

Success Factors in Concession Projects: Asian Infrastructure Experience

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Abstract

Concession contracts have become one of the innovative ways of financing infrastructure projects. Asian countries are increasingly using this method to procure private finance, management capabilities, and technical know-how to develop their infrastructure facilities. This paper focuses on the recent experiences of the Asian countries in implementing concession projects. A data base consisting of 318 projects, at various stages of the project life cycle, was compiled to study the projects on a macro level. In addition, a detail analysis was carried out on a number of case studies. The objective of this paper is to identify the relative influence of global risks in project success.

Key Words: Infrastructure, Concession Projects, Global Risks

1. Introduction

Concession contracts have become one of the innovative ways of financing infrastructure projects. Asian countries are increasingly using this method to procure private finance, management capabilities, and technical know how to develop their infrastructure facilities. One of the important elements of a concession project is the risks inherent in the procurement process. These risks govern the success or failure of a concession project. The risks involved in a concession project varies for different participants. It also varies for different sectors and the type of concession contract. Generally, risks can be divided in to global risks and project risks. This paper focuses on the global risks involved in a concession project. The global risks of seven Asian countries are related with project success to assess the relative importance of each risk factor. A project promoter would be relatively more confident in mitigating project risks than global risks. Therefore, mitigation of global risks mainly rest with the government.

Countries which promote concession projects should try to reduce the global risks. This paper discusses the experiences of Asian countries in mitigating such risks.

2. Research Methodology

To study the experiences of concession projects in Asian countries, a database consisting of 318 projects, at various stages of the project cycle, was compiled (Zainudeen, 1997). It contains brief project information such as, cost of the project, concession type, location, concession period, output, parties involved, etc.,. Among the 318 projects, 25 projects were studied in detail as case studies. The data compiled were mainly from three sources; magazines; books, academic papers, publications of multilateral agencies, publications of individual countries, and conference proceedings; and direct contact with project participants. Magazines such as, Asian Infrastructure Monthly, Far Eastern Economic Review, Asian edition of the Business Week, Engineering News Record, Maritime Asia etc.,

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are a continuous source of current project information on Asian countries. Books and academic papers related with concession projects, privatization, infrastructure development, etc., carry a considerable amount of information on past projects (Asia Law & Practice, 1995; Finnerty, 1996; Henseley and White, 1993; Jomo, 1995; Liyin et. al., 1996; Merna & Smith, 1995; Tiong, 1990; Tiong 1995a; Walker & Smith, 1995). In addition, publications of multilateral agencies such as ADB and World Bank and individual countries provided information on ongoing projects in Asia. A vast amount of information was collected through proceedings of the conferences such as, "APEC Public-Private Sector Dialogue" held in Jakarta, "BOT Asia" held in Manila, "Privatization in Asia" held in Manila, "Financial Times Conference on Asian Electricity" held in Singapore, and "National Privatization Summit of Malaysia" held in Kuala Lumpur. Direct contact was made with five leading Japanese contractors and one contractor in Malaysia. They provided some valuable information related with not only the projects which they were involved, but also other projects for which detail data were available.

The data base includes all the countries in the Asian region, except Japan. The countries such as Hong Kong, Malaysia, China, Thailand, Indonesia, the Philippines and India recorded a high proportion of the number of projects. Therefore, these seven countries are taken into the analysis in the following chapters. Other

countries, comprising, Pakistan, Vietnam, Taiwan, Myanmar, Cambodia, Singapore, Korea, Nepal, and Sri Lanka, are grouped together. The distribution of projects by stages of the project cycle is given in Table 1. Even with all these sources, it is impossible to cover all the concession projects implemented in Asia. However, according to the authors understanding, at least 90% of the projects have been included in the data base. The projects which have come to limelight through these sources are considered to be the most important projects implemented in Asia. The very reason they were published in such sources shows the importance attached in one way or another. Therefore, the data base used in this study can represent if not the whole, the most important examples in Asia.

