

# Valuation – Summary

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## 1 Intro

This lecture summarizes what we have done in this course.

The short summary:

Valuing corporations.

Method: Forecasting Free Cash Flows (FCF) from corporation

Current value → Present value this stream of FCF.

Practicalities:

- Forecasting Horizon
- Cash Flow Estimation
- Terminal value
- Cost of capital

Alternative method: Ratio Analysis

## 2 Discounted Cash Flow valuation of Companies

Estimate the future cash flows of the asset - in this case the firm.

Discount the cash flow with a risk-adjusted discount rate

$$Value = \sum_{t=1}^{\infty} \frac{FCF_t}{(1+r)^t}$$

Where

$FCF$  is the cash flow (FCF-Free Cash Flow)

$r$  is a discount rate reflecting the risk of the cash flows.

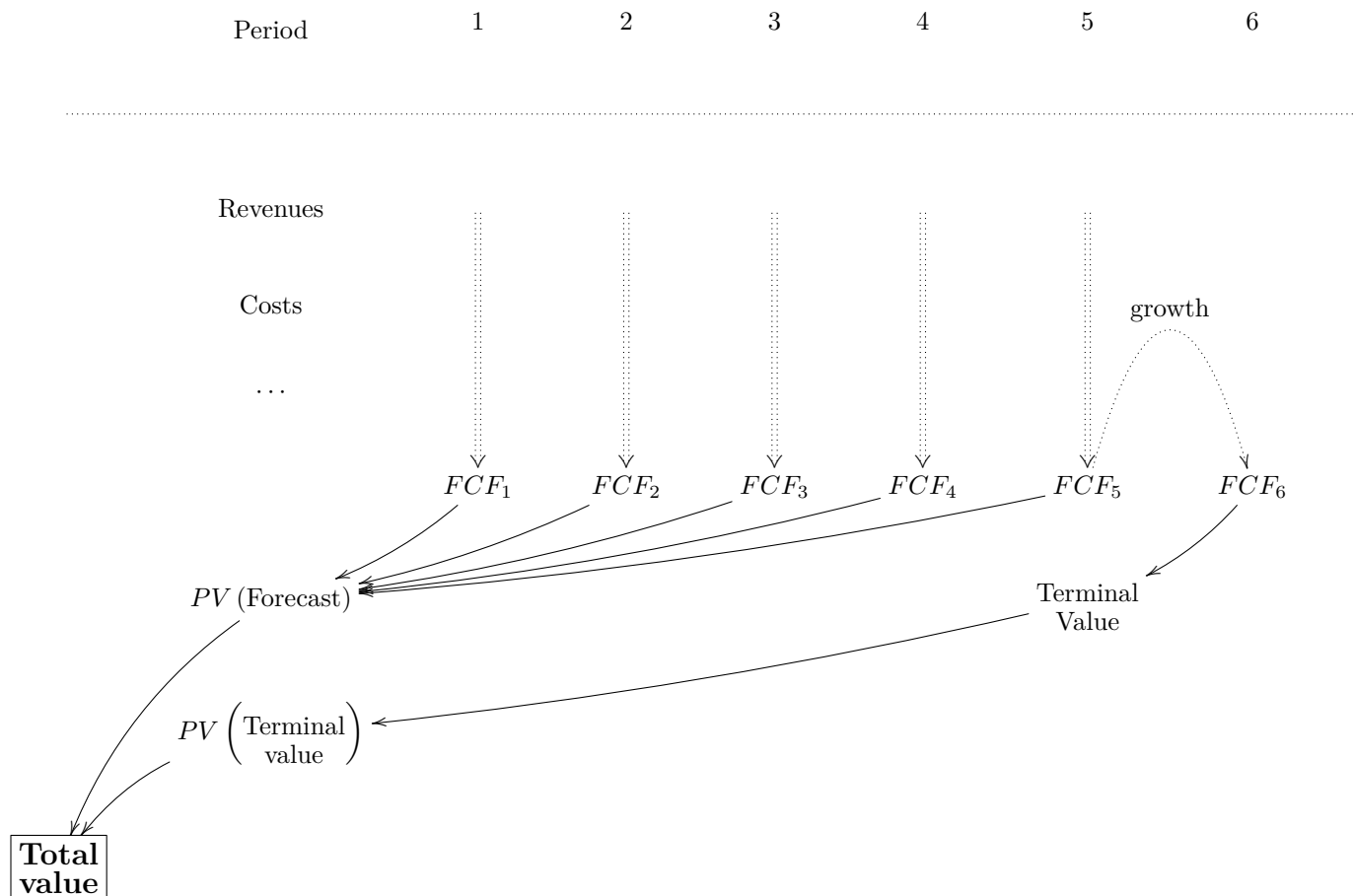
### 2.1 When to use discounted cash flow

