



P3 Evaluation: Financial Assessment

P3-VALUE Webinar – March 13, 2014

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P3-VALUE Webinars

- **P3-VALUE:** Suite of four integrated analytical tools and supporting documentation to help practitioners understand processes used to quantitatively evaluate P3 options
- This is the last of four webinars on P3-VALUE
 - P3 Evaluation Overview (September 5, 2013)
 - P3 Project Risk Assessment (September 20, 2013)
 - Value for Money Analysis (January 23, 2014)
 - **Financial Structuring and Assessment** (today)
 - Recordings for P3-VALUE webinars are available at:
http://www.fhwa.dot.gov/ipd/p3/toolkit/p3_value_webinars/index.htm/

P3-VALUE Tools

■ Risk Assessment Tool

- Identifies risks, risk allocation, risk response strategies, potential cost and schedule impacts (September 20, 2013 webinar)

■ Public Sector Comparator (PSC) Tool

- Calculates risk-adjusted life-cycle costs of conventional procurement (January 23, 2014 webinar)

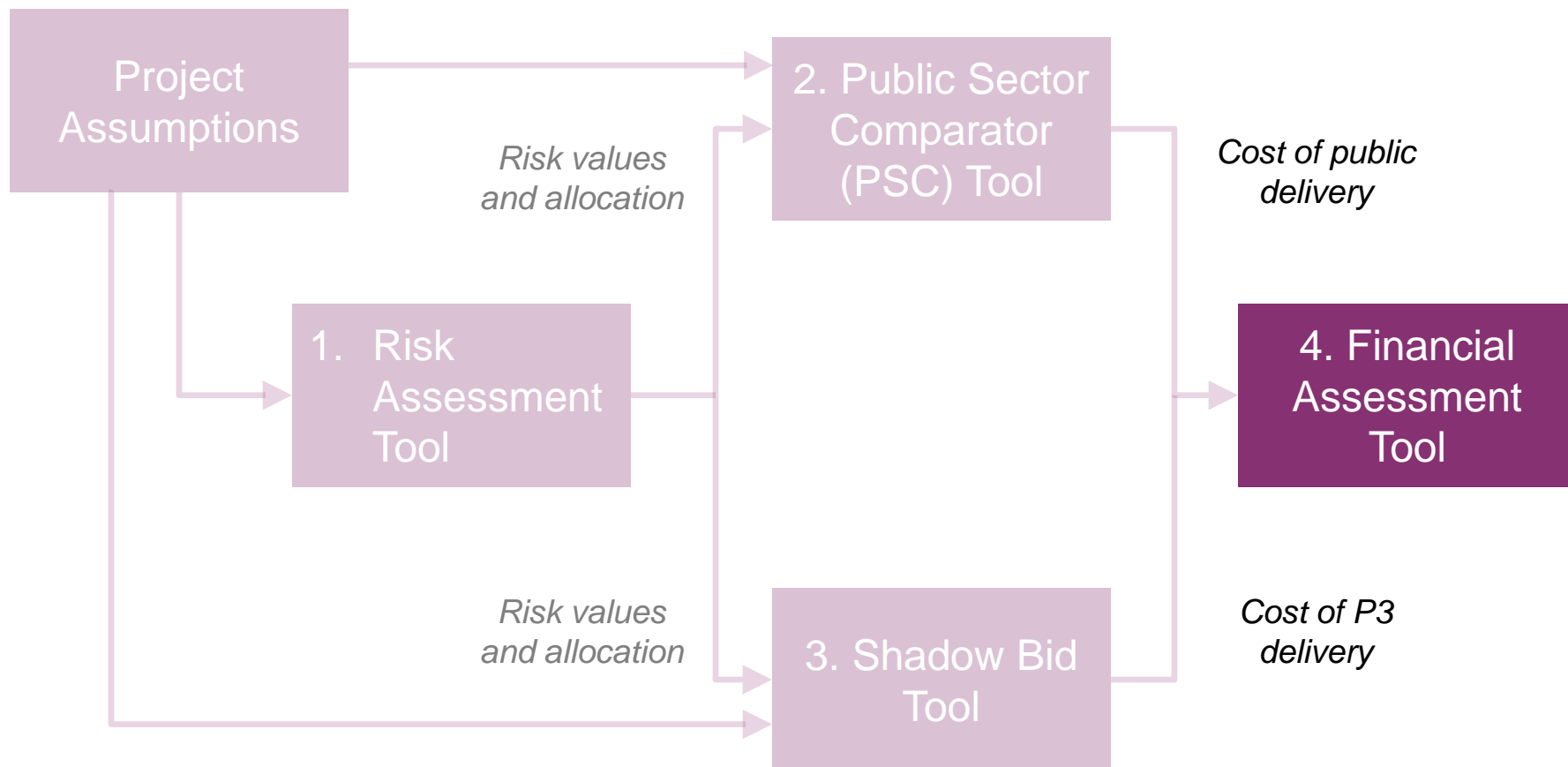
■ Shadow Bid Tool

- Calculates costs of P3 procurement, including payments to private partner (January 23, 2014 webinar)

■ Financial Assessment Tool

- Assists in assessing financial viability from the public agency's perspective (today's webinar)

P3-VALUE Tools





Course Outline

- [Lesson 1](#) P3 Financial Structure
- [Lesson 2](#) Financial Models
- [Lesson 3](#) Simple Illustration of a Financial Model
- [Lesson 4](#) Financial Assessment - Public Agency Perspective
- [Lesson 5](#) Financial Assessment – Lenders Perspective
- [Lesson 6](#) Financial Assessment – Concessionaire Perspective

[Summary](#)

For an *Introduction to P3s*, please review FHWA's *Public–Private Partnership Concessions for Highway Projects: A Primer* at: <http://www.fhwa.dot.gov/ipd/p3/resources/#fhwa> Or review the *Introduction to P3s* webinar recording on the topic at: http://www.fhwa.dot.gov/ipd/p3/resources/intro_p3.htm

Course Objectives

After taking this course you should be able to:

