A COMPARATIVE STUDY OF BOT IN DEVELOPING ASIAN COUNTRIES

by

Hiroaki Iizuka

B.E., Civil Engineering
Kyoto University, Kyoto, Japan
(1984)

Submitted to the Department of Civil and Environmental Engineering in partial fulfillment of the requirements for the Degree of

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Signature of Author_____
Department of Civil and Environmental Engineering

Certified by_____
Professor Fred Moavenzadeh
Thesis supervisor
Director, Henry L. Pierce Laboratory
George Macomber Professor of Construction Management

Accepted by_____
Joseph Martin Sussman
Chairman, Departmental Committee on Graduate Studies

Eng.

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Abstract

The Build-Operate-Transfer (BOT) scheme is a limited recourse financing technique. It has become popular world-wide as an alternative approach to traditional public financing for infrastructure development. The purpose of this thesis is to discern critical success factors of the BOT scheme especially in developing Asian countries.

This thesis first provides the general characteristics of BOT in developing Asian countries, such as China, the Philippines, Thailand, and Malaysia. The backgrounds of these countries, the objectives of BOT, the allocation of associated risks, and the basics of financing for BOT are described.

Second, it describes seven specific BOT projects. Four power plant projects in China and the Philippines, and three toll road projects in Thailand, Malaysia, China are presented.

Third, it examines the achievements of the participants' objectives, the detailed risk allocation at each stage, and the financial structure of BOT. The analyses discern specific requirements for appropriate risk allocation.

Finally, it suggests several critical success factors to be considered in future BOT projects from the points of view of both the government and the private sector. Promoting vital projects, establishing long term corporate strategies, using proven technologies, and good project management as well as having efficient turnkey contractors are the most important tasks of the private sector.

Thesis Supervisor: Fred Moavenzadeh
Title: Professor of Civil and Environmental Engineering
Director, Henry L. Pierce Laboratory
George Macomber Professor of Construction Management

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May 1994, at Arlington Massachusetts

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Chapter I

Introduction

1.1 The background of BOT

The Build-Operate-Transfer (BOT) scheme is a limited-recourse project financing technique[1] for implementing infrastructure development by using private funds. A project promoter, usually an international construction contractor or developer, builds and operates an infrastructure project for a certain concession period, typically between 10 and 30 years, then transfers the project and the ownership at no cost to the host country. Although similar kinds of project financing techniques were applied in the nineteenth century for constructing toll roads in France and Spain, and for the famous Suez Canal in the Middle East[2], the BOT scheme was invented by Turkey's Prime Minister Turgut Ozal in early 1985 to attract foreign investment. Since he introduced BOT, it has been utilized in several Asian developing countries for the following reasons:

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[1] The limited-recourse project financing method is comparable to the traditional non-recourse project financing method which has been used in the oil industry. Although non-recourse project financing relies only on the credibility of the project itself, limited-recourse project financing relies on both the project and guarantees provided by the host government and the sponsor companies.

[2] Augenblick, Mark and B. S. Custer, The Build, Operate, and Transfer ("BOT") Approach to Infrastructure Projects in Developing Countries, Policy Research and External Affairs Infrastructure Working Papers, Washington, The World Bank, August 1990.

- **The infrastructure crisis in ASEAN[1] countries**

ASEAN governments, despite their countries' economic expansion, had not considered infrastructure development a priority. Therefore major infrastructure, including power plants, highways, harbors, and airports, became insufficient to sustain the continuous expansion of their economies. Because it is very difficult to develop needed infrastructures quickly these governments require private participation.

- **Debt crisis in developing countries and infrastructure needs**

Despite their serious infrastructure needs, developing countries have difficulty in providing sufficient funds for their construction because of their lack of budget and their limited foreign debt capacity.

- **Host governments' and international lending institutions' interest in privatization**

The governments of the developing countries and lending agencies were very active in the 1980's because of the developing countries' lack of funds on the one hand, and the international lending agencies' appetite to create new investment opportunities on the other.

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[1] ASEAN countries are Malaysia, Thailand, Indonesia, and the Philippines

1.2 The background of BOT in Asian countries

In Asian countries, the BOT scheme was initially implemented in Hong Kong, and Australia, then in relatively stable countries such as Malaysia because of the importance of political stability, legal systems, and hard currency requirements. Thereafter, the scheme began to be used in less stable countries such as the Philippines, Thailand, Indonesia, and China.

In order to apply the scheme successfully in such developing countries, government and project promoters must be very sophisticated in dealing with some of the critical factors of BOTs. Many problems have arisen because of the inexperience of both sectors. For example, the Second Stage Expressway Project in Thailand was expropriated by the Thai government, and other projects have had problems as well, such as the poor performance of the government joint venture partner, the delay of land acquisition, loss as a result of currency fluctuation, construction cost overruns, delays in construction, and poor construction quality.

1.3 Objectives

The objective of this thesis is to discern critical success factors for future projects through intensive risk analyses of current BOT projects in Asia. The thesis examines problems as well as risks and their allocation in current BOT projects. It includes an analysis of government support and financing. In particular, it examines seven BOT

projects from the view-points of both the government and the private sector.

1.4 Organization

In Chapter II, the thesis first provides the background history of BOT in developing Asian countries, such as China, the Philippines, Thailand, and Malaysia. It presents each country's needs for BOT, regulatory arrangements, and current BOT and other privatization projects. Second, it presents the participants and their objectives and the possible constraints of BOT. Third, a general understanding of the associated risks and the allocation in BOT are described. The financing basics for funding sufficient equity and debt are then presented.

In Chapter III, seven BOT cases are described. Of the four power plant projects described in China and the Philippines, one in each country is under construction and one in each country is under operation. Next, three toll road projects in Thailand, Malaysia, and China are described. All three projects are under construction.

In Chapter IV, the thesis first summarizes the major project features of the cases described in Chapter III. Next, the achievements of the objectives presented in Chapter II are evaluated. Finally, the detailed risk allocation in each project is examined with a comparison of all projects.

In Chapter V, critical success factors for future BOT projects from the points of view of both the government and the private sectors are discussed.

Chapter II

General Characteristics of BOT

2.1 Introduction

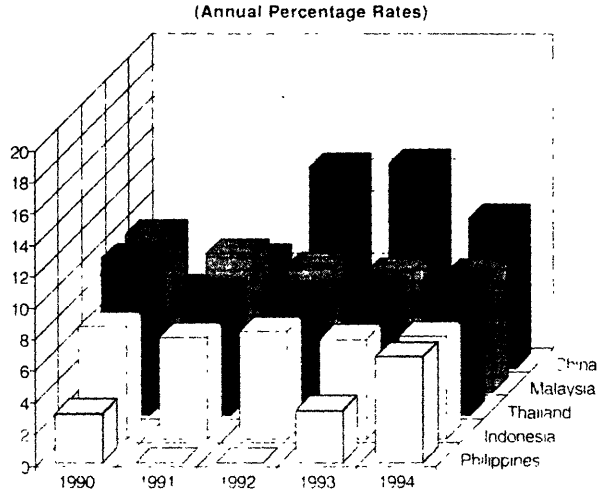
The background histories of BOT in developing Asian countries, such as China, the Philippines, Thailand, and Malaysia are first provided. Second, each country's needs for BOT, regulatory arrangements, and current BOT and other privatization projects are presented. Third, the participants in BOT and their objectives are described. The main objectives of the government are the additionality and efficiency gains from BOT. The private sectors' major objective is a high return on their investment. Thereafter, general understandings of the associated risks and the allocation in BOT are described. The financing basics for funding sufficient equity and debt are then presented.

2.2 The background of BOT in Asian countries

The background of BOT in developing Asian countries, China, the Philippines, Thailand, and Malaysia is discussed. First, Asian countries' economic growth and their current policy toward infrastructure development are described. Thereafter, their infrastructure needs, regulatory adjustment toward privatization, including BOTs, and current BOT and other privatization projects are presented.

2.2.1 Economic growth and infrastructure development

Sharp economic growth in Asian countries has expanded the need for infrastructure far beyond that which government can provide without increasing budget deficits or foreign borrowing. China and ASEAN countries' GNP growth for 1990-1994 is shown in Figure 2-1.



Source: Pacific Economic Outlook 1993-1994 and OECD (1990-92: actual rates, 1993-94 forecast rates except China government actual 1992 and estimates 1993).

Figure 2-1
China and ASEAN Countries' GNP Growth for 1990-1994[1]

Because of their need to develop their infrastructure, these countries have changed their policy and now cooperate with foreign investors. Such Asian countries have even enhanced their political, legal, and social condition to induce foreign investment, as the infrastructure demand is

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[1] Heginbotham, Erland, Asia's Rising Economic Tide: Unique opportunities for the U.S., National Planning Association, 1993.
Source: Pacific Economic Outlook 1993-1994 and OECD (1990-92: actual rates, 1993-94 forecast rates except China government actual 1992 and estimates 1993).

urgent, especially in the power sector in the Philippines and China, and in the transportation sector in Thailand and Malaysia. Therefore, BOT has become very attractive both for these countries and for foreign investors. Each country's specific background for privatization is described in the following sections.

2.2.2 China

2.2.2.1 Infrastructure needs

In China, as in other Asian countries, the power and transportation sectors are urgently in need of infrastructure development. Since the implementation of the "Open Door" policy, the power sector has increased its capacity quickly. The annual added capacity has exceeded 11,000 MW since 1988. However, the GNP has risen by 8.8% annually during the last decade, more than the capacity growth of 7.7%. Therefore, brownouts are still daily phenomena. China's energy planners are going to add a total of 12,000-15,000 MW of new capacity each year for at least the next decade, mainly in the industrializing regions of southern and eastern China.[1]

2.2.2.2 Regulatory changes to promote BOT

It seems too early to predict the sustainability of the recent Chinese policy for foreign infrastructure investors. However, China is definitely pursuing the privatization of power plants, roads, and other utilities. The government has

[1] Gray, Frank, "Doors opened to foreign investment," Financial Times, 25 May 1993.

been modifying laws to keep up with rapid economic development. It first decreased private business ownership restrictions to attract foreign investors in late 1970s. During the 1980s, joint corporations and joint ventures between Chinese and foreigners, and wholly owned foreign enterprises were introduced. However, such enterprises were restricted to technology and export related sectors because of technology transfer and the foreign currency shortage. Also, public services such as electricity generation were restricted to the government. In the 1990s, the government recognized the importance of foreign capital and enabled foreign investors to invest in such infrastructure projects. Major preferential policies for cooperative and equity joint venture projects include a certain amount of tax exemption for income and the repatriation of investments; custom duty exemptions for imported machinery, equipment, and materials; and land use rights.

2.2.2.3 Current BOT projects

In the power sector, the Shajiao B Power Plant, completed in 1987, is the only functioning example of the BOT project. Shajiao C is also the only project under construction. However, two successive projects have been announced recently. One is Hong Kong based Cathey International Group's joint venture project in the Shandong province which constructs 300 MW power plants. This project, including the renovation of two other plants will cost US$

500 million. The other project is the Colorado based Wing Merril International's coal fired plant located in the central Chinese province which is under negotiation for US$ 2,800 million.[1] Between 30 to 40 more projects are planned under the Sino-Foreign Joint Venture scheme over the next eight years, beginning in 1994, by BOT or BOO.[2]

In the transportation sector, Guangzhou-Shenzhen-Zhuhai Superhighway (Phase I) is under construction, and the initial agreement for Phase II was agreed in November, 1992.[3]

In Chinese projects, Hong Kong investors have played a very important role, accounting for 58 percent of China's export and 42 percent of its import in 1989. Over 59 percent of China's foreign investments from 1979 to 1989 came from or through Hong Kong investors, making them invaluable for Chinese projects because of their experience and connections.[4]

2.2.3 Philippines

2.2.3.1 Infrastructure needs

In the Philippines, the most urgently required infrastructure is power plants for alleviating the power shortage in Manila. Brownout in Manila occurred up to 10 hours a day in the summer and 4 hours in the fall of 1993, and has caused more than US one billion dollars loss in

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[1] Goldstein, Carl, "Charged Up: Foreign firms plan Chinese power ventures," Far Eastern Economic Review, 15 April 1993.

[2] Aixung, Tan, "The Development of China's Electric Power Industry: Opportunities and Challenges," Conference on Private power in China, Infocast, San Francisco, Feb. 1994.

[3] Goldstein, Carl, "Open Sesame: Hopewell's troubled China road nears completion," Far Eastern Economic Review, 16 December 1993.

[4] Heginbotham (1993).

production and 400,000 jobs since 1990.[1] To meet this power crisis, the National Power Corporation (NAPOCOR) has formed a plan to add 20,687 MW of installed capacity between 1993 and 2005.[2] In 1993, the Philippines legislature enacted "The Electric Power Crisis Act of 1993", which gave the president emergency power to exempt legal and administrative procedures regarding the construction of power plants, to exclude opposition in environmental problems, to sell national property to construct power plants, and to change the organization of NAPOCOR. The law is effective for two years.[3]

2.2.3.2 Regulatory changes to promote BOT

In May 1987, the government established a power developing program under Executive Order No. 215. The law ended the National Power Corporation's monopoly and enabled private generation in the power industry. In 1991, the Build-Operate-Transfer Law, Republic Act No. 6957, went into effect. The law gave authority to concerned government agencies and relevant local government agencies to approve projects within their jurisdictions. Although, all national projects must be approved by Congress before the call for bids.[4] In addition, the Philippines improved the climate for

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[1] Thomas, Eapen, "Manila Lightens Up," Infrastructure Finance, Fall 1993.

[2] The prospectus of Consolidated Electric Power Asia Limited, 24 November, 1993.

[3] Engineering Business, "Hijyoutaikenhou seiritsude chuumoku atsumeru Philippines denryoku project," Japan, 15 May 1993.

[4] East Asian Executive Reports, "Philippine BOT Law Update Implementing Rules and Regulation for Foreign Investment Act of 1991," 15 February 1992.

foreign investment. The Foreign Investment Act of 1991 (Republic Act No. 7042) allowed foreigners to own 100% of equity in Philippine companies, and in 1992, the Central Bank removed restrictions on retention of foreign exchange earnings which significantly reduced the borrowing cost of the US dollar. More private sector involvement in the power industry is desirable (Thomas, 1993).

2.2.3.3 Current BOT and other privatization projects

NAPOCOR is pursuing three types of privatization structures such as BOT, Build-Transfer-Operate (BTO), and Rehabilitate-Operate-Transfer (ROT). BOT has drawn the most attention of the three because of project financing and NAPOCOR's particular risk allocation. Before NAPOCOR implemented BOT, many conferences about BOTs and field trips to US private power utilities were held by US AID to educate NAPOCOR about the effectiveness of BOT schemes. It was, in a sense, an advertising scheme for US firms to acquire an advantage in the Philippines (Evans, 1992).

- **BOT**

A typical BOT scheme evolves as follows: NAPOCOR supplies land and fuel to a private consortium; the private consortium then arranges the financing; it designs, builds, operates the plant, and after the concession period, transfers it back to NAPOCOR at no cost. Payments for the sponsor come in two forms: a capacity fee for the plant

investment and reasonable return, and an energy fee for the cost of generating electricity. A certain amount of the payments is in the foreign currency determined by the sponsor. The reason for BOT's usage in the Philippines are twofold. First, BOT financing is considered cheaper than NAPOCOR's financing, as is shown in the study done by Bechtel for the Pagbilao Project. Second, NAPOCOR's plants are regarded less reliable than plants constructed by BOT because of the terrible track record of NAPOCOR (Thomas, 1993). Current BOT projects are shown in Table 2-1.

Table 2-1
BOT Projects in the Philippines[1]

Commissioning date	Plant	Proponent	Cooperation Period (years)	Capacity (MW)	Type	Fuel
Jan. 1991	Navotas I	Hopewell (HongKong)	12	210	Gas Turbine	Distillate
Mar. 1993	Navotas II	Hopewell (HongKong)	12	100	Gas Turbine	Distillate
June 1993	Mindanao DSL	Alcantara/Tomen	-	60.5	Diesel	Bunker C
Sep. 1993	Mindanao DSL	Alcantara/Tomen	-	40	Diesel	Bunker C
Apr./May 1993	Batangas DSL	Enron Power (USA)	10	105	Diesel	Bunker C
Oct. 1994	Baung	First Private Power Co.	12	215	Combined Cycle	Bunker C
June 1995 May 1996	Pagbilao	Hopewell (HongKong)	25	350 350	Coal	Coal
Lan. 1998	Sual	Under Solicitation	25	1000	Coal	Coal
Jan. 1998	Mindanao Coal	Under Solicitation	25	200	Coal	Coal

[1] The author adopted the data from Thomas, Eapen, "Manila Lightens Up," Infrastructure Finance, Fall 1993, and Malixi, Pablo V., "The Philippines: National Policy with Respect to Private Power Generation, and the Co-Existence of Public and Private Power," Infocast conference, Private Power in the Pacific Rim, Los Angeles, 25-26 January 1993.

· **BTO**

The only difference between BOT and BTO is the entity which provides the financing for the project. In the BTO scheme, NAPOCOR obtains a loan for project financing. Therefore, BTO is similar to a turnkey contract with operation and maintenance guarantees. NAPOCOR could handle new technology with a shorter implementation period than a traditional turnkey contract because detailed design specifications are not necessary because of such guarantees. NAPOCOR implemented the BTO scheme instead of BOT when it needed urgent capacity increase because of the much shorter implementation process. Current BTO projects are shown in Table 2-2.

Table 2-2
BTO Projects in the Philippines[1]

Commissioning date	Plant	Proponent	Cooperation Period (years)	Capacity (MW)	Type	Fuel
Jan. 1993	Bataan I SC-1-3 Bataan I CC-4	ABB/Marubeni/Kawasaki (Swiss/Japan)	15	3*70 1*90	Combined Cycle	Banker C
Apr. 1993 May 1994	Bataan II SC-1-3 Bataan II CC-4	ABB/Marubeni/Kawasaki (Swiss/Japan)	15	3*70 1*90	Combined Cycle	Banker C
Sep. 1993	Mindanao DSL II	Tomen/Wartsila (Japan/Finland)	10	40	Diesel	Bunker C
Dec. 1993	Makban Binary	Ormat, Inc. (USA)	10	15.7	Geothermal	-
Feb. 1994	Mindanao Power Barges	Mitsui/BWES (Japan/Denmark)	15	2*100	Diesel	Bunker C
May 1994	Bacan Binary	Ormat, Inc. (USA)	10	15.7	Geothermal	-

[1] Malixi (1993).

· **ROL**

In this scheme, the sponsor rehabilitates an existing plant, operates it, and returns it to NAPOCOR after a specified cooperation period. The scheme consists of two periods: the assessment period and the operation-maintenance period. In the assessment period, the sponsor sets performance upgrade targets for the plant to improve its life, capacity, flexibility, and efficiency. Following the assessment, the sponsor implements and finances the program. The payment for the sponsor is through the capacity and energy fees based on actual performance during the cooperation period. Even though the scheme is in the experimental stage, three facilities have already been contracted (Malixi, 1993).

2.2.4 Thailand

2.2.4.1 Infrastructure needs

Thailand has been developing very quickly with its rapid expansion of export, foreign investment, and tourism. However, as a result of its rapid expansion, the Bangkok metropolis has lacked the urban planning, public utilities, and infrastructure necessary for large cities. Furthermore, the population and transportation needs around Bangkok are rapidly increasing. Thailand desperately needs to improve its infrastructure for expressways, power plants, communication systems, and sewage works to keep up with its

more than 7% economic growth. The seventh national plan infrastructure projects table is shown below.

Table 2-3

Seventh National Plan Infrastructure Projects 1992-1996[1]

Project	Estimated cost (US$ mm)	Duration
All energy-related projects	11,071	1992-96
Bangkok 2m telephone lines	3,922	1992-96
Nong Ngu Hao International Airport	3,200	By 2000
Hopewell elevated railway (60 km)	3,137	1991-01
Provincial 1m telephone lines	1,961	1992-96
MRTA Skytrain (19 km)	1,804	By 1997
Second stage expressway (40.5 km)	1,176	1991-95
Provincial Highways	1,145	1990-95
Tanayong electric train	800	1992-96
Third stage expressway (31 km)	878	1995-00
Ekamai-Ramindra expressway (18.7 km)	412	1994-96
Dong Muang tollway	408	1991-94
Optical fibre network	373	1992-93
Thailand national satellite project	216	1993

Source: Board of Investment Review Vol. 2 No. 1

In the transportation sector, in 1972, the government created the Expressway and Rapid Transit Authority of Thailand (ETA), and constructed its First Stage Expressway within the government budget in order to overcome traffic congestion. However, as a result of ETA estimations that in the year 2001, trips in Bangkok within the outer ring road would grow to 29 million per day or 460,000 vehicles per peak hour. It is plain that the government budget is insufficient, and the ETA is now seeking foreign investors for the following Third and Fourth Stage Expressway Systems and other Projects.

[1] Barnes, William and Victor Mallet, "Thais make a mess of their muddling," Financial Times, 22 June 1993.

In the power sector, the power supply has always been larger than the consumption, as is shown in Figure 2-2. However, the Electricity Generating Authority of Thailand (EGAT) plans to more than double the capacity in ten years to cope with the demand which will increase as a result of rapid industrial and residential development on the Eastern Seaboard.

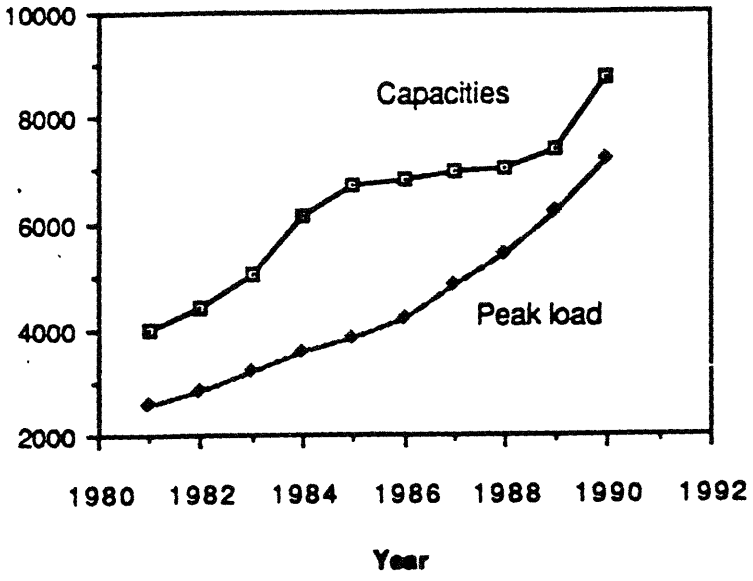

Figure 2-2
Thai's Installed Capacities and the Peak Load[1]

2.2.4.2 Regulatory changes to promote privatization

In the transportation sector, the Thai government seemed to support the developers fully, having supplied subsidies for land acquisition and having suggested several remedies in the concession scheme. However, problems in the Second Stage

[1] Ruangrong, Pallapa, "Private Power Development in Thailand," Infocast conference, Private Power in the Pacific Rim, Los Angeles, 25-26 January 1993.

Expressway revealed that public infrastructure development in Thailand is especially complicated because both the military and the civilians have interests in those projects. This is a special risk in Thailand.[1] Therefore, a solid regulatory framework must be agreed upon to promote transportation projects in the future.

In the power sector, three main regulatory changes have sided progress toward privatization since 1991. The first was the introduction of a new policy which allowed the previously prohibited practice of private power companies to sell electricity, a practice which had been prohibited. The second was that the government would be permitted to purchase power from small power producers. The third was the commercialization of electrical utilities and the privatization of the large power projects. Although EGAT announced a further expansion plan, it seems that investment may be limited because of the authority's tendency to guard its territory jealously against privatization.[2]

2.2.4.3 Current BOT projects

Thailand, especially Bangkok, has been regarded as very suitable for BOT because of fierce traffic conditions, a strong economy, stable currency, a relatively low inflation rate, and political stability. Therefore many project plans are concentrated in the Bangkok metropolis.

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[1] Sender, Henny, "Don't Bank on it: Foreign lenders want out of Thai highway project," Far Eastern Economic Review, 24 February 1994.

[2] Ferrigno, Joseph W., "Prospects for Private participation in Asian Infrastructure," Public Works Financing International, January 1993.

In the transportation sector, the research of the US transportation consulting firm, Wilbur Smith Associates (WSA), revealed that seven major public and private transportation projects were under construction or development, including the Second Stage Expressway (SES), the Don Muang Tollway, and Hopewell's expressway and toll systems. The construction of the first stage of SES was finished, but the project has had conflicts between the project company and the ETA, and this problem has decreased Thailand's credit for foreign investors. Don Muang is under construction with huge cost overruns and conflicts of alignment at the interchanges. Hopewell has not yet implemented construction. Because the projects are concentrated in downtown Bangkok, WSA found physical and commercial problems with these plans. Physically, a seven-level interchange might rise to up to 108ft. Commercially, because many agencies and participants are planning on similar routes for their projects, some coordination is required to decrease the competition.[1]

In the power sector, the first projects were the 1,232 MW Rayong and 600 MW Khanom gas fired combined cycle plants, and the 700 MW Ao Phai imported-coal-fired plant. EGAT financed the construction of the Rayong and Khanom plants and established subsidiaries to sell shares to the public. The

[1] Reina, Peter, "Bangkok exploits its Market Strengths to Attract BOT Builders for transit," Public Works Financing International, July 1992.

plant is under consideration for the privatization method (Pallapa, 1993).

2.2.5 Malaysia

2.2.5.1 Infrastructure needs

The Malaysian infrastructure demand has changed because the economy has shifted from dependence on commodities and agriculture to an emphasis on the manufacturing and industrial sectors. This change has created more sophisticated demands on infrastructure development. For example, in the transportation sector, 74% of the road network was paved by 1990. The Malaysian policy is balanced in that it emphasizes the development of rural road and interstate road networks.[1] The road sector chose BOTs both because of high traffic growth in the 1970s and early 1980s, and because of a lack of government funding.

2.2.5.2 Regulatory changes to promote privatization

The Malaysian privatization experience has often been referred to as a distinguished example of privatization. The characteristics of privatization include the introduction of new techniques represented by BOT, the role of a strong capital market, and the utilization of the privatization process to promote economic equality among social and ethnic groups. The strength of privatization in Malaysia is

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[1] Moggie, Datuk Leo, "Malaysia: Privatization in strategic sectors should accelerate growth in this rapidly expending economy," Institutional Investor, September 1991.

generated by the government leadership in the person of the Prime Minister, and by Malaysia's highly structured and developed institutional capacity.[1] The government has amended a number of laws which had impeded the implementation of privatization projects, including the regulations relating to the supply of telecommunications and electricity.

