

INTERNATIONAL FINANCE FINANCIAL MODEL

Lesson 2

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Summary



- Lesson 1 exercise references and solution
- Sponsor's ratios and discounted cash flow
- Exercise

Exercise

Under the following assumptions (M€):

	Year 1	Year 2	Year 3
Revenues	200	300	250
Costs	50	150	90

- Tax rate 30% on the Earning before taxes (EBT)
- Asset Value of 300 M€, to be amortized in 3 years with a fixed value
- No Working Capital
- Debt structure:
 - initial debt outstanding of 180 M€,
 - Repayment in 3 years with 60 M€ + financial interests
 - interest rate of 5.0%

Please draw: (i) P&L, cash flow (ii) before debt and (iii) after debt

Exercise

INPUT

	Year 1	Year 2	Year 3
Revenues	200	300	250
Costs	50	150	90

Asset Value of 300 M€, to be amortized in 3 years with a fixed value

No working capital

Tax rate 30% on the Earning before taxes (EBT)

Debt structure: initial debt outstanding of 180 M€, Repayment in 3 years with 60 M€ + financial interests, interest rate of 5.0%

MODEL

Project input

- Revenues
- Opex

Project input

- Asset Value / Capex

Project input

- Revenues/Opex terms

Macro economy

- Tax rate

Financial input

- Debt structure

NOTES

Values already given, without inflation rate

Cash out at year 0, D&A every year from year 1 to year 3

Simplified assumption

Cash in year 0, cash out every year from year 1 to year 3 (capital repayment + interests)

Solution

At year 0:
Asset Value
(Capex) = 300
Initial debt
outstanding =
180

P&L	1	2	3
Revenues	200	300	250
Costs	50	150	90
Ebitda	150	150	160
D&A	100	100	100
Ebit	50	50	60
Financial interests	9	6	3
Ebt	41	44	57
Tax	12	13	17
Net profit	29	31	40

Cash Flow	1	2	3
Net profit	29	31	40
D&A	100	100	100
Financial interests	9	6	3
Cash flow before debt	138	137	143

Principal repayment	60	60	60
Financial interests	9	6	3
Cash flow after debt	69	71	80

P&L - Profit and Losses (Income statements)

- (+) Revenues *Given*
- (-) Operating Costs *Given*

- (=) **EBITDA** (*earnings before interests, taxes, depreciation and amortization*)
- (-) D&A – depreciation and amortization *To be calculated*
- (=) Ebit (*earnings before interests and taxes*)
- (-) Interests *To be calculated*
- (=) Ebt (*earnings before taxes*)
- (-) Taxes *To be calculated*

- (=) **Net Profit**

How to calculate D&A

Asset Value of 300 M€, to be amortized in 3 years with a fixed value

Year	1	2	3
Asset value - Initial	300	200	100
D&A	100	100	100
Asset value - final	200	100	-

$$D\&A = 300/3$$



Final value = initial value – D&A
To Balance sheet

How to calculate Debt variations

Debt structure: initial debt outstanding of 180 M€,
 Repayment in 3 years with 60 M€ + financial interests
 interest rate of 5.0%

Debt		1	2	3
Debt outstanding - Initial		180	120	60
Initial debt / 3	→ Principal repayment	60	60	60
Initial – repaym.	→ Debt outstanding - final	120	60	-
Initial debt * 5%	→ Financial interests	9	6	3
Principal repayment + interests	→ Total repayment	69	66	63

References to the Balance Sheet

Assets

Property, plant & equipment

(Capex/investements)

