Financial Statement Analysis and Security Valuation

Chapter 1: Introduction to Investing and Valuation

Financial statements are the primary information that firms publish about themselves and investors are the primary users of financial statements.

Financial statement analysis is the method by which users extract information to answer their questions about the firm.

The analysis of information that focuses on valuation is called valuation analysis, fundamental analysis, or, when securities like stocks and bonds are involved, security analysis.

Investment styles and fundamental analysis

- Intuitive investors
  - Rely on their own instincts
  - The intuitive investor has the problem of the intuitive bridge builder: One may be pleased with one's intuition but, before building gets under way, it might pay to check that intuition against the calculations prescribed by modern engineering. Not doing so might lead to disaster.
- Passive investors
  - Trust in market efficiency. They assume that the market price is a fair price for the risk taken, that market forces have driven the price to the appropriate point
  - The passive investor is in danger if stocks are mispriced. It is tempting to trust, as a matter of faith, that the market is efficient, and much economic theory says it should be. But it is good practice to check
- Fundamental analysis
  - Analyzing the underlying key figures of the share price, e.g. Price/earnings (P/E). Ask themselves whether a stock is too expensive from e.g. the P/E, and make calculations about what is a good price. Distinguish price from value, price is what you pay and values is what you get. They inspect the stock. evaluates likely payoffs to ascertain whether the asking price is a reasonable one.
  - An investor who relies on fundamental analysis, is a fundamental investor
  - Use public accessible information
- Fundamental investors
  - See risk as the risk of paying too much (or selling for too little). Worried that securities are not efficiently priced
  - Abnormal returns → Alphas
- Defensive investor/ passive investor
  - Is careful and use a fundamental analysis to avoid trading at the wrong price
  - Risk can be reduced by diversification
  - See risk in business operations delivering less value than expected
  - Beta risk → information from an analysis about the level of risk a person is taking on
- Active investor

    - Uses fundamental analysis to discover mispriced stocks that might earn exceptional rates of return.
- Intrinsic value
    - Intrinsic value is the worth of an investment that is justified by the information about its payoffs
- CAPM: Capital Asset Pricing Model
- Index investing
    - Extreme form of passive investing
    - The index investor buys the market portfolio of stocks or a portfolio like the S&P 500 Index, which closely resembles the market. The market portfolio provides the ultimate diversification, so the investor does not even have to know the beta
    - Low transaction costs
- Financial statement analysis
    - Organizing the accounting information

Bubble, bubble, toil, and trouble

- Stock market bubbles damage economies. People form unreasonable expectations of likely returns and so make misguided consumption and investment decisions. Mispriced stocks attract capital to the wrong businesses. Entrepreneurs with poor business models raise cash too easily, deflecting it from firms that can add value for society. Investors bor- row to buy paper rather than real productive assets. Debt burdens become intolerable. Banks that feed the borrowing run into trouble. Retirement savings are lost and a pension crisis develops.

How bubbles work

- In a bubble, investors behave as if they are joining a chain letter. They adopt speculative beliefs that are then fed on to other people, facilitated in recent years by talking heads in the media, bloggers, and indeed by analysts and poor financial reporting. Each person believes that he will benefit from more people joining the chain, by their buying the stock and pushing the price up. A bubble forms, only to burst as the speculative beliefs are not fulfilled.
- Momentum investing
    - Has features of a chain letter
    - Advocates of momentum investing advise buying stocks that have gone up, the idea being that those stocks have momentum to continue going up more. What goes up must keep on going up. Indeed, this happens when speculation feeds on i t s e l f as the chain letter is passed along.

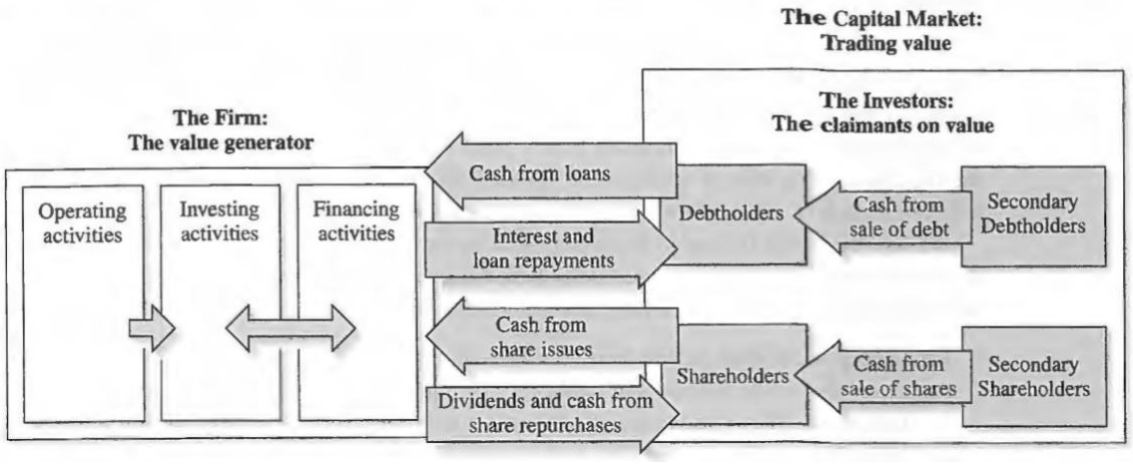
Analysts during the bubble

- To be fair to analysts, it is difficult to go against the tide of speculation. An analyst might understand that a stock is overvalued, but overvalued stocks can go higher, fed along by the speculation of the moment. The nature ofa bubble is for prices to keep rising. So, making a sell call may be foolish in the short run. Analysts are afraid to buck the trend. If they turn out to be wrong when the herd is right, they look bad. If they and the herd are wrong together, they are not penalized as much. But there are big benefits for the star analyst who makes the correct call when the herd is wrong.

The setting: Investors, Firms, Securities, and Capital Markets

- Securities can be traded in security markets, like stocks and bonds
- Contingent claims, such as convertible bonds, options and warrants are derivative claims whose payoffs are based on the price of firms' stocks or bonds, usually stocks
- The equity is the most important corporate claim, and the value of the equity is a particular focus for financial analysis. It is the primary claim, so much so that common stock is sometimes referred to as the fundamental security. The equity is the owners' claim on the business, often referred to as owners' equity or shareholders' equity. This claim is the residual claim on the value of the firm after other claimants have been satisfied. It is, by far, the most difficult claim to value

FIGURE 1.1 The Firm, Its Claimants, and the Capital Market



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  - Debtholders (bondholders, banks, and other creditors) make loans to the firm in exchange for a claim for a payoff in the form of interest payments and loan repayments
  - Shareholders contribute cash in exchange for equity shares that entitle them to a payoff in the form of dividends or cash from share repurchases. The amount of the payoff, less the amount paid for the claim, is called the return.
  - When a firm sells debt or equity claims it trades in the capital market. The capital market can be a formal, organized stock exchange where public, "listed" firms trade; an informal market involving intermediaries such as venture capitalists, private equity firms, banks, and investment brokers; or a simple process of raising capital from family and friends.
  - For shareholders, the payoffs are in the form of dividends from the firm and proceeds from the sale of shares, either to the firm in a share repurchase (where the firm buys back shares) or to other investors in the stock market.

- Debtholders receive interest and a settlement payment, either by the firm redeeming the debt before or at maturity or by selling the debt in the bond market.
- The value of a claim traded in the capital market is based on the anticipated payoffs that the firm will ultimately pay on the claim. So the diagram describes the firm as the value generator. Debtholders want enough value generated to recover interest and principal. Share- holders get the residual value after the return to the bondholders
- It is always the case that the value of the claims on a firm must add up to the value of the firm:

  $$Value\ of\ the\ firm = Value\ of\ debt + Value\ of\ equity$$

  The value of the firm is sometimes referred to as the value of the enterprise or enterprise value
- Financing activities
  - Transactions with claimants that we have just talked about: raising cash for the business in exchange for equity and debt claims and returning cash to claimants. These activities are investing activities for the claimants but financing activities for the firm.
- Investing activities
  - Use the cash raised from financing activities and generated in operations to acquire assets to be employed in operations. These assets may be physical assets, like inventories, plant, and equipment, or knowledge and intellectual assets, like technology and know-how.
- Operating activities
  - Utilize the assets in which the firm has invested to produce and sell products. Operating activities combine assets with labor and materials to produce products and services, sell them to customers, and collect cash from customers. If successful, the operations generate enough cash to reinvest in assets or return to claimants.

The business of analysis: The professional analyst

- Investing in firms: The outside Analyst
  - Analysts outside the business
  - Two main types of outside analysts
    - Credit analysts and equity analysts
- Investing within Firms: The Inside Analyst
  - Inside the firm
  - Invests money contributed to the firm in business assets
  - The insider's view on analysis should be no different from that of the outsider. The outside investor must be persuaded to buy shares at the market price and, to decide, looks to analysis. What value is likely to be added over the price? The inside investor must be persuaded to buy an idea or a strategy at what it will cost to implement and, to decide, looks to analysis. What value is likely to be added over the cost?
- Value-based management
  - Investing and managing with valuation analysis

- Inside and outside analysts differ in one respect: Inside analysts have far more information to work with. Outside analysts receive the published financial statements along with much supplementary information, but they are typically not privy to "inside information."

Strategy and Valuation

- Business model
  - What is the firm aiming to do? How does it see itself to be generating value? And what are the consequences of the strategy?
- For the inside investor, the business strategy is the outcome of valuation analysis: A strategy is chosen after determining whether it will add value.
- For the outside investor, the business strategy is the starting point for analysis, for firms can be valued only under a specified strategy. But the outside investor also should be aware of alternative strategies that have the potential for enhancing value. Some takeovers occur because outside investors believe that more value can be created with new ideas and with new management. Strategies are ever evolving, so the analyst must be attuned to the way firms adapt to change.

Investeringstyper

- Intuitiv investering
  - Stoler på intuition og fornemmelse: ingen formel analyse
- Passiv investering
  - Accepterer kursen som en fair værdi: ingen formel analyse
  - Tror på markedsefficiens
- Screening
  - Gør beskeden brug af information, men ingen forecasting: minimal analyse
- Fundamental investering
  - Udleder værdi gennem forventede payoffs (dividender)
    - Analyserer information
    - Forecaster payoffs på baggrund af information

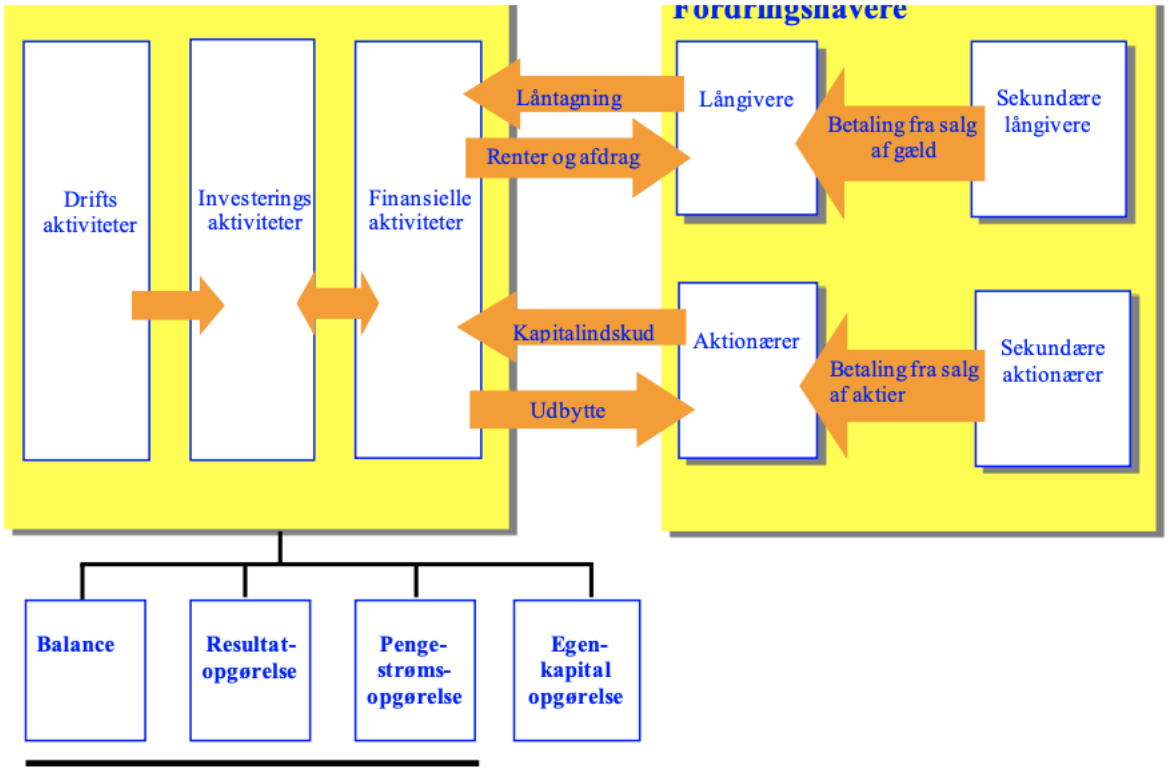
Omkostninger ved de forskellige indfaldsvinkler

- Fare ved intuitiv investering
  - Selvbedrag – ignorerer evne til at undersøge intuition
- Fare ved passiv investering
  - ”Pris er hvad du betaler – værdi er hvad du får ”
- Fare ved screening
  - Ignorerer information omkring fremtiden
  - Ved ikke hvor meget risiko vi påtager os
- Forsigtighed fordrer analyse: et forsvar imod at købe (eller sælge) til den forkerte pris
  - Laver analysen fordi man er bange for at sælge for billigt eller købe for dyrt
  - *Den defensive investor*
- Aktivisme fordrer analyse: en mulighed for at opspore forkert prisfastsatte aktier
  - Laver analyse for at søge overnormal profit
  - *Den aktive investor*

Fundamentalrisiko og prisrisiko

- Fundamentalrisiko er risiko, der udspringer af virksomhedens aktiviteter.
  - Risiko forbundet med at drive virksomhed
  - Prøve at slippe for denne risiko ved diversificering
- Prisrisiko er risikoen for at handle til den forkerte pris
  - Betale for meget
  - Sælge for billigt

Virksomheden, dens fordringshavere og kapitalmarkedet



De finansielle opgørelser:
Information omkring værdiskabelse

- Hvilke aktiviteter er værdiskabende
- Finansiel aktivitet når vi handler med fordringshaver
  - Optager lån, sælger aktier
  - Rejser kapital
- Investeringsaktivitet → Når vi bruger kassen til at investere i f.eks. maskiner
  - Konverterer kassen til maskiner
- Driftsaktiviteter → udnytte investeringerne og sælger varen
- Udover udbytte er der også aktietilbagekøb (penge fra ejer til aktionær)
- Køb og salg af aktier til markedsværdi er værdineutral
- Kig altid på værdien pr. aktie
- Salg af medarbejderaktier til underkurs, giver tab for de nuværende aktier, da værdien pr. aktie udvandes
  - Tab ved medarbejderaktier skal bogføres som en lønomkostning

- Kapitalindskud giver i sig selv ikke nogen værdi jf. Ovenstående
- Som udgangspunkt er finansieringsaktiviteter værdineutralt (undtagelse er aktier til underværdi)
- Værdi skabes igennem driftsaktiviteter ved at udnytte imperfektioner i aktiemarkedet
  - Overnormal profit på driftsaktiviteter
- **Finansieringsaktiviteter:** vedrører fremskaffelse af kapital fra investorer og tilbagebetaling til investorer
- **Investeringsaktiviteter:** investerer den rejste kapital i driftsaktiver
- **Driftsaktiviteter:** udnytter de foretage investeringer til at producere og sælge produkter
- I pengeinstitutter er alt driftsaktiviteter

Nutidsværdimodeller (Net-present-value models)

- Kræver budgettering
  - Dividende modellen
  - DCF modellen
  - Residualindkomst modellen
  - Prissætning af overskud- overskudsvækst analyse
- Under korrekt anvendelse giver alle modeller den samme værdi
- DCF modellen er den mest anvendte model i praksis
- Hvad er det væsentligste når man laver analysen
  1. Budgetforudsætninger
  2. Diskonteringsfaktor
  3. Valg af model

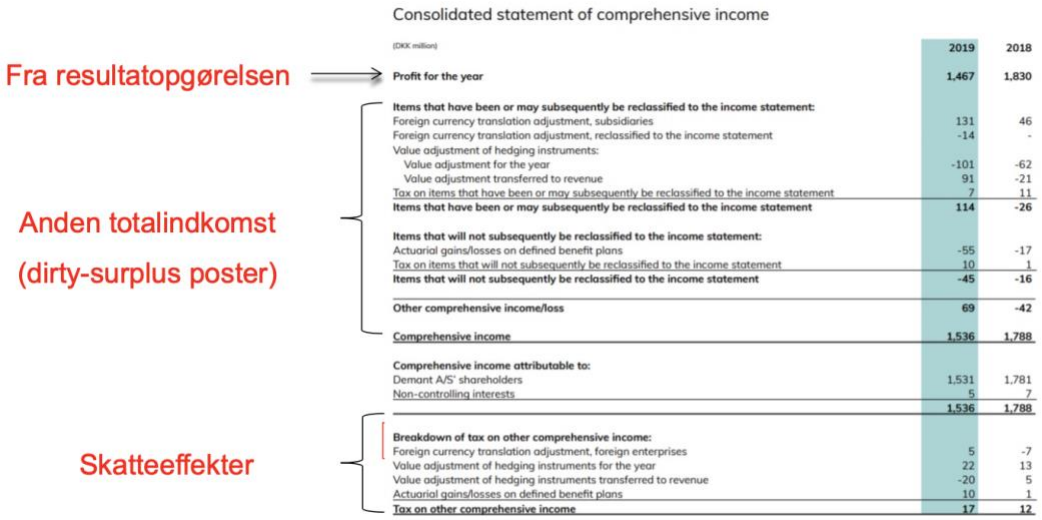
Læresætninger inden for fundameltalanalyse

- *Man køber ikke en aktie, men en virksomhed*
- *Når der investeres i en virksomhed: forstå virksomheden*
- *Værdi afhænger af forretningsmodellen, strategien*
- *Gode virksomheder kan være dårlige køb*
- *Pris er hvad du betaler værdi er hvad du får*
- *En del af risikoen ved at investere er risikoen for at betale for meget for en aktie*
- *Sammenblad ikke hvad du ved med spekulation*
- *Forankrer i hvad du ved frem for spekulation*
- *Vær varsom med ikke at betale for meget for vækst*
- *Når værdi beregnes til at udfordre priser pas på med ikke at lade pris indgå i beregningen*
- *Hold fast i din overbevisning og vær tålmodig; priser konvergerer mod fundamentale værdier, men det kan tage lang tid.*

Balancen

- Aktiver = Forpligtelser + Egenkapital ***eller*** Egenkapital = Aktiver - Forpligtelser
  - Aktiver kaldes også ressource
- Sammenlign med :
  Værdi af egenkapital = værdi af virksomhed – værdi af gæld
  $$V^E = V^F - V^D$$
- Kortfristet er alt inden for 1 år, langfristet er over 1 år

Totalindkomstopgørelsen



Consolidated statement of comprehensive income

(DKK million)	2019	2018
Profit for the year	**1,467**	**1,830**
Items that have been or may subsequently be reclassified to the income statement:		
Foreign currency translation adjustment, subsidiaries	131	46
Foreign currency translation adjustment, reclassified to the income statement	-14	-
Value adjustment of hedging instruments:		
Value adjustment for the year	-101	-62
Value adjustment transferred to revenue	91	-21
Tax on items that have been or may subsequently be reclassified to the income statement	7	11
Items that have been or may subsequently be reclassified to the income statement	**114**	**-26**
Items that will not subsequently be reclassified to the income statement:		
Actuarial gains/losses on defined benefit plans	-55	-17
Tax on items that will not subsequently be reclassified to the income statement	10	1
Items that will not subsequently be reclassified to the income statement	**-45**	**-16**
Other comprehensive income/loss	**69**	**-42**
Comprehensive income	**1,536**	**1,788**
Comprehensive income attributable to:		
Demant A/S' shareholders	1,531	1,781
Non-controlling interests	5	7
	1,536	**1,788**
Breakdown of tax on other comprehensive income:		
Foreign currency translation adjustment, foreign enterprises	5	-7
Value adjustment of hedging instruments for the year	22	13
Value adjustment of hedging instruments transferred to revenue	-20	5
Actuarial gains/losses on defined benefit plans	10	1
Tax on other comprehensive income	**17**	**12**

- Stigningen i egenkapital der ikke skyldes stigningen i transaktioner med ejere
  $$Dividende + Aktietilbagekøb - Kapitalindskud$$
- Other comprehensive income → Direkte på egenkapitalopgørelsen uden om resultatopgørelsen (Føres direkte på egenkapitalopgørelsen)
- Net income → Profit of the year (Årets resultat)
- Comprehensive Income = Net Income + Other Comprehensive Income
  - Fra billedet ovenfor: 1535 = 1467 + 69
- Comprehensive income → Totalindkomst

Resultatopgørelsen

- Periodens værditilvækst

Pengestrømsopgørelsen

- Udarbejdes med henblik på at se udstrømningen fra kassen

Pengestrømme fra driften (CFO)

\+ Pengestrømme fra investering (CFI)

\+ Pengestrømme fra finansiering (CFF)

