INTERNATIONAL FINANCE
FINANCIAL MODEL
Lesson 7
Exercises and Risk analysis

LUISS Guido Carli

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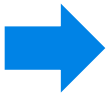
Course Responsible: Federico Merola

Assistant: Marco Pignoloni

marco.pignoloni@arpinge.it

Summary



Excercise A

Excercise B

Overview of risk analysis

Case study – Metro 5 Milan structure

Excercise (A)

Under the following assumptions:

- Asset Value at year 0 of 150 M€, to be amortized in 3 years with a fixed value
- Investment and project life 3 years (years of investment + 3 years)
- Revenues 120 yearly + inflation rate (starting at year 1)
- Costs 60 yearly + inflation rate (starting at year 1)
- Inflation rate 1%
- Tax rate 35% on EBT
- No Working Capital
- Debt structure: repayment in 3 years with fixed rata (principal + interests) with interest rate of 6.0%

Please calculate the optimal leverage (D/E ratio) to maximize Levered IRR, with the following covenants: min DSCR, average DSCR, min LLCR, and average LLCR > 1.4x

Excercise (A) - solution

Procedure:

- Make an assumption on the possible initial leverage (ex. 60%)
- Build-up P&L, (Balance sheet) and Cash flow
- Calculate levered IRR, and lender's covenant
- If covenants are >1.4x, try to change the leverage until they reach a closer value to 1.4x. Since project IRR > interest rate, by increasing the leverage, the levered IRR should increase as well
- Final result:
  - With fixed debt service: best leverage 74%, levered IRR 16.0%
  - With fixed capital repayment: best leverage 71%, levered IRR 14.4%

Please refer to the excel under lesson of October 15th

Summary

Excercise (B)

A financial investor is considering the possibility to invest in a hydroelectric power plant in Laos, thought an SPV named “Alfa”. The project is fully authorized and has to be built.

Total construction cost is considered (capex) of **1.450 M$,** already including some contingencies for unexpected works. Construction works are expected to be done in 1 year. D&A: Plant amortization in fixed value during the plant life *(if the plant life is 15 years – 1/15 every year)*

The financial structure considers a leverage of 70%, to be repaid in 12 years with a fixed repayment (capital repayment + financial interests = fixed value every year, use the excel formula “rata” or “pmt”). Financial interests are 8% every year. No financial interests during the grace period (during construction). Financial interests start once the plant is operating

Alfa has signed a power purchase agreement with a governative body, to sell the entire electricity production. Also according to detailed technical studies on the historical water flows, Alfa can expect annual revenues of 400 M$, yearly adjusted according to inflation rate.

Alfa expects around 200 M$ of annual costs (whereof 110 M$ for maintenance, 20 M$ for insurance, 40 M$ for royalties and the remaining part for general costs or contingency.

Tax rate is the 20% of EBT, and inflation rate is 2.5%, starting from the first year of operation

