Screening of PPP Projects for Financial Feasibility

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Presentation Outline

• How do you know whether a PPP project can attract private investors?
• Some usual financial indicators
• Demonstration of the WB/PPIAF Toolkit for PPP in Highways
• Workshop: Group exercise to screen a PPP project for financial feasibility
• Presentations and discussions of the group exercise
How can PPP projects attract private investors?

- Risks and profit must be competitive with other investment alternatives
- Some usual indicators: Project Financial Internal Rate of Return (FIRR), Return on Equity (ROE), Debt Service Cover Ratio (DSCR), Loan Life Cover Ratio (LLCR)
- The Toolkit Financial Simulation Model (Excel files, graphical and numerical format) is an excellent tool for preliminary scrutiny of PPP projects
Indexes (or ratios) calculated by the financial simulation tools

- ADSCR (Annual Debt Service Coverage Ratio)
- LLCR (Loan Life Coverage Ratio)
- Equity IRR (Internal Rate of Return) or ROE (Return On Equity)
- Project Financial IRR
- Project NPV (Net Present Value) = PV of VAT - PV of subsidies
Toolkit Financial Models

- **Purpose**
  - Familiarization of non-financial specialists with the basics of project finance and financial simulations for a (highway) PPP project
  - Better understanding of key parameters which affect the financial viability of a PPP project
  - Preliminary scrutiny of PPP projects

- **Limits**
  - Simplified financial models: graphical and numerical versions
  - Specific project assessment requires detailed financial models prepared by experienced financial practitioners
Graphical Model

• The model represents the main financial features of a project company in graphic form and their sensitivity to a range of 14 key assumptions.

• The graphs change according to the key project assumptions:
  • Cash Flow graph
  • Debt graph
  • Dividends graph
Numerical Model

- The model provides financial statements by a potential concessionaire to analyze the construction and operation of a highway concession under a Build-Operate-Transfer (BOT) scheme.
- The Assumptions sheet of the model contains all the key parameters and data input as determined by the user.
- The assumptions of the model make it possible to perform an initial project analysis at pre-feasibility level.
- The financial model is not a banking model and is not intended to provide project-specific financial modeling.
Project Financial Internal Rate of Return (IRR)

\[
\sum_{i=\text{first year of construction}}^{\text{end of the concession}} \frac{(OCFBF)_i}{(1 + IRR)_i} = 0
\]

i = year
OCFBF = Operating Cash Flow Before Financing
Debt Service Cover Ratio (DSCR)

\[
DSCR_{n} = \frac{\left( CAFDS \right)_{n}}{\sum_{i=1}^{3} (Debt\ Service)_{i,n}}
\]

where
- \(i\) = number of loan tranches, \(1 \leq i \leq 3\)
- \(n\) = current year
- \((Debt Service)_{i,n}\) = (Principal) \(i,n\) + (Interest) \(i,n\)
- \(CAFDS\) = Cash Available for Debt Service
Return on Equity (ROE)

Where:

Equity injected\(_i\) is the equity provided by the sponsors in year \(i\)

Dividends\(_i\) are the dividends distributed to shareholders in year \(i\)
Present Value of Tax (VAT)

\[
NPV_{on\,VAT} = \sum_{i=1}^{\text{end of concession}} \frac{(VAT)_i}{(1 + r + \text{infl})^{i-\text{year of operation}}} - \sum_{n=1}^{\text{DebtService, n}}
\]

where:
Infl is the inflation rate for the year of study
r is the real interest rate
[Nominal interest rate = real interest rate + inflation rate]
Minimum Toll Rate to Attract Private Investment for a PPP Project

Construction cost, $ million/km

$/km

5,000 vpd
10,000 vpd
15,000 vpd
20,000 vpd
## Basic Assumptions Used to Estimate the Minimum Toll Rate to Attract Private Investors for a PPP Project

- The feasibility study showed that the project is economically feasible
- Concession term: 20 yrs
- **Construction Cost**: $1mil/km to $5mil/km
- Operation cost: $500,000/km/yr
- Equity: 14%
- Subsidies: 0
- Interest rate: 5%/yr
- Grace period: 4 yrs
- Repayment period: 14 years

- Initial traffic: 5,000 vpd to 20,000 vpd
- Traffic growth: 3%
- Inflation: 6%
- Tax: 18%
- IRR ≥ 12%
- ROE ≥ 16%
- LLCR ≥ 1.1
- DSCR ≥ 1.1
- Discount rate: 10%
Workshop Numerical Exercise

• This exercise’s objective is to train participants in the use of the graphical and numerical financial simulation models.

