

IMPACT OF FINANCIAL PACKAGE VERSUS TECHNICAL SOLUTION IN A BOT TENDER

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ABSTRACT: The two main components in the tender of a privatized infrastructure project let under the build-operate-transfer (BOT) contractual arrangement are the technical design and the financial package. This paper examines the impact of a financial package when assessed against the technical design during the selection process. It is concluded that the ability to provide an attractive financial package is critical under the conditions when (1) the project is technically certain; (2) the tolls to be charged are of government's main concern; (3) competition is keen; and (4) the project viability and financing are uncertain. However, promoters must not underestimate the importance of an innovative technical solution as it could make an attractive financial package possible. The role of an innovative technical solution was never in question in the cases studied in spite of the great importance attached to the financial package by the governments.

INTRODUCTION

This paper is concerned with the financial package in a build-operate-transfer (BOT) tender. The paper examines the financial package's impact when assessed against the technical design in the selection of proposals submitted for the tender of a privatized infrastructure project that is let under the BOT concept. The financial package and the technical solution are the two main components of a BOT proposal that are rigorously assessed, often by different groups of experts hired by the government—the technical design by the consulting engineers and the financial proposal by the financial advisors. The financial package would normally include the financial and commercial aspects of the project. The financial elements would include the sources of loans, the interest rate, the capital structure, the repayment and drawdown schedules, and the currency of loans and payments. The commercial aspects would include, among other things, the concession period, the tolls, and the mechanism for the increase of tolls (Issen 1992).

An attractive financial package must be based on the following principles:

- Low cost. The financial charges and interest rates of the package must be low. These generally imply that the package must include soft loans that carry a much lower interest rate.
- Credibility. The package depends on sound and efficient financial planning and analysis by reputable bankers. The plan must integrate well with the project's technical scope and assumptions.
- Minimal Financial Risks to the Government. There must be no government funding or guarantees if this is categorically stated in the request for proposal (RFP).
- Minimal Burden on Debt-servicing Capacity of Project Revenues. This requires maximizing fixed-rate financing and minimizing refinancing risk.

RESEARCH HYPOTHESIS AND METHODOLOGIES

In a BOT tender, the financing package must be attractive to the government and must therefore be competitive when

compared with the other tenders' proposals. To the government, an attractive financial package is an integral part of a BOT tender and is important for the project to be successfully implemented.

To the promoter, an attractive financial package gives them the competitive edge over the other promoters in the tender. To them, the critical issue is whether an attractive financial package has a greater impact in winning the concession than the proposed technical solution. This is addressed in the following hypothesis:

The ability to provide an attractive financial package has a greater impact in winning the concession than the project's physical design or its technical solution

The hypothesis is researched as part of a research project on "Evaluation and Competitive Tendering of BOT Projects." In the research, it was decided to combine case-based research with survey-based research methods. Other sources of information include interviews with promoters and government officials as well as the RFPs and the tender proposals as listed in Appendix I. In addition, continuous correspondence is maintained with overseas professionals involved in BOT projects to seek clarifications and to seek their comments on the research findings.

QUALITATIVE ANALYSIS

Requirements and Weights in RFPs

The hypothesis is first researched by analyzing the RFPs and then studying those cases involved. The questions that need to be addressed here are

1. Is the requirement for a credible financial package stated in the RFPs?
2. Do the RFPs state that the attractiveness of a financial package is an important criterion that government will use in selecting a proposal?
3. Are the weights for technical solution and financial package stated in the RFPs? If yes, which has a greater weight in selection? If no, can a study of the cases reveal which has a greater impact during the selection and negotiation?