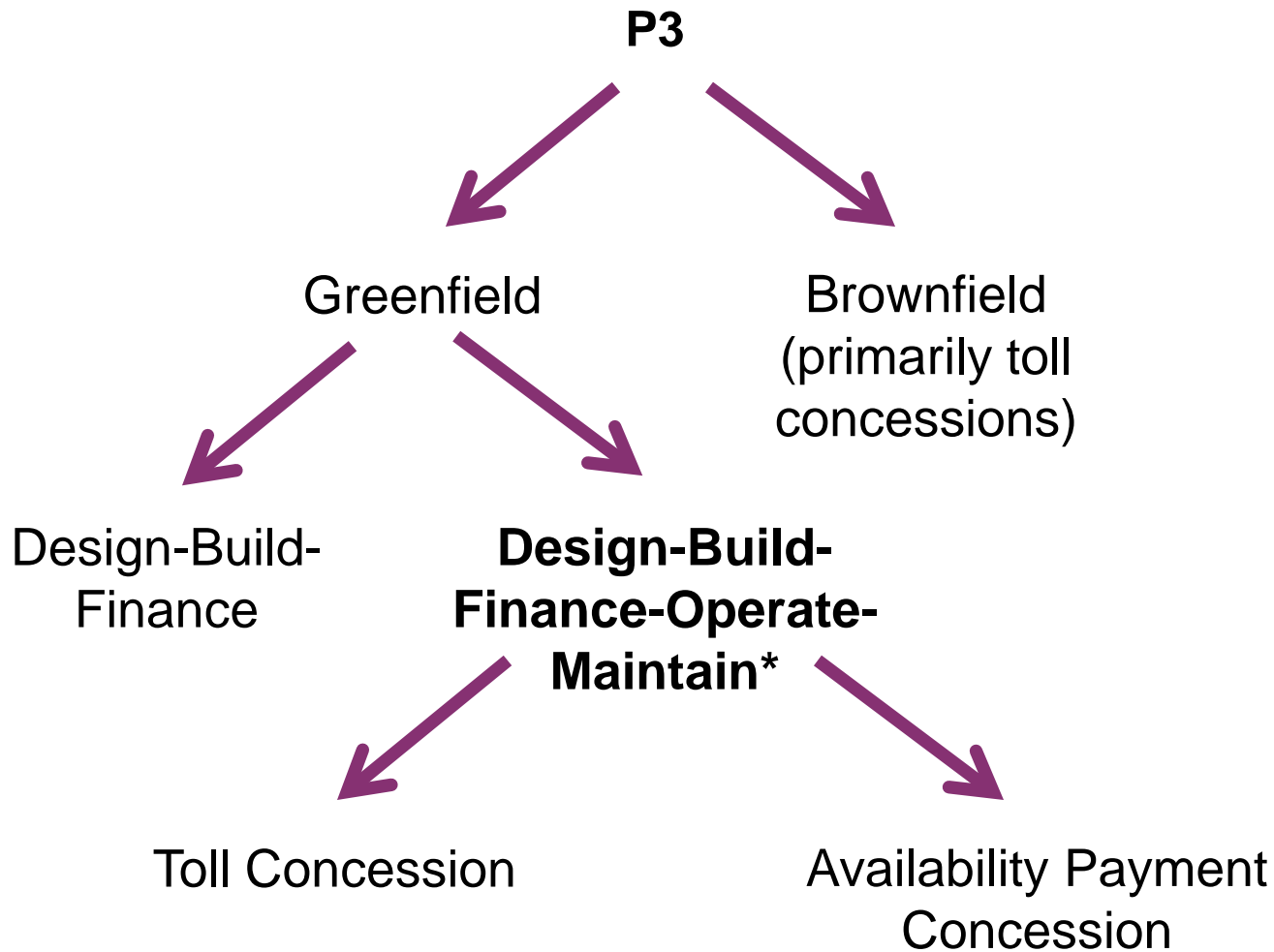
- Explain how P3s are structured
- Describe the role of financial models, and list key inputs and outputs
- Describe the key metrics and processes used to evaluate the financial viability of a project from the perspectives of (1) public agencies, (2) lenders, and (3) concessionaires
- Describe the outputs from P3-VALUE's Financial Assessment tool



Lesson 1

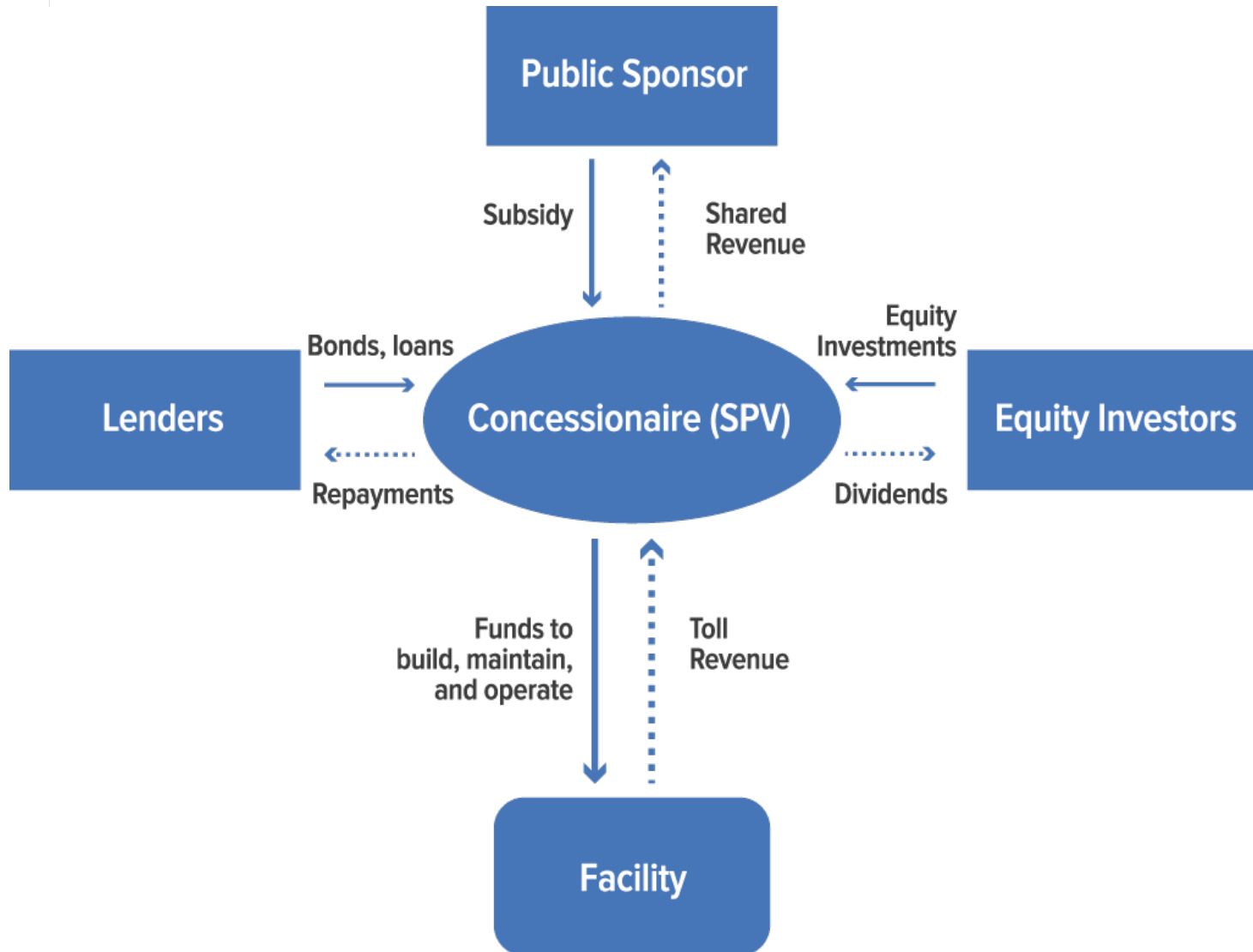
P3 Financial Structure

Common Types of P3s



*Focus of P3-VALUE tools

Typical Toll Concession Financing Structure



Project Finance

- **Financing** is the method by which an investment in an asset is paid for:
 - A temporary provision of funds in exchange for a return paid to investors from future revenues
 - It involves “rearranging” future revenues over a defined period of time so that they can be used to fund a project today