Malaysia's first privatization policy was announced in 1983 and then stated in the "Guidelines on Privatization" published in 1985 by the Economic Planning Unit of the Prime Minister's Department. It was followed by the government's "Privatization Master plan" published in 1991, which had started in 1988, funded in part by the British government, and conducted by an international consortium of bankers, lawyers, and accountants. The policy included the "Privatization Action Plan" which specified the following five objectives:

- To relieve the financial and administrative burden of government;
- To improve efficiency and productivity;
- To facilitate economic growth;
- To reduce the size and presence of the public sector in the economy;
- To contribute to national economic policy targets

In order to achieve these objectives, the government encouraged private sector involvement through:

[1] Hensley, Matthew L. and Edward P. White, "The Privatization Experience in Malaysia: Integrating Build-Operate-Own and Build-Operate-Transfer Techniques within the National Privatization Strategy," The Columbia Journal of World Business, Spring 1993.

- Sale of assets
- Lease of assets
- Management contract
- BOT, BOT, BOOT concepts

2.2.5.3 Current BOT projects

Before the establishment of the Electricity Supply Act in 1990, the government indicated that it would consider BOT proposals for airports, free trade zones, most forms of rail and road projects, inter-modal and multi-modal transport schemes, and water supply and waste water treatment facilities. Therefore, most of the BOT projects were roads and water supply projects as is shown in Table 2-4.

Table 2-4
BOT Projects in Malaysia[1]

Project Name	Year commissi-oned	Sector	Value of Contract (M$ mm)
Kuching Interchange	1987	Roads	86.0
North Klang Bypass	1987	Roads	20.5
Kuara Lumpur Interchange	1987	Roads	300.0
Lubuan Water Supply	1988	Water	126.5
North-South Highway	1988	Roads	4,300.0
Larut Matang Water Supply	1989	Water	339.0
Ipoh Water Supply	1989	Water	308.0
Labuan-Beaufort Interconnection	1989	Roads	80.0
Garbage Disposal	1990	Services	50.0

In the power sector, the power demand growth and its forecast are shown in the Table 2-5.

[1] Adam, Christopher et al., Adjusting privatization: case studies from developing countries, Ian Randle, London, 1992.

Table 2-5

Power Demand Growth and Forecast of Malaysia[1]

Year	Growth (%)
1980s	increased steadily
1990	14.07
1991	12.90
1992	14.77
1990-1995*	12.4
1995-2000*	9.4
2000-2005*	9.2

* Demand forecast

In order to meet the demand, Tenaga Nasional Berhad (TNB) will develop a generation capacity of 3200 MW between 1993 and 1996, and 4500 MW between 1996 and the year 2000. When TNB went public in May, 1992 with an offering of its shares, the offering was oversubscribed. TNB is still organizing regulatory, competitive, and institutional frameworks for the realization of private power plants which will sell their electricity to TNB.

2.3 Participants of BOT

A BOT project can include 15 or 20 parties. However, the major outlines of the project structure are usually negotiated and constructed among the host government, project

[1] Sukro, Pian bin, "Malaysia National Policy with Respect to Private Power Generation, and the Co-Existence of Public and Private Power," Infocast conference, Private power in the Pacific Rim, Los Angeles, 25-26 January 1993.

sponsor, and lenders.[1] The typical project structure of power projects is shown in Figure 2-3.

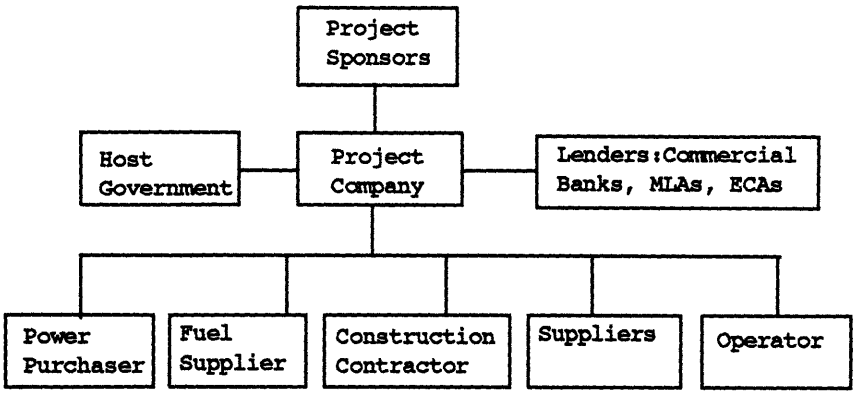

Figure 2-3
Typical Project Structure in Power Projects

2.3.1 The host government

The host government's role in BOT is very important because a project requires not only numerous host government approvals, licenses, concessions and permission for construction but also guarantees which support the project. A government's strong commitment to a project and its ability to cooperate with private sectors are considered critical factors for a successful BOT project.

2.3.2 Project sponsor

A project sponsor usually establishes a new company to

[1] Wigmore, Cary S., "Risk management: The legal and Insurance perspective," Infocast conference, Private power in the Pacific Rim, Los Angeles, 25-26 January 1993.

pursue each specific project. In general, project sponsors, (in other words, equity participants) are developers, contractors, operators, major machinery and equipment suppliers, raw material suppliers, and other investors who are seeking high rates of return from their projects. Because of the number of participants and complicated procedures, BOT promotion is costly and requires patience.[1] Strong leadership and unity of the sponsor companies are therefore necessary.

2.3.3 Lenders

Senior lenders, mainly international and local commercial banks, from a large syndication under one or two leading banks, and lend to the sponsor through it.

Export Credit Agencies (ECAs) such as the Export Import Bank of the United States (USEXIM), the Export Import Bank of Japan (JEXIM), the Overseas Private Investment Corporation (OPIC), the Japanese Ministry of International Trade and Industry (MITI), and the Multilateral Agencies (MLAs) such as the World Bank, the International Finance Corporation (IFC), the Multilateral Insurance Guarantee Agency (MIGA), and the Asian Development Bank (ADB) sometimes participate in BOT projects either as lenders, guarantors, or equity participants.

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[1] The Bechtel group, for example, spent some US$ 7 million over nearly 5 years on an unsuccessful power plant project in Turkey, and Kumagai Gumi reportedly spent US$ 5 million in pre-signing costs on a road project in Thailand (Augenblick and Custer, 1990). Also Hopewell spent HK$ 10 million in preparing an unsuccessful Hong Kong air port study.

2.3.4 Contractor

Construction contractors often take leadership in promoting BOT projects. They are usually reliable international contractors, and have the ability to deal with turnkey fixed price contracts.

2.3.5 Operator

The operators operate and maintain a project during the concession period. Therefore, a certain performance level is required to produce the maximum potential of the facility. With regard to the power project, experienced U.S. and U.K. utilities have often been selected as operators to improve plant efficiency as a result of in reaction to the reduced growth in their home countries (Wigmore, 1993).

2.3.6 Suppliers

Large machinery and equipment companies sometimes become equity participants mainly of their need to sell their products. However, in many cases, such major companies are highly experienced in similar kinds of projects in their local area. Therefore, equity participation could be beneficial for the sponsors.

2.3.7 Other participants

In addition to the major participants, others are included, depending on the type of the project. In power plant projects, the fuel supplier and power purchaser's roles

are very important for generating consistent electricity and assuring expected earnings.

2.4 Objectives of BOT participants

This section summarizes the objectives of BOT participants, including both the public and the private sectors. Public objectives can be broken down into seven factors. Among them, additionality and efficiency gains are the major objectives. Private sectors' major objectives are considered to be a high rate of return and the utilization of new investment opportunity.

However, a monopoly on the part of the private sectors and the public sector's resulting loss of control might cause problems. Each factor is summarized as follows:

2.4.1 Objectives of public sectors

2.4.1.1 Additionality

Additionality is a net increase in investment resources made available to the economy as a result of the private investment infrastructure.[1] When a government lacks funds or the bond capacity required to implement a project, it can minimize the impact on its capital budget by using BOT as an additional source. Because of additionality a government can also sometimes implement other infrastructure projects that cannot be done by BOT.

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[1] Israel, Arturo, "Issues for Infrastructure Management in the 1990s," The World Bank Discussion Papers 171, Washington, D. C., 1992.

Even though the amount of additionality is not clear, the foreign equity portion of the financing is obviously additional because it will not be utilized by the government without the BOT scheme (Israel, 1992). Foreign debt financing is the same as foreign equity investment if the debt providers are unwilling to lend the funds to the government without some security packages in the BOT scheme.

Historically, several countries that frequently used BOT, such as Turkey, Pakistan, Malaysia, and the Philippines, pointed out "additionality" as the prime reason for their interest (Augenblick and Custer, 1990).

2.4.1.2 Efficiency gains

Efficiency gains can be realized not only by cost reduction in construction and operation but also by market sensitive, cost conscious management (Israel, 1992).

- **Construction cost reduction**

Regarding BOT projects, cost reduction seems more possible when competitive bidding is used. However, competitive bidding is difficult because the real competition begins at a very early stage when the project is proposed by some sponsor company. As a result, in many cases, the company which made the proposal in the first place has already been awarded the project. This was true in the case of the Sydney Harbor Tunnel, Hong Kong Eastern

Harbor Crossing, the Navotas Power Plant, and the Pagbilao Power Plant.

Moreover, there are many additional premium costs which run counter to cost reduction in BOT projects, such as the use of turnkey contracts and some risk hedging. Therefore, it is difficult to predict the possibility of efficiency gains by construction cost reduction.

· **Operation cost reduction**

Operation cost reduction will be realized by the private sector if the operator has sufficient incentives to improve its performance. Therefore, performance bonuses and adequate penalties should be used for cost reduction. In addition, from the public point of view, operation cost reduction can be realized by a cut in public administrative expenses.

· **Management improvement**

In developing countries, even though the introduction of BOT does not reduce costs extensively, the efficiency gained by management improvement through utilizing private foreign companies will be substantial. The public sector will have an opportunity to learn updated management methods throughout the construction and operation period. The efficiency gain, in this case, will be realized by the quality and service improvement. However, the existence of inappropriate government policies, a weak regulatory

system, and ineffective institutional arrangements will hamper improvement.

· **In the case of private power companies**

The efficiency of private power companies as compared to public utilities has been researched, mostly on the basis of US cases. Donahue (1989)[1], summarized past research results, which are shown in Table 2-6, and concluded that there was no evidence of superiority of private companies in their efficiency from the view point of the cost reduction.

Table 2-6

Electric Utility Cost Studies

Study	Conclusion
Meyer, 1975	Public more efficient
Yonker, 1975	No significant difference
Neuberg, 1977	Public more efficient
Pescatriee and Trapani, 1980	Public more efficient
Fare, Grosskopf, and Logan, 1985	No significant difference
Atkinson and Harvorsen, 1986	No significant difference

He pointed out that low efficiency in the private sectors was caused by the rate of return regulation. Regulators normally set a minimum rate which will allow the smallest possible profit for the private utilities.

1 Donahue, John D., The privatization decision: public ends, private means, Basic Books, 1989.

Consequently, private utilities lose their incentive to pursue profitability and, at the same time, they cannot invest in large efficient facilities because of the suspicion of the public sectors. He pointed out other difficulties private utilities have in generating incentives to pursue efficiency gains, including the complexity of contractual relationships with many participants such as utility managers, investors, regulators, and consumers.

- **In the case of a toll road**

In the study of Gomez-Ibanez and Meyer (1993)[1], the only limited efficiency enhancement (cost reduction) of private roads was presented in the cases of France and Spain. In only one case, a French private toll road company, was there a reduction of 23 % of construction costs along with an increase in the productivity of labor and equipment. Some of the reasons for limited efficiency improvement in these cases were the government's lack of encouragement, and the private sectors' lack of incentives to economize construction costs since their construction fees were generally proportional to the monetary scale of the project.

In the operation phase, an efficiency gain by the private sector becomes plausible with the enhancement of the learning curve and scale or scope economies,

[1] Gomez-Ibanez, Jose A. and John R. Meyer, Going Private, The Brookings Institution, Washington, D.C., 1993.

especially, when an experienced world wide operator is available.

In addition, If contractors and financiers cannot be changed whether the owner is public or private because of the large project size, the project cost reduction will be restricted and, as a result, a major change of efficiency by cost reduction won't be expected.

2.4.1.3 Government risk reduction

Some of the traditional government risks are reduced by transferring the risks to the BOT sponsor and financiers. However, governments are usually required to support the BOT sponsors and lenders by providing some guarantees that the private sector cannot provide.

2.4.1.4 Positive externalities

The successful adoption of BOT will create positive externalities. For example, the local capital market may be created or strengthened by foreign investors, and other investment climates may be improved by the reputation of success. In the long run, if the successful BOT improves the condition of the country's infrastructure, it may bring the possibility of further economic expansion. In addition, governments can create a long term source of income either by capturing the increased value of adjacent land or by developing the adjacent land of the project.[1]

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[1] Stainback, John P., "Privatization Is the Answer, but There Is No Free Lunch," Real Estate Finance, Vol. 6, No. 4, Winter 1990.

2.4.1.5 Technology transfer

In developing countries, technology transfer is used to the government's benefit. In BOT schemes, foreign contractors and operators must pursue projects efficiently. In order to do so they must rely on efficient technology, rather than state of art technology to maximize the project's productivity. In this way, developing countries will be able to acquire technology and their workers will have the chance to improve their skills in the field. Technology transfer in BOT schemes takes place both during construction and during long operation phases.

2.4.1.6 Political environment enhancement

In the case that tax payers are sensitive to tax increases for providing public works financing, BOT can be an effective source for governments so they can provide needed projects without losing the political support of the citizens.

2.4.1.7 Rapidity of development

Sometimes the government can progress with a project more quickly by using the BOT scheme. For example, the Navotas Power Plant in the Philippines developed quickly with the strong support of the government. If the project is really needed and encouraged by the government, the BOT scheme will accelerate its progress effectively.

2.4.2 Objectives of sponsors

2.4.2.1 High return on investment

Realizing a high return on their investment is the major motivation for sponsors. A certain level of profitability, if possible higher than that of their domestic market, must be assured to proceed with BOT projects in developing countries.

2.4.2.2 Project finance

Limited or non-recourse project financing used in BOT schemes is attractive to sponsors, because by using project financing, the sponsors can raise funds based not on their balance sheet but on the project's assets.

2.4.2.3 The cycle of construction demand

BOT sponsors are usually led by large construction contractors that have projects world wide. These contractors have to reserve a certain number of contracts to maximize their employees' productivity. Therefore, when the domestic demand is high, their incentives usually decrease toward risky projects like BOTs. Conversely, when the domestic demand is small, they tend to take risks on BOT projects. This tendency might be strong in Japanese contractors because of their life-long employment system.

2.4.3 Objectives of Lenders

Lenders seek a high return on investment with guarantees provided by sponsors, host governments, multilateral agencies, and other agencies. International lenders' participation depends on their domestic economic environment.

2.4.4 Constraints of BOT

2.4.4.1 Possible monopoly

From a governmental point of view, consumers must be protected from monopoly abuse by private sectors by the creation of regulatory systems. Regulatory systems require transparency in transactions, the lifting of any inappropriate regulations, and price controls. "Successful privatization of natural monopolies in lower income countries requires regulatory framework that separates out potentially competitive activities, establishes the tariff regime, clarifies service goals, develops cost minimization targets, and creates or strengthens an agency to supervise the process."[1] In BOT projects, monopoly abuse could occur. However, it can be eliminated by using an appropriate rate of return regulation with incentive fees.

- **the case of private power**

In the past, private power was regulated in some countries and not regulated in others. Electricidad de Caracas, the private power company in Caracas in Venezuela,

[1] Kikeri, Sunita and et al., Privatization, The Lessons of Experience, The World Bank, 1992.

is an example of a private power company extremely well run without regulations. For many years, despite the government's urging to raise the rates for tax revenue purposes, the company not only refused to do so but even supplied electricity for poor people with concessional rates.[1] On the other hand, some electrical companies in Latin America can be seen as examples of problematic private power companies with low earnings and poor service because of regulations.[2] The fact that unregulated private power service is superior suggests the difficulty of control with regulation. In developing countries, private power is more prevalent in isolated areas, despite the possible abuse of monopoly power (Roth, 1988). As a result, consumers facing monopoly suppliers could have serious problems. Therefore, extremely careful regulatory systems are required for private power projects.

· the case of toll road

Gomez-Ibanez and Meyer (1993) pointed out that surprisingly little controversy has arisen over the potential problem of monopoly or market cc In their cases, the profitability is regulat allowance of rate of return on investment ambiguous toll rate. In California's ca

[1] Ruhl, Juan, Ricardo Zuloaga 1867-1932, Caracas de Caracas, 1978.
[2] Roth, Gabriel, The Private Provision of Publi Countries, Oxford University Press, 1988.

rate is set and a private sponsor can manage the toll rate within the ceiling rate. This approach is acceptable to private investors and probably has a lot of advantages, although it is difficult to set the rate. However, in California, even though the earnings exceed the set return, up to 6 % incentive returns above their allowed rate are applied to the project if it meets certain public objectives.

2.4.4.2 Loss of control

Clifford Chance (1991) describes government concern over losing control in the following points:[1]

- service quality throughout the term of concession
- safety and environmental protection standards
- charges levied upon consumers
- maintenance and repair works carried out in order to provide an adequate service

In order not to lose control, the government should set up a precise regulatory framework.

2.5 Risks and governmental supports in BOT

In BOT projects such as toll roads and power plants, various kinds of risks are associated with each stage of the project. BOT sponsors are required to have skills which will allow them to identify the risks and allocate them to the most appropriate participants, so that they can be dealt with

[1] Clifford Chance, Project Finance, 1991.

as efficiently as possible. These skills are critical because, as Beidleman (1990) said, "Only around 20 % of the projects that are seriously considered are successfully completed. The causes of this high failure rate are delays in adoption and completion, technical failure, poor management, and legislative or regulatory changes. The key to accurate forecasting and successful project finance is to identify and manage these risks."[1] The risks referred to are either country specific risks or project oriented risks.

In BOT's risk allocation, the governmental role is much larger than in general project financing because BOT projects are usually infrastructure projects which were traditionally created by governments. Because of the nature of the infrastructure, nothing can be done by the private sector alone.

2.5.1 Country risks

Each country has a different political background, legal system, culture, and language. Therefore, it is very important to assess the unique risks which are affiliated with the project. Although country risks can be assessed by such experts as credit rating agencies and magazines, it is very difficult to evaluate the risks appropriately, especially in developing countries. For example, "Standard & Poors Corp. placed Thailand on its "credit watch" list just after the riot in May 1992, but it did not reduce Thailand's

[1] Beidleman, Carl R. and et al., "On Allocating Risk: The Essence of Project Finance," Sloan Management Review, Spring 1990.

A- long-term debt rating and A-1 commercial paper rating."[1] Even so, the Thai government expropriated the Second Stage Expressway Project in August 1993. Specialized advisors familiar to the region may be helpful in analyzing the country's risks. The World Bank's Enhanced Co-financing Operation (ECO), which guarantees the obligation between government and project sponsor company, might also be helpful to reduce the risks. It is used in Pakistan's Hub River build-own-operate power generating project. Kappaz and Menendez (1992) said the ECO guarantee allowed the project to structure US$ 360 million of commercial bank financing even though no more than US$ 100 million could be raised with the Pakistan government guarantee."[2]

· **Political risks**

Political risks affect all aspects of a project through site selection, construction, operation, and transfer. Political risks include not only expropriation or seizure of the project by the government but also more subtle methods by which a government can take over control,[3] such as making changes in tax laws, environmental regulation, and legislative procedures. In reality, political risk protection is too difficult to be handled by the private sector. Therefore, in many instances, political risks are assumed by the sponsor's own export credit agency such as the

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[1] Corben, Ron, "The Stakes are High," Infrastructure Finance, Fall 1992.
[2] Kappaz, Michael H. and Adolfo Menendez, "Wading Through the Hub River," Infrastructure Finance, Summer 1992.
[3] Nevitt, Peter K., Project Financing, Euromoney, 1983.

Private Investment Corporation (OPIC), or some international insurance agency such as the Multilateral Investment Guarantee Agency (MIGA). MIGA insures US$ 50 million maximum limit per project per coverage. In Fiscal Year 1992, it insured US$ 313 million for 21 projects.[1]

· **Legal risks**

An established legal system is desirable for BOT because of the complications of the scheme itself, the large number of participants, and the contractual complexities. However, in developing countries the legal system is usually immature, unclear, and slow. In this case, political support for accelerating the complicated processes of regulatory and administrative issues must be provided by the government in order to make projects feasible. The Philippines government's Electric Power Act of 1993[2] is an example of government support to pursue needs of electricity. In addition, knowledgeable local legal advisors and local joint venture partners are helpful to enforce legal procedures quickly.

Transparency in the legal system is important throughout the project because without transparency, foreign sponsors can easily be face with misunderstandings and suspicion. Such misunderstandings, for example, led to the project

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[1] Millian, Martine and Gregory Millian, "The New Politics," Infrastructure Finance, Spring 1993.

[2] The Philippines congress granted President Ramos the emergency power in April 1993 to enter into negotiate contracts for construction, repair, rehabilitation, improvement or maintenance of power plants.

abandonment of Cogentrix's Batangas power plant in the Philippines.[1]

Furthermore, governmental policy in supporting BOT must be consistent through all levels of government agencies. Wigmore (1993) says "if a government's ministry of finance or national development agency endorses the concept of private power generation, but the state-run utility refuses to pay tariff rates that allow full recovery of cost, or government-run fuel suppliers cannot guarantee the project owner a reliable supply of fuel on a long term basis, then projects will not prove financeable, despite the commitment of key elements of the national government."

Import restrictions and import tariffs might be eliminated by the government. In power plant projects, machinery and equipment are usually imported, and spare parts should be imported during the long concession period. Therefore a waiver of import tariffs and administrative procedure would eliminate costly delays, thus creating another incentive to private sectors for BOT projects.

In terms of tax related support, Augenblick and Custer (1990) summarize the standard features of special regimes for BOT projects as:

- Waiver of local income tax during concession period
- Waiver of any withholding tax or interest and dividends paid to foreign investors

[1] Evans, Peter C., Opening Electric Power Generation to the Private Sector in the Philippines: Policy Origins and Early Experience, Master thesis, Massachusetts Institute of Technology, May 1991.

· Reduction or elimination of local income tax on the salaries of expatriate personnel staff

They explain, however, that when foreign investors considers local taxes as part of overall costs, such taxes are recoverable one way or another.

· **Force majeure risk**

Force majeure risks are the types of risks that are beyond control of the participants of the project. The risks include both insurable events such as fire, flood, earthquake, and other events which may be insured or covered by the government, such as wars, civil disturbances, expropriations, and political interferences. A certain amount of a government support is required to allocate these risks appropriately.

· **Cultural and language risks**

Cultural and language differences should be well understood. It is strategically important to be familiar with the country's culture and language especially in Asian countries because these countries emphasize personal relationships and connections. Local advisors, and joint venture partners will be helpful in mitigating cultural and language barriers.

2.5.2 Project risks

During the entire project, the proportion and variety of project risks change in sequence. These risks can be evaluated in three different phases: development, construction, and operation. Furthermore, these risks in development and construction phases are generally larger than those of operation phases, because infrastructure projects are capital oriented and much ambiguity exists in the early phases of BOT projects. Risk phases and periodical changes of risk amount in a sample of BOT project financing is shown in Figure 2-4.

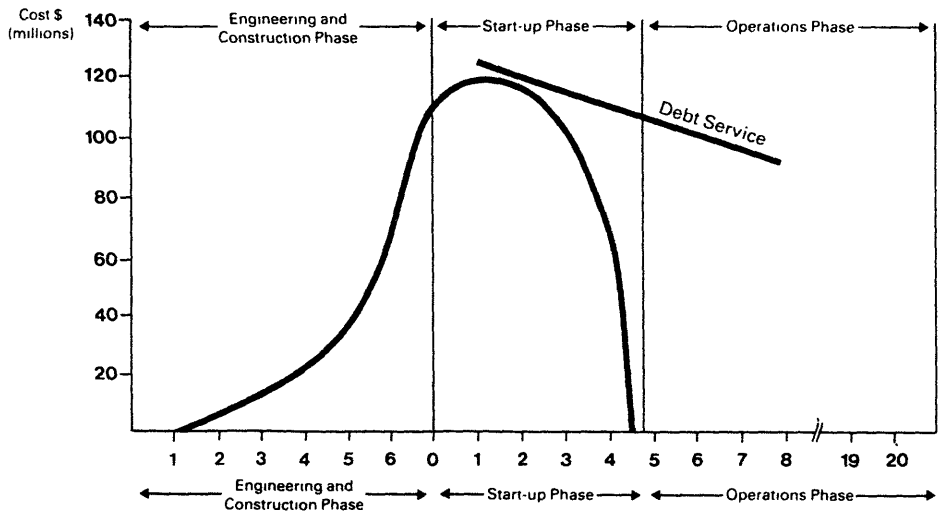

Figure 2-4

Risk Phases in a Project Financing (Nevitt, 1983)

Development phase

A development phase is very important because all of the risks perceived in the entire project will be evaluated and allocated in this phase. Furthermore, in this phase the

private sector must become familiar with the public sector's institutional and organizational responsibilities and power relationships in order to assure the smooth progress of the project; this is the key to successful progress for complicated BOT schemes. Meanwhile, clear cut responsibilities and harmonious relationships should be established among the private partners during this phase.

· **Technical risk**

The greatest technical risk in the development phase is design default caused by a lack of data. Subsurface conditions should be examined as much as possible in the early stages. Even though engineers are aware of the importance of investigating subsurface conditions, this is easily postponed because of the difficulty in proceeding with an investigation before contracting. If technically unclear points remain in the development phase, they should be studied by professionals, and adequate reserves and back up equity should be allocated for them.

· **Bid risk**

Even with the bidder's full commitment, they might fail the bid. This risk is difficult to eliminate in competitive bidding. Financial advisors who work with success fee bases and are familiar to the local environment, might be helpful.

· **Sponsor's credit risk**

The credit of the sponsor company affects the attractiveness of the project to investors. Therefore sponsor companies can ask credit agencies for an evaluation. Letters of credit issued by merchant banks also enhance the sponsor's credit.

Construction phase

Once construction begins, sponsor's and lenders' risks increase quickly through the capital expenditure of the project.

