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Power and Energy Systems Engineering Economics

Applications Examples

Chapter 5 – Financial Analysis

Notes:

1. Cells with black characters include inputs
2. Cells with red characters include formulas
3. Some examples need for calculations the installation of Add_Ins developed by the author. See installation instruction in the file introduction.

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Disclaimer

The Examples are solely and exclusively indented to provide support and assistance to the readers for practicing and better understanding of the theoretical part of this book.

The author, Panos Konstantin, believes that all information and guidance provided and all calculations in these examples are correct. Nevertheless anyone using these examples should carry out their own due dilligence and appraisal of the contents.

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Proposals for improvements of the contents are welcome and will be considered in upcoming updates!

EE-Ch-5_Financial-Economic-Analysis_Examples.xlsx

WACC excl. tax

Item	Equity	Loan
Asset shares	30%	70%
Risk free rate of return / interest	5.0%	5.0%
Risk and venture premium	6.0%	1.0%
Cost of capital in nominal terms	11.0%	6.0%
$WACC_n$ in nominal terms	7.50 %/a	
./. Expected Inflation rate	2.00 %/a	
$WACC_r$ inflation adjusted	5.39 %/a	

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WACC incl. tax

Item	Equity	Loan
Asset shares	30%	70%
Expected returns after tax		
Risk free rate of return / interest	5.0%	5.0%
Venture risks premium	6.0%	1.0%
Country risk premium (depends on country)	0.0%	0.0%
Cost of capital in nominal terms, after tax	11.0 %/a	6.0 %/a
Corporate tax 25%	3.7 %/a	0.0 %/a
Cost of capital in nominal terms, before tax	14.7 %/a	6.0 %/a
WACC_n in nominal terms, before tax	8.60 %/a	
./. Expected Inflation rate	2.00 %/a	
WACC_r inflation adjusted	6.47 %/a	

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Ex. 5-1 & 5-2 Cashflow_modified

Item	Rates		Projection over life time €					
Shares of capital		1,000,000 €						
Equity	30%	300,000 €						
Loan (outstanding debt, by year's end)		700,000 €	560,000	420,000	280,000	140,000	0	
Project life time		5 a						
			Year					
Profit and Loss Statement			0	1	2	3	4	5
Revenues (Gross income) *)	5 %/a	270,037	283,539	297,716	312,601	328,231	344,643	
- Operating expenses (OPEX)	5 %/a	-50,000	-52,500	-55,125	-57,881	-60,775	-63,814	
= Operating income (EBITDA)			231,039	242,591	254,720	267,456	280,829	
- Depreciation	20%		-200,000	-200,000	-200,000	-200,000	-200,000	
- Interest on loans	6%		-42,000	-33,600	-25,200	-16,800	-8,400	
= Net operating income before taxes (EBT)			-10,961	8,991	29,520	50,656	72,429	
- Corporate tax	25%		0	-2,248	-7,380	-12,664	-18,107	
= Net operating income after tax			-10,961	6,743	22,140	37,992	54,322	
+ Depreciation			200,000	200,000	200,000	200,000	200,000	
= Cash flow (CF)			189,039	206,743	222,140	237,992	254,322	
- Principal repayment of loan	20 %/a		-140,000	-140,000	-140,000	-140,000	-140,000	
= Free cash flow			49,039	66,743	82,140	97,992	114,322	
Discounted cash flow (DCF) **)	1.0750	322,500	45,617	57,755	66,120	73,377	79,632	

*) determined with goal seek to obtain 7.5% return on equity

***) Discount rate WACC excluding corporate tax

Year	Unit	0	1	2	3	4	5
outstanding debt by years end	€	700,000	560,000	420,000	280,000	140,000	0
Operating income	€ / a	-	231,039	242,591	254,720	267,456	280,829
Interest on loans	€ / a	-	-42,000	-33,600	-25,200	-16,800	-8,400
Principal repayment	€ / a	-	-140,000	-140,000	-140,000	-140,000	-140,000
Debt service coverage ratio DSCR		-	1.27	1.40	1.54	1.71	1.89
Loan life coverage ratio LLCR	7.5%	-	1.47	1.56	1.65	1.76	1.87
Project life coverage ratio PLCR	7.5%	-	1.47	1.56	1.65	1.76	1.87

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Ex. 5-3 BCR

Item	Unit	Value
Capital expenditures, CAPEX	mln €	158.0
Buildings and access roads, parking	mln €	125.0
Interior facilities	mln €	25.0
Compensation fees to land owners	mln €	8.0
Benefits "B"	mln € /a	18.0
Admission tickets for sport events	mln € /a	12.0
Revenues from concerts	mln € /a	3.5
Other revenues	mln € /a	2.5
Disbenefits "DB"	mln € /a	3.0
Rent for the site	mln € /a	2.5
Others	mln € /a	0.5
Operation expenses "OPEX"	mln € /a	4.0
Administration and Personnel	mln € /a	1.0
O&M cost	mln € /a	3.0
Annualized CAPEX "AnuC" 40 a 5.0%a	mln € /a	9.21
BCR =(B-DB)/(AnuC+OPEX)	-	1.14