- **Project Finance** is a type of financing:
 - For any asset that has an expected future revenue stream generated from a project (or committed by a public agency to private investors) as the means for repaying the upfront investment
 - Also known as **non-recourse financing** –the project’s lenders have no recourse or only limited recourse to the shareholders in the event of default on the debt



Repayment – Typical Cash Flow Waterfall



Project Revenues



Revenue Fund

Operation & Maintenance Expenses

Operations & Maintenance Reserve Fund

Senior Debt Service Payments and Reserve Fund

Subordinate Debt Service Payments and Reserve Fund

Rehabilitation & Reconstruction Reserve Fund

Return on Equity



Sources of P3 Project Revenue

- Facility revenues:
 - Tolls from users
 - Ancillary Revenue – e.g., fees from advertising
- Public agency subsidies:
 - Availability Payments
 - Shadow tolls
 - Progress payments and completion payments
- Revenue sources for public agency subsidies:
 - Tolls, general taxation, or value capture strategies (from project beneficiaries)

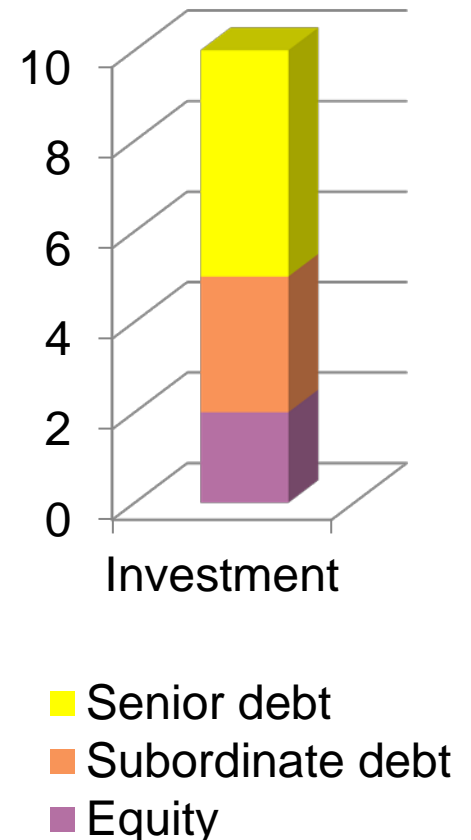


Sources of P3 Project Financing

- Equity
 - Infrastructure development companies
 - Investment banks
 - Infrastructure funds
 - Pension funds, foundations, insurance companies, etc.
- Debt
 - Loans
 - Private bank loans
 - TIFIA
 - State Infrastructure Bank (SIB) loans; Section 129 loans
 - Bonds
 - Private Activity Bonds (PABs)
 - Corporate bonds
 - Project revenue bonds

P3 Project Debt

- Lenders are paid before equity investors
 - Equity is “taken out” first in case of bankruptcy,
- But:
 - They require lower rates of return than equity
 - Their rate of return is fixed - There is no upside potential
- Interest rates vary depending on:
 - Project risk profile (e.g., revenue risk, brownfield vs. greenfield)
 - Tax exemptions
 - Private lenders vs. government (e.g., TIFIA)
 - Market demand



Private Equity

- Equity investors assume the highest risks
- Equity's rate of return is not fixed:
 - It depends on the project's net cash flows after debt service costs are paid
 - There is upside potential
 - They could also lose their entire investment (e.g., in case of a default on debt)
- Equity investment is needed to attract private debt – the ratio of debt to equity is called **leverage**



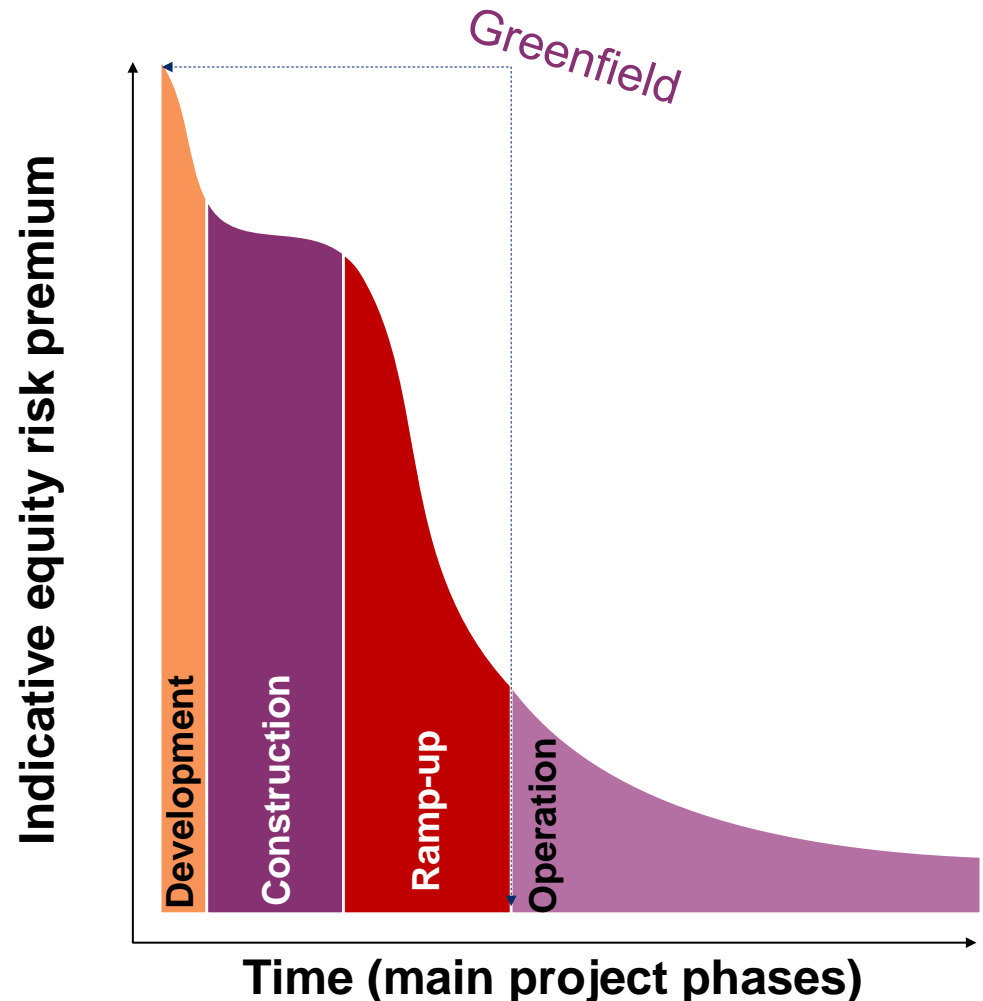
Impact of Leverage on Revenue Required

- Leverage (debt-to-equity ratio, a.k.a. “gearing” ratio) is lower on high risk projects (e.g., toll concessions)
- Equity investors in a concession attempt to maximize leverage, while still ensuring an investment grade rating