· **Environmental risk**

Environment problems can cause a project to be abandoned not only before construction begins but during the concession period as well. The environmental review process is extremely important both in developed and in developing countries. For example, serious environmental problem arose concerning the Aliga Coal Fire Power Plant Project in Turkey, which was suspended for environmental and political reasons after the sponsor was awarded the contract. The local residents, stirred up by an opposition political party against BOT, went to court and had the project suspended for two reasons. They insisted that an environmental assessment should be made before the project was implemented, even though such an assessment had not been required and the plant design had fulfilled all its obligations. The residents'

second reason fro stopping constructions was the conflict in land acquisition procedure in the specified Free Trade Zone.

· **Completion risk**

Once construction begins, most of the expected risks are shifted from the sponsor to the construction contractors. The turnkey construction contract has been used many times to protect a project from delay and cost overrun. Also, performance bonds provided by contractors cover completion risks. It is important to select contractors from well known, experienced, and skillful companies. Familiarity in the country and area is also important. Performance incentives for the contractor are effective in getting the project finished on time.

· **Cost overrun risk**

Cost overruns can occur as a result of a price change in transportation, energy, machinery, equipment, raw materials, and labor. This risk will be assumed by the turnkey contractors if their contract does not include escalation clauses. Otherwise it is addressed to a contingency or price escalation clause in off take contracts.

· **Contractor's performance risk**

With reference to power plant construction, for example, plant performance deficiency might occur as a result of designers' or contractors' mistakes throughout the plant

construction. Therefore performance guarantees from contractors are desirable to cover this risk. Large machinery and equipment suppliers usually guarantee their own products. Strategic alliances with reputable firms are very important in eliminating this costly risk.

Operating phase

· **Liability risks**

Liability risks vary greatly depending on the type and the size of the projects. For instance, because of the size and high accident rate of highway projects, liability insurances do not cover their liability risks. Therefore, a shift of the burden to the public is logical. To cope with this problem, the AB 680 toll road in California incorporates a Build-Transfer-Operate solution.[1]

· **Cash flow risks**

During a long concession period, a project's cash flow will be different from its original cash flow projections because the original cash flow includes much uncertainty about the revenue stream. Part of the uncertainty originates within the public sector because cash flow risk is linked to other risks such as political risk, currency exchange rate risk, and force majeure risk, which are uncontrollable by the private sector. Therefore public support is essential in

[1] Feldman, Roger D. and Bonnie S. Temple, "New Opportunities for Banks in Infrastructure Finance" The Bankers Magazine, July/August 1991.

order to make the BOT projects feasible to the private sector, and it is reasonable to expect this support because any infrastructure is originally a public good. In developing countries, government support is vital for private sectors because of unstable local political and legal conditions. Finally, Gold (1992) described that "If the public sector wants to encourage private investment, it should not have the ability to arbitrarily influence the financial rate of return of the private developer."[1] Public support can be considered in two ways: financial support and non financial support.

(1) Financial government support

Financial support is necessary when the future return on the project is uncertain. This support is either a guarantee of certain returns or of traffic volume.

· Guarantee of certain returns

Take or pay agreement -- This agreement guarantees the particular payment level for the product whether or not the product is purchased. It is often used for power plant electricity purchase agreements. Moreover, a power purchase agreement should be guaranteed by a government when the power purchaser's credit is low.

Put or pay contract -- Medium to long-term supply contract such as oil purchase agreement.

[1] Gold, Barry P., "Competition on the Highway," Infrastructure Finance, Summer 1992.

· Guarantee of a certain traffic volume or of a shortfall in investor return

Through put agreement (tolling agreement) -- This agreement guarantees a certain payment level for the service whether or not the service is used.

(2) Non financial government support

Non financial support, mainly a government's cooperation, is as important as financial support.

· Crippling with the creation of a similar public project

This is a guarantee from the public sector not to construct similar competitive types of projects for a certain length of time. In the Eurotunnel project, a "No second facility" guarantee was granted by the government.[1]

· Right-of-way and air right endorsement for the private sector

In California's AB 680 toll road, the right to use air space will be effectively used as non financial support by the public sector. The risk of inadequate toll revenues is best addressed by providing other potential revenue sources that can be pledged to support highway financing. For example, the public sector provides the opportunity to lease rights-of-way for a nominal rental during the

[1] Tiong, Robert L. K., "Comparative Study of BOT Project," Journal of Management in Engineering, Vol. 6, No. 1, January 1990.

franchise term. This airspace can be developed with service stations, restaurants, hotels, and offices and be put to other commercial uses. In addition, it may be possible to capture some of the increase in the value of other properties located near the highway (Gold, 1992). The same concept was used in the Guangzhou-Shenzhen-Zhuhai Superhighway Project in China.

· **Currency risk**

In an international project, the fluctuation of the foreign exchange rate will directly affect the projects' revenue if the revenue is paid in the local currency. Therefore, the best way is to earn the profit in hard currency. However, this is sometimes difficult when the revenue is coming from the users in the country. Another way to avoid currency risk is to make a government agreement for a certain exchange rate guarantee. Finally, Beidleman (1990) said, ".. it is appropriate to hedge with either a series of long date forward currency contracts or else a currency swap to mitigate the currency risk."

· **Interest rate risk**

Abrupt changes of interest rates can seriously affect the cash flow of the project. Beidleman (1990) said that the interest rate risk of borrowers and lenders who use

contractually determined or fixed income securities could be reduced by using Coupon Swaps.[1]

· **Operator's performance risk**

The operating company must be selected from well experienced companies to eliminate this risk. Performance guarantees by the operator will be usually required by lenders. The operator must collaborate with the contractor during the start-up and testing phase to eliminate operating problems

· **Operation cost overrun risk**

A qualified operating company must be selected to eliminate this risk. However, if a cost overrun is caused by an unexpected reason, it can be addressed to the price escalation clause.

2.6 Financial structure

Because BOT financing is based on the economics of the project cash flow, it must have sufficient equity or quasi equity provided by the sponsors. If sufficient equity is not available a loan should be provided by commercial banks, international financial institutions, and bilateral government lenders.

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[1] "A coupon swap is an exchange of one coupon or interest payment for another that has a different configuration but the same principal amount" (Beidleman 1990).

2.6.1 Equity

The sponsor companies' equity participation is very important not only for the host government but also for other investors because their participation is understood as a commitment to the project. Furthermore, if the interest rate soars or the revenues drop during the life of a project, this equity can be the projects security against financial trouble.

2.6.1.1 Sources of equity

Generally, equity contributors come from several sources:

- **International and local construction contractors**
- **Equipment and machinery suppliers**
- **Raw material suppliers**
- **An end-user or purchaser of the output**
- **Multilateral agencies**
- **So called "mezzanine[1]" investors**

2.6.2 Debt

Successful fund-raising in a BOT project is one of the critical success factors through the entire project because it is the base for determining the feasibility of the

[1] Mezzanine finance is an "in-between" kind of financing. It slots between share capital and conventional senior debt. As an in-between financing, mezzanine finance is subordinated to senior debt but senior to share capital (Pyle, 1992).

project. Therefore, funds should be raised by the cheap, fixed rate, and long period finance.[1]

2.6.2.1 Sources of debt

Debt contributors are so diversified that their objectives and contributions differ as to the amount and period. Major sources are:

- **Commercial banks**

  Commercial banks are looking for large, highly visible projects with strong sponsorship and government supports. Large international banks usually provide loans through a major syndication. Their maturities are usually between 12 to 15 years.

- **Multilateral Agencies**

  Multilateral Agencies (MLAs) provide loans with much longer repayment periods and lower interest rates than those offered by commercial banks. The participation of MLAs would significantly enhance the view of potential investors thinking of financing such projects (Kayaloff, 1988). However, a lengthy approval processes could delay the project (Nevitt, 1983).

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[1] Pyle, Thomas H., "Salient Features of BOT Schemes Financial Aspect of BOT Projects (in Transportation)," United Nations Center on Transnational Corporation Roundtable Discussion of BOT and the Private Sector Project Financing for the 1990s, 25 February 1992.

The MLAs' co-financing programs can be utilized as a source to attract commercial banks and their longer term maturities. By participating under the umbrella of co-financing, commercial banks can enjoy the benefits of stronger assurance against sovereign rescheduling and the withholding of taxes. MLAs are becoming more positive toward the BOT scheme in developing countries. For example, the ADB's Earman, the Senior Co-financing Officer, indicated[1] that the bank encourages developing countries to consider the BOT/BOO approach and promised to provide financial assistance and advice. Their participation in BOT enhances not only the attractiveness of investment for lenders and equity participants but also provides credit for the project and a decrease in the interest rate of the sponsors.

Traditionally, in Far East Asia, Japanese commercial banks have played a major role. However, in the 1990s, instead of adopting the positive attitude of the multilateral agencies and international lending agencies, they have reduced their fund limits for Asian BOT projects due to economic depression in their domestic market.

- **Export Credit Agencies**

Foreign export credit agencies (ECAs) such as US Exim and Japan Exim are available as a loan source. They

[1] Earman, R. N. Jr., "Public Sector Source of Financing," Infocast conference, Private Power in the Pacific Rim, Los Angeles, 25-26 January 1993.

typically provide up to 85% of equipment cost[1] for as long as 15 years. Issues like national exposure and quality of sponsor group are ECAs' key decision factors for their lending. Other key features in gaining acceptance of ECAs' lending are:[2]

- Size of the portion to be sourced from their country
- Importance of the local contractor
- Attitude of the other agencies
- Potential involvement of official agencies such as IFC
- Unwillingness by any individual agency to be perceived as being "behind the times"

· **Vendor/Supplier credit**

Large suppliers such as Asea Brown Boveri (ABB) and General Electric (GE) can be used for some credit.

· **Institutional lenders**

Institutional investors such as life insurance companies, casualty insurance companies, and pension plans can be good sources for long term-debt after several BOT projects have succeeded. This is because, in the United States, the institutional debt markets have traditionally provided long-term fixed rate funds (Nevitt, 1983).

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[1] Although US Exim requires sponsor at least 25% cash equity commitment and at least US$ 50 million US content it offers financing up to 85% of the US export value.

[2] Kayaloff, Isabelle J., Export and Project Finance, Euromoney, 1988.

· **Wealthy individuals**

They can be a good source if BOT becomes more familiar with them after several projects.

· **Capital market**

Capital markets in Asian developing countries are not large. However, as ADB's Earman presented, it is essential to develop the capital market for BOT's expansion because it will depend on a great extent on the existence of strong capital markets capable of mobilizing long term funds from private savers. However, for the international developers, other capital market debt can be used as in the Hopewell case in HongKong.[1]

· **Domestic Investors**

In developing countries, the contribution to debt of local domestic investors is smaller than that of international investors. However, governments, banks, companies, and some individuals can be used with local sponsor partners.

2.6.3 Placing Debt and Equity

The debt equity ratio in a financial structure varies

[1] Hopewell's subsidiary, Consolidated Electric Power Asia (CEPA), was listed on the Stock Exchange of Hong Kong in early December 1993 with the professed aim of building power plants across Asia. Currently it has just a handful of plants in operation or under construction in China and the Philippines. However, the stock issue, combined with commitments from Hopewell, provided CEPA with more than US$ 1 billion to invest and CEPA is considering issuing non-recourse project bonds in the US.

depending on the project's nature; such considerations are project type, cost, location, and condition of the project. In the past three BOT power projects, the debt equity ratio has varied from 13 to 1 in China's Shajiao B, 3 to 1 in the Philippines' Navotas, and 0.6 to 1 in China's Shajiao C. In the course of the past three years, the debt leverage ratios for Asian projects in general and power stations in particular have become more conservative due to the diminishing capacities of commercial banks, especially Japanese banks (Pyle, 1993). Sample financing structure is shown in Figure 2-5.

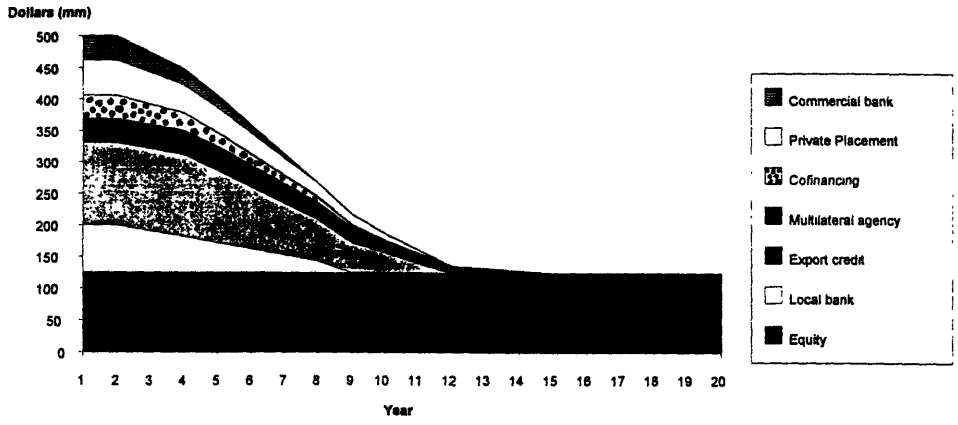

Figure 2-5

BOT Power project Sample Financial Structure[1]

[1] Pyle (1993).

Chapter III

BOT Cases

3.1 Introduction

Four power plant projects and three toll road projects are described. Two power plant projects, Shajiao B in China and Navotas I in the Philippines are under operation, and other two power plant projects, Shajiao C in China and Pagbilao in the Philippines are under construction. The three toll road projects, Second Stage Expressway in Thailand, North South Highway in Malaysia, and Guangzhou-Shenzhen-Zhuhai Superhighway in China are under construction. These projects' organizational structures, the construction and operation status, the risk sharing of the participants, and the financial structures are focused upon.

3.2 Shajiao B Power Station[1]

3.2.1 Outline of the project

Shajiao B is located in Guangdong Province in the People's Republic of China (PRC). This plant contains two 350 MW pulverized coal-fired generation units which commenced operation in April, 1987. This initial Chinese BOT project was developed by Hopewell Holdings Limited (HHL)[2] which had no

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[1] The general description in this section is based on the prospectus of Consolidated Electric Power Asia Limited, Tiong (1992), Pyle(1993), and Augenblick and Custer (1990).

[2] HHL is the Hong Kong based holding company of the Hopewell Group, which operates power generation projects, transportation infrastructure projects, property investment and management projects. The company was established in 1972. The Group's net profit for the year ending 30th June, 1993 was over HK$ 2 billion.

experience with power plants, but which went into the business as a result of their hotel project which frequently suffered brownouts and needed a stable power supply. The plant was developed on a BOT basis under a Joint Venture Contract between Hopewell Power (China) Limited (HPCL)[1], and Shenzhen Energy Corporation (SEDC)[2] with a 10 year cooperation period which expires on March, 1998.

This project seemed risky due to several facts: it was the first BOT project in China; at the time China's relationships with the rest of the world were bad; the project was subject to the strictures of the Coordinating Committee for Export to Communist Area (COCOM) which severely limited high-tech exports to Communist nations; Hopewell's own lack of experience in power generation; the lack of Chinese expertise on such projects; and the lack of multinational aid.[3] In spite of all these negative features, the project was successfully constructed and is operating. One reason for this success seems to be the willingness of commercial banks to accept substantially greater credit risks (Augenblick and Custer, 1990).

The construction of the plant was undertaken by a turnkey contractor consortium headed by Mitsui. The first unit of the plant was completed 11 months before the end of the 33 months construction schedule specified in the Joint Venture Contract, and a bonus of HK$ 395 million and RMB 11.6

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[1] A 50% associated company of Hopewell Holdings Limited

[2] Formerly known as Shenzhen Special Economic Zone Development Company

[3] Financial Times, "BOT: Why Shajiao B stands out from the rest," 18 May 1992.

million was earned from its early operation. The plant was completed at a total cost of approximately HK$ 4.1 billion (US$ 520 million) which was financed through a combination of equity, foreign currency and RMB bank loans, supplier credits and shareholder advances. The plant is one of the largest operating plants in the Guangdong Province.

3.2.2 Project structure

Hopewell established the project company HPCL as is usually done in project financing. HPCL has been managing the project based on contracts and agreements such as a Joint Venture Contract, a Coal Supply Agreement, and an Offtake Agreement. The project's structure and agreements are shown in Figure 3-1.

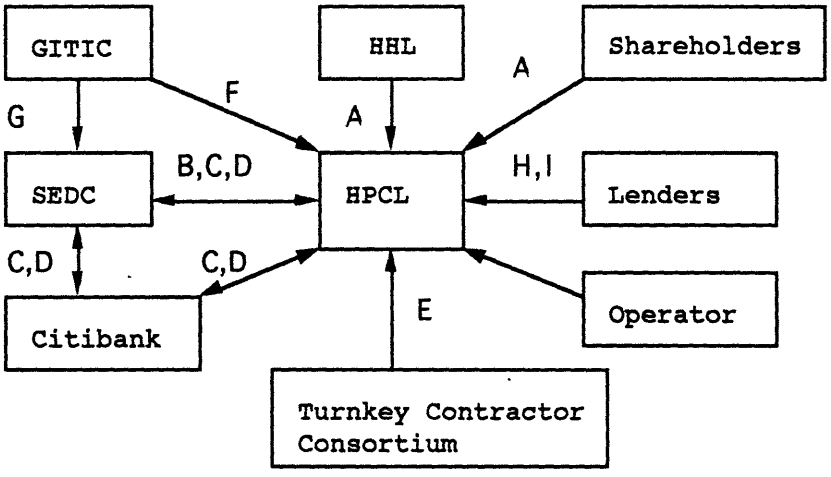

Figure 3-1
Project Structure of Shajiao B

3.2.3 Construction

The contractor consortium, headed by Mitsui, completed the plant 11 months ahead of the construction schedule, and by virtue of the early completion, HPCL earned an extra income of HK$ 395 million and RMB 11.6 million.

Mitsui subcontracted each portion to different companies such as Toshiba (turbines), IHI (boilers and coal handling), and Slipform (Civil Works) in order to hedge the unforeseen risks in this project. Other Contractors were Costains of the UK (Project Management), Ewbank Preece/Guangdong Electric Power Design Institute (power station designs), British Electricity International and Fluor Daniel (operations and maintenance), and Brown & Root of the U.S. (technical advice to financiers).

3.2.4 Operation

Since the commencement of Shajiao B, the quantity of electricity purchased by SEDC has exceeded the minimum quantity specified in the off-take contract, and the purchase quantity has gradually increased. Operating statistics of Shajiao B from 1990 to 1993 are summarized in Table 3-1.

Through the years 1990 to 1993, HPCL's revenues rose due to cost reduction resulting from its staff localization policy and a consistent increase in electricity generation. In 1990, HPCL substantially reduced its operating cost by replacing the expatriate personnel of Electric Power Services

Table 3-1

Operating Statistics of Shajiao B[1]

Item	Year ended 31st December ,			Six months ended 30th June,
	1990	1991	1992	1993
Revenue of HPCL ($'000)(Note)	1,095,690	1,119,465	1,152,098	578,005
Operating expenses of HPCL (Note)				
Fuel ($'000)	302,012	308,707	286,355	119,601
Other Costs ($'000)	151,957	127,520	116,535	62,227
Profit before taxation ($000)	80,500	144,292	168,644	91,903
Taxation ($000)	(9,200)	(10,602)	3,189	(6,993)
Profit attributable to share holders ($000)	71,300	133,690	171,833	84,910
Electricity generated (megawatt hours)	4,463,184	4,659,254	4,826,751	2,446,350
Electricity sold (megawatt hours)	4,129,861	4,313,134	4,474,156	2,271,069
Electricity sold as a percentage of installed capacity	67%	70%	73%	74%

Note: Revenues are paid to HPCL half in RMB and half in foreign currency, while the majority of operating expenses of HPCL are incurred in RMB. Depreciation of the RMB against the Hong Kong dollar (in which HPCL's accounts are prepared) and the adjustment of the electricity purchase price from January 1992 account for the increase in profit margin between 1991 and 1992.

(China), a US-British joint venture company which had been responsible for the operation and management of Shajiao B, with trained local personnel. In 1991, HPCL replaced the operation contract from Electric Power Services (China) with the Guanghua Industry Import and Export Corporation. By virtue of the revenue increase, HPCL achieved considerable interest savings by making an early repayment of the outstanding balance of a Hong Kong dollar credit facility

[1] Source: prospectus of Consolidated Electric Power Asia Limited.

obtained in 1990 and originally scheduled to be repaid in 1994, and of the term loan borrowed in 1992 which originally amounted to Yen 11 billion and was scheduled to be repaid by 1994.

3.2.5 Risk allocation

The project risks are allocated to each participant through contracts and agreements, such as a Joint Venture Contract, an Offtake Agreement, a Long Term Coal Supply Agreement, and GITIC insurance.

3.2.5.1 Joint Venture Contract

HPCL and SEDC agreed in March, 1985 to cooperate for 10 years, from April 1988, to March 1998. At the end of the cooperation period, HPCL must transfer the plant to SEDC in normal and operational condition at no cost.

(1) HPCL's responsibility

- Arrange the project financing, including foreign currency bank financing
- Construct, operate, maintain, and repair Shajiao B during the cooperation period

(2) SEDC's responsibility

- Provide HPCL with the right to use of the site
- Apply for certain governmental approvals and exemptions.

· Make up the purchase of electricity within three months if the power station is unable to transmit electricity due to transmission problems outside the power station (except force majeure).

(3) HPCL's rights

· Owns all the facilities, machinery and equipment of Shajiao B and operates, manages, and sells the electricity

· Owns all revenues from the power station subject to the payment of the management fee.

3.2.5.2 Offtake Agreement

SEDC, HPCL and Citicorp International Limited signed this Offtake Agreement in December 1985.

(1) SEDC's obligation

· Guarantee of minimum purchase quantity

SEDC purchases a minimum of 60% of the installed capacity of the plant, at a fixed rate unit price, calculated in RMB, in each year of the cooperation period. The unit purchase price is the same regardless of the amount of purchase[1]. If a unit is closed down for other than permitted maintenance and repairs, the minimum quantity is reduced based on the length of the closure unless the closure is caused by SEDC

[1] Although purchase price exceeding the minimum quantity was originally priced lower than that of minimum purchase price[1], the price was increased to the same price for the minimum quantity from January 1992.

· Monthly offtake payment

Off-take payments are made monthly to HPCL, half in RMB and half in foreign currencies converted from RMB at pre-determined exchange rates[1]. The increased purchase in excess of the minimum purchase amount is payable only in RMB. In the case that the payments are denominated in foreign currency, SEDC is solely responsible for the difference between predetermined and actual exchange rate. In any other cases, HPCL and SEDC are responsible for the difference, to be divided at 70% and 30% respectively. However, HPCL is fully responsible for the effect the difference may make the operation and other expenses of the power station. For the year ended 30th June, 1993, when the RMB devalued substantially against the Hong Kong dollar, the loss attributable to HPCL amounted to approximately HK$ 187 million.

· Subordinated loan to HPCL

The SEDC is obliged to make a subordinated loan to HPCL to meet such a deficiency up to an amount of HK$ 500 million if the revenue received by HPCL from operating Shajiao B is insufficient for meeting certain project expenses as a result of an event of force majeure or for any other reason other than an act or omission by SEDC or breach by SEDC of its obligations under the Off-take Agreement or the Coal Supply Agreement

[1] Conversions into HK$ are made at a rate of RMB 0.28:$ 1 and conversions into Japanese Yen at a rate of Yen 91.3: RMB 1.

· Advance payment for electricity to HPCL

SEDC is obliged to reduce the shortfall of HPCL, subject to certain limitations, by way of advanced payments for electricity if an insufficiency of its revenue is caused by SEDC or a breach of its obligations.

3.2.5.3 Long Term Coal Supply Agreement

This Coal Supply Agreement was signed between SEDC, HPCL and Citicorp International Limited in December, 1985.

(1) SEDC's obligation

· Deliver coal to HPCL at the site of Shajiao B to meet the requirements for the operation of the plant.

The base price of the coal, payable in RMB, is fixed for the duration of the cooperation period but subject to adjustment depending on the quality of the coal supplied.

If SEDC is unable to supply coal and HPCL is required to purchase coal from outside the PRC, SEDC is obliged to provide all foreign exchange necessary for the transactions and assist HPCL in applying for all relevant approvals and consents and exemptions from import duties.

(2) Event of force majeure

If SEDC fails to supply coal due to an event of force majeure affecting its principal source of coal, then for a period equal to the lesser of the duration of such force majeure event and two months, the increased cost of

supplying coal to Shajiao B must be borne by HPCL. If the force majeure event continues beyond this two month period, SEDC becomes responsible for such increased costs.

3.2.6 Insurance

The obligations of SEDC under the Offtake Contract and Coal Supply Agreement are guaranteed by the Guangdong International Trust and Investment Corporation (GITIC), an institution owned by the Guangdong provincial government, for the duration of the cooperation period. HPCL has agreed to pay GITIC an annual fee of HK$ 20 million for providing the guarantee.

3.2.7 Financing

The cost of Shajiao B, HK$ 4.1 billion (US$ 520 million) was financed through a combination of foreign currency loans, RMB bank loan, supplier credits and shareholder advances. The issued share capital of HPCL, set up in 1985, is held by the following entities:

Table 3-2
Share Holding of HPCL

Hopewell China Development Limited (HCDL)[1]	(50%)
Bank of China Group Investment Limited	(40%)
Kanematsu Corporation	(5%)
Two Chinese state enterprises	(5%)

[1] A subsidiary of HHL

Foreign currency loans in the principal amount of HK$ 3.3 billion were provided by a syndicate of commercial banks. The terms and conditions of the loans are described in the Syndicated Facilities Agreement. RMB bank loan of RMB 250 million is described in the Renminbi Loan Agreement.

3.2.7.1 Syndicated Facilities Agreement

The agreement was signed between HPCL, certain financial institutions and Citicorp International Limited (Citicorp) as agent of the syndication. HPCL was granted two term loan facilities of HK$ 600 million and Yen 11 billion and a guarantee facility of up to Yen 52 billion for the benefit of the turnkey contractor to finance project costs.

The two loan facilities have been paid in full and the guarantee facility has been refinanced under a Supplemental Syndicated Facilities Agreement in July, 1987 under which HPCL was granted a syndicated loan facility of Yen 49 billion.

Table 3-3
Original Foreign Currency Project Finance Facility

Term loans:	HK$ 600 million
	¥ 11 billion
Guarantee Facility	¥ 52 billion

Table 3-4

Refinanced Foreign Currency Project Finance Facility

Second syndicated term loan:	¥ 49 billion
Interest rates	1.125% p.a. above LIBOR
Repayment	25 quarterly installments
Commencing	September, 1988

3.2.7.2 Master Swap Agreement

The Master Swap Agreement was signed between Citibank N.A., China Development Finance Company (Hong Kong) Limited, DKB Asia Limited, Wardley Limited, The bank of Tokyo, Ltd., Banque Paribas (Collectively, the "Swap Counterparties"), HPCL and Citicorp in July 1987. Under this agreement, HPCL may enter into transactions with the Swap Counterparties for the purpose of converting HPCL's obligations to pay interest at a floating rate under the Facility into obligations to pay interest at a fixed rate.

