fact, exist, they significantly reduce the viability of infrastructure investment projects since they limit foreign firms' ability to balance Chinese risks with corresponding returns.

Financing

In the face of Chinese BOT risks, project financing can be difficult, with high costs of capital due to the high levels of perceived risk. The Chinese government is unwilling to provide financial guarantees to private infrastructure ventures, since one of the primary objectives in letting concessions in the first place is to offload its own financial exposure. BOT developers in China are challenged to assure investors of secure rates of project return in the face of inherent uncertainty; creative approaches to financing and investment security are required to avoid extremely high costs of capital.

Determining Service Pricing in China

As far as the scope of BOT means is concerned, it generally applies to those areas where competition is not so keen. Specifically, they may include or potentially include such projects as railways, highways, bridges, tunnels, ports, airports, water supplying and draining systems and power station, etc. Though these infrastructure need long periods in construction and substantial amount of investment, they still have certain appeal to private capital because they possess the nature of natural monopoly, provide identical products, gain profit by charging the users for the service they offered and also the market risk is low and profit is relatively steady. The principle for the private capital operation is interest drive, so the rate of returns is the first thing the investors will consider. Generally speaking, the premise for a BOT project is a certain limit to a certain lowest service volume, so the charging standard of infrastructure, that is, the problem of service pricing, becomes a decisive factor for the rate of investment returns. The higher the price, the higher the rate of returns. If the price is so low that the private capital can't get the same rates of returns as that in other fields, the private investors will lose their interest. As for government, it is a key point to the introduction of BOT means that certain rate of returns should be assured for the foreign party.

Though in a market economy state, service pricing by non-BOT means will occasionally be regulated by government, but the price won't deviate too much because the market mechanism is in operation. Whereas in China, the price system had been twisted greatly due to the long

period of planned-economy system. Those products with nature of monopoly were subsidized by the state and the price of service was set so low that it couldn't cover its actual cost. Also the domestic infrastructure industry had been operating at a loss over a long term so it's unrealistic to let the investors of BOT projects accept such a price which is deviating far from the market price. But if the price is raised and the original price system is still working, a double-track system will surely follow, resulting in chains of reactions. First, raising the service pricing of infrastructure will lead to an increase in the production cost of the enterprises, which can cause bankruptcy in case the price exceeds the bearing limit of the enterprises. Second, the increase of production cost will reduce governmental revenue. Third, it may even touch off a cost-promoted inflation. All of these elements should be considered when the government negotiates with private capital about service pricing.

As stated above, there are many kinds of infrastructure projects which can be built by BOT means. Each project varies in the degrees of monopoly, modes of transaction, means of construction and investment return. For instance, the volume of transport is hard to guarantee, the return of road building investments also difficult to assure. The construction of power station which usually adopts the means of combined networks will be able to assure the investors' return provided the government can determine the capacity generated by BOT power station in the combined network and the purchase price. So a uniform standard for pricing is out of the question. Even so, the basic problems in pricing still call for attention.

Inadequate Profit Return from the Project

Some BOT projects could generate enough income once the projects are complete and, therefore, are bankable by themselves. Take surface transportation projects for instance. One such profitable example is building a railroad line in highly-populated areas in Hong Kong, like the MTR. The income of MTR is mainly generated by collecting fares and developing the superstructure-related real-estate projects around the MTR stations. Due to the high ridership and high land value, such a railroad line project is bankable by itself. Other BOT projects, like building a similar railroad line in most of China's metropolitan areas, are not going to be as profitable. In fact, some of them are doomed to be loss-makers by the BOT schemes alone. The main reasons are that the land supply in China is much larger than that of Hong Kong and that the market for BOT is not as mature as that in Hong Kong.

Many other projects are situated somewhere in between the two extremes. There are two tollroads in the United States of America that are good examples of BOT projects in this category. Both tollroads opened to traffic in 1995 [3,4]. One is the \$330-million Dulles Greenway

and the other is the \$126-million State Route 91. The Dulles Greenway opened September 29, 1995 and runs from Leesburg, Virginia to Washington-Dulles International Airport, where it connects with the Dulles Toll Road. State Route 91 opened December 27, 1995 and is a ten-mile stretch of toll lanes built into the middle of an existing freeway in Orange County, California. Both tollroads so far have drawn disappointing daily travelers, well short of the expected averages their owners projected by the end of the first year of operation. These roads are being studied as examples of mistakes to avoid, even by those who believe the Greenway will eventually reach its projected volume. In particular, toll road and transportational officials in the U.S.A. believe the Greenway has been hindered by its lack of a market study, consumer-oriented advertising and off-peak pricing.

To achieve a high rate of return for their investments in a BOT project that can not generate adequate profit return by itself, foreign investors would ask for other forms of compensation, like land compensation, from the central or local governments of the host country.

Disagreement over Toll-Rate Principles

In the Dulles Greenway Tollroad, pricing is seen as a problem. Drivers have resisted paying the stipulated toll even though they get a brand-new traffic-free road. This underscores the importance of pricing in a surface transportation project. The developers of such a BOT project have to be very sensitive to the price that travellers are willing to pay for convenience. Otherwise the buildup will be slow, and it will take a long time for the project's traffic to reach its break-even point. If the buildup of traffic is too slow, the developers may have to foreclose the project or seek refinancing.

To avoid the light traffic problem at a project's debut, foreign investors for such a BOT project would ask for favorable and flexible toll-rate formula. When this is denied by the central or local governments of the host country, the BOT scheme will fizzle. A good example is a 45-km BOT tollroad in Shenzhen, China. The sticking point for this project is that the foreign investors and the local government can not reach a set of mutually agreeable toll-rate principles. The provincial government wants final say over how much the future users of the road will be charged. But the foreign investors argue that if the government won't agree to allow tolls to increase in step with inflation and any devaluation of the Chinese yuan, authorities must guarantee that the government itself will make up the difference. From the foreign investors' view point, the toll-rate principles need to form the basis of a bankable arrangement and the concepts outlined. If these conditions are successfully and legally agreed and implemented, they should provide a sound base for the financing and indeed the project itself.

Fear Of Depreciation Of Local Currency

Inflation is the biggest threat to sustained rapid growth in some developing countries. China endured two big price rises in recent memory: one in 1988 and another in 1994. Now things are better, as the government officials learned more about price control and management. They are paying close attention to the overall scale of investment and growth in the money supply. They are undertaking price reforms to make sure prices don't change too abruptly. They are maintaining the proper supply of agriculture products and key consumer necessities, and also are looking to prevent profiteering whenever supplies fall short. But there is still a great potential for Renminbi (RMB), the Chinese currency, to depreciate against other key foreign currencies, as the predicted 1996 growth rate for China is still much higher than the rates predicted for most of the industrialized nations.

Limited Convertibility Of Local Currency

Foreign companies are paid in Chinese currency for local projects, which is not an internationally convertible currency and is usually undervalued. Basically, investments made by foreign investors in BOT schemes in developing countries are foreign loans encouraged by the government of a host country to ease the capital shortage. Since the revenue produced by a BOT project is in local currency and the loan made by the foreign investors is in foreign currency, conversion of currency is necessary for both loan service and capital and profit repatriation. Timely conversion of currency is also desirable if the adverse effect of depreciation of local currency is to be minimized. But when there is a credit crunch in the country where the BOT project is located, the government of that country may impose a strict quota on the foreign currency available for conversion, making any BOT scheme more difficult if not impossible. To avoid this problem from the onset of a BOT project, foreign investor usually will seek foreign-exchange guarantee from the central government of the host country or, if that is not possible, the support from the local governments.

Exchange rate and currency convertibility of the Chinese RMB have posed risks for foreign firms in the PRC for several years. China has gone through difficult times with its currency, switching from a two-currency system to the RMB single-currency system five years ago and coming through periods of dangerously low foreign exchange reserves. However, today foreign reserves are among the world's highest, and China's continuing foreign exchange reform is doing much to allay investor fear about currency conversion. Be that as it may, the Renminbi

is still only a partially convertible currency. There are corresponding risks to the ability of a foreign venture in China to convert and repatriate RMB profits into foreign currency.

Lack Of Full Operational Rights

Another hurdle for BOT schemes is the reluctance of central or local governments of the host country to give full operational rights to foreign investors for infrastructure projects. Many government officials of the host country who are directly in charge fail to fully understand the meaning, spirit and potential of the new innovative contracting method for infrastructure projects. Traditionally, foreign companies involved in infrastructure projects in the third world countries are viewed by many as capable of playing only supporting roles. Foreign companies are viewed by them as instruments to bring urgently needed foreign loans, means to import advanced construction equipment or foreign currency, or tools to meet the requirements of the World Bank or other international financial institutions. Therefore, they think token involvement of foreign companies in the project will be enough to satisfy their intended purposes for these companies and are unwilling to give them full operational rights of the BOT project.

A light-rail line project in Wuhan, China proposed by a group of Hong Kong investors in 1995 is such an example. In the BOT concept, the investors receive the reward of their investment by operating, directly or through an operational company, an infrastructure project for a certain period before handing it over to the government. Denying full operational rights of a BOT project to foreign investors is contrary to the fundamental concept of BOT.

Lack Of Regulatory Frameworks

Lack of regulatory framework in some countries usually make the development period of a BOT scheme unnecessarily long and costly. The investors of a scheme may have to deal with many different authorities, go through a complex series of negotiations, and still be unsure that their investment could get a reasonable rate of return. During a time period when there is a surge of foreign investments into a host country, the government, in an attempt to reduce the terms of the concession and thus the profit return of potential BOT investors, may even use delay tactics and try to play one BOT investor against another. In such a case, foreign investors from certain countries or with certain culture backgrounds will have unfair edges over their competitors. Further discussion on this deterrent is given in the subsection "Fear of Becoming Victim Of Political Conflict" below.

Fear Of Becoming Victim of Political Conflict

In a developing country, a BOT project financed and constructed by foreign investors can easily become the victim of political struggle between confronting local political groups. The 2,015 Mw Dabhol Power Project in India is an example in point. It became a well-known project in the engineering as well as investment communities when the U.S. government issued an warning to the Indian government in 1995 regarding this project. The warning came amid an inquiry by the, then, newly elected government of Maharashtra, the India state of which Bombay is the capital, into a \$2.9 billion agreement between the Houston, Texas-based Enron Development Corp. and the previous state government to build a power station over-looking the Arabian Sea. The warning was issued jointly by the British Finance Minister and other foreign chambers of commerce. The new government said it was investigating how the contract had been awarded to Enron and the new plant's cost to the state, and ordered Enron to stop work at the site in August 1995. A major source of opposition to the gas-fired facility had been a guarantee given by India's federal government to Enron that involved fixed returns for foreign investors in power projects.

After the suspension, Enron filed its arbitration proceeding in London to recover as much as \$900 million in development cost, contractor penalty payment and lost profits. The suspension also led other foreign developers and financial institutions to put a hold on their power plant plans for India. In response to the suspension, Enron had offered to cut \$300 million from the initial cost. Nearly six months of uncertainty later, Enron finally obtained approval from the Maharashtra state administration to revive the stalled project. But the action came tagged with a modified project profile substantially different from what the firm had initially conceived. Under the proposed agreement, capital cost would be cut to \$1.825 billion and the electricity rate would drop to 5.4 cents per kwh over 20 years, compared with 7 cents in the original agreement. Enron had to agree to several concessions, including bearing the entire cost of converting the project into a multi-fuel plant. It needed to seek domestic fuel supplies, rather than depending on imported liquefied natural gas. Reductions in cost and rates would actually be accompanied by increased generating capacity. Dabhol's two phases would have an installed combined capacity of 2,450 Mw instead of the initially conceived capacity. Until January 1996, Enron still refused to withdraw its arbitration proceeding from London.

The Dabhol Power Project is a good case for illustrating a BOT project where foreign investors have lost trust, near completely, in the governments of the host country. To restore the trust of foreign investors and would-be investors, the New Delhi-based Associated Chambers of

Commerce and Industry demanded that an independent regulatory authority be set up in India so that large infrastructure projects are not reversed with changes in governments.

Sharing of BOT Risks and Costs

BOT business is risky business. BOT schemes are intrinsically risky no matter where these projects are located. In U.S.A., the Congress passed a bill in 1991 to encourage public/private partnership in tollway development. But many investors are gun-shy about joining forces because of the lack of history in the area of new tollroad projects in the country. Tollway defaults in the 1950s and 1960s, such as the Calumet Skyway in Illinois and the West Virginia Turnpike, are still fresh in the minds of many developers and government officials there. Those tollways, which have since regained profitability, defaulted primarily due to a lack of coordination between tollway authorities and department of transportation.

Tollroad defaults in the states in the past may well repeat themselves in some developing countries in the near future. The BOT concept is relatively new in these countries, and there is a lack of domestic BOT history on which the government officials could base their judgement. Usually, the government officials will underestimate the risks and costs associated with BOT schemes, and are unwilling to take initiatives to pass laws that facilitate their formation, shorten licensing process, accelerate procurement of materials and equipment needed to build the facilities, and quickly address regulatory matters. As a result, the risks and costs associated with BOT projects will keep increasing for the foreign investors.

The difficulty is for the foreign developers to educate cautious officials of the host country, who fear giving away too much, about the risks and costs involved. It is even more difficult to convince them that their government has to bear some of the risks and costs, for the foreign investors will not take it all on themselves. Many BOT negotiations will simply fizzle when the foreign investors fail to see a match between the risks and costs involved and the ceiling on the rate of return placed by the governments.

Differences In Standards and Practices

Standards, specifications, and practice methods used in engineering and construction vary from country to country. Design engineers, planners, architects, and constructors on different levels of the same learning curve tend to see the same design problem and interpret the same contract term differently. In BOT projects, the foreign developers sometimes have a preference to use architect and engineer from their own or other developed countries; while the officials invariably have a preference to use local ones. For the foreign investors, having an architect

and/or engineer from their own country involved in the project will ease communication and help overcome language difficulties. The project will also benefit from past experience and using state-of-art standards and practices. But for the officials, engineering and construction companies of the host country, using foreign architects and engineers in BOT projects means reduction of the market shares for the local companies and higher costs for the projects. The Petronas Twin Towers Project in Kuala Lumpur, Malaysia is a good example for illustrating that foreign investors may have a point in such a case.