| | Low leverage | High leverage |
|--|--------------|---------------|
| Project cost (millions) | \$1,000 | \$1,000 |
| (a) Debt | \$500 | \$900 |
| (b) Equity | \$500 | \$100 |
| (c) Required return on equity: (b) x 15% | \$75 | \$15 |
| (d) Annual interest rate on debt | 5% | 6% |
| (e) Interest payment: (a) x (d) | \$25 | \$54 |
| Revenue required: (c) + (e) | \$100 | \$69 |

Note: Interest rate can be much higher with high leverage. This simplified example assumes “bullet” repayments of the principal on debt and the equity investment at the end of the concession term.

- This graph is representative of total financing costs, because leverage increases over time
- Some equity investors may invest only after construction is complete and revenue has stabilized to lower their risk exposure





Test Your Knowledge

True or False:

Project financing is only possible if a revenue source exists to repay debt and equity.

Questions?

Submit a question using the chat box





Lesson 2

Financial Models

Types of Financial Assessment

- **Procurement Evaluation (Value for Money Analysis):**
 - Would P3 procurement add value relative to conventional procurement?
 - Which of several P3 options would add most value?
- **Financial Viability Evaluation**
 - **From a public agency's perspective:** Is the project affordable to the government, i.e., are any needed public subsidies acceptable and is the government willing/able to fund or borrow the amount required and is it willing/able to charge the user fees required?
 - **From the lenders' perspective:** Is the project bankable?
 - **From the equity investor's perspective:** Is the project profitable?



Financial Viability Assessment

- Also called “Financial Feasibility” assessment
- Uses financial modeling, which considers project costs, revenues and financing over a defined period in the form of “cash flows”
- Modeling is primarily used by:
 - **Public agencies** – for affordability assessment
 - **Lenders** – to evaluate debt capacity and for “stress” testing under extreme scenarios , e.g., higher than expected costs and lower than expected revenues
 - **Concessionaires** – to determine capacity for equity investment and bid price
- Financial modeling involves “discounting” of cash flows

Discounting Cash Flows

- **Present Value:** A metric for determining the time- adjusted (and risk-adjusted) value of project costs and revenues
- **Discount rate** is a percentage by which a cash flow element in the future is reduced per year, applied exponentially
 - An exchange rate between present and future cash flows
 - Represents required rate of return for an investment over time
 - Accounts for time value of money (price of delayed consumption)
 - Can also be used to account for uncertainty in future cash flows – one “certain” dollar is worth more than one uncertain dollar
 - However, need to know whether uncertainties are already accounted for in the cash flows



Calculating Nominal Discount Rate

■ Real Discount Rate:

- Applied to “real” cash flows, i.e., cash flows in today’s dollars that do not account for inflation
- Generally used in economic evaluation

■ Nominal Discount Rate:

- Applied to “year of expenditure (YOE)” cash flows, i.e., cash flows in YOE dollars
- Accounts for inflation as well as “real” time value
- Generally used in financial evaluation

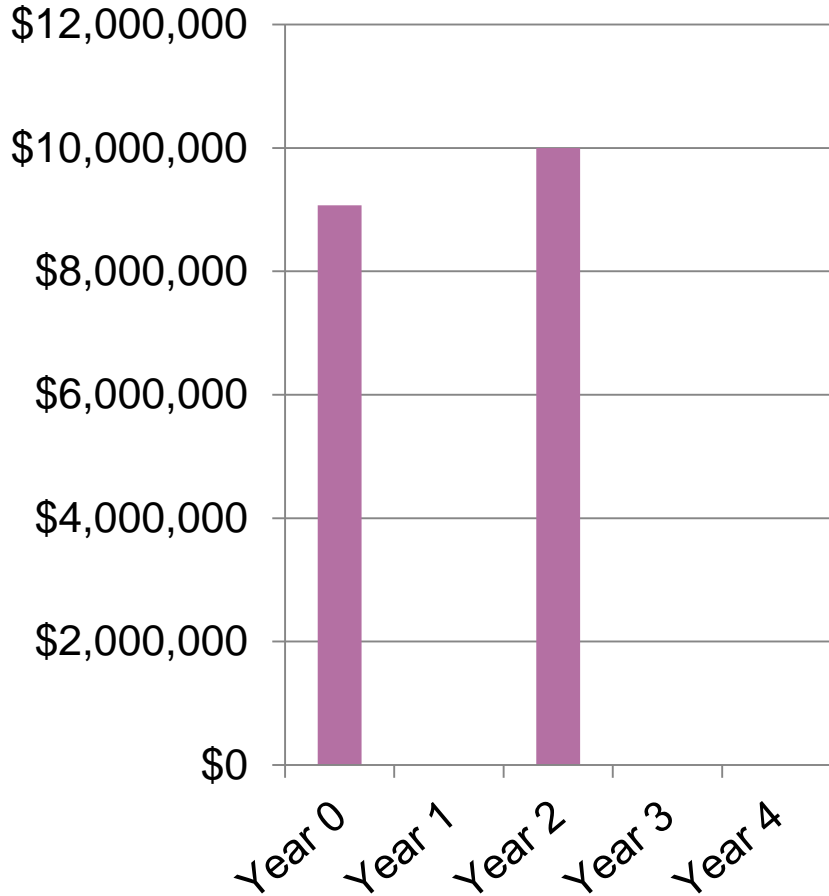
■ Relationship between real and nominal discount rate:

- Nominal rate = $(1 + \text{real rate}) \times (1 + \text{inflation rate}) - 1$
- Example: $(1 + 6\%) \times (1 + 2.5\%) - 1 = 8.65\%$
Where real rate = 6% and inflation rate = 2.5%