To perform the analysis for questions 1 and 2, the RFPs for 38 BOT projects that were procured through competitive tendering in 10 countries were studied. Table 1 shows which RFP specifies the requirement of a credible financing package and which states that the attractiveness of a financial package is an important criterion. Table 2 shows the summary of the

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TABLE 1. Requirements for Financial Package in RFPs

Country (1)	Project (2)	Requirement for credible financial package? (3)	Attractive financial package an important criterion? (4)
Australia	F4 tolled road	Yes	No
Australia	F5 tolled road	Yes	No
Australia	Sydney airport link	Yes	No
Australia	Sydney water-treatment plants	Yes	No
Australia	Loy Yang power plant, Victoria	Yes	No
Australia	Collic power plant	Yes	No
Australia	Victoria toll road	Yes	No
Australia	Melbourne tolled bypass	Yes	No
Canada	Northumberland Strait Crossing Bridge	Yes	No
Canada	Toronto airport extension	Yes	No
Hong Kong	Eastern Harbor Crossing	Yes	Yes
Hong Kong	Tate's Cairn Tunnel	Yes	Yes
Hong Kong	Western Harbor Crossing	Yes	Yes
Hungary	M1 tolled road	Yes	No
Indonesia	Cikampek-Padalarang Tollway	Yes	No
Malaysia	Johor water supply	Yes	No
Malaysia	North-South Highway	Yes	No
Malaysia	Ipoh water supply	Yes	No
Malaysia	KL tolled interchanges	Yes	No
Philippines	Hopewell's gas-turbine power plant	Yes	No
Philippines	Hopewell's coal-fired power plant	Yes	No
Philippines	Manila light-rail transit	Yes	No
Thailand	Second Stage Expressway	Yes	Yes
Thailand	Third Stage Expressway	Yes	Yes
Thailand	BMA light rail	Yes	Yes
Thailand	Hopewell's road/rail	Yes	Yes
Thailand	Don Muang Tollway	Yes	Yes
Thailand	Skytrain	Yes	Yes
U.K.	Channel Tunnel	Yes	No
U.K.	Dartford Bridge	Yes	No
U.K.	Second Severns Bridge	Yes	No
U.K.	Skye Bridge	Yes	No
U.K.	Manchester Metrolink	Yes	No
U.K.	Birmingham Relief Road	Yes	No
U.S.	Caltrans transport projects	Yes	No
U.S.	Florida high-speed rail	Yes	No
U.S.	Texas high-speed rail	Yes	No
U.S.	Honolulu high-speed rail	Yes	No
U.S.	Arizona transport projects	Yes	No

TABLE 2. Requirements for Credible and Attractive Financing Packages in RFPs

No. of RFPs (1)	Requirement for credible financing package (2)	Requirement for attractive financing package (3)
Yes	38	9
No	0	29
Total	38	38

number of RFPs that specify the requirement for a credible financing package in the proposal and the number that specifies the requirement for an attractive financing package.

It can be seen that the requirement is specified in all the RFPs that are open to competition. Some are very general, such as those issued for the US projects where the projects

are very conceptual. Others have very detailed requirements such as those in Thailand, where financing is of paramount importance. In the RFP for Canada's Northumberland Straits Crossing, detailed financial plans constitute the third proposal, which was the final crucial stage of evaluation. Short-listed promoters had to pass all the criteria in the first and second stages of evaluation of their qualifications, experience, and technical solution before they were allowed to proceed to the third stage.

There are nine projects that require attractive financial packages in the proposal. These are the six projects in Thailand and the three projects in Hong Kong, which are described later.

Cases Where Weights Are Explicit in RFPs

The RFPs for the 38 BOT projects were reviewed and it was found that the explicit weights for the evaluation criteria are not stated in the RFPs except for the Caltrans, Honolulu, Arizona, and Hungary projects. Most governments could not state the weights publicly, as the governments either did not use weights or wanted to keep the weights a secret.

In the Philippines and Malaysia, for example, the government compared proposals based on a net present value basis. For the Honolulu project, the weights were kept in a secured safe until the actual evaluations began. The weights remained unchanged during the entire evaluation process and no one but the selection committee had access to them. The weights were later revealed in the selection committee report.

The weights for evaluation criteria of projects for Caltrans, Honolulu, Arizona, and Hungary are tabulated in Table 3.

