

Financial Viability Analysis of Bridge Construction Project—A Case Study of Hyderabad Toll way Private Limited

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Abstract

Project investment decisions are one of the most important decisions taken in the organizations. Successful organizations are successful today because of the past successful project investment decisions. They have long term impact and mostly irreversible. One wrong decision will have impact on the survival and sustainability of the entire organization. Hence, it is very important to consider various facets of these decisions at the beginning itself. One of the most important aspects is studying the financial viability. The case study attempts to present one of such decision in construction industry and also tries to analyse the financial viability of the project by applying various criteria like NPV, IRR etc.

Keywords: Back Period, Cash Flows, IRR, NPV, Pay SPV etc.

1. Introduction

Hyderabad Tollway Pvt. Limited Company is a Special Purpose Vehicle (SPV) incorporated in the year 2015 by a group of overseas and Indian promoters after being awarded by National High Authority India (NHAI) with a 20-year concession to Design, Build, Operate and Transfer (DBOT) bridge in the heart of the city Hyderabad connecting industrial areas and residential areas in City. The DBOT project is essentially a form of leasing, where the government allows a private entrepreneur (SPV in this case) to design, finance and build an infrastructure facility. In return, the SPV is permitted to collect tolls and operate the facility for a specified period (the concession period), during which the SPV is expected to recover all of its costs and earn a reasonable profit. This arrangement is meant to facilitate the implementation of capital-intensive infrastructure projects by the government with funds from outside the budget allocation and at the same time, transferring the risks involved to the private sector. The Financial Closure of the DBOT project was achieved in March 2016 and the Design and Construction was commenced on 1st April 2016. The Project is expected to be completed on 31st March, 2016 and will be put to commercial operations from 1st April, 2019.

Mr. Rajan is one of the promoters and also the chief executive officer of the company. He is analyzing

the viability of the bridge construction project which the company wants to work on provided that it yields profit. The project is accepted based on the preliminary screening in the initial phase of selection process. Now, it is the time where the in depth financial analysis of the projects is to be carried out. In fact, in the month of March, 2019, meeting of board of directors is scheduled where the CEO is expected to present the viability of the project to the members. The project will require an investment of Rs 5000 crores which is proposed to be financed by way of equity and borrowings. Mr. Rajan is supposed to present before the board members the financial viability or otherwise of the project for the company.

2. Design Highlight

The Geometric Standards and the Specifications are mostly based on the standards of Indian Road Congress (IRC) and Ministry of Surface Transport (MOST)

Maximum Design Speed: 45 Kmph

Minimum Sight Distance: 80 meters

Seismic Force: Seismic Force as per IRC: 6-2000 for Zone-III has been considered

Foundation Details of Main Bridge: Diameter of River Well – 11 meters

: Maximum Depth of Well – 50 meters from Bed Level

: Type of the Pier – 800mm thick Hollow Section

Main Bridge: 780 meters Long Single – Plane Multi-Span Extra dosed Cable supported Bridge of 29 meters width, Depth 3.2 meters and Length 3.37 meters Segment for 6-Lane Carriageway weighing maximum 150 MT (approx.)

Expansion Joint: 120 meters centre to centre Modular Type with Steel Beam at Mid Span expansion joint location with Strip Seals.

3. Construction Highlight

Construction technique adopted for Foundation: Underwater well sinking for maximum depth of 60 meters within steel caissons.

All types of civil construction like: Well Foundation, Pile Foundation, Retaining wall, Segment Casting and Erection, Road Over Bridge (ROB), Road Under Bridge (RUB), Tunnels, Roads, Buildings, Culverts, Under Pass etc. was involved in the Project.

The construction of RUBs by Box pushing method (BPM) was done without blocking the existing Main Railway Line running above.

