

INTERNATIONAL FINANCE FINANCIAL MODEL

Lesson 9

Risk analysis and excercises

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Academic Year: 2018/2019

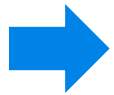
November 12th

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Summary



Sample term sheet - analysis

Exercise D - solution

Exercise D – assignment

Sample term sheet

Referring to the bank term sheet:

- **Please model the debt repayment (Senior Debt Facility and VAT Facility) and calculate DSRA and Arrangement Fee**
- Considering the exercise B of lessons 6 and 7, please apply Distribution Conditions to recalculate distributions and double check if cash flow after debt (SPV) is the same of cash flow for shareholders (distributions)

Sample term sheet – key input

Senior Facility

Oustanding debt (€'000)

50.000

Debt tenor (duration)

8

Spread

2,5%

Simplification, rather than 15 years as in the term sheet

Arrangment fee

1,5%

DSRA

50,0%

1.5% of the outstanding debt has to be paid upfront as initial financial fee

An amount equal to the 50% of the debt service has to be blocked in a dedicated DSRA account

Interest rate = euribor + spread, where at least 70% of the interest rate has to be covered.

We will assume a 0% coverage or a 100% coverage

@Nov 11th: Euribor 6 months = 0% (variable-rate over the time)

@Nov 11th: Irs 8 years = 0.8% (fixed-rate over the time)

VAT facility to cover the VAT expenses during construction

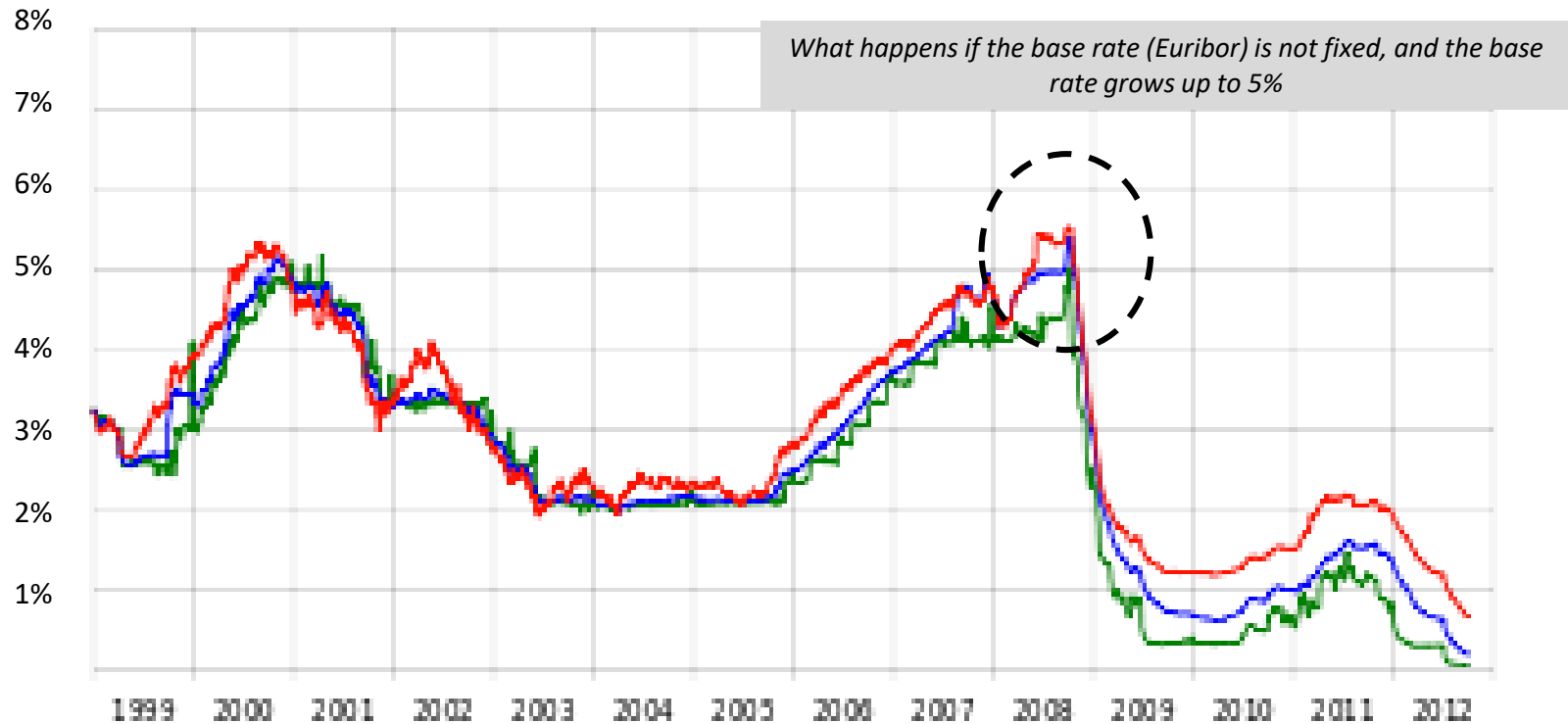
Sample term sheet – senior loan, Euribor-index