It is not possible to use these four cases where the explicit weights are stated in the RFPs to statistically prove whether the hypothesis is true or not. Nevertheless, the comparison shows that the financial package is assigned a higher weightage in three out of the four cases except for Caltrans projects. The reason for the lower weightage in the Caltrans project is that the agency felt that an independent opinion of robustness and integrity of the financial plan is sufficient for the conceptual proposals. The main attention is on the transportation service that the proposal provides, the degree of local support for the proposal, and the ease in implementation of the technical solution. Financial and commercial considerations are therefore secondary ("Guidelines" 1990).

Cases Where Weights Are not Explicit in RFPs

An analysis is carried out for the rest of the cases where the weights are not stated in the RFPs. This is done by reviewing documents and information that is available concerning the actual competition, the negotiation with the government, the evaluation done by government, and the selection committee reports. The results were verified with the practitioners involved with these projects.

For cases whose weights are not explicit in the RFPs, the impact of the financial package versus technical solution depends on government's policy on the evaluation process and

TABLE 3. Weights for Evaluation Criteria

Evaluation criteria and weights (1)	Caltrans' transporta- tion projects (2)	Honolulu's high-speed rail project (3)	Arizona's transporta- tion projects (4)	Hungary's transport projects (5)
Technical	60%	47.5%	25%	15%
Financial	15%	52.5%	35%	85%
Others	25%	0%	40%	0%
Total	100%	100%	100%	100%

whether it would be a "political" concession or a "commercial" concession.

Impact of Financial Package versus Technical Solution

Political Concession

In the case of the Channel Tunnel fixed link, the selection was to be decided by politicians, the prime minister of the United Kingdom and the President of France. It was therefore a political concession and not a commercial concession. The governments were in fact more interested in the technical feasibility and the political aspects of safety, security, and environment. The governments simply wanted a practical solution that can be built with proven technology to minimize any cost and time overruns. In this case, the technical solution appears to be more important than the financial package. Notwithstanding the preceding, on the financial and commercial aspects, the governments were also interested in the feasibility of the project. The promoters therefore were asked to provide strong financial commitments and the governments in return gave the promoters commercial freedom.

Commercial Concession

Where the concession is determined on a commercial basis, the following conditions determine whether the financial package has a greater impact or not:

- Technical certainty. This depends on how confident the government is that there is a feasible technical solution for the project. If it is, the government still chooses the most cost-effective solution, and then it wants to see stronger up-front financial commitments and more attractive financial offers by the promoters.
- Government's concern and desire to control the tolls or tariff. Such concerns and desire always lead to restricted toll increases allowed. Tolls are determined principally by the throughput of the facility, that is, traffic volume, and also other financial and commercial parameters in the financial package such as fixed construction costs, financial charges, and capital structure. Governments therefore want to see strong commitments and guarantees by promoters on these parameters to mitigate any risks.
- Keenness of competition. This is the dark-horse element in any BOT negotiation, especially in negotiating the financial offers. Keenness during negotiations often drives up the competitiveness and attractiveness of the financial offers to the government. Promoters with the most cost-effective solution must be able to produce the most attractive financial package or else it is difficult for government to justify to the public.
- Uncertainty of project viability. This causes the financing to be uncertain also. The uncertainty in the project viability increases the concerns and desires of the government that the private sector provide strong and sufficient guarantees and commitments by their lenders to ensure that adequate funds are available for successful completion and operation of the project, while maintaining low tolls or tariffs.
- Uncertainty of project finance. By presenting a financial package that addresses these concerns, the promoter certainly is in a strong position to win the concession.

Table 4 shows the number of the above conditions that are present in each of the BOT projects studied. It shows that there are at least two conditions that are present in each case. This indicates very strongly that the financial package has a greater impact than the technical solution during the selection

for these projects. This is further discussed in the following cases.

Australia's Projects

In Australia, concerns about the tolls and the desire to avoid the use of any state funds, the keen competition by the promoters and bankers in Australia, and uncertainty about the traffic flows and therefore the revenues in the privatized tolled roads and other infrastructure projects caused the government to demand attractive financial packages to be offered by the private sector. For example, in the F4 tolled road, the government refused to underwrite the traffic risk. The financial advisor, the Commonwealth Bank of Australia, retained this risk and then bought insurance for this risk. As a result, it could underwrite the loans for the whole project totalling A\$220 millions on its own without any syndication.