Cash and associated

Working capital

*(+) Receivables, (-) Payables, (\pm)
VAT/tax credit/debit, etc.*

Financial investments

Other assets

Total Assets

Liabilities

Equity and retained earnings

Shareholder loans

Financial debts *(loans, etc.)*

Other liabilities

Total Liabilities

Drafting the P&L and tax calculation

	P&L	1	2	3
	Revenues	200	300	250
	Costs	50	150	90
Revenues - Costs	➔ Ebitda	150	150	160
From previous calculation	➔ D&A	100	100	100
Ebitda – D&A	➔ Ebit	50	50	60
From previous calculation	➔ Financial interests	9	6	3
Ebit – F.Interests	➔ Ebt	41	44	57
Ebt x 30%	➔ Tax	12	13	17
Ebt – Tax	➔ Net profit	29	31	40

From P&L and BS to Cash Flow



P&L

- D&A – depreciation & amortization, are not uses of cash
- Financial interests are debt related (we will split the cash flow between "before debt" and "after debt")



Balance Sheet

- Capex variation – investments / disinvestments (net of depreciation and amortization)
- Working capital variation
- Financial debt variations
- [Other financial investments / asset / liabilities variations]
- Equity and shareholder loan variation are now considered as outcome of the model (sponsor perspective)

Cash Flow Available for Debt Service (before debt)

Two ways to calculate the cash flow:

From Net Profit

From Ebitda

$$\text{Net Profit} = + \text{Ebitda} - \text{D\&A} - \text{Financial interests} - \text{Tax}$$

(+) Net Profit

(+) D&A

(+) Financial Interests

=

(+) Ebitda

(-) Taxes

(-) Investments (disinvestments)

(+/-) Working capital variation


**(=) Cash Available for Debt Service
(or before debt)**

(-) Investments (disinvestments)

(+/-) Working capital variation

**(=) Cash Available for Debt Service
(or before debt)**

**Project IRR
Project NPV**

 *To be discussed
next lesson*

Drafting the cash flow before debt

The exercise will proceed in the first way (starting from net profit). However, the same result can be reached by starting from Ebitda

	Cash Flow	1	2	3
From P&L	→ Net profit	29	31	40
From P&L (+)	→ D&A	100	100	100
From P&L (+)	→ Financial interests	9	6	3
Net profit – D&A – financial interests	→ Cash flow before debt	138	137	143



- No Working capital variation
- No Capex variation

Before debt to after debt



- Debt increase (drowdown)
- Principal repayment
- Financial interests
- Other debt-related cash-out (*commissions, agency fee, DSRA*)



- Tax benefit coming from debt – on financial interests
- *As simplification, this representation does not distinguish the debt tax benefit (to be subtracted in cash flow before debt and readded in cash flow after debt). An example will be given in the following lesson*

Free Cash Flow after debt

- (+) Cash Available for Debt Service
 - (+) Debt increase (drowdown)
 - (-) Principal variation
 - (-) Financial interests
 - (-) Other debt related expenses / flows (commissions, agency fee, DSRA)
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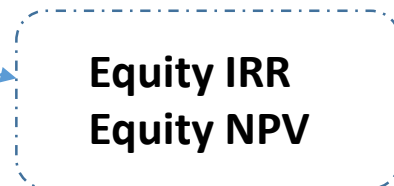
(=) Free Cash Flow

[Distribution rules]



Banks can set some rules to limit or control the distributions (from the project/SPV) to the shareholders, for instance covenant check. Without debt free cash flow can correspond to the cash flow for shareholders, while with debt, there is usually a mismatch