- At the calculation date (Nov 11th), interest rate = euribor 6month (0%) + spread (2.5%)
- Usually, debt service has to be calculated according to the interest rate at the calculation date

Base case - with euribor 0% (theoretical)	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Euribor 6m	0,0%									
Spread	2,5%									
Total interest rate	2,5%									
Debt service	6.973									
Initial outstanding debt		50.000	44.277	38.410	32.397	26.234	19.916	13.441	6.803	0
Debt drawdown	50.000									
Debt service		6.973	6.973	6.973	6.973	6.973	6.973	6.973	6.973	0
Whereof financial interests		1.250	1.107	960	810	656	498	336	170	0
Whereof capital repayment		5.723	5.866	6.013	6.163	6.318	6.475	6.637	6.803	0
Final outstanding debt	50.000	44.277	38.410	32.397	26.234	19.916	13.441	6.803	0	0

- However Euribor is a variable-rate, and the interest rate is expected to vary over the time
- To recalculate the yearly debt service, usually the capital repayment is blocked, and financial interests change over the time (changing the debt service accordingly)

Sample term sheet – Euribor historical



Euribor rates for 12m (red), 3m (blue) and 1w (green) between 1998 and 2011.

Sample term sheet – senior loan, Euribor-index

- A possible worst scenario, a shock causes an Euribor rise up to 5%

Base case - with variable-rate euribor	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Euribor 6m		0,0%	1,0%	3,0%	5,0%	5,0%	5,0%	3,0%	2,5%	2,5%
Spread		2,5%	2,5%	2,5%	2,5%	2,5%	2,5%	2,5%	2,5%	2,5%
Total interest rate		2,5%	3,5%	5,5%	7,5%	7,5%	7,5%	5,5%	5,0%	5,0%
Initial outstanding debt		50.000	44.277	38.410	32.397	26.234	19.916	13.441	6.803	0
Debt drawdown	50.000									
Debt service		6.973	7.416	8.126	8.593	8.285	7.969	7.377	7.143	0
Whereof financial interests		1.250	1.550	2.113	2.430	1.968	1.494	739	340	0
Whereof capital repayment		5.723	5.866	6.013	6.163	6.318	6.475	6.637	6.803	0
Final outstanding debt	50.000	44.277	38.410	32.397	26.234	19.916	13.441	6.803	0	0

- Mitigation strategy: interest-rate coverage (IRS or other coverage scheme)

Sample term sheet – senior loan, Euribor-index

- Mitigation strategy: interest-rate coverage (IRS 8 years)
- The risk is transferred to a third-part: the SPV will pay more at the beginning, with no risks if the Euribor index rises

Base case - with variable-rate euribor	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Irs 8 years	0,8%									
Spread	2,5%									
Total interest rate	3,3%									
New debt service	7.213									
Initial outstanding debt		50.000	44.437	38.690	32.753	26.621	20.286	13.743	6.983	0
Debt drawdown	50.000									
Debt service		7.213	7.213	7.213	7.213	7.213	7.213	7.213	7.213	0
Whereof financial interests		1.650	1.466	1.277	1.081	878	669	454	230	0
Whereof capital repayment		5.563	5.747	5.936	6.132	6.335	6.544	6.760	6.983	0
Final outstanding debt	50.000	44.437	38.690	32.753	26.621	20.286	13.743	6.983	0	0

Sample term sheet

Referring to the bank term sheet:

- Please model the debt repayment (Senior Debt Facility and VAT Facility) and calculate DSRA and Arrangement Fee
- **Considering the exercise B of lessons 6 and 7, please apply Distribution Conditions to recalculate distributions and double check if cash flow after debt (SPV) is the same of cash flow for shareholders (distributions)**

Sample term sheet - covenant

	<u>Definition</u>	<u>Term sheet covenant</u>
DSCR Debt Service Cover Ratio	<ul style="list-style-type: none">• $DSCR = \text{Cash Flow before debt} / \text{Debt Service}$• Covenant: $ADSCR \text{ (Average)} \geq \text{Target}$• $DSCR \text{ min} \geq \text{Target}$ (over the project life)	<ul style="list-style-type: none">• $\text{Min DSCR} > 1.30x$• $ADSCR > 1.30x$
LLCR Loan Life Cover Ratio	<ul style="list-style-type: none">• $LLCR = (\text{NPV of CFADS over Loan Life [+DSRA]}) / \text{Debt Balance}$• Covenant: $ALLCR \text{ (Average)} \geq \text{Target}$• $LLCR \text{ min} \geq \text{Target}$ (over the project life)	<ul style="list-style-type: none">• $\text{Min LLCR} > 1.35x$• $ALLCR > 1.35x$
Debt / Equity	<ul style="list-style-type: none">• Relative proportion of shareholders' equity and debt used to finance a company's assets.• Covenant: $\text{Debt} / \text{Equity} \leq \text{Max D/E}$	<ul style="list-style-type: none">• $D/E < 75/25$

Sample term sheet - DSCR

Project Cash flow M€	2021	2022	2023	2024	2025	2026	2027
EBITDA	205	210	215	221	226	232	238
Tax	-7	-9	-11	-14	-16	-18	-21
Capex investments	-1,450						
Tax benefit of financial interests (-)	0	-16	-15	-14	-13	-12	-11
Cash flow before debt service (unlevered)	-1,450	175	179	183	187	192	196
Debt drawdown	1,015	0	0	0	0	0	0
Capital repayment	0	-53	-58	-62	-67	-73	-79
Financial interests	0	-81	-77	-72	-67	-62	-56
Tax benefit of financial interests (+)	0	16	15	14	13	12	11
Cash flow after debt service (levered SPV)	-435	57	60	63	66	69	72
Equity variation							
Equity distribution (assumption = cash flow)							
Final cash SPV							
Cash flow before debt service (unlevered)		175	179	183	187	192	196
Debt service		135	135	135	135	135	135
DSCR		1,30	1,33	1,36	1,39	1,42	1,45
Min DSCR	1,30						
ADSCR	1,48						

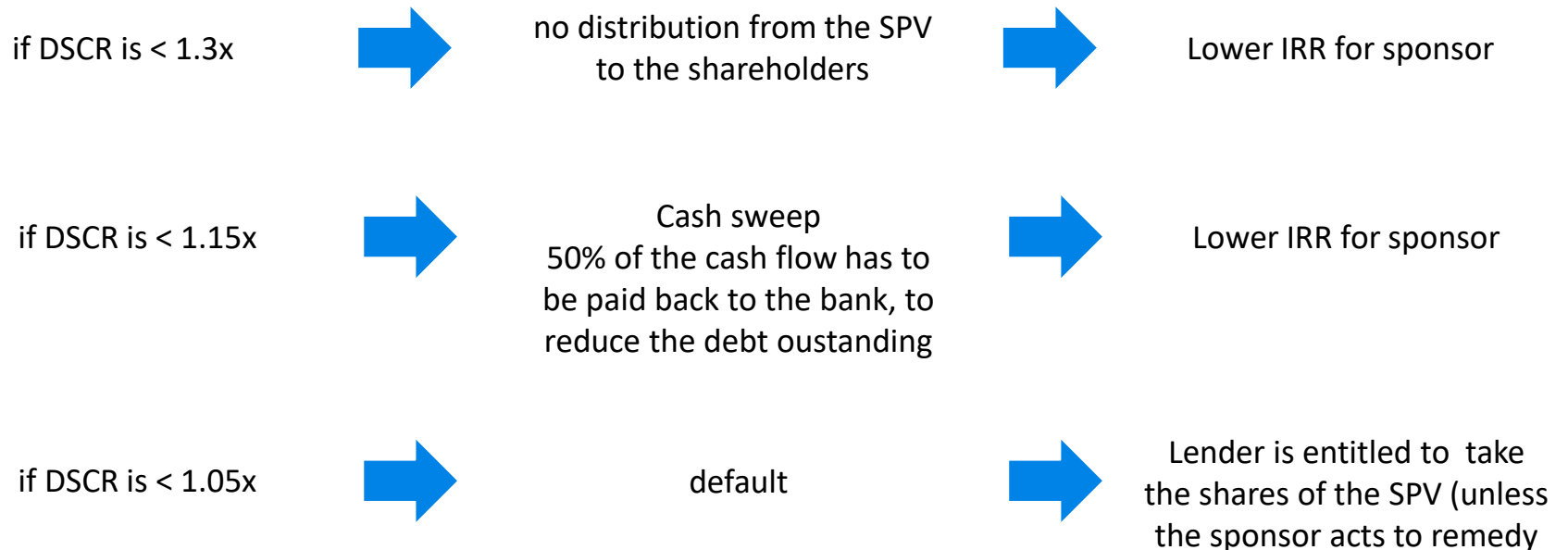
For unlevered vs levered valuation, tax benefit of finance is considered with adjustments. Usually DSCR calculation does not take into consideration this adjustment