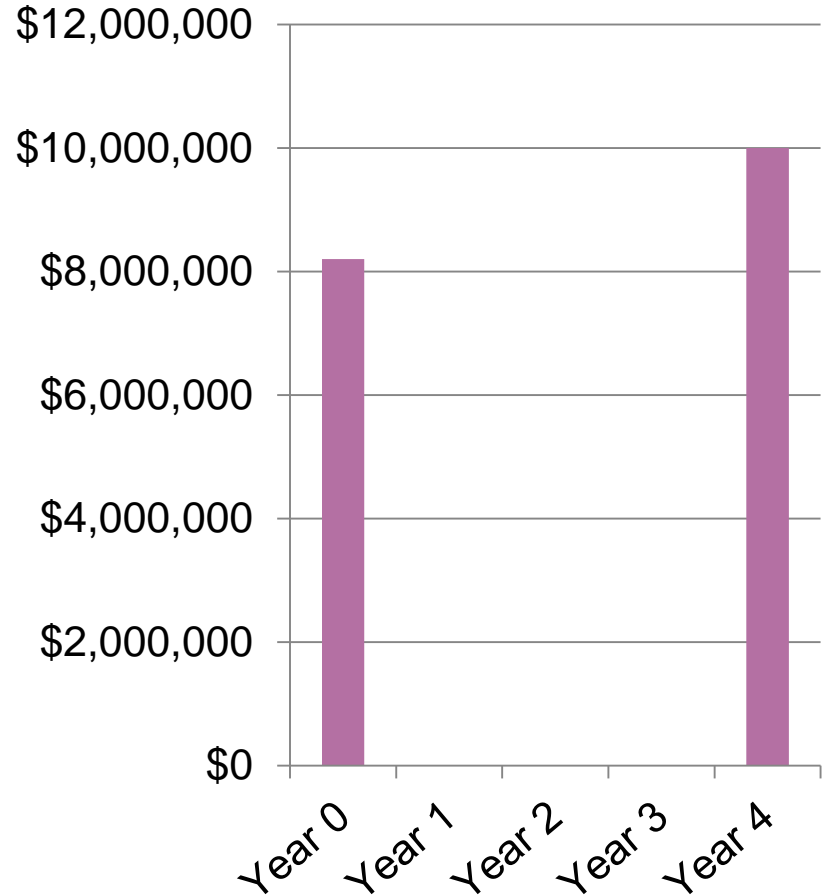


Example of Present Value Calculation

Present Value of \$10M received in Year 2 at 5% discount rate



Present Value of \$10M received in Year 4 at 5% discount rate



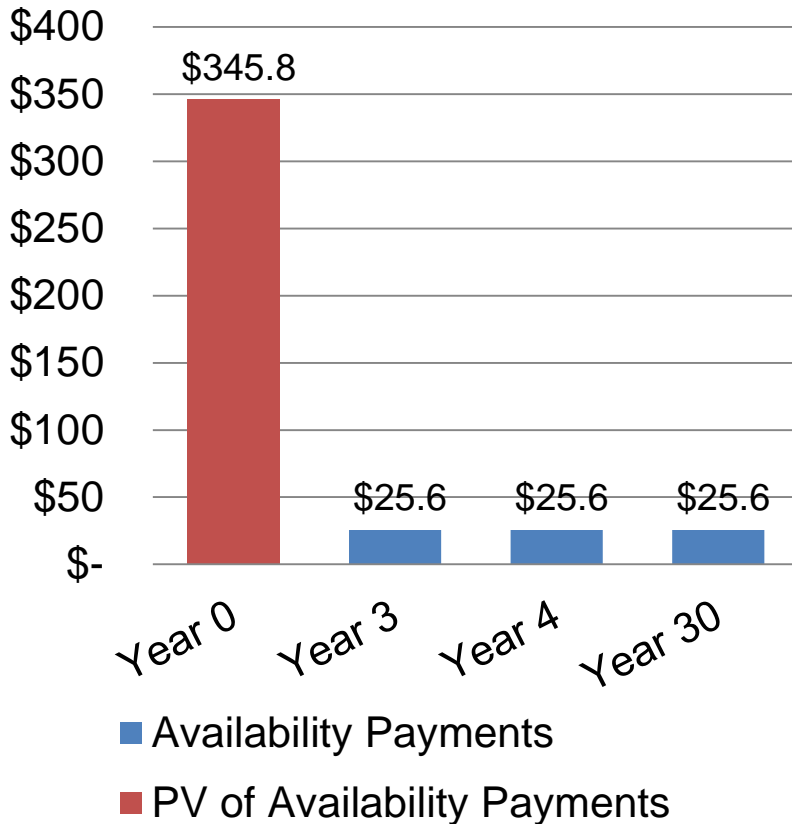
Net Present Value

- Sum of present values of positive and negative cash flows, including initial investment, is called *Net Present Value* (NPV)
- For a sum that is a net cost, the term *Net Present Cost* (NPC) may be used
- Using a high discount rate will favor lower upfront investment with higher recurring costs in the future (since the high discount rate will minimize the effect of future costs)

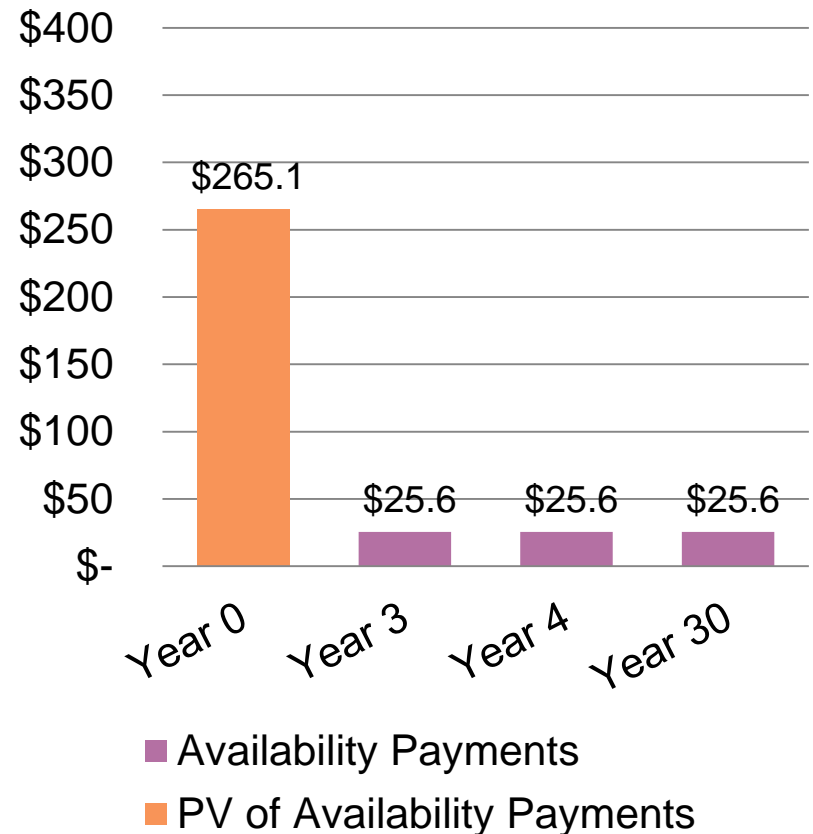
Effect of a High Discount Rate

- The same annual payment (\$25.6 M) appears to be much smaller with a higher discount rate

PV at 5% discount rate



PV at 7.2% discount rate





Financial Model Inputs and Outputs

Funding sources:

- Funding amounts (grants, loans, etc.)
- Revenue stream (traffic forecasts, toll rates, etc.)