(=) Cash Flow for the shareholders



Drafting the cash flow after debt

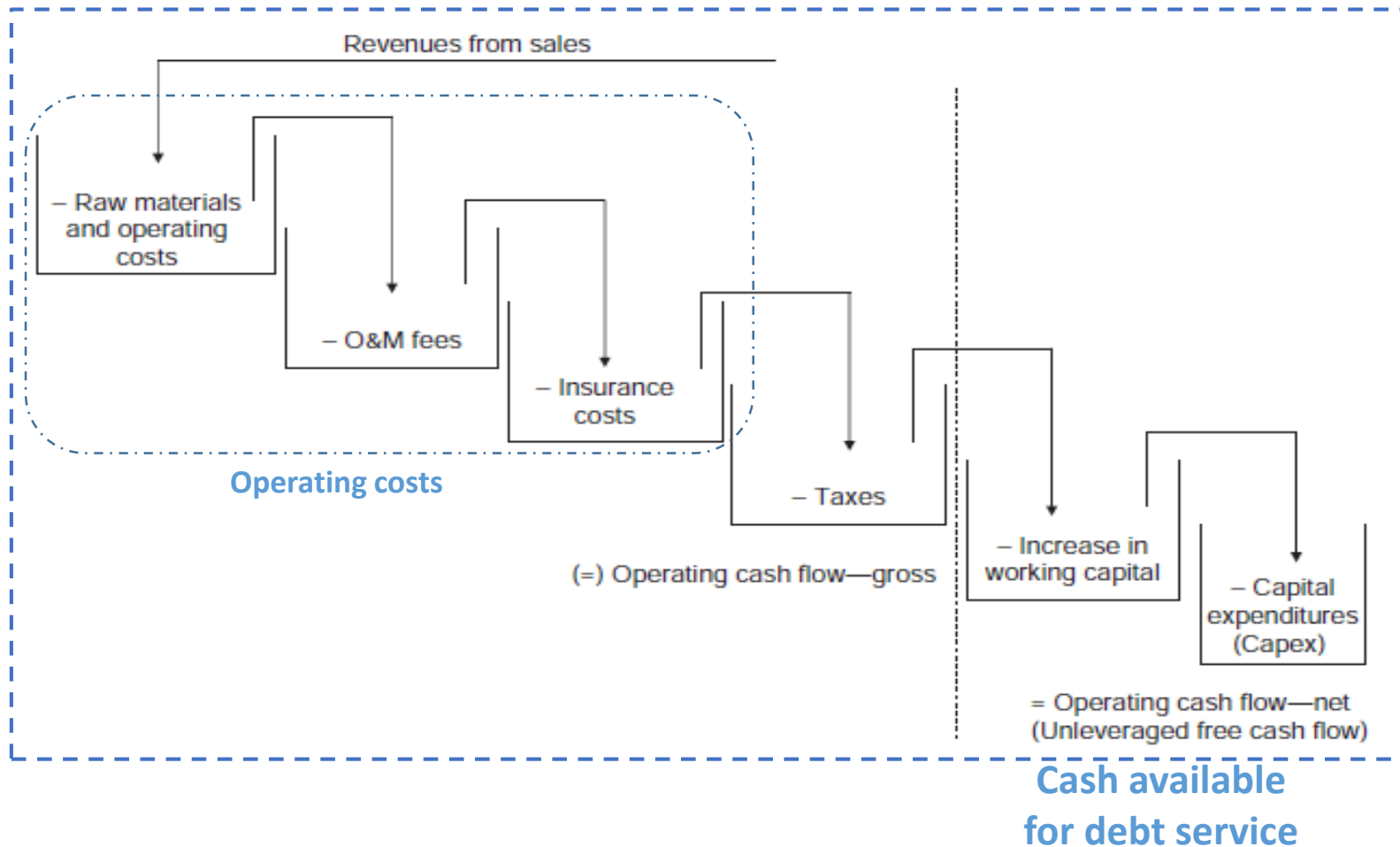
Cash Flow		1	2	3
	Cash flow before debt	138	137	143
From Balance Sheet (debt calculation)	→ Principal repayment	60	60	60
From P&L	→ Financial interests	9	6	3
Cash flow before debt (-) Principal repayment (-) Financial interests	→ Cash flow after debt	69	71	80