3.2.7.3 Security

Under the assignments and agreements between HPCL and Citibank, such as an Account Assignment, a Deposit Banks' Account Assignment, an Assignment of Insurance, an Assignment of Project Contracts, a Fixed and Floating Charge, and a Supplemental Security Agreement, Citibank will be entitled to exercise its rights in the event of HPCL's default under a Facility and Master Swap Agreement. Also, under a Charge on

Shares between the HPCL's shareholders and Citicorp, and Supplemental Security Agreement, each of HPCL's Shareholders has created a charge over its shares in HPCL as security of the performance of HPCL's obligations under the Facility and Master Swap Agreement.

3.2.7.4 Renminbi Loan Agreement

In the agreement of March, 1986 between SEDC and HPCL, HPCL agreed to reimburse SEDC in respect to all principal and interest payments of the loan up to RMB 250 million. The outstanding principal is scheduled to be repaid over a period commencing in October, 1995 and terminating in December, 1997. The interest rate is payable annually based on similar loans published by the People's Bank of China.

3.2.7.5 Shareholder Support and Subordination Agreement

The Agreement was signed between HPCL's Shareholders, HPCL, HHL, and Citicorp in April, 1986. The Shareholders agreed to provide subordinated shareholders' loans of HK$ 299 million to HPCL. HPCL's shareholders have assigned all their rights of the loans as security for the obligations of HPCL under the Facility and the Master Swap Agreement.

3.3 Shajiao C Power Station[1]

3.3.1 Outline of the project

Following the success of Shajiao B, HHL has entered upon its second and larger BOT project called Shajiao C, which is located slightly to the east of Shajiao B. The plant will contain three 660 MW pulverized coal-fired generating units, capable of producing over 17,500 million kilowatt hours of electricity annually. This project is being developed under a Joint Venture Agreement between Shajiao Power[2] and Hopewell Energy Limited[3] (HEL), which together established Guangdong Guanghope Power Co. Ltd. (GGPCL) for constructing, operating, and managing the plant. This agreement provides for a 20 year cooperation period expiring in June, 2016.

The construction of Shajiao C is being undertaken by a turnkey contractor consortium comprised of GEC ALSTHOM of the United Kingdom and France (GA), Slipform and CE International China Inc. (CE) of the US. The project management is being carried out by Hopewell Tileman Limited, a wholly-owned subsidiary of HHL. The construction commenced in April, 1992, and upon completion, Shajiao C will be the largest coal-fired power station in Guangdong Province. Under the turnkey construction contract, the first unit is required to

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[1] The general description in this section is based on the prospectus of Consolidated Electric Power Asia Limited, Tiong (1992), and Pyle (1993).

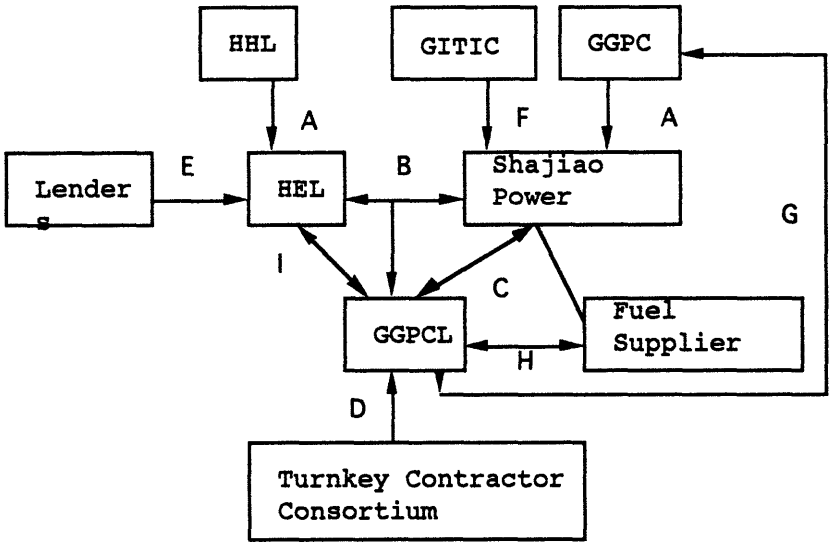
[2] Shajiao Power is a wholly-owned subsidiary of GGPC, which is a state-owned company established to deal with foreign entities in the management of power plants and transmission networks in the Guangdong province.

[3] HEL was established as a wholly-owned subsidiary of HHL for the Shajiao C project and, it has agreed to contribute to the registered capital of and make shareholder loans to GGPCL.

be completed in March, 1995. Also, the Joint Venture Contract specifies that all three units are to be completed by 30th June, 1996.

The cost of the project is expected to be US$ 1,966 million, of which US$ 375 million will be financed by equity contributions of Shajiao Power and HEL, and another US$ 375 million will be financed by shareholder loans and the remaining US$ 750 million will be financed by a syndication of international commercial banks. The details of the financial structure is shown in Table 3-5.

3.3.2 Project structure



A: Shareholding
B: Joint Venture Contract
C: Operation and Offtake Agreement
D: Turnkey Contract
E: Credit Facility Agreement
F: Guarantee of Shajiao Power's Obligation
G: Power Purchase Agreement
H: Fuel Supply Agreement
I: On-lending Agreement

Figure 3-2
Project Structure of Shajiao C

3.3.3 Risk allocation

The risks of the project are allocated through contracts and agreements such as Joint Venture Contract, Operation and Offtake Agreement, Power Station Development Contract, Turnkey Contract, and several financial agreements.

3.3.3.1 Joint Venture Agreement

Shajiao Power and HEL established GGPCL for the construction, operation and management of the Shajiao C Power Station. During the joint venture cooperation period which will expire 20 years after the contract completion date of June 1996, GGPCL has the right to construct, own, operate, and manage the power station and sell all electricity generated.

(1) Shajiao Power's responsibility

- Provide the site for the power station
- Assist in obtaining certain preferential tax treatments, licenses, and permits
- Assist in the purchase of local materials and install certain equipment

(2) HEL's responsibility

- Plan, design, and construct the power station
- Arrange the project financing
- Assist GGPCL and construction consortium in the purchase and importation of supplies and equipment

· Transfer all the remaining assets of GGPCL to Shajiao Power at no cost upon the expiration of the cooperation period

(3) Early completion incentives

Early completion income will be distributed 20% to Shajiao power and 80% to HEL. Such income is to be loaned back to GGPCL to cover construction cost and other repayments.

3.3.3.2 Operation and Off-take agreement

Under the operation and off-take agreement between GGPC/ Shajiao Power ("Operator") and HEL/GGPCL, each party is responsible for the following issues:

(1) Operator's responsibility

· Maintain, operate and manage the plant

The operation fee not relating to the supply of coal will be increased by 5% per annum beginning on 30th June, 1996.

· Supply coal during the cooperation period

If the price of coal rises, the Operator is entitled to adjust the cost of the coal, which is subject to an equivalent adjustment in the electricity fee. Therefore, the Operator and GGPCL are shielded from movements in the coal price.

- Provide transmission network
- Purchase minimum electricity at a fixed price

The minimum purchase obligation is 3,600 million KWH of electricity each year from each of the three Shajiao C, which represents 62.27% of the expected installed capacity of the units, at a fixed price.

The Operator will purchase electricity from GGPCL and will pay for it in part in US$ and in part in RMB. The payment is subject to the deduction of an operation fee payable to Shajiao Power and GGPC for services performed in relation to the maintenance, operation and management of the power station and for the supply of coal.

- Make an advance payment to GGPCL

If GGPCL's revenue is not sufficient to meet operating expenses and payments, the Operator will make an advance payment. The maximum amount of such payments is limited to the Minimum Offtake Quantity for the remainder of the relevant year. However it is not applicable when the Cash Deficiency is directly attributable to the failure by GGPCL or HEL to comply with its obligations under the Operation and Off-take Agreement or the Joint Venture Contract.

- Accept responsibility for their losses due to the power station's operation failure

GGPCL and HEL will not be liable for any such losses.

(2) GGPCL's obligation

- Pay the Operator a pre-operation fee and an advance payment to assist it in purchasing coal and consumables for construction
- Supply the Operator with transmission equipment, the value of which does not exceed US$ 40 million

(3) Guarantee from GITIC of Operator's obligation

GITIC provides a guarantee that the Operator will meet its obligations under the Operation and Off-take Agreement. The guarantee is only until all amounts due under the Credit Facilities Agreement have been repaid.

3.3.3.3 Power Station Development Contract

Under a Power Station Development Contract in December, 1992, between HEL, Shajiao Power and GGPCL, the obligation of HEL in this contract is to:

- Procure the construction and completion of Shajiao C in accordance with the Turnkey Contract on or before the Contract Completion Date.
- Pay damages to GGPCL if any unit of Shajiao C is not completed by the Contract Completion Date.

However, HEL has undertaken to pass on to GGPCL all of its rights and benefits under the Turnkey Contract (including any damages received) and to enforce its rights under the Turnkey Contract for the benefit of and in consultation with

GGPCL. GGPCL has undertaken to pay to HEL such amounts as will enable it to meet its payment obligations under the Turnkey Contract (including any bonus payments). GGPCL is also obliged to reimburse HEL for certain insurance and other costs incurred by HEL during the period of construction of Shajiao C. Under the Turnkey Contract Shajiao Power has agreed to assist GGPCL, HEL and the contractor in obtaining various permits, approvals, customs clearances and exemptions from relevant authorities within the PRC.

3.3.3.4 Turnkey Contract

The Turnkey Contract was agreed upon in August, 1992, by HEL and a consortium consisting of GA, Slipform, and CE (Contractor). The Turnkey Contract sets a fixed contract price of US$ 1,479,044,743 and stipulates that this can only be increased by reason of changes in Hong Kong or PRC law. The Turnkey Contract provides for the completion of each unit by March, 1995, June, 1995, and by September, 1995. These dates may only be extended by a breach of contract or other fault, negligence, failure or delay on the part of HEL, force majeure, variations ordered by HEL or a failure to obtain necessary PRC consent.

(1) Turnkey contractor's responsibility and rights

- Design, construct, complete and bring into commercial operation the power station.
- Pay liquidated damages in the event of delay.

· Repair any defect which arises within two years from completion of the relevant unit and any latent defects
· Be entitled to a bonus if a unit is completed prior to the relevant target date for completion

(2) HEL's responsibility and rights
· Pay all principal and interest on the bank financing and all interest on the shortfall loans and the shareholders loans if the generating units are not completed by 30th June, 1996 for reasons other than specified force majeure events.
· Be entitled to the liquidated damages or, in certain circumstances, to reject the unit if a unit fails to maintain warranted heat and output performance levels.

HEL has the right to terminate the project at any time upon giving written notice to the Contractor; also, the Contractor can terminate in case HEL fails to make payments. The Contractor also holds rights to suspend performance if any specified events of force majeure prevent it from performing its obligations for a continuous period of six months. Also, if such events prevent the Contractor from performing its obligations for a further continuous period of twelve months then either party may terminate the Turnkey Contract. In all such cases the Contractor is entitled to its unpaid costs until the date of termination. Except in the case of termination for

force majeure, it is entitled to a sum equal to any expenditure reasonably incurred by the Contractor in the expectation of completing the power station and to the demobilization costs.

3.3.4 Financing

The project will cost approximately US$ 1,966 million (including financing costs anticipated to be US$ 306 million) of which approximately US$ 1,480 million is the cost of the Turnkey Contract. The project will be financed through equity, shareholders loans, and bank financing. The financial plan of Shajiao C is shown in Table 3-5.

Table 3-5
Financing Plan of Shajiao C: (US$ million)

Shareholders equity:		375
Shajiao Power (60% in RMB)		
HEL (40% in US$)		
Loans:		
Shareholders loans		444
Shajiao Power (in RMB)	185	
HEL (in US$)	190	
Capitalized Interest	69	
Shareholders Shortfall Finance and capitalized Interest		214
EGB loans and Accrued Interest		183
Foreign Commercial Bank loans		750
Total		1,966

3.3.4.1 Terms and conditions of the loans

The total equity of US$ 375 million is provided 60% by Shajiao Power in RMB and 40% by HEL in US dollars.

Shareholders loans of US$ 185 million by Shajiao Power and up to US$ 139 million by HEL will be used for project expenses, and US$ 51 million of shareholder's loan by HEL will be used for paying interest at 10% p.a. Regarding the foreign commercial loans, lenders require GITIC's guarantee for the US dollar payment of Shajiao power and GGPC under the Operation and Offtake Agreement before the drawdown of the commercial loan facility. The terms of the commercial loans are shown in Table 3-6 and 3-7. These funds are to be repaid in the same currency from the revenue stream. However, if the US dollar revenue becomes less than the amount of repayment, RMB cash flows will be converted into US dollars.

3.3.4.2 Credit Facility Agreement

Under the Credit Facility Agreement between commercial banks and HEL, HEL has been granted the Term Loan Facility of US$ 650 million and the Revolving Facility of US$ 100 million.

Table 3-6
Term Loan Facility of Shajiao C

Purpose	Finance the payment for coal, design, construction, and operation
Loan amount	US$ 650 million
Interest rates	Pre-completion 1.375% above LIBOR Post-completion 1.0% above LIBOR
Commitment fee	0.375% p.a.
Repayment	8 semiannual
Commencing	December, 1996

Table 3-7

Revolving Loan (Letter of Credit) Facility of shajiao C

Purpose	Support the Letters of Credit in respect of the payment of HEL of the electrical and mechanical portion of Turnkey Contract.
L/C issuing Bank	Hong Kong and Shanghai Banking Corporation Ltd.
Loan amount	US$ 100 million
Interest rates	Pre-completion 1.375% above LIBOR Post-completion 1.0% above LIBOR
Guarantee fee	1.25 % p.a.
Repayment	Earlier of 30th June, 2000 or six months after the all repayment of Term Loan Facility

3.3.4.3 Security

The security of the project is provide by fixed and floating charges over all assets and undertakings of the borrower, a fixed charge over all the borrower's shares, a Security Deed, and a Charge of Assets. Under a Security Deed for the security of Credit Facilities Agreement between HEL and Commercial Banks, all of HEL's assets and rights, including those in the following project documents are assigned to the Agent (Wardley Limited).

- Joint Venture Contract
- Operation and Offtake Agreement
- GITIC guarantee
- Power Station Development Contract
- Performance Bond, Parent company guarantee
- On-Lending Agreement
- Undertaking and Guarantee
- Borrower's interest in all insurance

In addition, under a Charge of Assets between GGPCL and HEL, HEL secures all the GGPCL's assets as security for its payment under On-lending Agreement including the assets and rights in the following documents.

- Contracts: Joint Venture Contract, Operation and Offtake Contract, power Station Development Contract.
- GITIC guarantee
- Insurance Proceeds
- All plant and machinery
- Security accounts

3.3.4.4 Other guarantees and support

- GITIC's guarantee for US$ payment obligation of the Operator
- Guangdong Provincial People's Government's pledge of its support by the way of the Comfort Letter for the borrower
- HHL and Shajiao Power's Shortfall Loans up to US$ 250 million

3.4 Navotas I Power Station[1]

3.4.1 Outline of the project

Navotas I is located at the Navotas Fishport Complex to the north of Metro Manila in the Philippines. The facility contains three oil-fired generating units with a combined capacity of 210 MW. The project was developed under a BOT project agreement signed in November 1988, between National Power Corporation (NAPOCOR)[2] and Hopewell Project Management Company Limited (HPML)[3] which provides for a 12-year cooperation period beginning in March, 1991. By an accession undertaking, Hopewell Energy (Philippines) Corporation (HEPC)[4] became a party to the project agreement and agreed to perform and comply with all obligations of HPML. The construction of the plant was completed by Slipform, and even though the construction was delayed for several reasons, the plant has been successfully operated with high plant availability ratios. The construction cost of Navotas I was originally US$ 41 million[5] and was financed through a combination of

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[1] The general description in this section is based on the prospectus of Consolidated Electric Power Asia Limited. Pyle, Thomas H. Private Finance of Infrastructure; Understanding the New Hidden Key to Development Success, A presentation to the World Development Section of The World Bank, Washington D.C., 11 January 1994. Evans, Peter C., Opening Electric Power Generation to the Private Sector in the Philippines: Policy Origins and Early Experience, Master thesis, Massachusetts Institute of Technology, May 1991.

[2] A government owned entity responsible for the generation of substantially all of the Philippines' electricity.

[3] A 83.36% subsidiary of the Hopewell Holdings Limited.

[4] A 60.1 % subsidiary of HPML.

[5] HHL, through HPML, provided additional advances of approximately US$ 2.8 million to HEPC to cover costs incurred in connection with the defective equipment.

equity through HPML, Citicorp, IFC, ADB, and limited recourse term loans and shareholder advances.

3.4.2 Project structure

In the Philippines, law requires foreign companies to establish local legal entities for pursuing development projects. Therefore, Hopewell established HEPC, but in addition Hopewell used HEPC to secure "pioneer" status for the project from the Board of Investment. The status, only eligible for local companies, provides the project with a waiver of the 60-40 rule on foreign ownership, a six year tax holiday and full exemptions from customs duties and taxes. On the other hand, the Philippine's Uniform Currency Act states that, except in certain circumstances, any obligation contracted between two parties in the Philippines must be paid in pesos.[1] This means that if the local project company contracts with NAPOCOR, the currency paid by NAPOCOR must be in pesos. This status was obviously unacceptable by Hopewell because of their loan payment in hard currencies. Therefore, Hopewell constructed a triangular corporate structure among HPML, HEPC, and NAPOCOR to satisfy its desire for "pioneer" status, and hard currency payment from NAPOCOR. The project structure is shown in Figure 3-3.

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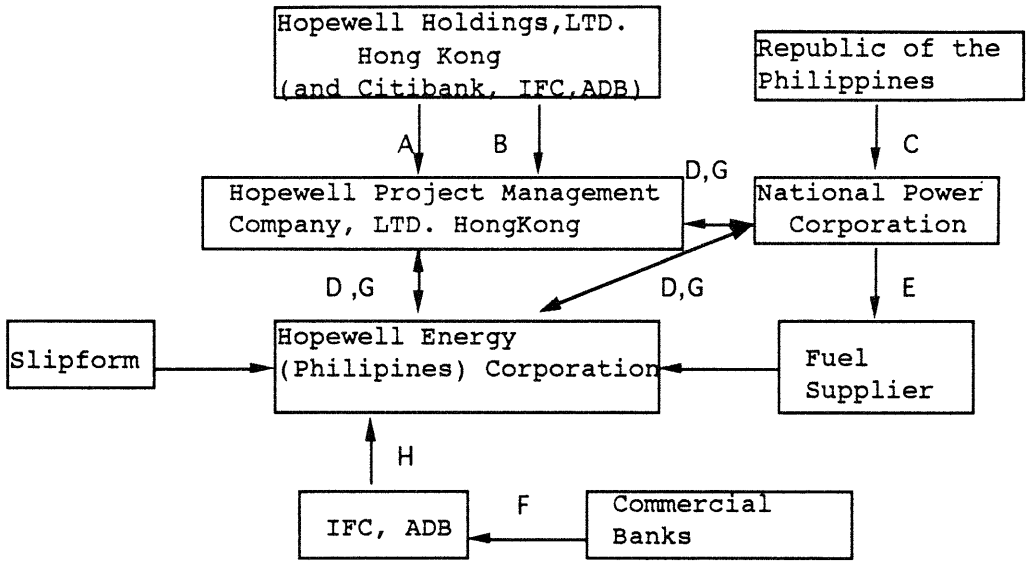
[1] Evans (1991): An Act to Assure Uniform Value to Philippine Coin and Currency, Republic Act No. 529, (as amended by R. A. No. 4100) June 16, 1950. Section 1 (b).



A: Sahreholding
B: Parent Guarantee
C: Performanc guarentee regarding Project Agreement and the Accession Undertaking
D: Accession Undertaling
E: Supply Undertaking
F: Subsciption of a Complimentary Co-financing
G: Project Agreement
H: Term Loans

Figure 3-3
Project Structure of Navotas I

3.4.3 Construction

Slipform was the project manager for the design, construction and development of this project. Two of the power station's three units were commissioned ahead of the contract completion schedule (which had been extended by five months due to a shipping accident beyond the Group's control), the commissioning of one unit was delayed primarily as a result of equipment being found to be defective upon its delivery to the Philippines. However, before ordering the equipment, Hopewell had some problems in obtaining certain governmental consents, in particular the Accession

Undertaking by the Department of Finance in support of NAPOCOR's payment obligations. A further delay occurred in securing an effectively registered title for the land at Navotas which was to be leased by NAPOCOR from another government authority. Pending satisfaction of these conditions, Hopewell delayed its purchase of the equipment from Tri-state.[1] As a result, Navotas I was completed in March, 1991, two months behind the extended contract completion date.

3.4.4 Operation

Navotas I was designed to be utilized only for peak loading, and its operation on weekends and public holidays was to be undertaken only upon notice by NAPOCOR. However, Navotas I has been operating above anticipated levels since commercial operations commenced as a result of the continuing power crisis in the Philippines. This has resulted in increased revenues and a corresponding increase in maintenance requirements. The only major interruption to plant operation occurred in September, 1992 when the turbine blade of one of the units shattered, causing the unit to be shut down for two months. This resulted in availability for the year which ended on 30th June, 1993 being reduced to 82%, compared to 98% for the year which ended 30th June, 1992.

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[1] Pyle (1994): Three gas turbines were purchased from Tri-State generation and Transmission Association, a private power generation cooperative in Denver. The units were Westinghouse W501B gas turbine generators in operation at Tri-State's Wray, Colorado facility. Originally installed in 1975, the units had very low running hours.

HEPC has received insurance payments amounting to US$ 3,166,010, which covered losses incurred as a result of the accident. For the month of August, 1993, Navotas I operated for an average of approximately 19.8 hours per day.

The revenue and operating expenses of HEPC for the two years ended 30th June, 1993, together with selected operating statistics of Navotas I, are summarized in Table 3-8.

Table 3-8
Operating Statistics of Navotas I

	Year ended 30th June, 1992	1993
Revenue of HEPC ($'000)	106,342	123,220
Operating expenses ($'000)	51,064	62,750
Profit before taxation ($'000)	38,278	52,983
Electricity generated (megawatt hours)	814,509	895,627
Electricity sold (megawatt hours)	800,494	891,246
Electricity sold as a percentage of installed capacity	46%	51%
Capacity factor	47%	51%
Availability	98%	82%

3.4.5 Risk allocation

3.4.5.1 Project agreement between NAPOCOR and HPML

(1) NAPOCOR's obligation

- Make the site available at no cost and be responsible for all real estate taxes, rates and other charges in respect of the site and the power station.
- Ensure the provision of all necessary utilities, and construct, install and connect the transmission line.
- Supply and deliver all fuel (which must meet the specifications set out in the Project Agreement) for the

power station at its own cost, and purchase all the electricity generated at the request of NAPOCOR.

- Pay following fees to HPML on a monthly basis during the cooperation period,

(i) a capacity fee, payable in US dollars, based on the contracted capacity for each year following completion of the power station (as nominated by HPML but not exceeding 210,000 kW unless NAPOCOR agrees) and any capacity rate of US$ 3.225 per month but subject to adjustment in the event of any reduction in the available capacity of the power station during the relevant month;

(ii) an energy fee (payable partly in US dollars and partly in Pesos, with the portion payable in Pesos being subject to adjustment for inflation) based on the amount of electricity generated pursuant to requests from NAPOCOR and a base energy rate of US$ 0.003 and Pesos 0.023 per kWH; and

(iii) start-up fees (payable partly in US dollars and partly in Pesos), in each case calculated in accordance with formulas specified in the Project Agreement.

- Responsible for all costs and expenses incurred in connection with the transfer at the end of the cooperation period.

(2) HPML's obligation

- Carry out the design, development, construction, completion, testing and commissioning of Navotas I

- Raise all funds for the HPML's portion of the contract (US$ 41 million) of the project.
- Obtain all necessary approvals and the importation of all necessary equipment.
- Deliver the power station, together with all fixtures, fittings, machinery and equipment, and be responsible for its management, operation, maintenance and repair.
- Maintain insurance with respect to the power station construction and development during the cooperation period.
- Transfer the power station to NAPOCOR for no consideration at the end of the cooperation period on an "as is" basis.

3.4.5.2 Other specific approvals

HPML required NAPOCOR other specific approvals to ensure the project profitability and bankability (Pyle, 1994).

- "Pioneer status" of the project, allowing exemptions from tax for six years and from custom duties on imported equipment and supplies
- Certification from National Economic and Development authority confirming that the project had "high national priority"
- Receipt of a performance undertaking from the Republic of the Philippines for NAPOCOR's payment obligations, including an "Accession Undertaking".

Pyle (1994) says that the Accession Undertaking was a vital and unique feature of this BOT financing. Under Accession Undertaking Hopewell may require NAPOCOR to buy

out, or NAPOCOR may require Hopewell to sell out upon the occurrence of certain specified events, including;

- Any approval, consent, law, or regulations required for the project are withdrawn, rescinded, or amended
- Any changes in Philippine law or regulations which materially and adversely affect HPML's interest in the power station or its economic return on its investment
- Any failure by NAPOCOR to pay sums due for 3 months
- The operation difficulty of the power station due to subsequent environmental laws or regulations
- Certain events of force majeure[1], related to wars or riots involving the Philippines, or actions taken by any governmental authority within the Republic of the Philippines, or any other event which shall be within the reasonable control of NAPOCOR or the Government or any agency or regional or municipal authority of it.

3.4.5.3 Government guarantee

The obligations of NAPOCOR under the Project Agreement and the Accession undertaking are guaranteed by the Republic of the Philippines.

[1] In general, each party's performance of its obligations under the Project Agreement is excused due to an event of Force Majeure outside its reasonable control.

3.4.6 Financing

3.4.6.1 Conditions for financing proposed by Hopewell

Hopewell's bids included two important conditions to ensure the profitability and bankability of the project. First, if Hopewell were to arrange bridge financing for the equipment and construction cost, the Philippine government would have to agree to Hopewell's subsequent arrangement of long-term refinancing. Second, all payments from NAPOCOR would have to be guaranteed by the Republic of the Philippines. Based on this understanding a project agreement was signed in November and Hopewell formed a wholly owned subsidiary of HEPC.

