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A Financial Model to Estimate Annual Payments Required under Performance Based Contracts

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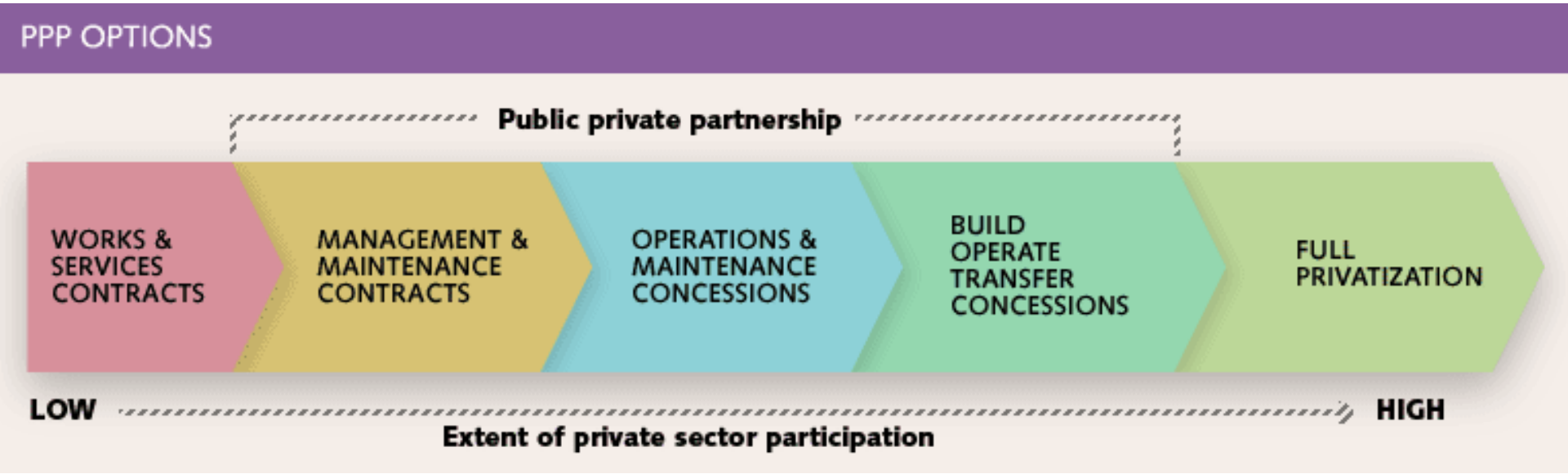
Outline

- Introduction
- Objective
- Graphical Financial Model for Performance Based Contracts
- Numerical Example
- Summary and Conclusions

Introduction

- Over the last couple of decades - an increased interest by road agencies to adopt Performance Based Contracts (PBC) for road maintenance as a means to increase the efficiency of maintenance operations
- The overall perception is that PBC:
  - **provide cost savings** compared to other maintenance procurement methods
  - enable a **greater transfer of risks** from the agency
  - **promote innovation** within the industry, ultimately leading to improved maintenance level of service (Kim et al. 2008)
- Performance based contacts may have different forms and include activities like routine and/or periodic maintenance

Continuum of PPP options



The World Bank Toolkit presents a broad definition of PPP including performance-based contracts

Objective

- **To develop a model for estimating the annual payments by the government that will be required by potential contractors to undertake a PBC project**
- **Based on the World Bank/PPIAF Toolkit for Public-Private Partnership in Roads and Highways (World Bank 2009), which is available at:** *http://www.ppiaf.org/sites/ppiaf.org/files/documents/toolkits/highwaystoolkit/index.html*

Financial Model for Performance Based Contracts

- **Developed in MS Excel®**
- **Consists of five sheets:**
  - Data sheet
  - Cash Flow Graph
  - Debt Graph
  - Dividend Graph
  - Summary of Assumptions and Results

Data Sheet

Graphical Model for Financial Simulation of Performance Based Contracts

Summary of project assumptions

Source of funds

Subsidies	0%	
Equity	25%	
Credit	75%	
Nominal interest rate	7.0%	
Debt maturity	5	years
Grace period	1	years
Capitalization	1	years
Repayment of loan	P+I constant	

Rehabilitation costs (VAT excluded, indexed on inflation)