- No debt drawdown
- Debt service – to be discussed next lessons

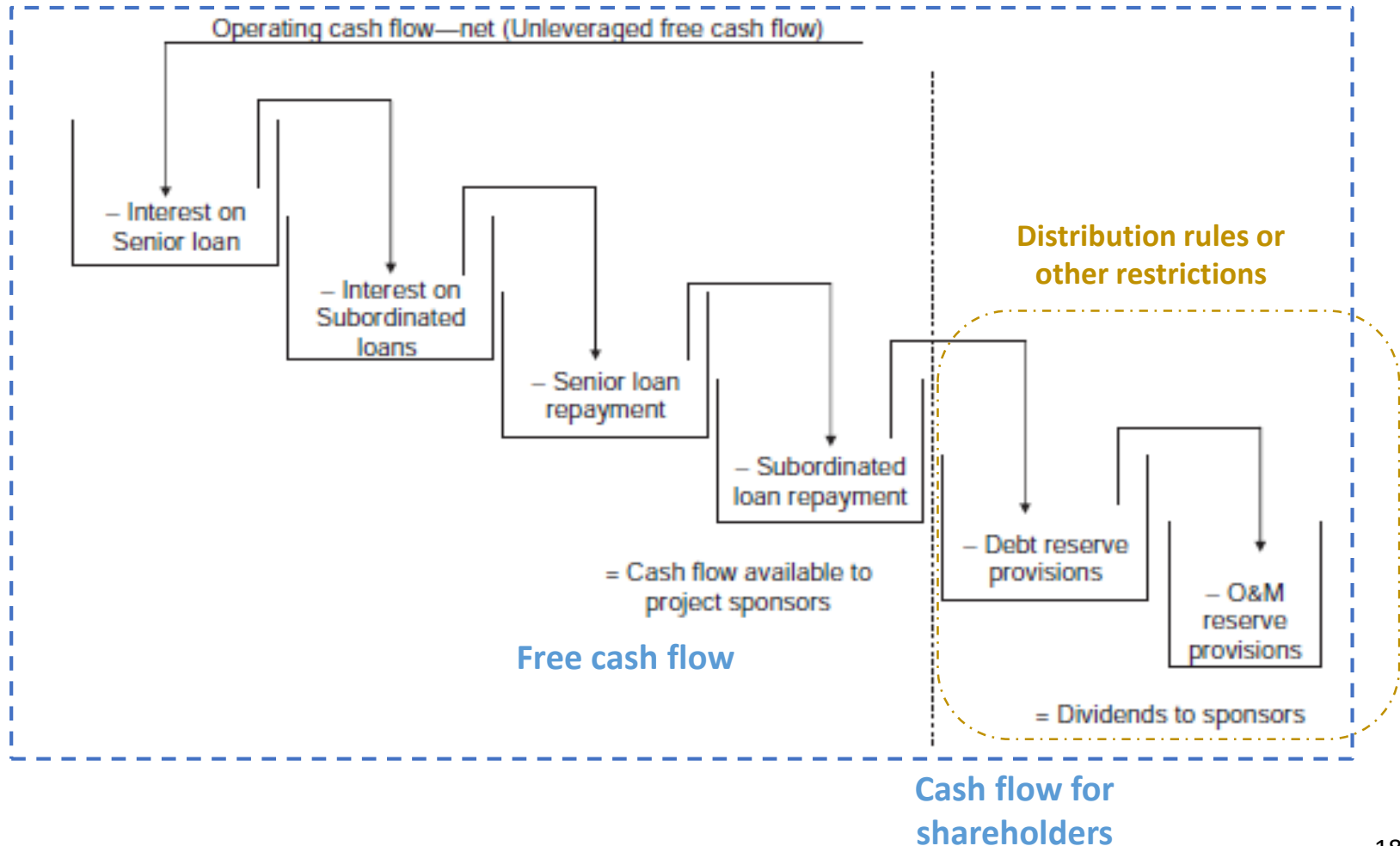
CASH FLOW WATERFALL

General scheme - Before financing



CASH FLOW WATERFALL

General scheme - After financing



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- Exercise



Different perspectives: Lender vs Sponsor

Different perspectives according to different roles, strategies and risk profiles

Risk based remuneration
Sensitivity analysis
Multiple Scenario



Lower remuneration
Lower risk
Stress test to avoid default

Ratio
(IRR, ROE, NPV, EPS)
DCF, Payback period

Covenant
(DSCR, LLCR, D/E)
Stress test

Example for discussion

An European Investor is considering a possible investment (>500 M\$) in a power generation (electricity) plant coal fired. The plant has to be built and it will be located in China.