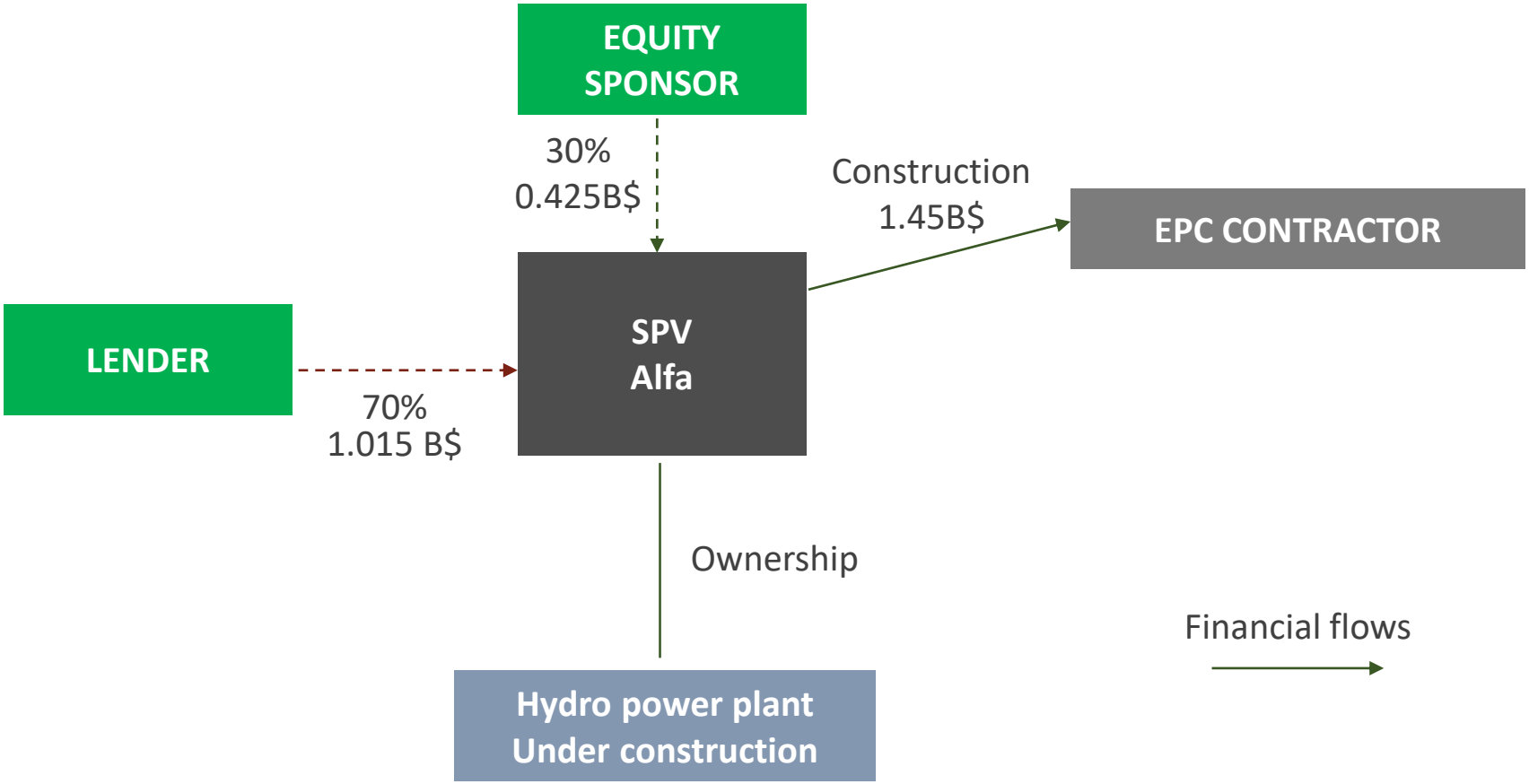
Please write or calculate:

- Some project risks and how they have been covered in the structure
- P&L, cash flow to identify IRR and NPV
- Ke and WACC based on market estimations

Backlog lesson 15/10

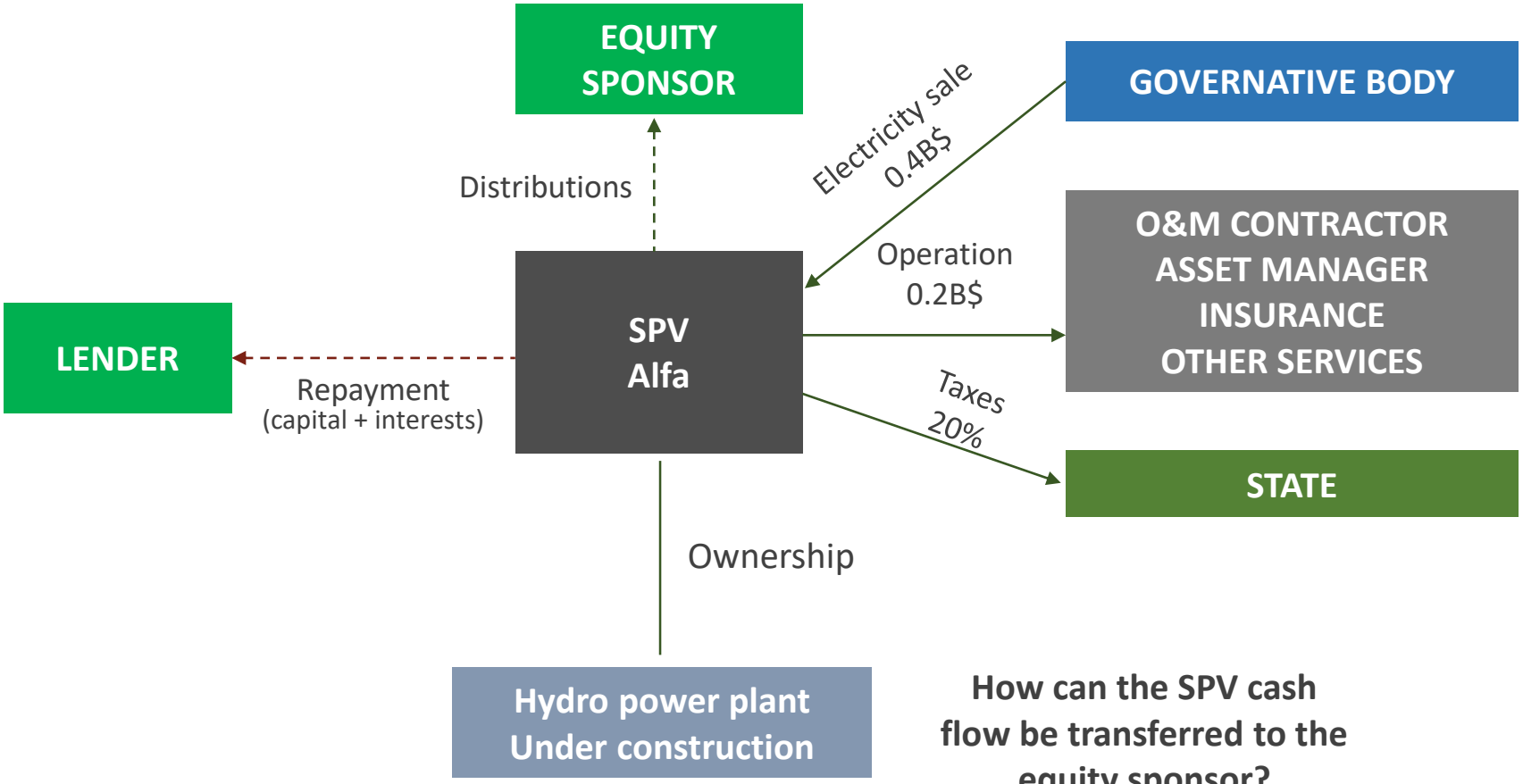
Excercise (B) – financial structure – «year 0»