The 1.7-million square-meter, 451-meter-tall twin-tower building in Malaysia is nine meters taller than the record-setting Sears Tower in Chicago, U.S.A. The tallest towers in the world did more than setting a new world height-record in January 1996. The voracious consumption of imported new technologies and foreign skills by the project is helping Malaysia achieve its ambition to join the rank of the most-developed nations by 2020. The project hired American, French, British, Korean, and Japanese engineers in a big way, and, as a result, is designed in line with international standards. It is equipped with the most advanced mass dampers, automated building controls, power backup, fiber optic cabling, and energy recovery system. The towers give Malaysia a giant leap in knowledge and technology, because Malaysian engineers and constructors get hands-on experience on many cutting-edge technologies. The technology transfer of the project has left the Malaysians self-reliant and confident to go it alone.

The Petronas Twin Towers Project illustrates the benefits of involving foreign consultants and construction firms from the very beginning of a project with big numbers. Involving foreign architects and engineers in smaller projects or at a later phase of the project can be beneficial also. In the freeway project mentioned in subsection "Disagreement Over Toll-Rate Principles," a foreign developer and a foreign engineering/construction firm came in at a time when the design of the tollroad was almost complete. In a very short period of time, the foreign engineering/construction firm walked through the proposed route, reviewed the design performed by local firms, and discovered an unbelievably large quantity of unbalanced earthwork between cut and fill and other fatal flaws in the original design. The foreign firm was able to provide to the tollroad project the kind of engineering services that are normally provided by a rigorous value engineering team.

Cultural and Language Barriers

Cultural and language barriers are not unique to BOT projects in developing countries. Since these BOT projects are essentially joint ventures with foreign partners, some problems encountered on these projects are problems that are commonly encountered on such joint

ventures. These problems include: differences in language and culture, disagreements over how to divide the work between the partners, differences in the philosophies, corporate cultures and policies of the partners regarding acceptable profit margins and levels of risk, differences in compensation levels between the partners, and differing interpretation of contract terms. The language problem requires further explanation. There is not just one Chinese dialect. People coming from different parts of China may speak their own unique dialect. Although Mandarin is the national language and schools are taught in Mandarin, education is far from universal in China and people from different regions may speak different forms of Mandarin. Many of the aforementioned deterrents to the BOT schemes in developing economies can also be classified into one or more of these problems on joint ventures with foreign partners. These problems, if not handled in the right way by either one of the partners, can evolve into a long and arduous struggle between the partners and eventually will break the joint venture.

The Petronas Twin Towers Project in Kuala Lumpur is, again, a good example for reducing cultural and language barriers. Aside from the Malaysians who gained immensely from technology transfer from West to East, almost all of the engineers from other nations also benefited from working on the mega-project. Westerners, especially Americans, working on the job have made a major attitude shift to accommodate different traditions. In Malaysia, jobs are driven by protocol and relations, and there is less direct confrontation than in New York. Americans also had to get used to a slower decision-making process. The undertaking has taught them to open their eyes wider, giving them insights. Most importantly they have learned that their way is not the only way to accomplish something. For others, including the towers' Korean and Japanese contractors, they have learned things like tolerances and quality control. In fact, almost all who participated in the job learned from each other by sharing the best parts of all their cultures in construction, manufacturing and in every other regard.

Management and Co-ordination Difficulties

In many cases, foreign personnel at the management level of a joint venture may earn ten times more than their Chinese counterparts. Chinese staff may thus bear grievances about the difference in reward. Such grievances lead to low moral and negative attitudes toward co-operation with foreign personnel.

Coordinating construction teams from foreign countries and China is sometimes quite difficult because of the inadequate communication facilities in China. Communication between the site office in China and the head office in foreign countries is essential since arrangements for

foreign materials purchase have to be made in foreign countries. Service charge of international phone calls in China is one of the most expensive in the world and service is not always reliable.

Local Labor Supply and Quality

Cheap labor is one of the attractive elements which encourage foreign contractors to carry out construction projects in China. However, in spite of the cheap salaries compared to western countries, the total labor costs of a project is significantly higher than the salaries paid to workers. The reason is that any company with foreign investment has to make payments for retirement and pension funds and unemployment insurance funds for Chinese staff and workers, according to the Labor Regulations published by the State Council of China. Moreover, housing or housing subsidy funds has to be provided. Therefore, many foreign contractors in joint ventures have claimed that the total labor expense can amount to two or three times the individual worker's actual salary. Consequently, the under-estimation of such costs and expenses will lead to problems of budget overruns which many then cause serious operating difficulties.

In addition, although China has a huge labor force, it is largely unskilled. Skilled technical personnel only accounts for 4% of the total, which is only around 6.6 million. Nearly 30% of the construction work force were originally farmers (Chan, 1995). In general, Chinese workers carry out traditional builder's work, such as fabricating steel reinforcement, pouring concrete and laying brickwork. They are not familiar with the work related to advanced techniques. Material wastage is usually high due to poor organization of work, poor workmanship and careless handling of construction materials. In addition, the site supervisor appointed by the Chinese enterprise may not be familiar with the work he is supervising. He may only know one particular work and has no experience or knowledge in supervision of other works. Therefore, intensive training has to be provided for them before the construction work actually starts.

The efficiency of Chinese workers is usually lower than that of foreign workers due to the lack of incentives. The socialist theory of everybody eating from the same pot has caused workers to be accustomed to receiving the same payment irrespective of his performance. The shortfalls are compensated by employing more workers who are willing to work longer hours. Towards the end of a project, shift work is often necessary to make up for the time lost caused by late deliveries or variations. All these, in turn, leads to the increase of construction costs.

Technical level is dropping in engineering circles because of people having lower education level and the loss of a whole technical generation during the Cultural Revolution. It is thought that of all the trades in China, the quality of technicians in civil engineering is the worst.

Large numbers of peasants crowd into cities and are assigned all the engineering jobs without necessary training and proper management. It makes the situation even worse.

Laws and regulations are imperfect in China. People's consciousness of law-abiding needs to be heightened. And loopholes can be hardly avoided when the society changes from planning economy to market economy. There are also problems existing in the system of the assessment and the promotion of technicians and technical workers. Engineering advisory has just been put into practice. The examination system for engineers is still in preparation. Moreover, harmful customs like department separations, department protectionism and administrative interference in technological practice make people even more indifferent to law enforcement.

Shortage of Local Materials and the Hardship of Importing Materials

One of the major problems concerning construction development in China is the shortage of construction materials. This problem has become even more serious in recent years due to the rapid expansion of the construction industry. For example, even the three basic building materials of timber, cement and steel, have to be imported in order to meet the demand. The shortage of local materials indicates that the increase in production of construction materials is much slower than the increase in construction projects. Even if the material is available, the quality might not be up to standards. For example, nearly all finishing materials and engineering and mechanical systems have to be imported because of the low quality of local products. The styles and coloring of local finishing materials are conservative and selection is limited. Furthermore, high-quality products are often exported to earn foreign currency. Therefore, only materials of secondary standard are retained for local use. It is obvious that for imported materials, an additional transportation cost is incurred which in turn increases the total construction cost.

In general, construction materials cannot be imported freely into China. The construction company that wants to import materials must first apply for an import license with the Ministry of Foreign Economic Relation and Trade (MOFERT). The MOFERT is very careful and conservative in issuing this import license. Negotiation between the company and the MOFERT is usually required. However, such procedures are very time-consuming and may take three or more months to complete. Delays in obtaining the import license can often lead to delays in purchasing materials which then results in the delay of the overall construction schedule.

Even after an import license has been obtained, delays in work schedules might still occur because the construction materials are held up in the transportation process. Building

materials are generally transported to the region by ship whenever possible. Otherwise materials are delivered by train freight transport. Delay of delivery frequently occurs, even in major cities such as Shanghai and Tianjin, due to the lack of berths and trains. This problem is exaggerated by poor import-export planning and warehouse shortages. Ships may have to wait a long time before cargo can be unloaded.

Construction Schedule

One of the main responsibilities of an international firm in a BOT deal in China is to take on the construction completion risk by guaranteeing the schedule. However, when one considers the actual extent of the foreign contractor's control on a project, significant gaps become evident. China is not the firm's home country. The fact that an EPC firm may be able to confidently guarantee project performance at home, where it is intimately familiar with the operating and legal environment as well as the material and labor markets, does not necessarily mean that it can do the same in China. Experienced international contractors are accustomed to managing third-country projects, and off-load many of the construction risks to local subcontractors with lump-sum contracts with Liquidated Damages clauses while maintaining overall project control; however, the foreign firm must deal with the complicated business of coordinating multiple Chinese subs and suppliers. It must manage this collection of companies, working in the Chinese language and culture, with radically different productivities and work attitudes than in the firm's home market.

There are numerous examples where foreign firms have met special difficulties in Chinese construction: recently, labor unrest has resulted in strikes at a number of foreign-operated sites in southern China and Shanghai; productivity on one toll road construction project was far below expectations, delaying the foreign contractor's schedule by almost a year and sending the project 30% over-budget; the influx of labor from the countryside into China's major metropolitan areas has spawned powerful mafia-like labor brokers that must be relied upon by foreign firms to ensure a quality labor supply on a project; and poor quality of plant from a Chinese supplier was blamed by another foreign builder/operator for delays on a power project...

The list of local Chinese construction risks is long. This puts significant pressure on international EPC firms guaranteeing project schedules and budgets in China.

RECOMMENDED ACTIONS

Now, after all the common deterrents facing the foreign investor in China's construction market have been listed, what is the solution to breaking these barriers? A large part of the solution rests in the hands of the government officials and law makers of the host country, and the remaining part of the solution rests in the foreign investors' own hands.

China is a vast market for construction companies with huge infrastructure projects which are profitable. China offers many opportunities and challenges to local as well as foreign construction companies. Due to the inherent weaknesses of the construction industry in China, the magnitude and complexity of the problems and risks are discouraging enough to sober the enthusiasm of any optimist. Both Chinese construction authorities and international contractors must work shoulder to shoulder towards creating a modern construction industry in China.

To the Chinese Construction Ministry

Transformation is not easy work, especially in China, a country with 1.2 billion people. Difficulties and tensions are inescapable. The ideas of a socialist economy remain largely untried and untested. The ideology is there but the systems of state control are still in place. State planning and market competition are not natural partners, but the key issue is how to integrate them effectively.

Competition should be market-based. Chinese state-owned construction companies need to unload and enter the market to compete equally with others, including foreign firms. With further reform, more problems should be overcome and the reality will converge more closely with the ideology.

The government officials and law wishing to attract foreign investments for their infrastructure projects first need to understand the objective of importing BOT schemes is to gain access to these projects sooner and in more-effective manner than under traditional government financing. They need to understand that if there is adequate resources from domestic private sector foreign investments would not be required, and that the need for foreign capital is both enormous and for relatively long period. They need to know that their infrastructure projects are competing with similar projects in other developing as well as industrialized countries. They need to comprehend that unless their need for capital is filled the high economic growth of their economies cannot be sustained.

Future competition in the construction industry will be strongly internationally based. More and more overseas participants will join in the competition with high technical and management bases. With a market-based economy, competition between enterprises will mainly

depend on the capacities of the individual firm's professional skills. A internationally standardized and accredited education program along with the establishment of a professional registration system are needed to put China in the same playing field as these international participants.

Once the need for foreign participation in the domestic infrastructure projects is widely understood and the method of BOT contracting method sincerely accepted, a credible policy and an institutional framework that would remove the various aforementioned deterrents that now hinder foreign investment need to be established as soon as possible. In addition, government objectives on specific BOT schemes need to be clarified, transactions costs to foreign partners need to be reduced and public opinion in favor of foreign investment in specific projects needs to be mobilized.

China has made impressive progress under the current system. However, despite its notable achievements, it lagged behind developed as well as many developing countries in construction technology, management and research. The good news is that the Chinese Construction Ministry recognized the inherent inefficiencies in their system and decided to introduce reforms to incorporate all the good features of international practices for modernizing the construction industry. To achieve the goal, recommendations are presented.

Attracting International Contractors Involvement in China

It is in the long run interest of the Chinese government to attract foreign companies to participate in modernizing the Chinese construction industry. Korea's experience in developing its local construction industry is a classical example of how foreign competition can benefit a country. When Korea started rebuilding its war-torn infrastructure in the mid-1950's, the government adopted a deliberate policy of opening up the works to the foreign companies. As a result, most of the early contracts were awarded to foreign contractors. In the process, local contractors were exposed early on to modern, up-to-date, construction practices and fierce competition.

By the time the U.S. started its massive build-up in Vietnam in the mid-1960's, Korean contractors had gained sufficient expertise, equipment, financial backing and trained managers to venture out on their own. Their success in winning contracts in head-to-head competition with American contractors was quite impressive. And this was just the beginning. With the launching of massive civil works projects in the Persian Gulf during the 1970's and 1980's, Korean contractors were able to compete successfully with the best companies from Europe, North America and Japan.

Today, with about US \$70 billion worth of civil works being tendered annually around the world following International Competitive Bidding (ICB) standards, Korean contractors are consistently winning about 5 percent of these contracts, or some US \$3.5 billion each year. By comparison, China, which is a much bigger country with a larger pool of engineers and skilled laborers, has only a total of US \$2.9 billion worth of overseas contracts in 1995. (ENR 1995)

The lessons from the example are clear. In order to develop a healthy, modern, efficient and competitive construction industry, China must adopt international practices and open up to international competition.

Continue to Reform Construction Practices

China's modernization program has enjoyed real success over the past 20 years. The basic components of the current reform programs include reduced central control over state-owned enterprises, incentives, bonuses for individuals, and expanded competition. The objectives of the construction reforms include the following (Mayo 1995):

- Restructuring the industry's administrative system
- Opening construction markets
- Allowing autonomy in state-owned construction enterprises
- Establishing a competitive bidding system
- Adopting professional construction management practices
- Improving project management skills

Does the Chinese Construction Ministry need to continue to reform the current practices? To answer the question, let's first take a look at international practices. Countries with modern, efficient, productive and competitive construction industries usually excel in management, technology, research, and marketing. A contractor is regarded as a full partner in the process of contract implementation and the obligations of the Owner, the Project Manager and the Contractor are clearly defined. With support of these practices, contractors can develop the ingenuity, the skills, the ability to manage risks and the courage to innovate. Furthermore, they provide the contractor with the incentives to work hard and to do a quality job efficiently, economically and on time (Golan 1994).

China's construction industry lacks these features. To meet the basic requirements outlined above, to be competitive both at home and in the international market, the Chinese Construction Ministry must continue to reform construction practices. This is in the long-run interest of China.