If you were the Investor, can you list some key characteristic of the project, financially relevant?

For reference, please consider the following figures :

- *10-years governative bond China: return 3.5%*
- *Market premium for Chinese stocks: 8%*
- *Volatility of Chinese infrastructural stocks: 0.8x*
- *Risk premium for greenfield projects: 2.0%*

Main Sponsor's ratios

IRR
Internal rate
of return

- The "annualized effective compounded return rate" or rate of return that makes the net present value of all cash flows (both positive and negative) from a particular investment equal to zero.

NPV
Net present
value

- Measurement of the profitability of an undertaking that is calculated by subtracting the present values (PV) of cash outflows (including initial cost) from the present values of cash inflows over a period of time

Payback
period

- Length of time required for an investment to recover its initial outlay in terms of profits or savings (simple or actualized).

[ROE
Return on
equity]

- Amount of net income returned as a percentage of shareholders equity. Return on equity measures a corporation's profitability by revealing how much profit a company generates with the money shareholders have invested.

Comparables and Questions

IRR
Internal rate of
return

Comparable: $IRR > \text{Target value?}$
Is it still true if some assumptions change (sensitivity analysis)?

NPV
Net present
value

Is $NPV \geq 0$
Which discount rate to be used?
Under a merger or acquisition (M&A) analysis, NPV is used in the Discounted Cash Flow (DCF) method

Payback period

Is the payback shorter than the investment period (is there a break even point)?
Is the result satisfactory?

Discounted Cash Flow (DCF)

- Discounted Cash Flow (DCF) is a valuation method used to estimate the **attractiveness of an investment opportunity**.
- DCF analysis uses **future free cash flow projections and discounts** them by a defined rate of return to identify a present value. If the present value is higher than the possible investment cost, the opportunity may be a good one.
- DCF analysis is frequently used in Merger & Acquisition (M&A) deals.

$$DCF = \frac{CF_1}{(1+r)^1} + \frac{CF_2}{(1+r)^2} + \dots + \frac{CF_n}{(1+r)^n}$$

CF = Cash Flow

Cost of equity required by the sponsors \approx hurdle rate

Levered vs Unlevered evaluation

**Cash Flow for debt service
(unlevered cash flow)**

**Free Cash Flow (after debt)
(levered cash flow)**

- Unlevered IRR
- Unlevered NPV
- Unlevered payback (simple and actualized)
- Levered IRR
- Levered NPV
- Levered payback (simple and actualized)

These values should be somehow related (we will discuss during the next lessons)