= Årets likviditetsændring

Strøm- og beholdningsligningen

- Egenkapital ultimo

$$Egenkapital\ Ultimo = Egenkapital\ primo - Nettoudbetaling\ til\ ejerne + Totalindkomst$$

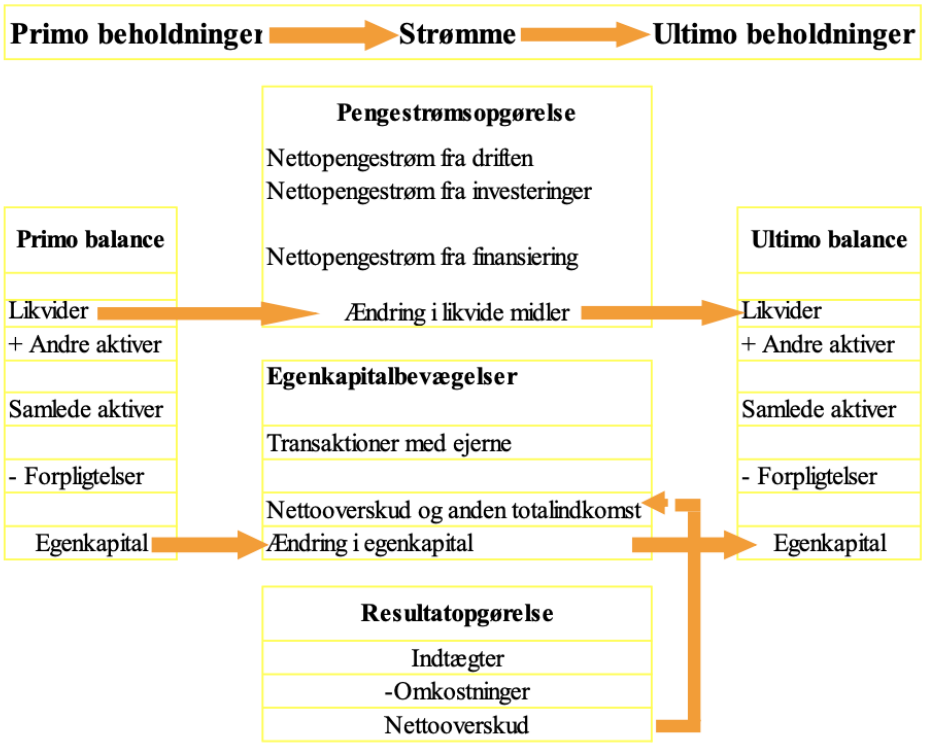
- $Nettoudbetaling\ til\ ejerne = Dividende\ +\ Aktietilbagekøb - Kapitalindskud$
- Nettoudbetaling til ejerne (d)

$$= Udbytte + Aktietilbagekøb - Kapitalindskud$$

- Totalindkomst

$$Totalindkomst = Nettooverskud \pm Anden\ Totalindkomst$$

Artikulation af finansielle opgørelser



Indre værdi og bogført værdi

- Indre værdis præmie ($V^E - B$)
  - Fundamental værdi af egenkapital (minus) bogført værdi af egenkapital
- Markedspræmie ($MVE - B$)
  - Markedsværdi af egenkapital (minus) bogført værdi af egenkapital
- Indre værdi-til-bogført værdi (V^E / B)
  - Fundamental værdi af egenkapital / bogført værdi af egenkapital
  - Når $\frac{V^E}{B} > 1$, forventer jeg at få et afkast som er større end mit afkastkrav ($ROE > r_e$), og så er jeg villig til at betale mere end den bogførte værdi
  - Hvad den bør handles til
- Kurs-til-bogført værdi *(MVE / B)*
  - Markedsværdi af egenkapital / bogført værdi af egenkapital
  - Hvad den faktisk handles til

Måling af værditilvækst (value added)

- Værditilvækst = Værdi ultimo – værdi primo + dividende
- Aktieafkast = $P_t - P_{t-1} + d_t$
  - Ligger forventninger
- Regnskabsmæssig værditilvækst =
  Egenkapital ultimo – Egenkapital primo + netto dividende = totalindkomst
- Værditilvækst er i praksis aldrig lig med aktieafkastet
- Aktiemarkedet indregner anticiperende →

Principper bag overskudsmåling

- Indregner kun værditilvækst fra salg til kunder
  - Realisationsprincip
  - Indregn værdi når den er indtjent (normalt når der er foretaget et salg)
- Matchingprincip
  - Match omkostninger mod indtægter for hvilke de er afholdt.
- Regnskabsmæssig værditilvækst (nettooverskud): Indtægter - omkostninger

Kapitel 5: Accrual Accounting and Valuation: Pricing Book Values

This chapter shows how to estimate the value omitted from the balance sheet and thus how to estimate intrinsic price-to-book ratios.

- How to price the book value of equity

Price-to-book ratio

- Book value represents shareholders' investment in the firm
  - Assets minus liabilities → net assets
  - Typically does not measure the value of the shareholders' investment

P/B ratio

- Therein lies the concept of the P/B ratio: Book value is worth more or less, depending upon the future earnings that the net assets are likely to generate. Accordingly, the intrinsic P/B ratio is determined by the expected return on book value.
- This concept fits with our idea that shareholders buy earnings. Price, in the numerator of the P/B ratio, is based on the expected future earnings that investors are buying. So, the higher the expected earnings relative to book value, the higher the P/B ratio. The *rate of return on book value-sometimes* referred to as the *profitability-is* thus a measure that features strongly in the determination of P/B ratios.

Premium over book value:

- Value = Book Value + Premium

Valuing a Project

- Residual earning
  - Captures the value added to book value
  - Residual Earnings_1 = Earnings_1 – (Required return x Investment_0)
  - Residual earnings is the earnings in excess of these required dollar earnings.
  - Residual earnings is sometimes referred to as **abnormal earnings** or excess **profit.**
- Residual earnings model
  - A model that measures value added from forecasts of residual earnings
  - Value = Book Value + Present value of Expected residuals earnings
  - Positive residual earnings → value is added
  - The residual earnings value for a terminal project is always the same as that calculated with discounted cash flow methods

Valuing a Savings account

- An asset is worth a premium or discount to its book value only if the book value is expected to earn nonzero residual earnings.
- Residual earnings techniques recognize that earnings growth does not add value if that growth comes from investments earning the required return.
- Even though an asset does not pay dividends, it can be valued from its book value and earnings forecasts

- The valuation of the savings account does not depend on dividend payout. The two scenarios have different expected dividends, but the same value: The valuation based on book values and earnings is insensitive to payout.
- The valuation of the savings account is unrelated to free cash flows

The normal price-to-book ratio

- A P/B ratio of 1.0 is an important benchmark case, for it is the case where the balance sheet provides the complete valuation. It is also the case where the forecasted return on book value is equal to the required rate of return, and forecasted residual earnings is zero
- The required return is sometimes referred to as the normal return for the level ofrisk in the investment. Accordingly, as an investment with a P/B of 1.0 earns a normal return, a P/B of 1.0 is sometimes referred to as a **normal P/B ratio**

A model for anchoring value on book value

- Anchoring principle
  - If one forecasts that an asset will earn a return on its book value equal to its required return, it must be worth its book value.
  - Correspondingly, if one forecasts that an asset will earn a return on book value greater than its required return-positive residual earnings- it must be worth more than book value; there is extra value to be added.
- The valuation model that captures the extra value for the equity of a going-concern is

$$\text{Value of common equity } (V_0^E) = B_0 + \frac{\text{RE}_1}{\rho_E} + \frac{\text{RE}_2}{\rho_E^2} + \frac{\text{RE}_3}{\rho_E^3} + \cdots \qquad \textbf{(5.1)}$$

  -
    - RE is residuals earnings for equity
    - B_0 is the current book value of equity on the balance sheet
    - ρ_E is the required return. Also called the equity cost of capital
    - We calculate the value of equity by adding the present value of forecasted residual earnings to the current book value in the balance sheet. The forecasted residual earnings are discounted to present value at 1 plus the equity cost of capital, ρ_E. We calculate the intrinsic premium over book value, $V_0^E - B_0$, as the present value of forecasted residual income. This premium is the missing value in the balance sheet. The intrinsic price-to-book ratio is $\frac{V_0^E}{B_0}$
    - This makes sense: Ifwe expect a firm to earn income for shareholders over that re- quired on the book value of equity (a positive RE), its equity will be worth more than its book value and should trade at a premium.
    -

$$\text{Residual earnings} = \text{Comprehensive earnings} - (\text{Required return for equity} \times \text{Beginning-of-period book value})$$

$$\text{RE}_t = \text{Earn}_t - (\rho_E - 1)B_{t-1}$$

  -
  - CAPM = Capital asset pricing model

Return on Common Shareholders' Equity

- $ROCE_1 = \frac{Comprehensive\ earnings\ to\ common_1}{Book\ Value_0}$
  - After preferred dividends
  - Book value is the book value of common shareholders' equity
  - Also referred to as return on equity (ROE)
  - Also referred to as book rate of return or an accounting rate of return
- $ROCE_1 = \frac{Comprehensive\ earnings_1}{\frac{1}{2}(B_1+B_0)}$
  - When calculation for longer periods, like a full fiscal year
  - Denominator is the average of beginning and ending book value for the year
  - More strictly the denominator should be a weighted average of book values during the year
  - Calculation can be done on a per-share basis: $ROCE_1 = \frac{EPS_1}{BPS_0}$
    - EPS is based on comprehensive income
    - BPS is book value of common equity divided by shares outstanding. Shares outstanding is issued shares minus shares in treasury

Residual Earnings Drivers and Value Creation

- For every earnings period t, we can restate residual earnings as

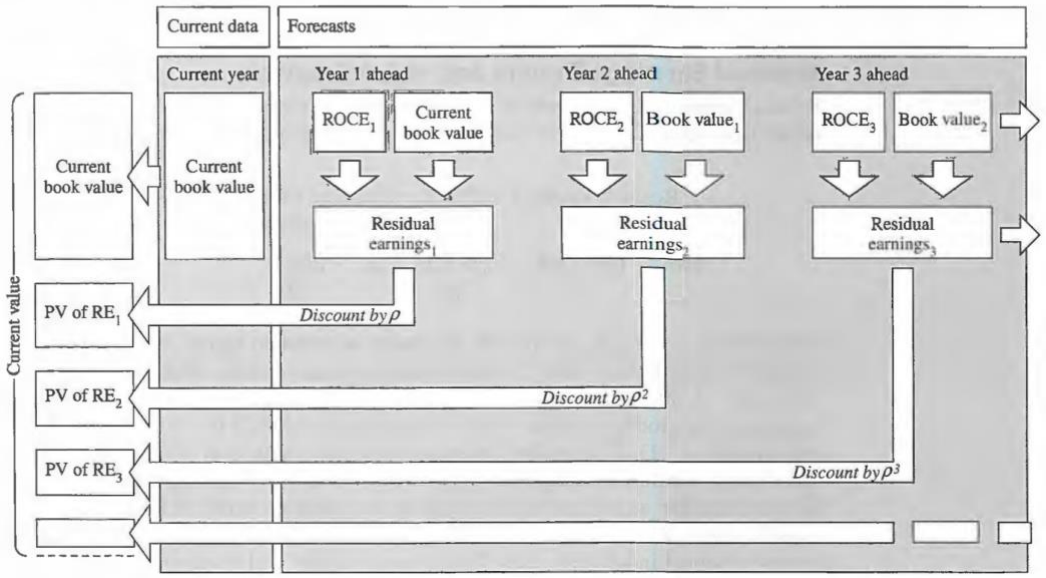
$$\text{Residual earnings} = (\text{ROCE} - \text{Required return on equity}) \times \text{Book value of common equity} \qquad \textbf{(5.2)}$$

$$\underset{(1)}{\text{Earn}_t - (\rho_E - 1)B_{t-1}} = \underset{(2)}{[\text{ROCE}_t - (\rho_E - 1)]B_{t-1}}$$

  -
  - $ROCE_1 = \frac{Earn_t}{B_{t-1}}$, is the rate of return on common equity
  - Thus residual earnings compares ROCE to the required return, $\rho_E - 1$, and expresses the difference as a dollar amount by multiplying it by the beginning-of-period book value.
  - If ROCE equals the required return, RE will be zero.
  - If we forecast that the firm will earn an ROCE equal to its cost of capital indefinitely in the future, intrinsic price will be equal to book value
  - If we forecast that ROCE will be greater than the cost of capital, the equity should sell at a premium. Ifwe forecast that ROCE will be less than the cost of capital, the equity should sell at a discount.
  - RE is determined by two components, (1) and (2) in expression 5.2. The first is ROCE and the second is the amount of the book value of the equity investment (assets minus liabilities, or net assets) that are put in place in each period. These two components are called **residual earnings drivers**. Firms increase their value over book value by increasing their ROCE above the cost of capital. But they further increase their value by **growth in book value (net assets)** that will earn at this ROCE. For a given ROCE (greater than the cost of capital), a firm will add more value with more investments earning at that ROCE. Indeed these two drivers are sometimes referred to as ***value drivers***

The drivers of residuals earnings and the calculation of the value of equity

Residual earnings is driven by return on common equity (ROCE) and the book value of investments put in place. Valuation involves forecasting future ROCE and the growth in the book values of net assets, discounting the residual earnings that they produce to present value, and adding the current book value.



On average a higher P/B is associated with a higher ROCE

Simple valuation model

- $Ending\ book\ value = Beginning\ book\ value + Comprehensive\ income - Net\ dividend$
- A simple valuation capitalizes the residual earnings forecasted for Year 1 as a perpetuity with growth:
  - $V_0^E = B_0 + \frac{RE_1}{\rho_E - g}$
    - This is a *simple valuation model:* A constant growth rate is applied to the forecast for the forward year. The forecast horizon is very short, just one year ahead.
  - $V_0^E = \frac{d_1}{\rho_E - g}$

Applying the model to equities

- For a forecast over T-period horizon

$$V_0^E = B_0 + \frac{\text{RE}_1}{\rho_E} + \frac{\text{RE}_2}{\rho_E^2} + \frac{\text{RE}_3}{\rho_E^3} + \cdots + \frac{\text{RE}_T}{\rho_E^T} + \frac{V_T^E - B_T}{\rho_E^T} \qquad \textbf{(5.3)}$$

where $V_T^E - B_T$ is the forecast of the intrinsic premium at the forecast horizon.

  - Horizon premium
    - The stock's expected value relative to book value T periods from now
- The steps to follow for a residual earnings valuation

1. Identify the book value in the most recent balance sheet.
2. Forecast earnings and dividends up to a forecast horizon.
3. Forecast future book values from current book values and your forecasts of earnings and dividends.

   Book value = Beginning Book value + Earnings − Dividends
4. Calculate future residual earnings from the forecasts of earnings and book values.
5. Discount the residual earnings to present value.
6. Calculate a continuing value at the forecast horizon.
7. Discount the continuing value to present value.
8. Add 1, 5, and 7.

-

The long-term level of RE and its growth rate are sometimes referred to as the **steady-state condition** for the firm

The calculation of Continuing values

- A continuing value is always calculated at the end of a period on the basis of a forecast for the following period. So a con- tinuing value at the end of Year T is based on a forecast of residual earnings for T + 1:

  -
  $$CV_T = \frac{RE_{T+1}}{\rho_E - g}$$
- This continuing value is discounted to present value at the discount rate for Year T, ρ_E^T. The following calculations give the same value

  -
  $$V_0^E = B_0 + \frac{RE_1}{\rho_E} + \frac{RE_2}{\rho_E \times (\rho_E - g)} \quad (1)$$

  $$V_0^E = B_0 + \frac{RE_1}{\rho_E} + \frac{RE_2}{\rho_E^2} + \frac{RE_2 \times g}{\rho_E^2 \times (\rho_E - g)} \quad (2)$$

Converting analysts' forecasts to a valuation

- Consensus forecast
  - Average of forecasts made by sell-side analysts covering the stock
- Analysts typically do not forecast dividends, so one usually assumes that the current payout ratio- DPS/EPS- will be maintained in the future

Value-to-price ratios

- Compare calculated value to the current market price. If V/P>1.0, a buy recommendation is implied. IF V/P<1.0, a sell recommendation is implied
- ρ is the required return
- In good times the risk premium declines, so prices rise. This is the "efficient markets" intrepretations

Build your own valuation engine

- The mechanics of the valuations can easily be handled in a spreadsheet. The spreadsheet requires the following inputs:
  (1) current book value
  (2) earnings and dividend forecasts up to a given forecast horizon
  (3) a required return
  (4) a long-term growth rate to calculate the continuing value.
- You then build in the spreadsheet calculations to forecast future book values, residual earnings, a continuing value, and finally the present value of the forecasts. The standard spreadsheet has forecasts for two years ahead (that's what analysts forecast) and applies a growth rate for years thereafter.
- You can experiment with your input (følsomhedsanalyse)
  - Sensitivity of the inputs
- BYOAP = Build your own analysis product

Applying the model to projects and strategies

- $Book\ value_t = Book\ Value_{t-1} + Income_t - Cash\ Flow_t$
  - Cash flow comes from the revenues
- The value ofthe project is its book value plus th e present value ofexpected residual income calculated from the forecasts ofnet income and book values.

Residual earnings valuation (Inspection of the method)

ADVANTAGES	
Focus on value drivers:	Focuses on profitability of investment in net assets and growth in net assets, which drive value; directs strategic thinking to these drivers.
Incorporates the financial statements appropriately:	Incorporates the value already recognized in the balance sheet (the book value); to add value to the balance sheet, it forecasts the income statement, which typically is a better measure of value added than the cash flow statement.
Uses accrual accounting:	Uses the properties of accrual accounting that recognize value added ahead of cash flows, matches value added to value given up, and treats investment as an asset rather than a loss of value.
Forecast horizon:	Forecast horizons can be shorter than for DCF analysis and more value is typically recognized in the immediate future.
Versatility:	Can be used with a wide variety of accounting principles (see text below and Chapter 17).
Aligned with what people forecast:	Analysts forecast earnings (from which forecasts of residual earnings can be calculated).
Protection:	Protects from paying too much for growth.
Reduces reliance on speculation:	The valuation relies less on the uncertain continuing value calculation and speculation about long-run growth.
DISADVANTAGES	
Accounting complexity:	Requires an understanding of how accrual accounting works (see Chapters 2 and 3).
Suspect accounting:	Relies on accounting numbers, which can be suspect (must be applied along with an accounting quality analysis; see Chapter 18).

-

Residual Earnings Are Not Affected by Dividends, Share Issues, or Share Repurchases

- These transactions affect both earnings and book values in the residual earnings calculation such that their effect cancels to leave residual earnings unaffected.

What the residual earnings model misses

- Owners make money from selling or buying the firm at a price that is different from fair value.
- The residual earnings model calculates (appropriately) that there is no value added from an anticipated share issue or repurchase at fair value. However, this is not so ifthe share issue or repurchase is at a price that is different from fair value: The gain or loss to the existing shareholders is not captured by the model.

Summary

- Residual earnings measures the earnings in excess of those required if the book value were to earn at the required rate of return.
- Residual earnings treats investment as part of book value, so that an investment that is forecast to earn at the required rate of return generates zero residual earnings and has no effect on a value calculated.
- Residual earnings is not affected by dividends, or by share issues and share repurchases at fair value, so using the resid ual income model yields valuations that are not sensitive to these (value-irrelevant) transactions with shareholders.
- The calculation of residual earnings uses accrual accounting, which captures added value over cash flows .
- Residual earnings valuation protects us from paying too much for earnings growth generated by investment and earnings created by accounting methods.
- The residual earnings model provides a way of thinking about a business and about the value generation in the business. To value a business, it directs us to forecast profitability of investment and growth in investment
- It directs management to add value to a business by increasing residual earnings, which, in turn, requires increasing ROCE and growing investment.

p/e, p/s, p/b

- Levered fordi prisen er I tælleren
- Unlevered hvis egenkapital I tælleren

I et efficient marked forventes prisen at vokse med afkastkravet

Modeller

	Pengestrømsbaserede	Regnskabsbaserede
Direkte • Ejernes afkastkrav er diskonteringsfaktoren • V_0^E	DDM (Discounted dividend model)	(RE) Residualindkomst-model AEG-model
Indirekte • Wacc • $V^E * V^P = V_0^E$	DCF (Dividend cash flow)	ReOI (Residual operating income) AOIG (Abnormal operating income growth)

- Budgetterer kun driftsaktivtet I indirekte modeller
  - Kan køre med konstant wacc i indirekte modeller
- Budgetterer både drifts- og finansieringsaktivitet i direkte modeller
  - Medtager finansieringsaktivitet fordi vi tror det kan skabe positivt residualoverskud for virksomheden
- Kan ikke bruge indirekte modeller på finansielle virksomheder (f.eks. pengeinstitutter)

Frie cashflow

- FCF
- $FCF_{T+1} = FCF_T \; x \; (1 + g)$

Øgede investeringer → reducerede frie cashflow

- Ikke i sig selv et problem at have negativt cashflow → skaber dog et likviditetsbehov → dette kan finansieres ved at optage gæld, udstede nye aktier, sælge finansielle aktiver

For vækst virksomheder er det frie cashflow typisk negativt, med mindre vi har en meget lang tidshorisont (budgetperiode)

Overnormalt overskud= mere end forventet

- Residual earnings (RE)
- Hvis vores normale overskud er 8, og vi nu får 10 i overskud har vi et overnormalt overskud på 2

Metoder til udregning af residual earning

- $R_E = NI - (r_e \; x \; B_{t-1})$
  - $RE_1 = overskud_1 - (afkastkrav \; x \; investering)$
  - $10 - (0{,}08 \; x \; 100) \; \rightarrow 10 - 8 = 2$
- $R_E = (ROCE - r_e) \; x \; B_{t-1}$
  - $(0{,}10 - 0{,}08) \; x \; 100 = 2$
  - $\frac{NI_T}{B_{t-1}}$

RE=AE

- Residual earnings = Abnormal earnings
  - $\Delta RE = AEG$

- vi har ikke balancen med i AEG modellen

Højere ROCE → højere residualoverskud

To drivere

$$earn_t - (r_e \times B_{t-1}) = [ROCE_t - r_e] \times B_{t-1}$$

(1) (2)

1. **ROCE**

- Hvis ROCE = r_e => RE=0
- Hvis ROCE > r_e => $V_0^E > B_0$
- Hvis ROCE < r_e => $V_0^E < B_0$

- **2. B** (aktiver – forpligtelser) indsat for at generere ROCE

RE-model analyse

Fordele

Fokus på value drivere	Fokuserer på rentabilitet samt vækst i investeringer, hvilket driver værdi
Gør brug af regnskabet	Medtager den værdi som allerede er indregnet i balancen (bogført værdi); forecaster resultatopgørelse og balance i stedet for pengestrømsopgørelsen
Gør brug af Periodeserings-Principper	Gør brug af egenskaber ved perioderegnskabet, der indregner value forud for cash flows og matcher value added med value lost og behandler investeringer som et aktiv snarere end tab af værdi
Er forenelig med hvad Analytikere forecaster	Analytikere forecaster overskud (hvorfra residualoverskud kan beregnes
Validering	Forecast af residualoverskud muligør budgetopfølgning

Ulemper

Kompleks	Kræver kendskab til perioderegnskabet!
Suspekt	Hviler på regnskabstal, der kan være suspekte
Budgetperiode	Budgetperiode er kortere end under DCF-analyse, men længden af budgetperioden afhænger af kvaliteten af regnskabet

Chapter 6: Accrual Accounting and Valuation: Pricing Earning

How much should one pay per dollar of earnings?