Duration of works (years): 1 years

Year	%	Amount (MUSD)
1	100%	20
	0%	
	0%	
	0%	
	0%	
Total in MUSD		20.00

Amortization: 6 years

Annual Payments

First year Payment	7.3	MUSD
Payment growth	0%	per year

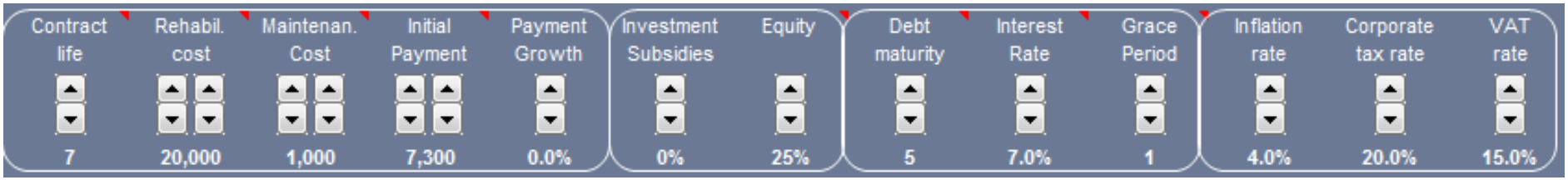
Annual maintenance costs (indexed on inflation)

Amount in opening year: 1,000 kUSD per year

Economic

Inflation rate	4.0%
Corporate tax rate	20.0%
VAT rate	15.0%
State discount rate (real terms)	6.0%
(nominal terms)	10.24%

Key Project Characteristics



- Contract life
- Rehabilitation cost
- Maintenance cost
- Initial annual payment
- Payment growth
- Investment subsidies
- Equity
- Debt maturity
- Interest rate
- Grace period
- Inflation rate
- Corporate tax rate
- VAT rate

Five Key Project Indicators/ ratios:

Project IRR (real/year7)	Equity IRR (real/year7)	ADSCR (min)	LLCR (min)	PV (VAT + Tax - AP - Subsidies)
12.53%	22.84%	1.21	1.24	-23,458

- **Project IRR** – the project financial Internal Rate of Return for the contract period (in real terms)
- **Return on Equity** (ROE) for the contract period (in real terms)
- The minimum **Annual Debt Service Coverage Ratio** (ADSCR)
- The minimum **Loan Life Coverage Ratio** (LLCR)
- Present Value (PV) of net financial contribution from government

Annual Debt Service Coverage Ratio (ADSCR)

$$ADSCR_i = \frac{CBDS_i}{DS_i}$$

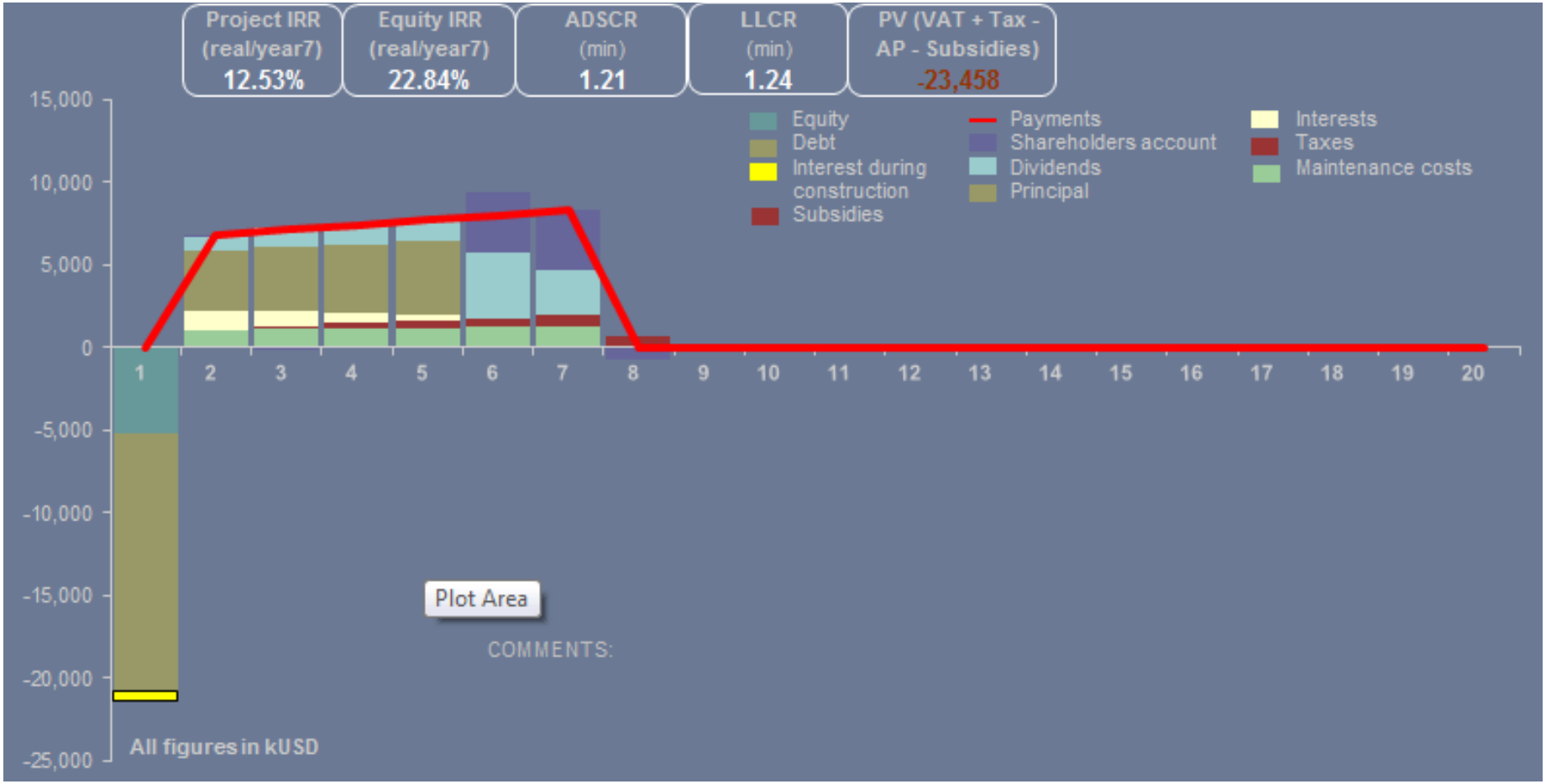
- $CBDS_i$ - net cash flow before debt service in year *i* (i.e., the amount of cash remaining in the project company after operating costs and taxes have been paid)
- DS_i - debt service to be paid in year *i* (principal and interests)