Hong Kong's Projects

The RFPs for the Hong Kong projects did not explicitly mention the word "attractiveness" for the financial package, but it was implicit from the negotiations that an attractive financing package was expected from the shortlisted promoters. The first RFP issued in 1986 for the Eastern Harbor Crossing (EHC) project was very brief as the government was not sure what it wanted. But, after several rounds of negotiations, the government officials gained experience and revised the brief to include five evaluation criteria that are all related to competitive financial and commercial elements such as equity, concession period, tolls, and returns to the government. The criteria were since used for the Tate's Cairn Tunnel project and the Western Harbor Crossing project.

The criteria are

- The lowest and most stable toll regime
- The greatest financial returns to government and benefits to government
- The shortest franchise period
- A high level of equity contribution
- Avoidance of exposing the mass rapid transit corporation to payments in any currency other than Hong Kong dollars ("Project" 1986)

Promoters were then given the revised brief and were asked to submit their best and final offers within a short time. At that point in time, the technical solution, the construction cost, the concession period, and the construction period had already been finalized. It would not be possible to negotiate these further. What was left was the financial parameters such as the tolls, the equity/debt ratio, and financial guarantees. The competition was keen and the project viability was uncertain. The promoters for the EHC project even asked the government to introduce toll differentials between the existing tunnel and the new tunnel so that more traffic is diverted to the new tunnel. The financial package then became the winning factor. The promoters were asked to provide their best offers on the financial structure, tolls and mechanism for toll increases, and financial guarantees.

Thailand's Projects

In Thailand, the government expected attractive financial packages to accompany the technical proposals. In the competition for the Second Stage Expressway, the consortium led by Kumagai Gumi won the competition because of the following:

TABLE 4. Conditions Determining Impact of Financial Package

Country (1)	Project (2)	Technical certainty (3)	Govt's control on tariff (4)	Keeness of competition (5)	Uncertainty in project viability (6)	Uncertainty of project finance (7)
Australia	F4 tolled road	Yes	Yes	Yes	No	Yes
Australia	F5 tolled road	Yes	No	Yes	Yes	No
Australia	Sydney airport link	No	Yes	Yes	Yes	No
Australia	Sydney water-treatment plants	Yes	Yes	Yes	No	No
Australia	Loy Yang power plant	Yes	Yes	Yes	No	No
Australia	Collie power plant	Yes	Yes	Yes	No	Yes
Australia	Victoria toll road	Yes	No	Yes	Yes	Yes
Australia	Melbourne tolled bypass	Yes	No	Yes	Yes	Yes
Canada	Northumberland Strait Crossing Bridge	Yes	Yes	Yes	Yes	Yes
Canada	Toronto airport extension	Yes	No	Yes	Yes	No
Hong Kong	Eastern Harbor Crossing	Yes	Yes	Yes	Yes	No
Hong Kong	Tate's Cairn Tunnel	Yes	Yes	Yes	No	No
Hong Kong	Western Harbor Crossing	Yes	Yes	Yes	Yes	Yes
Hungary	M1 tolled road	No	No	Yes	Yes	Yes
Indonesia	Cikampek-Padalarang Tollway	No	Yes	No	Yes	Yes
Malaysia	Johor water supply	Yes	Yes	Yes	No	No
Malaysia	North-South Highway	No	Yes	Yes	No	No
Malaysia	Ipoh water supply	Yes	Yes	Yes	No	No
Malaysia	KL tolled interchanges	Yes	Yes	No	No	No
Philippines	Hopewell's gas-turbine power plant	Yes	Yes	Yes	No	No
Philippines	Hopewell's coal-fired power plant	Yes	Yes	Yes	No	No
Philippines	Manila light-rail transit	Yes	Yes	Yes	Yes	Yes
Thailand	Second Stage Expressway	Yes	Yes	Yes	No	No
Thailand	Third Stage Expressway	Yes	Yes	Yes	No	No
Thailand	BMA light rail	Yes	Yes	Yes	No	No
Thailand	Hopewell's road/rail	Yes	Yes	Yes	Yes	Yes
Thailand	Don Muang Tollway	Yes	Yes	No	Yes	Yes
Thailand	Skytrain	Yes	Yes	Yes	Yes	Yes
U.K.	Channel Tunnel	No	No	Yes	Yes	Yes
U.K.	Dartford Bridge	Yes	Yes	Yes	No	No
U.K.	Second Severns Bridge	Yes	Yes	Yes	Yes	Yes
U.K.	Skye Bridge	Yes	Yes	Yes	No	No
U.K.	Manchester Metrolink	Yes	Yes	Yes	No	No
U.K.	Birmingham Relief Road	Yes	No	Yes	No	Yes
U.S.	Caltrans transport projects	No	No	Yes	Yes	Yes
U.S.	Florida high-speed rail	Yes	No	Yes	Yes	Yes
U.S.	Texas high-speed rail	Yes	No	Yes	Yes	Yes
U.S.	Honolulu high-speed project	Yes	No	Yes	Yes	Yes
U.S.	Arizona transport projects	Yes	No	Yes	Yes	Yes
U.S.	Dulles tolled road	Yes	No	No	Yes	Yes