A price-to-book ratio is de- termined by expected earnings that have not yet been booked to book value, and the higher the future earnings relative to book value, the higher the *P/B* ratio

P/E ratio

- As share prices anticipate future earnings, the *P/E* ratio compares the value of expected future earnings (in the numerator) to current earnings (in the denominator)
- P/E ratio is based on expected earnings that have not yet been booked

- P/E ratios are high when we forecast considerably higher future earnings than current earnings and P/E ratios are low when forecasted earnings are expected to be lower than current earnings
- P/E ratio prices earnings growth
- A sound *P/E* valuation prices earnings growth but does not price growth that does not add value

Prototype valuation

- The stock of value implied by earnings is:

$$\text{Capitalized earnings} = \frac{\text{Earnings}}{\text{Required return}}$$

  -
  - Value = capitalized earnings + Extra value for forecasted earnings growth
  - $Value\ of\ savings\ account = \frac{Forward\ Earnings}{Required\ return}$
- One does not pay for growth that comes from a n investment that earns only the required return, for such an investment does not add value.
- The total earnings from both sources are referred to as **cum-dividend earnings,** that is, earnings with the dividend reinvested
  - Earnings without the reinvestment of dividends are called **ex-dividend earnings.**
  - Value is always based on expected cum-dividend earnings and the P/E ratio is always based on cum-dividend earnings growth
- $Cum - dividend\ earnings_{2014} = Earnings_{2014} + (\rho - 1)dividend_{2013}$
  - Where ρ is 1 + required return
  - We only pay for earnings growth that is greater than the required return
  - Earnings that are due to growth at the required return are called **normal earnings**
  - $Normal\ earnings_t = \rho Earnings_{t-1}$
  - The part of cum-dividend earnings for which we will pay is the cum-dividend earnings growth over these normal earnings, that is, the **abnormal earnings growth:**
    - $Abnormal\ earnings\ growth = Cum - dividend\ earnings_t - Normal\ earnings_t = [Earnings_t + (\rho - 1)dividend_{t-1}] - \rho Earnings_{t-1}$
- Concepts from this:
  - An asset is worth more than its capitalized earnings only if it can grow cum-dividend earnings at a rate greater than the required return. This recognizes that one pays only for growth that adds value.
  - When forecasting earnings growth, one must focus on cum-dividend growth. Ex-dividend growth ignores the value that comes from reinvesting dividends.
  - Dividend payout is irrelevant to valuation, for cum-dividend earnings growth is the same irrespective of dividends

The normal forward P/E ratio

- The *forward P/E* is price relative to the forecast of next year's earnings
- $Normal\ Forward\ P/E = \frac{1}{Required\ return}$
- If one forecasts no abnormal earnings growth, the forward *PIE* ratio must be 1/required return. Or, put differently, if one expects the growth rate in cum-dividend earnings to be equal to the required return, the forward *P/E* ratio must be normal

- → Normal P/E implies that normal earnings growth is expected
- If one forecasts cum- dividend earnings to grow at a rate greater than the required return, the P/E must be above normal: One pays extra for growth above normal. If one forecasts cum-dividend earnings to grow at a rate lower than the required return, the PIE ratio must be lower than normal: One discounts for low growth.

The normal trailing P/E ratio

- Trailing P/E
  - Multiple of current earnings
- The trailing P/E must always be based on cum-dividend prices:
  - $TrailingP/E = \frac{Price+Dividend}{Earnings}$
  - Dividend-adjusted P/E
  - The adjustment is necessary because dividends reduce the price (in the numerator) but do not affect earnings (in the denominator).
  - The adjustment is not necessary for the forward *P/E* because both prices and forward earnings are reduced by the current dividend
- Normal trailing P/E
  - $Normal\ Trailing\ \frac{P}{E} = \frac{(1+Required\ return)}{Required\ return}$
  - The normal forward P/E and the normal trailing *P/E* always differ by 1.0, representing one current dollar earning at the required return for an extra year

A poor P/E model

- $Value\ of\ equity = \frac{Earn_1}{\rho_E - g}$
  - g: 1 plus the forecasted earnings growth rate
  - with this model the forward P/E ratio is $\frac{1}{(\rho_E - g)}$
  - this model is wrong.
  - It is applied with forecasts of ex-dividend growth rates rather than cum-dividend growth rates. Ex-dividend growth rates ignore growth from reinvesting dividends. The higher the dividend payout, the higher the omitted value cal- culated by the formula with ex-dividend growth rates.
  - The formula clearly does not work when the earnings growth rate is greater than the required return, for then the denomi- nator is negative

A model for anchoring value on earnings

- Anchoring principle
  - If one forecasts that cum-dividend earnings will grow at a rate equal to the required rate of return, the asset's value must be equal to its earnings capitalized
- Value of equity

Value of equity = Capitalized forward earnings + Extra value for abnormal cum-dividend earnings growth

$$V_0^E = \frac{\text{Earn}_1}{\rho_E - 1} + \frac{1}{\rho_E - 1}\left[\frac{\text{AEG}_2}{\rho_E} + \frac{\text{AEG}_3}{\rho_E^2} + \frac{\text{AEG}_4}{\rho_E^3} + \cdots\right]$$

$$= \frac{1}{\rho_E - 1}\left[\text{Earn}_1 + \frac{\text{AEG}_2}{\rho_E} + \frac{\text{AEG}_3}{\rho_E^2} + \frac{\text{AEG}_4}{\rho_E^3} + \cdots\right] \quad \textbf{(6.2)}$$

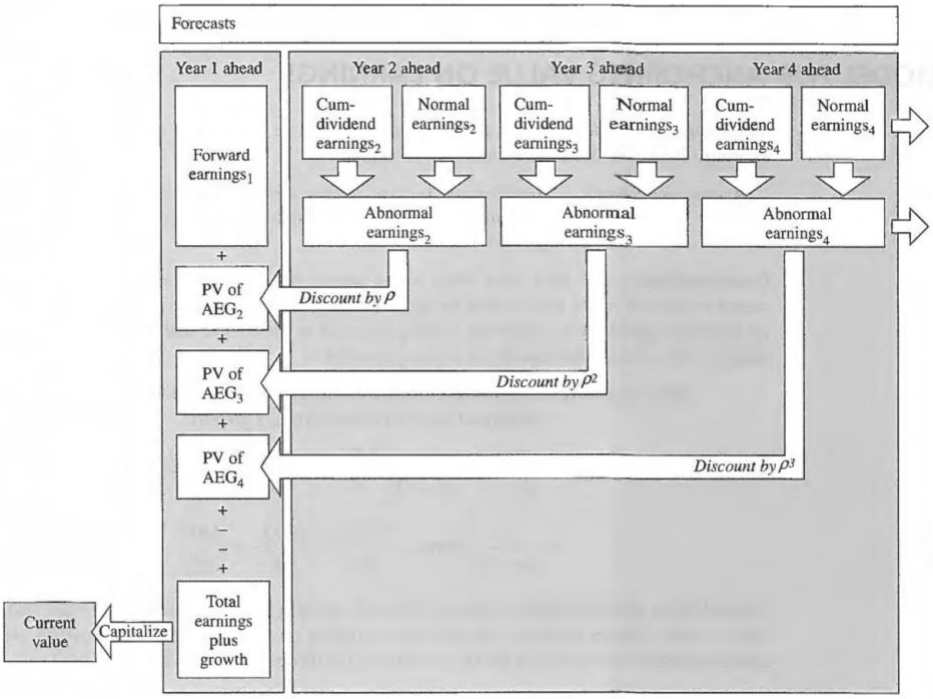
-
- AEG = Abnormal (cum-dividend) earnings growth for years after the forward year, year 1

- To value a share, proceed through the following steps:

1. Forecast one-year-ahead earnings (Year 1).
2. Forecast abnormal earnings growth (AEG) after the forward year (Year 2 onwards).
3. Calculate the present value (at the end of Year 1) of expected abnormal earnings growth after the forward year.
4. Capitalize the total of forward earnings and the value of abnormal earnings growth.

FIGURE 6.1 Calculation of Equity Value Using the Abnormal Earnings Growth Model
Abnormal earnings growth is the difference between cum-dividend earnings and normal earnings. The present value of abnormal earnings growth for Year 2 and beyond is added to forward earnings for Year 1, and the total is then capitalized to calculate equity value.

Abnormal earnings growth$_t$ = Cum-dividend earnings$_t$ – Normal earnings$_t$
Cum-dividend earnings$_t$ = Earnings$_t$ + (ρ_E – 1) dividend$_{t-1}$
Normal earnings$_t$ = ρ_E Earnings$_{t-1}$



-
- The model says that values is based on future earnings, but with earnings from normal growth subtracted
- Intrinsic forward P/E, if no abnormal earnings growth is forecasted
  - $V_0^E = \frac{Earn_1}{\rho_E - 1}$
- P/E is normal

- $\frac{V_0^E}{Earn_1} = \frac{1}{\rho_E - 1}$
- The abnormal earnings growth model, or the Ohlson-Juettner model

Measuring abnormal earnings growth

- Abnormal earnings growth (AEG) is earnings (with dividends reinvested) in excess of earnings growing at the required return:
  - $Abnormal\ earnings\ growth_t = Cum - dividend\ earn_t - Normal\ earn_t = [Earn_t + (\rho_E - 1)d_{t-1}] - \rho_E Earn_{t-1}$
- Abnormal earnings growth can be expressed in terms of growth rates relative to required return rates:
  - $Abnormal\ earnings\ growth_t = [G_t - \rho_E]\ x\ Earnings_{t-1}$
  - G_t is 1 plus the cum-dividend earnings growth rate for the period
  - AEG is the dollar amount by which a prior year's earnings grow, cum-dividend, relative to the required rate
  - If G_t is equal to the required rate of return, there is no abnormal earnings growth

EXHIBIT 6.2 **Forecasts for a Firm with Expected Earnings Growth of 3 Percent per Year**
In millions of dollars. Required return is 10 percent per year.

		Forecast Year				
	0	1	2	3	4	5
Residual earnings forecasts:						
Earnings	12.00	12.36	12.73	13.11	13.51	13.91
Dividends	9.09	9.36	9.64	9.93	10.23	10.54
Book value	100.00	103.00	106.09	109.27	112.55	115.92
Residual earnings (RE)		2.360	2.431	2.504	2.579	2.656
RE growth rate			3%	3%	3%	3%
Abnormal earnings growth forecasts:						
Earnings	12.00	12.36	12.73	13.11	13.51	13.91
Dividends	9.09	9.36	9.64	9.93	10.23	10.53
Earnings on reinvested dividends		0.909	0.936	0.964	0.993	1.023
Cum-dividend earnings		13.269	13.667	14.077	14.499	14.934
Normal earnings		13.200	13.596	14.004	14.424	14.857
Abnormal earnings growth (AEG)		0.069	0.071	0.073	0.075	0.077
Abnormal earnings growth rate			3%	3%	3%	3%
Cum-dividend earnings growth rate		10.57%	10.57%	10.57%	10.57%	10.57%
Normal earnings growth rate		10.0%	10.0%	10.0%	10.0%	10.0%

The Calculations:

Earnings on reinvested dividends refers to the prior year's dividend earning at the required return. So, for Year 2, earnings on reinvested dividends is 0.10 × 9.36 = 0.936.

Cum-dividend earnings adds earnings on reinvested dividends to the ex-dividend earnings forecasted. So, cum-dividend earnings for Year 2 is 12.73 + (0.10 × 9.36) = 13.667.

Normal earnings is the prior year's earnings growing at the required return. So, for Year 2, normal earnings is 12.36 × 1.10 = 13.596.

Abnormal earnings growth is cum-dividend earnings − normal earnings. So, for Year 2, AEG = 13.667 − 13.596 = 0.071.

Abnormal earnings growth is also the prior year's earnings multiplied by the spread between the cum-dividend growth rate and the required rate. So, for Year 2, AEG is (1.1057 − 1.10) × 12.36 = 0.071.

Anchoring valuation on current earnings

- $V_0^E + d_0$
  - The value obtained is the cum-dividend value (price plus dividend) appropriate for valuing current earnings

$$V_0^E + d_0 = \frac{\rho_E}{\rho_E - 1}\left[\text{Earn}_0 + \frac{\text{AEG}_1}{\rho_E} + \frac{\text{AEG}_2}{\rho_E^2} + \frac{\text{AEG}_3}{\rho_E^3} + \cdots\right] \quad \textbf{(6.4)}$$

  -

- With no AEG after the current year, the trailing P/E is normal

Build your own valuation engine

- The mechanics of the valuations can be built into a spreadsheet which requires the following input:
  1. Earnings and dividend forecasts up to a given forecast horizon
  2. A required return
  3. A long-term growth rate to calculate the continuing value
- The standard spreadsheet has forecasts for two years ahead and applies a growth rate for years thereafter

Abnormal earnings growth

- $$\begin{aligned} AEG_t &= [Earn_t + (\rho_E - 1)d_{t-1}] - \rho_E Earn_{t-1} \\ &= Earn_t - Earn_{t-1} - (\rho_E - 1)(Earn_{t-1} - d_{t-1}) \end{aligned}$$
- $$\begin{aligned} AEG_t &= Earn_t - Earn_{t-1} - (\rho_E - 1)(B_{t-1} - B_{t-2}) \\ &= [Earn_t - (\rho_E - 1)B_{t-1}] - [Earn_{t-1} - (\rho_E - 1)B_{t-2}] \\ &= RE_t - RE_{t-1} \end{aligned}$$
- Abnormal earnings is always equal to the change in residual earnings
- Forecasting that there will be no abnormal earnings growth is the same as forecasting that residual earnings will not change. Abnormal earnings growth of zero means that (cum-dividend) earnings are growing at the required rate of return, forecasting this normal growth rate is the same as forecasting that residual earnings will not change. Forecasting cum-dividend earnings growth above normal → is the same as forecasting growth in residual earnings
- AEG valuation enforces the point that a firm cannot add value from growing earnings unless it grows earnings at a rate greater than the required rate of return.
  - Same as saying that the firm must grow residual earnings to increase its P/B ratio.
  - Added value comes from investing to earn a return greater than the required return, and that added value has its manifestation in both growth in residual earnings and growth in cum-dividend earnings over a norm al growth rate.

Features of the abnormal earnings growth model

- Advantages and disadvantages of the abnormal earnings growth valuation

ADVANTAGES	
Easy to understand:	Investors think in terms of future earnings and earnings growth; investors buy earnings. Focuses directly on the most common multiple used, the P/E ratio.
Uses accrual accounting:	Embeds the properties of accrual accounting by which revenues are matched with expenses to measure value added from selling products.
Versatility:	Can be used under a variety of accounting principles (Chapter 17).
Aligned with what people forecast:	Analysts forecast earnings and earnings growth.
Forecast horizon:	Forecast horizons are typically shorter than those for DCF analysis and more value is typically recognized in the immediate future. There is less reliance on continuing values.
Protection:	Protects from paying too much for growth.
DISADVANTAGES	
Accounting complexity:	Requires an understanding of how accrual accounting works.
Concept complexity:	Requires an appreciation of the concept of cum-dividend earnings and abnormal earnings growth.
Sensitive to the required return estimate:	As the value derives completely from forecasts that are capitalized at the required return, the valuation is sensitive to the estimate used for the required return. Residual earnings valuations derive partly from book value that does not involve a required return.
Use in analysis:	The residual earnings model provides better insight into the analysis of value creation and the drivers of growth (in Part Two of the book).
Application to strategy:	Does not give an insight into the drivers of earnings growth, particularly balance sheet items; therefore, it is not suited to strategy analysis.
Suspect accounting:	Relies on earnings numbers that can be suspect. Should be implemented along with an earnings quality analysis. (Chapter 18).

-
- The abnormal earnings growth model embodies the idea that the value of a firm is based on what it can earn.
- Not sensitive to expected dividend payout or share issues and share repurchases
- A firm adds value by finding investments that yield abnormal earnings growth, not by keeping cash in the firm or paying it out.
- When the higher earnings are combined with the lower book values (in a residual earnings valuation), value is unaffected.
- Shifting income from current earnings to forward earnings increases the trailing P/E; there is now more anticipated earnings growth next year and the P/E prices growth. However, shifting income to the future decreases the forward P/E-there is now less anticipated growth after the forward year, and the value of the earnings (in the numerator) does not change.
- We distinguish growth that come from accounting from growth that comes from real business factors
  - If growth is induced by the accounting, he changes the P/E ratio, but he does not change the valuation
  - Applying the AEG model (or indeed the residual earnings model) protects him from making the mistake of pricing earnings that are due to accounting methods.

The Fed model

- The "Greenspan model" or the "Fed model" compares the expected earnings yield with the 10-year Treasury yield to assess whether stocks are overpriced. The expected earnings yield, measured as forward earnings/price, is just the inverse of the forward *P/E* ratio, so an earnings yield of 4.75 implies a forward P/E 21.05
- The Fed model says that stocks are likely to be overpriced when the forward *P/E* for stocks rises above the *PIE* for Treasury notes.