4. Infrastructural Advantages

The Bridge is an infrastructure project which connects roads. Most of the economic benefits are derived from transportation economics (in the form of fuel saving and maintenance) leading to overall financial boost of the region or country as a significant development model. The Toll way is supposed to provide multiple benefits of connectivity in the region. The project has drastically reduced the travel time. The Project will lead to a substantial economic growth of the region that directly hinges on the connectivity aspect of the bridge. The project is expected to serve as a catalyst for economic growth of the region.

5. Financial Analysis

- Project is expected to cost Rs 5000 crores. It is planned to be financed by equity and borrowing.
- The net cash flow during the construction period (2016-2019) is negative as there will not be any inflow

but fixed interest on loan is to be paid. It is positive during the operation period (2019-2039).

- It is agreed that the SPV will be started with an equity of 2000 crores to be provided by the sponsors and rest would be borrowed from a leading financial institutions. This arrangement will make debt equity ratio to be 3:2. Interest on loan is expected to be 12% p.a. to be paid semiannually at the end of September and March. Loan is taken on 1st April 2016.
- The loan is to be repaid in five equal installments starting from 16th year of the project (reckoned from the date of operation). It is expected that the project would generate enough cash flows in the latter phase so as to repay lender from 16th year of the project.
- Annual Operation and Maintenance cost is expected to be 2.5% p.a. of project cost. In addition to this, there will a periodic maintenance at the end of every five years starting from 5th year of operation. The annual operation and maintenance cost is expected to increase 2% annually in next 5 years and thereafter it will increase by 1%.
- After the completion of construction on 31st march, 2019, revenue is generated from toll from vehicles during the operation period, which is fixed based on technical viability of the project. Toll revenue is expected to be 8% of project cost in first year i.e. by the end of March, 2020. It is also supposed to increase 10% annually over previous year up to 2028 and thereafter it will increase by 5%.
- Depreciation means allocation of project cost over the life of the project. It only reduces taxable income and provides an annual tax advantage equal to the product of depreciation and the (marginal) tax rate, but it does not lead to a cash outflow from the company. The most common method for depreciation is straight-line depreciation. Under this method, annual depreciation equals a constant proportion of the initial investment. It is assumed that the project cost of Rs 5000 crores is to be written off over the 20 years which is the life of the project.
- Corporate Tax rate is 34%.

Financial viability is an important consideration for any project before it is undertaken by any private entity as it has a direct impact on their sustainability. Financial viability can be defined as the ability of an entity to continue to achieve its operating objectives and fulfill its mission over the long term. A private entity would be interested to undertake a project only when it adds to their profitability. Financial viability is a test of that ability. A DBOT infrastructure

project can be considered as financially viable, when the following conditions are simultaneously fulfilled:

- The Net Present Value (NPV) for the project should be positive. The discount rate for financial analysis may sometimes include a premium for risk over the current commercial lending rate.
- The financial IRR should have a value greater than the discount rate.
- The cash flow (liquidity position) in each year of the concession period should be satisfactory. That means the cash balance at the end of every year should be positive.
- Payback period/Breakdown year should be less than the concession period.

6. Questions for Discussion

1. Comment on the financial viability of the project by taking into account the following measures assuming a discount rate of 12%:
 - a. NPV
 - b. Payback period
 - c. Discounted payback period
 - d. Profitability Index
 - e. Project IRR
 - f. Equity IRR
2. If the maintenance cost goes up by 50% from 1st year and expected revenue is 6%, how would these affect the financial viability of the project?

Teaching Notes

Working Notes

Cash Flow Estimate for the project
(From 2017 to 2024)

	2017	2018	2019	2020	2021	2022	2023	2024
Toll Revenue				400.00	440.00	484.00	532.40	585.64
Less: Operation & Maintenance				125.00	127.50	130.05	132.65	135.30
Interest on Loan	360.00	360.00	360.00	360.00	360.00	360.00	360.00	360.00
Depreciation				250.00	250.00	250.00	250.00	250.00
PBT	-360.00	-360.00	-360.00	-335.00	-297.50	-256.05	-210.25	-159.66
Less: Tax	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
PAT	-360.00	-360.00	-360.00	-335.00	-297.50	-256.05	-210.25	-159.66
Repayment of loan								
Project Cash Flow	-360.00	-360.00	-360.00	-85.00	-47.50	-6.05	39.75	90.34
Equity Cash Flow	-597.60	-597.60	-597.60	-322.60	-285.10	-243.65	-197.85	-147.26