DSCR = cash flow before debt service / debt service (capital repayment + financial interests)

Min DSCR and ADSCR higher than covenant – ok for distributions

Sample term sheet – DSCR (worst case)

During operation – every year the SPV has to update the financial model, to check the compliance of all the covenants



Sample term sheet - LLCR

Project Cash flow M€		2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
EBITDA		0	195	200	205	210	215	221	226	232	238
Tax		0	-3	-5	-7	-9	-11	-14	-16	-18	-21
Capex investments		-1.450									
Tax benefit of financial interests (-)		0	-16	-15	-14	-13	-12	-11	-10	-9	-7
Cash flow before debt service (unlevered)		-1.450	175	179	183	187	192	196	200	205	209
Debt drawdown		1.015	0	0	0	0	0	0	0	0	0
Capital repayment		0	-53	-58	-62	-67	-73	-79	-85	-92	-99
Financial interests		0	-81	-77	-72	-67	-62	-56	-50	-43	-36
Tax benefit of financial interests (+)		0	16	15	14	13	12	11	10	9	7
Cash flow after debt service (levered SPV)		-435	57	60	63	66	69	72	76	79	82
Equity variation		435	0	0							
Equity distribution (assumption = cash flow)						-66	-69	-72	-76	-79	-82
Final cash SPV						0	0	0	0	0	0
Cash flow before debt service (during loan)						187	192	196	200	205	209
NPV of future cash flows	8%	1.467	1.409	1.343	1.267	1.181	1.084	975	853	716	564
Final debt outstanding		1.015	962	904	841	774	701	623	538	446	347
LLCR			1,47	1,49	1,51	1,53	1,55	1,57	1,59	1,61	1,62
Min LLCR		1,47									
ALLCR		1,57									

LLCR = NPV of the cash flow before debt service during finance / outstanding debt

Min LLCR and ALLCR higher than covenant – ok for distribution

Sample term sheet – D/E

Project Cash flow M€	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
EBITDA	0	195	200	205	210	215	221	226	232	238
Tax	0	-3	-5	-7	-9	-11	-14	-16	-18	-21
Capex investments	-1.450									
Tax benefit of financial interests (-)	0	-16	-15	-14	-13	-12	-11	-10	-9	-7
Cash flow before debt service (unlevered)	-1.450	175	179	183	187	192	196	200	205	209
Debt drawdown	1.015	0	0	0	0	0	0	0	0	0
Capital repayment	0	-53	-58	-62	-67	-73	-79	-85	-92	-99
Financial interests	0	-81	-77	-72	-67	-62	-56	-50	-43	-36
Tax benefit of financial interests (+)	0	16	15	14	13	12	11	10	9	7
Cash flow after debt service (levered SPV)	-435	57	60							
Initial cash SPV		0	0							
Equity variation	435	0	0							
Equity distribution (assumption = cash flow)		-57	-60							
Final cash SPV	0	0	0							
Final debt outstanding	1.015	962	904							
Minimum equity required for covenant (A) 25%	338	321	301							
Equity	435	435	392							
Net profit of the year	0	14	21							
Total equity (equity + net profit) (B)	435	449	413							
Max allowed distribution (B-A)	97	128	112	101	97	101	112	132	161	199
Total cash (C)		57	60	63	66	69	72	76	79	82
Distribution - min(B-A;C)		57	60	63	66	69	72	76	79	82
check	ok	ok	ok	ok	ok	ok	ok	ok	ok	ok