3.4.6.2 Cost and financing structure

The total project cost, US$ 41 million, of Navotas I consists of US$ 33 million for machinery and equipment and another US$ 8 million for civil works and financing expenses. The finance was provided by equity and limited recourse term loans and shareholder advances. Costs and financing structure are shown in Table 3-9 and 3-10.

Table 3-9

Cost of Navotas I: (US$ 000)

Supply of gas turbine station	23,600
Refurbishment and modifications	1,165
Dismantling, inspecting, packaging, shipping, re-installing, commissioning, testing	4,450
Electrical switch gear and installation	1,300
Ancillary power station equipment and Installation	1,750
Spare parts	100
	32,365
Civil engineering	2,057
Project supervision and engineering	800
Insurance	700
Financing, professional and legal fees	700
Interest, start-up expenses, working capital	3,378
	7,635
Total	41,000

Table 3-10

Financing Plan of Navotas I: (US$ 000)

Shareholder funds:		11,000
HPML	60.1%	
Citicorp	19.9%	
IFC	10.0%	
ADB	10.0%	
Term Loans:		
IFC		10,000
ADB		10,000
Commercial banks (under ADB Complimentary Co-financing)		10,000
Total project cost		41,000

A total of US$ 11 million was provided in the form of equity contributions from HPML and other minority shareholders of HEPC. HHL made shareholder loans of US$ 5.5 million to HPML to fund HPML's equity contributions to HEPC. Term loans totaling US$ 20 million were provided to HEPC by the IFC and the ADB, each of which has a final maturity date of 15th September, 1999. In addition, a syndicated term loan in the amount of US$ 10 million was provided by four commercial banks and is required to be repaid by 15th September 1996. Such term loans are secured by a charge on almost all of the property and assets of HEPC, including all of the assets related to Navotas I. Under the agreements governing such loans, dividends may not be paid by HEPC unless certain requirements are met by them and an event of default under the terms of such agreements has not occurred. Of the original US$ 30 million combined principal amount in term loans, US$ 19.3 million was outstanding on the 31st August, 1993.

· Loan from ADB to HEPC

ADB made a loan of US$ 10 million to HEPC amounting to 10 % of the share capital of HEPC. The loan is repayable in 36 quarterly payments, commencing on 15 December, 1990, with the final payment due on 15th September, 1999. HEPC is obliged to pay interest at a rate of 11.35% per annum on the principal amount outstanding from time to time and a commitment charge of 1% per annum on undrawn amounts.

· Complementary Loan From the ADB to HEPC

The ADB made an additional loan of US$ 10 million to HEPC, to be funded by the ADB entirely from participation in the loan by commercial banks. The loan is repayable in 24 quarterly installments with the final payment due on 15th September, 1996. HEPC is obliged to pay interest at a rate of 1.75% per annum above the London inter-bank offered rate and a commitment charge of 0.5% per annum in respect of undrawn amounts.

· Loan from IFC

IFC made a loan of US$ 10 million to HEPC amounting to 10% of the share capital of HEPC. The loan is repayable in 36 quarterly payments, commencing on 15 December, 1990, with the final payment due on 15th September, 1999. HEPC is obliged to pay interest on the principal amount outstanding from time to time at a rate of 2% above the London inter-bank offered rate. In addition, a commitment charge of 0.5% per annum is payable in respect to undrawn amounts.

3.5 Pagbilao Power Station[1]

3.5.1 Outline of the project

Pagbilao is situated on a sparsely populated island located approximately 100 miles south of Manila in the Philippines. The facility, being developed on a BOT basis, will contain two 367.5 MW pulverized-coal-fired generating units, and will be the largest coal-fired thermal power plant in the Philippines. Hopewell Power (Philippines) Corporation (HPPC)[2] established by HEIL, IFC, CDC[3], and the ADB will build the plant and operate it for 25 years and will then turn it over to the Philippines National Power Corporation.

The construction of Pagbilao is being undertaken by a turnkey contractor consortium comprised of Mitsubishi Corporation of Japan and Slipform, and the project management is being carried out by Hopewell Tileman Limited.[4] The construction of Pagbilao commenced in April, 1993, and the expected completion dates for the first and second units are April and July, 1996.[5]

The cost of the project is estimated to be US$ 933 million of which US$ 235 million will be funded through the equity contributions by HEIL, IFC, CDC, and the ADB to HPPC,

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[1] The general description in this section is based on the prospectus of Consolidated Electric Power in Asia, and the Engineering Business, 1993.

[2] A wholly owned subsidiary of Hopewell Energy International Limited (HEIL), a 49% associated company of the Hopewell Holdings Limited.

[3] Commonwealth Development Corporation.

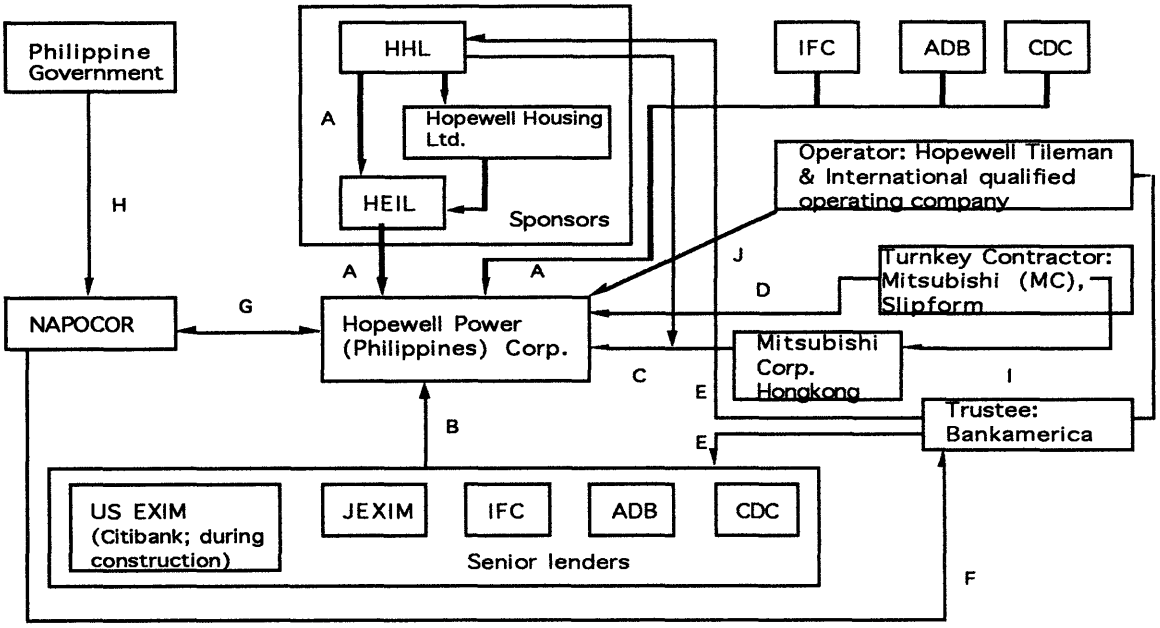
[4] A subsidiary of the Hopewell Holdings Limited.

[5] The Hopewell's directors expect that the units will commence commercial operations approximately seven months ahead of those dates During the early completion period.

and through loans and other credit facilities by JEXIM, USEXIM, IFC, CDC, the ADB, and other third parties to HPPC.

3.5.2 Project structure

The project structure is similar to Navotas I. Hopewell established a triangular corporate structure among NAPOCOR, HEIL in HongKong, and HPPC in the Philippines to acquire the pioneer status and hard currency payment from NAPOCOR. The other particularity of this project is the loan participation of ECAs and MLAs. In addition, the co-financing facility through IFC is under negotiation.



A: Shareholding
B: Loan Agreement: Common Agreement
C: Subordinated loans
D: Turnkey Contract
E: Payment: Trust and Retention Agreement
F: US dollar payment for electricity
G: Energy Conversion Agreement
H: Government Guarantee
I: Subordinated loans

Figure 3-4
Project Structure of Pagbilao

3.5.3 Risk allocation

Project associated risks are allocated to each participant through contracts and agreements such as the Energy Conversion Agreement, the Turnkey Contract, the Completion Support Agreement, Common Agreements, and the Trust and Retention Agreement.

3.5.3.1 Energy Conversion Agreement

This agreement specifies the rights and obligations between NAPOCOR and HEIL (HPPC) regarding the energy conversion.

(1) NAPOCOR's obligation

- Provide site at no cost and to construct, install and connect the transmission line
- Supply and deliver all fuel for the power station
- Pay following fees for the all electricity generated by the power station at the request of NAPOCOR

(i) a capacity fee based on the contracted capacity for each unit for each year

The capacity fee is divided into a capital recovery fee payable in US dollars, a fixed operating fee payable partly in US dollars and partly in Pesos and subject to adjustment for inflation, an infrastructure fee payable in US dollars, and a service fee payable in US dollars.

(ii) an energy fee-payable partly in US dollars and partly in Pesos and subject to adjustment for inflation-based on

the amount of electricity generated by requests from NAPOCOR

- Pay to HPPC/HEIL early completion income and fees equal to the capacity fees and the energy fees when a unit is completed ahead of schedule
- Buyout the plant from HEIL if certain events occur which materially and adversely affect HEIL's interest in the project or its economic return on its investment, such as any changes in Philippine law or regulations, force majeure, NAPOCOR's failure to ensure the payment of any sum within 3 months of its due date.

An Energy Conversion Agreement is not held responsible if it is prevented from performing such obligations due to an event of force majeure outside its reasonable control. However, NAPOCOR shall not escape responsibility for an event of force majeure relating to wars, riots, or other events involving any governmental authority or the Republic of the Philippines, or any other event within the reasonable control of NAPOCOR, regional or municipal authority, and the government of the Republic of the Philippines.

(2) Government guarantee

The obligations of NAPOCOR under the Energy Conversion Agreement and the Accession Undertaking are guaranteed by the Republic of the Philippines.

(3) HEIL's obligation

- Construct, maintain a bridge connecting between Pagbilao Grande Island to the mainland
- Provide a 10,000 KVA electricity sub-station for the electricity required during the construction process
- Arrange the financing of the project
- Obtain all necessary approvals
- Import all necessary equipment
- Pay penalties in the event that completion is delayed for more than 30 days due to the fault of HEIL excepting the delays by specified events of force majeure
- Transfer both units to NAPOCOR on an "as is" basis for no consideration at the end of the cooperation period

(4) Standby letter of credit by Citibank N.A.

HEIL has procured the provision by Citibank N.A. of a standby letter of credit in a maximum amount of US$ 16 million in respect of HEIL's obligations to make such payments. In the event that this standby letter of credit is fully drawn, HEIL has no further liability to make penalty payments.

3.5.3.2 Turnkey Contract

HPPC and a turnkey consortium consisting of Mitsubishi Corporation (MC) and Slipform have agreed to do all things necessary to achieve the design, construction, completion, commissioning, and bringing to full commercial operation the

power station to the standards and within the time specified in the Turnkey Contract for a fixed price of US$ 743,948,000. The obligation of the contractor and HPPC are as follows:

(1) Contractor's obligation

- Pay liquidated damages not exceeding 20 percent of the contract in the event of the construction delay and the lack of plant performance.
- Make subordinated loans up to US$ 200 million to HPPC if any funding insufficiencies of HPPC arises from breach or default of the Turnkey Contract by Mitsubishi or Slipform under the Turnkey Contractor Completion Support Agreement between HPPC, HHL, HEIL, Mitsubishi Corporation (HongKong), Ltd. However, this obligation shall not arise during an event of force majeure; also, all the obligations of Mitsubishi under the Completion Support Agreement have been guaranteed by its parent company MC, and Slipform's obligation in respect of its performance and payment is guaranteed by HHL.

(2) HPPC's obligation

- Payment of the contract price
- Provide access to the site, and sufficient labor for the operation
- Provide coal, fuel oil, and electricity
- Assist the contractor in obtaining necessary approvals

3.5.3.3 Sponsor Completion Support Agreement

Under the agreement among HPPC, HHL, HEIL, the various lenders to the project described below, and BankAmerica National Trust Company (Trustee)-HHL and HEIL agreed to make subordinated loans up to an aggregate amount of US$ 200 million to HPPC to meet any funding insufficiency. In addition, HHL and HEIL have agreed to make additional subordinated loans of up to US$ 51 million (or in excess of such amount if HHL and HEIL agrees) if called upon to do so by HPPC pursuant to the Common Agreement.

3.5.4 Financing

The particularity of this project is the participation of JEXIM and USEXIM. This is the first time that these banks provide limited-recourse financing without government guarantees for a very large power project in a developing country. IFC's Chaudhry, a power division manager, said that "The availability of export credits without guarantees from host country governments will be critical in expanding the private sector's role in the power sector."[1] HPPC's financial plan is shown in Table 3-11.

[1] International Finance Corporation, News, 29 April 1993.

Table 3-11

Financial Plan of Pagbilao: (US$ million)

Shareholder funds:			235.0
HEIL	87.5%	205.0	
IFC	4.25%	10.0	
CDC	4.25%	10.0	
ADB	4.25%	10.0	
Term Loans:			
JEXIM			367.5
USEXIM			185.0
IFC			60.0
ADB			40.0
CDC			35.0
Third parties through IFC			11.0
			933.0

3.5.4.1 Loans and share subscription agreements

The borrower is HPPC and the agreements are named CDC Investment Agreement, IFC Investment Agreement, ADB Investment Agreement, JEXIM Loan Agreement, USEXIM Loan Agreement, and Citibank Credit Agreement. Each agreement's terms and conditions are shown in Table 3-12 and 3-13.

Table 3-12

Terms and Conditions of the Loans for Pagbilao (1)

	CDC	IFC	IFC, Co-financing(Under negotiation)	ADB
Equity (US$)	10 million	10 million	0	10 million
Loan (US$)	35 million	60 million	40 million	40 million
Interest rates	9.75 % p.a.	10.25 % p.a.	conditional	10.25 % p.a.
Commitment fees	1.00 % p.a. US$ 350,000 (front end fee)	1.00 % p.a. 1 % of the loan (front end fee)	conditional	1.00 % p.a. US$ 400,000 (arrangement fee)
Repayment	12 equal semiannual	20 equal half-yearly	conditional	20 equal half-yearly
Commencing	July, 1997	July, 1997	conditional	July, 1997

Table 3-13

Terms and Conditions of the Loans for Pagbilao (2)

	JEXIM	JEXIM	Citibank (construction period)	USEXIM (operation period)
Equity (US$)	0	0	0	0
Loan (US$)	220,411,500	146,941,000	172,442,600	
Interest rates	7.46 % p.a.	2.15 % above LIBOR	2.75 % above LIBOR	7.16 % p.a.
Commitment fees	0.50 % p.a.	0.50 % p.a.	1.00 % p.a.	0.50 % p.a.
Repayment	12 pro rata semiannual	20 pro rata semiannual	Single installment	20 equal semiannual
Commencing	July, 1997	July, 1997	March, 1997 or 30 days after project's completion	July, 1997

· CDC Investment Agreement

HPPC must comply with certain procurement requirements, including the United Kingdom suppliers and contractors must be given full opportunity to pre-qualify and to submit tenders on a basis no less favorable than others.

· IFC Investment Agreement

HPPC is obliged to make mandatory prepayment in accordance with the Trust and Retention Agreement or on a pro rata basis in the event of a prepayment under any of the other financing documents. The provisions of the Common Agreement concerning events of default are incorporated by reference into the IFC Investment Agreement

· ADB Investment Agreement

ADB's obligation to subscribe shares and to make available the loan may be suspended or canceled by the ADB

upon the occurrence of certain specified events including an event of default under the Common Agreement.

- JEXIM Loan Agreement

The right of HPPC to make drawings is subject to suspension in certain circumstances, including where there is an event of default under the Common Agreement and JEXIM Loan Agreement shall terminate automatically in accordance with the provisions of the Common Agreement. HPPC may be required to pay the outstanding principal amounts in accordance with the terms of the Trust and Retention Agreement or in the event of a prepayment under any of the other financing documents.

- USEXIM Loan Agreement

The facility is subject to mandatory prepayment in accordance with the Trust and Retention Agreement or in the event of a prepayment under any of the other financing agreements. The provisions of the Common Agreement concerning events of default are incorporated by reference into the USEXIM Credit Agreement.

- Citibank Credit Agreement

The right of HPPC to disbursements of the loan and the issuance of letters of credit is subject to suspension in certain events, including where there is an event of default under the Common Agreement. The obligations of HPPC to

certain of the Banks under the Citibank Credit Agreement are guaranteed by USEXIM upon the occurrence of certain political or economic conditions or events. A guarantee exposure fee is payable by HPPC to USEXIM.

3.5.4.2 Common Agreement

Lenders secure their right by setting out certain common representations, warranties and covenants given by HPPC to each of the Lenders, certain uniform conditions of disbursements and certain common events of default.

Events of default include (i) default by HPPC under any of the project documents or financing documents referred to above or in respect of any other indebtedness for borrowed money; (ii) default by any of HEIL, HTPSC or, prior to completion of the project, Slipform or Hopewell Tileman Limited in respect of any indebtedness for borrowed money exceeding US$ 1 million; (iii) default by HHL or MC in respect of any indebtedness for borrowed money exceeding US$ 10 million or US$ 20 million respectively, in each case prior to completion of the project; (iv) the winding-up or liquidation of any of HPPC, HHL, HEIL, HTPSC or, prior to completion of the project, MC, Slipform or Hopewell Tileman Limited; and (v) HHL ceasing to own, directly or indirectly, at least 51% of the voting rights in HEIL.

3.5.4.3 Trust and Retention Agreement

Under a Trust and Retention Agreement among HPPC, HEIL, HHL, MC, Mitsubishi, Slipform, the lenders and trustee, all proceeds received by HPPC from the sale of electricity (other than payments made by NAPOCOR in Pesos under the Energy Conversion Agreement), insurance claims, payments received under the Turnkey Contract, the Sponsor Completion Support Agreement and the Contractor Support Agreement and from any secured assets are to paid into an account established by the Trustee.

The Trustee is to apply such proceeds on behalf of HPPC first in payment of operating and maintenance costs and taxes owed by HPPC and second in payment of interest and principal due under the various financing documents in the order of priority specified in the Trust and Retention Agreement.

3.6 Second Stage Expressway[1]

3.6.1 Outline of the project

The Second Stage Expressway (SES) is located in Bangkok, Thailand. The project has been developed under the Concession Agreement between the Expressway and Rapid Transit Authority of Thailand (ETA) and the Bangkok Expressway Co. Ltd. (BECL) led by Japanese Kumagai Gumi Co., Ltd. It is the first large project performed by public-private partnership in Thailand. The concession period is 30 years from March, 1990 which was when the construction began.

The purpose of the entire expressway system was to ease the traffic jams in downtown Bangkok which had become a threat to the city's economic growth. In addition, the system had to be constructed systematically in order to cope with the expanding commuting area and increased travel which accompanied the rapid expansion of the city. The 20-mile SES project is an extension of the First Stage Expressway project constructed by the government, and Third and Fourth Stage

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[1] The information in this section is based on the following documents: Handley, Paul, "No Highway?," Far Eastern Economic Review, 5 August 1993. Hirsh, Michael, "Thanks for the highway, now take a hike," Asia Journal, May 1993. Handley, Paul "Road to Ruin," Far Eastern Economic Review, 10 June 1993. Reina, Peter, "Bangkok builds BOT megaprojects," Enginnering News-Record, 15 June 1992. Reina, Peter, "Bangkok exploits its market strengths to attract BOT builders for transit," Public Works Financing July 1992. Ferrigno, Joseph W., "The Bangkok Second Stage Expressway Project," Public Works Financing July 1990. Barns, William and Victor Mallet, "Thais make a mess of their muddling," Financial Times, 22 June 1993. The Expressway and Rapid Transit Authority of Thailand, Balancing Public and private sector interests, September 1993. The Expressway and Rapid Transit Authority of Thailand, Overview of the Second Stage Expressway System in Greater Bangkok, March 1989. Makioka, Hiroshi, Project finance for transportation Projects, Master thesis, Massachusetts Institute of Technology, June 1992. Ishikawa, Hiroshi, "How to BOT," Infrastructure Finance, Fall 1992.

Expressways are being considered in the future. The route of SES is shown in Figure 3-5.

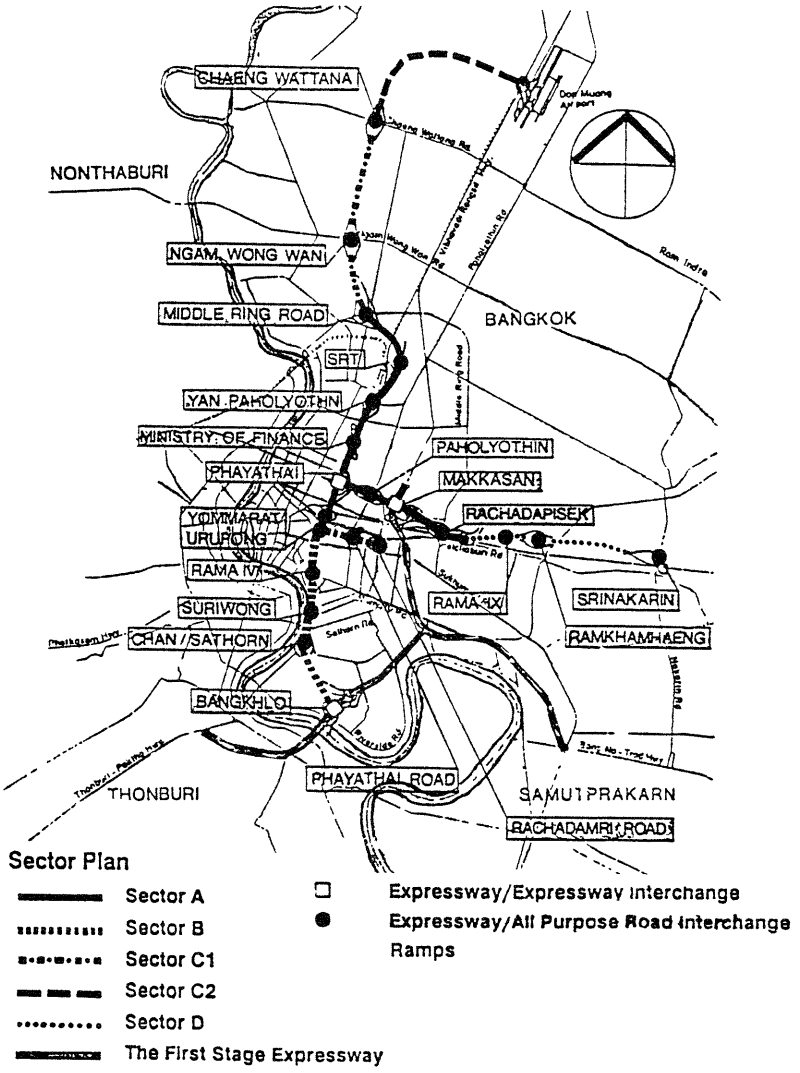


Figure 3-5
Route of the Second Stage Expressway[1]

The feasibility study of the SES project was conducted by the ETA with the cooperation of the Japan International

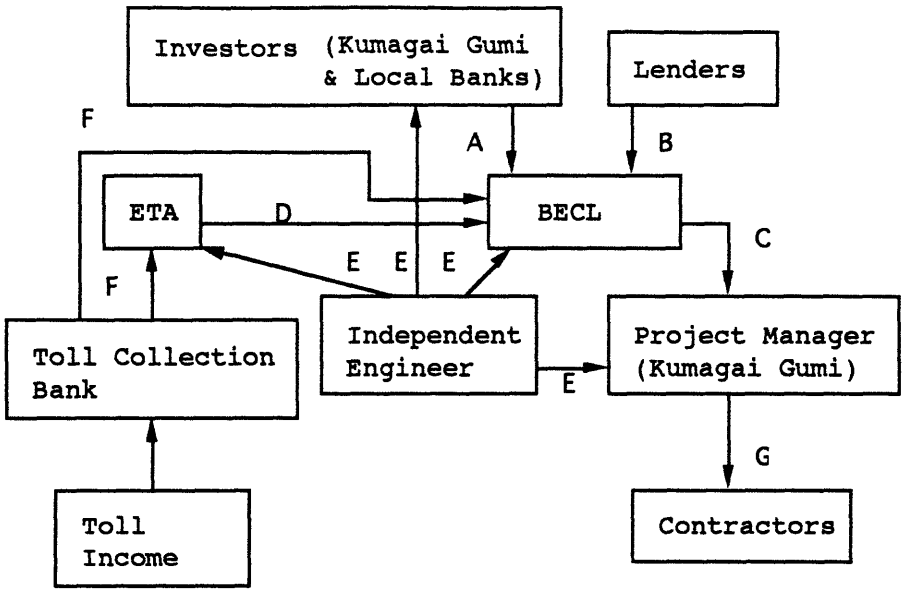
[1] The Expressway and Rapid Transit Authority of Thailand (1989): Sector Plans Proposed by BECL.

Cooperation Agency (JICA) from 1982 to 1983. In March, 1985, the Council of Ministers approved the SES project. Following the approval, the ETA commissioned a detailed design of the expressway in 1986. In June, 1987, the Council of Ministers advised the ETA to involve the private sector in the SES project, and in August, the ETA invited interested firms to submit proposals. The ETA received two proposals, one from BECL and the other from the Thai Expressway Development Joint Venture Co., Ltd. The ETA finally selected BECL, negotiated detailed conditions, and signed a contract in December 1988.

In the project, the ETA is in charge of land acquisition, and BECL will reimburse them for its cost during the concession period. The Kumagai Gumi Co. Ltd. acted as construction manager for the design and construction of the project with a staff of 300. Kumagai had provided a warranty for the cost and completion of construction works which was secured by performance bonds. BECL separated the job into substructure and deck contracts, and awarded seven contracts to five consortiums for Sectors A and C1 of the first 12.4-mile section.

The cost of the project is expected to be Baht 27.5 billion (US$ 1.1 billion: excluding land acquisition cost), of which Baht 5.5 billion (US$ 220 million) is provided by the equity contribution of Kumagai, seven local banks, and the Asian Development Bank; also, Baht 22 billion (US$ 880 million) is provided by Onshore and Offshore Credit Facilities.

3.6.2 Project structure



A: Shareholding
B: Term Loan
C: Warranty Agreement, Project Management Agreement
D: Concession Agreement
E: Reports
F: Revenue share
G: Agreement

Figure 3-6

Project Structure of the Second Stage Expressway

3.6.3 Particularity of the concession scheme

When the project was negotiated in 1987-88 with the former government, the government supported the implementation of this scheme. First it agreed to share the toll revenues with BECL for the entire expressway system according to the agreed ratio. Second, it agreed that the ETA would acquire the land necessary for the project and BECL would refund it during the concession period. This arrangement was profitable for BECL because, under the ETA's land acquisition, some privileges, including an eight year

corporate income tax relief after earning the revenue, and tax exemptions on dividends, are eligible to the concession (Augenblick and Custer, 1990).