3. Risks in Concession Projects

Infrastructure projects present themselves with a relatively higher degree and with more types of risks than the usual investment projects in the manufacturing or the service sectors. The reasons for this are fairly obvious. Infrastructure projects are longer in time horizon, larger in scope, larger in scale, involves more parties, involves more regulatory agencies and requires complex financing and government support. The risks associated with investment in infrastructure are many and they have compounding effects. Risks can be classified into two categories as, global (country) risks and project risks. Global risks are pervasive and have a overwhelming influence on most infrastructure projects and are more

Table 1: Distribution of Projects by Stages

Stage	China	Hong Kong	India	Indonesia	Malaysia	Philippines	Thailand	Others	Total
Inception	13	-	17	5	5	12	9	3	64
Negotiation	4	1	32	10	3	20	1	4	75
Post Contract	15	2	3	15	15	12	-	10	72
Construction	7	1	1	6	9	2	2	1	29
Operation	7	4	3	8	9	24	2	5	62
Abandoned	-	-	3	-	-	1	-	-	4
Status Unknown	1	-	1	3	1	4	-	2	12
Total	47	8	60	47	42	75	14	25	318

difficult to quantify and to mitigate compared to project risks. Generally, project promoter have more control over and more ways to handle project risks. An experienced promoter would be relatively more confident in mitigating project risks than global risks. Therefore, countries which are promoting concession projects should try to reduce the global risks so as to attract investors.

The global risks of a concession project can be divided into four major risk elements as follows (Tiong, 1995b; UNIDO, 1995):

1. Commercial Risk: related to economic condition of a country, openness of the market to foreign investors and business climate in general.
2. Financial Risk: related to the financial situation of a country and the problems of inflation, interest rate fluctuations, and currency convertibility and their impact on the cost of finance.
3. Legal Risk: related to the dependence on the contractual and legal framework to support project financing arrangements, the ownership of

property and licenses, and the scheduled implementation of the project.

4. Political Risk: related to the internal and external political situation and stability of the host country.

4. Comparison of Global Risks Among Asian Countries

As explained in the previous chapter, it is very difficult to measure global risks. One of the problems is the difficulty of allocating a specific measure to represent a risk element. To overcome measurement difficulties, a compound index can be used to represent various conditions related with a risk element. One of such indices have been used in this study to compare the global risks of Asian countries. The World Competitiveness Report published by the Institute of Management Development and The World Economic Forum of Switzerland rank the competitiveness of 48 countries on more than hundred criteria (World Competitiveness Report, 1995). These criterion are aggregated into factors of competitiveness. Among them, factors related to economic strength, financial situation, legal situation and political stability can be found.