Uses of funds:

- Capital and operating expenses
- Financing (interest rate, term, equity rate of return, etc.)



Financial Model



- Cash flow (source and use of funds)
- Capacity of project revenues to repay debt
- Capacity to attract equity
- Public subsidy payments

Financial Model Limitations

- Financial models are very complex, due to the complexity of financing options – simpler models may be adequate in early stages of project development to provide insight into financial viability
- Reliability of a financial model depends on the validity of the data and assumptions used as inputs
- Need experts to develop the model

Use of Financial Modeling

■ Project development phase

- To determine financial feasibility (subsidy requirement, toll rates, etc.)
- Public agencies create a Shadow Bid to predict bidders' costs and financing structure to determine whether a P3 is likely to provide Value for Money

■ Bidding phase

- RFP designed to ensure project can be successfully tendered and implemented as a P3
- Bidders test potential financial structures to assess impacts on their projected cash flow throughout the project life cycle
- Evaluation of bids by public agency



Use of Financial Modeling (Cont.)

- **Commercial and Financial close**
 - Lenders use models for “due diligence” and for tracking ongoing loan performance
 - In negotiations on terms with selected bidder
- **Concession period**
 - Monitoring project performance
 - To price compensation payments required by the contract due to variations from base assumptions, and to calculate any refinancing gains that are to be shared
 - If revenue is to be shared based on rate of return
 - Handback



Test Your Knowledge

True or False:

Using a high discount rate with a stream of future cash flows will result in a lower NPV.

Questions?

Submit a question using the chat box





Lesson 3

Illustration of a Simple Financial Model

Overview

- We will use hypothetical project data to illustrate how a project's financial viability may be estimated using a financial model
- We will use a very simple model:
 - To illustrate each step of the process
 - Using simple assumptions
- We will then show results produced by P3-VALUE focusing on:
 - How the results differ from our simple calculations
 - Why the results differ



Simple Hypothetical Assumptions

- Project life = 30 years (concession length)
- Design and Construction Costs (nominal dollars)
 - Base = \$100 M (\$30 M in Year 1; \$70 M in Year 2)
 - Risks = \$20 M (\$6 M in Year 1; \$14 M in Year 2)
- Operations and Maintenance Costs (real dollars)
 - \$10 M/year
 - Risks = \$2 M/year
- Inflation Rate = 3%
- Nominal discount rate = 5% (i.e., borrowing rate of public agency)



Capital Cost Calculations (\$M)

| | Base Design-Build Cost | Design-Build Risk Cost | Total Capital Cost | Present Value of Capital Cost |
|-------------------|------------------------|------------------------|--------------------|-------------------------------|
| Year 0 | | | | |
| Year 1 | 30.0 | 6.0 | 36.0 | 34.3 |
| Year 2 | 70.0 | 14.0 | 84.0 | 76.2 |
| Total (nominal) | 100.0 | 20.0 | 120.0 | |
| Total NPV | 92.1 | 18.4 | 110.5 | 110.5 |
| P3-VALUE NPV est. | 88.8 | 17.7 | 106.5 | 106.5 |

Note: NPV estimates in P3-VALUE are lower due to discounting at 6-month intervals instead of annually and an assumption that payments are made at the end of each period



Operations Cost Calculations (\$M)

| | Base O&M Costs | O&M Risk Costs | Total O&M Cost | NPV of O&M Costs |
|-------------------|----------------|----------------|----------------|------------------|
| Year 3 | 10.9 | 2.2 | 13.1 | 11.3 |
| Year 4 | 11.3 | 2.3 | 13.6 | 11.1 |
| Year 5 | 11.6 | 2.3 | 13.9 | 10.9 |
| Year 30 | 24.3 | 4.9 | 29.2 | 6.7 |
| Total (nominal) | 469.1 | 93.8 | 562.9 | |
| Total (NPV) | 206.3 | 41.3 | 247.6 | 247.6 |
| P3-VALUE estimate | 203.4 | 40.7 | 244.0 | 244.0 |

Note: NPV estimates in P3-VALUE are slightly lower due to the net effect of using 6-month cash flow periods instead of annual periods (compounding of inflation at 3% and discounting of nominal values at 5% has a net effect of reducing estimates when done every 6 months)



Simple Project Revenue Assumptions

- Base revenue estimate:
 - Average Annual Daily Traffic (AADT) in Year 3 = 21,600 vehicles, no growth over project life (for simplicity)
 - Average toll rate = \$2.00 in Year 0 dollars (increases with inflation)
 - Year 3 Revenue = 21,600 X 365 days X \$2.19 = \$17.2 M
- Adjustment for “revenue leakage,” i.e., uncollected tolls (5% reduction):
 - Year 3 = \$17.2 M - \$0.8 M = \$16.4 M
- Ramp-up period (Year 3 and Year 4):
 - Year 3 = 67% reduction = \$16.4 M - \$11.0 M = \$5.4 M

Revenue Calculations

| | Avg. annual daily traffic | Average toll rate | Leakage | Ramp up reduction | Revenue (\$M) |
|-------------------|---------------------------|-------------------|---------|-------------------|----------------|
| Year 0 | | \$2.00 | | | |
| Year 3 | 21,600 | \$2.19 | 5% | 67% | \$5.4 |
| Year 4 | 21,600 | \$2.25 | 5% | 33% | \$11.3 |
| Year 5 | 21,600 | \$2.32 | 5% | 0% | \$17.4 |
| Year 30 | 21,600 | \$4.44 | 5% | 0% | \$36.4 |
| Total (nominal) | | | | | \$686.2 |
| NPV* | | | | | \$295 |
| P3-VALUE NPV est. | | | | | \$290 |

Note: Revenues are discounted at the same rate as costs. P3-VALUE estimate is lower due to 6-month cash flow periods.

Financial Assessment

| | Million \$ |
|--|----------------|
| NPV of capital costs | \$110.5 |
| NPV of operations costs | \$247.6 |
| NPV of life-cycle costs | \$358.1 |
| NPV of project revenues | \$295.0* |
| NPV of public agency subsidy needed | \$63.1 |

Note: This simplified analysis assumes that the net project revenues can be fully leveraged to help fund capital investment at an interest rate equal to the 5% discount rate that was used to calculate NPV.