The government also gave BECL recourse to some remedies in the case of "Exceptional occurrences" (Augenblick and Custer, 1990). Such remedies are:

- an adjustment in the revenue sharing proportions
- an increase in tolls on the system
- an extension of the duration of the revenue allocation percentage
- an extension of the overall concession period of the project

"Exceptional occurrences" are:

- material increase in interest rate
- material economic dislocation in Thailand
- material delays in the relocation or diversion of utilities
- government action or inaction (including undue interference with the execution of the project
- unanticipated adverse ground conditions
- significant disruptions in the local construction and building materials industries
- non-insurable events of force majeure

3.6.4 Construction

BECL's original construction schedule[1] was to:

[1] The Expressway and Rapid Transit Authority of Thailand (1989).

· start construction on March 1, 1990 with completion by March 1, 1993 for Sector A and C1.

· start construction on August 1, 1992 with completion by August 1, 1995 for Sector B.

Although Sectors A and C1 were officially completed in November, 1992, the construction tended to fall behind schedule mainly because of the land acquisition problems of the ETA. The construction of Sector B has not yet started because the land has not been fully acquired.

The SES is an almost entirely elevated structure; therefore, the viaduct's design has a critical impact on the construction costs and schedules. Kumagai found that the ETA's original design of U-beams and box girders was more expensive than the span by span construction using match-cast segments. Segmental construction is only advantageous when the number of the spans are considerable because of the high initial investment cost for huge launching girders and the construction of a precasting plant. BECL arranged for a single precasting plant to serve all the contractors in order to maximize the learning curve and minimize the cost of the products. BECL supplied most of the equipment and materials, and the German/Thai consortium operated the plant. The adoption of the segmental construction and the usage of single precasting plant are considered the main reason for the success of its scheduling.

3.6.5 Financing

The SES's financing scheme was recognized as an innovative example because of the Thai banks' positive participation and because of the cooperation between Thai and foreign banks. The loans were the largest in the local financial market in terms of amounts and maturity in spite of the Thai banks' severe limit on lending to single borrowers. Because all of the revenue comes from tolls in Baht, Baht financing was deemed necessary to minimize exchange risk, so foreign investment bankers put together the offshore facility of 5 billion Baht credit to guarantee the Thai's onshore facility. Lenders were to be secured by the relevant provisions under the Civil and commercial Code of Thailand, various assignment and share pledges, and a construction warranty by Kumagai. The security package was granted from the Thai Military Bank, an agent of the lenders.

However, the syndication has fallen apart between the domestic and foreign investors because of the government's failure to keep the scheduled land acquisition and because they decreased the toll from Baht 30. Local banks have been willing to support the government because of their political connection with it. The government's two deputy prime ministers and the finance minister are former top executives of three of the principal banks: Siam Commercial Bank, Thai Military Bank and Bangkok Bank.

3.6.5.1 Original financial structure

Table 3-14

Funds' Sources and Uses of SES (Baht million)

Sources:	
Shareholder's equity	5,500
Credit	22,000
ETA's bond	14,300
Total	41,800
Uses:	
Construction cost	25,000
Land acquisition cost	16,800
Total	41,800

Under the Shareholder Agreement of March 21, 1989, the shareholders capital was Baht 5,500 million. Kumagai held 70 % of the shares. Kumagai intended to sell their shares and subscribe new shares to the public after the project entered the operation stage. The list of share holders is shown in Table 3-15.

Table 3-15

Shareholder's Percentage of the Shares in BECL

Shareholders	%
Bangkok Bank	9.43
Siam Commercial Bank	3.00
Bureau of the Crown Property	2.66
Thai Military Bank	3.77
Krung Thai bank	3.64
Asia Bank	2.50
Chor Karn Chang	5.00
Kumagai Gumi	70.00
Total	100.00

Note: In December 1990, Asian Development Bank (ADB) formally signed agreements with BECL to provide a long-term loan and equity investment of US$ 40 million. However that amount is not counted in this table because of the lack of information.

Under the Onshore Credit facilities Agreement of March 21, 1989, with a syndication of 11 major local banks, the total credit amount is up to Baht 22,000 million. The onshore facility is comprised of three separate parts, Tranches A to C. Tranche A finances up to Baht 15,000 million, Tranche B up to Baht 5,000 million supported by the Offshore Credit Facility, Tranche C up to Baht 2,000 million. The onshore facility will mature in March 2009, with repayment beginning in March 1996. The borrowing under Tranche B is supported by an Offshore Credit Facility consisting of 30 major international banks led by Credit Lyonnais, DKB Asia, LTCB Asia, and Nat West. The Offshore facility provides guarantees to Tranche B for loans up to the lower of Baht 5,500 million or US$ 275 million. The facility includes a US$ 100 million revolving loan. The Offshore Credit Facilities will have reached final maturity in early 1999.

3.6.5.2 Original forecast of economic return

Economic analyses of the project were conducted by JICA in 1983, and the National Engineering Consultants Co., Ltd. (NECCO) in 1986. JICA and NECCO took slightly different routes in analyzing the economic return. However, both studies concluded that the SES would be economically viable. Their results are shown in Table 3-16 and 3-17.

Table 3-16

Comparative Investment Cost of SES

Source (Year)	Investment Cost (Baht million)
JICA (1983)	16,118.82
NECCO(1986)	17,620.00
BECL (1989)	30,399.00

Note: Excluding Interest during construction

Table 3-17

Comparative Economic Analysis of SES

Description	JICA (1983)	NECCO (1986)
Net Present Value* (Baht 1000 million)	6.09	20.60
B/C ratio*	1.65	2.32
IRR (%)	17.00	22.60

*) discount rate: 12%

3.6.6 Current issues

The project was originally negotiated in 1987-88 when the military backed government, Prem Tinsulanonda, was stable. However, after the bloodless coup in February 1991, the new government changed the land evaluation basis of the SES from a lower tax value to a higher market value in order to acquire popularity. Because of this change, the land purchase price tripled, and it became difficult for the ETA to acquire land on schedule. As a result, the ETA delayed providing land for the BECL in Sectors A and C1, and did not completely acquire the land necessary for the rest of the construction of the SES. Further, the ETA began to explore

the ambiguities of the concession contract as the SES's opening approached. For example, when the construction of Sectors A and C1 was officially completed in November, 1992, BECL claimed a share of the toll of Baht 30. However, the ETA had a different view, holding that the toll sharing could only begin after the priority components were operational. Because it did not have these funds, BECL defaulted on its interest payments, and the banks suspended their loans to BECL in February, 1993. In addition, in April, two weeks before the opening of sectors A and C1, the government announced a change in the predetermined toll rates from Baht 30 to Baht 20 in order to maintain its popularity with the public. The cut in tolls was to be made at the expense of the ETA which was almost bankrupt.

Kumagai decided to withdraw from this project because it could not live with the ETA's ambiguous attitude and Thailand's insufficient legal structure. International bankers and businessmen have said that even though Thailand desperately needs huge infrastructure improvements, the Thai government's decision against the SES makes it harder to finance at least US$ 30 billion worth of planned projects.

3.7 North-South Highway[1]

3.7.1 Outline of the project

The 785 km North-South Highway Project is a part of the 900 km expressway system, which extends through the Malay peninsula from the Thai border to Singapore. It was originally started by the government; however, because of financial difficulties, the government decided to complete the remaining 504 km portion of the project using the BOT method. The project, including finance, design, construction, and operation, was awarded in 1987 to Project Lebuhraya Utara-Selatan Bhd (PLUS), a joint venture company formed by United Engineers Malaysia (UEM) and the Faber Group, for a 30-year concession period from May, 1988 to May, 2018.

The construction was delayed because of PLUS's limited financial resources, and their technical inexperience. As a result, the expected completion date of construction has been postponed from 1992 to 1995.

The construction cost was initially estimated to be US$ 1.3 billion, but it is currently estimated to be around US$ 2.3 billion, which is being financed through the Malaysian capital market, and commercial and government loans.

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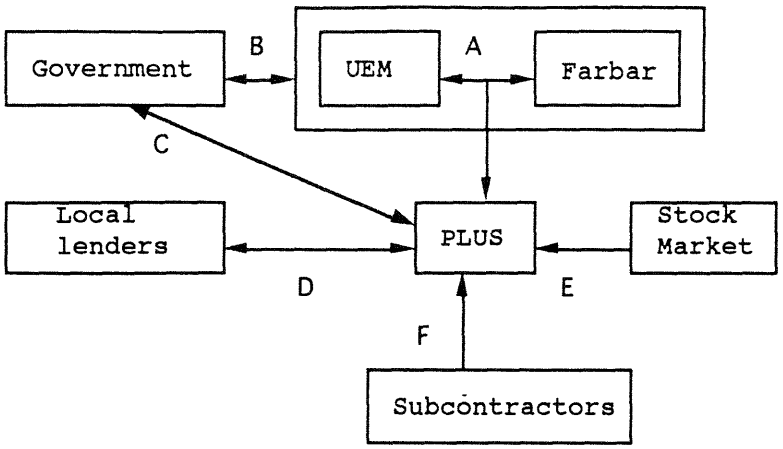
[1] The general description in this section is based on the following articles: Hensley, Matthew L. and Edward P. White (1993). Vellu, S.S., "Policy Towards BOT Projects and the Incentives Provided by the Malaysian Government to Promote Private Sector Financing of Major Projects," Conference on "BOT Opportunities in Asia," Nov. 1988. Reinhardt, William G., "The Road Case Study #5: Malaysia," unpublished article.

3.7.2 Project structure



A: Joint Venture Agreement
B: Concession Agreement
C: Loan Agreement
D: Loan Agreement
E: Shareholding
F: Construction Contract

Figure 3-7
Project Structure of the North-South Highway

3.7.3 Construction

PLUS appointed Pengurusan Lebuhraya Berhad (PL) to manage the highway's construction work, and contracted with around 40 sub-contractors for the project. Because the project is geographically spread out, PLUS established a head office in Kuala Lumpur and regional offices along the route of the highway. PL also regionally separated the Construction Management Division and the Contract Division, but all offices are staffed in a similar way.[1]

3.7.4 Government support

The project has been criticized as an example of a

[1] Lam, Patrick, Procurement of Infrastructure Through the Privatisation Approach, Master thesis, University of Bath, United Kingdom, 1992.

misuse of privatization in terms of the contract-awarding process, and of excessive government support after the award was made to UEM. In the bidding stage, the government discouraged potential competitors by limiting its support; consequently, very few contractors bid on the project. As a result PLUS, the joint venture company formed by UEM and the Faber Group, whose major shareholders included the Prime Minister and the Minister of Public Works, was awarded the contract. Neither UEM nor Fabor had proven track records for highway projects, nor did they have strong financial standing. After PLUS had been awarded the project, however, the government developed an extensive security package for them, including the following aspects:

- Right-of-way
- Negotiated toll rates: the concession company receives the absolute right to the collection of all toll charges for their own benefit for 30 years
- Support loans of M$ 1.65 billion for 10 years
- Traffic volume guarantee; traffic volume supplement to meet any shortfall for the first 17 years
- External risks supplement, to meet any advance exchange rate movements during the first 17 years
- Guarantees against foreign exchange and interest rate risk
- Guarantees against various events of force majeure or government action

3.7.5 Financing

The cost of the construction has been estimated around US$ 2.3 billion. At the time of the award, PLUS did not have equity for the project. However, it has raised over US$ 296.3 million in the local stock market; also, it expects to raise another US$ 444 million to cover its cost overrun. In addition, they have obtained US$ 926 million in 15-year commercial loans from local banks with both fixed and floating rates together with the government loans of 630 million in US dollars.

Table 3-18
PLUS's Financing Plan of NSH: (US$ million)

Equity	296.3	
(Local stock market)	444.0	(planning)
Loans		
Government	630.0	
Commercial	926.0	
Total	2,296.3	

3.7.6 Earlier Road Projects in Malaysia

Before the North-South Highway was implemented, three road projects had already been carried out under the BOT scheme. The first project was the North Kelang Straits Bypass Project, an urban bypass, with a 25-year concession period and an estimated cost of US$ 7.4 million. The second project was the Kepong Interchange Project in Kuala Lumpur, under a 9-year concession period with a cost of US$ 31.9 million. Both projects have completed construction and are

now under operation. The third project was the Kuala Lumpur Interchange Project, a series of seven urban interchanges and toll plazas, with a 12-year concession period and a cost of about US$ 11 million. The government itself set the toll rates, designed the interchanges, and awarded the concession for the bidder with the shortest concession period. The government tried to utilize the effect of competition in this contract. The concessionaire received no government guarantee. However, in 1991 after the road opened, three days of riots ensued in the city against the government-set toll rates. The toll was immediately reduced by half, and the revenue difference has been compensated for by the government. As a result of this experience, the government and BOT proponents understood the necessity of certain government guarantees.

3.7.7 Particularity of road projects in Malaysia

The Malaysian government limited its role in the first three projects because the government's objective was the complete transfer of risks to the private sectors. Therefore, the government did not provide any risk guarantee to concessionaires. By contrast, the North-South Highway project was highly guaranteed because the government felt the necessity for some government guarantee for the third project and because of its own connection to it. Therefore, the government severely mitigated the risk in that project. In a

sense, Malaysia has moved from one extreme to another in the public-private risk sharing (Reinhardt).

The Malaysian BOT is generally considered successful because of the actual completion of several projects. The government has strategically developed BOTs from small projects to larger ones, which enhanced their learning curve and decreased the damage experienced through their mistakes.

Mr. John Burnham, a director of J. Henry Shroeder Wagg, a large U.K. bank, explained the Malaysian success as follows:

1. They started down the BOT road at a time when the local economy was in acute recession and public funds for capital projects were scarce. There was a strong need to seek private capital.
2. The public works agencies had made some mistakes on previous projects resulting in large overruns and foreign exchange losses. There was a feeling among top political operatives and within certain segments of the civil service that private concessionaires could manage the risks more effectively.
3. The government made strong efforts to be flexible in sharing risks so that the concessions ended up being financeable deals. Different terms were negotiated for each project depending on real-world assessment of its economic viability and tried to hand all of its risks over to the private sector.

4. The move to BOT came from the Prime Minister and other senior members of the government. That greatly helped to overcome bureaucratic inertia and outright opposition. In addition, the public procurement team was centralized at a high level within the government. That created a wider perspective than would have been possible at the level of individual Ministries. It also meant that new approaches could be taken quickly and unilaterally, without having to stop and educate the various segments of the civil service first..
5. The BOT program was launched by giving infrastructure entrepreneurs the sole right to negotiate concessions for projects the government wanted built. Initially, if a conceptual proposal was strong, the proposers were given six months to try to negotiate contract terms. A number of real projects got built that way, generating strong investor and contractor interest. Initial terms were generous; not outrageous but good enough to open the right doors.

   The new approach is to inject as much competition as possible into selection of the concessionaires although exclusivity is still granted to firms with truly innovative solutions. Also, the deals are not as rich because they do not need to be to attract contractor and investor interest.
6. With the exception of the North-South highway, most of the projects were relatively small, 50 million to 60

million in U.S. dollars. Both sides learned how to structure risks and rewards on strong, stand alone projects that could be financed locally. They did not go for the large, prestigious projects first. If they had, they probably would have failed.

More generally, Malaysia succeeded where many others have not because of the stability of its government; the size and sophistication of its capital market; and the low interest rates on borrowed capital.

3.8 Guangzhou-Shenzhen-Zhuhai Superhighway (Phase I)[1]

3.8.1 Outline of the project

The Guangzhou-Shenzhen-Zhuhai Superhighway (GSZ) is located in the Guangdong Province of the People's Republic of China. The project consists of two phases. Phase I will link Shenzhen/HongKong area with Guangzhou, and Phase II will link Guangzhou with the Zhuhai/Macau area. Both phases will be connected by the proposed Guangzhou Ring Road. Phase I shown in Figure 3-8 consists of 122.8 km of dual three-lane toll roads with 15 interchanges. This project is being developed under BOT by a joint venture with Hopewell China Development (Superhighway) Limited and the Guangdong

[1] The information in this section is based on the following documents: Green, Michael, S.G. Warburg Research: Hopewell Holdings Ltd, S.G. Warburg Securities, November 1993. Pyle (1992). Pyle, Thomas H. "Private Financing of Chinese Power," Infocast conference, Private Power in China, 8 February 1994. Goldstein, Carl, "Skirting the potholes," Far Eastern Economic Review, 3 December 1992. Goldstein, Carl, "Open Sesame," Far Eastern Economic Review, 16 December 1993.

Provincial Highway Construction Company, which represents the Guangdong provincial government. The concession period is 30 years beginning from the expected construction completion date of June, 1994. In addition, the joint venture is developing commercial centers at the ten of fifteen interchanges. Each center will have a gross floor area of approximately 900,000 square feet.

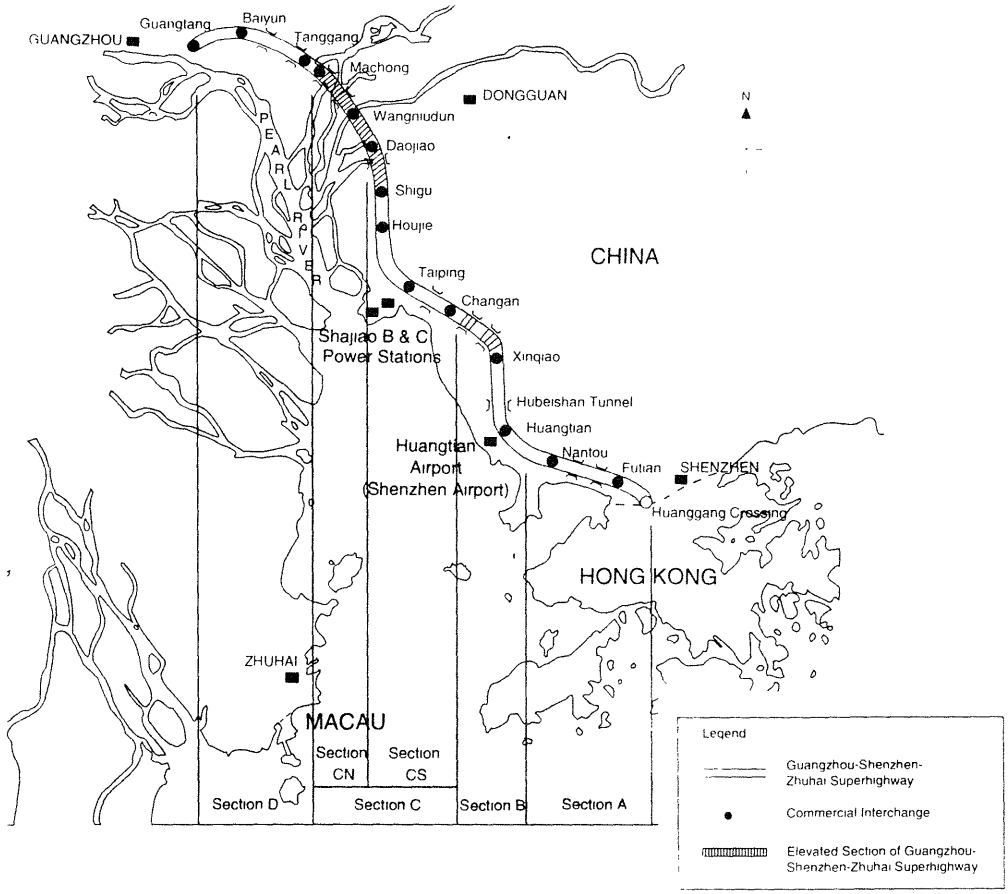


Figure 3-8
Layout of the Guangzhou-Shenzhen-Zhuhai Superhighway (Phase I)[1]

[1] Green (1993).

The project cost of Phase I is estimated at US$ 1,2 billion through HK$ 1.56 billion equity and US$ 800 million international limited recourse syndicated loans and a RMB 730 million provided by the People's Bank of China. The cost of the commercial centers is estimated at HK$ 2.0 billion and will be funded by the Hopewell Group.

3.8.2 Project structure

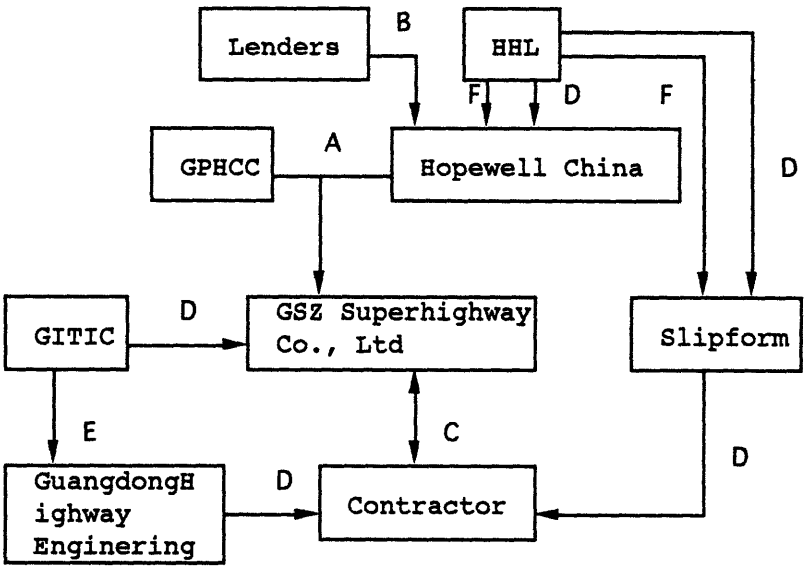


Figure 3-9
Project Structure of the GSZ Superhighway

3.8.3 Land acquisition

Hopewell has negotiated with land holders for constructing the Superhighway. The last piece of land was handed over in February, 1994, almost six years after the

first contract had been signed. Hopewell realized that the money they paid for the land had not been filtered down to the local level and complained to senior provincial officials. Hopewell's Wu explained "Everything is highly negotiable. You just have to pay a little more money, then get some senior officials to clobber someone" (Goldstein, 1993). As a result of these experiences, Hopewell turned the land acquisition responsibility over to the provincial government in the next contract of Phase II between Guangdong and Zhuhai.

3.8.4 Construction

The construction of Phase I was separated into three parts in August 1992. Hopewell has been responsible for the construction of the central 80 km, and GPHCC has been responsible for the sections at each end. In order to win the contract of the Superhighway project, Hopewell accepted the joint venture with the Chinese company in 1987 against its will. Officials of the Chinese company proved to be "more interested in the size of their dormitories and whether they had air-conditioning and color television" than in efficient operation and early completion, Wu says (Goldstein, 1992).

The research done by S.G. Warburg in August 1993 included a two day site visit, and the conclusion of some important aspects regarding construction progress and project management.

· **Construction delay**

Construction progress is not only behind its original target date of June, 1993 but also behind its contractual completion date of June, 1994. The construction of the approximately 21 km (13 miles) of elevated section and elevated interchanges throughout the highway is progressing slowly. Therefore, Warburg estimated that actual completion for full toll collection might be possible in late 1994. In addition, Warburg faulted Hopewell's lack of detailed project scheduling and budgeting. Their lack in project scheduling is also obvious from their unrealistic statements of early completion.

· **Possible cost overrun**

Cost overruns occurred for two main reasons. The first reason was the design change of a 6 km portion in Section B near Xinqiao and Changan. This portion was not originally designed as elevated, but elevation was necessary because of poor soil conditions and possible flooding. The second reason was the soaring construction costs, especially concerning RMB material costs of steel reinforced bars and cement during 18 months from the beginning of 1992 to mid 1993. Steel reinforcing increased in price approximately 140% in RMB. Hopewell's exposure to the soaring RMB construction costs were fortunately reduced by Hopewell's payment for construction materials in US dollars. US dollar steel prices increased approximately 26% from July 1992 to

March 1993, and cement prices rose only marginally. However, it is possible that construction costs have increased as much as 65%.

Referring to Hopewell's Sept. 27, 1993, public statement about its expenditures for the superhighway, Warburg indicated that it was clear that the total cost could exceed the original budget substantially.

- **Lack of evidence in quality control**

The quality control for the reinforced concrete and road surface is insufficient. The evidence for such a statement includes the usage of welding in the structuring of reinforced bars, the too-great concentration of reinforced bars which might prevent concrete from being poured at some structuring junctions, and the nonexistence of on-site laboratories or test holes for density and elasticity tests for road construction. The lack of quality control may increase maintenance costs and cause a loss of toll revenue which would result when roads are closed for repairs.

3.8.5 Interchanges

Warburg also made some observations regarding the construction of the interchanges. The summary of the interchanges is shown in Table 3-19.

Table 3-19

Summary of Interchanges in GSZ[1]

Number of interchanges	:14
Number of commercial interchanges	:10
Budget cost	:HK$ 1149 million
Scheduled completion	:1995
Stage of completion	:30-35%
Estimated completion	:1995
Co-operation period	:30 years
Profit share	:80%
Gross floor area of accommodation	:approx. 7.25 million square feet

Hopewell will only receive 40% of the toll for ten years and 30% after ten years. Its main profit will come from the commercial developments of the interchanges. The profitability of the commercial facilities on the interchanges depends on the traffic of the Superhighway. Warburg concluded that it will need longer than is generally appreciated to achieve rentals of $15 psf and full occupancy for the following reasons:

- Each interchange is far from urban areas
- The spread of private vehicles in China is still slow
- The traffic on the Superhighway alone is not enough to achieve the full occupancy of the commercial facilities

[1] Green (1993).

In addition, the traffic on the Superhighway might be affected by a new highway that could be constructed in the near future, around 2010. Also, modern commercial facilities might be constructed near the urban area or close to the outdated centers. These are serious concerns, as early traffic increases and full occupancy of the shopping centers are important for the profitability of the Superhighway project.

3.8.6 Financing

The Superhighway is financed by equity and debt through international and Chinese loans. The costs and sources of the financing are shown in Table 3-20 and 3-21.

Table 3-20
Cost of GSZ: (US$ million)

Land acquisition	132
Total construction	731
Interest on bank loan	202
Interest on loan from shareholders	78
Administration and contract cost	63
Total	1,206

Table 3-21
Sources of Financing for GSZ: (US$ million)

Equity of the superhighway joint venture	90
Loan from shareholders	129
Bank syndicated loan	800
Value of land acquired	187
Total	1,206

3.8.6.1 Bank syndicated loan

The terms and conditions of the Bank syndicated loan are shown in Table 3-22. Because of the country risk in China, it was necessary to obtain some guarantees and insurance from the Chinese government in order to make the project bankable. Political risk was insured by a project guarantee offered by GITIC. In addition, political insurance from the People's Insurance Company of China was arranged.