"Year 0" Construction phase



Excercise (B) – financial structure – years 1-15

"Years 1-15" Operation phase



How can the SPV cash flow be transferred to the equity sponsor?

Excercise (B) – project risks

To be discussed during lesson
And to be updated after lesson

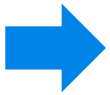
Excercise (B) – solution

To be discussed during lesson
And to be updated after lesson

Summary

Excercise A

Excercise B



Overview of risk analysis

Case study – Metro 5 Milan structure

Risk management

- Which are the main project risks?
- Which could be a possible variation depending on the project risk?

- Is it necessary to cover the risk?
- Is it economically favorable to have a coverage
- Sensitivity / Stress test

- Which is the economic impact on my business plan?

Risk identification

Technology

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

Counterpart

- Delay in construction
- Default during construction
- Default during operation

Market

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

Macro economy

- Different inflation rate
- Commodity price

Political

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

Finance

- Different financial conditions
- Higher interest rate

Risk adversion – Sponsor vs Lender

Different perspectives according to different roles, strategies and risk profiles

Sponsor

- The trade-off between risk and economic outcome is the «decision maker»
- How to maximize the economic return, considering a fair risk reduction?

Lender

- The outstanding repayment plus interests has to be secured, with the guarantee to be repaid
- The more the risks can be covered, the more the lender is secured

Sensitivity analysis

- A sensitivity analysis is a technique for evaluating **how different values of an input variable could change the economic outcome**.
- Sensitivity analysis – *also called as what-if or simulation analysis* - is a way to predict the economic outcome of different input values.
- The more the input variable are **correlated**, the more the sensitivity analysis is complex.
- The sensitivity analysis is the **result of the risk analysis**, that identify which input variables can change and their possible range of variation
- While a sensitivity analysis aims to quantify the possible outcome of a variable change, a **scenario analysis** aims to identify possible scenario and their related economic outcome

Stress test analysis

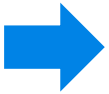
- A stress test is the analysis to determine the ability of a given project to deal with a "**worst scenario"**
- Starting from a base case scenario, a stakeholder (sponsor or lender) may do stress testing to **prove the robustness of the project to mitigate possible crashes**
- Some questions to be asked by a stress test analysis:
  - What happens if the inflation rate goes below the base case value?
  - What happen if the interest rates goes over the base case value?
  - What happens if oil prices rise of a defined percentage?
  - What happens if my construction budget does not meet my base case budget?
- Two ways to build-up a stress test analysis: (i) by calculating the impact on the economic return, with the maximum change in the variables, or (ii) by calculating the maximum variation in the variables to keep a sustainable economic outcome