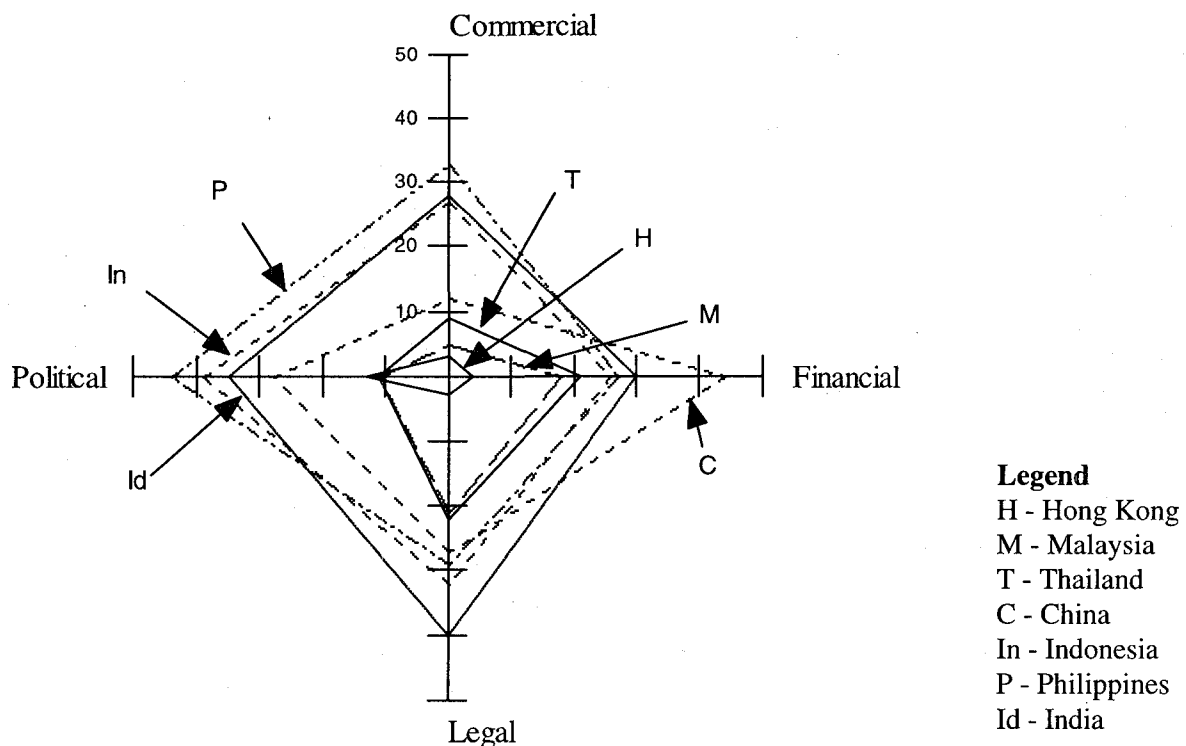


Figure 1: Relative Magnitude of Global Risks in Asian Countries

Table 2: Comparison of Global Risks in Asian Countries

Country	Commercial	Financial	Legal	Political
Hong Kong	Very Low	Very Low	Very Low	Low
Malaysia	Very Low	Low	Low	Low
Thailand	Very Low	Medium	Medium	High
China	Low	Very High	Medium	Medium
Indonesia	Medium	Medium	Medium	High
Philippines	High	Medium	Medium	Very High
India	Medium	Medium	High	High

These factors are calculated using various statistical data and opinion surveys. For example, the financial situation of the countries are derived using data such as country credit rating, financial risk rating, funds raised on the international market, international bond issues, number of banks among the world's top 500, and numerous other similar indicators. As such the aggregated factor rankings are adapted as a representative of the global risk elements of the Asian countries. The higher the rank the higher the risk element of a particular country. A comparison of the risks obtained through this method is given in Figure 1.

It is clear from the figure that overall global risk is least in Hong Kong followed by Malaysia, Thailand, and China. It is relatively higher in Indonesia, the Philippines, and India. However, a readily apparent ranking is not possible among these three countries. Regarding individual risk elements, Hong Kong's political risk is relatively higher than the other three. Malaysia's legal and financial risks are relatively higher than the other two. China's financial risk is exceptionally higher than the other risks. Political risks are relatively higher in Thailand, Indonesia and the Philippines. India is having a relatively higher legal risk than other countries. If the above results are arranged in an ordinal scale, Table 2 can be obtained.

5. Evaluation of Project Success in Asian Countries

The success of a traditional infrastructure project can be measured using a criteria tied with the objectives of the project. These criterion could be

EIRR, FIRR, cost overruns, time overruns etc.,. However, the success of a concession project cannot be measured simply by an indicator as above. One of the main barrier is the presence of an operation phase in the concession contract. The revenue stream of operation phase dictates the success of a project. Also the criterion used to measure project success differs among the parties involved in a project. Furthermore, not a single project has completed its concession term and transferred back to the government up to date. Therefore, a detail analysis on project success is still premature at this moment. To overcome these problems, a macro level analysis is adopted in this paper. Even though it is a crude measurement of the relative success among countries, it serves the objectives of this paper. The following two criterion has been used to rank the relative success of concession projects in the selected countries.

Criteria 1: Projects in Operation

Concession projects take a long time since the inception to become a physical reality. Initial stages, particularly the negotiation stage takes a considerably longer time than a traditional infrastructure project. During this period, the probability of abandoning a project is also high. If not abandoned, the project will drag on for a long time if necessary actions are not taken. In such a condition, a project becoming operational alone is a success. Therefore, to evaluate the relative success, the percentage of projects in operation (PPO), as given in the following formula, can be used.

$$PPO = \frac{\text{Number of projects in operation}}{\text{Total number of projects}} \times 100$$

Table 3: Ranking Countries Using PPO

Country	Number of Projects in Operation	Total Number of Projects	PPO	Rank
Hong Kong	4	8	50.0	1
Malaysia	9	42	21.4	3
Thailand	2	14	14.3	6
China	7	47	14.9	5
Indonesia	8	47	17.0	4
Philippines	24	75	32.0	2
India	3	60	5.0	7

Using the data base information, PPO values were calculated and given as in Table 3. According to the table, Hong kong rank the highest and India the lowest.