Loan Life Coverage Ratio (LLCR)

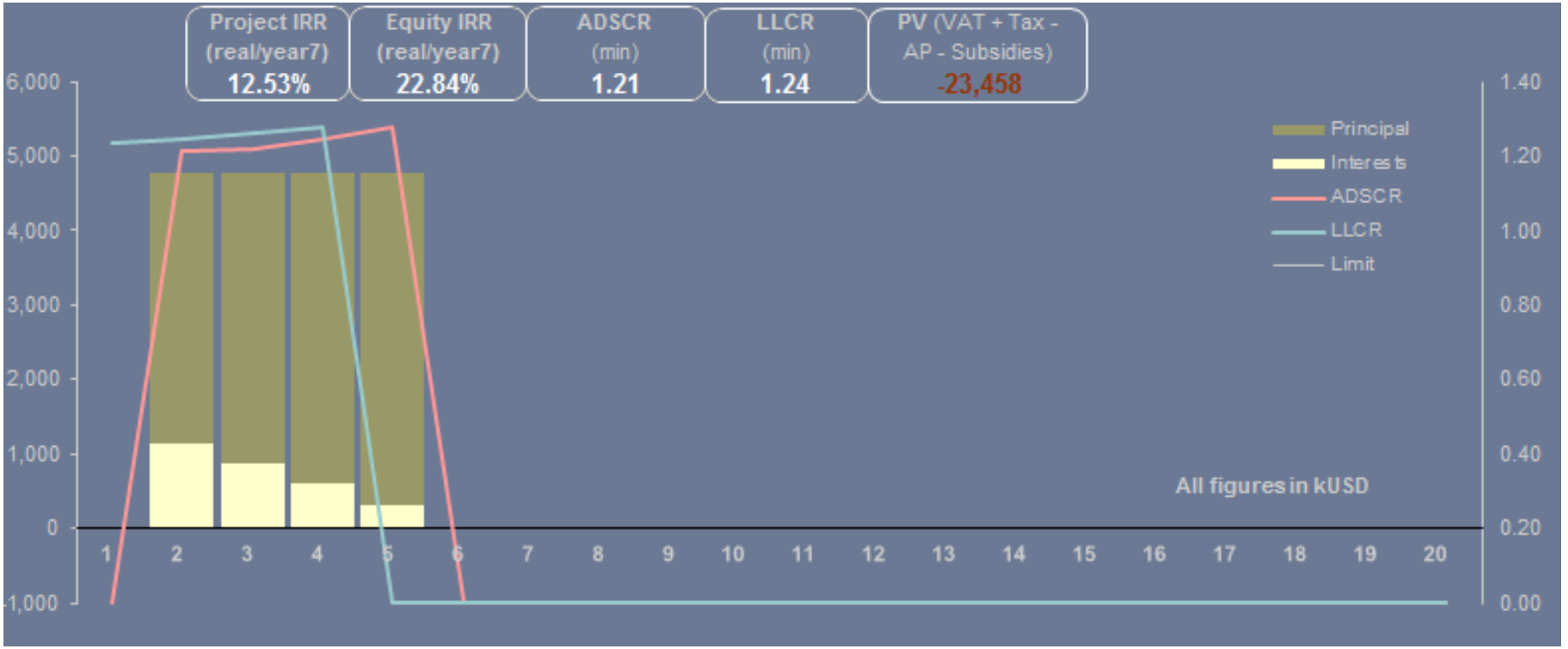
$$LLCR_i = \frac{NPV(CBDS_i \rightarrow end)}{DS_i \rightarrow end}$$

- ***NPV*** $(CBDS_i \rightarrow end)$ - the present value of the net cash flow before debt service from year *i* to the end of the debt repayment period
- $DS_i \rightarrow end$ - total of debt service remaining at year *i* (principal and interests).