PEG ratios

- PEG = P/E-to-earnings-growth
  - Compares the P/E ratio to a forecast of percentage earnings growth in the following year
  - $PEG\ Ratio = \frac{\frac{P}{E}}{1-year\ ahead\ percentage\ earnings\ growth}$
  - The P/E in the numerator is usually the forward P/E, but sometimes the trailing P/E is used
  - If the forward *P/E* is used, the appropriate measure of growth in the denominator of the PEG ratio is the forecasted one-year growth after th e forward year, that is, growth for two years ahead
  - If the ratio is less than 1.0, the screener concludes that the market is underestimating earnings growth. Ifit is greater than 1.0, th e screener concludes that the market is too optimistic about growth

Cum-dividend earnings

- Earnings that include earnings on prior dividends paid

Ex-dividend earnings

- Earnings without consideration to the earnings that can be earned on dividends

Geare en virksomhed = optage gæld

- Medfører hårdere tilbagediskontering

$\frac{1}{r_E}$ → forward P/E

- Kapitaliseringsfaktor
- Inverse af ejernes afkastkrav

From P/B Valuation to P/E Valuation

The residual earnings pro forma for Nike, Inc:

		Forecast Year					
	2006	2007	2008	2009	2010	2011	2012
EPS		2.96	3.80	3.07	3.93	4.28	4.65
DPS		0.71	0.88	0.98	1.06	1.20	1.12
BPS	14.00	16.25	19.17	21.26	24.13	27.21	30.74
Residual earnings (9% charge)		1.700	2.338	1.345	2.017	2.108	2.203
Change in residual earnings			0.638	−0.993	0.672	0.091	0.095

$$V_0^E = \frac{1}{\rho_E - 1}\left[\text{EPS}_1 + \frac{\Delta\text{RE}_2}{\rho_E} + \frac{\Delta\text{RE}_3}{\rho_E^2} + \frac{\Delta\text{RE}_4}{\rho_E^3} + \frac{\Delta\text{RE}_5}{\rho_E^4} + \frac{\Delta\text{RE}_6}{\rho_E^4(\rho_E - g)}\right]$$

$$V_{2006}^E = \frac{1}{0.09}\left[2.96 + \frac{0.638}{1.09} + \frac{-0.993}{1.09^2} + \frac{0.672}{1.09^3} + \frac{0.091}{1.09^4} + \frac{0.095}{1.09^4(1.09 - 1.045)}\right]$$

$$= \$53.18$$

-

- Samme værdi:
  V = Bogført værdi + PV af RE

= Kapitaliseret forward earnings + PV af ændringer i RE

- Samme mål:
  Ændring i RE = Abnormal Earnings Growth (AEG)

Abnormal Earnings Growth (AEG) er vækst i overskud ud over afkastkravet

Value of savings account = $\frac{Forward\ earnings}{Required\ return}$

Forward P/E = $\frac{1}{Required\ return}$

Cum-dividend earnings = $d_{t-1} * r_e + E_t$

- Dividende I sidste periode gange med ejernes afkastkrav plus earnings i periode t
- Når cum-dividend earnings = afkastkravet → AEG=0
- Når cum-dividend earnings > afkastkravet → AEG>0

Formler, trailing og forward P/E:

$$Forward\ P/E\ = \frac{Price_0}{Earnings_1}$$

$$Trailing\ \frac{P}{E} = \frac{Price_0 + Dividend_0}{Earnings_0}$$

$$Normal\ forward\ \frac{P}{E}\ = \frac{1}{Afkasttkrav}$$

$$Normal\ trailing \frac{P}{E} = \frac{1 + Afkastkrav}{Afkastkrav}$$

$$Normal\ forward \frac{P}{E} = Normal\ trailing \frac{P}{E} - 1$$

$$Indre\ forward \frac{P}{E} = \frac{Earnings\ valuation}{Earnings}$$

- Holdes oppe imod den handlede forward P/E

Normaloverskud er overskud, der vokser med afkastkravet:

$$Normaloverskud\ = \rho_E * Earnings_{t-1}$$

Overnormal overskudsvækst er vækst udover normal overskudsvækst

$$AEG = cum - dividend\ earnings - normal\ overskud$$

Et aktiv er værd det kapitaliserede forward overskud, såfremt den forventede overnormale overskudsvækst er nul.
Et aktiv har en normal P/E ratio, såfremt den forventede overnormale overskudsvækst er nul
Overskud kommer fra to kilder:

- Overskud fra aktivet
- Overskud fra reinvesterede dividender

Dividender berører ikke cum-dividend earnings
Dividender berører ikke værdien

Værdi af opsparingskonto = Kapitaliseret forward overskud + Ingen ekstra værdi

- Ekstra værdi tillægges, såfremt (cum-dividend) overskud forventes at vokse med en vækst større en afkastkravet

En model for forward P/E:

$$V_0^E = \frac{Earn_1}{\rho_E - 1} + \frac{1}{\rho_E - 1}\left[\frac{AEG_2}{\rho_E} + \frac{AEG_3}{\rho_E^2} + \frac{AEG_4}{\rho_E^3} + \bullet\bullet\right]$$

$$= \frac{1}{\rho_E - 1}\left[Earn_1 + \frac{AEG_2}{\rho_E} + \frac{AEG_3}{\rho_E^2} + \frac{AEG_4}{\rho_E^3} + \bullet\bullet\right]$$

Den indre P/E $\left(\frac{V_0^E}{Earn_1}\right)$ fås ved at dividere igennem med $Earn_1$

- Kapitaliseret forward overskud + ekstra værdi for AEG

Alternativ beregning af AEG

- $AEG_t = [G_t - \rho_E] * earnings_{t-1}$
  - G_t = cum-dividend overskudsvækst (plus 1)

AEG er lig med ændringen i RE

- $\Delta RE = AEG$

$$AEG_t = [earn_t + (\rho_E - 1)d_{t-1}] - \rho_E earn_{t-1}$$
$$= earn_t - earn_{t-1} - (\rho_E - 1)[earn_{t-1} - d_{t-1}]$$

- Fra strøm- og beholdningsligningen for egenkapital
  - $B_{t-1} = B_{t-2} + earn_{t-1} - d_{t-1}$, så $earn_{t-1} - d_{t-1} = B_{t-1} - B_{t-2}$
- Dette kombineret giver
  - $$AEG_t = earn_t - earn_{t-1} - (\rho_E - 1)[B_{t-1} - B_{t-2}]$$
    $$= [earn_t - (\rho_E - 1)B_{t-1}] - [earn_{t-1} - (\rho_E - 1)B_{t-2}]$$
    $$= RE_t - RE_{t-1}$$

Chapter 9: The analysis of the statement of Shareholders' Equity

Outside investor
- Compare value with price to buy, sell, or hold

Inside investor
- Compare value with cost to accept or reject strategy

Statement of shareholders' equity
- It is a summary statement, tying together all transactions that affect shareholders' equity. By analyzing the statement, the analyst ensures that all aspects of the business that affect shareholders' equity are included in his analysis to value the equity.
- Value is generated for equity holders through operations, not by equity financing activities.

Reformulating the statement of owners' equity
- Provides the reconciliation of beginning and ending owners ' equity according to the stocks and flows equation
  - The change in owners' equity is explained by comprehensive income for the period plus capital contributions from share issues, less dividends paid in cash and stock repurchases.
- Reformulated statement of Common Shareholders' Equity

Reformulated Statement of Common Shareholders' Equity

Beginning book value of common equity
+ Net effect of transactions with common shareholders
  + Capital contributions (share issues)
  – Share repurchases
  – Dividends
  = Net cash contribution (negative net dividends)
+ Effect of operations and nonequity financing
  + Net income (from income statement)
  + Other comprehensive income
  – Preferred dividends
  = Comprehensive income available to common
Closing book value of common equity

-
- Excludes preferred equity → treated as a liability. The beginning and ending balances refer only to common shareholders' equity
- The net addition to common equity from transactions with shareholders- the negative net dividend- is separated from the addition to shareholders' equity that arises from business activities.
- The total effect of operations and nonequity financing on the common shareholders is isolated in *comprehensive income.*

Reformulation procedures

- Restate beginning and ending balances for the period for items that are not part of common shareholders' equity:
  - Preferred stock. Reduce the balances by the amount of preferred stock in those balances. An exception is redeemable preferred stock
  - Noncontrolling interests. Must be deducted from opening and closing balances
  - Dividends payable.
- Calculate net transactions with shareholders (the net dividend)
  - Nets dividends and stock repurchases against cash from share issues
- Calculate comprehensive income
  - Comprehensive income combines net income and other income reported in the equity statement
  - The income reported outside net income is referred to as *other comprehensive income,* so comprehensive income is net income plus other comprehen- sive income. Note that all items in other comprehensive income are after tax
- Retained earnings is a mixture of accumulated earnings, dividends, share repurchases, and stock dividends already identified in the reformation, so does not bear on the analysis

Dirty-surplus accounting

- Reporting income items as part of equity rather than in an income statement is known as *dirty-surplus accounting.*
- An equity statement that has no income other than net income from the income statement is a **clean-surplus accounting** statement
- Dirty-surplus items
  - Unrealized gains and losses on securities
  - Foreign currency translation gains and losses
  - Unrealized gains and losses on certain derivatives

Ratio analysis

- The reformulated statement distinguishes the creation of value from the distribution of value
- The reformatted statement of changes in owners' equity gives the growth in equity over a period
- Both return on common equity (ROCE) and growth in equity- the two drivers of residual earnings- can be identified in the statement
- Dividend payout
  - $Dividend\ payout = \frac{Dividends}{Comprehensive\ Income}$
- Total payout ratio
  - $Total\ payout\ ratio = \frac{Dividends + Stock\ repurchases}{Comprehensive\ Income}$
  - Calculated with total dollar amounts rather than per-share amounts. The difference between this ratio and the dividend payout ratio gives the percentage of earnings paid out as stock repurchases
- Dividends-to-book value = $\frac{Dividends}{Book\ value\ of\ CSE + Dividends}$
  - CSE = Common shareholders' equity
- Total payout-to-book value = $\frac{Dividends + Stock\ repurchases}{Book\ value\ of\ CSE + Dividends + Stock\ repurchases}$
- Retention ratio
  - Focuses on earnings retained rather than earnings paid out
  - $Retention\ ratio = \frac{Comprehensive\ income - Dividends}{Comprehensive\ Income} = 1 - Dividend\ payout\ ratio$

Shareholder profitability

- The reformulated statement yields the comprehensive rate of return on common equity, ROCE, the profitability of the owners' investment for the period. ROCE is also the growth rate in equity from business activities
- $ROCE_t = \frac{Comprehensive\ income}{\frac{1}{2}(CSE_t + CSE_{t-1})}$
  - Income statement and balance sheet are not needed to calculate ROCE

Growth ratios

- The growth in shareholders' equity is simply the change from beginning to ending balances. *Growth ratios* explain this growth as a rate of growth.
- The part of the growth rate resulting from transactions with shareholders is the net investment rate
  - $Net\ investment\ rate\ = \frac{Net\ transactions\ with\ shareholders}{Beginning\ book\ value\ of\ CSE}$
- Growth rate of CSE
  - $Growth\ rate\ of\ CSE = \frac{Change\ in\ CSE}{Beginning\ CSE} = \frac{Comprehensive\ income + Net\ transactions\ with\ shareholders}{Beginning\ CSE}$
- If ROCE is calculated with beginning CSE in the denominator
  - $Growth\ rate\ of\ CSE = ROCE + Net\ investment\ rate$

Hidden dirty surplus

- The distinction between comprehensive income a..nd transactions with shareholders in the reformulated statement of owners' equity separates the creation of value from the raising of funds and the distribution of value to shareholder s.
  - Transactions with shareholders do not create value
  - If shares are issued at less than market value → shareholders lose

Stock option loss is the difference between the exercise price and the market price of the shares at the date of exercise. This is the amount that shareholders lose by not issuing the shares at market price

Basic EPS

- Basic EPS is sim- ply earnings available to common (after preferred dividends) divided by the number of out- standing shares

Diluted EPS

- An "as if" number that estimates what earnings per share would be if holders of contingent equity claims like stock options, warrants, convertible debt, and convertible preferred shares were to exercise their option to convert those claims to common shares; rather than shares outstanding, the denominator is shares outstanding plus shares that would be outstanding should conversion take place

Accounting quality watch: The equity statement

Accounting Item	Quality Problem
Dividends payable	GAAP treats dividends payable as a liability. Rather, it is part of shareholders' equity. Shareholders have a claim to these dividends that have been declared but not paid. They do not owe them to others.
Unrealized gains and losses on securities	Unrealized gains and losses on available-for-sale debt and equity securities are reported as part of other comprehensive income in the equity statement rather than in the income statement. Thus, the full performance of an investment portfolio is not reported in the income statement. Worse, as firms report realized gains and losses in the income statement, they can "cherry pick" gains into the income statement (and earnings per share) by selling securities that have appreciated in value while holding those on which they have experienced losses and reporting those unrealized losses in the equity statement.
Translation gains and losses	A gain or loss results from holding assets and liabilities in foreign currencies when exchange rate change is not recognized in the income statement. (The effect is booked to equity in the equity statement, bypassing the income statement.)
Preferred dividends	Preferred dividends are treated as a distribution of equity rather than a cost to (common) shareholders.
Stock compensation credits to equity	GAAP recognizes deferred compensation from grant of stock options as a credit to equity, as if shareholders' equity increases by compensating employees. This is a liability—to give up value on the exercise of options—not an increase in equity.
Grant-date stock option accounting	GAAP recognizes stock option compensation at option grant date. However, the expense (to the shareholder) is incurred at exercise date as shares are issued for less than market price. If granted options are not exercised, GAAP overstates wages' expense. If options are exercised, GAAP typically understates wages' expense.
Accounting for warrants and options	GAAP does not report the loss to shareholders when warrants and (call and put) options on the firm's stock are exercised and shares are issued or repurchased at prices differing from market price.
Accounting for convertible bonds and preferred stock	GAAP converts these claims to equity at their book value. Thus, no loss is recognized on the conversion.
Omitted borrowing costs	As losses are not recognized on conversion of nonequity financing instruments (like convertible bonds) into equity, borrowing costs are understated.
Omitted (off-balance-sheet) liabilities	Outstanding obligations to issue shares at less then market price are not recognized on the balance sheet. These include the option overhang from outstanding stock options.

AEG

- Direkte model
  - Finder værdien af egenkapitalen I ét hug
  - $V_0^E = \frac{1}{r_e}[EPS_1 + PV_{AEG}]$
  - AEG = cum-dividend earnings – normal earnings
    - $E_t + (d_{t-1} * r_e) - E_{t-1} * (1 + r_e)$

Reinvested dividends = dividends x required rate of return

Indre forward P/E = $\frac{Value\ of\ the\ equity}{Forward\ earnings}$

Hvis den indre værdi er større end handlede værdi → overnormal profit (der er positiv AEG)

Normal forward P/E = $\frac{1}{r_e}$

Normal trailing P/E = $\frac{1+r_e}{r_e}$ → per definition = Normal forward P/E +1

Normal forward P/E = normal trailing P/E -1

Forward P/E = $\frac{Price_0}{Earnings_1}$

Cum-dividends earnings = earnings_(t-1) + dividends reinvested_t

Hvis pengestrømmene er upåvirket → ingen ændring i værdien

Normal earnings går op → AEG går ned

Minoritetsinteresser opstår når vi har ikke fuldt ejede datterselskaber

- F.eks. et datterselskab hvor vi ejer 95% af selskabet, ejes de sidste 5% af andre, som medfører minoritetsinteresser

Strøm- og beholdningsligningen

- Stock- and flow equation
- Bogført værdi primo – nettoudbetaling til ejerne + totalindkomst = bogført værdi ultimo
  - nettoudbetaling til ejerne måler periodens værdidistribuering
  - totalindkomst måler periodens værdiskabelse

egenkapitalopgørelse til analysebrug

Egenkapital primo, **ordinære aktionærer**
+ Kapitalindskud
- Aktietilbagekøb
- Udbytte
= **Nettokapitalindskud** (negativ = nettodividende *d*)

+ Årets nettooverskud
+ Anden totalindkomst
- Præferenceudbytte
= Totalindkomst

Egenkapital ultimo, **ordinære aktionærer**

Bemærk, at eventuel præferenceaktiekapital og minoritetsinteresser er taget ud af opgørelsen (og behandles som separate fordringer i den reformulerede balance)

Reformuleringsproces:

1. Korrigér primo og ultimo saldoen for poster, som er forkert klassificeret :

minus Præferenceegenkapital
minus Minoritetsinteresser

2. Beregn nettotransaktioner med ejerne

udbetalt udbytte + aktietilbagekøb - kapitalindskud

3. Beregn årets total indkomst
   = nettooverskud ± anden totalindkomst

minus effekt fra regnskabsprincipændring
minus præferenceudbytte
minus minoritetsaktionærernes andel af totalindkomsten
minus 'skjulte' omkostninger

præferenceaktiekapital er en forpligtelse

- Omkostninger ved denne er en omkostning

Anden totalindkomst

- Ikke indregnes i resultatopgørelsen, men direkte i egenkapitalopgørelsen

Egenkapitalforrentning

- $ROCE_t = \frac{Årets\ totalindkomst}{\frac{1}{2}(CSE_t + CSE_{t-1})}$

Nøgletal

- $Udbytte\ payout = \frac{Udbytte}{Totalindkomst}$
- $Samlet\ payout = \frac{Udbytte + aktietilbagekøb}{Totalindkomst}$
- $Udbytte - til - bogført\ værdi = \frac{Udbytte}{CSE + udbytte}$
- $Samlet\ payout\ til\ bogført\ værdi = \frac{Udbytte + aktietilbagekøb}{CSE + udbytte}$
- $Retention\ ratio = \frac{Totalindkomst - udbytte}{Totalindkomst} = 1 - udbytte\ ratio$
- Nyinvesteringsrate = $\frac{Nettotransaktioner\ med\ ejerne}{Egenkapital\ primo}$
- Vækst i CSE = $\frac{\Delta CSE}{\Delta CSE\ primo} = \frac{Totalindkomst + nettotransaktioner\ med\ ejere}{Egenkapital\ primo}$

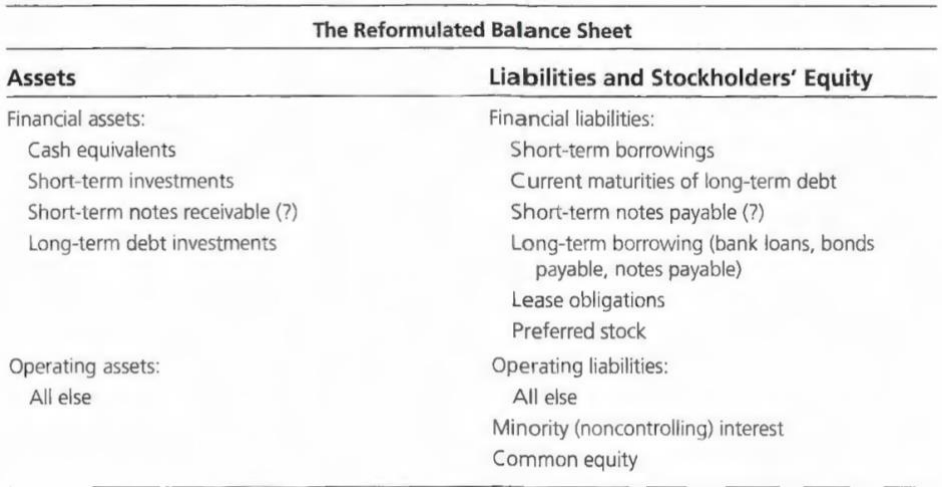
Reformulering

- Identificer driftsaktiver og driftsforpligtelser
  - Dem som er fremkommet fra kapitalmarkedet er finansielle aktiver/forpligtelser
- Net operating assets = operating assets – operating liabilities
  - Det beløb som er bundet I driften
- Netto finansielle Bruttogæld – finansielle aktiver
- Finansielle aktiver
  - Aktiver som midlertidigt opbevare likviditet
- Finansielle forpligtelser
  - Alt det som er rentebærende
- Andre kapitalandele
  - Ejerandel i en virksomhed på mindre end 20%
- Kapitalandele i associerede virksomheder
  - Ejerandel i en virksomhed mellem 20% og 50%
- Som default er ”anden gæld” og ”andre tilgodehavender” tilknyttet driftet
  - For at være sikker kan man tjekke i noter, hvor der står hvad dette er tilknyttet for at kunne kvalificere det ift. driften
  - F.eks. gæld til det offentlige
- 0,5-2% af nettoomsætningen er nødvendigt for driften i likviditet → tommelfingerregel
  - Resten vil derfor opfattes som et finansielt aktiv
  - Kan også være begrænset (restricted) likviditet, som fratrækkes inden driftslikviditeten udregnes
- Investering i obligationer → finansielt aktiv
  - Kan være tilfælde hvor obligationer er driftsaktiver → Hvis virksomheder aktivt ligger og spekulerer i obligationer i markedet
- Investering i kapitalandele (<20%) → typisk en strategisk investering
- Aktiver bestemt for salg og forpligtelser relateret til aktiver bestemt for salg: Finansielt aktiv og finansiel forpligtelse
- Leasing aktiver → driftsaktiver
- Leasingforpligtelse → finansiel forpligtelse
- Udskudte skatteaktiver og passiver → driftsaktiv/ driftsforpligtelse
- Minoritetsinteresser → ikke en finansiel forpligtelse

Chapter 10: The analysis of the balance sheet and income statement

The main aim of reformulating the balance sheet and income statements, however, is to discover the drivers of ROCE (return on common equity) and growth in preparation for forecasting and valuation

Reformulation of the balance sheet

- Current = kortfristet
- Non-current= langfristet
- NOA = net operating assets
- Net financial assets (obligations)
  - Net debt
- Operating assets and liabilities are those involved in the business, in selling goods and services
- Financing assets and liabilities are those that are involved in raising cash for operations and disbursing excess cash from operations.
- Make sure you can answer the question, What business is the firm in? Because this determines how to classifies what is the operating assets and liabilities
- Operating assets and liabilities generate operating income and financial assets and liabilities are those that produce financial income or incur financial expenses
- 

The Reformulated Balance Sheet	
Assets	**Liabilities and Stockholders' Equity**
Financial assets:	Financial liabilities:
Cash equivalents	Short-term borrowings
Short-term investments	Current maturities of long-term debt
Short-term notes receivable (?)	Short-term notes payable (?)
Long-term debt investments	Long-term borrowing (bank loans, bonds payable, notes payable)
	Lease obligations
	Preferred stock
Operating assets:	Operating liabilities:
All else	All else
	Minority (noncontrolling) interest
	Common equity

Issues in reformulating balance sheets

- Cash
  - Operating cash → needed as a buffer to pay bills as they fall due is an operating asset
  - Financial assets → excess cash invested in short term securities, or in general interest bearing cash → cash over the liquidity demand (financial assets)
- Short-term notes receivable
  - If the notes are temporary investments of excess cash, treat them as financial assets → treat them as financial assets if they bear the market rate of interest
  - If they are trade notes, treat them as operating assets.
  - If the firm is using credit to attract customers, treat the notes as operating assets: The firm is effectively offering a lower interest rate instead of a lower price for goods

shipped. Correspondingly, the interest income should be classified as operating income, part of the income from selling goods with favorable credit terms