P3-VALUE Results

| <i>Nominal Discount Rate</i> | P70 |
|---|----------------------|
| 5.00% | NPC |
| <i>Costs</i> | |
| Construction Costs | 88,762,142 |
| O&M | 203,384,304 |
| Other Project Costs | - |
| NPC of Life Cycle Costs | 292,146,446 |
| <i>Revenues and Funding</i> | |
| Toll + Other Revenue | (290,082,714) |
| Project Subsidy | - |
| NPC of Revenues and Funding | (290,082,714) |
| NPC of Risk Impacts | 58,429,289 |
| Net Project Cost (excluding financing) | 60,493,021 |
| Cost of Financing (Interest & Fee) | - |
| Net Project Cost (including financing) | 60,493,021 |





Test Your Knowledge

True or False:

A financial model may be used by a public agency to estimate the level of public subsidy that might be needed to support a project.

Questions?

Submit a question using the chat box





Lesson 4

Financial Assessment – Public Agency Perspective

Project Evaluation

- **Economic Efficiency Assessment:**
 - Considers full range of costs and benefits to society
 - May include financial elements, but some such elements may not be included, e.g., tolls
 - Employs benefit-cost analysis (BCA)
- **Financial Viability (or Affordability) Assessment:**
 - Considers financial elements only, i.e., “cash flows”
 - Public agency’s perspective – focuses on “costs” and “revenues”; “benefits” to society (e.g., travel time savings from accelerated project delivery) not assessed quantitatively
 - Non-financial benefits are generally left to qualitative assessment
 - Employs financial models



Purpose of Financial Viability Assessment

Public agency perspective

- To determine affordability of the project (budgetary impact)
- To determine the value of the concession, the amount of public subsidy needed, and/or toll rates required
- To structure an optimum P3 to ensure marketability/bankability of the project for investors:
 - Most attractive project scope
 - Concession term
 - Payment type – toll concession vs. availability payment or shadow tolls
 - Timing of payments



Key Metrics for Public Agency

- Concession fee – for “revenue positive” projects (i.e., when NPV of revenues exceeds NPV of costs)
- Amount of public subsidy required – for “revenue negative” projects:
 - Completion payments
 - Availability payments
 - Shadow toll rate
- Toll rates:
 - Balance between toll rates and public subsidy required
- Concession term
 - Length of concession term vs. amount of public subsidy required or concession fee

Toll Rate Sensitivity

- Effect of toll rates on public subsidy needed (assuming no demand elasticity):

| | Toll Rate (in Year 0) | | |
|-------------------------------|---|---------------------------------------|---------------------------------------|
| | \$2.00 | \$2.50 | \$3.00 |
| PV of toll revenue | \$295.0 M | \$368.7 M | \$442.5 M |
| PV of life-cycle costs | -\$358.1 M | -\$358.1 M | -\$358.1 M |
| Difference | -\$63.1 M* (shortfall) | +\$10.6 M* (surplus) | +\$84.4 M* (surplus) |

*A positive difference suggests that there is potential for a concession fee. More rigorous analysis that accounts for risks is needed to estimate such a fee.

Concession Term Sensitivity

- Effect of project life on public subsidy needed (assuming \$2.00 toll):

| | Concession term (years) | | | |
|-------------------------------|-------------------------|------------------|------------------|------------------|
| | 30 | 35 | 40 | 50 |
| PV of toll revenue | \$295.0 M | \$334.8 M | \$370.8 M | \$433.4 M |
| PV of life-cycle costs | -\$358.1 M | -\$389.9 M | -\$418.8 M | -\$468.9 M |
| Net | -\$63.1 M | -\$55.1 M | -\$48.0 M | -\$35.5 M |



Test Your Knowledge

True or False:

A financial model may be used by a public agency to estimate the fee that a potential concessionaire might be willing to pay for a revenue-positive project.

Questions?

Submit a question using the chat box





Lesson 5

Financial Assessment – Lender Perspective



Purpose of Financial Assessment

Lenders' perspective

- To determine the project's capacity to repay debt
 - Are the revenues and expenditures relatively predictable?
 - Are the projected net cash flows adequate to cover debt service payments?
- To analyze the project's long-term prospects and risks
 - To conduct "due diligence" of project contracts and related risks
- Stress testing under extreme scenarios:
 - Cost extremes – e.g., inflation
 - Revenue extremes – e.g., traffic demand
- To track the project's loan performance

Key Metric Used by Lenders

- Annual Debt Service Coverage Ratio (ADSCR) =
$$\frac{\text{Cash Flow Available for Debt Service (CFADS)}}{\text{Required Debt Service}}$$

How ADSCR affects debt capacity:

| ADSCR requirement | 1.30 | 1.15 |
|---|----------|----------|
| Debt term | 25 years | 25 years |
| Interest rate | 6% | 6% |
| CFADS | \$1,000 | \$1,000 |
| Max. annual debt service : CFADS/ ADSCR | \$769 | \$870 |
| Amount of debt which can be raised (based on annuity repayment) | \$9,833 | \$11,116 |



Loan Life Coverage Ratio (LLCR)

- Takes into consideration CFADS over the entire life of the loan
 - Sum of the PVs of CFADS for each year over the loan life, divided by the LLCR = Maximum debt capacity



Illustrative Debt Capacity Analysis

- **Using Loan Life Coverage Ratio:**
 - A simplified methodology is used to demonstrate the concept
 - The methodology determines the maximum feasible debt – actual debt will be governed by ADSCR of individual annual net (positive) cash flows
 - Net cash flows are first reduced by a “coverage ratio” (which depends on risk) to provide a safety margin
 - Interest rate to be charged on debt may be used to discount future cash flows available for debt service (CFADS)
 - Debt capacity is obtained by summing the discounted cash flows

Note: The models built by lenders to address debt structure and coverage are very sophisticated and often include optimization algorithms that adjust debt parameters and timing



Illustrative Calculation of Debt Capacity

| | Revenue (\$M nominal) | O&M Costs (\$M) | CFADS (\$M nominal) | CFADS/ LLCR (\$M)* | Debt Capacity (\$M in PV)* |
|---------|-----------------------------|-----------------------|---|--------------------------|-------------------------------|
| Year 0 | | | | | |
| Year 1 | | | | | |
| Year 2 | 69.6 | | 69.6 | 58.0 | 52.6 |
| Year 3 | 5.4 | 13.1 | -7.7 | -6.4 | -5.5 |
| Year 4 | 11.3 | 13.6 | | | |
| Year 5 | 17.4 | 13.9 | | | |
| Year 30 | 36.4 | 29.2 | <i>Calculations similar to above</i> | | |
| NPV* | | | | | 91.5 |

*LLCR of 1.2 and average Interest Rate on Debt of 5% is assumed.

Note: Based on the public sector viability analysis, a construction completion payment of about \$69 million (\$63 M in PV) is assumed in Year 2. This is revenue for the concessionaire, allowing additional debt capacity.



Test Your Knowledge

True or False:

Lenders use financial models to help determine the amount of debt that can be supported by project revenues.

Questions?