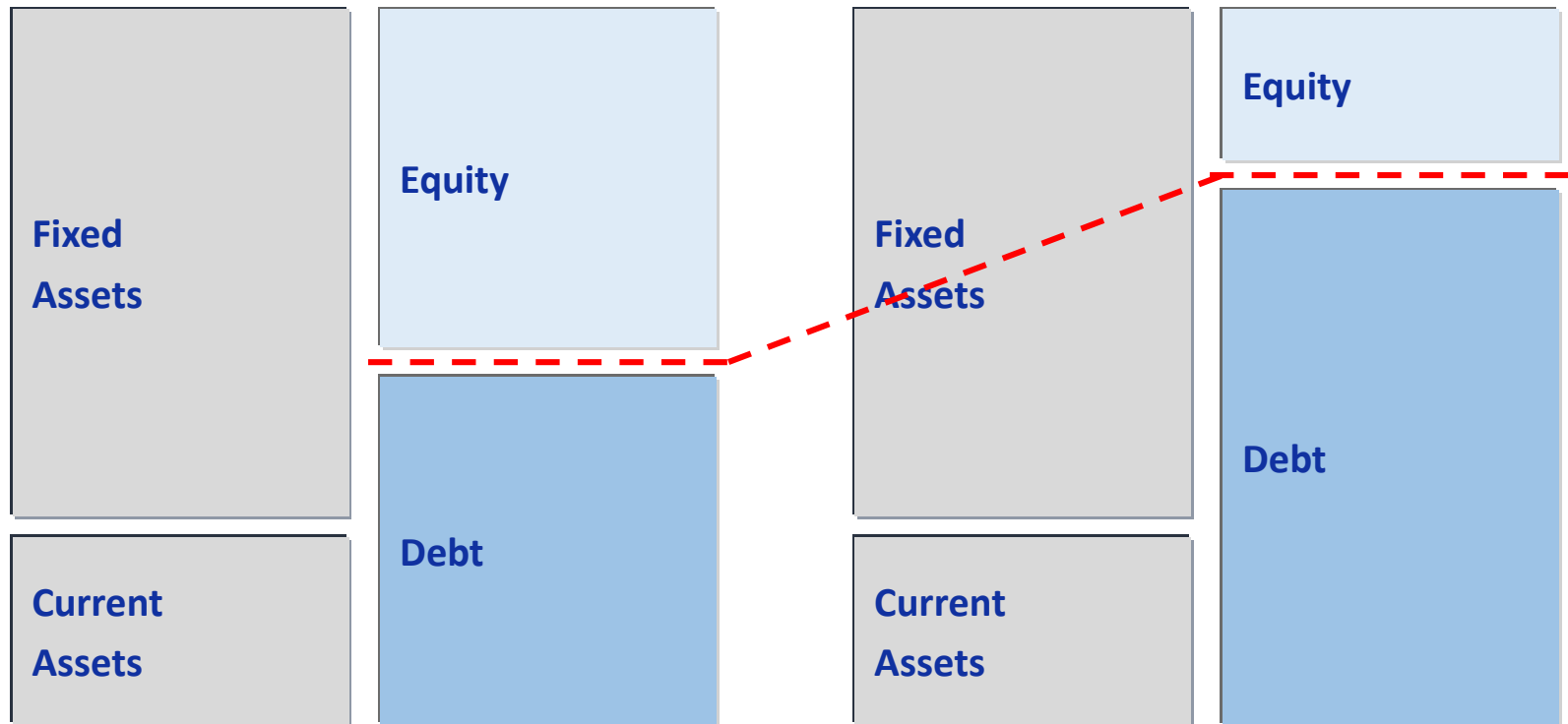
The leverage effect

Under some specific conditions projects can take benefit from leverage.
However, some other factors have to take into consideration