Given the final debt outstanding of every year,
By using the max D/E ratio of 75/25, it is calculated the minimum required equity (A)
By adding initial equity and net profit of the year, it is possible to identify the final equity every year (before distribution), (B)
The difference between (A) and (B) is the maximum allowed distribution for D/E covenant.
Planned distribution should be consistent (lower) than the maximum distribution

Sample term sheet – D/E – worst case

What happens if the max D/E allowed is 70/30?

Project Cash flow M€	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
EBITDA	0	195	200	205	210	215	221	226	232	238
Tax	0	-3	-5							
Capex investments	-1.450									
Tax benefit of financial interests (-)	0	-16	-15							
Cash flow before debt service (unlevered)	-1.450	175	179							
Debt drawdown	1.015	0	0							
Capital repayment	0	-53	-58							
Financial interests	0	-81	-77	-72	-67	-62	-56	-50	-43	-36
Tax benefit of financial interests (+)	0	16	15	14	13	12	11	10	9	7
Cash flow after debt service (levered SPV)	-435	57	60	63	66	69	72	76	79	82
Initial cash SPV		0	20	34	42	42	35	19	0	0
Equity variation	435	0	0							
Equity distribution (assumption = cash flow)		-37	-46	-55	-66	-77	-88	-95	-79	-82
Final cash SPV	0	20	34	42	42	35	19	0	0	0
Final debt outstanding	1.015	962	904	841	774	701	623	538	446	347
Minimum equity required for covenant (A) 30%	435	412	387	361	332	301	267	230	191	149
Equity	435	435	412	387	361	332	301	267	236	231
Net profit of the year	0	14	21	29	37	45	54	64	74	84
Total equity (equity + net profit) (B)	435	449	433	416	397	377	355	331	309	315
Max allowed distribution (B-A)	0	37	46	55	66	77	88	100	118	166
Total cash (C)		57	80	97	108	112	107	95	79	82
Distribution - min(B-A;C)		37	46	55	66	77	88	95	79	82
check	ok	error	error	error	error	error	error	ok	ok	ok

With a 70/30 D/E ratio, for some years (2019-2024), the D/E ratio does not allow the full distribution of the available cash.

IRR calculated on distribution falls from 16.4% down to 15.8%



Sample term sheet – take out

- In financial loans, also ancillary conditions are relevant to evaluate IRR for sponsors (in this case, such as DSRA account or upfront fees)
- A preliminary check to the compliance of lenders' covenant (DSCR, LLCR, D/E) can avoid default or identify if there is a mismatch between cash flow for SPV and cash flow for distribution

Summary

Sample term sheet - analysis



Exercise D - solution

Exercise D – assignment

Excercise D (assignment)

Project

- People mover, one-to-one electric transportation system from the city center to the city airport of a primary city. The project is running and fully operating
- The project package means the project rights (authorization for the use of the line in a monopoly system) and the necessary tools to operate the system (trains, stations, devices, etc.)