When one can predict the expected cash flows

When one can find the cost of capital reliably

## 2.2 Typical firm valuation

The valuation in such a case proceeds as illustrated in figure



- Choose a horizon period to do detailed estimation (e.g. 5/7 years)
- Estimate the firm's cash flows for estimation period.  
Typically based on historical accounts, and short term growth assumption
- Estimate a "horizon" value.  
Cash flows at (horizon+1), long term growth rate
- Estimate a discount rate
  - Use stock market data, either for this firm, or for similar firms, to get at the relevant risk for this firm/industry.
  - Use that to estimate the cost to equity to the firm.
  - "Unlever" the cost of equity to get an estimate of the cost of capital to the whole firm.
- Discount the terminal value and the budgeted cash flows for the estimation period
- Find the value estimate
- Investigate the sensitivity of the estimate to changes in assumptions. (e.g. value sensitivity plots)

A number of things must be in place for this to be a valid procedure.

- The historical accounts must have some relation to future operations of the firm – if not, necessary to investigate future projects of the firm, estimate future cash flows from the projects directly.
- The riskiness of the firm must not change – otherwise the use of historical data for finding the right risk adjusted cost of capital result in a wrong risk adjustment – alternative: estimate risk of future projects directly.

What is the inputs necessary for such a procedure?

- Cash flow budgets
- growth rates
  - sales?
  - earnings?
  - ...
- Opportunity cost of capital.

What are examples of problems that can occur

- Negative cash flows in current accounts (firms in trouble).  
Can't say that the firm will have the same cash flows going forward, then it should rather be terminated.
- Firms being restructured (e.g. selling off divisions). Old accounts no longer relevant. Need to estimate cash flows of restructured firms.
- Firms involved in mergers.
  - Accounts of the merged firm?
  - The cash flow changes from the merger–synergies?
- Nonlisted firms  
What do we do to estimate the cost of equity when we do not observe a stock price.
- Future contingent choices.  
A firm closes a production line if the market price of the product falls.  
Hard to build such decisions into an discounted expected value sum.  
Need the tools of contingent claims valuation

### 3 From firm value to equity value

Typically want to also value the residual claimant's value (equity value).

In practice there are three ways of doing a DCF valuation of a firm's equity.

- Value just the equity part, the value of the equity stake in a business.  
Flow to equity
- Value the entire firm, value to all claimants
  - Bond/Debt holders

- Equityholders
- Other claimants (e.g. Employee options)

WACC

Implicit assumption: Capital structure constant

- Value the firm in pieces
  - Value of operations
  - add effect of debt, other nonequity claims

Adjusted present value

In symbols

- Flow-to-equity

$$\text{Value of equity} = \sum_{t=1}^{\infty} \frac{Cflow\ equity}{(1 + k_e)^t}$$

Where  $Cflow\ equity_t$  is the expected cash flow to equity in period  $t$ , and  $k_e$  is the cost of capital for equity.

- WACC

$$\text{Value of firm} = \sum_{t=1}^{\infty} \frac{Cflow\ firm}{(1 + WACC)^t}$$

- APV

$$\begin{aligned} \text{Value of firm} &= \text{Value of all-equity financed firm} \\ &+ PV(\text{tax benefits}) \\ &- PV(\text{expected bankruptcy costs}) \end{aligned}$$

With last two methods, first find firm value, then subtract estimated market values of

- Debt
- Other claims to non-equity parties (e.g. executive options).

## 4 Calculating firm cost of capital

We want to calculate

$$\text{Cost of capital} = \frac{D}{D + E} r_D + \frac{E}{D + E} r_E$$

Things needed:

- Cost of debt
- Fraction of each asset in the financing mix.

