BUSINESS CONCEPTS FOR LIFE SCIENTISTS
A FREE ONLINE COURSE IN BUSINESS STRATEGY, FINANCE AND BUSINESS DEVELOPMENT

Business Concepts for Life Scientists: Finance

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Revenue & Costs
What the enterprise earns and spends

Forecasting
Estimating the funding of the enterprise

Cost of Capital
Required rate of return to make an investment
Cost of Capital

- How do I evaluate and prioritize my projects?
- How will my projects be assessed financially?
- How to compare projects financially?
Cost of capital

Cost of capital is the rate of return required to persuade an investor to make a given investment.

For example, Biotech XYZ wants to raise equity to fund a clinical trial of its lead drug. Equity investors require a 30% rate of return to make the investment. Therefore, the company’s cost of capital (for equity) is 30%.

The cost of capital is dependent on the perceived risk of the company/investment. The less risky an investment is, the lower the cost of capital will be.
Cost of capital in Drug Development

Cost of capital

Probability of Success
Opportunity cost

Opportunity cost is the cost of the next-best alternative that must be forgone in order to choose a desired plan.

I can choose an apple or an orange. If I choose the apple, the opportunity cost is the orange.

If I decide to attend graduate school, the opportunity cost is the value of the foregone wages if I had worked instead.

Investors have multiple options to invest their capital and will demand a higher return, i.e. higher cost of capital, to invest in riskier companies.
Opportunity cost - example

Which company has the higher cost of capital?

- Biotech A has a drug candidate that is in preclinical testing and needs to raise money to file an IND
- Biotech Z has a drug candidate in phase 3 clinical studies and needs to raise money to file an NDA
Net Present Value (NPV)

Relies on the time value of money, the fundamental principle that a dollar today is worth more than a dollar in the future.
Net Present Value (NPV)

NPV translates an investment’s value over time into today’s dollar

Future cash flows (inflows or outflows) are discounted to today’s dollar

\[ FV = PV(1+r)^n \]

FV = Future Value
PV = present value
r = interest rate
n = number of periods (years)

Interest compounds, not linear equation, exponential function

Net Present Value is the Summation of all Present Values
NPV example calculation

Biotech X is considering developing a drug. It will cost $500M over 8 years before the drug is approved. Then the drug will produce $1,500M profit over 2 years. Should the biotech company invest in this drug?

<table>
<thead>
<tr>
<th>Year</th>
<th>Annual cash flow</th>
<th>Discount rate</th>
<th>Present value of cash flow</th>
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<tbody>
<tr>
<td>1</td>
<td>($10)</td>
<td>25%</td>
<td>($8)</td>
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<tr>
<td>2</td>
<td>($20)</td>
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Net Present Value (sumation of all present cash flows) $32
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The NPV is positive – the investment would earn money for the biotech company.
Net Present Value (NPV)

NPV is an indicator of how valuable a project could be and whether it is worth investing in.

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<th>If...</th>
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<tr>
<td>NPV &gt; 0</td>
<td>add value to the firm</td>
</tr>
<tr>
<td>NPV &lt; 0</td>
<td>subtract value from the firm</td>
</tr>
<tr>
<td>NPV = 0</td>
<td>neither gain nor lose value for the firm</td>
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Internal Rate of Return (IRR)

Technical definition: the interest rate at which the net present value of all the cash flows (both positive and negative) from a project equal zero.

Practical use: can be used to evaluate the attractiveness of a project or investment.

If the IRR of a new project exceeds a company’s required rate of return, that project is desirable. If IRR falls below the required rate of return, the project should be rejected.
IRR example

A venture capitalist is considering an investment in a biotech company developing a drug for Alzheimer’s disease. The company will require a $10M investment today and another $20M investment in 2 years. The venture capitalist expects to sell the shares for $90M five years from today. The venture capitalist’s hurdle rate is 25% for biotech investments. Should she make the investment?

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**IRR** 33.5%
### IRR example

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**IRR** 33.5%

The discount rate at which the NPV of all the cash flows equals zero is 33.5%. The IRR is higher than the hurdle rate and the venture capitalist should invest in the company.
Summary and conclusions

Cost of capital

- Used by all organizations
- When assessing cost of funding operations

NPV

- Used mainly by companies
- When valuing assets to acquire

IRR

- Used mainly by investors
- When evaluating an investment opportunity
Advanced Topics: Developing finance requires

Analysis of the following areas:

- Cost of debt and cost of equity (weighted average cost of capital -WACC)
- Discount rate sensitivity
- Multiple of capital

Use of the following skill sets:

- Accounting
- Understanding assumptions that go into forecasts
- Analytical thinking
Parallels to Academia: Questions to consider

- What are examples of opportunity cost in the lab?
- How do you decide which projects to invest in?
- Have you calculated NPV in the lab?

- Tell us about your near and long term financial strategies for your lab.
Finance course objectives

You should now be able to:

1. Identify the 3 different financial statements and how scientists use them
2. Read and understand a P&L statement
3. Calculate burn rate
4. Explain and apply concepts such as opportunity cost, cost of capital, and net present value
5. Apply these concepts in financial planning

THANK YOU FOR WATCHING