Summary

Excercise A

Excercise B

Overview of risk analysis



Case study – Metro 5 Milan structure

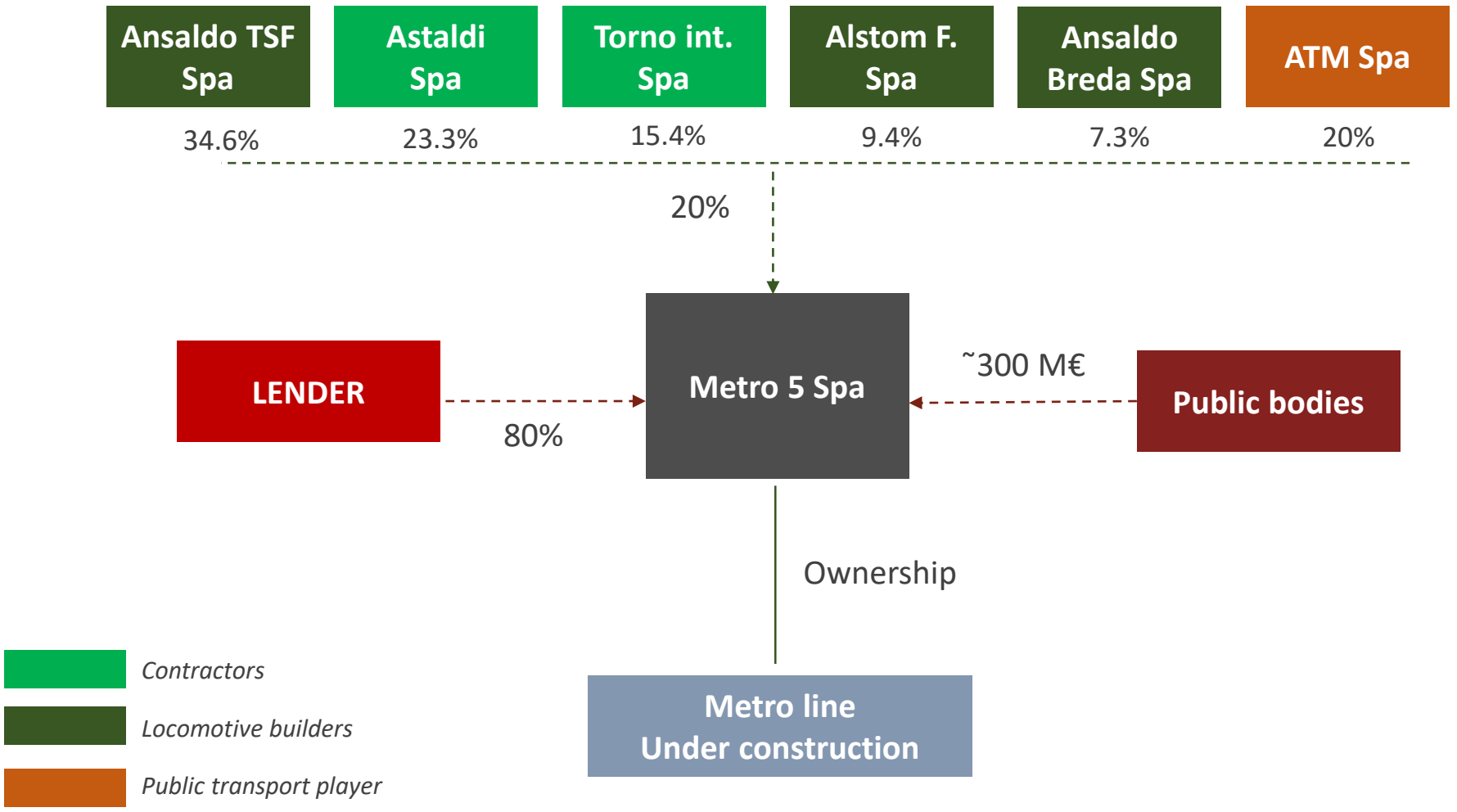
Case study – Milan metro 5

- Taken from case study #4 reference book and other references
- New metro line of around 13 Km, opened in stages between 2013 and 2015, using driveless veichles
- In 2003, a consortium proposed the project under project-finance/public-partnership scheme. The consortium included industrial players (contractors, and locomotive builders) and a public transport player
- City of Milan called for a tender, where the consortium was awarded, and created the purpose veichle Metro 5 Spa