Standardizing the Transactions, Develop Tendering and Bidding

The construction market's transactions should be carried out under competitive format, resolutely and effectively pursue tendering and bidding. However, because of the strong entrenched traditional influence of a planned economy, inefficient management, incomplete set of reform measures: the current tendering and bidding practice is not standardized, the processing order is relatively mixed up. Therefore, the following measures should be incorporated in standardization.

- To establish a comprehensive tendering and bidding legislation. The concerned authorities should increase cooperation and coordination of each management segment. Follow a strict management system of invitation for tenders and bidding, so as to form a necessary segment in the tendering and bidding procedure. Concertedly clean up the corruption phenomenon in the tendering and bidding processes.
- To standardize the format of the tendering documents and their procedure, comprehending the methods and effective management of such activities. They should be approached technologically, reasonably, fairly evaluated and awarded. Progressively extend the design of invitation for tenders, which necessitates the contracting firm to carry out the designing of project operations.
- To coordinate the tendering and bidding along with the management of contracts, reinforce the management to guarantee the quality of works and high efficiency.

Pursue the Reform of Prices, Establishing a New Price Mechanism

Under the planned economic system, prices and value deviated, the corrupt nature of fixed prices is still prevalent up to now. For this reason, under a market economy's general purpose umbrella, there should be a strong undertaking in the reform of prices. The main measures to be undertaken are:

- Standardizing the basic project construction cost, with respect to the contents of the works. The portioning of a project item, measurements and bill of quantities firms' regulations. The drafting of labor, material consumption amounts, invitation for tenders and the minimum setting for bids to be compared against the bidding as index reference, government should undertake macro-regulatory measures. Labor and material costs; equipment and machinery usage cost; construction supervising party's expenses, all these are to be harmonized by the market. The government authorities responsible for the manufacturing prices to periodically at proper intervals (say monthly or quarterly) publish the price trends for reference information.

- To guide the construction firm according to standardized methods of drafting their production quota, self estimation for the bid price, eventually forming a pattern of bilateral prospecting for both parties (employer and contractor) through market competition, the value principle and demand and supply forces. They have to negotiate and settle for the contract sum for the works, enforce management so as not to give room to monopolies, cheating and unfair competition.
- In spite of continuing to specify the different profits with regard to different types of projects, there should be a room for other firms which can contract for projects with higher technological requirements, large scale in scope, high risk. These are bigger and medium core firms whom should get reasonable commissions and profits for their investments.
- To undertake awards for quality and optimization strategy for projects that attain quality grades and carried through optimization, those projects which cannot reach quality requirements or contractual requirements corresponding to quality standards, the firm's contract sum should be deducted by a certain margin.

Reinforce the Transparency and Carrying Out of Operations under Contracts

To develop a construction market, the emphasis on the usage of contracts and its usefulness according to legal regulations. To protect the market orderliness, to guarantee the parties involved, by their legal rights. For this reason, there should be the emphasis on publicity of the contract knowledge, to attract and guide the awareness and transparency of contract management level: carefully undertake various contract regulations; to implement the corresponding standard contract document; to carry out tendering and bidding process and contract signing, project and contract management and honoring of contracts to be coordinated; establishing the concept of claims, to upgrade the project claims management level, enhancing claims' healthy development activities. Emphatically establish a system of resolving the disputes associated with contracts through negotiated settlement and arbitration procedures. Ways and methods, reinforce the contract supervision and works superintendence to guarantee the comprehensive contract undertaking.

Intensify the Management of Quality and Upgrade Project Quality

The construction products are the market transactions forces, their quality also affects the contracting and tendering for each of the concerned party's benefit. Also it has a bearing on the

social and public influence if is of any benefit, determining whether or not the market is fairly comprehensive or not. Therefore the construction products' quality must guarantee the highest possible quality level. To upgrade the control measures of quality should include: to complete the quality management regulations and standards; to establish a quality system, intensify the supervision of quality, engineering, inspection and certification of works.

Develop the Market of Production Elements

The market for production element is of many types. It should comprehensively develop. But, there should be an outstanding labor force market. Through the many years of reform, the construction sector's labor force has been transformed from the government allocation of labor to the autonomy to recruit labor. This the labor cost has slowly emerged out a planned economic system's labor inefficiency practices, gradually has been trends of the labor orderly movements, intermediary services in the labor force has started to develop. Social guarantee has started to be in the making the training recruiting of labor has also started to hold. Examinations and interviewing system has started to be established. To explore and protect the labor resources, upgrade the work force's ability quality-wise. To reinforce the labor market management and the protection laborers' rights, to carry out the certification by grades and labor qualification certificates. To encourage the sprouting labor markets and firms involved so as to make the value of labor market oriented. Because of the price of labor is harmonized to alleviate the conflict of supplying the required labor and the movement forthwith.

Strengthen the Market's Macro-Management and Macro-Regulation

Macro-management and regulation is to establish and develop China's construction market – as one of the most distinguished measures. The Chinese market did not grow by itself, but because of the Nation's common arrangements to gradually develop it. It is the necessity for the country to carry out macro-regulatory measures for the market, in order to provide a healthy social environment.

Such measures are carried by the central government and regional authorities in the construction sector who are authorized and their measures are legally binding. The measures undertaken includes: to carry out entrepreneurship policy, to protect the market demand and supply equilibrium, to structure the market into a streamlined one, standardize the market practices, maintain an orderly competitive environment. To inhibit destructive and blindness in the market. During the course of macro-management and regulation, the government should honor the following measures:

- Policy guidance – this refers the enterprising guidance, price policy, and distribution policy
- Lawful supervision – this refers to the use of laws and regulations, standards specifications and measurements
- Professional management – this refers to the management of enterprising or to professional excellency, to respect professional specifics, harmonize the market, services, finance, investments, supply, employers, contracts, intermediary services and other areas relationship
- And coordination services – coordinating the services of the different construction sectors to upgrade the market's efficiency.

Towards this end, there has been a legislation on “the management of the construction market,” to manage the market subjects, market elements, market prices, market practices’ regulations. Wherever there is law, it should be honored, and it should be strictly enforced. The market subject and management should be enforced through the practice of law, according to law-thing have got to be done, exchange and transactions, offending, and other phenomena against the law should be intensely fought.

Speed Up the Price Reformation of Building Products

In China, the prices of elements that constitute the building product are free now, but price of building product still is determines by the fee system of the state budget quota, so the contradiction between the rigid quota, and the free market, is very glaring. Thus we must reform the old mechanism that forms the price of building product and set up a new price system that can reflect both the price and the relation between supply and demand and progressively make the transition from fixing the price according the state state budget to doing that according the market, that is, to practice quoting price decided for enterprise itself, competing according the rules of market, fixing price by contract and settling accounts according to law.

Readjust the Organization Structure of the Industry

The organization of construction industry that carry out coordination among specialized departments is the form of the system general contracting and sub-contracting for projects, so we must, according to the demands of the system and the principles of scale merit, readjust the organization structure of the industry.

The large scale enterprises must develop from the labor intensive form to the intelligence intensive form for general contracting for works, the medium and small scale enterprises must

develop to the form of construction contracting and specialized construction contracting and the enterprises that are too small to on the ranks may provide labor service specially. By readjusting the organization structure of the industry this way, the advantages of each enterprise may be brought into full play by itself, the degree of the aggregation, socialization and specialization of construction may be improved and the efficiency of economic activity may be raised.

Give Impetus to the Improvement of Science and Technology

Effected by the system of planned economy, construction enterprises fulfilled the rapidly increased demands of construction mainly depending on the increase the labors for a long time, so it is the rough management that hindered the manage quality from improving. When entered the market economy, construction enterprises have to exist and develop in the home and overseas markets which all full of acute competitions, so they must change the way of economic development, give impetus to the improvement of science and technology and rely on that to improve the construction quality, to shorten the period of construction and to cut down the consumption of materials.

Develop the Education and Improve the Quality of the Laborers

The competition in market is, in the final analysis, the competition of the qualified personnel. To view the situation of China's construction industry as a whole, the quality of the laborers are lower not only than that of industry, but also than that of the average level of whole country. It is investigated that the average educated years of industry enterprises is 13 years, that of construction enterprises is only 7 years, and among the educated laborers of construction enterprises, about 60% of them are under the education degree of the junior middle school, about 30% of them are in the degree of senior middle school or special or technical secondary school and about 10% of them are over the degree of universities and colleges, and among the leading cadres, only about 10% of them have the title of a technical or professional post or have the record of formal schooling over the degree of special or technical secondary school and about 56% of them have not the record of formal schooling that required at their post stipulated by state, and the workers at the forefront are almost unskilled and unfixed peasant-workers. To develop the educational undertakings and improve the quality of the laborers, China must stipulate in policy the systems of holding the post card to work at the post, of training in the post and of continuing education, as well as of testing and registering for practice, besides running well the normal specialized education, and set up the base to select and send people to go abroad to be trained in a planned way with the focal points on training a number of enterprisers who have the

spirit of opening up and respecting their profession, understand technique, are good at managing and administering.

To International Contractors

In China, the growth rate of the construction industry is one of the fastest compared with other regions in the world. The attitude of international contractors currently operating in China towards further involvement is quite positive. This is despite all the aforementioned risks and problems. This suggests that the projects conducted by the contractors are profitable.

Not only is the Chinese construction market full of opportunities, but it is also full of challenges. There are many problems that international contractors faced or may face after they enter the market. No single solution will solve all of these problems. However, based on the research, measures can be taken to minimize risks in China.

Understanding the risks involved in a Chinese BOT project is half the battle. However, once an international firm has recognized the risks, what can it do to mitigate them? The following section addresses methods of risk mitigation in China.

Work with Investors from Home Country

The international contractors interviewed pointed out that the most efficient way to expand their business in China is to work with investors from their home country. The reason is quite obvious. While the foreign investors develop the Chinese market, they also bring their equipment, manufacturing, and production lines. Due to specific processing or manufacturing requirements, the manufacturing facilities need special designs. Therefore for these types of facilities, foreign investors usually bring their own design team. In construction, good quality is desired, and the investors trust international contractors to use their experience and expertise from similar projects in other parts of the world.

Projects funded by the World Bank or the Asian Developing Bank specify that qualified contractors from a member country of the bank have a right to participate in the bidding process. The evaluation of the bids depends on the overall quality of the contractor, prior experience on similar projects, technical strength, human resource strength, financial strength, etc., which give international contractors great opportunities to win the contracts.

Work with Smaller Projects

It can help to limit the size of a project in order to avoid participation by the PRC central government. The State Planning Commission must review and approve projects over a certain

investment threshold; however, if a firm can break a project down into smaller pieces and project companies (say, by dividing a toll road into sections to be built by different joint ventures), it can keep the project pieces under the SPC threshold.

Involve Others

If things go wrong, and a project is threatened by political forces, the Chinese legal system offers little protection. If anything, the legal system exists at the pleasure of whatever government agency happens to be dealing with the project, and interpretation by officials tends to over-ride an objective rule of law. With little legal protection against the PRC government, foreign firms must rely on a combination of international financial pressure and insurance policies.

One way is to involve investors, financial institutions, and foreign government aid agencies from as many countries as possible in a project financing. This way, government actions that jeopardize the project produce a backlash from the international investment community against the government itself, in the form of reduced credit ratings or overall increases in the cost of capital to China. With the backing of international investors and institutions, such as OPIC and various national Ex/Im banks, a foreign builder/operator can impress upon the Chinese government that acting rashly against a project will have negative ramifications on the country's credibility, thus damaging its ability to finance further infrastructure and economic growth. International firms are generally familiar with this type of financial protection, due to extensive experience in third country projects in the past.

Political Insurance

In cases where a government agency moves ahead with an action such as expropriating project assets despite pressure, "political insurance" can be a useful last resort. One kind of political insurance is offered by the Multilateral Investment Guarantee Agency (MIGA). MIGA policies offer coverage against (1) wars and civil disturbances, (2) expropriation (including "creeping" expropriation), (3) breach of contract by a government agency, and (4) currency transfer problems directly resulting from government actions or policy changes. In each case, MIGA insurance pays the net book value of the insured investment, and premiums are significantly lower than similar policies obtained through private insurance firms.

To qualify for MIGA political insurance, a firm must be from a member country. Further, the project to be insured must be evaluated by MIGA as financially, economically and environmentally sound, and must also be judged to contribute positively to the host country's

development needs. Finally, the host country central government itself must approve the insurance application, declaring up front that it will comply with the project contract terms.

Cooperate with Chinese Construction Companies

Another effective way to develop the Chinese construction market is to cooperate with Chinese construction companies. While it may prove frustrating at times, the benefits often outweigh the problems. Foreign investors and firms attracted by the profit potential of the BOT market need to know the cultures of the country in which they invest. They need to understand that venturing into this market is no solitary proposition, and forging alliances with the right companies in the host country can be critical to a BOT scheme's success. Once this is understood, it is not difficult to figure out that the best-case scenario would involve a recognized local company that is both politically affiliated and technologically receptive and compatible with the business purpose of the foreign investor.

International contractors may form joint ventures with Chinese contractors. The joint venture company can use the strengths of both parties. The foreign partner has the management experience, technical expertise and financial strength. The Chinese partner has a good understanding of local practices. An association with a local company will greatly reduce the risks of bureaucratic red tape. The Chinese partner will work closely with local government officials to simplify the inspection and approval procedures, and to deal with corruption. When looking for Chinese partners, international contractors may consider working with Chinese international contractors who have international ventures outside of China. The leading Chinese company with overseas contracts is the Chinese State Construction Engineering Corp, with a total worth of international contracts amounting to 669.5 million dollars in 1994 (ENR 1995). This company is ranked number 42 in ENR's list of "the top 225 international contractors." Chinese contractors with overseas activities have a basic knowledge of international practices. Because of this, they can cooperate with their foreign partners more effectively. When conflicts or disagreements are encountered, both parties can settle the disagreement in accordance with international practices.

Most foreign investors know that teaming up with local partners will limit liability and reward, and that using overseas partners' infrastructure will reduce entry cost. However, teaming of any kind across cultural lines involves risk. The biggest single problem for foreigners in a place like China is figuring out who is the real power, who has the right political power backing, who is technically receptive and compatible, who is trustworthy and if there is any money. In

other words, the real solution for a foreign investor is to gain local sensitivity and have a fine feel for what are the doubles for him in the host country.