Criteria 2: Issues and Problems in Implementation

During the procurement process of a concession project, numerous issues and problems can crop up. One of the challenges to the parties of the contract is to overcome these difficulties in an acceptable manner. The problems which threatens the basic survival of a project or its contract conditions are treated as an indication of failure. In this premise, the most serious condition is the abandonment of a concession project. The issues and problems which are serious enough to be taken as a potential threat to a project are considered as "major problems". Other problems, which are significant but not as serious as the major problems are taken as "minor problems". By studying a project in detail, the significance of problems if any, could be detected. The sources from which information was collected for the database always tend to report problematic projects. Also the cases studied in detail, as given in Table 5, reports the problems in detail. The number of projects with significant problems are given in Table 4. Using an ordinal scale of 5-3-1, numerical values could be attributed to the failures. The summation of these values are called "Failure Index" in Table 4. From the index, it is clear that India records the highest score followed by the Philippines,

Table 4: Project Failures in Asian Countries

Country	Abandonment	Major	Minor	Failure Index
Hong Kong	-	-	-	0
Malaysia	-	-	-	0
Thailand	-	2	-	6
China	-	-	-	0
Indonesia	-	-	1	1
Philippines	1	1	1	9
India	3	2	-	21

Thailand and Indonesia. Problems were not detected in Hong Kong, Malaysia and China.

Combining Criteria 1 and 2

By combining criteria 1 and 2, the relative project success could be ranked. Undoubtedly, The highest project success rates were observed from Hong Kong, followed by Malaysia and China. Similarly, India records the least success rates among the seven countries. The PPO ranks of the other three countries are so close that the second criteria seems to be the most suitable in raking them. Therefore, those countries were ranked in between in the order of the second criteria. Finally, the order of the relative success of concession projects can be given as follows:

Hong Kong > Malaysia > China > Indonesia > Thailand > Philippines > India.

6. Relating Project Success with Global Risks

Project success can be given as a combination of the influences of the four global risks. The higher the risks the lower the probability of success of a project. The reciprocal of the above argument is also true. That is, higher the risks the higher the probability of failure. The following equation portrays this concept.

$$PF_i = \alpha CR_i + \beta FR_i + \gamma LR_i + \delta PR_i$$

Where,

PF_i is the probability of project failure in the i th country; CR_i , FR_i , LR_i , and PR_i are respectively the commercial risk, financial risk, legal risk, and