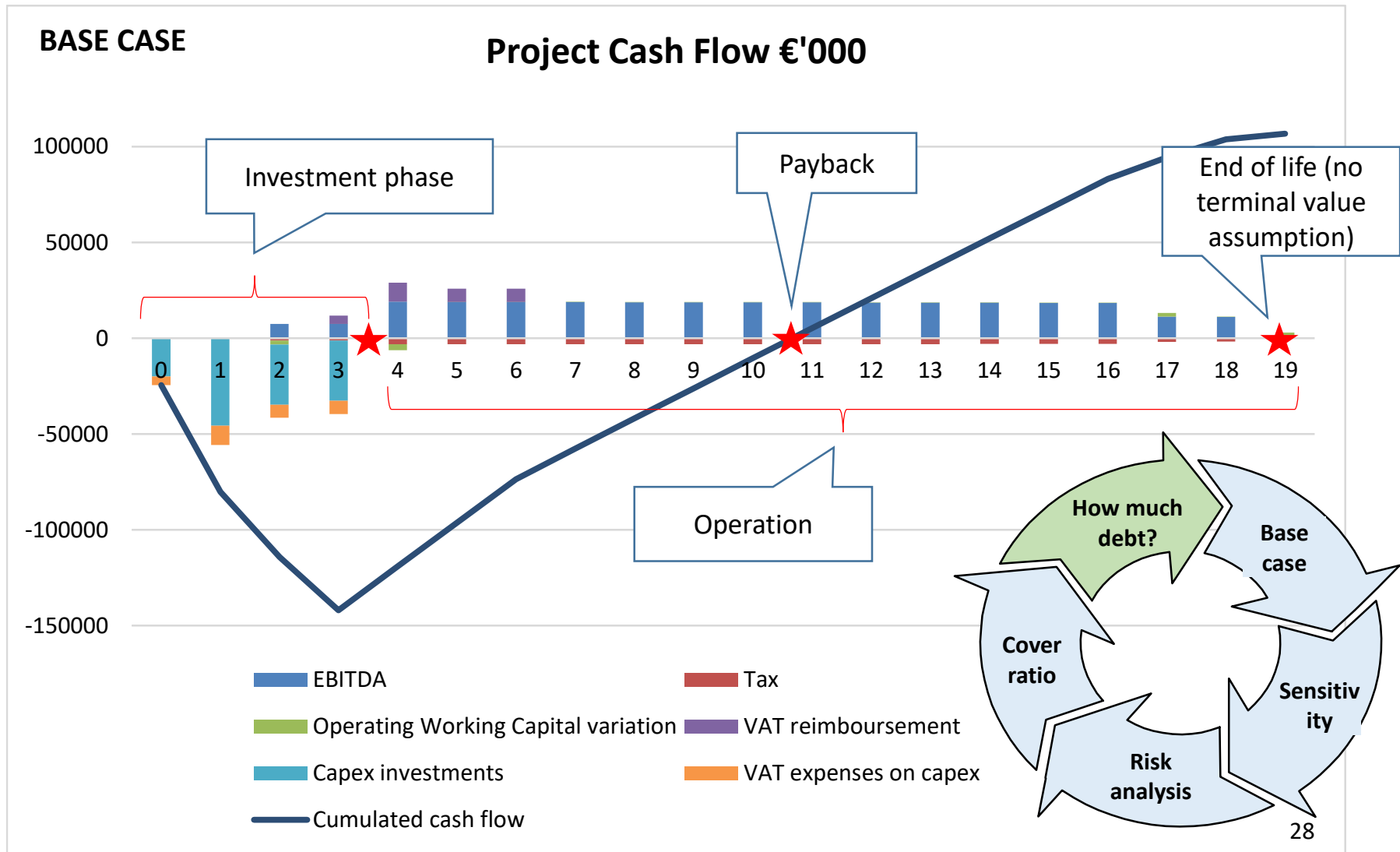
- ROI (unlevered IRR) > net interest rate → Leverage can increase the return
- ROI (unlevered IRR) < net interest rate → Leverage is negative for the return

How the leverage can have impact on IRR?