Cost of equity: typically a variant of CAPM.

Beta: Estimated from historical data, or use comparables

Cost of debt: Either market rates, or using the debt rating

Weights:

- Equity: Market value
- Debt:
  - Book value, adjusted towards market if possible
  - Exclude non-interest bearing debt

*IF* we do a WACC calculation, we are including the tax savings in the interest rate

$$r_{WACC} = \frac{D}{D+E} r_D (1 - \tau) + \frac{E}{D+E} r_E$$

## 5 Survey 2022 - Parameters for Norway

- Market risk premium: 5%
- Risk free interest rate:
  - Interest on Norwegian Government debt with 10 year maturity, or “normalized risk free rate”
  - Typical risk free interest rate: 3%–5% (most common 3.5%).
- Small stock premium: Yes (86%).
- Control premium: Yes, between 20%-30%.
- Inflation expectation: 2%
- Long term growth in nominal earnings (for terminal value): 2%.
- ESG - does it matter?
  - Majority add to cost of capital for weak ESG companies
- What are the major risk factors the next year?
  - Energy prices
  - Inflation
  - House price falling (household debt)

## 6 Relative valuation

Relative valuation - value assets based on how similar assets are currently priced in the market.

Easy to use (and misuse)

Two components:

1. To value assets relatively, must be standardized (multiples of earnings/book values/sales)
2. Find similar firms

Use of relative valuation – widespread

Why so popular?

1. Can be done quickly, with few assumptions
2. simple to understand and present

3. more likely reflect current mood in the market

Potential pitfalls

1. Simplicity lets on apply the method inconsistently, ignoring important differences between ratios/- firms
2. Reflecting the market mood not necessarily correct (irrational exuberance)

## 7 Cash

### 7.1 How to adjust for cash holdings

Recommended procedure when valuing the whole firm.

Find the part of the cash/financial assets necessary for operations.

Take the rest of cash out.

Do a FCF valuation based on the operating cash flows.

Add back the market values of the cash/financial assets.

## 8 Common mistakes

Some common mistakes

- Using comparison companies without making them comparable.  
For example: Want to estimate equity beta for “our” company from bunch of equity betas for comparables.  
Need to correct for differences in capital structure.  
Typically – do everything in terms of asset betas, then “relever.”  
Similar issues when looking at ratios.
- Forgetting assumptions behind WACC.  
To use WACC, we assume that debt/equity ratio is constant.  
Implicitly, we issue/retire equity capital/debt (at competitive rates) to make this true.
- Forgetting what business we are in.  
Need to think a bit about what is potentially special about the industry we analyze.  
Do not forget strategy.  
OTOH: Do not do strategy without using it.

## 9 Monkey Business

In ? *Monkey Business* a couple of ex-investment bankers give their entertaining view on valuation using DCF and ratios, which we can summarize as *The Cynics view on Valuation*

### 9.1 The cynical view on DCF analysis

The DCF analysis is especially useful for valuing companies with no real business . . .

The associate always take the first pass at developing the DCF model. The associate has a quick rule of thumb—reality is irrelevant. The projections should always show revenues going up and expenses going down.

When the associate finishes taking wild stabs in the dark on the DCF model, the more senior bankers get involved. The senior vice president will decide that the revenue growth should be 11% per year instead of 8%. There are standard investment banking reasons [for this] They always involve phrases like “operating efficiencies,” “synergies,” and “economies of scale.” . . . At the end of the day there’s only one immutable goal. The team has to reach the valuation target that the company will be happy with.

### 9.2 The cynical view on multiples analysis

“The problem with the comps analysis is that most of the time bankers wants to have a group of comps with the highest multiple possible and that, in turn, means that the bank have to use companies as comps that are completely different from the company being valued.”

“ The associate’s job then becomes figuring out a way to make all the companies seem similar, even though they’re not. I once worked on an IPO for an engineering company that had a lot of clients in the broadcasting industry. Broadcasting companies were selling at huge premiums to engineering companies in the market, so we convinced the buyers that the company going public was actually a *broadcasting* company that just happened to employ a lot of engineers.”

From “Monkey Business”, by John Rolfe and Peter Troob