Another common deal structure used by international firms in China is the "Cooperative Joint Venture" (CJV). This consists of a joint venture between the foreign firm and a PRC central government agency, whereby the government provides land, natural resources or local currency while the foreign firm contributes the remaining required capital as well as technology and managerial skill. The CJV structure has the advantage of giving the Chinese government a direct interest in the welfare of the project; this can help in influencing the project approvals process, as well as to shelter the project from other political risks. With sufficient clout, the government agency can help greatly in dealing with the military, as well.

Generally, local government partners with the most to gain or lose by a project are the most valuable allies. Compared to Beijing, the provincial and municipal governments are much more aggressive in pursuing infrastructure investment and the local economic growth that accompanies it. Furthermore, these partners understand that they cannot receive revenues from the CJV partnership until a facility is built, and are therefore cooperative in expediting the approvals process.

Understand Local Culture

Western companies, in particular, need to understand that the Chinese may prefer companies from Western Europe and America to those from Japan or other Asian countries for reasons of a higher level of technology transfer as well as the larger average scale of work conducted by Western companies. However, these same Western companies restrict themselves by not understanding the Chinese system, by not familiarizing themselves with Chinese affairs and culture before entering the system. They do not know how the Chinese think or what the Chinese expect from them and, therefore, they often do not fully exploit their advantages. This has resulted in much of the difficulty they encounter when approaching the Chinese market.

Some of the basic steps that a company should do prior to working in China is to understand how the local system works. Contractual requirements, inspections, code compliance, and a host of other issues can be planned for, thus reducing the potential for costly delays or even fines and litigation. Items such as labor availability, classifications/pay rates, and labor burden inclusions/calculations are essential to completing accurate estimates. Material and equipment needs relative to logistics and cost need to be carefully analyzed. Most importantly, the cultural aspects should be understood prior to doing business in China. These beliefs will largely determine how the Chinese people view work and how they conduct themselves in business

situations. In addition, such issues as socio-economic norms will need to be understood to evaluate strategies for managing employees and motivating the work force, plus maintaining expected levels of productivity.

Establishing "Guangxi"

In any facility development, the construction phase involves high risks, enough to require different capital costs for financing of a facility in its construction versus its operation phase. An international construction company in a BOT project is generally required to take responsibility for construction cost and schedule of the facility. In order to guarantee time and budget in China, the construction firm must have an intimate knowledge of the Chinese construction market and how to do business in it.

Much of Chinese business and political culture hinges on personal connections and relationships, or "Guanxi" in Chinese. The Guanxi mentality can promote the development of long-term business relationships; on the other hand, it can also lead to bribery and corruption. For better or worse, foreign firms in China must attempt to do business the Chinese way ("Rujin-suisu" is the Chinese equivalent of "When in Rome..."). Generally, this requires guanxi with local Chinese partners as well as cooperation with various levels of the Chinese government.

Hire Outstanding Local Personnel

In general, much of the construction work is subcontracted to Chinese companies, but the task of coordinating these firms falls to the foreign firm. One of the difficulties of working in China is the language barrier. To ensure that it understands and can function effectively in such a situation, an international firm must have Chinese-speaking staff with knowledge of how to manage local subcontractors and suppliers. This problem may be overcome by hiring Chinese engineers who understand English. In order to work effectively in the Chinese construction industry, an international contractor needs bilingual personnel to assist them. Since Chinese young engineers have received their college education where English language classes are mandatory, they know English. Needless to say, they also know the Chinese culture, customs, and local practices. They can act like a bridge to connect both parties for the common interest. In a Cooperative Joint Venture with the government or in a partnership with a local private company, the foreign firm must rely heavily on its Chinese counterparts to handle everyday construction issues. Therefore, it is critical that international firms in China find quality, trustworthy local partners. Chosen well, Chinese partners, both private and public, can greatly help a foreign firm to deal with the construction business in China.

Financing the Project

Considering the risky nature of Chinese BOT projects, financing can be a challenge. If foreign builder/operators want to avoid extremely high costs of capital for projects in China, they must structure the financing such that investors are protected from risk as much as possible. Equity financing and cooperation with government partners can enable foreign builder/operators to limit investor risks. In addition, interesting alternatives to contract payment, such as land development rights, are starting to be used to capture value in Chinese BOT projects.

Companies can choose between debt and equity financing, or combinations of the two, in covering the costs of developing infrastructure. Studies have shown that equity financing is critical to the success of BOT projects, and often influences the ability of a firm to secure further debt financing.

Initial Public Offerings (IPOs) of China-linked project companies are now very popular on the Hong Kong stock exchange, and provide an excellent vehicle for raising equity project finance. It can be ideal for a firm to use an IPO to raise funds to cover the construction costs of a facility when debt financing is most difficult. After the facility is built and the high-risk construction phase has been successfully passed, the firm can access cheaper debt from banks. Furthermore, the use of equity capital to finance construction not only protects the lenders from construction completion risk, it also gives the builder/operator a chance to verify that facility usage levels are real and "bankable".

Cooperation with the government partner in a CJV relationship can also help a foreign firm to finance its Chinese BOT project. Since it is guaranteed to own the asset after the concessionary JV period, the government partner is often willing to take a reduction in its early dividend stream in return for greater dividends later. Such cooperation in revenue-sharing can greatly assist the foreign firm with its equity returns and debt financing.

Finally, land development rights are being considered by some foreign builder/operators as an alternative method of deriving value from BOT projects. Some of the major Hong Kong-based companies use projects such as BOT toll roads to obtain development rights along the road routes. The huge potential profits from hotels, shopping centers, office buildings, etc., along these major new roads are sufficient to make up for a significant portion of value on BOT projects. In some cases, HK firms have been rumored to accept losses on the construction phase of a BOT project in return for banking on the future of their land development rights. Western firms have tended to be more cautious with regards to land development, tending to rely on traditional cash-for-services payment schemes; however, some Western builder/operators are now

starting to consider development rights as an option for making the most of their infrastructure projects.

Service Pricing

First, the key point is how to actively introduce BOT means to expedite the construction of infrastructure according to China's status quo. Concerning service pricing, a reasonable return should be assured to the most possible extent based on the full consideration of the risks in the transitional process. Someone may consider that the secured rate of return won't do good to declining the cost and improving the operation efficiency. This idea is not very exact. We assure the rate of returning order to reduce the uncertain elements to the least not in the efforts to ensure the investors' stable yields. We should let the investors realize that they may acquire higher return by their endeavor within their controllable scope.

Second, service pricing should vary in accordance with different project. Any successful BOT project is the consequence of the cooperation between the government and the investors. The private won't pay attention to the infrastructure projects unless the government offer certain preferences and entitle some rights. So service pricing and the preferences should be taken into consideration as a whole.

Last, China is not the unique spot of investment, so it is necessary to investigate the policies of surrounding countries'. The competition in the introduction of investment inclined to be more and more keen owing to the rapid development of Southeast Asian economy. Of course, the competition won't be without limitations, and the preferential policies won't be given at the cost of the whole nation's interests. How to understand the nation's long term interests is a matter worth discussing. We should be aware that the introduction of BOT project is not only the problem of capital import, but also the means to improve the investment quality, introduce the competition mechanism and raise the operation efficiency in the field of infrastructure. Furthermore, as we are in the course of price system reform, the service price of BOT project with the purpose of obtaining a normal rate of return, which is formed by market forces under the government's macro-regulations can be used as the reference for our reform of infrastructure price system and then push forward the reform of the present price system.

Guarding Against the Changing RMB

The PRC government plans to achieve free convertibility of Renminbi into foreign currency by the year 2000. In the meantime, the government has implemented conditional current account convertibility, and there are several techniques available to international builders

and operators to deal with the issue of exchange and conversion. Options presently available to foreign firms in China wishing to convert RMB into foreign currency include: direct conversion through Chinese banks, currency swaps with other companies, balancing between projects, dual currency contracts, and special hedging measures for RMB.

In early 1996, Beijing decided that the People's Bank of China had sufficient foreign reserves to allow direct conversion of RMB to foreign currency for current account transactions. Since then, foreign firms have been able to use this route to handle a portion of their currency conversion, although this does not protect them from fluctuations in the exchange rate. Before this, the only way for foreign firms to convert RMB to foreign currencies in China was through government-sponsored "swap centers", where foreign firms had to choose from among a limited number of swap partners, most of whom were Chinese government-run enterprises engaged in import/export. The option of using the swap centers for currency conversion is still open to foreign firms, while they can also attempt to find other foreign swap partners on their own.

If it has more than one project running in China at the same time, an international construction firm has the further option of balancing currencies between two or more projects. It can spread RMB earned on one project to other projects-in-progress where local costs are incurred. This reduces the amount of RMB conversion necessary over multiple projects, rationalizing the company's China currency transactions as a whole.

International EPC firms often use dual-currency contracts, with certain portions to be paid in RMB and other transactions denominated in foreign currency. Such contracts are generally used when significant portions of a project are conducted outside of China (e.g. in procuring plant to be imported from another country), with associated costs incurred in a foreign currency. Therefore, dual contracts are less of a "hedging" mechanism than they are a means of covering project costs incurred outside China.

Finally, hedging tools specifically tailored to China's partially convertible currency have been introduced recently by foreign banks. Foreign banks are strictly limited in the scope of their transactions allowed within China using RMB; however, banks in Hong Kong and Singapore have come up with ways around these limitations to respond to demand by foreign firms in China for ways to protect against devaluation of the Renminbi. One example is the "Non-Delivery Forward" (NDF), a hedging instrument where no actual RMB cash is required for the transaction. Instead, the entire transaction is conducted in foreign currency (usually US dollars) outside of China, with the payout tied to the official closing Renminbi rate posted each day by the PRC State Administration of Exchange Control. The NDF requires a contract rate and reference rate (the official rate); the difference between the two rates then determines the gain or loss for each

party in the transaction. Either way, transactions are automatically converted into foreign currency, so no RMB ever changes hands. Hence the "Non-Delivery" aspect of the forward.

Tackling Tariffs

The PRC government's insistence on annual renegotiation of tariff levels makes financial forecasts for private infrastructure facilities difficult. Worse, it introduces an element of risk into a project's future revenues that leads to an increase in debt financing costs for the facility. Hence, the PRC's effort to control inflation in China greatly increases the costs to foreign firms attempting to build and finance infrastructure in the country.

In dealing with tariff adjustment, good relations with the government and a positive public image of the project are critical. However, there are also some more objective techniques to reduce the risks of tariff adjustment.

From an international builder/operator's perspective, it is ideal to have a formulaic method of tariff adjustment in place that can enable objective calculation of tariffs each year. Such formulas are widely used on BOT contracts around the world, and generally attempt to account for factors such as inflation, exchange rates, and demand fluctuations. Because the formulas help to remove the tariffs from a purely political realm, foreign firms should negotiate hard for them.

Another option in negotiating tariff adjustment mechanisms is to separate and re-define them. For example, on a toll road project, a single toll paid upon entrance to the expressway can be replaced by a composite tariff divided into pay-by-use and yearly components. "Entry Tolls" are set, to be levied per use at entry points to the highway. Next, "Annual Usage Fees" are decided separately, to be paid by vehicles in the area to register for the right to use the highway. The provincial government's Price Administration Bureau can reserve the right to approve future adjustments to the Entry Toll; however, approval of the Annual Usage Fees can be left to the local city government. As a result, the foreign builder/operator can maintain a high degree of control over the Usage Fees.

This approach has been used successfully on a recent toll road project in southern China. The foreign builder/operator had to relinquish a large degree of control in determining the Entry Tolls; however, it maintained control over the Annual Usage Fees, which accounted for most (roughly 75%) of the project revenues. As a result, control of the Entry Tolls could be relinquished in negotiations without undermining the project's overall financial viability.

Formulaic tariff adjustment mechanisms and creative breakdowns of tariff structures, as described above, can reduce a foreign builder/operator's exposure to tariff adjustment risk, and further reduce foreign financing costs of China projects.

CASE EXAMPLE OF THE INTERNATIONAL ARRIVALS BUILDING AT JFK

To better understand how the use of BOT can be successfully implemented, the example of the International Arrivals Building being constructed at the John F. Kennedy International Airport in New York City, United States, will be used. Though the project does not place in China, it is a good demonstration of how government owners can tender a project so as to provide the most transparency to would-be participants and thus create the environment for successful BOT implementation.

Though the JFK project is not located in China, but rather in the United States, this project was chosen for a variety of reasons. First of all, due to this author's inability to obtain precise documents, such as Request for Proposals or even direct interviews with the participants, the case study was forced to be found elsewhere. Second, this project has a number of characteristics discussed in the earlier sections and is a good example of the requirements of a successful BOT project. Third, the contractor, Schiphol, is an international contractor working for their first time in the United States. Thus, it is a good demonstration of the difficulties a foreign contractor might encounter in another environment and how they can mitigate these problems. Finally, this project is a recent project, thus it has relevance to the here and now.

Background

The John F. Kennedy International Airport (JFK), located in the southeastern section of Queens County, New York City, on Jamaica Bay, is fifteen miles by highway from midtown Manhattan. Equivalent in size to all of Manhattan Island from 42nd Street South to the Battery, JFK consists of 4930 acres. The airport provides employment for approximately 35,000 people.

Much of the original master planning of JFK arose from the circumstances and standards of air travel in those first post-war years, not only in technical and functional terms, but also in terms of the public perception. In 1957, going to the airport was an event, one which justified the fountains, expansive plazas and vistas that adorned the original International Arrivals Building (IAB). Air travel was glamorous – airports exciting destinations in themselves. The IAB was the keystone of the eight separate unit terminals that composed the airport. Sophisticated modern buildings expressed the wonder of air travel, where welcomers could watch through a clear glass wall, since made opaque, as passengers proceeded through customs.

The IAB's "elegant efficiency," was challenged over the decades, as the terminal was modified and reshaped in response to industry changes. Large 747 aircraft bringing larger passenger loads heightened security requirements and an ever-increasing annual growth in passenger volume all required alterations to the basic plan. Outside the terminal, landscaped open

spaces gave way to parking lots, parking garages, and new roadways. Expansion of the IAB extended its life but altered the original plan beyond recognition.