Table 3-22

Summary of the Bank Syndicated Loans for GSZ[1]

Borrower:	Hopewell China Development (Superhighway) Limited	
Loan amount:	Term loan facility	US$ 720 million
	Revolving facility	US$ 80 million
Interest rates:	Pre-completion	1.5% above LIBOR
	Post-completion	1.375% above LIBOR

Loan release schedule:

Year	Amount (US$ million)
1991	109
1992	224
1993	264
1994	123
	720

Repayments: 29 unequal quarterly installments starting on June 30, 1995:

Year	Payment per year	Total annual payment (US$ million)
1995	3	30
1996	4	60
1997	4	70
1998	4	90
1999	4	110
2000	4	130
2001	4	150
2002	2	80
2003	(Revolver)	80
		800

[1] Pyle (1992).

Performance test:

At the end of each annual period. To be satisfied if:

1. the Debt Service Coverage Ratio ("DSCR") exceeds 1.1:1;
2. traffic consultants forecast shows that future volume and revenue projections for the immediately succeeding annual period will meet the requirements of Point 3 just below;
3. the projected DSCR, under exchange and interest rates and currency convertibility assumptions determined by the agent and using the traffic consultant's forecasts of revenues, exceeds 1.1:1 in the immediately succeeding annual period;
4. a prepayment of not less than US$ 25 million has been made out of surplus revenues from the project in that annual period, and;
5. all sums outstanding under the Shortfall Payment guarantee have been repaid.

Security:

Pre-completion

1. Completion guarantee: joint and several guarantee by the contractor consortium
2. Contractors Sponsors' guarantee: several guarantee by GITIC and Hopewell Holdings to make up any shortfall under the Completion Guarantee
3. Investment Insurance: special insurance taken out with the People's Insurance Company of China covering political risks like wars, civil unrest, changes in policy, nationalization and transfer risks
4. Hopewell undertaking and Guarantee: Hopewell Holdings undertakes and guarantees certain obligations of the borrower, the joint venture company and the agent unless these are not covered by any other security arrangements
5. Security deed: Assignment of insurance, guarantees and agreements
6. Charge of assets: Charge over assets and bank accounts and contracts of the Joint Venture Co.

Post completion

1. Operating Expenses Support Agreement: joint and several undertakings by Party A and Hopewell to makeup shortfalls of the operating income for payment of the operating expenses
2. Shortfall Payment Guarantee: guarantee by GITIC for the joint venture Co's obligations

Security Accounts: All revenues to be paid into them

Covenants:

1. Negative Pledge
2. No dividends or repayment of subordinated loans to be made until Performance Test is met

3. No change in ownership
4. No new borrowing without authorization
5. Adequate insurance at all times
6. New toll proposals subject to prior consent of lenders
7. Event of Default if project completion later than 30 June, 1996

Law: Hong Kong

Chapter IV

Comparative Study of the BOT Cases

4.1 Introduction

This chapter summarizes the major project features of the cases described in Chapter III. Next, the achievements of objectives presented in chapter II are evaluated. Finally, detailed risk allocations for each project are examined and critical factors are discerned.

4.2 Project feature

Tables 4-1 and 4-2 were compiled to clarify and summarize the similarities and differences of four power plant projects and three toll road projects.

Table 4-1

Comparisons of Features in Power Projects

	Shajiao B	Shajiao C	Navotas I	Pagbilao
Location	People's Republic of China	People's Republic of China	Philippines	Philippines
Type	Coal-fired power plant	Coal-fired power plant	Oil-fired power plant	Coal-fired power plant
Capacity (MW)	350 * 2	660 * 3	210	367.5 * 2
Cost (US$ million)	513	1,966	41	933
Concession Period	10 years (1988-1998)	20 years (1996-2016)	12 years (1991-2003)	25 years (1996-2021)
Development procedure	Joint Venture Contract (HPCL & SEDC)	Joint Venture Contract (HEL; 60 % & Shajiao Power; 40 %)	Project Agreement (HEPC & NAPOCOR)	Energy Conversion Agreement (HPPC & NAPOCOR)
Concession company	Hopewell's subsidiary: HPCL	Joint Venture between Hopewell's subsidiary: HEL, and Chinese State Owned Company	Hopewell's subsidiary: HEPC	Hopewell's subsidiary: HPPC, and MLAs' equity participation
Government representative	State owned company: SEDC	State owned company: Shajiao Power/ GGPC	Government owned entity: NAPOCOR	Government owned entity: NAPOCOR
Construction and operation status	Under operation: Very successful	Under construction: possible cost overrun and construction delay	Under operation: Construction delayed, but Very successful in operation	Under construction: Construction delayed because of the late start

Table 4-2
Comparisons of Features in Toll Road Projects

	Second Stage Expressway (SES)	North-South Highway (NSH)	Guangzhou-Shenzhen-Zhuhai Superhighway (GSZ)
Location	Thailand	Malaysia	People's Republic of China
Type	Elevated urban toll expressway	Toll highway	Toll highway
Length	32 km	504 km	122.8 km
Cost (US$ million)	1,100	2,300 (originally 1,300)	1,206
Concession Period	30 years (1990-2020)	30 years (1988-2018)	30 years (1994-2024)
Development procedure	Concession Agreement (ETA and BECL)	Concession Agreement (Government and UEM)	Joint Venture Agreement (Chinese agency and Hopewell's subsidiary)
Concession company	Bangkok Expressway Co. Ltd. (BECL) led by Japanese Kumagai Gumi	PLUS led by United Engineers Malaysia	Joint venture (Hopewell China)
Government representative	Expressway and Rapid Transit Authority of Thailand (ETA)	Malaysian Government	Joint venture (Guangdong Provincial Highway Construction Company: GPHCC)
Construction and operation status	First sectors have been completed. But, in August 1993, they were expropriated by the government	Under construction: Expected construction completion date delayed from 1992 to 1995	Under construction: Construction completion will be delayed

Similarities in all projects

- Needed projects by governments
- Bureaucratic nature of the government agencies

Similarities in power plant projects

- High coefficient of utilization

- Substantial government and sponsor supports
- Project types using established technology: Three projects are coal-fired and one is a thermal power plant. Both types use established technology.

Similarities in toll road projects

- Large project sizes
- Long concession periods (30 years): much longer than power plant projects
- Problems in land acquisition or/and construction: SES and GSZ have had problems in land acquisition, and NSH and GSZ have problems in cost overruns and delay of construction.

Differences in power plant and toll road projects

- The amount of government support: Power plant projects seem to be better supported by governments than road projects in terms of risk allocation. For example, in power projects, currency exchange risks are partially guaranteed by US dollar payment for electricity purchase, but are only guaranteed in NSH in road projects.

Differences in power plant projects

- Construction and operation status: the first two projects Shajiao B and Navotas I, are operated smoothly, but the other two projects have some problems in construction. Shajiao C is expected to have a cost overrun because of some problems in quality control and the necessity for repetitive

work. Pagbilao has been behind schedule because of litigation with local people who are against the construction.

- Project sizes: Project sizes vary from 210 to 1980 MW.
- Concession periods: Concession periods vary from 10 to 25 years.
- Contract type: Joint Venture Contract is used for Chinese projects; a Chinese state-owned company is contributing in equity for Shajiao C, and Project Agreement and Energy Conversion Agreement are used for the other two Philippine projects respectively.
- Government entity: the Chinese joint venture partners are state owned entities, but the Philippines' NAPOCOR is a government utility which had been responsible for all electric power plant projects.

Differences in toll road projects

- Project type: SES is an urban expressway, unlike the other two local highway projects. Because of its construction in the congested city of Bangkok, more proficiency was required of the SES construction management than of the management of the other two projects.
- Projects' geographical requirements: SES is situated in a small area in Bangkok, whereas the other two projects are much more extensive. Because of the distances involved, NSH and GSZ needed to manage their projects with a number of similar construction teams. It was important for all of

these teams to manage contractors to complete their sections on time.

- Development procedure: SES and NSH are being developed through a concession agreement, but GSZ is being developed through a joint venture agreement
- Concession company: BECL is managed by an experienced international contractor, Kumagai; the other two projects' concession and joint venture companies, however, are managed by contractors who do not have prior experience in large highway projects.
- Government representatives: Especially in GSZ, the bureaucratic characteristics of GPHCC, a Chinese joint venture partner, made it difficult for Hopewell to manage the project efficiently.
- Expropriation of SES by Thai government

4.3 Achievements of the objectives

As I described in Chapter II, the general objectives of governments in developing countries are categorized in terms of the following: additionality, efficiency gains, government risk reduction, positive externalities, technology transfer, enhancement of political environment, and rapidity of development. On the other hand, the objective of the private sectors, including sponsors and lenders is to achieve a high rate of return on their projects. Although we must wait through long concession periods of 30 years to evaluate exactly the success of each project in reaching both public

and private goals, we are able to present a brief comparison of the achievements of these objectives so far in Table 4-3 and 4-4.

Table 4-3

The Achievements of the Objectives of BOT in Power Projects

Objectives	Degree of achievements of the objective			The bases of evaluation
	High	Medium	Low	
Government Additionality	All			Chinese and the Philippine government simply lack the funds for construction. In addition, all projects utilize offshore financing.
Efficiency gains by cost reduction	Navo.			Hopewell imported second hand units from U.S. to reduce costs in Navotas. Shajiao B, C, and Pagbilao--Information is limited.
Efficiency gains by management improvement	B, Navo., (Pag.)	C		All projects except Navotas have/had international turnkey consortiums which are much efficient than Chinese agencies and Philippines utilities. In terms of operation, Shajiao B was managed by an international operator to make Chinese learn the operation. Pagbilao will also be operated by an international operator.
Government risk reduction		All		All projects have been efficiently constructed and managed by governmental view point. However, both governments share substantial risks, including currency exchange, and the equity participation in Shajiao C.
Positive externalities	All			Power plant projects fundamentally posses the possibilities for further economic expansion. In addition, a Chinese BOT might improve China's investment climate if they are successful.
Technology transfer	All			These two countries' technologies are about 10 years behind than those of developed countries
Political environment enhancement		Navo., Pag.	B, C	Power shortage in Manila is a serious problem. Therefore, even the President is involved in making BOT power project successful.
Rapidity of development	B, (C, Pag.)	Navo.		Shajiao B completed construction 11 months ahead of the schedule. Navotas delayed its completion, but two of three units were commissioned ahead of the schedule.
Private sectors High return	B, Navo.,	(C, Pag.)		Hopewell expects high returns with early completion of the project and a high coefficient of availability. Shajiao C expects a major cost overrun. Pagbilao delayed its construction start

Table 4-4

The Achievements of the Objectives of BOT in Toll Road Projects

Objectives	Degree of achievements of the objective			The bases of evaluation
	High	Medium	Low	
Government Additionality	SES, NSH, GSZ			SES and NSH were originally started by governments, but they stopped them because of the lack of funds. All projects utilize offshore finances.
Efficiency gains by cost reduction	SES	GSZ	NSH	SES--Cost management by experienced project manager GSZ--Cost overrun is expected. NSH--Government monetary supports NSH substantially. The construction cost was
Efficiency gains by management improvement	SES	GSZ	NSH	SES--Kumagai completed construction on time. GSZ--Problem in the incentives of Chinese contractors. Join venture separated the project to two parts, and are being managed by themselves.
Government risk reduction	SES	GSZ	NSH	SES--Efficient project management by private sector GSZ--Government share some risks by Joint Venture, also many shareholder supports were provided by the government NSH--Government strongly supports the project
Positive externalities	GSZ, NSH	SES		GSZ--Sponsor develops the area along the road, including shopping centers NSH--It developed the local capital market
Technology transfer		SES	NSH, GSZ	No new technology was used for construction.
Political environment enhancement	SES		GSZ, NSH	New government utilized SES for their popularity.
Rapidity of development	SES, GSZ, NSH			These projects cannot be provided quickly without BOT
Private sectors High return	(GSZ) (NSH)	-	SES(ex-propri-ated)	It is too early to define expected returns. however, Hopewell expects high returns because of the actual traffic increase far beyond their feasibility studies

From this brief comparison, it is obvious that power plant projects have been much more successful than highway projects. Most of the government objectives have been

accomplished and a high return for private sectors has been realized so far.

Power projects

All projects generally meet the objectives so far as is shown in Table 4-3. The main objectives of the BOT of the power development project will be their "Additionality" with which an urgently needed electricity supply increase will be realized. From the view point of the private sector, the profitabilities of Shajiao B and Navotas I seem to meet their expectations. On the other hand, Shajiao C and Pagbilao may have a cost overrun and a completion delay. The potential for construction cost overruns in power plant projects are considered smaller than road projects for the following reasons: large components of the plants are sub-contracted with set prices, generator units are standardized, electrical and mechanical equipment is largely imported, assembled, tested, and commissioned within a relatively standardized civil structure (Green, 1993). In this sense, achieving BOT objectives, from both the public and the private sectors' view point, will be easier in power plant projects than in road projects.

· **Shajiao B**

Shajiao B was completed 11 months before the scheduled deadline and Hopewell earned an early completion bonus. The success was mainly because of efficient construction

management by Costains, a reputed international contractor, despite several anticipated problems described in the case study. The operation of the plant is going well with the Chinese operator which has taken over the operation after international operator trained the local employees.

· **Shajiao C**

The rapid construction, with pressure to get early completion incentives, has been managed by Hopewell's subsidiary which had less management skills than Costains. Therefore, some quality deficiency of the construction has been revealed and caused cost overruns for some repetitive work (Green, 1993).

· **Navotas I**

This project is small and simple compared to other power projects. After the success of Shajiao B, Hopewell strategically contracted this project aiming to contract larger Pagbilao. Although the construction of the plant was delayed 2 months mainly because of equipment which was defective on delivery, it is operated successfully.

· **Pagbilao**

Pagbilao started construction in April 1993 behind the schedule because of the litigation with local residents. In addition, Green (1993) reported that the quality control of

the project, which included the usage of sub standard aggregates, was poor.

Toll Road projects

- **SES**

The project generally achieved its objectives as is shown in Table 4-4 before the government expropriated it. The success was mainly the result of efficient construction management and an appropriate amount of government support.

- **GSZ**

GSZ is having problems in the formation in its construction joint venture. Although the government's joint venture partner is very supportive of the project, the partner's incentives are not shared by its own contractors. The contractors lack the incentives for efficient project management and are not concerned about any delays in construction. Further, Hopewell seems to lack project management skills (Green, 1993). Therefore, in spite of the strong support, both from the government partner and the private sector, standards of efficiency have not been realized as expected.

- **NSH**

NSH is less successful, from the government point of view, than other projects because of excessive Malaysian government's distortion of the project. The Malaysian

government could have executed the project more economically and efficiently if politics had not been involved in its awarding process.

However, all of these projects have great possibilities of high return and positive externalities because of the expected rapid increase of traffic volume in each region.

4.4 Risk allocation

In order to clarify the differences in risk allocation among the four power plant projects and the three highway projects, and analyze the appropriate risk sharing, I have compiled Table 4-5, 4-6 and analyzed the critical points for success of BOT.

Table 4-5

Comparisons of Risk Allocation in Power Projects

Project phase	Risk	Resolution or risk allocation	Shajiao B	Shajiao C	Navotas I	Pagbilao
All phases	Political	Political risk Insurance	-	-	No. But, the risk is covered by another agreement	No. But, the risk is covered by another agreement
		Joint venture with public partner	Yes	Yes (Equity participation of the public partner)	No	No
	Legal	**Privileges in tax exemptions**	-	-	Six year tax holiday. Full exemption from custom duties and taxes	Six year tax holiday. Full exemption from custom duties and taxes
	Changes in law	**Government guarantee**	-	-	Give Hopewell a right to sell out the plant to the government	Give Hopewell a right to sell out the plant to the government
	Force majeure controllable by governme-nt	**Government guarantee**	Yes, responsible for increased costs caused by Force majeure and any other reasons with subordinated loans and other methods	Comfort letter from the provincial government	Give Hopewell a right to sell out the plant to the government	Give Hopewell a right to sell out the plant to the government
	Governme-nt's exceptio-nal action (default)	**Performan-ce guarantee**	No. But, GITIC insurance guarantees SEDC's obligation	No. But, GITIC insurance guarantees Shajiao Power's obligation	Yes. Guarantees NAPOCOR's obligations	Yes. Guarantees NAPOCOR's obligations Existence of the Trustee
	Sponsor's performa-nce	Sponsor's Equity participa-tion	Yes	Yes	Yes	Yes
Develo-pment phase	Land acquisit-ion & Transmis-sion line	**Provision by the public sector**	Yes	Yes	Yes	Yes
	Contract efficien-cy	Competiti-ve bidding	No	-	Yes	-
	Technical	Tradition-al construct-ion methods	Yes	Yes	Yes	Yes
	Credit risk on developi-ng the project	Participa-tion of MLA, and ECA	No	No	IFC, ADB, ADB co-financing	IFC, ADB, CDC, JEXIM, USEXIM
		Reliable track record of parent companies	No	Yes	No	Yes

Table 4-5

Comparisons of Risk Allocation in Power Projects (continued)

Project phase	Risk	Resolution or risk allocation	Shajiao B	Shajiao C	Navotas I	Pagbilao
Construction phase	Completion, cost overrun, and quality	Turnkey contractor	Yes: International Consortium	Yes: International Consortium	Yes: Hopewell's subsidiary (Slipform)	Yes: International Consortium
		Project management	Costains (an international contractor) under Hopewell	Hopewell's subsidiary: HTL	Hopewell's subsidiary: Slipform	Hopewell's subsidiary: HTL
	Completion, cost overrun	Early completion incentives	Yes. 100 % HPCL (HK$ 395 mm, RMB 11.6 mm)	Yes. HEL: 80 % Shajiao: 20 %	Behind the schedule	Yes. 100 % HPPC
		Sponsor's shortfall loan	Yes, from shareholders	Yes. HHL and Shajiao Power US$ 250 mm	-	Yes. Sponsors agree to provide subordinated loans up to US$ 200 mm
	Contractor's performance	Guarantee by sponsors	No	No	No	No
Operation phase	Cash flow	**No second facility guarantee**	No	No	No	No
		Concession to operate existing facility	No	No	No	No
		Minimum electricity purchase	Purchase half in RMB, and half in US$	Purchase in part US$ and in part RMB	Purchase all NAPOCOR requested in US$ & Peso	Purchase all NAPOCOR requested in US$ & Peso
		Security account	-	Yes	-	Yes
	Currency exchange rate	**Government guarantee**	No, but payment is partially done in US$	No, but payment is partially done in US$	No, but payment is partially done in US$	No, but payment is partially done in US$
	Interest rate	**Government guarantee**	No	No	No	No
	Maintenance and operation cost overrun	Shortfall guarantee by sponsors	SEDC will make subordinated loan to HPCL (max. HK$ 500 million)	GITIC provides guarantee in respect of the performance of the operator	-	-
		Experienced operator	International Operator at the beginning, but changed to a local company	No. Chinese state owned company	No. Hopewell's subsidiary (HPML)	International Operator will be selected

Table 4-6

Comparisons of Risk Allocation in Toll Road Projects

Project phase	Risk	Resolution or risk allocation	Second Stage Expressway	North-South Highway	Guangzhou-Shenzhen-Zhuhai Superhighway
All phases	Political	Political risk Insurance	No	No	Yes. People's insurance company of China covers it
		Joint venture with public partner	No (Concession Agreement)	No (Concession Agreement)	Yes
	Legal	**Privileges in tax exemptions**	eight year corporate tax relief after earning the revenue	-	Some tax exemptions because of the joint venture
	Changes in law	**Government guarantee**	Yes	Yes	Changes in policy is covered by an insurance
	Force majeure	**Government guarantee**	Yes	-	Yes (The same insurance for the political risk)
	Governmen-t's exceptional action	**Guarantee by government**	Yes (by remedies)	Yes	No, but GITIC insurance guarantees it
	Sponsor's performance	Sponsor's equity participatio n	Yes	No	Yes
Developm-ent phase	Land acquisition	**Provision by public sector**	Yes, including subsidy	Yes	No (Hopewell did)
	Contract efficiency	Competitive bidding	Yes. Competitive but only in 2 Companies	Yes. Competitive but only in few companies	-
	Technical	Design by traditional construction methods	Yes	Yes	Yes
	Unknown subsurface condition	**Government remedies**	Yes	-	-
	Credit risk on developing the project	Participati-on of MLA, and ECA	ADB provided a loan and equity of US$ 40 million	No	No
		Reliable track record of parent companies	Yes	No	Yes

Table 4-6
Comparison of Risk Allocation in Toll Road Projects
(continued)

Project phase	Risk	Resolution or risk allocation	Second Stage Expressway	North-South Highway	Guangzhou-Shenzhen-Zhuhai Superhighway
Construc-tion phase	Completion, cost overrun, and quality	Turnkey contractor	Yes, with Kumagai's warranty and performance bonds	Yes (PLUS contracted with 40 sub contractors)	Yes, with completion guarantee
		Project management	Kumagai	Pengurusan Lebuhraya Berhad (PL); Local	-
	Completion, cost overrun	Early completion incentives	-	-	Yes
		Sponsor's shortfall loan	Construction warranty by Kumagai	-	Yes from both Hopewell and a government agency
	Contractor's performance	Guarantee by sponsors	Construction warranty from Kumagai	-	GITIC and Hopewell guarantees its performance
Operation phase	Cash flow (toll revenue)	**No second facility guarantee**	No	No	No
		Concession to operate existing facility	Yes, and share the toll together	Yes. Toll is collected by PLUS for their profit	No (New highway)
		Minimum traffic guarantee by government	No	Yes	No
		Security account	Yes. Toll collection bank	-	Yes
	Currency exchange rate	**Government guarantee**	No	Yes	No
	Interest rate	**Government guarantee**	No	Yes	No
	Maintenance and operation cost overrun	**Shortfall guarantee by sponsors**	-	-	Yes
		Internation-al operator	No. Government agency	-	Joint venture

All phases

· **Political risk**

In the power projects, no special political insurance is procured by the projects, but in Shajiao B, Navotas, and Pagbilao, governments guaranteed force majeure risks which include political risks.

With regard to road projects, in GSZ, because of China's paramount political risk, special investment insurance was taken out with the People's Insurance Company of China covering political risks like war, civil unrest, changes in policy, and nationalization. GSZ consists of a joint venture with a Chinese partner which might have been helpful from the view point of political risk reduction; however, the joint venture partner was incompetent in construction, and caused the project to be delayed. In SES and NSH, such insurance was not taken by sponsors.

In developing Asian countries, political risks still exist despite their economic expansion; therefore, securing political risks with insurance and the participation of various international and local investors, including MLAs and ECAs is recommendable. When SES was funded, foreign banks were invited to participate in the project. The reason was not because their money was needed but because the local Thai banks thought their presence would help the project progress. However, the participation did not work well[1]

[1] Sender, Henny, "Don't bank on it," Far Eastern Economic Review, 24 February 1994.

· **Legal and force majeure risks**

The governments have been generally supportive of all seven projects in sharing these risks because they need such projects and lack their own funds. The Philippines, Thailand, and Chinese governments offered tax privileges to project companies. All governments except China guaranteed their agencies' performances and their unchanges in laws. In the Chinese cases, GITIC insurance guaranteed the agencies' performance. With regards to the force majeure risks, the Philippines government guaranteed to buyout Navotas and Pagbilao if the force majeure was within reasonable control of the government. In Shajiao C, government guaranteed the cost increase if it occurred by force majeure.

· **Sponsor's performance risk**

All sponsors except UEM in NSH contributed to the equity. In NSH, the sponsor raised all equity in the capital market. This is very unusual in BOT in developing countries. The established capital market enabled the sponsors to execute the project without investing their own money. This is, in a sense, considered dangerous for other participants such as lenders in terms of securing proper management for the project. However, the utilization of capital market should be considered in other developing countries.

Development phase

· **Land acquisition risk**

Government entities were responsible for land acquisition except GSZ. SES and GSZ had problems in land acquisition. In SES's case, the government agency was responsible for land acquisition, but a change in the land evaluation basis delayed the acquisition. The delay affected the construction schedule of SES. In GSZ's case, Hopewell was responsible for acquiring the right of way. The negotiation for land acquisition in China was extremely difficult and time consuming because of the involvement of bureaucracy and because of the Chinese culture's emphasis on the man rather than the rule. Therefore, it is reasonable to expect that the government partner will be responsible for land acquisition risk in BOT. Further, it is especially important for sponsors to choose suitable partners who can manage the acquisition punctually.

· **Bidding risk**

In Shajiao B, only Hopewell bid on the project. Hopewell also negotiated Navotas I extensively. On the other hand, competitive bidding existed in the three road projects, although I wonder whether other qualified bidders were able to participate, because substantial time and money are required to bid on such huge projects. For this reason, I believe that the efficiency gains of competitive bidding were

not realized. On the other hand, the bidders were probably shielded from bidding risks.

· **Technical risk**

Two major technical risks are involved in BOT projects. First is the risk in using new construction technology. It is important to secure the construction cost by using assured technology. For example, in SES, segmental construction was used and succeeded in reducing costs and construction time. On the contrary, the Don Muang project in Thailand, which used the new technology of Dywidag method of Germany, experienced cost overruns and construction delays. The second risk is unknown subsurface conditions which have the potential to change construction methods and costs substantially. Therefore, they must be carefully investigated. If this condition has not been assured, something must be done about it. For example, in SES, the government allowed remedies such as changes of revenue sharing proportions and toll rates, if different subsurface conditions prevail.

· **Credit risk**

MLAs and ECAs' participation is very supportive to enhancing the credit of the project for the lenders. The sponsor's track record is also important. In the Philippines power projects, several MLAs and ECAs participated with co-financing. Their participation enhanced the credit of the

projects. On the other hand, only the ADB participated in SES in road projects. MLAs seem more interested in power than in highway projects. With regard to the track record of the sponsors, reliable track records in similar projects are essential for credit enhancement and the success of BOT. Hopewell's Shajiao B and UEM's NSH was exceptional because of the Citibank's positive loan participation for Shajiao B and excuse of government support for NSH.