- Debt investments
  - For nonfinancial firms, investments in bonds and other interest-bearing investment are financial assets
  - Banks make money on the spread between borrowing and lending rates, so in their case, debt investments and debt liabilities are operating items.
- Long-term equity investments
  - Long-term equity investments (in the shares of other firms) are investments in the operations of other companies, and so they are classified as operating assets
  - Equity investments in subsidiaries include the parent's share of net financial assets of subsidiaries. Thus they are investments in financial assets and obligations of these subsidiaries as well as their operating assets → as an expediency, treat the entire investment as an investment in an operating subsidiary.
- Short-term equity investments
  - Short-term marketable equity investments can be an exception to classifying equities as operating assets. If they are part of a trading portfolio, they are operating assets.
  - If they are used to temporarily mop up excess cash, they are financial assets
- Short-term notes payable
  - Financial obligations if written to generate cash → treat them as financial liabilities if they are interest-bearing at market rates
  - If they are non-interest-bearing, or carry an interest rate less than the market rate for this type of credit → classify as operating liabilities
  - A note written to satisfy a trade obligation results from operating activities but if it is interest bearing at market rate, the operating liability (the accounts payable) has effectively been converted into a financial liability (the note payable).
- Accrued expenses
  - Operating liabilities
  - Interest payable on financial obligations is a financing item
- Deferred revenues (unearned revenues)
  - Operating liabilities
- Leases
  - The lease asset is an operating asset
  - The lease obligation is reported under liabilities and is classified as a financial obligation in reformulated statements
- Deferred tax assets and liabilities
  - Operating assets or liabilities
- Dividends payable
  - Shareholders' equity
- Preferred stock
  - Financial obligations
- Other items
  - Check these in footnotes → assumed to be operating
- Minority (noncontrolling) interest
  - Treat as a separate line

- Reformulated statement with minority interest: NOA – NFO = CSE + Minority interest

Balance sheet equation

- CSE = NOA – NFO
  - Net operating assets NOA is the difference between operating assets and operating liabilities
  - Net financial assets NFA is the difference between financial assets and financial obligations

Strategic balance sheets

- Can refer a reformulated balance sheets to a strategic balance sheet

Reformulation of the income statement

- The income statement reports the profits and losses that the net operating assets and net financial assets have produced
- The reformulated statement groups these items into operating and financing categories.
- Operating income → NOPAT (Net operating profit after tax)

Reformulated Comprehensive Income Statement

Net sales
– Expenses to generate sales
Operating income from sales (before tax)
– Tax on operating income from sales
  + Tax as reported
  + Tax benefit from net financial expenses
  – Tax allocated to other operating income
Operating income from sales (after tax)
± Other operating income (expense) requiring tax allocation
  Restructuring charges and asset impairments
  Merger expenses
  Gains and losses on asset sales
  Gains and losses on security transactions
– Tax on other operating income
± After-tax operating items
  Equity share in subsidiary income
  Operating items in extraordinary income
  Dirty-surplus operating items in Table 9.1
  Hidden dirty-surplus operating items
Operating income (after tax)
– **Net financial expenses after tax**
  + Interest expense
  – Interest revenue
  ± Realized gains and losses on financial assets
  = Net taxable financial expense before tax
  – Tax benefit from net financial expenses
  = Net taxable financial expenses after tax
  ± Gains and losses on debt retirement
  ± Dirty-surplus financial items in Table 9.1 (including preferred dividends)
  ± Hidden dirty-surplus financing items
– Minority interest
= **Comprehensive income to common**

-
  - Operating items are separated from financing items
  - Operating income from sales are separated from other operating income
  - Tax is allocated to components of the statement, with no allocation to items reported on an after-tax basis

As a basic rule, firms should not hold cash with- out purpose, but rather pass it out to shareholders: Cash is a zero residual earnings asset (adding no value) that sharehold- ers can just as well hold on their own account

They may have investment oppurtunities to use the cash. Financial assets are held for the following purposes:

1. For payout to shareholders (in dividends and stock repurchases) in the near future.
- Default
2. For payment of an upcoming debt maturity. (The payment does not affect net financial assets.)
3. For capital expenditures or acquisitions in the near future.
4. As "insurance" against bad times in operations: If cash flow turns negative, the firm has financial assets to alleviate the cash crunch.
- Controversial

Valuation of common equity

- Value of common equity = Value of net operating assets + Value of net financial assets

Tax allocation

- Tax benefit from debt (tax shield)
  - Tax benefit = Net interest expense * Tax rate
- After-tax net interest expense
  - After-tax net interest expense = Net interest expense * (1-Tax rate)
- Tax on operating income
  - Tax on operating income = Tax expense as reported + (Net interest expense * Tax rate)
- NOL = net operating loss
  - Can be carried back and deducted from taxable income in the previous two years or carried forward to income for 20 future years. So a firm loses the tax benefit only if the loss cannot be absorbed into taxable income over the carryback and carryforward periods.
- Effective tax rate for operations

$$\text{Effective tax rate for operations} = \frac{\text{Tax on operating income}}{\text{Operating income before tax, equity income, and extraordinary and dirty-surplus items}}$$

-

- Top-down and bottom-up methods of tax allocation

GAAP Income Statement		Top-Down Tax Allocation			Bottom-Up Tax Allocation		
Revenue	$4,000	Revenue		$4,000	Net income		$350
Operating expenses	(3,400)	Operating expenses		(3,400)	Interest expense	$100	
Interest expense	(100)	Operating income before tax		600	Tax benefit	35	65
Income before tax	500	Tax expense:			Operating income after tax		$415
Income tax expense	(150)	Tax reported	$150				
Net income	$ 350	Tax benefit for interest ($100 x 0.35)	35	(185)			
		Operating income after tax		$ 415			

-

  - The top-down approach adjusts the reported tax for that which applies to financing activities.

- The bottom-up approach works up from the bottom line, net income, and calculates operating income after-tax as net income adjusted for the after-tax financing component of net income.

Issues in reformulating income statements

- Must know the business
- Lack of disclosure is often a problem

Value added to strategic balance sheets

- A reformulated income statement identifies the earnings flowing from the strategic balance sheet; operating income reports the earnings flowing from the net operating assets; and net financing income (expense) reports the earning s flowing from the net financial assets (obligations).
- Reformulated income statements and balance sheets are designed to identify the value added to the strategic balance sheet
  - The focus is on the operating activities, for that is where the firm trades with customers and suppliers to add value

Residual income from operations

- The value-added measure is referred to as residual operating income (ReOI)
  - $Residual\ operating\ income_t = Operating\ income_t - (Required\ return\ x\ Net\ operating\ assets_{t-1})$
  - $ReOI_t = OI_t - (\rho - 1)NOA_{t-1}$
  - OI = Operating income from the reformulated income statement
  - NOA is net operating assets at the beginning of the year
- The reformulated statements identify two drivers of residual operating income: Operating income from trading with customers plus the value of strategically structuring operations to deliver a float.

Comparative analysis of the balance sheet and income statement

- To make judgments about a firm's performance, the analyst needs benchmarks. Benchmarks are established by reference to other firms (usually in the same industry) or to the same firm's past history.
  - Comparison to other firms is called *cross-sectional analysis.*
  - Comparison to a firm's own history is called *time-series analysis*
- Cross-sectional comparisons → uses common-size analysis
- Statements are compared over time → using trend analysis

Common-size analysis

- Standardization of line items to eliminate the effect of size
- Identify unusual features that requires further investigation
- Expressed as a percentage of the revenue
- The common-size analysis reveals two things
  - How firms do business differently and the different structure of revenues and expenses that result.
  - Operating profitability per dollar of sales. As each operating item is divided by sales revenue, the common-size number indicates the proportion of each dollar of sales the item represents. Thus the number for an operating expense is the percentage of sales that is absorbed by the expense, and the number for operating income is the percentage of sales that ends up in profit. The latter is particularly important:
    - Operating profit margin from sales = Operating income from sales (after tax) / Sales
- The final comprehensive income number, expressed as a percentage of sales, is the (comprehensive) *net profit margin.* The comparison of this number to the operating profit margin reveals how much the firms increased or decreased their profits through financing activities.
- Common-size balance sheets
  - Common-size balance sheets often standardize on total assets, but a more informative approach, using reformulated statements, standardizes operating assets and liabilities on their totals
  - The percentages describe the relative composition of the net assets in the operating activities.

Trend analysis

- Trend analysis expresses financial statement items as an index relative to a base year
- Trend analysis gives a picture of how financial statement items have changed over time.
- The index for net operating assets indicates whether the firm is growing investments in operations, and at what rate, or is liquidating.
- The index for common stockholders' equity tracks the growth or decline in the owners' investment.
- The index for net financial obligations tracks the net indebtedness. Similarly, the indexes for the income statement track the income and the factors that affect it.
- Of particular interest are sales, operating income from sales, and comprehensive income.
- The indexes for specific line items indicate where the growth has come from, and year-to-year changes indicate the periods that have contributed most to growth
- Common-size and trend analysis can be combined by preparing trend statements on a common-size basis. This facilitates the comparison of one firm's trends with those of comparable firms.

Ratio analysis

- Profit margin ratios
  - Profit margins are the percentage of sales that yields profits
  - $Operating\ profit\ margin\ (PM) = \frac{OI(after\ tax)}{Sales}$
  - $Sales\ profit\ margin\ (PM) = \frac{OI\ (after\ tax)\ from\ sales}{Sales}$
  - $Other\ items\ profit\ margin\ (PM) = \frac{OI\ (after\ tax)\ from\ other\ items}{Sales}$
  - These two margins sum to the operating profit margin
- Net (comprehensive) income profit margin = $\frac{Comprehensive\ income}{Sales}$
- Expense ratio
  - Expense ratios calculate the percentage of sales revenues that is absorbed by expenses
  - $Expense\ ratio = \frac{Expense}{Sales}$
  - The ratio is calculated for each expense item in operating income from sales → $1 - Sales\ PM = Sum\ of\ expense\ ratios$
- From the reformulated statements, we can calculate two ratios that summarize the profitability of the operating activities and the financing activities: return on net operating assets (RNOA), which is operating income after tax relative to net operating assets, and net borrowing cost (NBC), which is net financial expenses after tax relative to net financial obligations
  - After tax and after the tax benefit of debt
  - Use average of beginning and ending balances in the denominator

Balance sheet ratios

- Composition ratios
  - $Operating\ asset\ composition\ ratio = \frac{Operating\ asset}{Total\ operating\ asset}$
  - $Operating\ liability\ composition\ ratio = \frac{Operating\ liability}{Total\ operating\ liabilities}$
  - The ratio for individual items sum to 100 percent within their category
- Operating liability leverage
  - $Operating\ liability\ leverage\ (OLLEV) = \frac{Operating\ liability}{Net\ operating\ assets}$
  - The **operating liability leverage** ratio gives an indication of how the investment in net operating assets has been reduced by operating liabilities. It is called a leverage ratio because it can lever up the return on net operating assets (RNOA) with a lower denominator.
- Financial leverage
  - Capitalization ratio = NOA / CSE
  - Financial leverage ratio (FLEV) = NFO / CSE
    - Negative if the firm has positive net financial assets
    - **Financial leverage** is the degree to which net operating assets are financed by common equity.
  - it is always the case that → Capitalization ratio – Finance leverage ratio = 1.0
  - Thus, either measure can be used as an indication of the degree to which net financial assets are financed by common equity or net financial debt, but it is usual to refer to the financial leverage ratio.

Accounting quality watch

Accounting Item	The Quality Problem
Assets	
Held-to-maturity debt investments	Held-to-maturity debt investments (typically classified as financial assets) are carried at historical cost. This may not indicate their "cash value." Identify market values from footnotes if available. (Historical cost is usually a reasonable approximation of market value.)
Held-to-maturity equity investments	"Held-to-maturity" equity investments (permanent investments) are carried at historical cost when they involve less than 20 percent ownership of another firm (see Accounting Clinic III). So the balance sheet does not give an indication of the value of the investments. Nor does the income statement: Only dividends from the investments are recorded there, and dividends are not an indicator of value. The analyst needs to find a market value for the securities (if traded) or identify the share of income in the investee, as in the equity method.
Marked-to-market equity investments available for sale	Marking equity investments to market solves the problem of the held-to-maturity treatment. However, further issues arise. First, unrealized gains and losses from the marking to market are not reported in the income statement but rather in the equity statement. This not only misreports the performance of the equity portfolio in the income statement, but it also permits firms to "cherry pick" realized gains into the income statement and report unrealized losses in the equity statement. (Reformulating the income statement on a comprehensive-income basis solves the problem.) Second, market prices can be bubble prices, so bubbles are brought into the financial statements. (They can also be depressed prices in an illiquid market.) Third, fair-value accounting allows estimates of the market price when market prices are not available—so-called Level 3 estimates—and these estimates can be suspect.
Receivable allowances	Allowance for bad debts can be biased. Decreases in allowances increase earnings (through lower bad-debt expense) and increases decrease earnings. The same issue arises with allowances on other assets, for example, a bank's allowance against loans for default.
Deferred tax assets	Deferred tax valuation allowances reduce deferred tax assets for the probability that the tax benefit will not materialize. The estimates involved are suspect, and earnings can be increased by changing the allowance. Refer to the deferred tax footnote for details of the valuation allowance.
Goodwill	The price paid for an acquisition is divided between the fair value of identifiable (tangible and intangible) assets acquired and goodwill. As tangible and intangible assets have to be subsequently depreciated or amortized against earnings, firms might allocate more of the purchase price to goodwill (that is not amortized, but rather subject to impairment).
Liabilities	
Deferred (unearned) revenue	Revenue must be recognized as goods are shipped or services performed. With multiyear contracts, firms defer revenue to later years when performance takes place, creating a deferred revenue liability. The amount deferred is subject to judgment: Firms can defer too little (aggressive revenue recognition) or too much (conservative revenue recognition). In either case, current revenues may not be a good indication of future revenues.
Accrued expenses	These are often estimates that can be biased. Watch particularly for estimated warranty liabilities (for servicing warranties and guarantees on products) and estimated restructuring costs.
Lease obligations	Lease obligations, under capitalized leases, are on the balance sheet but those for operating leases are not. Check the footnotes for off-balance-sheet lease obligations.
Pension liabilities	This involves a number of actuarial assumptions and the choice of a discount rate, so is a "soft" number. Pension expense (in the income statement) is affected by changes in the estimated liability from changing these assumptions.
Dividends payable	This should be classified as shareholders' equity, not a liability.
Contingent liabilities	Check the footnotes for any off-balance-sheet, contingent liabilities (for product liability or environmental clean-up lawsuits, for example).
Other liabilities	Dig into footnotes to see what these involve.
Preferred stock	GAAP classifies preferred stock as equity (or, if it is redeemable, between liabilities and equity). This is a liability from the common shareholders' point of view.

Reformulation ofthe income statement and balance sheet is necessary to calculate ratios that correctly measure the results ofthe firm's activities. Iffinancing items are classified as operating items, we get an incorrect measure of both operating profitability (RNOA) and financing profitability (NBC or RNFA)

Chapter 11: The analysis of the Cash Flow Statement

The cash flow statement describes the cash generation in a business, and reformulation highlights the cash flows that are important to analysis.
Analysis of the cash flow statement is necessary for liquidity analysis and financial planning

- Liquidity analysis is involved in assessing the risk of debt, for liquidity (cash) is required to settle debt. So liquidity analysis is very much the tool of the credit analyst.
- Financial planning is the tool of the treasurer. She must ensure that financing is in place to meet the needs for cash- to make investments and cover dividends, as well as servicing debt

Forecasting free cash flow is best done by forecasting reformulated income statements and balance sheets rather than cash flow statements

Free cash flow

- The difference between cash flow from operations and cash investment in operations
- Free cash flow = Operating income – change in net operating assets
  - $C - I = OI - \Delta NOA$
  - Operating income must be comprehensive
- Free cash flow = Net financial expense – Change in net financial obligations + Net dividends
  - $C - I = NFE - \Delta NFO + d$
  - If minority (noncontrolling) interests are involved:
    - $C - I = NFE - \Delta NFO + d + Minority\ interest\ in\ income - \Delta Minority\ interest\ in\ the\ balance\ sheet$
    - Net financial expense must be comprehensive
- C: Cash from operations
- I: Cash investments in those operations
- d: net dividends to shareholders
- F: Net payments to debtholders and issuers
- Cash conservation equation
  - Free cash flow = net payments to shareholders + Net payments to debtholders and issuers
  - C – I = d + F
  - Left hand side is cash flow from operations
    - Can be negative
  - Right hand side is financing payments to shareholders
- Cash flow statements

GAAP Statement of Cash Flows
Cash flow from operations
– Cash used in investing activities
+ Cash from financing activities
= Change in cash and cash equivalents

Reformulated Statement of Cash Flows
Cash flow from operations
– Cash investments
= Free cash flow from operating activities
Cash paid to shareholders
+ Cash paid to debtholders and issuers
= Cash paid for financing activities

-
- The direct and indirect method

Direct and indirect method cash flow statements

- The direct method lists the separate sources of cash inflow and cash outflow in operations in the following form

Cash inflows
Cash from sales
Cash from rents
Cash from royalties
Cash from interest received
Cash outflows
Cash paid to suppliers
Cash paid to employees
Cash paid for other operating activities
Cash paid for interest
Cash paid for income taxes

-
- Difference between cash inflows and cash outflows is cash from operations
- The direct method has the advantage of listing the individual cash flows that generate the net cash, so is more informative about the sources of cash flows

- Indirect method calculates cash from operations by subtracting accrual (noncash) components of net income

Net income
– Accruals
= Cash from operations

-
- The indirect method has the feature of identifying the accruals made in calculating net income, so it reconciles net in- come to cash flow.
- Almost all firms use the indirect method

Reclassifying cash transactions

- Here are the main problems we encounter in trying to discover free cash flow from the GAAP statement
    1. Change in cash and cash equivalents
    2. Transactions in financial assets
    3. Net cash interest
    4. Tax on net interest
    5. Noncash transactions

REFORMULATING GAAP CASH FLOW STATEMENTS

GAAP free cash flow	
– Increase in operating cash	1
+ Purchase of financial assets	2
– Sale of financial assets	2
+ Net cash interest outflow (after tax)	3,4
– Noncash investments	5
= Free cash flow	
GAAP financing flow	
+ Increase in cash equivalents	1
+ Purchase of financial assets	2
– Sale of financial assets	2
+ Net cash interest outflow (after tax)	3,4
– Noncash financing	5
= Financing cash flow	

NIKE, INC.
Reformulated Cash Flow Statement, 2010
(in millions)

	Free cash flow		
	Reported cash from operations		$3,164
3,4	Net interest payments (after tax)		4
			3,168
	Cash investments reported	$ 1,268	
1	Investment in operating cash	1	
2	Net investment in financial assets	(937)	332
	Free cash flow		$ 2,836
	Financing flows to claimants		
	Debt financing:		
	Decrease in notes payable	205	
	Reductions in long-term debt	32	
2	Net purchases of financial assets	937	
3,4	Net interest payments (after tax)	4	
1	Investments in cash equivalents (net of exchange rate effects on cash)	835	2,013
	Equity financing:		
	Share issues	(423)	
	Share repurchases	741	
	Dividends	505	823
	Total financing flows		$ 2,836

Cash flow from operations

- Investment **in** research and development is reported as part of cash from operations rather than part of the investment section. And investments in short-term assets are classified as cash from operations (in GAAP)

Accounting quality watch

- Cash flow from operations
    - Reported cash flow from operations reported under GAAP includes interest payments and receipts. These are not cash flows from operations, but rather financing flows. (IFRS allows firms to choose the operating section or the financing section for reporting net interest payments.)
- Taxes on net interest
    - These taxes are included in cash flow from operations, along with the net interest. They should be reclassified to the financing section of the statement.
- Transaction in financial assets
    - Purchases and sales of these "investments" are incorrectly classified as net cash investments in operations (under both GAAP and IFRS). They are financing flows

Summary

- Look to the cash flow statement to assess the ability of the firm to generate cash
- free cash flow is necessary to anticipate liq- uidity and financing requirements in the future.
- Unfortunately, the GAAP statement of cash flows is a little messy. But, having reformulated income statements and balance sheets appropriately, free cash flow can be calculated simply by Methods 1 and 2 laid out in this chapter.