Plans for the IAB

In the early 1990's, the PA again determined that the 35-year-old terminal was inadequate to meet the continuing growth in international travel. The IAB was functionally obsolete. Everything in the airline business had changed dramatically – the IAB had evolved, but not near enough. Space usage, waiting areas, service areas, security areas, and commercial areas simply had not adapted to 35 years of changes in how passengers use and move through airport terminals. While the structural systems were sound and clean, the numerous deficiencies were readily apparent. An assessment of the IAB terminal in relation to international terminal (IATA) criteria and standards, listed the following faults (from the Request for Proposal):

- Disorientation due to building layout and environment
- Long passenger processing times
- Long walking distances
- Inefficient handling of passengers, well wishers, and meeters/greeters
- Overcrowding at peak travel times
- Circuitous circulation
- Multiple security points
- Poorly located retail
- Limited gate flexibility
- Demand greater than capacity
- The 1957 Air Handling Units (AHUs) are in poor condition and the 1970 AHUs are also in deteriorated condition.
- Majority of fire and smoke detection systems in need of upgrade
- No centralized building services controls or monitoring systems
- Communication/information systems out of date; include many manual procedures.

There were more than 40 airlines operating at the IAB, with 50% of the fleet mix composed of Boeing 747 aircraft. The demand pattern is highly peaked, with most flights arriving and departing between 2:00 and 10:00 p.m. Shortcomings on the airside include:

- Not all gates accommodate large aircraft.
- Non-optimal utilization of ramp space and congestion on service roads

- An obsolete and inadequate communications/gate management system.

Working with the airlines, the PA undertook a joint effort to redevelop the IAB. Among the 14 signatory Tenants there were divergent proposals to address the IAB problems, ranging from a major refurbishing to total reconstruction. As each option was explored, it became clear that the price tag would range from \$600 million to \$1.1 billion. In the development of program choices, the Authority took the lead and began preliminary feasibility studies for the IAB.

Feasibility Analysis of the IAB

If isolated as a stand-alone terminal, the existing IAB would be the fourth largest international airport in the U.S., serving 45 airlines and over 6 million passengers per year from 14 gates. Currently, it is the only terminal at JFK still operated by the PA. As the owner-operator of the IAB, the challenge to the Authority was to balance two principal needs – the physical requirements of an aging and obsolete building and the financial requirement to preserve the cash flow from the facility at a reasonable pass-through cost to the airlines that use it. An A/E team and a forecasting and financial feasibility modeling team were quickly selected to assist in making the best business decisions.

The cost increments from the feasibility analysis were staggering. For \$200 million, the building systems could be renovated; for \$600 million, modest improvements in the ticketing areas and gate availability would also be achieved, but the traveling public would see few internal amenities. At \$1.0 billion, complete demolition and construction of a new terminal plus apron and frontage roadway replacement could be accomplished.

The financial risks associated with undertaking a project of this magnitude raised key issues:

- What would it take – and what would it mean – to get long-term commitments from prospective airline tenants? How firm would these commitments be, given the volatility of the aviation industry? How firm did they have to be?
- What passenger volume would be required – and what level of confidence does the forecast hold – to permit the project to proceed based only on per passenger charges and a per-use tariff to the users, i.e. with no long-term airline commitments?
- Other variables were highlighted in the risk analysis:

Revenue Factors:	NY Region International Market Share of North Atlantic Flights
	JFK International Market Share of NY Region
	IAB International Market Share of JFK
	Passenger Growth Rate
	Revenue per Passenger:
	Emplanement Rate
	Concession
Construction Factors:	Construction Cost
	Construction Schedule
Operational Factors:	Restrictive Covenants
	Operations During Construction
	Industry Changes
Business Factors:	PA Capital Capacity
	Private Industry Capability
	Environmental
	NYC Long Term Lease

Careful competitive analysis led the PA to focus on the assumption that there may be no signatory tenants. Supply and demand factors indicated the IAB was essential to the market and a core level of usage could be guaranteed. The metropolitan New York region generates high demand for North Atlantic traffic. Also, there was little risk that operators of the other eight terminals at JFK could expand their international capacity to absorb the IAB's 45% market share. Worst case scenarios left the IAB with half of its current market share of the international activity, assuming major investments by airline alliances at the other terminals took place.

The feasibility work concluded that JFK's air traffic market demand was sound and that construction of a new terminal was financially feasible and the most desirable option. Net present

value (NPV) analysis showed that while complete new construction produced lower cash flow initially, it was, in the long-term, the best alternative with the best return on investment. JFK had problems handling the growth in air traffic. In a few years, the IAB would burst its seams and break down completely. Mere renovations would strengthen the seams but would not solve the problem.

The next obstacle was earmarking \$1 billion to construct the terminal. With a desire to accelerate the project and a realization that competing interests might complicate the financing of the project, the Authority simultaneously initiated design and the investigation of alternative financing plans via privatization options.

Preliminary Design - 1993 to 1994

Recognizing that the terminal facility no longer functioned as it was intended, it was decided that a significant capital investment would be made to restore the IAB and the redevelopment objectives were set. In June 1993, after an extensive competitive process, the A/E team of TAMS Consultants Inc., Skidmore, Owings & Merrill, and Ove Arup & Partners was given 12 months to rapidly advance the preliminary design for the terminal. Working with the PA's engineers, the charge was to bring the design to the 25% completion level, produce a Basis of Design Brochure summarizing the project's functional and design criteria and associated drawings for all aspects of the project. Supplemental documents include a geotechnical report, life safety code analysis, construction staging plan, a proposed retail plan, contract procurement strategy, an overall cost estimate including construction cost estimates, and an implementation schedule. Separately, an operations and maintenance plan and budget for the new terminal were prepared.

A quick commitment to a design was driven by:

- The unacceptability of further time delay
- No guarantee of private sector interest in the project
- A better position for partner selection with a more advanced base plan.
- In the absence of any precedent for an airport project of comparable scope and magnitude, there was concern about the character and quality of the responses that would be answered by an early preliminary design.

The 25% design by the A/E team provided for a 16-gate terminal including facilities for opening two additional gates and provisions for adding 21 more. The design also provides for direct transfer of rail passengers inside the terminal, should transit ever come to New York City's largest airport. This design was based on the projected needs in 2005 with a peak hour capacity of 3200 international deplaning passengers and 2600 international enplaning passengers. The terminal can be expanded to accommodate future IAB traffic with a peak hour capacity of 6000 deplaning passengers per hour.

The Pre-Qualification and Bidding Process - 1995 to 1997

By mid-1995, sufficient project details were available to support a Request for Qualifications (RFQ). The RFQ requested information beyond just company experience and qualifications. By providing a comprehensive briefing book with the RFQ, respondents were asked to identify their financing structure and business relationship with the Authority. They were also asked to estimate enplanement rates, equity participation, returns to the Authority and issues that should be addressed to enable the respondent to make a firm business proposal.

Seven teams were identified as having the qualifications to proceed with the contract process. All seven teams had conflicting sentiments about the project. There was strong interest combined with an equally strong skepticism that the deal would materialize due to the earlier cancelled construction plan by the PA. To deal with this skepticism, in an unprecedented fashion, the PA gave the developers access to all relevant design documents prior to the release of the RFP. Preliminary business terms for the deal were released. Developers were encouraged to submit alternate designs. Two full days were set aside whereby the developers could query the Authority on design, financial, business and operational matters. This open-book approach enabled the PA to demand an equally comprehensive and detailed proposal.

Of the seven prequalified teams, three decided to drop out. These include BAA USA Inc., JFK-IAB Partners (Turner Construction, JP Morgan), and Raytheon Infrastructure Services. Two of the teams cited difficulty in filling out their team and the third questioned the project's feasibility. The four that decided to continue with the process included:

- **IAB Gateway Developers:** Airport Group International, United Infrastructure, Goldman Sachs, Merrill Lynch
- **Idlewild Associates:** Johnson Controls, Lehrer McGovern Bovis, Hines Development, Paine Webber/Bear Stearns
- **Schiphol USA/LCOR Incorporated:** Schiphol, LCOR, Morse Diesel, Fluor Daniel, Lehman Brothers, Citicorp Securities

- **Ogden Corporation:** Ogden, Tishman Construction, Ralph M. Parsons, Smith Barney

The Authority formed an evaluation team augmented by consultants familiar with the project. O'Brien Kreitzberg, the Program Manager for the overall JFK Redevelopment effort, provided the technical support and expertise. Financing experts from Fullerton & Friar and airport operating experts from Landrum and Brown and NAPA Airport Development Consultants were brought on board. Cambridge Partners was selected as the PA's financial advisor. These different components were broken up into three independent panels – Business and Finance, Development, and Operations and Management. These panels will conduct the initial review of the proposals. The Development panel probed the cost estimate, design concept and construction schedules. Project phasing was of particular importance, since the plans had to accommodate the 6 million annual passengers and 40 airlines using the terminal during the construction. The Operations and Management panel reviewed the depth of the proposer's terminal management knowledge, staffing and cost estimates for running the terminal. The Business and Finance panel closely scrutinized funding sources, flow of funds, equity, debt service coverage and overall cohesiveness of the financing packages, plus airline and retail leasing plans.

With the distribution of the Request for Proposals (RFP), the PA listed their objectives in the entire project. In order to best fulfill these objectives, along with a base proposal using the PA's approach from the preliminary design, proposers were allowed to submit an alternate proposal and design. The PA's objectives include the following:

- To develop a new facility which meets the needs of the airport, the traveling public, and the airlines serving the airport;
- To keep the charges to the airlines using the terminal at reasonable levels which are comparable to the cost of other international facilities at the airport;
- To provide a reliable "baseline" revenue stream for the PA from the facility, while providing the PA an opportunity to share in the "upside" potential of revenues generated in the terminal;
- To minimize or, if possible, eliminate the PA's financial risk related to the development and future operation of the facility, and;
- To minimize or, if possible, eliminate the need for the PA to incur any capital costs for the project or issue debt obligations backed by the credit of the PA.

Four comprehensive proposals were received on March 4, 1996. According to the RFP, the proposals were evaluated based on the following criteria:

- 1) **Financial Return to the Port Authority:** Proposals will be evaluated on the valuation of guaranteed and variable payments made to the Authority and the conditions or assumptions which support the payments. The long term return will be examined for value for the initial ten year period and through the 25 year lease term. Interim payments made during construction and prior to DBO will also be examined. A net present value analysis will be the Authority's primary, but not exclusive, basis for evaluating financial return. In addition, an assessment of risk related to the ability of the Authority to realize its return will be conducted;
- 2) **Financial Plan:** Proposals will be evaluated on their level of capital commitment, the demonstrated feasibility of the plan, the financial resources of the Proposer, the sources of capital and the conditions assigned to the proposed plan. The Authority will analyze all estimates of construction and operating costs, enplanement rates, concession revenues and rents, among other factors, in evaluating the financial plan;
- 3) **Development, Management and Operations Plan:** Proposals will be evaluated on the quality of design, the level of service provided to tenants and passengers, construction staging and schedule, and initial and life-cycle capital costs. The management and operations plans will be evaluated for quality of the O&M estimates, retail plan, ramp operations plan, leasing plan and transition planning for operations during construction and for the utilization of current staff in the IAB;
- 4) **Team Experience:** Proposals will be evaluated on the team's experience relating to capital formation, international air terminal design, terminal construction, and terminal and aeronautical management and operations;
- 5) **Overall Quality and Cohesiveness of Proposal:** Proposals will be evaluated on the responsiveness, feasibility and overall content of their proposal. The level of integration and coordination of individual components of the proposal will also be considered.

Six weeks later, the PA had a signed Memorandum of Understanding (MOU) covering all basic business terms with the selected team of Schiphol USA/LCOR. The selected design was a variation of the Authority's original plan, with slimmer concourses and an expanded and upgraded retail court. The largest public/private airport deal in the United States was underway.

New York Land Lease Problem

A key future problem facing the private operators is the expiration of the land lease with New York City (NYC) on December 31, 2015. Since 1947, the PA has been leasing all 4930 acres of airport land from New York City. Because of its location just 15 miles from midtown Manhattan, the land is presumed by many to have a high market value. The lease requires PA to pay rent equal to the net revenue generated by operations at JFK, with a minimum guaranteed annual rent of \$3.5 million. There has been an ongoing argument between NYC and the PA on whether or not the PA has been shortchanging it on rent, at least since 1991. Payments have dropped from a peak of \$80 million in the late 1980's to \$6.2 million in 1994 and \$14 million in 1995. New York City claims that a cumulative shortfall of \$400 to \$800 million is owed from the PA in "rent" payments since 1991.

The impact of this conflict on the IAB project will be unknown until the termination of the current lease with NYC in 2015. The city then has the option of renting out the land at a much higher price or could possibly even decide not to continue to lease the land. The latter possibility is considered to be very unlikely since the airport generates major economic benefits by providing over 173,000 jobs through on- and off-airport aviation and indirectly related businesses. JFK contributes \$15.8 billion annually in economic activity to the NY/NJ region, of which \$4.8 billion is in wages and salaries. To deal with this issue, the PA asked proposers in the RFP to identify their assumptions as to the city's actions at the end of the lease.

Consortium Members - JFK International Air Terminal LLC

After their selection, the Schiphol USA/LCOR Incorporated consortium changed their title to JFK International Air Terminal LLC (JFKIAT). JFKIAT is a limited liability New York corporation established in November 1996. JFKIAT combines the resources of LCOR Incorporated, an accomplished national real estate firm; Schiphol USA, the American affiliate of the firm that operates the widely acclaimed Schiphol airport in Amsterdam; and Lehman Brothers JFK, an affiliate of Lehman Brothers Inc. Schiphol, LCOR, and Lehman have membership interests in JFKIAT of 40%, 40%, and 20% respectively. In addition, JFKIAT includes Fluor Daniel, Inc., as construction program manager; Morse Diesel International as construction manager; and TAMS Consultants, Skidmore, Owings & Merrill and Ove Arup & Partners as architects of the new terminal, and Communications Arts as retail designer. Lehman Brothers, Inc., and Citicorp Securities, Inc., serve as the project's financial advisors.

JFKIAT will contribute \$15 million to the project; \$10 million will be used to fund certain contingencies for the new terminal prior to DBO, while the remaining \$5 million will be used to pay a portion of the project's development and construction costs. Of this total amount, Schiphol and LCOR will each contribute 40% (\$6 million) and Lehman will contribute the remaining 20% (\$3 million) in equity.

Charles A. Gargano, Vice-Chairman of the PA, said, "This project is another important step in the privatization of PA facilities. We reached out to the private sector to draw on its expertise in delivering top-quality services to our customers. The new terminal will accommodate millions of travelers a year and strengthen the region's commanding position in tourism and international business. The winning team, JFKIAT, includes firms recognized around the world for their expertise."