TABLE 5. Revenue Sharing in Bangkok's 2nd Stage Expressway

Year (1)	Percent of revenues for government (2)	Percent of revenues for Kumagai Gumi (3)	Total (%) (4)
4-12	40	60	100
13-21	50	50	100
22-30	60	40	100

- A proposal that conformed with the conditions and requirements concerning the financial and technical aspects of the proposal as stated in the terms of reference
- Registered capital (equity) was equal to 20% of the project costs as required by the conditions, while the other party's equity was 10%
- Cheaper construction costs
- Sharing of revenues with the government
- Better land use for commercial development with environmental mitigation plan proposal
- An implementation plan that offered full project construction within a specific period

Kumagai initially proposed a 27:73 sharing of revenues, with the 27% for the government. After several rounds of negotiation, it agreed to the sharing as shown in Table 5. It

TABLE 6. Ranking for Bangkok's Skytrain Project

Consortium (1)	Points awarded (out of 100) (2)	Ranking by government (3)
Asia-Euro	89.2	1
Lavalin International	71.7	2
Franco-Japanese	66.7	3

can be seen from the table that Kumagai Gumi substantially reduced its sharing of revenues while the government's share was increased.

In the Skytrain project, the technical solutions provided by Lavalin and Leighton were completely different. Lavalin's proposal was for a light-rail transit system, while Leighton's proposal was a heavy-rail transit system that would carry more passengers. Leighton's proposal was favored by a group of independent consultants sponsored by the U.S. government and their ranking was as shown in Table 6.

The government, however, reached agreement that all three promoters were technically qualified to undertake the Skytrain scheme and it decided to focus on the financial proposals (Samarnphun 1988). In the end, Lavalin was chosen despite the Asia-Euro consortium's proposal being recommended by the consultants as the best technical solution. Lavalin was selected because of its financial package, which included

shouldering all loan and currency risks, whereas other proposals assumed a certain participation by the Thai government in the financing. (Lavalin's financial package was, however, not taken up by the financial lenders due to political turmoil in Thailand at the time the deal was concluded and the concession was subsequently cancelled by the government.)

U.K. BOT Projects

In the three BOT bridge crossing projects in the United Kingdom, namely the Dartford Bridge, the Second Severns Crossing, and the Skye Bridge, the government explicitly announced that the winner must provide the best overall value of money to the government and public. Even though the routes or the structures were not determined or defined during the tendering stage, the projects were studied technically by the government consultants. There were also existing tunnels and bridges that were built many years back. The projects were therefore deemed to be buildable to safety standards for traveling motorists.

During the negotiations for the Dartford Bridge, the governments limited the opportunity of the private sector to gain upside profits by shortening the concession period if the toll revenues were higher than expected and the debt could be paid off faster. There would thus be no excessive profits to the concessionaire. The competition was very keen, with Trafalgar House and several leading European toll operators tendering in all the projects. This led to the promoters proposing very competitive construction costs, tolls, and concession periods. Thus, though the projects are monopolistic and therefore viability is quite certain, the impact of the financial package is greater than the technical solution.