Formålet med at reformulere

- Få separeret driftsaktiviteten fra finansieringsaktiviteten

Ser regnskabet gennem de ordinære aktionærernes øjne

- Common shareholders

Analytisk balance

- Aktiv
  - Net operating assets
- Passiv
  - Net financial obligations + equity + (minoritetsinteresser)

Operating income – Net financial expenses = Comprehensive income (totalindkomst)

- Normal forstået som værende efter skat
- Skatteallokering → fordeler skatten fra resultatopgørelsen ud på operating income og NFE
- Tax shield (skatteskjold)→ Eksempel: Vi har NFE på -100, og selskabsskatten er 22% → -100*0,22=-78 (NFE=-78)
  - Fradrag i skatten fordi vi har negativ NFE
  - Hvis vi har en finansiel indtægt efter skat, på 13, lægges dette til de -78, da dette også er efter skat → -78+13=-65 (NFE=-65)
- Operating income
  - Operating income from sales → Sales – operating expenses = OI sales
  - Operating income, other (som kommer fra driften, men ikke den primære aktivitet)
- Profit margin
  - PM = PM sales + PM other = OI / Sales
  - PM sales = $\frac{OI\ sales}{Sales}$
  - PM other = $\frac{OI\ other}{sales}$
- Som udgangspunkt er alle poster før skat (med mindre andet er angivet → og derfor skal der ikke beregnes skat herpå)

Reformuleret resultatopgørelse

- Driftsposter er adskilt fra finansielle poster
- Driftsoverskud fra salg er adskilt fra "andet driftsoverskud"
- Der er allokeret skat til de forskellige overskudskomponenter – ingen allokering til poster, der rapporteres på efter-skat basis eller der ikke tiltrækker sig skat

Problemstilling ved resultatopgørelse til analysebrug
Kapitalinteresser i associerede selskaber (ejer 1/3)

- Opgøres til indre værdis metode
- Aktiver – Forpligtelser = Egenkapital
  - Eks: 400 – 100 = 300
    - Aktiver=400, Forpligtelser=100, Egenkapital=300
  - Da vi ejer 1/3 → 300*1/3 = 100
- Vi har indregnet alle aktiver og forpligtelser som driftsaktiver og drifts finansiering, da vi ikke har nogen forudsætninger for at kunne udskille drift fra finansiering → tager derfor et valg om at indregne det hele
- Hvis det associerede selskab har 30 i overskud → indregner 10 i indtægter fra associerede selskaber, efter skat → indregnes som OI other, da vi har antaget at kapitalinteresser i associerede selskaber er operating assets (OA) → de 10 i overskud indeholder også nettofinansielle omkostninger, men indregnes stadig som drift, da vi igen ikke har information til at adskille det, og vi indregner derfor det hele

$$ROCE = RNOA + \left[\frac{NFO}{CSE} x(RNOA - NBC)\right]$$

- RNOA = $\frac{OI}{NOA}$
- $NBC = \frac{NFE}{NFO}$
- Lavere gearing → risikoen falder → ejernes afkastkrav falder
- $RE = (ROCE - r_e) * CSE_{t-1}$
- $ROCE$ op → RE op → Værdien af selskabet er uændret

Reformulering

- Andre værdipapirer og kapitalandele
  - Tjek noten
  - Hvis obligationer → finansielt
  - Hvis strategisk → drift
  - Lav antagelser og argumentér (Der hvor der kan være tvivl)

Tidsrækkeanalyse af rentabilitet (støj)

- Virksomheden kan have opkøbt andre virksomheder gennem perioden
  - Salg og opkøb af virksomheder
- Nye standarder, f.eks. indregning af flere aktiver grundet nye regnskabsprincipper
- Opdeling af regnskabsposteringer

Tre metoder til at beregne Free cash-flow

- FCF = C - I
- $C - I = OI - \Delta NOA$
- $C - I = NFE - \Delta NFO + d + MININC - \Delta MIN$
  - NFA
- Ud fra den reformulerede pengestrømsopgørelse

Mulige problemer med den officielle pengestrømsopgørelse

- Ændring i transaktionskasse skal inkluderes i investeringsafsnittet, og ændring i overskydende likviditet skal inkluderes i finansieringsafsnittet
- Investering i finansielle aktiver under investeringsafsnittet skal føres under finansieringsafsnittet
- Netto finansielle udbetalinger/indbetalinger under driftsafsnittet skal føres under finansieringsafsnittet (på efter-skat basis)
- Opgørelsen afspejler ikke "ikke-kontante" transaktioner q Effekter fra køb og salg af virksomheder
- Aktiverede renter

Køb og salg af værdipapirer → finansieringsaktivitet

Chapter 12: The analysis of profitability

The analysis of the drivers of ROCE is called profitability analysis and the analysis of growth is called growth analysis.
Profitability analysis establishes where the firm is now. It discovers what drives current ROCE.

Return on Common stockholders' equity (ROCE)

- Return on common equity (ROCE) $= \frac{Comprehensive\ income}{Average\ CSE}$
  - $ROCE = \frac{OI - NFE}{NOA - NFO}$
  - $ROCE = \left(\frac{NOA}{CSE}\ x\ RNOA\right) - \left(\frac{NFO}{CSE}\ x\ NBC\right)$
    - RNOA = OI / NOA
    - NBC = Net financial expense / NFO

$$ROCE = RNOA + \left[\frac{NFO}{CSE} \times (RNOA - NBC)\right]$$
$$= RNOA + (Financial\ leverage \times Operating\ spread)$$
$$= RNOA + (FLEV \times SPREAD)$$

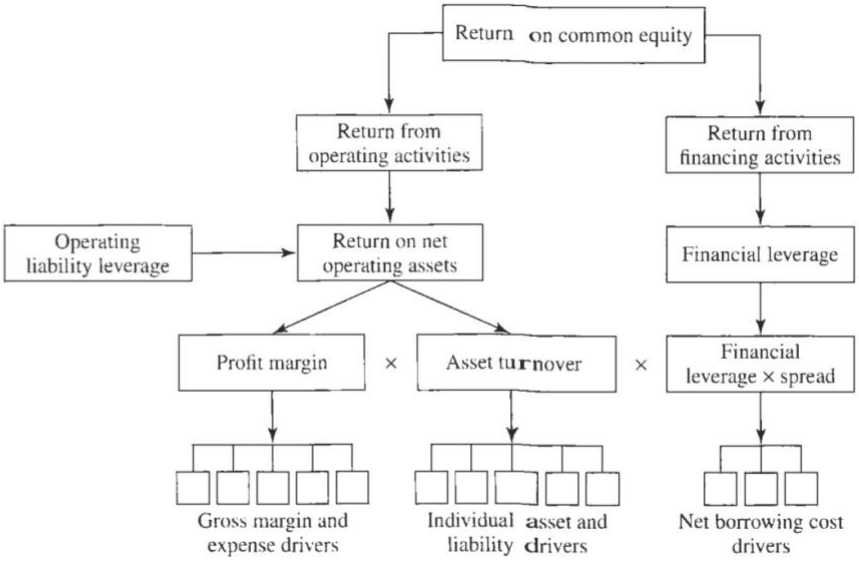
-

- Drivers of the ROCE
  - RNOA = Return on net operating assets
  - NBC = Net borrowing cost
    - Return on financing activities
  - RNFA = Return on net financial assets

The analysis of profitability

- Three levels
  - First level: Effects of operating and financing activities are analyzed
  - Second level: Effects of profit margins and asset turnovers on operating profitability are identified
  - Third level: Drivers of profit margins, asset turnovers, and net borrowing costs at the lowest level of the figure are calculated

FIGURE 12.1 The Analysis of Profitability The breakdown of return on common equity (ROCE) into its drivers.



Leverage → "levers" the ROCE up or down through liabilities

- Sometimes referred to as gearing

Financial leverage

- Financial leverage is the degree to which net operating assets are financed by borrowing with net financial obligations (NFO).
  - FLEV = NFO/CSE → captures financial leverage
  - Typical about 0,4 but variates among firms
- $Return\ on\ common\ equity = Return\ on\ net\ operating\ assets + (Financial\ leverage\ x\ Operating\ spread)$
- ROCE = RNOA + [FLEV X (RNOA – NBC)]
- ROCE can be broken down into three drivers
  - Return on net operating assets (RNOA = OI/NOA).
  - Financial leverage (FLEV = NFO/CSE).
  - Operating spread between the return on net operating assets and the net borrowing cost (SPREAD= RNOA - NBC).
  - Operating income and net financial tax is after tax
- This formula says that the ROCE is levered up over the return from operations if the firm has financial leverage and the return from operations is greater than the borrowing cost. The firm earns more on its equity if the net operating assets are financed by net debt, provided those assets earn more than the cost of debt.
- If financial leverage is zero → ROCE = RNOA

- If financial leverage is positive → the difference between ROCE and RNOA is determined by the amount of the leverage and the operating spread between RNOA and the net borrowing cost
- If a firm earns an RNOA greater than its after-tax net borrowing cost, it is said to have **favorable financial leverage or favorable gearing:** The RNOA is "levered up" or "geared up" to yield a higher ROCE. If the SPREAD is negative, the leverage effect is unfavorable
- Financial leverage generates a higher return for shareholders if the firm earns more on its operating assets than its borrowing cost, but financial leverage hurts shareholder return if it doesn't.
- ROCE is related to RNOA
  - $ROCE = RNOA - \left[\frac{NFA}{CSE}\ x\ (RNOA - RNFA)\right]$
  - RNFA = Net financial income / NFA. (Return on net financial assets)
  - Positive spread reduces ROCE

Operating liability leverage

- Operating liabilities can lever up the return on net operating assets
- Operating liabilities are obligations incurred in the course of operations and are distinct from financial obligations incurred to finance the operations
- Operating liability leverage (OLLEV) = $\frac{OL}{NOA}$
  - Typically around 0,4
  - Operating liabilities reduce the net operating assets that are employed and so lever the return on net operating assets
- To compute the leverage effect, first estimate the implicit interest that a supplier would charge for credit, using the firm's short-term borrowing rate for financial debt:
  - Implicit interest on operating liabilities= Short-term borrowing rate (after tax) x Operating liabilities
    Then calculate a return on operating assets, ROOA, as if there were no operating liabilities:
    Return on operating assets (ROOA) = $\frac{OI + Implicit\ interest\ (after\ tax)}{Operating\ assets}$
  - RNOA is driven by operating liability leverage as follows:

$$\begin{aligned}\text{Return on net operating assets} &= \text{Return on operating assets} \\ &\quad + (\text{Operating liability leverage} \\ &\quad \times \text{Operating liability leverage spread})\end{aligned} \qquad \textbf{(12.3)}$$

$$\text{RNOA} = \text{ROOA} + (\text{OLLEV} \times \text{OLSPREAD})$$

    - Where OLSPREAD is the **operating liability leverage spread,** that is, the spread of the return on operating assets over the after-tax short-term borrowing rate:
    - OLSPREAD = ROOA - Short-term borrowing rate (after tax)
    - RNOA is driven by the rate of return on operating assets as if there were no operating liability leverage, ROOA, plus a leverage premium that is determined by the amount of operating liability leverage, OLLEV, and the operating liability leverage spread, OLSPREAD. The effect can be **favorable operating liability** leverage- if ROOA is greater than the short-term borrowing rate- or unfavorable- if ROOA is less than the short-term borrowing rate

Summing Financial Leverage and Operating Liability Leverage Effects on Shareholder Profitability

- Shareholder profitability, ROCE, is affected by both financial leverage and operating liability leverage. Without either type of leverage, ROCE would be equal to ROOA, the rate of return on operating assets. Operating liability leverage levers RNOA over ROOA and financial leverage levers ROCE over RNOA:
  - $ROCE = ROOA + (RNOA - ROOA) + (ROCE - RNOA)$

Return on net operating assets and return on assets

- $ROA = \frac{Net\ income + Interest\ expense\ (after\ tax)}{Average\ total\ assets}$
  - Minority interest in income is added to the numerator
  - Net income in the numerator is usually reported net income rather than comprehensive income
- ROA is a poor measure of operating profitability
- ROA understates operating profitability, compared to RNOA
- To analyze profitability effectively, two procedures must be followed:
  - Income must be calculated on a comprehensive (clean-surplus) basis.
  - There must be a clean distinction between operating and financing items in the income statement and balance sheet.

Dealing with minority interests

- ROCE = ROCE before MI x MI sharing ratio
  - ROCE is the return on common equity to the shareholders of the parent company (the majority)
  - ROCE before MI = $\frac{Comprehensive\ income\ before\ MI}{CSE+MI}$
    - Gives the return to total common equity, minority and majority
  - Minority interest sharing ratio = $\frac{Comprehensive\ income\ before\ MI}{\frac{CSE}{CSE+MI}}$
    - Sharing of the return

Financial leverage and Debt-to-Equity ratios

- A common measure of financial leverage is the *debt-to-equity ratio,* calculated as total debt divided by equity.

Second-level breakdown: Drivers of operating profitability

- ROCE = RNOA + [FLEV X (RNOA – NBC)] = (PM X ATO) + [FLEV X (RNOA – NBC)]
- Two drivers of RNOA are
  - Operating profit margin (PM): PM = OI (after tax) / Sales
    - The profit margin reveals the profitability of each dollar of sales
  - Asset turnover (ATO): ATO = Sales / NOA
    - The asset turnover measures sales revenue per dollar of net operating assets put in place. It measures the ability of the NOA to generate sales. It is sometimes referred to as its in- verse, *I*/ATO =NOA/Sales, which indicates the amount of net operating assets used to generate a dollar of sales: If the ATO is 2.0, the firm is using 50 cents of net operating assets to generate a dollar of sales.
- RNOA = PM X ATO
- DuPont model
  - It says that profitability in operations comes from two sources. First, RNOA is higher the more of each dollar of sales ends up in operating income; second, RNOA is higher the more sales are generated from the net operating assets. The first is a profitability measure; the second is an efficiency measure. A firm generates profitability by increasing margins and can lever the margins up by using operating assets and operating liabilities more efficiently to generate sales.
- Firms with low asset turnovers tend to have high profit margins, and firms high assets turnovers tend to have low profit margins
- Business with large capital investments, typically have low turnovers and high margins

Third-level breakdown

- Profit margin drivers
  - PM = Sales PM + Other Items
    - Other items include subsidiary income, special items, and gains and losses on asset sales → not sales revenue
  - Two components of the profit margin have further components:

$$\text{Sales PM} = \text{Gross margin ratio} - \text{Expense ratios} \qquad \textbf{(12.6)}$$
$$= \frac{\text{Gross margin}}{\text{Sales}} - \frac{\text{Administrative expense}}{\text{Sales}} - \frac{\text{Selling expense}}{\text{Sales}} - \frac{\text{R\&D}}{\text{Sales}} - \frac{\text{Operating taxes}}{\text{Sales}}$$

$$\text{Other operating items PM} = \frac{\text{Subsidiary income}}{\text{Sales}} + \frac{\text{Other equity income}}{\text{Sales}} + \frac{\text{Special items}}{\text{Sales}} + \frac{\text{Other gains and losses}}{\text{Sales}} \qquad \textbf{(12.7)}$$

    -
    - Profit margin drivers
    - Profit margins are increased by adding to gross margins (reducing cost of sales), by adding other items income, and reducing expenses per dollar of sales

- Turnover drivers
  - Overall ATO can be broken down into ratios of the individual assets and liabilities:

$$\frac{1}{\text{ATO}} = \frac{\text{Cash}}{\text{Sales}} + \frac{\text{Accounts receivable}}{\text{Sales}} + \frac{\text{Inventory}}{\text{Sales}} + \cdots + \frac{\text{PPE}}{\text{Sales}} + \cdots - \frac{\text{Accounts payable}}{\text{Sales}} - \frac{\text{Pension obligations}}{\text{Sales}} - \cdots \quad \textbf{(12.8)}$$

    -
    - Balance sheet are averages over the year
    - The turnover is expressed here as a reciprocal of the ATO, which is the amount of net operating assets to sup- port a dollar of sales, as are the individual turnovers → individual turnovers aggregate to the overall turnover
  - Accounts receivable turnover = $\frac{Sales}{Accounts\ receivable\ (net)}$
  - PPE Turnover = $\frac{Sales}{Property,\ plant,\ and\ equipment\ (net)}$
    - Fixed asset turnover
  - A firm increases its turnover (and thus RNOA) by maintaining operating assets at a minimum while increasing sales. But the ATO is also affected by operating liability turnovers, and this of course reflects operating liability leverage: Operating liability leverage increases ATO and, if operating liability leverage is favorable, RNOA.
  - Turnover ratios → activity ratios or asset utilization ratios
  - Days in accounts receivable = $\frac{365}{Accounts\ receivable\ turnover}$
    - Days sales outstanding → number of days it take to collect cash from sales
    - Efficiency is increased by turning sales into cash quickly → typical number is 35 days
  - Inventory turnover = $\frac{Cost\ of\ good\ sold}{Inventory}$
    - Not affected by changes in profit margins
  - Days in inventory = $\frac{365}{Inventory\ turnover}$
  - Days in accounts payable = $\frac{365\ x\ Accounts\ payable}{Purchases}$
    - Assesses the ability to get operating liability leverage by extending credit form suppliers
  - Purchases = Cost of goods sold + Change in inventory

Key drivers

- Three key drivers
  - Sales
  - Operating profit margin
  - Asset turnover

Borrowing cost drivers

- Operating spread → RNOA – NBC
- The net borrowing cost is a weighted average of the costs for the different sources of net financing

$$\text{NBC} = \left[\frac{\text{FO}}{\text{NFO}} \times \frac{\text{After-tax interest on financial obligations (FO)}}{\text{FO}}\right] - \left[\frac{\text{FA}}{\text{NFO}} \times \frac{\text{After-tax interest on financial assets (FA)}}{\text{FA}}\right] - \left(\frac{\text{FA}}{\text{NFO}} \times \frac{\text{Unrealized gains on FA}}{\text{FA}}\right) + \left(\frac{\text{Preferred stock}}{\text{NFO}} \times \frac{\text{Preferred dividend}}{\text{Preferred stock}}\right) + \cdots$$

  - Weights are calculated from balance sheet averages
- A lower rate of return on financial assets t h a n the borrowing rate on obligations increases the composite net borrowing cost over that for the obligations.
- The difference in the rates for the two components is called the spread between lending and borrowing rates

Key concepts

- favorable financial leverage (or favorable gearing)
  - is an increase in ROCE over RNOA, induced by borrowing
- favorable operating liability leverage
  - is an increase in return on net operating assets over return on operating assets, induced by operating liabilities
- growth analysis
  - is the analysis of the determinants of growth in residual earnings
- operating liability leverage spread
  - is the difference between the return on operating assets and the implicit borrowing rate for operating liabilities
- operating spread
  - is the difference between operating profitability and the net borrowing cost
- profitability analysis
  - is the analysis ofthe determinants of return on common equity (ROCE
- spread
  - is a difference between two rates of return. Examples are the operating spread, the operating liability leverage spread, and the spread between borrowing and lending rates
- spread between borrowing and lending rates
  - is the difference between the return on financial obligations and the return on financial assets.

Effektiv skattesats = $\frac{Tax\ expenses}{Earnings\ before\ tax}$

Hvis resultat før skat = skattepligtig indkomst → effektiv skattesats = selskabsskattesatsen

- forskel kan skyldes fradrag, tilskud etc.

Tax shield = NFE x t (selskabsskatten)

OI before tax – reported tax expenses – tax shield

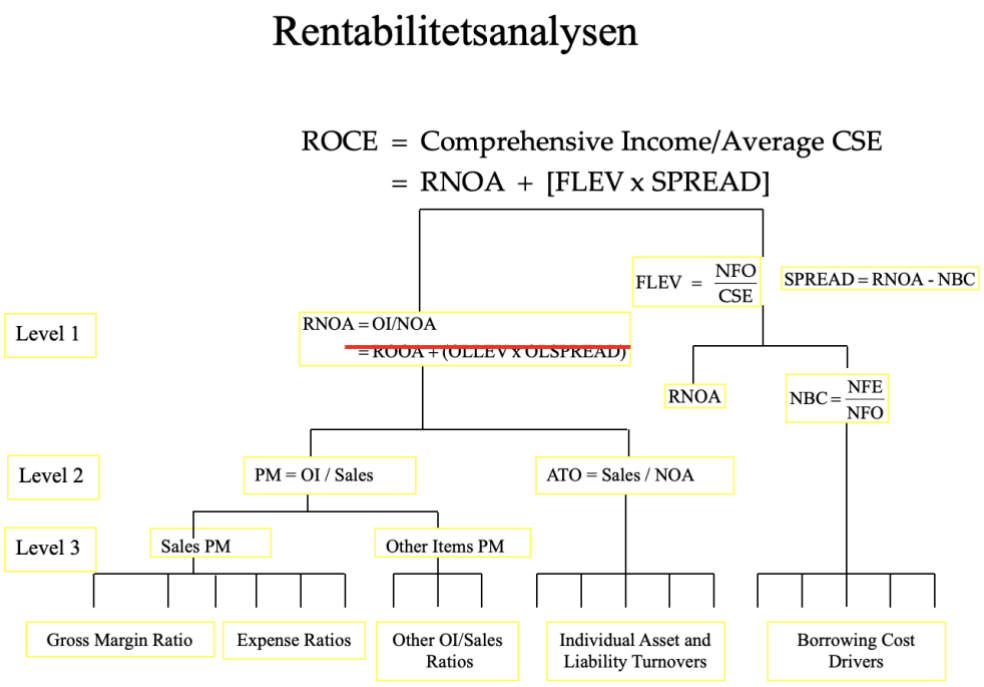
Effektiv skattesats OI = $\frac{Tax\ payed}{OI\ before\ tax}$

Vi reformulerede resultatopgørelsen for at sætte fokus på totalindkomsten (tælleren)
Vi reformulerede balancen for at sætte fokus på egenkapitalens komponenter (nævneren)
Vi erkendte, at den overskudskomponent der skaber værdi er OI samt, at de aktiver, der skaber denne værdi,er NOA