Submit a question using the chat box





Lesson 6

Financial Assessment – Concessionaire Perspective



Purpose of Financial Assessment

Concessionaire perspective

- To determine the potential value of the project, i.e., bid price:
 - Concession fee for revenue positive projects
 - Public subsidy for revenue negative projects
- To compare potential financing structures and optimize financing structure:
 - Type of debt – bonds vs. loans
 - Timing of debt -- grace period, maturity, etc.
 - Optimum shares of debt and equity
 - Upside potential for equity return



Key Metrics for Concessionaire

- WACC = Weighted Average Cost of Capital
- Equity IRR = Equity Internal Rate of Return
- Project IRR = Project Internal Rate of Return



Weighted Average Cost of Capital

- WACC is what it costs the company to obtain capital (both debt and equity)
 - Investing company's WACC does not account for project risks
 - Concessionaire WACC includes project risk premiums
- Formula: $WACC = (\text{Proportion of Equity} * \text{Cost of Equity}) + [(\text{Proportion of Debt} * \text{Cost of Debt}) * (1 - \text{Corporate Tax Rate})]$

Note: Proportion of equity and debt can change over time as project risk changes
- Example calculation:
 - Equity = 50%; expected rate of return = 12%
 - Debt = 50%; interest rate = 6%
 - Company's marginal tax rate = 35%
 - $WACC = (0.5 * 0.12) + (0.5 * 0.06) * (1 - 0.35) = 7.95\%$



Equity Internal Rate of Return

- Equity IRR accounts for project risk in addition to the investing company's cost of capital
- It is the discount rate at which the NPV of equity cash flows is zero.
 - Solve for r in the formula: $\sum \frac{D_i - I_i}{(1 + r)^i} = 0$

Where D = Equity distributions (after corp. taxes)

and I = Equity investments

- Minimum expected return is known as “hurdle” rate
 - Varies by the phase in which the investment is made

Example of Equity Return by Phase

- Expected minimum equity return varies by risk exposure

| Phase | Company WACC w/o project risk | Project Risk | Phase Risk | Equity Return |
|---------------------|-------------------------------|--------------|------------|---------------|
| Construction | 6% | 2-4% | 4% | 12-14% |
| Ramp-up | 6% | 2-4% | 2% | 10-12% |
| Long-term operation | 6% | 2-4% | - | 8-10% |

Source: E.R. Yescombe (2007). *Public–Private Partnerships: Principles of Policy and Finance*. Oxford, UK: Elsevier Ltd.



Project Internal Rate of Return

- Project IRR is the overall average return from all invested capital, i.e., both debt and equity
- It is the discount rate at which the NPV of all cash flows (including investment costs) is zero
 - Solve for r in the formula:

$$\sum \frac{R_i - I_i - C_i}{(1 + r)^i} = 0$$

Where R = Revenues

I = Investments (both debt and equity)

and C = Operating costs



Calculating Equity Distributions

- Equity distributions are made after tax payments.
- Calculation of tax payments involves estimating taxable income which includes consideration of depreciation
- It is a complex process involving calculation of:
 - $CFADS = \text{Revenue} - O\&M$
 - $\text{Taxable income} = CFADS - \text{Interest portion of debt service} - \text{Depreciation}$
 - $\text{Income after taxes} = \text{Taxable income} - \text{Tax}$
 - $\text{Equity distributions} = \text{Income after taxes} - \text{Principal portion of debt service} + \text{depreciation} - \text{reserve deposits}$

Use of Discount Rate in Viability Analysis

- **Equity capacity analysis:**
 - “Hurdle” rate of return (i.e., minimum acceptable rate of return) sought by equity investors may be used to discount future cash flows available for equity distributions
 - Alternative discount rates may be used with “aggressive” scenarios (e.g., P10 costs and revenues) to estimate maximum potential rate of return



Illustration of Project IRR Calculation

| | Revenue (\$M) | Investment Costs (\$M) | O&M Costs (\$M) | Public Subsidy (\$M) | Net cash flows (\$M) | PV of net cash flows |
|---------|---------------|------------------------|-----------------|----------------------|----------------------|----------------------|
| Year 1 | | 36.0 | | | -36.0 | -34.2 |
| Year 2 | | 84.0 | | 69.6 | -14.4 | -13.1 |
| Year 3 | 5.4 | | 13.1 | | -7.7 | -6.65 |
| Year 4 | 11.3 | | 13.6 | | -2.3 | -1.9 |
| Year 5 | 17.4 | | 13.9 | | 3.5 | 2.7 |
| Year 30 | 36.4 | | 29.2 | | 7.2 | 1.7 |
| NPV* | | | | | | 0 |

Note: Based on the public sector viability analysis, construction progress payments amounting to PV of \$63.1 are assumed in Year 2. PV of negative cash flows are exactly balanced by PV of positive flows in later years of the concession term at a discount rate of 5%.



Test Your Knowledge

True or False:

The equity IRR required by equity investors depends on the risk profile of the project, and can vary by project phase.

Questions?

Submit a question using the chat box





Course Summary



Course Summary

- Lesson 1** P3 Financial Structure
- Lesson 2** Financial Models
- Lesson 3** Simple Illustration of a Financial Model
- Lesson 4** Financial Assessment - Public Agency Perspective
- Lesson 5** Financial Assessment – Lenders Perspective
- Lesson 6** Financial Assessment – Concessionaire Perspective



Resources

FHWA's Office of Innovative Program Delivery (OIPD) P3 Website:

<http://www.fhwa.dot.gov/ipd/p3/>

OIPD's P3-VALUE Website:

http://www.fhwa.dot.gov/ipd/p3/toolkit/analytical_tools/index.htm

FHWA P3 Financial Structuring & Assessment Primer:

http://www.fhwa.dot.gov/ipd/pdfs/p3/p3_financial_assessment_primer_122612.pdf

FHWA P3 Financial Structuring Factsheet:

http://www.fhwa.dot.gov/ipd/pdfs/p3/factsheet_04_financialstructuring.pdf

P3-VALUE Financial Assessment Tool:

http://www.fhwa.dot.gov/ipd/p3/toolkit/analytical_tools/index.htm

P3-VALUE Financial Assessment Tool User Manual:

http://www.fhwa.dot.gov/ipd/pdfs/p3/p3_value_financialassessment_manual_v1.pdf



Homework Assignment 3

- Run a ***Financial Viability*** analysis using the P3-VALUE tools with the hypothetical project data for the tolled project presented in this webinar
- Homework instructions may be downloaded from the webroom
- Technical assistance options:
 - E-mail questions to: P3-VALUE@dot.gov
 - Participate in “Office-Hours” webinar on **Friday, April 18, 2014 at 1:30 p.m. (EDT)**
 - Connect to the “Office Hours” webinar at <https://connectdot.connectsolutions.com/ipdp3/>



Upcoming P3-VALUE Training

- **April 18:** Office Hours: Financial Assessment Homework Review

Connect to the webinar at 1:30 p.m. (EDT) at:

<https://connectdot.connectsolutions.com/ipdp3/>

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