• Following completion of the exercise, the participants should be able to work on several issues, such as the main factors defining the minimum toll rate (or minimum availability payment) required for a PPP project to attract private investors.
Instructions to Participants

- Please form groups of 3 to 5 members
- Groups will be numbered 1 to n
- Each group will be given basic data for a proposed PPP project and will be asked questions on the financial assessment of the project
- Please choose the group member who will make a brief presentation of your group’s results, after deliberations
- Please note that a previous study has concluded that the project is economically justified
- Because of time limitation, please consider questions 9 and 10 as optional
Basic data to be used by the working groups:

- **Concession term**: 30 years
- **Construction Cost**: US$210 million
- **Road length**: 30.0 km
- **Four-year construction**:
  - Year 1: 15%
  - Year 2: 30%
  - Year 3: 30%
  - Year 4: 25%
- **Operating expenses**: $10.0 million per year (at opening year); there are no variable expenses
- **Equity**: 30%; **Subsidies**: 0
- **Real interest rate**: 5% per year
- **Loan grace period**: 4 years
- **Loan repayment period**: 27 years
- **Discount rate**: 12%
Basic data to be used by the working groups (cont’d):

- Initial daily traffic (opening year), vehicles/day:
  - Group x: AADT = 5,000x, where x is the group number
- Traffic composition: cars, 70%; trucks, 25%; and buses, 5%
- Traffic growth: 3% per year
- Inflation: 5% per year
- Tax rate, VAT: 20%
- Project Financial Internal Rate of Return: IRR ≥ 12%
- Return on Equity: ROE ≥ 14%
- Loan Life Cover Ratio: LLCR ≥ 1.2
- Annual Debt Service Cover Ratio: ADSCR ≥ 1.2
- Please use the Graphical Model default values as required
Questions to each working group:

1. Please estimate the minimum car, truck and bus toll rates, in $/veh-km, for the project to be able to attract private sponsors. Please assume the following relations between toll rates:
   - Average truck toll rate = 3 x car toll rate
   - Average bus toll rate = 2 x car toll rate
   - The toll rate in the graphical model is the weighted average toll rate, WATR
     \[ WATR = \left( \frac{\%C \times TR_c + \%T \times TR_t + \%B \times TR_b}{100} \right) \]
   - %C, %T, %B = % of cars, trucks and buses in the traffic flow

2. If the initial average annual daily traffic (AADT) increases by 10%, what will be the effect on the minimum toll rate?
Questions to each working group (cont’d)

3. Are the toll rates estimated in the previous questions realistic for your country or countries? If not, please estimate the minimum required amount of government contribution to the capital cost of the project (i.e., subsidies) that would lead to more acceptable (affordable) toll rates.
Questions to each working group (cont’d)

4. What is the amount of subsidy the government should provide for the project to be fiscally neutral to the government?

5. How does the project financial internal rate of return (IRR) vary with the amount of subsidies? Is IRR independent from the financial structure (i.e., proportion of subsidies, equity, and credit)?

6. Is the return on equity (ROE) directly influenced by subsidies? Ceteris paribus, what would be the impact on ROE of an increase in subsidies from 0 to 10%?
Questions to each working group (cont’d)

7. In case there is no political support to charge actual tolls to road users, alternative approaches could include shadow tolls or availability fees. Assuming there will be no capital grants (i.e., no subsidies during construction), please estimate the minimum annual required payment by the government (availability fee, or availability payment, or annuity) during the first year of operation. How would you estimate the availability payment required in subsequent years?

Availability payment = 365 * AADT * WATR

8. What financial criteria would you use in the bidding documents, so as to facilitate the evaluation of financial proposals in the case of competitive selection of concessionaires?
Questions to each working group (cont’d)

9. Time permitting, please work with the numerical financial simulation model to answer the above questions. In your view, what are the pros and cons of the two models?

10. Module 5 of the Toolkit for PPP in Roads and Highways describes the five key stages to launch a PPP project. In which one (or ones) of these stages would you recommend to carry out a financial assessment of the project?
Allocation of Risks

- Traditional Outsourcing
- Performance-based Contracts
- Availability Payments
- Shadow Tolls
- Toll Road BOT
- BOO

Decreasing Public Risks, Increasing Private Risks
I'm sure glad the hole isn't in our end...
Thank you!
Main Stages to Launch a PPP Project

• Stage 1: Identification, Prioritization and Selection of the PPP Project

• Stage 2: Due Diligence and Feasibility Studies: includes activities and studies to ensure the selected project is well designed and can be successfully tendered and implemented

• Stage 3: Procurement: includes prequalification of bidders and the bidding and bid evaluation process, and a section on Unsolicited Bids

• Stage 4: Contract Award: gives advice on dealing with the preferred bidder(s)

• Stage 5: Contract Management: deals with the construction and operation periods of a project including transfer back if relevant
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Cesar Queiroz is an international consultant on roads and transport infrastructure, with main interest in public-private partnerships (PPP) in infrastructure, road management and development, performance-based contracts, port rehabilitation, improving governance, quality assurance and evaluation, research, teaching and training. Between 1986 and 2006, he held several positions with the World Bank in Washington, D.C., including principal highway engineer, lead highway engineer, and highway advisor. Prior to joining the World Bank, Cesar was the deputy director of the Brazilian Road Research Institute in Rio de Janeiro. He holds a Ph.D. in civil engineering from the University of Texas, USA, and a M.Sc. in Production Engineering from the Federal University of Rio de Janeiro. Cesar has published more than 130 papers and articles, and is a co-author of two World Bank main publications, the “Toolkit for PPP in Highways” and the “Resource Guide for Performance-based Contracting.” His recent countries of assignment include Russia, Brazil, Latvia, Lithuania, Poland, Ukraine, Philippines, Sweden, Norway, Egypt, Saudi Arabia.