The financing package proposed by Bank of America for all three projects did not include any equity. It was 100% debt financing and the government could take possession of the bridges as soon as the debt is being repaid.

U.S. Projects

In the United States, the financing is perceived by the governments to be the weakest factor in developing high-speed rail projects. This is because the popularity of the mode of transport has not been proven in the United States, and the state governments would not commit any state funds; hence, this is the first time the private sector has been asked to undertake such mammoth projects. The traffic is not robust and revenues are therefore uncertain. The competition was keenly contested by consortiums that consisted of internationally reputable developers, contractors, and operators.

In the Florida high-speed rail project, the Train "Grande Vitesse" (TGV) group proposed 100% debt financing without any equity investment on their part. This was rejected by the government. The winner, Florida High Speed Rail Corporation (FHSRC), on the other hand, proposed an equity and debt financial plan with additional revenues to be captured from the real estate development. (Unfortunately for the concession company, the real estate market collapsed during the fund-raising period and so did the project.) The situation was the same for the Texas high-speed rail project. Texas Fastrac refused to invest any substantial equity and proposed to undertake the project as a turnkey contractor with substantial government support in raising the finances. This was deemed unacceptable to the government. The Texas TGV group, on the other hand, promised to comply with the government's requirements on the financing and was awarded the concession.

ROLE OF INNOVATIVE TECHNICAL SOLUTION

The preceding qualitative analysis of case-study data has concentrated on determining the impact of financial packages versus technical solutions. While the evidence points to a greater impact of financial package in a BOT tender, and this is further supported in the quantitative analysis, the role of an innovative technical solution must not be ignored. Indeed, Tiong et al. (1992) described an imaginative technical solution as one of the six critical success factors in winning the bid for a BOT project. The role of an innovative technical solution was never in question in the tender of the Hong Kong's BOT tunnel projects in spite of the importance attached to the financial package by government. Innovative technical solutions definitely provide the competitive advantage and the following cases illustrate that an innovative technical solution could make an attractive financial package possible.

Sydney Harbor Tunnel Project, Australia

The Sydney Harbor Tunnel project was won by a joint venture of Kumagai Gumi, a Japanese construction company and Transfield, an Australian construction company, in 1986. Of all the other submissions received by the government on the proposed crossing, none was regarded as a suitable option when compared to the immersed tunnel scheme proposed by Kumagai Gumi and Transfield. The idea of a tunnel was not new, but the first proposal failed because it was too expensive for the government to build, and it was politically sensitive because of the amount of private land to be acquired for the project. The Sydney Tunnel proposal was fully engineered and investigated by the joint venture using its own funds, and it offered a simple solution to the traffic congestion. By linking to existing roads at either end of the Sydney Bridge, the tunnel would not need any additional private land and not a single house would need to be abolished (Burke 1989). The proposal attracted strong government support as well as the support of the financial community. As a result, the promoter was able to finance the project using an innovative, all-Australian financing instrument: \$280,000,000 worth of 30-year tunnel bonds. The bonds contained some unusual features that proved to be attractive to the Australian institutional investors: (1) extended maturity that is longer than the usual maturity in the Australian capital market; (2) repayments of principal with quarterly interest installments; and (3) yield of about 6%, indexed to inflation (Tiong 1990).

Eastern Harbor Tunnel Project, Hong Kong

The EHC project was won by a consortium led by Kumagai Gumi in 1985. Kumagai's proposal attracted the Hong Kong government's attention because of its innovative concept of a combined rail and road tunnel to relieve both road congestion and train overcrowding during peak travel periods. Due to physical constraints at the site, the innovative concept of building the world's largest immersed tube unit became a critical component of the engineering proposal and Kumagai's proposal was considered the best solution. This scheme attracted substantial support from the lenders and enabled the promoter to make an attractive financial proposal to the government.