Cash Flow Estimates for the project
(From 2025 to 20233)

	2025	2026	2027	2028	2029	2030	2031	2032	2033
Toll Revenue	644.20	708.62	779.49	857.44	900.31	945.32	992.59	1042.22	1094.33
Less: Operation & Maintenance	138.01	139.39	140.78	142.19	143.61	145.05	146.50	147.97	149.45
Interest on Loan	360.00	360.00	360.00	360.00	360.00	360.00	360.00	360.00	360.00
Depreciation	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00	250.00
PBT	-103.81	-40.77	28.70	105.24	146.69	190.27	236.09	284.25	334.88
Less: Tax	0.00	0.00	9.76	35.78	49.88	64.69	80.27	96.65	113.86
PAT	-103.81	-40.77	28.70	105.24	146.69	180.51	200.31	234.38	270.19
Repayment of loan									
Project Cash Flow	146.19	209.23	278.70	355.24	396.69	430.51	450.31	484.38	520.19
Equity Cash Flow	-91.41	-28.37	41.10	117.64	159.09	192.91	212.71	246.78	282.59

Cash flow Estimates for the project
(From 2034 to 2039)

	2034	2035	2036	2037	2038	2039
Toll Revenue	1149.05	1206.50	1266.82	1330.16	1396.67	1466.51
Less: Operation & Maintenance	150.94	152.45	153.97	155.51	157.07	158.64

(Continued)

	2034	2035	2036	2037	2038	2039
Interest on Loan	360.00	360.00	288.00	216.00	144.00	72.00
Depreciation	250.00	250.00	250.00	250.00	250.00	250.00
PBT	388.11	444.05	574.85	708.65	845.60	985.87
Less: Tax	131.96	150.98	195.45	240.94	287.51	335.19
PAT	307.84	347.40	460.99	576.69	694.63	790.42
Repayment of loan		960.00	888.00	816.00	744.00	672.00
Project Cash Flow	557.84	597.40	710.99	826.69	944.63	1040.42
Equity Cash Flow	320.24	-600.20	-367.09	-131.87	105.59	320.90

All these estimates are made in excel sheet.

Suggested Answer to Question No. 1

a. Net present value is the difference between present value of future cash flow and the initial cash outlay. For this, we are considering project cash flow calculated in the previous page.

Present value of FCF	(INR 1,519.25)
Initial Outlay	INR 5,000.00
NPV	(INR 6,519.25)

Net present value is negative. Hence, it can be said that the project will not be profitable for the company. Under the present forecasts, the project does not look financially viable.

b. Payback period is the time taken to recover initial investment. For this, we need to calculate cumulative cash flow and identify the time where the initial investment get recovered. The project will recover the initial investment between 2038 and 2039.

Payback period 21.87 Years
If we consider concession period only, then it will break even in between 18 and 19 years.

c. Discounted payback period considers time value of money. It is calculated as below
If we consider time value of money, then this project will never be able to recover its initial investment of Rs 2500 crores.

d. Profitability index = Present value of cash inflows/ initial outlay	
Present value of cash inflow	130.09
Initial outlay	5000
Profitability Index	2.60%

So, the above calculation shows that for every 100 rupees investment in the project, cost recovered is only Rs. 2.6.

e. 5. Project IRR	1.53%	IRR is calculated using IRR function in excel
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f. Equity IRR is negative. It cannot be calculated. Based on the above estimates, we can that the project is not very viable financially.

Suggested Answer to Question No. 2

If maintenance cost goes up by 20% and projected revenue is 6% instead of 8%, then project will not be financial viable at all.

7. References

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