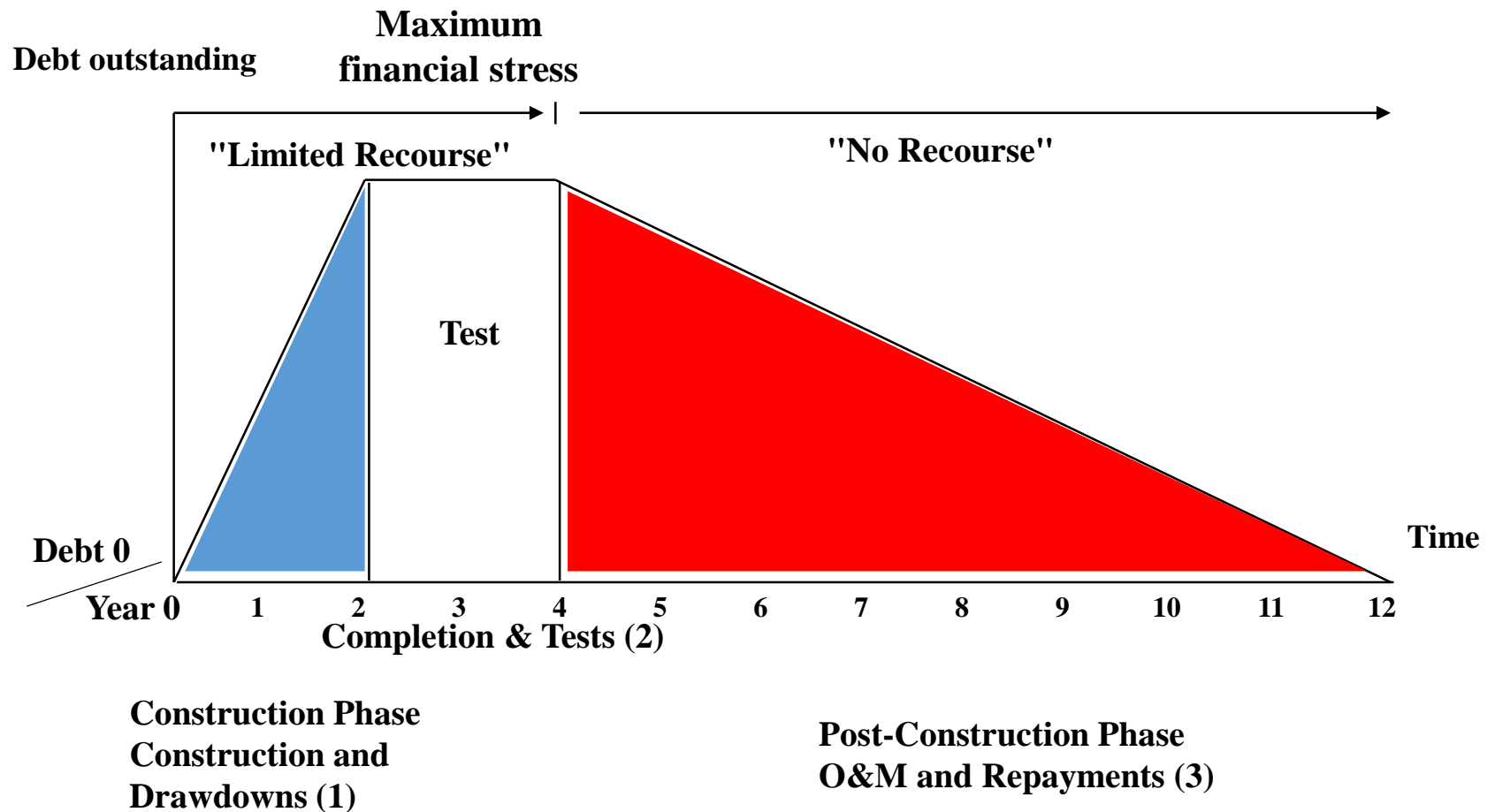


- Usually target IRR and debt interest rate have different values, where the first should be higher than the latter
- In the next exercise, we will analyze the possible benefit of the leverage, and its limits

J-Curve



Lender's perspective



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Exercise

Referring to the exercise at slide 3,

1) Please calculate the project value (unlevered) and the equity value (levered) using the discounted cash flow method, and considering:

- Discount rate for unlevered cash flow: 5.0%
- Discount rate for levered cash flow: 7.2%

For this question, do not consider the initial figures at year 0 (asset value 300M and initial debt outstanding 180M)

2) Please calculate IRR and payback period (levered and unlevered), considering two additional inputs:

- An initial investment at year 0 as cash out for the asset of 300 M€
- An initial debt drawdown at year 0 of 180 M€. Do not consider any financial interests during year 0