Tate's Cairn Tunnel Project, Hong Kong

The Tate's Cairn Tunnel project was won by a consortium led by Nishimatshu, a Japanese construction company, in 1988. In this project, an innovative method of construction enabled the company to offer a good engineering package, which would allow a short construction time of 37 months, instead of 54 months as originally estimated by the govern-

ment. The opening of the tunnel was accomplished 3 months ahead of the tight schedule. In this case, adits were driven, which allowed excavation to be opened at extra faces (Porter and Matson 1990). These design innovations reduced the construction costs and resulted in an estimated savings of 20% as compared with the conforming scheme required in the tender. As a result, the consortium was supported by financial institutions and was able to offer an attractive financial package of the lowest tolls, and the shortest concession period.

IPCO's Labuan Water Supply Project, Sabah, Malaysia

This was a negotiated BOT contract between the state government in Sabah, Malaysia and IPCO Constructor, a Singapore-based construction company, in 1987. The contract was awarded to IPCO based on its privately initiated proposal, which was more attractive and advantageous than the government's plans. The initial government plan, which was later shelved, was to build a dam in the Labuan Island. It then planned to deliver water from the mainland of Sabah to the island by using conventional large-diameter water pipes. This again failed to proceed because the project costs were too high due to technical difficulties in construction in swampy areas in the mainland. IPCO's innovative and economical design was a critical factor in winning the project. It made use of the experience gained in the oil and gas industry by delivering the water using high-pressure stainless steel pipes that could be laid in the swampy areas. As a result, its proposed construction costs were M\$100,000,000 as compared to the government's estimate of M\$180,000,000, and its proposed construction period was 18 months as compared to the government's estimate of 36 months. The company was also able to charge a tariff that was 50% lower than the government's proposed tariff, as it was confident in its designs and the reduced construction costs (Rabinowe 1992). The plan attracted support from a large local bank and the whole construction costs were underwritten by the bank even before any loan syndication was done.

QUANTITATIVE ANALYSIS OF SURVEY RESPONSES

As part of the research, two sets of questionnaires were developed. One set was entitled "Evaluation of Proposals for BOT Projects" and was targetted at the government officials and their consultants. The other set was entitled "Experiences in Tendering BOT Projects" and was targetted at contractors and project promoters and their financial and technical advisors. The respondents were asked to respond to the questions with reference to a specific BOT project that they were personally involved in.

For the first survey, sent in February, 1992, a total of 30 government officials and their advisors responded out of a total of 75 questionnaires mailed, giving a response rate of 40%. For the second survey, sent in April, 1992, a total of 32 construction professionals and their consultants responded out of a total of 85 questionnaires mailed, giving a response rate of 38%.

Direct Comparison of Views of Governments and Promoters on Financial Package versus Technical Solution

In the surveys, the respondents were specifically asked whether they agreed or disagreed that the ability to provide an attractive financial package has a greater impact in winning the concession than the project's physical design or technical solution. The results, as shown in Table 7, enables a direct comparison of views of governments and promoters on financial package versus technical solution.

TABLE 7. Responses on Hypothesis (Financial Package and Technical Solution)

Response (1)	Government (2)	Promoter (3)
Yes (%)	65	86
No (%)	35	14
Total	100	100

TABLE 8. Distribution of Points for Evaluation Criteria

Criteria group (1)	Average number of points distributed (2)
Financial package	40
Technical solution	33
Other criteria	27
Total	100

Table 7 shows that the majority of the governments and promoters agreed with the hypothesis. It is to be noted that a higher percentage of promoters agreed with the hypothesis as compared with the government respondents.

Weighting Technical and Financial Criteria

In another survey question, the government respondents were asked to weigh five evaluation criteria that are commonly used in BOT tender selection. The five criteria are (1) degree of attractiveness of financial package; (2) financial returns to Government; (3) relative soundness of technical solution for project implementation; (4) relative experience and expertise of the project promoter in similar projects; and (5) degree of environmental impact and any other criteria that should be included.