Table 5: Outline of the Case Studies

Country	Name of the Project	Description*	Problems	Government Support**
Hong Kong	The Country Park Section of Route 3	Road, BOT, HK\$ 7 m, 30 yrs.	No	LAND
	Harbour Tunnel Crossing	Road, BOT, Pounds 18.7 m, 30 yrs.	No	LAND
	Eastern Harbour Crossing	Road & Rail, US\$ 283.85 m, 20 yrs.	No	LAND
	Western Harbour Tunnel	Road, BOT, 30 yrs.	No	LAND
Malaysia	Labuan Water Supply	Water, BOT, 13 yrs.	No	OFF, TAX, LAND
	YLT Power Plant	Power, BOO, RM 3.0-3.5 b, 21 yrs.	No	OFF, RAW, FOREX
	Light Rail Transit (LRT)	Rail, BOT, RM 1.3 b, 30yrs.	No	RAW, LOAN
	North - South Expressway	Road, BOT, US\$ 1.8 b, 30 yrs.	No	LOAN, FOREX, INTEREST, MIN
	Johor Bahru Water S.	Water, BOT, RM 700 m, 20 yrs.	No	OFF
	Kota Kinabalu Water S.	Water, BOT, RM 300 m, 20 yrs.	No	OFF
	Taiping Water S.	Water, BOT, RM 50 m, 20 yrs.	No	OFF
Thailand	Second Stage Expressway	Road, BOT, US\$ 220 m, 30 yrs.	Major	
	Bangkok Elevated Road and Train System	Road & Rail, BOOT, US\$ 3.2 b, 30 yrs.	Major	
China	Shajiao B Coal-fired Power Plant	Power, BOT, 10 yrs.	No	OFF, RAW, LAND, FOREX, TAX
Indonesia	Paiton I Power Plant	Power, BOO, US\$ 2.5 b, 30 yrs.	Minor	OFF
	Toll Road Investment Throughout Indonesia***	Road, BOT, US\$ 3.5 b,	No	LAND, Investor Default
Philippines	Navotas Power	Power, BOT, US\$ 40 m, 15 yrs.	Minor	OFF, LAND, TAX
	Pagbilao Power	Power, BOT, 25 yrs.	No	OFF, RAW
	Batangas Power	Power, BOT, US\$ 120 m, 15 yrs.	No	OFF, RAW, FOREX
	Subic Bay Power	Power, BOT, 15 yrs.	No	OFF, RAW, FOREX
	Subic Bay Port		Major	
	Mindanao Power Barge	Power, BTO, 15 yrs.	No	OFF, RAW, FOREX, LAND, LOAN,
	Bataan Combined Cycle Gas-Turbine Power Plant	Power, BTO, 15 yrs.	No	OFF, RAW, LAND, LOAN, FOREX
India	Dabhole Power	Power, BOT, US\$ 2.8 b, 20 yrs.	Major	OFF
	Congentrix Power	Power, BOT, US\$ 1.01 b, 20 yrs.	Major	OFF

Notes: * Information given in this column represent brief project information in the order of sector, type of concession, cost of the project, and concession period.

*** Toll Road Investment Throughout Indonesia is not a single project. It contains 19 toll roads with a total of 767 Km.

** OFF - Offtake agreements
 RAW - Raw material supply agreements
 LAND - Land acquisition
 LOAN - Support loans
 TAX - Tax exemptions
 MIN - Minimum operating guarantee
 INT - Interest rate guarantee
 FOREX - Foreign exchange guarantee

political risk of the i th country; $\alpha, \beta, \gamma, \delta$ are weightages representing relative influences of each risk element on failure.

The weightages determine the relative influence of each risk element on project failure. Since the relative magnitude of each risk element was established in section 4, the probability of failure can be calculated using different rank combinations for the weightages. For example, one of the combinations could be:

$$\alpha > \beta > \gamma > \delta$$

Since there are four risk elements, the maximum number of combinations are sixteen. Analytical Hierarchy Process (AHP) is used to combine the hierarchies of the above model. The results obtained for the sixteen scenarios were given in Table 6. The table provides the calculated PF values for each country, with a total of 4 points. The scenario closest to the actual project success established in section 5 gives the relative influence of each risk element. Accordingly, scenarios 6, 7 and 10 gives the closest order with only Thailand's position being changed. Among these three scenarios, scenario 7 is selected as the

most closely resembling scenario to the actual project success. That scenario gives the highest difference between the Philippines and India, which can be observed in the actual situation. Accordingly, the relative influence of the risk elements can be given as follows:

$$\text{Legal Risk} > \text{Financial Risk} > \text{Commercial Risk} > \text{Political Risk.}$$

7. Measures Taken by Governments to Redress Global Risks

Global risks are important elements to be addressed by the governments to attract private investors and lenders to the infrastructure sector. The measures taken in this regard can be mainly divided into two categories as follows:

1. Government involvement and support given in a project.
2. Government policy initiatives in attracting investors.

The first category of measures are crucial for the smooth progress of a project after it has been initiated. The second category forges the image of a country as a reputable host. Therefore, both