The Amsterdam Airport Model

Schiphol USA is a subsidiary of the company that owns and operates Amsterdam's exceptionally functional airport. Schiphol Airport has led Business Traveller magazine's poll as best European airport since the early 1980's. Only Singapore/Changi ranks higher on world listings. U.S. airport terminals are not ranked highly. The Amsterdam airport is less revered for its architectural distinction than for its hyperefficiency at getting passengers on their way *and* at lightening their wallets. The Dutch have exploited the potential of airports as shopping plazas for passengers with time and money on their hands, as testified by Schiphol's glittering shops. Unable to resist the temptations of the airport's consumer amenities – which include a full mall with designer boutiques and a casino – travelers spend an average of \$35 per trip, compared with \$17.50 a head in JFK. The airport also sets maximums of 15 minutes check-in time and just six minutes for immigration. The Amsterdam airport is painless and profitable, a combination for which the Port Authority and the new proprietors of Terminal 4 hunger. Accordingly, the new IAB terminal will fulfill a pragmatic vision of a commercial hub that comforts travelers by immersing them in a familiar environment: a shopping mall, and a universe of small things in the Center Retail Court. This mall, which naturally has a New York City theme, is filled with wacky, freeform fixtures (some of which double as heating and air-conditioning ducts).

International Arrivals Building Project Requirements

The new IAB's total project budget is estimated at approximately \$858 million. This includes project contingencies of \$104 million, about \$89 million in construction contingency, and an allowance for inflation. In addition, a guaranteed maximum price (GMP) is set with a cost

of \$681 million. The authority is also involved in the financing of the project, as it will contribute approximately \$82 million that will be used to pay for certain roadways, utilities, and other infrastructure-related improvements. These projects will be constructed by the IAB construction team and, therefore, should not cause any timing or scheduling issues.

The project consortium consists of a mix of experienced domestic and international companies. The general contractor for the project's development and construction is Morse Diesel International, which has considerable experience in pre-construction and construction services for the aviation industry. For example, the company provided project management services for the East End Passenger Terminal at LGA (currently occupied by U.S. Airways) and is managing the construction of the TOGA project at JFK. Additionally, Fluor Daniel is the program manager for the IAB, and will be responsible for monitoring and supervising the general contractor and other project participants in all construction-related matters. Fluor Daniel also has significant transportation experience, as it was involved in construction at Kansai International Airport in Japan, Savannah International Airport in Georgia, and the E470 Toll Road in Denver.

Financing Strategy

The financing package proposed by Schiphol was a massive undertaking which is anchored by a loan of \$932 million for construction costs. The IAB project was to be a pure project financing, with no recourse: to the airlines that will use it, to the three companies that signed the 25-year lease to build and operate it, or to the PA. Prepayment of the debt is secured solely by the revenue stream associated with terminal operations. There are three keys to the success of the off-balance sheet financing:

1. PA was willing to share control of a major profit center with a private developer/operator.
2. PA agreed to let The Bank of New York, the bondholders' trustee, control the selection of a new operator if a serious problem arises with Schiphol. Because of this provision, Ernest Perez, airport analyst with Standard & Poor's, says, "The Port Authority hasn't really lost control of this facility. If something goes wrong with the transaction, the Port Authority will step in."
3. PA agreed to make \$80 million in IAB access improvements and subordinated most of its share of the net profits to bondholders.

Of the entire required costs of \$1.2 billion, the majority (\$932 million) was provided through special project bonds backed solely by airport revenues. Even with financing backed

FINANCING PACKAGE

Funding: Parent Company Equity	
Schipol	\$15 million
LCOR	\$6 million
Lehman	\$6 million
Principal Amount of Series 6 Bonds	\$3 million
Investment Earnings	\$932.4 million
Facility Rental prior to DBO	\$ 125,203,087.00
	\$ 124,368,951.00
	\$ 1,196,972,038.00

Costs: Construction Cost Estimate	\$	689,291,518.00
incl \$29 M for contingency & \$61 M for inflation		
Terminal/Frontage	\$580 million	
Roadways/Utilities	-\$70 million	
Ramp	\$130 million	
Project Contingencies	\$	74,027,557.00
incl \$28 M for further design, \$17 M for construction		
contingency, \$22 M for staging/OT expenses, and \$4 M		
for soft contingency		
Project Insurance	\$	27,782,985.00
Planning, Design, and Engineering	\$	58,409,975.00
General and Administrative Costs	\$	98,996,173.00
Marketing and Lease Costs	\$	9,175,500.00
(Area 2 Improvements - paid by PA)	\$	(82,000,000.00)
Debt Service Reserve Fund Deposit	\$	875,683,708.00
Financing Costs	\$	93,240,000.00
Interest on Bonds prior to DBO	\$	10,876,830.00
DBO = Date of Beneficial Occupancy; expected 12/1/2000		217,171,500.00
	\$	1,196,972,038.00

Bonds:	First Installment	\$ 357,000,000.00	Mature 2003-2015	Yield: 5.20-5.77%
	Second Installment	\$ 91,000,000.00	Mature 2017	Yield: 5.9%
	Third Installment	\$ 278,000,000.00	Mature 2022	Yield: 6.06%
	Fourth Installment	\$ 208,000,000.00	Mature 2025	Yield: 6.1%

solely by terminal revenues, the project received an investment-grade rating from three agencies, and qualified for bond insurance. The essential nature of the project translated into demonstrable demand and market-share potential. With the bonds' ratings of a BBB+ from Standard & Poor's, Baa2 from Moody's, and an A rating from Fitch, Monoline insurer MBIA Inc. guaranteed the debt service with an AAA-rating and the IAB project was truly underway. On April 25, 1997, the special project bonds were sold to institutional investors. The largest airport bond issue ever and the first major airport privatization in the U.S. sold out in less than 90 minutes.

Bond proceeds will be used to finance a portion of the development and construction costs for the new IAB at JFK, fund a debt service reserve fund, and pay issuance-associated costs. The PA agrees to enter into a lease agreement with JFKIAT to develop and operate the new IAB facility. This agreement, which extends for 25 years after the new terminal's date of beneficial occupancy (DBO), will terminate in 2015 unless the PA and the City of New York reach an agreement that extends the operating lease for JFK past 2015. Given this possible restriction, the JFKIAT consortium must make plans to make their money back by 2015 instead of the 25 year deadline. Under the terms of the lease agreement between the PA and JFKIAT, the consortium will make monthly facility rental payments in an amount that, in aggregate, equals annual debt service on the bonds.

The new facility, which has a total project budget of approximately \$858 million, has a DBO of October 31, 2000. This current IAB terminal will remain operational (at least 10 gates will always be available) throughout the construction period of the new facility. The consortium member of Morse Diesel International, Inc., which has significant airport experience at JFK (currently also overseeing another terminal construction project at JFK), is the general contractor for the project. Fluor Daniel, Inc., will act as the consortium's program manager.

The financing contains only a token amount of parent company equity - \$15 million: 40% from Schiphol; 40% from LCOR; and 20% from Lehman (see previous page). Of the total, \$10 million is to be placed in a lease contingency reserve during the construction period. The remaining \$5 million will pay part of the construction cost. In handling the revenue stream (see next page), the PA accepted a 60/40 split (60% to the PA, 40% to the private operators) of the net revenues after operation and maintenance expenses and debt services are paid. However, the PA agreed to cap its share of the revenue stream at \$60 million a year. The PA also allowed the operators to take their management fee up front as part of the operation and maintenance costs. In return, the operators pay a guaranteed base rent of \$12 million a year to the PA during the construction period. After that time, the \$12 million is set as the minimum terminal rent to the PA.

NET REVENUE DISTRIBUTION

Revenues
- Airline Revenue
- Concession Revenue
- Liquidation of Contingency Fund

Expenses
- Operations and Maintenance
- Land Lease (to NYC)
- Facility Lease (to PA) - \$12 M/yr
- Management Fees (to Consortium)

Debt Servicing
- Interest on Bonds
- Buy Back of Bonds on Maturing Yrs - see Attachment on Bonds

Revenue Sharing
- 60% to PA
- Max of \$60 M/Yr
- 40% to Consortium

When making financial forecasting calculations, bear in mind that JFKIAT took into consideration the possibility that the New York land lease would not be renewed or renewed at a significant cost to the consortium. Thus, they aimed to make their costs before the 2015 deadline. Any additional profit made after that would be the profit shared by the consortium members.

Enplanement Trends

JFK is the largest New York airport in terms of overall enplanements, accounting for 39% of 1996 total New York City area passengers. For the first nine months of 1996, the airport was ranked the eighth busiest in the United States. Passenger activity at JFK has experienced very modest growth since 1980, increasing to 31.2 million passengers in 1996 from approximately 26.8 million in 1980, a 0.9% average annual growth rate. International passenger traffic increased an average of 1.8% annually during this period, while domestic traffic decreased by an average annual rate of 0.1%.

Furthermore, in 1996, 17.4 million (56%) of JFK's total passengers were international passengers. Consequently, even as other airports around the nation expand their respective international operations, JFK remained the top international passenger gateway in the U.S. About 50% of JFK's scheduled weekly seats are for international destinations. Still, JFK's share of the New York area international passengers decreased from 97% in 1980 to 75% in 1996, resulting primarily from increased international service at the New Jersey International Airport. During the forecast period, JFK is expected to account for approximately 72% of the area's total international passengers.

Risks

In this agreement, the consortium had relatively low risk in their client, JFK. As noted earlier, the JFK airport is the top international passenger gateway airport in the United States. Specifically, the IAB accounted for 6.4 million passengers in 1996, representing 35% of JFK's total international traffic and 20% of the airport's total traffic. Between 1986 and 1996, total passengers at the IAB, which is served by more than 60 different airlines, increased to about 6.4 million from 5.7 million, equating to a 1.3% average annual growth rate.

In light of moderate historical growth, passenger traffic is projected to increase to a reasonable 7.2 million passengers in 2005, a 1.6% average annual growth rate. International passenger traffic, which comprises nearly 90% of the terminal's total passenger traffic during the forecast period, is expected to grow 0.5% annually. This passenger forecast includes the loss of approximately 25% of the IAB's passenger traffic over the 1998-1999 period. This is as a result of the Lufthansa, Air France, Korean Air, and Japan Airlines (signatory carriers at Terminal One) moving to the new Terminal One Group Association (TOGA) facility.

Most terminal competition concerns are mitigated by several factors. No other terminal at JFK currently has the land available to expand its facility or increase its current gate capacity. However, Terminal One will have some available gate capacity upon opening. Still, because the terminal will be operated by an airline association (TOGA), rather than a terminal developer/operator, different business and competitive parameters and objectives may be inherent in the association's decision-making/operating process. Also, the authority has agreed that, in the event an airline unit terminal becomes vacant, it will not allow a private developer to step in and subsequently convert the vacant terminal into a multi-airline terminal, which would be in direct competition with the IAB facility. Furthermore, Newark International Airport, which recently completed a \$120 million international terminal expansion, is severely constrained in terms of future growth by its airfield capacity. The authority has also stated that it has no current plans to expand its international facility at Newark. The Newark International Airport will remain primarily a domestic facility for the New York area and a hub for Continental Airlines, which uses considerable airfield capacity. Thus, the consortium of JFKIAT has a pretty secure revenue stream.

Also, the authority has agreed to provisions in its lease with JFKIAT that restrict additional Federal Inspection Services (FIS) capacity at other unit terminals. This severely limits the expansion capability of the other terminals as this service is mandatory for any international travel.

JFKIAT expects to derive solid revenues at the new IAT facility, which in turn generates sound debt service coverage (DSC). Base case DSC projections, assuming bonds are defeased in 2015, range from 1.63 times (x) in 1998 to 1.50x in 2005. Moreover, although this issue contains a 1.25x rate covenant, which would be invoked, several sensitivity analyses, using a 2015 defeasance, were conducted. In scenarios that included a 10% and 20% annual reduction in enplanements from the base case forecast (associated reductions in revenues and expenses were also incorporated), DSC remains adequate, ranging from 1.43x in 1998 to 1.27x in 2005 (10% reduction) and 1.22x in 1998 to 1.04x in 2005 (20% reduction).

Offsetting credit factors include a limited pledged revenue stream and the inherent competitive nature of the airline/airport industry. Similarly, changes in the dynamics of the airline industry may impact airport operations. In addition, even though costs per emplanement at the IAT facility (about \$54) will be benchmarked with respect to other JFK unit terminals, projected airline costs are high.

The IAB has an extremely diverse group of tenant airlines. More than 60 airlines operate at the IAB, and only three of the top 30 airlines (in terms of 1996 passengers) are U.S.-based carriers. The remaining 27 foreign-flag companies (of the top 30 companies) are from a diverse group of countries. There is no dominant carrier at the IAB; for example, in 1996, Air France was the leading airline at the IAB in terms of total passengers, as it accounted for 7.2% of the total. Following Air France was Aer Lingus with 6.5%, Lufthansa with 6.5%, El Al with 6.4%, and Alitalia with 5.1%. The remaining carriers accounted for less than 5% of total passengers in 1996. This diversity allows the IAB to function without dependence on one airline tenant and it also protects the operation from political or economical problems from any one country. For example, if there is a recession in France that would lower the amount of traffic going to that country, it would make a relatively small difference to the operation of the IAB as travel to other countries would not change. The leases with the existing airlines at the IAB were extended upon the closing of the series 6 bonds.

