

Company Valuation

Typical Firm Valuation

The typical method for valuing a corporation using discounted cash flow analysis

Period 1 2 3 4 5 6

Revenues

Costs

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FCF_1

FCF_2

FCF_3

FCF_4

FCF_5

FCF_6

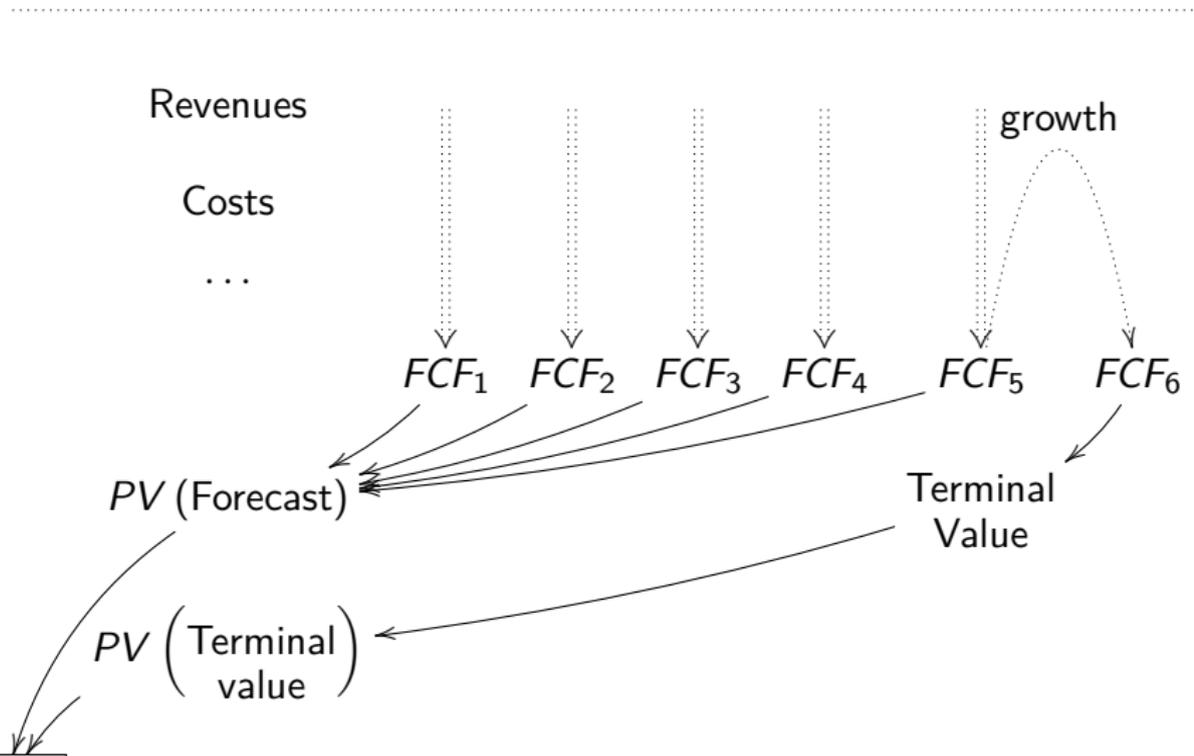
growth

PV (Forecast)

Terminal Value

PV (Terminal value)

Total value



Typical Firm Valuation

- ▶ Estimate the firm's cash flows for example five years¹ into the future by taking the historical accounts as a basis for cash flow budgets the next five years.
- ▶ 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.

¹Five years is a typical number. Depending on the quality of information and predictability one can use shorter or longer horizons.

Typical Firm Valuation

- ▶ Estimate a “horizon” value, the value of the firm five years from now, based on an estimate of the typical growth rate for this and similar firms.
- ▶ Discount the terminal value and the budgeted cash flows for the next five years
- ▶ Find the value estimate
- ▶ Investigate the sensitivity of the estimate to changes in assumptions. (e.g. value sensitivity plots)

From firm value to equity value

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

First find firm value, then subtract estimated market values of

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

Cash flow estimation

Free Cash Flow is the amount of cash a company can distribute to all its security holders (debt holders, equity holders, etc.) For corporate valuations, free cash flows are estimated from accounts as follows:

	Sales (revenues)
Less	Costs of goods sold
	Gross Profit
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Less	Operating expenses (including depreciation)
	Earnings before Interest and Taxes
Less	Taxes
	Net Operating Profit after taxes (NOPAT)
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Plus	Depreciation
Less	Capital Expenditure (CAPEX) (Investments)
Less	Increase in Working Capital (ΔNWC)
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	Free Cash Flow (FCF)

Cash flow estimation

Note some differences from accounting.

- ▶ Taxes are calculated without subtracting interest payments
- ▶ Depreciation is added back because it is a noncash expense
- ▶ Capital investments are subtracted when they are paid. (In the accounts activated and depreciated).