Construction phase

· **Construction completion and cost overrun risk**

First, this risk was guaranteed by turnkey contractors in all cases. Therefore, the participants were literally insured from the problems of cost overrun and construction delay. However, if completion was substantially delayed, the loss could be much larger than the contractors' liquidated damage payments or other compensations. Therefore, the selection of an efficient contractor is important despite the existence of turnkey contracts. For example, NSH and GSZ had problems with their contractors' overall construction management skills, including scheduling, budgeting, and quality control. The turnkey contractors in these projects are generally local contractors. Even though the construction technologies in these projects are common, it seems difficult for such contractors to be responsible for their obligation to keep to construction scheduling. In

addition, Chinese contractors in GSZ lack incentives to complete construction on schedule.

Second, the risks could be partially covered by the sponsor's project management ability. However, if the sponsor is not experienced, the risks can be covered by efficient project management company. For example, Hopewell had no experience when it implemented Shajiao B. Wu said Hopewell's inexperience in power projects was not problem because of its experience in every component of civil works; also the division of labor with mechanical and electrical suppliers enabled the project (Tiong, 1992). However, in reality, Shajiao B was managed by an internationally reputed project management company. As a result, the project was completed 11 months before the specified deadline, and Hopewell earned an early completion bonus. In addition, in SES, although the project was technically more difficult than the other two road projects, construction went smoothly because of efficient project control by the construction manager, Kumagai. On the contrary, in Shajiao C and GSZ, Hopewell is managing the project with its own subsidiaries, and major problems are being revealed. Green (1993) reported on their expected cost overruns, project delays, and on the low quality of the construction.

Third, early completion incentives could be used for decreasing the risks. They were used for major Hopewell projects to protect their projects from construction delays. Although the concept encourages contractors to complete the

project as early as possible, it would be dangerous to pursue only the incentives. Green (1993) reported Hopewell's staff problems were concentrated construction and project management activities as follows:

- High staff turnover ratio; approximately 40% p.a..
- Resignation of at least 10 engineers at Shajiao C since the beginning of the project; The reason is their lack of quality control because they are too concentrated on construction progress in order to get large personal bonuses which have been promised for early completion of the project.
- Senior management's disability to grasp the reality of the practical, logistical, and financial challenges which are being experienced in the forefront.

Therefore, it is especially important to employ a qualified construction manager and to set a realistic completion target date based on precise scheduling.

Furthermore, it is especially important to maintain the quality of the construction because the concessionaire has to maintain power plants and highways for long concession periods. Quality of construction affects the maintenance cost directly. In SES, Kumagai was the project manager for the entire project, and it seemed that the quality was well maintained. On the other hand, in GSZ, the Chinese and Hopewell are separately managing the construction, but S.G.

Warburg reported that there was no evidence of quality control on their job sites. In case something happens like structural failure, it would cost more than such incentives could bring in.

Fourth, the sponsor's shortfall loan and a warranty were employed to insure completion risks. For example, in two large power projects Shajiao C and Pagbilao, sponsors agreed to provide more than US$ 200 million shortfall loans to meet possible contractors' funding insufficiency. Projects in China are insured by shortfall loans both from Hopewell and Chinese entities because of the joint venture. On the other hand, Kumagai warranted the completion in SES.

· **Contractor's performance risk**

In the power projects, international turnkey contractor consortiums, including suppliers, have been responsible for the projects except in the small Navotas I project. Therefore, sponsors did not have to insure the contractors' risks. However, in the road projects, because of the number of small contractors participating compared to those in the power projects, sponsors' guarantees seemed to be required. For example, Kumagai warranted the contractors performance in SES. Also, GITIC insurance and Hopewell guaranteed the contractors' performance risks in GSZ. This guarantee is important so that lenders can be assured of project completion.

Operation phase

· Cash flow, currency, and interest rate risk

China and the Philippines lack electricity compared to other developing Asian countries, and need it not only for their economic expansion but also in their daily life. Therefore, in general, governments are very supportive for power projects. There are three similar features in the packages of their power projects:

1. Governments supply coal or oil to the plant
2. Governments guarantee minimum electricity purchase both in local currency and US dollars.
3. Governments do not use rate of return regulations

However, these features are minimum requirements to realize BOTs in developing countries. In other words, only the energy conversion portion is accountable on the BOT basis in power development projects. The portion of supplying raw materials to the plant and the distribution of electricity are too risky for the private sectors because they usually cannot control them. Therefore, such portions should be separated from BOT energy development projects. In addition, electricity purchase should be done in hard currency, except for the portion used for local payment, because the project company cannot afford currency fluctuation risks.

In road projects, the Malaysian government extensively supported NSH in this phase by providing an extensive security package. The government guaranteed minimum traffic

volume, foreign currency exchange rate, and interest rate. With these guarantees, the operation risks are almost entirely transferred from the private sector to the government. On the other hand, the Thai and Chinese governments did not provide such exclusive packages to SES and GSZ.

In terms of currency exchange rate guarantees, if private sectors need to take risks, they will need to transfer those risks to the conditions in the BOT contracts, such as the toll rate and the concession periods. In any case, the government must take responsibility for currency exchange risks. For example, Hopewell estimated a possible 15% annual depreciation of the Renminbi against the US dollar in GSZ. Governments should consider whether exchange guarantee costs are more expensive than the margins set by private sectors.

In addition, security accounts were set for Shajiao C, Pagbilao, and SES. The accounts are effective to assure periodical payment from government for the usage of electricity, and the trustee, in the case of Pagbilao, will apply the proceeds to operation cost, tax, interest, and principal due under the various financial documents.

· **Maintenance and operation risk**

In the Chinese projects, the government promised shortfall loans or guarantees for the operators' performances. In addition, international operators were used in Shajiao B during the first few years because of the Chinese local labors' unfamiliarity with power plant operation. However, the project company gradually reduced the number of expatriates by educating local laborers to reduce labor costs. International operators should be used at least at the beginning of a project when the operation requires special skills or is unfamiliar to local labors.

4.5 Financial structure

I have compiled Table 4-7, 4-8 in order to analyze the differences in financial structures among these seven projects.

Table 4-7
Comparison of Financial Structures

	Shajiao B	Shajiao C	Navotas I	Pagbilao
Cost (US$ million)	520	1,966	41	933
Equity: sponsors (US$ million)	18	225	6.6	205
Equity: share holders (US$ million)	18	150 (Joint Venture Partner)	4.4	30
Subordinated loans (US$ million)	0	841	0	0
Bank syndicated loans (US$ million)	484	750	30	698
Repayment	6.25 years commencing 9/1988	4 years commencing 12/1996	6-9 years commencing 12/1990	6-10 years commencing 7/1997
Debt/Equity	13.44	0.62	2.73	2.97
Participation of MLA and ECA	No	No	IFC, ADB, ADB co-financing	IFC, ADB, CDC, JEXIM, USEXIM, IFC co-financing
Fund raising	Onshore and Offshore	Onshore and Offshore	Offshore	Offshore
Shortfall loans	Yes	-	-	-
Currency swap	Interest rate swap	-	-	Yes

Table 4-8

Comparison of Financial Structures

	Second Stage Expressway	North-South Highway	Guangzhou-Shenzhen-Zhuhai Superhighway
Cost (US$ million)	1,100	2,296 (Originally 1,300)	1,206
Equity: sponsors (US$ million)	154	0	90 (Joint Venture)
Equity: share holders (US$ million)	66	296 (raised at the local stock market) 440 (planned to raise)	-
Subordinated loans (US$ million)	0	630	316
Bank syndicated loans (US$ million)	880	926	800
Debt/Equity	4.00	0.68	1.97
Participation of MLA and ECA	ADB provided a loan and equity of US$ 40 million	No	No
Fund raising	Onshore and Offshore	Onshore and Offshore	Onshore and Offshore
Shortfall loans	No	-	Yes, from both Hopewell and the government agency
Currency swap	-	-	-

· **Debt and equity**

The debt and equity ratios vary between 0.62 and 13.43 in power and 0.68 and 4.0 in road projects. An optimal general debt equity ratio does not seem to exist because of the differences in the conditions of each project. However, each project's ratio suggests some important aspects of fund raising in BOT.

For example, in power projects, the high ratio of Shajiao B is the result of the willingness of the commercial

bank, Citibank, to take advantage of the opportunity to participate in the first BOT project for the huge Chinese market (Augenblick and Custer, 1990). In Shajiao C, the ratio is 0.62. The consensus among Hong Kong bankers was that Hopewell could have achieved financing with a larger ratio, but it would have taken longer than Hopewell wished.[1] The ratios of the Philippines projects are moderate, but Hopewell's Wu said that he needed equity partners of IFC and ADB (and CDC) for the projects because he worried about the Philippines track record in foreign trade (Tiong, 1992).

In road projects, the particularity of the NSH is the raising of equity in the local stock market despite no equity contribution from the sponsors. The well established stock market and political stability made it feasible. The public will be willing to invest in the stock if the project has the potential to maximize their investments. The role of the stock market will be important in raising funds and making BOT feasible. Therefore, it is very important for developing countries' governments to facilitate such stock markets.

With regard to GSZ, the total loan amount rose to US$ 800 million which was a remarkable sum for the Hong Kong market at the time, only 18 months after the Tiananmen massacre. Hopewell's Wu's shrewd sense of what his bankers require enabled such a loan. He constructed a strong structure and assurance of the project with careful documentation and even provided a balance sheet in support of

[1] Pyle, Thomas H., "Case Studies of Chinese Power Generation; Shajiao B and Shajiao C."

his own company.[1] In addition, a shortfall loan was promised by both Hopewell and the government agency. This shareholder support is efficient in that it makes the project bankable. Similar support is guaranteed at Hopewell's Pagbilao Power Plant Project.

Strong sponsor track records in similar projects are very important in raising loan funds from commercial banks. The track records of Kumagai[2] seemed to enable fund raising at SES

Therefore, the participation of a specially interested party for a project, required time for arranging loans, participation of MLAs and ECAs, efficient use of the local stock market, strong structure and assurance of the project including the sponsors' financial support, and the project company's and sponsor's reputations should be considered in raising funds.

· Offshore loans

All three projects use offshore loans. When the number of BOT projects increases and profitability is assured, foreign investors will be more willing to participate in BOTs. However, I think government guarantees for the currency exchange will be necessary to encourage such

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[1] Pyle, Thomas H., "The new jersey turnpike of China," Public Works Financing, February 1994.

[2] Kumagai completed other BOT projects such as the US$ 435 million HongKong Eastern Harbor Crossing Project and the US$ 500 million Sydney Harbor Tunnel Project.

investments. Project companies will not be able to afford the risk by themselves.

Traditionally, large offshore funds have been supplied by Japanese commercial banks in Far East Asia. However, they have become conservative because of the domestic economic depression and the deficit from "bubble."

· **Participation of MLAs and ECAs**

MLAs have actively participated in the Philippines power projects. In addition, IFC has opened an office in Beijing and its vice president said that they would provide US$ 600 million to help finance projects with a total cost of US$ 3 billion over the next three years; also the ADB says China's concessional rate borrowings could be as much as US$ 1 billion per year.[1] For BOT developers, MLA's co-financing program could be used as insurance against the country risk that might be caused by nationalization and expropriation. In that sense, Hopewell used the fund in the Philippines projects. When Hopewell's Wu evaluated China for constructing power plants, he knew there would be no problem because China's track record in foreign trade is impressive. However, with regard to the Philippines, he worried and got ADB and IFC as equity partners (Tiong, 1992). Hopewell's Wu said "I think there's only one country, maybe Peru, which defaulted on World Bank loans" (Tiong, 1992). However, he is going to work with IFC as a partner and arranger of funds for

[1] Gray, Frank, "Doors opened to foreign investment," Financial Times 25 May 1993.

developing future power projects in China.[1] Compared with participation in power projects, only the ADB participated in SES by providing equity and a loan of US$ 40 million.

Pagbilao is the first BOT project which JEXIM and USEXIM have participated in. Their participation almost directly relates to their own exporters' participation in the project. Therefore, if the ECA participates in a BOT, that country's exporters will find it very advantageous to supply the materials and equipments that are needed. In any case, their participation will be very important as the size and the number of projects increase. At the same time, Especially, regarding China, ECAs' financiers are extremely positive and optimistic because of China's economic expansion and because of its market size. ECAs' interest rates for China, around 5 percent, are well below the OECD consensus interest rates of 6.86 percent for secured projects.[2]

Although ECA has begun to finance power projects using BOT, its attitude for highway projects might be different because there would be less usage of heavy equipment and materials. Therefore, it might be difficult to use such funds for highway projects.

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[1] The China Business Review, "Guangdong's Rockefeller," January-February 1993.

[2] Marks, John, "Financiers take the long view," Financial Times, 27 January 1994.

Chapter V

Conclusion

By analyzing these projects, I discerned some critical success factors on both the government and the private sides for structuring future BOTs. These factors are summarized in Table 5-1, and in the following description.

Table 5-1
Critical Success Factors in BOT

	Government side	Private sector side
All phases	· Establishment of solid legal structure · Appropriate project support · Government's joint venture partner's skill up	· Promotion of vital project · Establishment of long term corporate strategy · Standardization of the project design
Development phase	· Contract award process · Responsibility for land acquisition	· Usage of proven technology · Credit risk enhancement
Construction phase	· Collaborative attitude	· Good project management · Good turnkey contract
Operation phase	· Exchange rate guarantee	· Efficient operation strategy

Government side

· Establishment of a solid legal structure

A reliable legal structure is indispensable, because in BOT, all of the liabilities are allocated to many parties,

and their obligations are in contracts and agreements based on the local law and regulations. The disastrous expropriation of SES revealed that everything based on immature legal backing is nonsense. Such an expropriation could not have happened if the contracts and agreements had been given the same importance as they are in developed countries. It is critical for developing countries to establish a solid legal backing to promote BOT.

· **Appropriate project support**

It might be too early to predict whether these BOT projects will be successful and how much government support is sufficient for project companies. However, through my research of these several projects, I have understood that governmental support of "land acquisition" and "exchange rate guarantee" will be essential for future BOTs. Without such guarantees, the BOT promoter will have to insist upon a toll rate increase and an extended concession period. These two features should be guaranteed by governments. The appropriate amount of governmental support will become clear as similar projects are developed.

· **Government joint venture partner's skill up**

In the case of joint venture between a government and private sectors, a government partner should improve its technical skills and attitude toward the project. If the partner is incompetent as in the GSZ case, it will hamper the

smooth execution of the project and the advantages of the joint venture can easily be wiped out.

· **Contract awarding process**

Real competition in the bidding did not seem to exist in all projects. It would require several million dollars to investigate such huge projects seriously. Private companies cannot afford to spend so much money and time without the assurance of getting the contract. If the government wishes to increase efficiency by encouraging real competition, instead of extensive negotiation with a certain bidder for these kinds of huge projects, it should provide some financial assistance to developers to help them to investigate the project. Also, as in the Malaysian road project, the government may design a whole structure and set the toll and call bids for concession periods. It seems that simple competitive bidding cannot fit into the contract awarding process in BOT. Therefore, in terms of the contract awarding process, intensive negotiation with a preselected BOT promoter is the only solution in the contract award process.

· **Collaborative attitude**

The government agency or partner should be cooperative to BOT developers. However, such agencies sometimes feel that the foreign BOT promoter obstructs their territory. For

example, EGAT[1] demonstrated a tendency to jealously guard its territory against newcomers (Ferrigno, 1993).[2] In addition, Hopewell's Wu said "The biggest opposition during the negotiations for BOT is usually the host country authority. Initially, they will say that they could do the job themselves if they have the funds and that they could do just good if not better than Hopewell or any private investor" (Tiong, 1992). However, developing countries do not have funds; they must hope for help from foreign investors. Therefore, a positive atmosphere of mutual cooperation should be encouraged. Such an atmosphere will improve working relationships and accelerate the construction of sound infrastructures.

Private sector side

· **Promote vital projects to obtain government support**

It is very important to promote vital projects. The government will support such needed projects, and this support is critical for BOT projects in order for them to progress smoothly. For example, all of the cases described were well supported by governments because of the understanding that the projects would be indispensable to their economies and daily lives. Developing Asian countries' governments are favorably adjusting their political and legal systems toward BOTs. Furthermore, they are providing other

[1] The Electricity Generating Authority of Thailand

[2] It has announced ambitious expansion plans and an intention to involve the private sector in generating plants. Yet the role of private investors may be limited to minority ownership.

supports such as equity or loan participation, guarantees for changes in law and regulation, guarantees for force majeure, tax privileges, right of way, minimum traffic guarantees, and currency exchange and interest rate guarantees.

· **Long term corporate strategy**

In most cases, as far as a real competitive bidding does not exist, one project success leads to the next project opportunity. Therefore, a good track record is advantageous. The BOT promoters should develop strong connections and establish good project track records in targeted countries to assure smooth progress for BOTs.

For example, Hopewell has strategically developed smaller plants first in each country to learn the local particularities. It established a good track record in those pioneer projects, and bid on targeted projects. Their strategy has worked well, because a certain amount of time is required by host countries to understand the concept of BOT, and mutual reliance between Hopewell and the government should be established before constructing larger projects.

What is important is to select the project which will permit them to achieve their strategic objectives and to organize the proper teams to deal with the issues of the projects. For example, Hopewell developed Navotas I in order to develop Pagbilao. In terms of its connection and negotiation strategy, Hopewell's Wu said that it got a special team to push through the bureaucracy at its Bangkok

project (Tiong, 1992). Furthermore, BOT developers have to develop their package structuring skills quickly. Learning key points in BOT packaging is usually expensive.

· **Standardization of the project**

If there are many similar projects in the future like the Chinese power plants, standardization of the power plant's design should be considered in order to decrease project costs and enhance the leaning curve.

· **Usage of proven technology**

New technology was not used in all projects. Even though the risks were guaranteed by a lump-sum turnkey contractor and the provision of liquidated damages was also guaranteed by the contractor, the Don Muang highway project was plainly a failure from every point of view. Promoters should be careful in using new technologies because it is essential to assure the cost, quality, and scheduling of the construction.

· **Credit risk enhancement**

Low credit risks make it easier to raise equity capital and loans for BOTs. Credit risks can be lowered by the usage of MLA's co-financing program. Also, joint venture with the low credit risk company or the usage of reliable contractor consortium could improve the credit risk of the project.

· **Good project management**

Because the concession period is 30 years for all three projects, the quality of the highway is just as important as its punctual construction schedule and cost control. Turnkey is usually used for securing the management of cost and scheduling, but it is critically important to select a competent contractor that can control the entire project. Also, quality control must be emphasized to minimize the maintenance cost.

· **Good turnkey contract**

It is especially important to select a reliable turnkey contractor who can handle the high risks associated with the construction stage. A poor selection could endanger the project. In addition, a project developer should be prepared for unexpected accidents, and reserve some adjustable time and available funds. Hopewell's Wu said that he always tries to finish his project one year earlier than the contracted completion deadline.

· **Efficient operation strategy**

To secure proper operation, a reputed international operator could be used at the beginning of the project, especially in power projects. It could operate the plant efficiently both from the physical and from the managerial point of view. However, to reduce the labor costs, the operator should gradually change the laborers from

operator should gradually change the laborers from expatriates to local laborers. On the other hand, when the government agency operates the plant directly, some training should be required to enhance operation and management efficiency.

Bibliography

Adam, Christopher et al., Adjusting privatization: case studies from developing countries, Ian Randle, London, 1992.

Augenblick, Mark and B. S. Custer, The Build, Operate, and Transfer ("BOT") Approach to Infrastructure Projects in Developing Countries, Policy Research and External Affairs, Infrastructure Working Papers, The World Bank, Washington, August 1990.

Aixung, Tan, "The Development of China's Electric Power Industry: Opportunities and Challenges," Conference on Private power in China, Infocast conference, San Francisco, Feb. 1994.

Barnes, William and Victor Mallet, "Thais make a mess of their muddling," Financial Times, 22 June 1993.

Beidleman, Carl R. and et al., "On Allocating Risk: The Essence of Project Finance," Sloan Management Review, Spring 1990.

Clifford Chance, Project Finance, 1991.

Consolidated Electric Power Asia Limited, November 24, 1993

Corben, Ron, "The Stakes are High," Infrastructure Finance, Fall 1992.

Donahue, John D., The privatization decision: public ends, private means, Basic Books, 1989.

Earman, R. N. Jr., "Public Sector Source of Financing," Infocast conference, Private Power in the Pacific Rim, Los Angeles, 25-26 January 1993.

East Asian Executive Reports, "Philippine BOT Law Update Implementing Rules and Regulation for Foreign Investment Act of 1991," 15 February 1992.

Engineering Business, "Hijyoutaikenhou seiritsude chuumoku atsumeru Philippines denryoku project," Japan, 15 May 1993.

Evans, Peter C., Opening Electric Power Generation to the Private Sector in the Philippines: Policy Origins and Early Experience, Master thesis, Massachusetts Institute of Technology, May 1991.

Feldman, Roger D. and Bonnie S. Temple, "New Opportunities for Banks in Infrastructure Finance," The Bankers Magazine, July/August 1991.

Ferrigno, Joseph W., "The Bangkok Second Stage Expressway Project," Public Works Financing, July 1990.

_____, "Prospects for Private participation in Asian Infrastructure," Public Works Financing International, January 1993.

Financial Times, "BOT: Why Shajiao B stands out from the rest," 18 May 1992.

Gold, Barry P., "Competition on the Highway," Infrastructure Finance, Summer 1992.

Goldstein, Carl, "Skirting the potholes" Far Eastern Economic Review, 3 December 1992.

_____, "Charged Up: Foreign firms plan Chinese power ventures," Far Eastern Economic Review, 15 April 1993.

_____, "Open Sesame: Hopewell's troubled China road nears completion," Far Eastern Economic Review, 16 December 1993.

Gomez-Ibanez, Jose A. and John R. Meyer, Going Private, The Brookings Institution, Washington, D.C., 1993.

Gray, Frank, "Doors opened to foreign investment," Financial Times, 25 May 1993.

Green, Michael, S.G. Warburg Research: Hopewell Holdings Ltd, S.G. Warburg Securities, November 1993.

Handley, Paul, "Road to Ruin," Far Eastern Economic Review, 10 June 1993.

_____, "No Highway?," Far Eastern Economic Review, 5 August 1993.

Heginbotham, Erland, Asia's Rising Economic Tide: Unique opportunities for the U.S., National Planning Association, 1993.

Hensley, Matthew L. and Edward P. White, "The Privatization Experience in Malaysia: Integrating Build Operate-Own and Build-Operate-Transfer Techniques within the National

Privatization Strategy," The Columbia Journal of World Business, Spring 1993.

Hirsh, Michael, "Thanks for the highway, now take a hike," Asia Journal, May 1993.

International Finance corporation, News, 29 April 1993.

Ishikawa, Hiroshi, "How to BOT," Infrastructure Finance, Fall 1992.

Israel, Arturo, "Issues for Infrastructure Management in the 1990s," The World Bank Discussion Papers 171, Washington, D. C., 1992.

Kappaz, Michael H. and Adolfo Menendes, "Wading Through the Hub River," Infrastructure Finance, Summer 1992.

Kayaloff, Isabelle J., Export and Project Finance, Euromoney, 1988.

Kikeri, Sunita and et al., Privatization: The Lessons of Experience, The World Bank, 1992.

Lam, Patrick, Procurement of Infrastructure Through the Privatisation Approach, Master thesis, University of Bath, United Kingdom, 1992.

Makioka, Hiroshi, Project finance for transportation Projects, Master thesis, Massachusetts Institute of Technology, June 1992.

Malixi, Pablo V., "The Philippines: National Policy with Respect to Private Power Generation, and the Co-Existence of Public and Private Power," Infocast conference, Los Angeles, 25-26 January 1993.

Marks, John, "Financiers take the long view," Financial Times, 27 January 1994.

Millian, Martine and Gregory Millian, "The New Politics," Infrastructure Finance, Spring 1993.

Moggie, Datuk Leo, "Malaysia: Privatization in strategic sectors should accelerate growth in this rapidly expending economy," Institutional Investor, September 1991.

Nevitt, Peter K., Project Financing, Euromoney, 1983.

Pyle, Thomas H., "Salient Features of BOT Schemes: Financial Aspect of BOT Projects (in Transportation)," United Nations Center on Transnational Corporation Roundtable Discussion

of BOT and the Private Sector Project Financing for the 1990s, 25 February 1992.

_____, Private Finance of Infrastructure; Understanding the New Hidden Key to Development Success, A presentation to the World Development Section of The World Bank, Washington D.C., 11 January 1994.

_____, "Private Financing of Chinese Power," Infocast conference, Private Power in China, 8 February 1994.

_____, "The new jersey turnpike of China," Public Works Financing, February 1994.

Reinhardt, William G., "The Road Case Study #5: Malaysia" unpublished article.

Reina, Peter, "Bangkok builds BOT megaprojects," Engineering News-Record, 15 June 1992.

_____, "Bangkok Exploits Its Market Strengths To Attract BOT Builders for Transit," Public Works Financing International, July 1992.

Roth, Gabriel, The Private Provision of Public Services in Developing Countries, Oxford University Press, 1988.

Ruangrong, Pallapa, "Private Power Development in Thailand," Infocast conference, Private Power in the Pacific Rim, Los Angeles, 25-26 January 1993.

Ruhl, Juan, Ricardo Zuloaga 1867-1932, Caracas: C. A. La Electricidad de Caracas, 1978.

Sender, Henny, "Don't Bank on it: Foreign lenders want out of Thai highway project," Far Eastern Economic Review, 24 February 1994.

Stainback, John P., "Privatization Is the Answer, but There Is No Free Lunch," Real Estate Finance, Vol. 6, No. 4, Winter 1990.

Sukro, Pian bin, "Malaysia National Policy with Respect to Private Power Generation, and the Co-Existence of Public and Private Power," Conference on Private power in the Pacific Rim, Infocast, Los Angeles, 25-26 January 1993.

The China Business Review, "Guangdong's Rockefeller," January-February 1993.

The Expressway and Rapid Transit Authority of Thailand, Overview of the Second Stage Expressway System in Greater Bangkok, March 1989.

The Expressway and Rapid Transit Authority of Thailand, Balancing Public and Private Sector Interests, September 1993.

Thomas, Eapen, "Manila Lightens Up," Infrastructure Finance, Fall 1993.

Tiong, Robert L. K., "Comparative Study of BOT Project," Journal of Management in Engineering, Vol. 6, No. 1, January 1990.

_____, "The Structuring of Build-Operate-Transfer Construction Projects," Center for Advanced Construction Studies, Nanyang Technological University, Singapore, 1992.

Vellu, S.S., "Policy Towards BOT Projects and the Incentives Provided by the Malaysian Government to Promote Private Sector Financing of Major Projects," Conference on "BOT Opportunities in Asia," November 1988.

Wigmore, Cary S., "Risk management: The legal and Insurance perspective," Infocast conference, Private power in the Pacific Rim, Los Angeles, 25-26 January 1993.