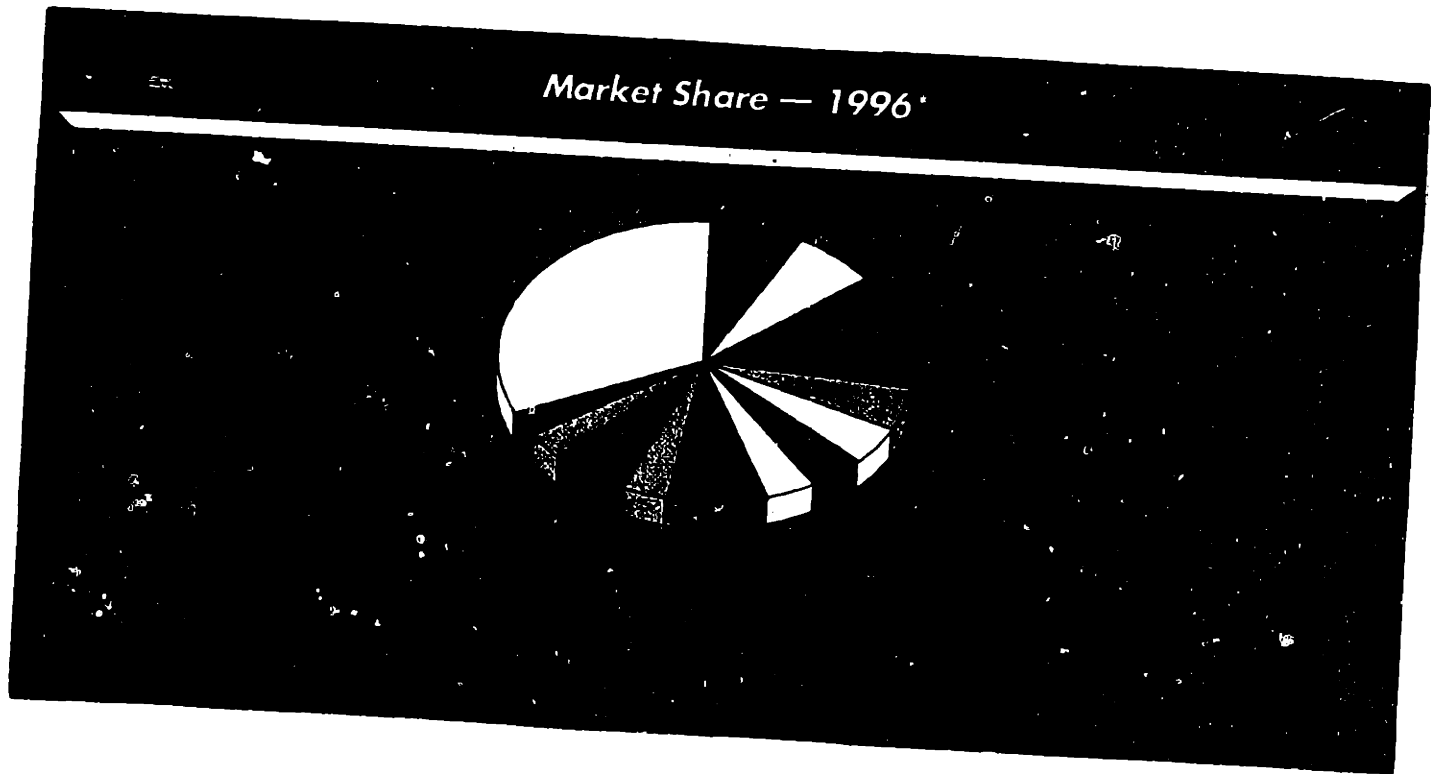
Thus, in summary, the strengths in this project include:

- Demand for new multi-airline facility
- Limited terminal expansion ability at JFK
- JFK's position as the top international gateway airport in the U.S.
- JFKIAT participant's experience
- Lease between the authority and JFKIAT mitigates some of the competitive concerns
- Solid debt service coverage

- Diverse group of tenant airlines

The risks include:

- Limited pledged revenue stream
- Competitive nature of airline/airport industry
- Airport operations may be affected by changes in the dynamics of the airline industry
- High projected airline costs



Security

The special project bonds, series 6, will be secured by facility rental payments by the lessee (JFKIAT), certain trust estate funds, security interests in the lessee's personal property, agreements relating to the new terminal, and other assets of the lessee. The bonds are further secured by a pledge of certain lessee funds and by a leasehold mortgage in favor of the trustee in the lessee's right, title, and interest in, to, and under the lease with the authority, and a guarantee of debt service payment by the lessee. There is no recourse to the authority for the payment of debt service on these bonds.

Some security features include:

- **Rate covenant** – The lessee covenants to collect revenues sufficient to provide for 1.25x coverage of debt service, after the payment of all permitted operating and maintenance expenses and ground rental payment. The coverage test must be met on both a historical basis via its annual audited financial statements and a projected basis using its annual operating budget.
- **Additional bonds** – The lessee covenants that it will not seek issuance of additional special project bonds unless the following conditions are satisfied. 1) Projected debt service coverage for each of the remaining years of the bonds meets the rate covenant requirement. 2) The lessee certifies that the proceeds of the additional bonds, in addition to other available funds, will be sufficient for the proposed purpose. 3) The proposed use will not impair the operations of the new terminal. Furthermore, the PA has authorized the issuance of up to \$1.2 billion of special project bonds for the IAT. The PA has provided no assurance that it will issue additional special project bonds if requested by the lessee.
- **Reserve fund** – A debt service reserve fund will be established from bond proceeds in an amount equal to 10% of the aggregate principal amount of the series 6 bonds outstanding. Amounts withdrawn from the reserve fund for transfer to the bond funds must be replenished from the first available funds, while excess amounts in the reserve fund will be transferred to the bond fund. A reserve fund credit facility may be used to satisfy the reserve requirement.

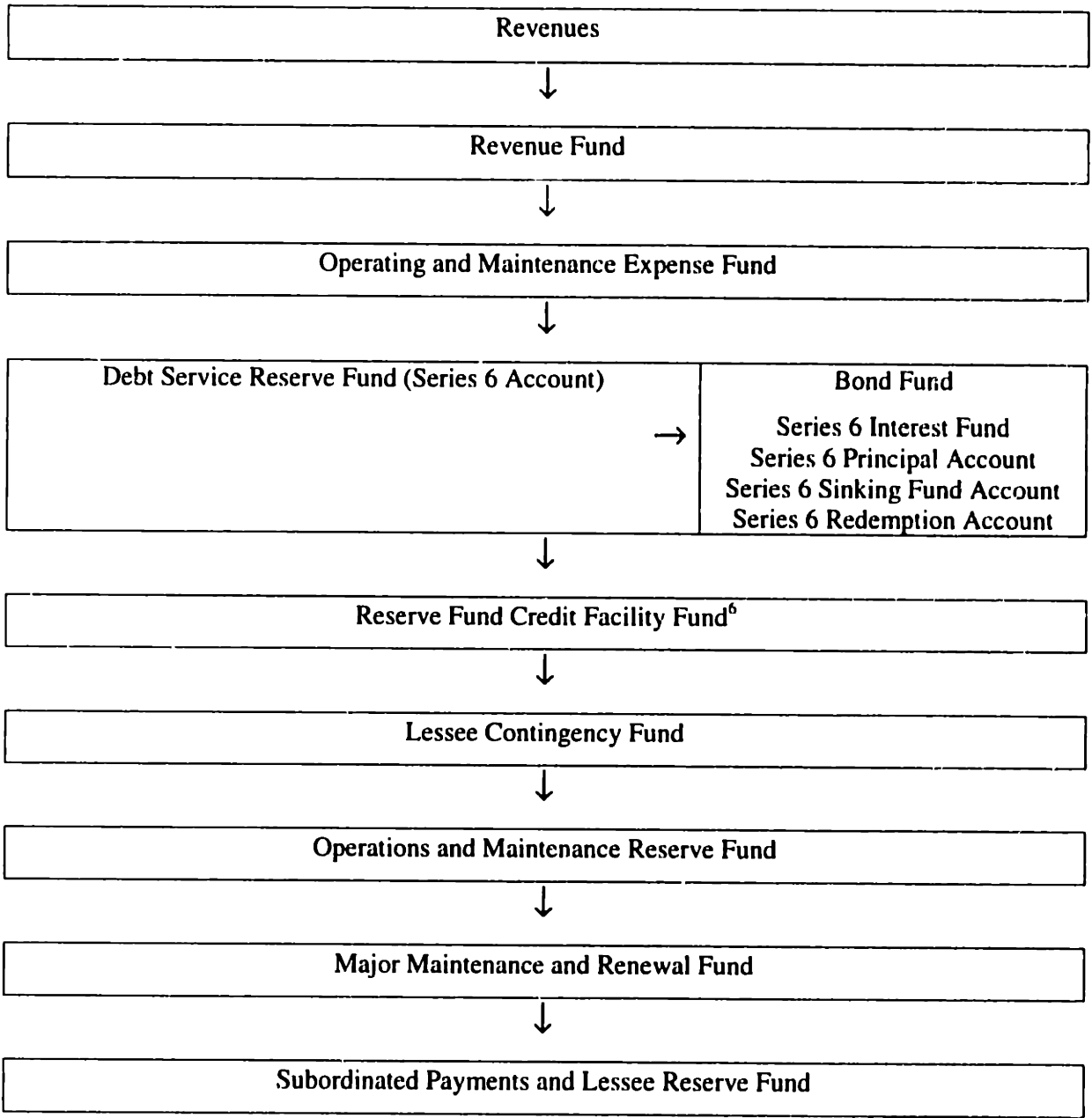
Lease Agreement

As noted, the authority and JFKIAT have entered into a lease agreement. The lease contains basic terms and conditions for the financing, development, construction, and operation of the IAB, as well as the operation and management, in the interim, of the IAB. This agreement,

which extends for 25 years after the terminal's DBO, will terminate in 2015 unless the authority and the City of New York reaches an agreement that extends the operating lease (city lease) for JFK past 2015. Furthermore, because the potential exists that the city lease may not be extended, these bonds, which are scheduled to mature in 2025, will be subject to mandatory redemptions that will result in the defeasance of all series 6 bonds by 2015.

Under the terms of the PA/JFKIAT lease agreement, JFKIAT will make monthly facility rental payments in an amount that, in aggregate, equals annual debt service on the bonds. Moreover, the lease agreement requires JFKIAT to make additional rental payments to the authority, including an annual ground rental of approximately \$10.7 million in 1997 dollars (escalated at the greater of one-half the Consumer Price Index or 4% per year) that is to commence at DBO. Also, the authority will receive a significant portion of the net residual cash flow from the terminal. The lease includes provisions that expedite the authority's need to consent to each additional sublease agreement (between JFKIAT and, among others, airlines and concession providers). Other important lease provisions include the authority's agreement not to increase current FIS capacity at other JFK unit terminals until the IAT is operating at its FIS capacity. Additionally, the authority has agreed that in the event an airline unit terminal becomes vacant, it will not allow a private developer to step in and subsequently convert the vacant terminal into a multi-airline terminal that would be in direct competition with the IAB facility. All these provisions, in essence, provides a safety net for both the authority and the consortium.

Flow of Funds



Financial Projections

Unlike many domestic airport operations, the IAB's financial structure will not utilize a cost-recovery methodology, but rather will use a market-based pricing system. It is anticipated that costs will be benchmarked, when possible, with costs at other unit terminals, including TOGA. Average airline costs per enplaned passengers at the IAB were \$8.50 for domestic

⁶ Revenues only deposited in the reserve fund credit facility fund to reimburse the provider of a reserve fund facility for any draws thereunder.

passengers and \$33.00 for international passengers in 1997, with moderate escalations throughout the interim period. Following DBO in the fall of 2000, airline costs are expected to increase to \$13.50 for domestic passengers and approximately \$50.00 for international passengers. These costs are generally higher than other international facilities but are attainable given the lack of available terminal capacity at JFK and the pricing of comparable facilities at the airport. The high airline costs reflect the new facility and its improved quality and service.

Financial Operations — Projected Debt Service Coverage

(\$'000, Years Ending Dec. 31)

	<u>1998</u>	<u>2000</u>	<u>2001</u>	<u>2003</u>	<u>2005</u>
Airline Revenue	95,835	115,138	136,110	150,709	162,600
Non-Airline Revenue	<u>15,845</u>	<u>24,345</u>	<u>21,310</u>	<u>28,811</u>	<u>31,935</u>
Total Revenue	111,680	139,483	157,420	179,521	194,535
Total Expenses*	52,738	54,536	60,981	67,475	72,908
Net Revenue	58,942	84,947	96,439	112,046	121,628
Facility Rental**	36,154	40,783	64,810	74,185	81,130
Debt Service Coverage (x)	1.63	2.08	1.49	1.51	1.50

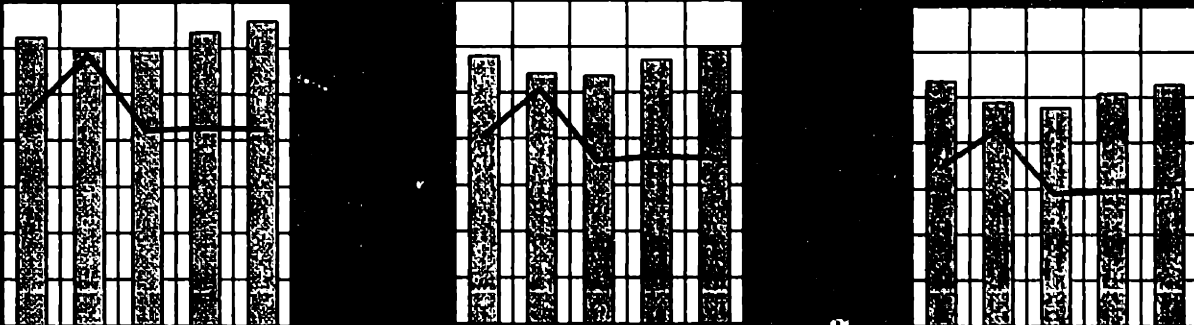
*Includes ground rental and operating and maintenance expenses. **Facility rental equals scheduled annual debt service on the series 6 bonds.
 Note: Assumes 2015 term. Source: Leigh Fisher Associates. Note: Numbers may not add due to rounding.

In addition, forecasts include an increase in the anticipated revenue per enplaned international passenger. For example, revenue per international passenger is expected to rise to \$30.78 in 2002 from \$19.49 in 1998 (pre-DBO). The significant terminal/concession revenue is projected to be generated due to several factors. First, JFKIAT has placed great emphasis on maximizing concession revenue by adding an additional 20,000 square feet of additional concession/retail space to the IAB, versus the existing IAB. In addition, the quality of the concessions are expected to be state-of-the-art, with a central marketplace theme and a new 12,000-square-foot duty-free shop as the anchor of the concession program. Accordingly, duty-free sales, which are expected to account for approximately 55% of post-DBO concession revenue, are also expected to increase moderately with the opening of the IAB. Finally, Schiphol has been integrally involved in the development of the concessions at the IAB, drawing on its successful experience at the Amsterdam Schiphol Airport in the Netherlands to create the IAB's concession/retail program.

Debt Service Coverage/Sensitivity Analyses

JFKIAT expects to derive solid revenue at the IAT that should generate sound DSC. Total airline revenue is expected to increase from \$95.8 million in 1998 to \$136.1 million in 2001. Additionally, non-airline revenue is expected to rise from \$15.8 million in 1998 to \$23.1 million in 2001, when it will account for about 14% of total revenues before increasing to 16% of the total in 2003. Expenses are projected to also increase from \$52.7 million in 1998 to \$61.0 million in 2001. Resultant net revenues are expected to range from \$58.9 million in 1998 to \$96.4 million in 2001 and amply cover the facility rental payments (debt service) by 1.63x in 1998 and 1.49x in 2001. Following 2001, annual debt service coverage is projected to be approximately 1.50x. These results assume amortization of all debt by 2015.