Cost of Capital estimation

Intuition:

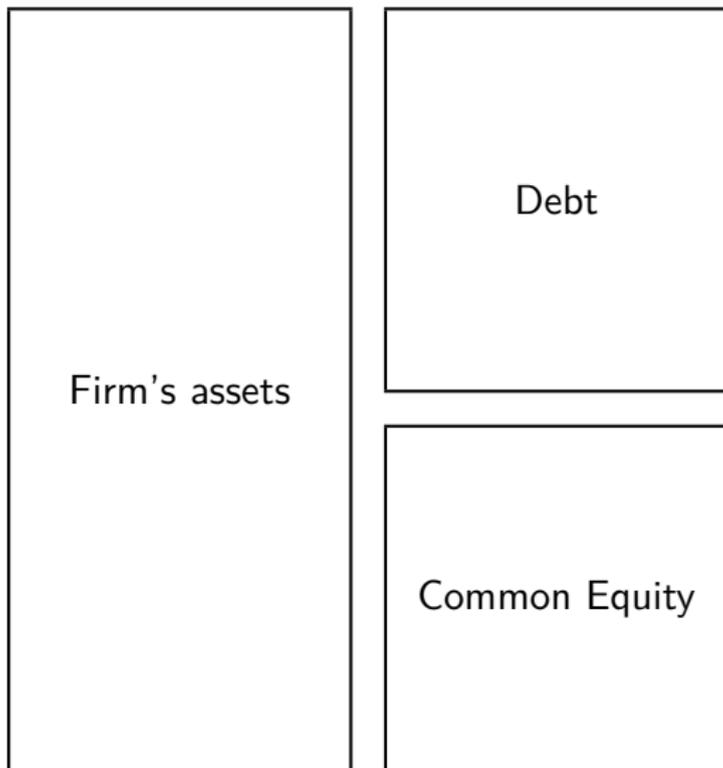
Want to value cash flows coming from the firm's *operations*.

Need to discount these cash flows with a discount rate that reflects the risk of the *future* projects of the firm.

Problem: This is not observable.

Cost of Capital estimation ctd.

Think of this in terms of a simplified balance.



What we want is the riskiness of the firms assets. Hard to estimate.

Cost of Capital estimation

Therefore, look on the righthand side of the balance.

Lots of information from financial markets which can be used to figure out the cost of capital for the equity and debt of a corporation.

Combining cost of capital estimates of equity and debt *also* provides the desired cost of capital for the *assets* (the lefthand side of the balance).

So, we need to estimate:

$$\text{Weighted average cost of capital} = \frac{D}{D + E} r_D (1 - \tau) + \frac{E}{D + E} r_E$$

where

- ▶ E : market value of the firm's equity
- ▶ D : market value of the firm's debt
- ▶ r_D : Borrowing costs for the firm.
- ▶ r_E : Cost of capital for the firm's equity
- ▶ τ : Tax rate

Cost of Capital estimation ctd

Things needed:

- ▶ Interest rate for the firm's long term debt.
What interest rate would the firm have to pay if its long term debt was issued *now*?
- ▶ Market value of the firm's long term debt.
Proxied by the book values in the firm's accounts. (Interest bearing debt).
- ▶ Market value of the firm's equity:
Number of shares outstanding times current stock price.

Cost of Capital estimation ctd

- ▶ The cost of capital demanded by the equity market.
What is the required return on the firms stock?
or, how risky is the stock?
Typically estimated using the CAPM: $r_i = r_f + \beta_i MRP$, where r_f is a risk free rate, β_i the beta, the measure of riskiness of a given stock, and MRP is the market risk premium. The parameters need estimation.
- ▶ Tax rate: Depend on the tax situation of the firm. (It may be below the statutory tax rate.)

Estimating a firms cost of equity capital

$$r_i = r_t + \beta_i MRP$$

Key parameter: beta, a measure of the riskiness of the stock.

Alternative ways of estimating:

- ▶ If a stock is listed, can estimate a stock's beta from historical prices.
- ▶ Alternatives:
 - ▶ Use a beta measuring the risk of the industry the firm is in.
 - ▶ Use a beta for a comparable firm.

Estimating a firms cost of equity capital ctd.

Other components

- ▶ Risk free rate: Interest on long term government bonds.

- ▶ Market Risk Premium:

What is the expected additional return from investing in the stock market relative to a risk free investment?

Current survey of Norwegian analysts: Most common number is 5%.

Calculation of value

Have two components

- ▶ Cashflow estimates $Cflow_t$
- ▶ Cost of capital r

Combine these and produce a value estimate:

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

This calculates the free cash flows to the firm, and discount them by an interest rate that incorporates the tax advantage of debt. This is called the weighted average costs of capital (WACC) method.