Table 6: Results of the AHP Calculations

Scenario	Hong Kong	Malaysia	Thailand	China	Indonesia	Philippines	India
Sc 1	0.15	0.33	0.54	0.65	0.74	0.79	0.79
Sc 2	0.16	0.33	0.54	0.70	0.73	0.79	0.77
Sc 3	0.12	0.37	0.51	0.75	0.71	0.75	0.79
Sc 4	0.14	0.35	0.52	0.74	0.71	0.77	0.77
Sc 5	0.15	0.31	0.52	0.59	0.77	0.84	0.81
Sc 6	0.13	0.33	0.51	0.60	0.77	0.82	0.84
Sc 7	0.10	0.38	0.48	0.70	0.74	0.78	0.84
Sc 8	0.16	0.30	0.52	0.67	0.75	0.84	0.77
Sc 9	0.16	0.27	0.50	0.61	0.78	0.88	0.8
Sc 10	0.10	0.35	0.46	0.63	0.77	0.82	0.86
Sc 11	0.11	0.34	0.46	0.71	0.74	0.82	0.82
Sc 12	0.13	0.31	0.47	0.71	0.75	0.84	0.80
Sc 13	0.14	0.27	0.47	0.56	0.81	0.91	0.84
Sc 14	0.12	0.30	0.45	0.56	0.80	0.89	0.87
Sc 15	0.11	0.31	0.44	0.65	0.78	0.87	0.85
Sc 16	0.13	0.29	0.45	0.65	0.78	0.89	0.82

Table 7: Forms of Government Support to Concession Projects

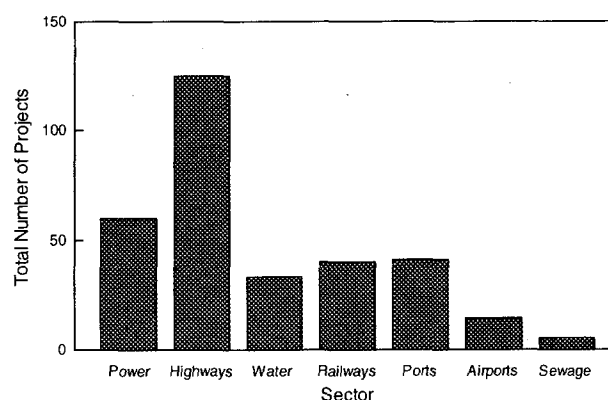
	Hong Kong	Malaysia	Thailand	China	Indonesia	Philippines	India
Offtake agreements	No	Yes	No	Yes	Yes	Yes	Yes
Raw material supply agreements	No	Yes	No	Yes	No	Yes	No
Land acquisition	Yes	Yes	No	Yes	Yes	Yes	No
Support loans	No	Yes	No	No	No	Yes	No
Tax exemptions	No	Yes	No	Yes	No	Yes	No
Minimum operating guarantee	No	Yes	No	No	No	No	No
Interest rate guarantee	No	Yes	No	No	No	No	No
Foreign exchange guarantee	No	Yes	No	Yes	No	Yes	No

of these measures play a role in the successful implementation of concession projects in Asian countries. The government involvement and support in the case study projects are given in Table 5. As it indicates, a considerable amount of support in one form or another has been given to all the projects studied in detail. It shows that without government support concession projects cannot be successfully implemented in Asian countries. However, when the global risks are low, the support extended by the government becomes low. Hong Kong's experience with least amount of government support proves the above observation. Based on the case studies, Table 7 provides a summary of the forms of government support extended to concession projects in Asian countries.

Government policy initiatives for attracting investors and lenders differs from country to country. Table 8 provides a brief idea of the types of policies implemented in various countries. As can be seen from the table, China and Malaysia are more inclined to use financial incentives to attract investors than other countries. In addition, China has made a tremendous improvement in the financial situation of the country. Hong Kong on the other hand is mainly concentrating on institutional aspects for attracting investors. Clear and transparent tendering procedures, clear regulatory mechanisms, strong coordinating agencies, free business environment, etc., gives Hong Kong a distinctive advantage over other countries. The Philippines and Indonesia mainly

relies on legal and institutional measures to attract investors into their countries.

Another noteworthy observation regarding government involvement in concession projects is the importance of the institutional strength of Implementing Agencies (IA's). Without a strong IA, the concession projects seems to be not imminent in a particular sector. The power projects in the Philippines (NPC), Indonesia (PLN) and Malaysia (TNB); and highway projects in Indonesia (JASA MARGA) proves this phenomena very clearly. In general, power and highway projects are much more popular for concessions than any other sector in Asia (refer Figure 2). However, this trend is changing gradually. The projects at the operational stage (those started in the early period of concession history) mainly consists of power and highways. However, those started late, which are still at the inception stage, has a much more equal distribution among sectors as shown in Figure 3.