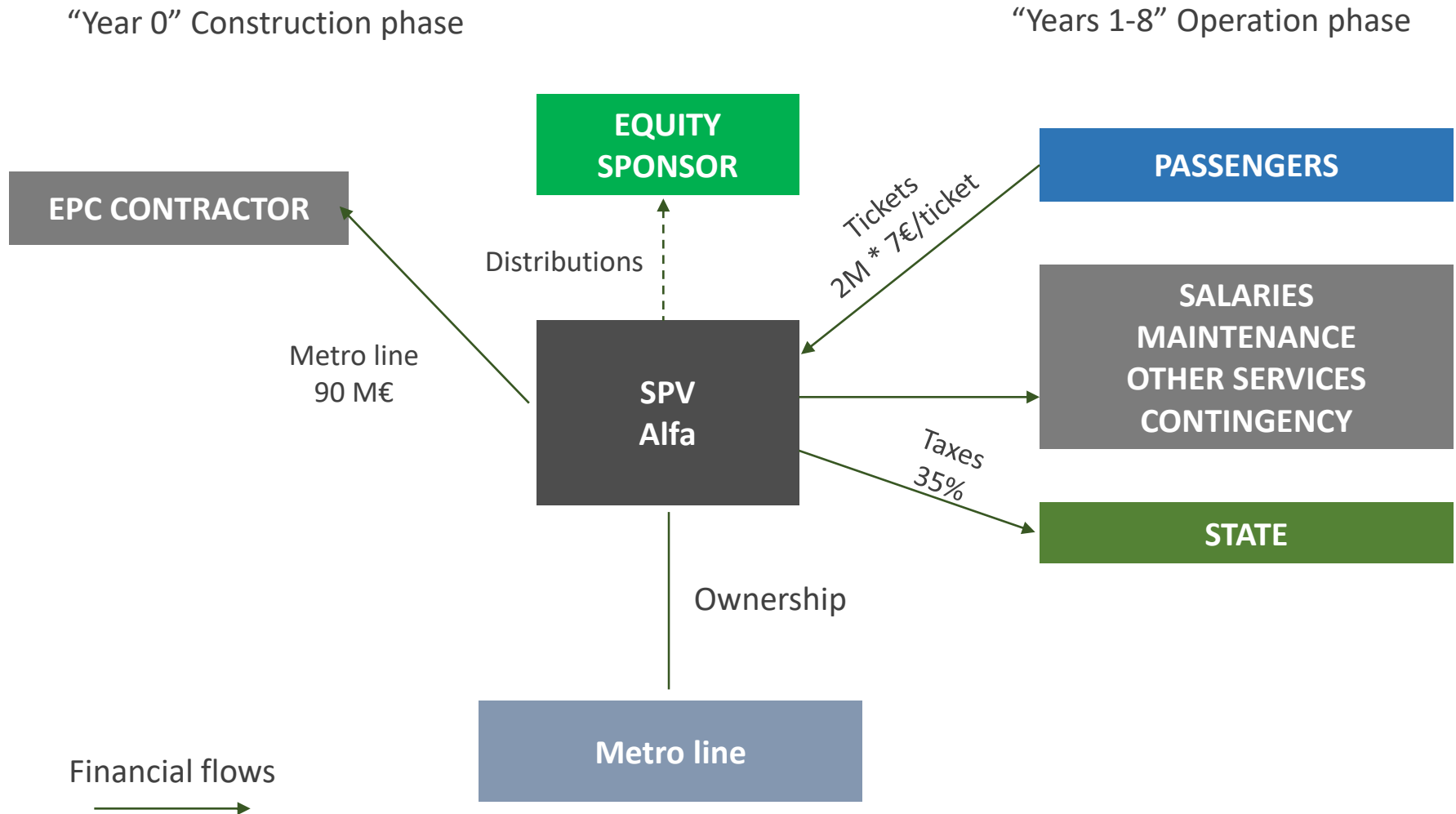
Input

- **CAPEX:** Initial asset book value: 90 M€ (price to be considered), asset remaining life 30 years, amortization rate 1/30 yearly; investment period 8 years; At the end of the investment period, the asset is sold at its residual book value
- **REVENUES:** Drivers are yearly passenger and ticket per passenger, Passengers are expected of 2.0 M per year (*2.0 M tickets*), Price per ticket is 7 € per ticket, with an yearly adjustment according to inflation rate
- **OPERATING COSTS:** Salaries 0.5 M€/year, Maintenance 1 M€/year, other services and general expenses: 2 M€/year, Contingency of 5% of the annual costs. All the previous costs adjusted according to the inflation rate
- **OTHER ASSUMPTIONS:** Inflation rate: annual 2% (according to historical value and market forecast, Tax rate: flat 35% on the annual EBT, No leverage, the project has to be considered full equity (debt free)

TO DO

- **Draw the business plan (profit & losses, cash flow) with the previous assumptions**
- **Identify some possible risks and the related effects**

Excercise D – business model



Excercise D – assumption

Input (M€)

Asset Value	90,0
D&A rate	3,3%
Investment period - years	8,0
Exit value	book value
Tax rate	35%
Inflation rate	2,0%
Yearly passenger (M)	2,0
Ticket per passenger (€)	7,0
Salaries	0,5
Maintenance	1,0
General & Administrative	2,0
Contingency	5%

Excercise D – general risks

Construction and operation

- Delay in construction
- Lower performances
- Higher degradation
- Higher operating costs
- Extraordinary maintenance
- Default during construction
- Default during operation

Political / country risk

- Delay in construction
- Change in law
- Tax rate change

Supply and Market

- Higher construction budget
- Lower revenue drivers
- Higher operation costs
- Commodity price

Economical and Financiale

- Different inflation rate
- Different financial conditions
- Higher interest rate

Excercise D – some project risks

To be discussed in class

Market / number of passangers

Inflation rate variation

Maintenance costs

Technological risks / Insurance costs

Tax rate variation

[...]