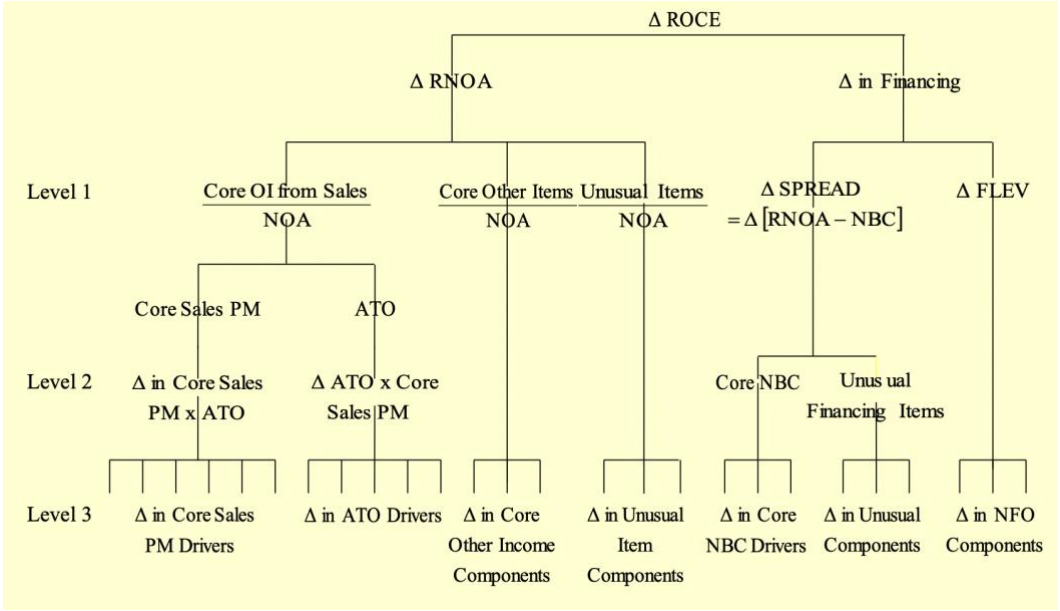
Stadier i fundamentalanalysen

1. Specificer de fremtidige payoff der skal budgetteres
2. information der budgetterer payoffs
   - Inden for regnskabet
   - Udenfor regnskabet
3. Udarbejd budget (pro forma analyse)
4. Fastlæg kapitalomkostningerne
5. Udled prisen fra pro forma analysen: kombiner pro forma med kapitalomkostningerne

Rentabilitetsanalysen



Analyse af ændringer i rentabiliteten



ROCE drivers

- ROCE er dekomponeret i den dens drivere over tre analyseniveauer
    1. Effekten af finansiel gearing (leverage)
    2. Analyse af driftsmæssig rentabilitet
    3. Analyse af Netto låneomkostninger (NBC)

First-level breakdown: Analyse af effekterne fra finansiel leverage (FLEV)

$$\text{ROCE} = \frac{\text{Comprehensive Income}}{\textit{Average CSE}}$$

$$= \frac{\text{(OI - Net Financial Expense)}}{NOA - NFO}$$

Det ses, at ROCE er et vægtet afkast fra driftsmæssige -og finansielle aktiviteter:

$$\text{ROCE} = \left[\frac{\text{NOA}}{\text{CSE}} \text{ x RNOA}\right] - \left[\frac{\text{NFO}}{\text{CSE}} \text{ x NBC}\right]$$

eller,

$$\text{ROCE} = \text{RNOA} + [\text{FLEV x } (\underbrace{\text{RNOA - NBC}}_{\textit{Spread}})]$$

RNOA = OI (After tax) / NOA (Return on Net Operating Assets)
FLEV = NFO / CSE (Financial Leverage)
NBC = NFE (after tax) / NFO (Net Borrowing Cost)

- **BRUG BELØBET FRA DEN REFORMULEREDE RESULTATOPGØRELSE I NFE AFTER TAX**

SPREAD = RNOA – NBC (Operating Spread)

RNOA versus ROA

- RNOA = $\frac{OI}{OA-OL}$
- ROA = $\frac{Nettooverskud+Finansielle\ omkostninger\ (efter\ skat)\ +Min.resultatandel}{Samlede\ aktiver}$
  - Min = minoritet
- Problemer med ROA
  - Finansielle aktiver indgår I tælleren
  - Finansiel indkomst I tælleren
  - Driftsmææsge forpligtelser I nævneren
  - Nettooverskuddet er ikke totalindkomst

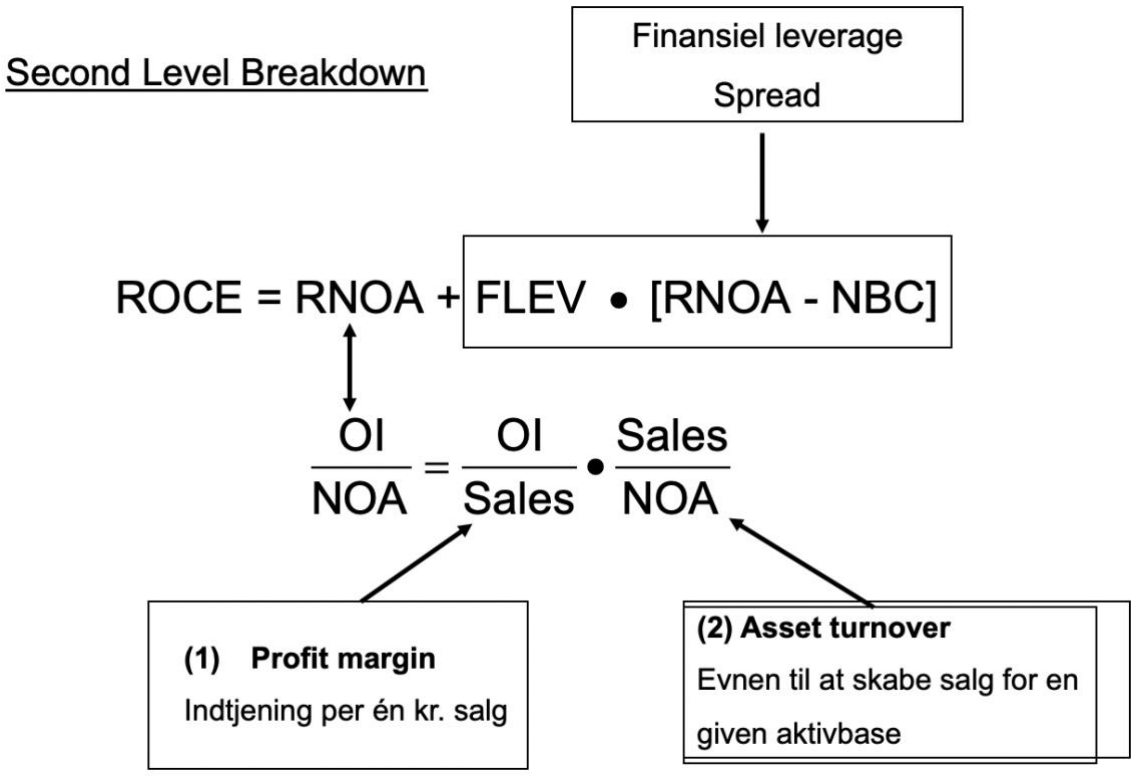
FLEV og DE

- D/E = $\frac{Total\ debt}{Equity}$
- FLEV = $\frac{NFO}{Equity}$
- Problemer med D/E
  - Ekskluderer finansielle aktiver (der reelt reducerer gælden)
  - Inkluderer driftsmæssige forpligtelser

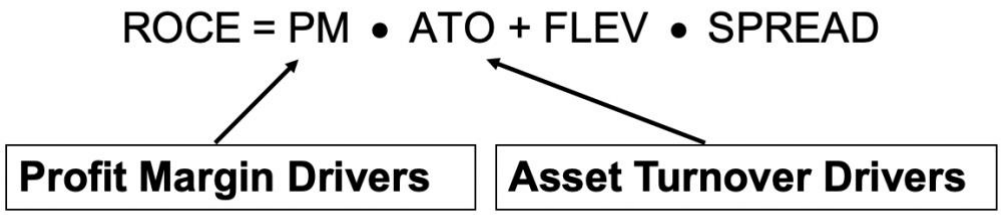
Behandling af minoritetsinteresser

- ROCE = ROCE før Min x Min sharing ratio
- ROCE før min = $\frac{Totalindkomst\ før\ Min}{CSE+Min}$
- Min sharing ratio = $\frac{\frac{Totalindkomst}{Totalindkomst\ før\ Min}}{\frac{CSE}{CSE+MI}}$
- ROCE = RNOA + [FLEV x (RNOA – NBC)] x Min sharing ratio
  - Hvor FLEV = NFO / (CSE + Min)

Drivere bag driftsmæssig rentabilitet (Second level breakdown)



Drivere bag driftsmæssig rentabilitet (Third level breakdown)



Profit margin drivers

- PM = Sales PM + Other operating income PM
- Sales PM = $\frac{GM}{Sales} - \frac{Admin\ Exp}{Sales} - \frac{Selling\ Exp}{Sales} - \frac{R\&D\ Exp}{Sales} - \frac{Taxes}{Sales} \ldots$
- GM (gross margin) = Sales – Cost of sales

Other OI PM = Other Operating Income/Sales

$$= \frac{\text{Subsidiary Income}}{\text{Sales}} + \frac{\text{Equity Dividends}}{\text{Sales}} +$$

- $$+ \frac{\text{Special Items}}{\text{Sales}} + \frac{\text{Other Net Gain \& Losses}}{\text{Sales}} + \ldots$$

Asset turnover drivers

$$\frac{1}{\text{ATO}} = \frac{\text{Cash}}{\text{Sales}} + \frac{\text{A/R}}{\text{Sales}} + \frac{\text{Inv}}{\text{Sales}} + \ldots \frac{\text{PPE}}{\text{Sales}} +$$

- $$\frac{\text{Sub. Investment}}{\text{Sales}} + \ldots - \frac{\text{A/P}}{\text{Sales}} - \frac{\text{Pension Obl}}{\text{Sales}} - \ldots$$

Analyse af Net borrowing cost (NBC)

$$\text{NBC} = \left[\frac{\text{FO}}{\text{NFO}} \text{x} \frac{\text{After-tax Interest on (FO)}}{\text{FO}}\right]$$

$$-\left[\frac{\text{FA}}{\text{NFO}} \text{x} \frac{\text{After-tax Interst on (FA)}}{\text{FA}}\right] - \ldots.$$

-

Chapter 13: The Analysis of Growth and Sustainable Earnings

Residual earnings growth is the focus when evaluating P/B ratios, and abnormal earnings growth is the focus when evaluating P/E ratios, but they are both measures for the same purpose: detecting added value from earnings growth.

What is growth?

- $Residual\ earnings_t(RE_t) = Earnings_t - [(\rho_E - 1)\ x\ Common\ shareholders' equity_{t-1}]$
  - $\rho_E - 1$ → required return for equity
  - Residual earnings measure the value added to book value over that required to cover the cost of capital.
- A growth firm is one that can grow residual earnings
- $Abnormal\ earnings\ growth_t\ (AEG_t) = [Earnings_t + (\rho_E - 1)d_{t-1}] - \rho_E Earnings_{t-1}$
  - d_{t-1} → net dividend paid in the prior year

- Firms do not add to their *PIE* ratio if they can only grow earnings at the required rate of growth. They add value only if they can grow earnings at a rate greater than the required rate → if they can deliver abnormal earnings growth
- Growth that ties into value creation → ability to deliver abnormal earnings growth
- In terms of valuation → we look at residual earnings growth and abnormal earnings growth
- Residual earnings is the relevant growth measure when evaluating the price-to-book (P/B) ratio.
- Abnormal earnings growth is the relevant growth measure when evaluating the price-earnings (P/E) ratio
- Abnormal earnings growth is equal to the change in residual earnings

Warnings about growth

- Growth is difficult to sustain
- Growth is risky
  - Growth can be competed away

Sustainable earnings

- Earnings that can repeat in the future, and grow, are called **sustainable earnings, persistent earnings, core earnings, or underlying earnings.**
- Earnings based on temporary factors are called transitory earnings or unusual items
- Normalize earnings → Identifying core earnings because it establishes "normal" ongoing earnings unaffected by one-time components

Core operating income

- Operating income consists of core (sustainable) operating income and unusual (transitory) items:
  - $Operating\ Income = Core\ operating\ income + Unusual\ items$
  - $Operating\ Income = Core\ operating\ income\ from\ sales + Core\ other\ operating\ income + unusual\ items$
  - $OI = Core\ OI\ from\ sales + Core\ other\ OI + UI$
- Extraordinary income → unusual income
- The unusual items → items that won't be repeated in the future and items that appears each period but can't be forecast e.g. currency gains and losses

EXHIBIT 13.1
Reformulation of the Operating Income Section of the Income Statement to Identify Core Income and Unusual Items.
Core operating income is core income from sales plus core other operating income. Taxes are allocated to each component.

Reformulated Operating Income
Core operating income
Core sales revenue
– Core cost of sales
= Core gross margin
– Core operating expenses
= Core operating income from sales before tax
– Tax on core operating income from sales
+ Tax as reported
+ Tax benefit from net financial expenses
– Tax allocated to core other operating income
– Tax allocated to unusual items
= Core operating income from sales
+ Core other operating income
+ Equity income in subsidiaries
+ Earnings on pension assets
+ Other continuing income not from sales
– Tax on core other operating income
= Core operating income
± **Unusual items**
– Special charges
– Special liability accruals
± Nonrecurring items
– Asset write-downs
± Changes in estimates
– Start-up costs expensed
± Profits and losses from asset sales
– Restructuring charges
± Profits and losses from discontinued operations
± Extraordinary operating items
± Accounting changes
± Unrealized gains and losses on equity investments
+ Gains from share issues in subsidiaries
± Currency gains and losses
± Derivative gains and losses (operations)
– Tax allocated to unusual items
= **Comprehensive operating income**

Issues in identifying core operating income

- Deferred (unearned) revenue
- Restructuring charges, asset impairments and special charges
- Research and development
- Advertising
- Pension expense
  - Service cost, interest cost, expected return on plan assets, amortization of prior service cost, amortization of transition asset or liability, actuarial gains and losses
- Changes in estimates
- Realized gains and losses
- Unrealized gains and losses on equity investments
- Unrealized gains and losses from applying fair value accounting
- Income taxes
- Other income
- Most operating items reported in other comprehensive income are unusual items rather than core income

Beware of returns on pension assets

- Returns on pension fund assets can be a significant portion of earnings
- Returns on pension assets can perpetuate a chain letter

- Beware of expected rates of return on plan assets

Core operating profitability

- $Return\ on\ net\ operating\ assets = Core\ RNOA + Unusual\ items\ to\ net\ operating\ assets$
- $RNOA = \frac{Core\ OI}{NOA} + \frac{UI}{NOA}$
- $RNOA = \frac{Core\ OI\ from\ sales}{NOA} + \frac{Core\ other\ OI}{NOA} + \frac{UI}{NOA}$
- If RNOA if driven by unusual, transitory items → it is of low quality (not sustainable)
- $RNOA = (Core\ sales\ PM\ x\ ATO) + \frac{Core\ other\ OI}{NOA} + \frac{UI}{NOA}$
- $Core\ sales\ PM = \frac{Core\ OI\ from\ sales}{Sales}$

Core borrowing cost

- $Net\ borrowing\ cost = Core\ net\ borrowing\ cost + Unusual\ borrowing\ costs$
- $NBC = \frac{Core\ net\ financial\ expenses}{NFO} + \frac{Unusual\ financial\ expenses}{NFO}$
- As before, unusual financial items are those that are not likely to be repeated in the future or are unpredictable. They include realized and unrealized gains and losses on financial items and unusual interest income or expenses.

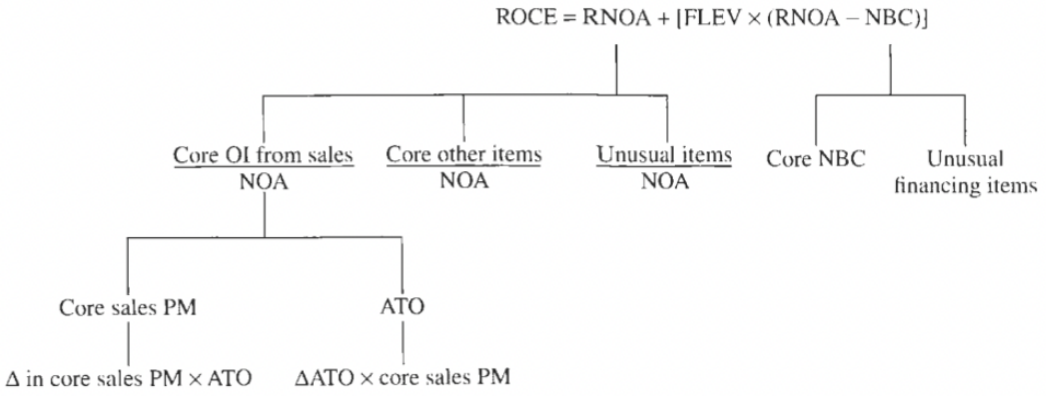
Analysis of growth

- Residual earnings, the focus for growth, are driven by return on common equity (ROCE) and the amount of common shareholders' equity:
  - $Residual\ earnings_t = (ROCE_t - Cost\ of\ equity\ capital)\ x\ CSE_{t-1}$
  - Growth in residual earnings is driven by increases in ROCE and growth in common shareholders' equity

Growth through profitability

- $ROCE = RNOA + [FLEV\ x\ (RNOA - NBC)]$

FIGURE 13.1 Sustainable Drivers of Return on Common Equity (ROCE)
Return on common equity is driven by core profitability, financial leverage, and net borrowing-costs. Operating profitability, RNOA, is driven by core (sustainable) operating profitability and one-time, unusual items. Net borrowing costs (NBC) are determined by core borrowing costs and one-time, unusual items.



Change in RNOA	= Change in core sales profit margin at previous asset turnover level	+ Change due to change in asset turnover
	+ Change due to change in other core income	+ Change due to change in unusual items

$$\Delta RNOA_{2010} = (\Delta \text{core sales } PM_{2010} \times ATO_{2009}) + (\Delta ATO_{2010} \times \text{Core sales } PM_{2010}) + \Delta\left(\frac{\text{Core other OI}}{NOA}\right) + \Delta\left(\frac{UI}{NOA}\right)$$

-

Operating leverage

- Changes in core sales PM are determined by how costs change as sales change. Some costs are **fixed costs:** They don't change as sales change. Other costs are **variable costs:** They change as sales change.
  - Depreciation, amortization, and many administrative expenses are fixed costs
  - Most labor and material costs in cost of sales are variable costs
- The difference between sales and variable costs is called the *contribution margin* because it is this amount that contributes to covering fixed costs and providing profits
  - $Sales\ PM = \frac{Sales - Variable\ Costs - Fixed\ costs}{Sales} = \frac{Contribution\ Margin}{Sales} - \frac{Fixed\ costs}{Sales}$
    - The first component is called the contribution margin
  - $Contribution\ margin\ ratio = 1 - \frac{Variable\ Costs}{Sales} = \frac{Contribution\ margin}{Sales}$
    - This ratio measures the change in income from a change in one dollar of sales.
  - Operating leverage is the sensitivity of income to changes in sales
    - $OLEV = \frac{Contribution\ margin}{Operating\ income} = \frac{Contribution\ margin\ ratio}{Profit\ margin}$
    - $OLLEV = Operating\ liability\ leverage$
  - $\%\ Change\ in\ core\ OI = OLEV\ x\ \%Change\ in\ core\ sales$

Leverage effects on ROCE come from two sources, change in the amount of leverage (FLEV) and the net borrowing cost.

Analysis of growth in shareholders' equity

- Residual earnings are driven not only by the rate of return on common equity but also by the amount of common shareholders' equity that earns at that rate.
- The shareholders' investment requirement is driven by the need to invest in net operating assets. But to the extent that debt is used to finance net operating assets, the shareholders' investment is reduced:
  - $\Delta CSE = \Delta NOA - \Delta NFO$
- As net operating assets are put in place to generate sales, sales are a driver of net operating assets and, thus, the shareholders' investment. The asset turnover (ATO) indicates the amount of net operating assets required to support sales.
  - $ATO = \frac{Sales}{NOA}$
  - $NOA = Sales\ x \frac{1}{ATO}$
  - $\Delta CSE = \Delta\left(Sales\ x \frac{1}{ATO}\right) - \Delta NFO$
  - Sales require investment in net operating assets and the inverse of the asset turnover, *1/ATO,* is the amount of net operating assets in place to generate $1 of sales
  - The change in CSE can be explained by three components
    - Growth in sales (Primary driver) → requires more investment in net operating assets which is financed by either net debt or equity
    - Growth in net operating assets that support each dollar of sales
    - Change in the amount of net debt that is used to finance the changes in net operating assets rather than equity

Zero abnormal earnings growth (AEG) → no growth in residual earnings (RE)
Positive abnormal earnings growth (AEG) → positive growth in residual earnings
The relationship between P/B and P/E is positive → if firms have high P/B they also tend to have high P/E and vice versa

- But it is possible to have a high P/B and a low P/E
- A normal P/B is equal to 1.0
- A normal trailing P/E is equal to $\frac{\rho_E}{\rho_E - 1}$

For both P/B and P/E to be normal, a firm must have zero expected future RE and current RE that is also zero (and thus current and future ROCE equal the cost of capital)
P/B is determined by the future RE a firm is expected to deliver but *PIE* is determined by the difference between current RE and the forecast of future RE, that is, growth in RE from current levels.