**Figure 2: Distribution of Total Number of Projects Among Sectors**

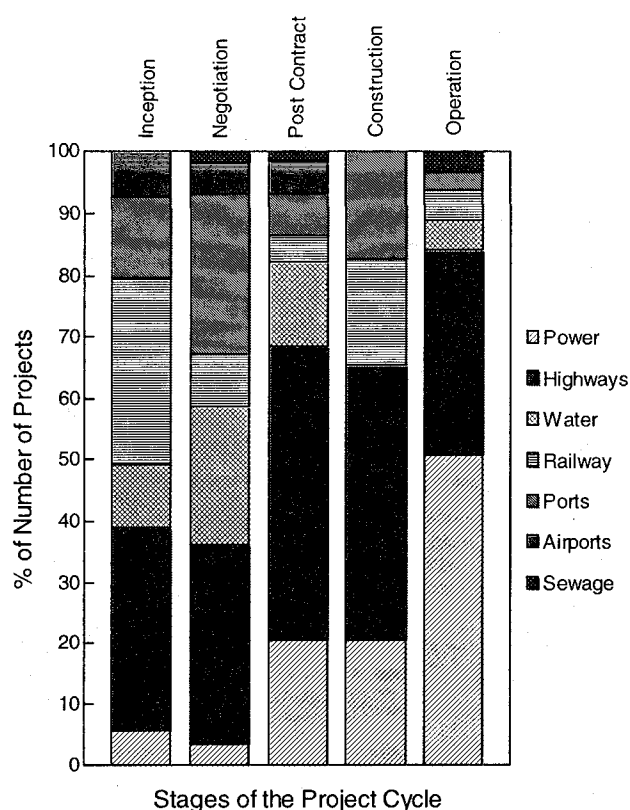


Figure 3: Distribution of Projects Among Sectors and Stages

This shows that concessions have started with much more reputable sectors for private participation. Those sectors provided the highest return for investment; less government subsidy; and the willingness of consumers to pay. However, the sectoral composition is changing with the experiences of the pioneering sectors. IA's in other sectors are learning from the pioneers' experiences and using the tested mechanisms such as offtake agreements, regulatory measures, guarantees, incentives and even legal provisions. It is a clear message of the maturing process of the way concession contracts are implemented in Asia.

8. Conclusions

Among the global risks, legal risk is the most influential element in terms of project success. Financial risk takes the second place followed by commercial and political risks. All the countries studied in this paper seems to take a note on the possibility of reducing these risk elements. Most of the countries are trying to tackle the legal and financial risks by two means. First method uses

Table 8: Policies Implemented to Attract Investors

Country	Policy Measures and Impediments
Hong Kong	1. Land acquisition for private projects 2. A government representative will coordinate the project to reduce bureaucratic red tape.
Malaysia	1. Privatization Master Plan of 1991. 2. Tax Exceptions for infrastructure projects
Thailand	1. Legal Monopoly of the state enterprises prevent revenue collection by private sector
China	1. Dismantling of the official exchange rate in 1994. 2. The restructuring of the financial system in 1994 after enactment of the Law of the People's Bank of China. 3. Minimum profit guarantee of 15%-30%. 4. Price adjustments to avoid the risk of inflation. 5. Property development rights.
Indonesia	1. Law No. 13 of 1980 provides authority for toll road construction. 2. Liberalization of financial system in 1988. 3. Law No. 23 of 1989 provides authority for private sector telecommunication development. 4. Restrictions on offshore borrowings in 1991. 5. Law No. 37 of 1992 provides authority for private sector electric power supply
Philippines	1. BOT Law of 1990. First of this kind in Asia. 2. Establishment of Private Sector Infrastructure Development Fund (PSIDF) 3. Establishment of the one stop "BOT Center". 4. Tax Exceptions
India	1. Legal outline for private sector participation, called "Normative" was implemented in 1992, twice amended in 1994 and once in 1995.

the government support and incentives targeted at the project level. The second method uses a broad based policy initiative to attract private investors. Both of these measures are important for the success of concession projects. In addition, the institutional capacity of the implementing agencies play a considerable role in the procurement process.

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