Excercise D – revenues and costs

Revenues breakdown M€		0	1	2	3	4	5	6	7	8
Yearly passenger (M)	2,0	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00	2,00
Inflation rate	2,0%	100%	102%	104%	106%	108%	110%	113%	115%	
Ticket per passenger (€)	7,0	7,00	7,14	7,28	7,43	7,58	7,73	7,88	8,04	
Revenues		0,0	14,0	14,3	14,6	14,9	15,2	15,5	15,8	16,1

Cost breakdown M€		0	1	2	3	4	5	6	7	8
Inflation rate		100%	102%	104%	106%	108%	110%	113%	115%	117%
Salaries	0,5	0,5	0,5	0,5	0,5	0,5	0,6	0,6	0,6	0,6
Maintenance	1,0	1,0	1,0	1,1	1,1	1,1	1,1	1,1	1,1	1,2
General & Administrative	2,0	2,0	2,1	2,1	2,2	2,2	2,2	2,3	2,3	2,3
Contingency	5%	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1	0,1
Operating costs		0,0	3,7	3,7	3,8	3,9	4,0	4,1	4,1	4,2

Excercise D – investment and asset sale

Asset value M€	0	1	2	3	4	5	6	7	8
Book Value - begin of the year		90	87	84	81	78	75	72	69
Asset investment (cash out)		90							
Depreciation & Amortization (D&A)	3,0	3	3	3	3	3	3	3	3
Asset sale (cash in)									66
Book Value - end of the year	90	87	84	81	78	75	72	69	0

Asset increase =
negative variation in
cash flow (cash out)

Asset decrease =
positive variation in
cash flow (cash in)

Excercise D – P&L

P&L M€	0	1	2	3	4	5	6	7	8
Revenues	0,0	14,0	14,3	14,6	14,9	15,2	15,5	15,8	16,1
Operation costs (Opex)	0,0	3,7	3,7	3,8	3,9	4,0	4,1	4,1	4,2
EBITDA (A-B)	0,0	10,3	10,5	10,7	11,0	11,2	11,4	11,6	11,9
Depreciations & Amortizations	0,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0	3,0
EBIT (C-D)	0,0	7,3	7,5	7,7	8,0	8,2	8,4	8,6	8,9
Interests									
EBT (E-F)	0,0	7,3	7,5	7,7	8,0	8,2	8,4	8,6	8,9
Taxes	0,0	2,6	2,6	2,7	2,8	2,9	2,9	3,0	3,1
Net profit (G-H)	0,0	4,8	4,9	5,0	5,2	5,3	5,5	5,6	5,8

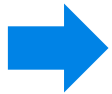
Excercise D – Cash flow

Base Case M€	0	1	2	3	4	5	6	7	8
EBITDA	0,0	10,3	10,5	10,7	11,0	11,2	11,4	11,6	11,9
Taxes	0,0	(2,6)	(2,6)	(2,7)	(2,8)	(2,9)	(2,9)	(3,0)	(3,1)
Asset investment	(90,0)	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Asset sale	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	66,0
Working capital	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0	0,0
Cash Flow before debt	(90,0)	7,8	7,9	8,0	8,2	8,3	8,5	8,6	74,8
Cash flow after debt	(90,0)	7,8	7,9	8,0	8,2	8,3	8,5	8,6	74,8
IRR	6,47%								

Summary

Sample term sheet - analysis

Exercise D - solution



Exercise D - assignment

Exercise D - assignment

- Based on exercise D, identify the maximum leverage allowed to respect the following covenant: $\text{min DSCR} > 1.3x$,
under the following conditions: interest rate: 5%, duration 8 years
- Based on the 3 main risks previously identified, build up a risk matrix and sensitivity analysis, referring to lesson 8