The respondents were asked to freely distribute points among the criteria according to their relative importance, assuming that a total of 100 points are used in assessing each proposal. The objective is to remove as much subjective bias as possible from the responses. In analysing the results for comparison of financial package and technical solution, the points for criteria 1 and 2 are grouped under one category, "financial package," whereas criteria 3 and 4 are grouped under another category, "technical solution." The mean score of the points for each category is shown in Table 8.

Government Views

It can be seen from Table 8 that, for the government respondents, the financial package has only a slightly higher weight. This can be deduced from their comments. Both parties agreed that the hypothesis holds true provided that the technical solution is satisfactory. The government respondents were of the views that the most attractive financial package in the first round of evaluation may not necessarily be the most cost-effective technical solution and they believe that the technical solution must be settled first before the financing can be considered. Therefore, the technical solution is initially more important. The importance of financing is in the final stage of negotiations and selection, and the impact can then be said to be greater. This is demonstrated in the tendering for the Second Severn Bridge crossing in the United Kingdom, where an inadequate technical solution disqualified a promoter.

Second Severn Crossing

In the case of the Second Severn crossing project, the functional technical requirements of the project were very fully

set out in the tender documents and included long-term maintainability requirements and stringent requirements on structural integrity in relation to resistance to slipping impacts. One promoter chose to disregard these functional requirements and produced what was apparently the most attractive financial package: lowest cost, lowest tolls, and shortest concession period required (14 years including the 4-year construction period). The promoter clearly hoped to get in and out before any latent defects or maintenance costs and with minimum chance of collapse due to ship collision. After discussion with this promoter, the government found that his technical solution was found to be incapable of amendment and it was rejected.

Promoter Views

The promoters also believe that the technical solution must be satisfied. However, it is their belief that this is not difficult. BOT projects are mostly traditional infrastructure projects and not new-technology projects. Governments themselves encourage use of proven technology to minimize any construction or completion risks. Most of the shortlisted consortiums, moreover, are reputable, world-class contractors. They have been prequalified based on their technical qualifications and experience.

Financing, on the other hand, is completely new to them and they have to rely on external financial consultants to assist them in assembling an attractive financial package. Their answers to the hypothesis are also a qualified "yes" as they are aware of the government's requirements of sound technical solution. They, however, believe that their technical solution, if it is not more innovative, could at least match their competitors' proposals. They therefore believe that the technical part could be easily satisfied. And once that is satisfied, the financial package becomes the deciding factor.

CONCLUSIONS

The hypothesis that the ability to provide an attractive financial package has a greater impact in winning the concession than the project's physical design or its technical solution is not strongly supported if it is a political concession such as in the case of the Channel Tunnel. Notwithstanding this, the promoters were still required to provide strong financial commitments. It is not supportable under the following conditions: (1) when a project is technically uncertain; and (2) where there is commercial freedom for promoters. Examples of these projects are the Caltrans projects where the government's main concern is the efficiency of the technical solution in providing the needed transportation service.

The hypothesis is certainly supportable when the following conditions are met: (1) a project is technically certain; (2) the government's main concern is the tolls or the tariff that the public or the government has to pay; (3) there is keen competition; (4) the project viability is uncertain; and (5) the financing is uncertain.

In a BOT project, the level of tolls or tariff is the central issue of negotiations around which the other financial parameters revolve. The tolls must be politically acceptable, that is, perceived as "reasonable" or even "low" by the government and the public, yet they must be sensitive to the rates of return that investors and lenders must earn to justify their investments. They must be flexible enough to provide comfort to the government that the project can successfully "grow" with future demand and yet accurately reflect and support the costs of operation and supply of capital, both initial and ongoing.

Governments therefore want the best deal for themselves and at the same time they want the promoters to make sure

that the project is financeable. Achieving a balanced financial package that can provide the finance to the technical solution and promise acceptable tolls requires special knowledge and experience. An attractive financial package is certainly attractive to the governments and certainly has a greater impact in winning the concession than the technical solution. In spite of this finding, promoters must not ignore the role of an innovative technical solution. An innovative technical solution has in fact shown to be important in several cases studied, as it made an attractive financial package possible.

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