Sensitivity Analyses – IAB Enplanement/Debt Service Coverage



Although the financial projects are achievable, two sensitivity analyses were performed because of the inherent limited nature of the revenue streams supporting debt service payments. Under one scenario, which included a 10% decrease in annual IAB enplanement (from the base case enplanement forecast), debt service coverage remained adequate, ranging from 1.43x in 1998 to 1.27x in 2005. A second and more severe scenario assumed a 20% reduction in enplanements from the base case forecast. Resultant coverage is anticipated to be 1.22x in 1998

and 1.04x in 2005. These sensitivity analyses include reductions in all passenger-related revenues and expenses. The rate covenant would be invoked if debt service coverage falls below 1.25x.

Closing the Deal

In May 1997, with over \$30 million already committed by the developer, the lease was signed, JFKIAT took the keys to the existing terminal, construction trailers moved in, and site work began. The new IAB terminal is expected to open in 2001, with the demolition of the old terminal completed in stages as the new terminal takes its place. The PA's goals from the onset of the search for a private sector partner had been achieved. They were:

- Construction of a new terminal
- Competitive rates for airlines
- Reliable revenue base and upside sharing potential
- Appropriate risk sharing
- Minimal contribution of capital and no PA-backed debt.

Lessons Learned from the IAB Case Example

Though the IAB example resides in the United States and not in China, it does show a number of characteristics commonly found in successful BOT projects and it demonstrates some lessons that both the Chinese government and international construction companies.

The lessons that the Chinese government should take away from this example includes the importance of identifying the goals of the project from the start and enlisting the aide of private partners. For the IAB, the Authority was clear from the start that they needed this new building and that the existing building would not be able to handle the forecasted passenger loads. In order to ward off having the same problems in the future, the Port Authority wanted a building that would be able to grow as the need dictated. Also, the PA was clear that they wanted to incorporate more retail space in the new building so as to raise revenue and also to provide more amenities to their passengers. So, from the start, the requirements of the building were set and the dedication of resources (staff) was dedicated to solving this problem. That was the first important step the PA took. The next was that they enlisted the help of the current users of the facility: the airlines. They also went out of their way to enlist would-be retailers that would rent out commercial space in the new building. Thus, the PA raised their lure for private operators by

providing a guaranteed income stream and interest. By providing such a guarantee, the PA was in a better position to get more competitive bids from operators.

By leading the project in terms of defining objectives and doing feasibility analysis for the building, the PA demonstrated to the private bidders that they were committed to the project. The feasibility analysis also allowed the Authority to get a clearer idea of what they wanted and what resources they would need. It was only through doing the feasibility analysis that they understood the amount of money they would need to invest in the project and that, being limited in that area, they arrived at the BOT procurement strategy. Many of the complaints of construction companies about bidding for public projects is that government institutions are usually not clear about what they want and sometimes, after having spent significant resources in putting a bid together, the government decides not to go ahead with the project. This is true all over the world and not just in China. With the IAB, the government showed a clear commitment from the start by spending the money to do a feasibility analysis. That is the third important step that the Authority took.

In the pre-qualification stage, the Authority also took some steps that the Chinese government can learn from. For one, they made the process completely transparent to bidders. All documents were open and there was a specified day set aside for questions and answers. By doing so, the PA in fact lowers the risk for the operators as they made clear all the factors involved with the project. The bidders, in turn, could submit a bid with less uncertainty. Thus, again, the Authority put themselves in a better position to receive competitive bids. Another step that the PA took was in enlisting the help of a separate company to evaluate the qualifications and bids. Thus, they had the benefit of the expertise of these corporations in selecting a company suited to their requirements and needs. Throughout the entire process, from project initiation to signing of the contract, the PA acted in a completely transparent manner and getting help when needed. Thus, they eliminated as much of the risk as possible for the operators. That is the biggest lesson that China should learn.

Chinese government is well-known for their secrecy in everything from project tendering to company selection to bid opening. By opening up what knowledge they have with respect to the project, for example, knowledge gained from past operations of that or similar facilities in the area, the Chinese government is in effect making it better for themselves and for bidders. For bidders, since China is a new working arena for them, it would lower the risk of operating in that area and thus they would be able to make a better estimate of what the operations and maintenance costs would be and lower their risk. Also, it would allow them to determine if they are capable of operating the facility. This would in turn decrease the amount of any later

problems that might come up and China would be secure against receiving bids from unqualified bidders. For China, a transparent method of tendering would mean getting lower bids as companies can make better estimates of costs and revenues.

The IAB is also a demonstration of how an international company can successfully bid and work in a foreign environment. Schiphol has never worked in the United States before. Even though they were technically competent in the operation of the airports, for the IAB project, they enlisted the help of local companies in forming their consortium. Thus, they had experienced local help to guide them through any problems that might come up due to unfamiliarity with the local operations. As mentioned previously, one of the most important steps a foreign firm can take to alleviate their adjustment to a foreign climate is by forming an alliance with a local firm.

A second step that Schiphol took was in hiring local personnel. Though the United States is far from being a country lacking in technical expertise, the current situation of airport crew is that the standards are still below other countries, e.g. Japan or the U.K. Schiphol could have chosen to hire, from their own country, technically competent personnel that were used to the level of operations demanded. However, they chose instead to make only a few additions to upper management of the new IAB, and to keep the majority of personnel currently working there. In this way, the airport would be operated by people that understood the local environment and it also provided another incentive for the PA to hire Schiphol as it would mean training of local personnel.

In the financing package, both Schiphol and the PA worked together to form a financing package that was beneficial to both. For the PA, they gained a guaranteed income stream in the form of the facility rental as well as a guaranteed proportion of the revenue stream. The added minimum revenue is greater than if the PA operated the IAB themselves. For Schiphol, they conducted in-depth financial analysis to show that they would still make money even in the worst case scenario. They took care to make allowances for omissions or errors so that they put in a bid higher than what they would earn in the worst case scenario. In this case study, both the government institution and the private operators worked together to form a win-win situation, in terms of financing and service pricing and in terms of facility operations and contribution to the public good (in the form of a more efficiently operated facility with more amenities).

CONCLUSION

As many foreign investors and would-be investors have already discovered, the BOT road in developing economies is a bumpy, if not an outright distressed, road. It is bumpier than the BOT road back home. It is commonly mined with financial uncertainties, technical difficulties, cultural barriers and, sometimes, political controversies. There are cases where foreign investors have had trouble getting their BOT projects started. There are cases where foreign investors who, after successfully negotiated a BOT agreement, have found themselves infuriated and have asked the support of their own government, because the host government would not honor their project accord. And there are cases where the BOT project turned out a technical wonder to the engineering profession, but a financial disaster to its investors. Many foreign investors who jumped ahead of the rest of the pack into the BOT market of developing economies are now caught in costly political and financial roadblocks. This makes many would-be foreign investors falter outside the market. As a result, BOT projects are not proliferating in these economies as quickly as the promise this alternate financing method holds.

However, private developers need to recognize that the environment for private investment in China has been changing rapidly over the past few years and that attractive opportunities are becoming available to private investors. Some of the more significant trends are the following:

- **Government commitment** – Governments have now indicated their explicit commitment to private participation in infrastructure.
- **Increased private interest** – There has been a dramatic increase recently in the supply of private developers in the power sector. Development of consortiums of equipment suppliers, consulting companies, construction companies, and fuel suppliers have created more than 200 prospective bidders for power projects worldwide. A recent invitation for IPPs in Thailand, for example, attracted more than 100 bidders, and more than 30 developers sought prequalification for the first IPP offering in Vietnam. Another interesting trend is the increasing participation of domestic and regional companies (for example, the China Light and Power Company in Hong Kong) in newer power projects.
- **Move to competitive processes** – Governments have moved toward some form of competitive procurement.
- **Greater availability of information** – There is increased information available about, and more widespread knowledge of, the private sector. Governments have now

become more confident about dealing with private participation in infrastructure than they were a few years ago.

- Acceptable prices and developer returns
- Size of projects

China has tried to encourage more foreign participation by introducing BOT into its system. However, since its introduction in 1995, relatively few projects have been undertaken. Obviously, there are some problems and BOT is yet the hoped-for cure-all solution to China's infrastructure woes. BOT's most obvious problems are:

- Continued lack of sovereign guarantees
- Currency convertibility at a fixed rate--a major concern given speculation over possible devaluation of the renminbi--is not completely assured, and remains the greatest perceived risk for Chinese project finance deals.
- Project risk is also high because, unlike elsewhere in Asia, contracts are negotiated on an ad-hoc basis with local government each time a project is tendered. This increases, sometimes by years, the time taken to land the deal.
- It gives foreign investors the near-impossible task of assessing the credit-worthiness of local authorities.

To further develop an environment that promotes international involvement, whether it be in BOT or some other construction procurement method, China must develop and normalize its construction market. In order to facilitate greater sector participation in infrastructure projects, the governments need to make more modifications to their existing system.

Firstly, China must break the present administration system of, blockaded by every department and cut apart by every prefecture, and build a uniform opening building market in the country, in which every project must be put, no matter what is invested by the state or enterprise or social organization. Part of this is appropriate allocation of risk. Risk sharing among the government, lenders, and developers is at the heart of most reservations or debate about private sector BOT projects. Therefore, China officials, in order to lure private investors, must allow developer returns commensurate with risks. Quantifying the risk inherent in – and, by extension, acceptable equity return on – large infrastructure projects is difficult but essential.

Second, China must perfect the system of the building market, not only to develop the building commodity market, but also to open all the elements markets of building production, including that of money, material and equipment, labor, technique and so on and to perfect the guarantee system for the production support secure through marketing the production elements.

Thirdly, China must perfect the conditions of the building market by introducing the general code of the world, setting up and strengthening the laws and regulations of the market, strengthening the power of executing the laws, standardizing the behaviors of both the employer and the contractor in the contract, guaranteeing the fair play in deals and the equality in competitions and to set up the arbitration organization to administrate contracts and mediate the market issues. Transparency of process is vital. Private sector investment opportunities are conditioned on the existence of specific government policies and programs that encourage private sector entry and a transparent system of evaluating bids and awarding contracts. Transparency and public accountability are best achieved by using a competitive bidding process to select contractors for infrastructure projects.

Fourthly, China must strengthen the market administration, to amplify and perfect the regulations of the qualification for employers and contractors who can enter the market and of the construction supervision, to prevent the illegal deals and the unfair competitions and to set up the arbitration organization to administrate contracts and mediate the market issues. A stable policy regime promotes a healthy environment. Private investors in infrastructure, whether they are domestic or foreign, seek a policy regime (including such elements as the tax and investment frameworks) that is both stable and predictable.

Lastly, China must set up the rules about guarantee of engineering credit, about settling accounts for projects and about claim damages according to the international practice. Bilateral and multilateral guarantees and credit enhancements are often critical to the successful financing of infrastructure (including, among others, independent power providers) projects, particularly during their early years and the transition from state dominance to a more market-oriented economic system.

Even with the restrictions facing the Chinese BOT market, there has been some successes. Foreign companies and the Chinese government have forged relationships that have worked around unique problems in order to provide the infrastructure for the Chinese people. They have come up with innovative financing methods. For example, there is the Meizhou Wan 724 MW power project in the Fujian province. It is being developed by InterGen and its partner through Fujian Pacific Electric Co. Ltd., a special purpose company formed as a wholly foreign-owned enterprise to finance, build, own, and operate the power plant. Before the plant was built, insufficient power was regarded as a major constraint on the region's rapid economic growth. The Meizhou Wan will be one of the first wholly foreign-owned limited-recourse power projects in China based on BOT principles. The 725 MW coal-fired power plant will be the Asian Development Bank's (ADB) first limited-recourse financing and second private sector power

project in China. The project will cost \$750 million, including contingencies and working capital. The ADB will provide direct and complementary loans totaling \$190 million. Banque Paribas, BA Robertson Stephens Asia Limited, Credit Suisse First Boston and The Tokai Bank, Ltd will be underwriting the \$150 million ADB complementary loan, a \$76 million term loan supported by extended political risk insurance from Spanish export credit agency (CESCE), a \$53 million term supported by political risk and commercial insurance from the French export credit agency (COFACE), a \$218 million commercial loan facility and a \$30 million working capital facility. Approximately \$189 million of owner equity will complete the financing package. The ultimate ownership of the project will be Intergen with 70%, Lippo China Resources Limited with 25%, and the ADB with 5%.

After completion, the net electrical output will then be sold to the Fujian Provincial Electric Power Bureau under a 20-year power purchase agreement. The project has even been designed, built and operated to conform to China and World Bank environmental standards. The facility will incorporate equipment capable of complying with all applicable air emissions, solid and liquid waste discharge, and noise standards. The power plant will include advanced burners for NO_x reduction and an electrostatic precipitator for particulate removal. SO₂ emissions will be controlled through the use of low sulfur Indonesian coal as the project's fuel.

Another example of foreign limited recourse BOT project is the Da Chang water treatment plant is a BOT project jointly invested by Bovis and Thames Water. It is scheduled to go online, ahead of schedule, on April 1999. The project's \$73 million cost has been funded by \$22 million of equity investment from the two British partners, and \$51 million in syndicated loans from five banks, led by Barclays of the United Kingdom. Though Da Chang does make extensive use of foreign equipment – much of it procured by Thames' Australian subsidiary – the financing notably avoids funding from export credit agencies. Thames will operate the plant for 20 years in accordance with a concession agreement signed with the Shanghai Municipal Water Authority.

Bovis should benefit doubly on its investment in Da Chang. In addition to Bovis getting return on its capital, bankers on the project required that a foreign firm undertake construction, and because Bovis itself had control of the project it undertook general contracting. Although it involves more risk, such work is potentially more lucrative than project management. Moreover, the value of Da Chang is \$73 million compared with the \$104 million in total construction value for all eleven other projects Bovis has completed in China.

How far will BOT go in building China's infrastructure? It is yet too early to tell. But if China learns from lessons of the past and makes the construction environment friendlier to

foreign participants and if foreign investors learn to adapt to working in that environment, then it bodes well for both sides. What will happen in the future is hard to predict. But it will be interesting to note how BOT, now in its infancy, will grow and develop in the upcoming years.

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