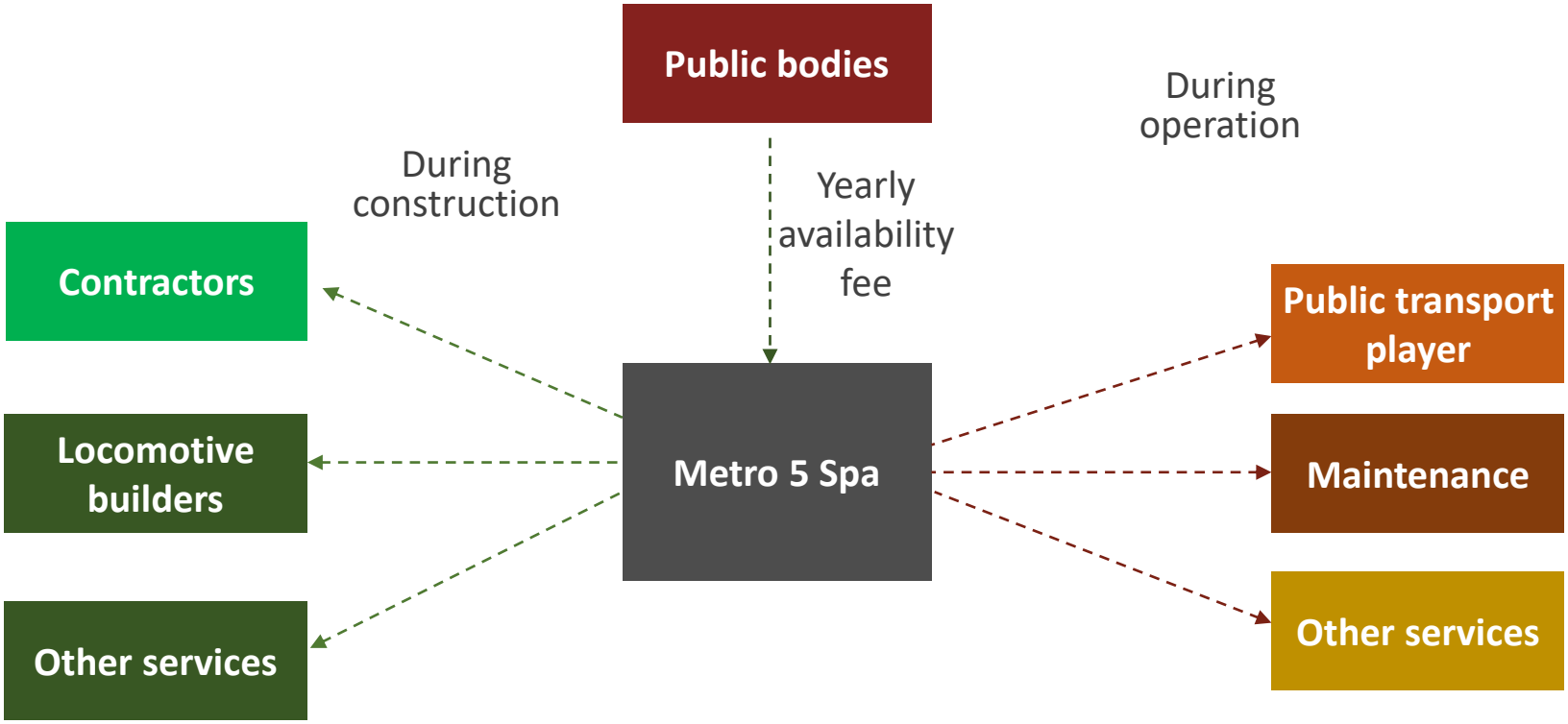
Case study – Milan metro 5

- Metro 5 Spa was charged to build, operate and maintain the metro line for around 32 years, and transfer the project at the end of the concession to the City of Milan
- Public grants were assigned to partially cover the project costs (from the central state and the municipality). The remaining portion of financial needs was covered by financial loan and equity
- Revenues are secured by an availability fee from the City of Milan to Metro 5 Spa, for the concession duration. The availability fee is partially based on the annual number of passengers (compared to a target value)
- Metro 5 is obliged to build the metro line within a defined period, and operate it by keeping a minimum level of service and security
- Specific penalties were considered in case of delays during construction, delays during operation or not regularity of service
- After construction (in 2017) some industrial shareholders sold their share to the public trainsport player FS Italiane

Case study – Milan metro 5
Financial structure



Case study – Milan metro 5
Commercial structure



Which project risk are relevant? How project risks have been allocated?