Cash Flow Graph



Debt Graph


Project IRR (real/year7) 12.53%
Equity IRR (real/year7) 22.84%
ADSCR (min) 1.21
LLCR (min) 1.24
PV (VAT + Tax - AP - Subsidies) -23,458
6,000
5,000
4,000
3,000
2,000
1,000
0
-1,000
1.40
1.20
1.00
0.80
0.60
0.40
0.20
0.00
Principal
Interests
ADSCR
LLCR
Limit
All figures in kUSD
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20

Dividend Graph

Summary of Assumptions and Results

Summary of Assumptions and Results

SUMMARY OF THE MAIN ASSUMPTIONS

GENERAL

Contract life	7	years
Rehabilitation Period	1	years
Rehabilitation costs	20,000	kUSD
Amortization	6	years

FINANCIAL STRUCTURE

Subsidy	0%	of the rehabilitation costs
Equity	25%	of the rehabilitation costs
Debt		
Maturity	5	years
Interest rate	7.0%	
Grace period	1	years
Repayment of loan	P+I constant	

ANNUAL PAYMENT

First year Payment	7300	kUSD
Payment growth	0.0%	per year

ANNUAL MAINTENANCE COSTS

Amount in opening year	1,000	kUSD per year

OTHER KEY PARAMETERS

Inflation rate	4.0%
Corporate tax	20.0%
VAT rate	15.0%

SUMMARY OF THE RESULTS

FINANCING PLAN

Uses (in kUSD)	**21,346**	**Sources** (in kUSD)	**21,346**
Rehabilitation costs (nominal terms)	20,800	Investment subsidy	0
Capitalised Interests	546	Equity	5,200
		Debt	16,146

FINANCIAL RATIOS

Minimum ADSCR (Annual Debt Service Coverage Ratio)	**1.21**
Minimum LLCR (Loan Life Coverage Ratio)	**1.24**
Minimum PLCR (Project Life Coverage Ratio)	**1.75**

SHAREHOLDERS' RETURN

Project IRR after tax (real terms)	**12.53%**
Project IRR after tax (nominal terms)	17.04%
Equity IRR (real terms)	**22.84%**
Equity IRR (nominal terms)	27.76%

PUBLIC AUTHORITIES' FINANCIAL FLOWS

PV on Availability Payments (kUSD)	-29,447
PV on Subsidy (kUSD)	0
PV on the VAT (kUSD)	4,417
PV on the Coporate Taxes (kUSD)	1,573
PV on the State revenues (kUSD)	**-23,458**

Numerical Example

A. Project Parameters

Contract Life: 7 years

Rehabilitation cost: $20 million (in Year 1)

Annual Maintenance Cost in subsequent years: $1 million

Capital structure: Equity, 25%; Loans, 75%

Discount rate (real terms): 6%

Inflation: 4% per year

Tax rates: (a) VAT: 15%; (b) Corporate tax: 20%

Amortization period: 6 years

B. Loan Terms

Nominal Interest rate: 7% per year

Loan grace period: 1 year

Loan repayment period: 4 years

Numerical Example

Assume the following targets (or constraints) to be met for the project to be able to attract private investors:

Project Financial Internal Rate of Return:	FIRR ≥ 8%
Equity Internal Rate of Return:	ROE ≥ 14%
Annual Debt Service Cover Ratio:	ADSCR ≥ 1.2

Numerical Example

Result: an **Annual Payment of $7.7 million** (in the first year of operation; payments in subsequent years would be adjusted according to inflation) should be able to attract private investors.

The corresponding three main financial indicators are:

- FIRR = 29.0%,
- ROE = 30.8%, and
- ADSCR = 1.21

Summary and Conclusions

- Performance Based Contracts (PBC) have been increasingly used over the last couple of decades as a means to increase efficiency of maintenance operations
- The paper presented the development of a user-friendly model to assess the required annual payments under PBC
- The applicability of the tool has been demonstrated through a numerical example of a potential road PBC project
- The model:
  - can be applied to any other type of infrastructure
  - can be used to carry out sensitivity analyses
  - is particularly useful when only preliminary project data is available

Thank you!

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