En vækstvirksomhed er kendetegnet ved at have vækst I residualoverskud

- Vækst er ikke lig med værdiskabelse

Analyse af vækst i residualoverskud

$$\begin{array}{l}\text{Ændring i}\\ \text{residual-}\\ \text{indkomst}\end{array} = \begin{array}{c}\text{Ændring qua}\\ \text{ændring i ROCE}\\ \text{over } \rho_E\end{array} + \begin{array}{c}\text{Ændring qua}\\ \text{ændring i CSE}\end{array}$$

$$\Delta RE_1 = \left[\Delta(ROCE - \rho_e)_1 \times CSE_0\right] + \left[\Delta CSE_1 \times (ROCE - \rho_e)_1\right]$$

Ændringer residualoverskud er drevet af:

1. Ændringer i ROCE
2. Ændringer i kapitalomkotninger
3. Ændringer i investeringer

- Erindrer: ΔRE = AEG, hvorfor beregningen giver AEG

Usædvanlige poster er karakteriseret af to ting:

- Ikke tilbagevendende (non-recurring)
- Markedsværdiregulering

Analyse af ændringer i rentabiliteten

STEP A Analyse af $\Delta RNOA$

1. Adskil permanente (core) og transitoriske overskudskomponenter

$$\text{RNOA} = \frac{\text{Core OI}}{\text{NOA}} + \frac{\text{UI}}{\text{NOA}}$$
$$= \frac{\text{Core OI from sales}}{\text{NOA}} + \frac{\text{Core other income}}{\text{NOA}} + \frac{\text{UI}}{\text{NOA}}$$

- CORE OI er permanent overskud fra virksomhedens kerneaktiviteter
- UI er udsædvanlige poster, der ikke er tilbagevendende (transitoriske)
- Alle overskud er EFTER skat
- Læs ledelsesberetningen og noterne for at identificere UI-poster

2. Adskil margin og turnover drivere vedr. Overskud fra kerneaktiviteterne

$$\text{RNOA} = \text{Core sales PM x ATO} + \frac{\text{Core other OI}}{\text{NOA}} + \frac{\text{UI}}{\text{NOA}}$$

$$\text{hvor Core sales PM} = \frac{\text{Core OI from sales}}{\text{Sales}}$$

3. Beregn ændring i drivere

$$\Delta\text{RNOA}_t = (\Delta\text{CorePM}_t \bullet \text{ATO}_{t-1}) + (\Delta\text{ATO}_t \bullet \text{CorePM}_t) + \Delta\left[\frac{\text{Other OI}_t}{\text{NOA}_t}\right] + \Delta\left[\frac{\text{UI}_t}{\text{NOA}_t}\right]$$

(i) *Effekt fra ændring i PM* (ii) *Effekt fra ændring i ATO* (iii) *Effekt fra periodens UI*

- Effekten fra ændring i PM (profit margin) er som regel vigtigere end ændring i ATO (asset turnover)

- Ønsker forbedring fra de første to led → højere kvalitet

Analyse af ændringer i rentabiliteten

Step B Analyse af ΔROCE

$$\Delta ROCE_t = \Delta RNOA_t + (\Delta SPREAD_t \bullet FLEV_{t-1}) + (SPREAD_t \bullet \Delta FLEV_t)$$

(i) *Effekt fra ændring i driftsmæssig rentabilitet* (ii) *Effekt fra ændring i spread* (iii) *Effekt fra ændring i leverage*

1. Forklar ændring i spread: RNOA – NBC

Adskil core og udsædvanlige låneomkostninger

$$NBC = \frac{\text{Core financing exp.}}{NFO} + \frac{\text{Unusual financing exp.}}{NFO}$$

Core financing exp

- ændring i renter (riskofri rente og risikopræmie)
- Ændring i skatteprocenter

Unusual financing exp

- Tab og gevinster vedr. finansielle poster

- Ser hellere end ændring fra spread end fra gearing (grundet øget risiko)

Eksempel på en reformuleret resultatopgørelse som skelner mellem permanente og transitoriske poster

Core driftsoverskud	**+/-**	**Transitoriske poster**
Core salgsindtægter		+ Opskrivninger på mateielle anlægsaktiver
- Core produktionsomkostninger		- Nedskrivninger på aktiver
= Core bruttofortjenste		+/- Ændring i regnskabsmæssige skøn
- Core andre driftsomkostninger		+/- Ekstraordinære poster
= Core driftsoverskud fra salg før skat		+/- Gevinster og tab ved salg af aktiver
- Skat på core driftsoverskud fra salg		+ Udbytte fra kapitalandele (<20%)
+ Officiel skatteomkostning		+/- Urealiseret gevinster og tab på kapitalandele (<20%)
+ Skattefordel fra gæld		+/- Valutakursgevinster og tab
- Skat allokeret til core andet driftsoverskud		+/- Gevinster og tab på afledte instrumenter (drift)
- Skat allokeret til transitoriske poster		- Omkostninger til restrukturering
= Core driftsoverskud fra salg		+/- Anden totalindkomst (drift)
+ Core andet driftsoverskud		- Skat på transitoriske poster
+ Overskud fra associerede virksomheder		**= Totalindkomst fra driften**
+ Afkast på pensionsaktiver		
+ Andet overskud		
- Skat på andet driftsoverskud		
= Core driftsoverskud		

Præferenceaktie som forpligtelse

Trailing price-earnings ratios and transitory earnings

- Because the trailing *P/E* is an indicator of the difference between current and future profitability, it is affected by current profitability
- P/E indicates future growth in earnings
- P/E is positively related to future earnings growth, but negatively related to current earnings growth
  - High- P/E firms are typically those whose earnings are down now but will rebound in the future
- Trailing P/E is affected by temporary aspects of current earnings

P/E Ratios and the analysis of sustainable earnings

- If earnings are temporarily high (and cannot be sustained), one should pay less per dollar of earnings- the *PIE* should be low.
- If earnings can be sustained- or can grow because they are temporarily depressed- one should pay a higher multiple

Price-to-book and growth

- High P/B stock → growth stock
- Low P/B stock → value stock

A growth firm is a firm that can increase its residual earnings

- To do so, the need the following features
  - Sustainable, growing sales
  - High or increasing core profit margins
  - High or improving asset turnovers
- Warns against growth that comes from financial leverage

Analyse af ændringer I ROCE

1. Analysér ændringer i rentabiliteten fra driften
2. Analysér effekter fra ændring i finansiering

$$ROCE = RNOA + [FLEV \times SPREAD]$$

(1) (2)

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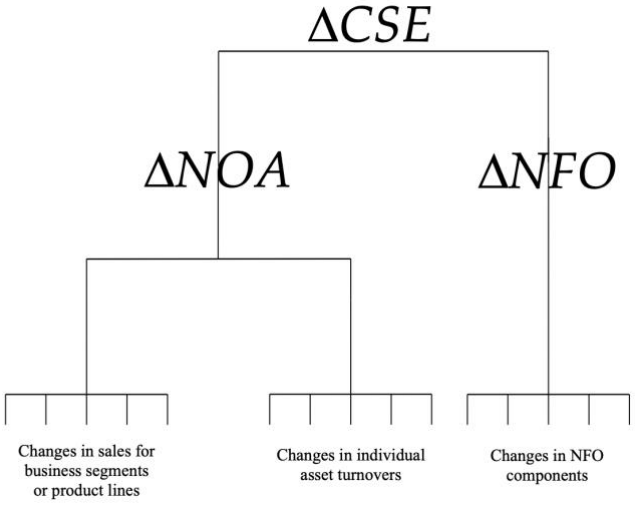
Analyse af ændringer i egenkapitalen

- 

Analyse af vækst i investeringer

$$\Delta CSE = \Delta\left(\text{sales} \times \frac{1}{ATO}\right) - \Delta NFO - \Delta MIN$$

- $$\Delta CSE_t = \left(\Delta sales_t \times \frac{1}{ATO_{t-1}}\right) + \left(\Delta \frac{1}{ATO_t} \times sales_t\right) - \Delta NFO - \Delta MIN$$

Chapter 14: The value of operations and the evaluation of enterprise price-to-book ratios and price-earnings ratios

How operating activities are valued separate from the financing activities

If net financial obligations are measured in the balance sheet at market value, financing activities can be ignored in forecasting

Leverage creates earnings but usually does not add value

If the financial assets and liabilities are measured at market value on the balance sheet, they do not contribute to the premium over book value.

- Net operating assets determine the premium

A modification to residual earnings forecasting: Residual operating income

- Residual earnings model for valuing equity

$$V_0^E = \text{CSE}_0 + \text{Present value of forecasted residual earnings} \quad \textbf{(14.1)}$$

$$= \text{CSE}_0 + \frac{\text{RE}_1}{\rho_E} + \frac{\text{RE}_2}{\rho_E^2} + \frac{\text{RE}_3}{\rho_E^3} + \cdots$$

  - Hvor $Residual\ Earnings\ (RE) = Earnings - Required\ earnings\ on\ book\ value\ of\ equity$
  - $RE_t = Earn_t - (\rho_E - 1)CSE_{t-1}$
  - RE model instructs us to anchor the valuation of equity on the book value of equity, then add value for earnings forecasted in excess of the required earnings on book value.
  - The required rate of return is the cost of capital for equity, $\rho_E - 1$
  - If an asset is forecasted to earn at its required rate of return, forecasted residual earnings will be zero → asset will be worth its book value
  - If the book value of an asset is equal to its intrinsic value → residual earnings is expected to be zero
- Value of equity
  - $V_0^E = CSE_0 + Present\ value\ of\ forecasted\ residual\ earnings\ from\ net\ assets\ not\ at\ fair\ market\ value$
- Components of Earnings and Book value, and corresponding residual earnings measure

Earnings Component	Book Value Component	Residual Earnings Measure
Operating income (OI)	Net operating assets (NOA)	Residual operating income: $OI_t - (\rho_F - 1)\ NOA_{t-1}$
Net financial expense (NFE)	Net financial obligations (NFO)	Residual net financial expense: $NFE_t - (\rho_D - 1)\ NFO_{t-1}$
Earnings	Common stockholders' equity (CSE)	Residual earnings: $Earn_1 - (\rho_E - 1)\ CSE_{t-1}$

- Residual earnings from net operating assets is residual operating income, and is referred to by ReOI:

- $Residual\ operating\ income = Operating\ income\ (after\ tax) - Required\ income\ on\ net\ operating\ assets$
- $ReOI_t = OI_t - (\rho_F - 1)NOA_{t-1}$
- Also referred to as "economic profit" or "economic value added"
- Residual operating income charges the operating income with a charge for using the net operating assets

- Residual earnings from the net financial obligations → residual net financial expense
  - $NFE_t - (\rho_D - 1)NFO_{t-1}$
  - If the firm has net financial assets → residual net financial income
- Value of the net operating assets, V_0^{NOA}
  - $Value\ of\ operations = Net\ operating\ assets + Present\ value\ of\ expected\ residual\ operating\ income$

$$V_0^{\text{NOA}} = \text{NOA}_0 + \frac{\text{ReOI}_1}{\rho_F} + \frac{\text{ReOI}_2}{\rho_F^2} + \frac{\text{ReOI}_3}{\rho_F^3} + \cdots + \frac{\text{ReOI}_T}{\rho_F^T} + \frac{\text{CV}_T}{\rho_F^T} \qquad \textbf{(14.2)}$$

  -
  - That is, the value is the book value of the NOA, plus the present value of expected residual operating income from these assets to a forecast horizon, plus a continuing value that is the value of expected residual operating income after the horizon
- The continuing value for the residual operating income model can take three forms

$$\text{Case 1:} \quad \text{CV}_T = 0$$

$$\text{Case 2:} \quad \text{CV}_T = \frac{\text{ReOI}_{T+1}}{\rho_F - 1}$$

$$\text{Case 3:} \quad \text{CV}_T = \frac{\text{ReOI}_{T+1}}{\rho_F - g}$$

  -
  - Case 1 → we expect residual operating income (ReOI) to be zero after the forecast horizon because we expect the net operating assets to earn at the cost ofcapital. In
  - Case 2 → we expect ReOI to be at a constant, permanent level
  - Case 3 → we expect ReOI to grow perpetually at the rate *g*
  - Value of the operations → value of the firm (or enterprise value)
- If NFO are measured at market value on the balance sheet → expected net financial expenses are zero → Value of equity is

$$\text{Value of common equity} = \text{Book value of common equity} + \text{Present value of expected residual operating income} \qquad \textbf{(14.3)}$$

$$V_0^E = CSE_0 + \frac{\text{ReOI}_1}{\rho_F} + \frac{\text{ReOI}_2}{\rho_F^2} + \frac{\text{ReOI}_3}{\rho_F^3} + \cdots + \frac{\text{ReOI}_T}{\rho_F^T} + \frac{\text{CV}_T}{\rho_F^T}$$

  -
    - Residual operating income model

The drivers of residual operating income

- Drivers of residual earnings can be broken down into two components

$$\text{Residual earnings} = (\text{ROCE} - \text{Required return for equity}) \times \text{Common equity}$$

$$\text{RE}_t = [\text{ROCE}_t - (\rho_E - 1)]\,\text{CSE}_{t-1}$$

(1) **(2)**

-
  - RE is driven by the amount of shareholders' investment and the rate of return on this investment relative to the cost of equity capital
- Residual operating income can be broken down into two components

$$\text{Residual operating income} = (\text{RNOA} - \text{Required return for operations}) \times \text{Net operating assets}$$

$$\text{ReOI}_t = [\text{RNOA}_t - (\rho_F - 1)]\,\text{NOA}_{t-1}$$

(1) **(2)**

-
  - The two components of ReOI are RNOA and net operating assets → residual operating income drivers
    - ReOI is driven by the amount of net operating assets put in place and the profitability of those assets relative to the cost of capital

A modification to abnormal earnings growth forecast: Abnormal growth in operating income

- Abnormal earnings growth model for valuing equity

$$V_0^E = \text{Capitalized [Forward earnings + Present value of abnormal earnings growth]}$$

$$= \frac{1}{\rho_E - 1}\left[\text{Earn}_1 + \frac{\text{AEG}_2}{\rho_E} + \frac{\text{AEG}_3}{\rho_E^2} + \frac{\text{AEG}_4}{\rho_E^3} + \cdots\right] \qquad \textbf{(14.4)}$$

where

$$\begin{aligned}\text{Abnormal earnings growth}_t\ (\text{AEG}) &= \text{Cum-dividend earnings}_t - \text{Normal earnings}_t \\ &= [\text{Earnings}_t + (\rho_E - 1)\text{d}_{t-1}] - \rho_E \text{Earnings}_{t-1} \\ &= [\text{G}_t - \rho_E] \times \text{Earnings}_{t-1}\end{aligned}$$

-
  - G is the cum-dividend earnings growth rate for the period
  - AEG model → Instructs us to forecast forward (one-year ahead) earnings, then add value for subsequent cum- dividend earnings forecasted in excess of earnings growing at the required rate of return for equity.
  - earnings growth in itself does not add value, only abnormal growth over the required growth

Abnormal growth in operating income and the "dividend" from operating activities

- Any analysis must focus on cum-dividend earnings growth
- C - I = d + F
  - C: Cash from operatings
  - I: Investment
  - d: Net dividends
  - F: Net payments to bondholders and debt issuers → dividends from the financing activities
- Abnormal operating income growth (AOIG)

$$= \text{Cum-dividend operating income}_t - \text{Normal operating income}_t$$
$$= [\text{Operating income}_t + (\rho_F - 1)\text{FCF}_{t-1}] - \rho_F \text{Operating income}_{t-1}$$

  -
  - Cash Flow (FCF) = C – I
- A firm delivers abnormal operating income growth if growth in op- erating income- cum-dividend, after reinvesting free cash flow- is greater than the normal growth rate required for operations.
  - When $AEG = \Delta residual\ earnings$ → $AOIG = ReOI$
- Abnormal operating income growth can be expressed in terms of cum-dividend growth rates relative to the required rate
  - $Abnormal\ operating\ income\ growth_t (AOIG) = [G_t - \rho_F]\ x\ Operating\ Income_{t-1}$
  - G_t: cum-dividend operating income growth rate
- Abnormal earnings growth measures that correspond to the operating and financing components of earnings

Earnings Component	Abnormal Earnings Growth Measure
Operating income (OI)	Abnormal operating income growth: $[OI_t + (\rho_F - 1)FCF_{t-1}] - \rho_F OI_{t-1}$ $[G_t - \rho_F] \times OI_{t-1}$
Net financing expense (NFE)	Abnormal net financial expense growth: $[NFE_t + (\rho_D - 1)F_{t-1}] - \rho_D NFE_{t-1}$
Earnings	Abnormal earnings growth: $[Earn_t + (\rho_E - 1)d_{t-1}] - \rho_E Earn_{t-1}$ $[G_t^F - \rho_E] \times Earn_{t-1}$

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$$\text{Value of net operating assets} = \text{Capitalized [Forward operating income} + \text{Present value of abnormal operating income growth]}$$

$$V_0^{NOA} = \frac{1}{\rho_F - 1}\left[OI_1 + \frac{AOIG_2}{\rho_F} + \frac{AOIG_3}{\rho_F^2} + \frac{AOIG_4}{\rho_F^3} + \dots\right]$$

-
  - Enterprise valuation model or a valuation model for the firm

Sustainable income

- Core (sustainable) operating income
  - $Core\ ReOI_t = Core\ OI_t - (\rho_F - 1)NOA_{t-1}$
  - Core operating income excludes all unusual, transitory items discovered in the reformulated income statemen → after tax

The cost of capital and valuation

- Valuation combines forecasts with the cost of capital to get a present value
- Three costs of capital
  - The cost of capital for equity → ρ_E

$$\text{Required return for equity} = \text{Required return for operations} + (\text{Market leverage} \times \text{Required return spread}) \quad \textbf{(14.7)}$$

$$\rho_E = \rho_F + \frac{V_0^D}{V_0^E}(\rho_F - \rho_D)$$

(1) (2)

    -
    - Operating risk and financing risk
    - If the firm has no net debt, the cost of equity capital is equal to the cost of capital for the operations → $\rho_E = \rho_F$
  - The cost of capital for debt → ρ_D
    - The cost of capital for debt is a weighted average of all components of net financial obligations, including preferred stock and financial assets
    - Better thought of as the cost of capital for all net financial obligations
    - $After-tax\ cost\ of\ net\ debt\ (\rho_D) = Nominal\ cost\ of\ net\ debt\ x\ (1-t)$
    - T is the marginal income tax rate
    - Effective cost of debt → the after-tax cost of debt
    - When we use ρ_D to indicate the cost of net debt → that is the effective cost of capital for net financial obligations
  - The cost of capital for operations → ρ_F
    - Cost of capital for operations or the cost of capital for the firm → the required return that compensates for the operation risk/ firm risk/ enterprise risk
    - The F in ρ_F is for firm

$$\text{Cost of capital for operations} = \text{Weighted-average of cost of equity and cost of net debt} \quad \textbf{(14.6)}$$

$$= \left(\frac{\text{Value of equity}}{\text{Value of operations}} \times \text{Equity cost of capital}\right) + \left(\frac{\text{Value of debt}}{\text{Value of operations}} \times \text{Debt cost of capital}\right)$$

$$\rho_F = \frac{V_0^E}{V_0^{NOA}} \cdot \rho_E + \frac{V_0^D}{V_0^{NOA}} \cdot \rho_D$$

    -
    - The required return to invest in operations is a weighted average of the required return of the shareholders and the cost of net financial debt, and the weights are given by the relative values of the equity and debt in the value of the firm
    - WACC → Weighted-average cost of capital

Financing risk and return and the valuation of equity

- Return on common equity

$$\text{Return on common equity} = \text{Return on net operating assets} + (\text{Book leverage} \times \text{Operating spread})$$

$$\text{ROCE} = \text{RNOA} + \left[\frac{\text{NFO}}{\text{CSE}} \times (\text{RNOA} - \text{NBC})\right]$$

-

- Required return for equity

$$\text{Required return for equity} = \text{Required return for operations} + (\text{Market leverage} \times \text{Required return spread})$$

$$\rho_E = \rho_F + \frac{V_0^D}{V_0^E}(\rho_F - \rho_D)$$

-

  - The equity return in both cases is driven by the return on operating activities plus a premium for financing activities, where the latter is given by the financial leverage and the spread. The only difference is that the second equation refers to required returns rather than accounting returns and the leverage is market leverage rather than book leverage.
  - Leverage increases ROCE, and residual earnings, if the spread is positive
  - Leverage increases the required return to equity because of the risk of getting a lower ROCE if the spreads turns negative → More risk, more return
  - ROCE drives residual earnings
  - Given a positive spread between RNOA and net borrowing cost → leverage will yield a higher ROCE → Higher RE
- We can use either RE or ReOI forecasting to value equity

Leverage and abnormal earnings growth valuation

- Financial leverage increases earnings per share
  - An increase in leverage along with a stock repurchase increases earnings per share even more
- With abnormal earnings growth
- We can use either AEG or AOIG valuation methods to price earnings growth

Leverage creates earnings growth

- Beware of earnings growth that is created by leverage. Leverage produces earnings growth → but not abnormal earnings growth
- Warning attaches to stock repurchases, for stock repurchases always involve an increase in leverage: The stock repurchase must be financed either by borrowing or by liquidating financial assets.
- Beware of!
  - Beware of earnings growth created by investment.
  - Beware of earnings growth created by accounting methods.
  - Beware of earnings growth created by financial leverage.
- Accounting relation of leverage to growth in earnings

$$\text{Earnings growth rate}_t = \text{OI growth rate}_t + [\text{Earnings leverage}_{t-1} \times (\text{OI growth rate}_t - \text{NFE growth rate}_t)]$$

$$g_t^{\text{Earn}} = g_t^{\text{OI}} + \text{ELEV}_{t-1}\left[g_t^{\text{OI}} - g_t^{\text{NFE}}\right]$$

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- ELEV = Earnings leverage

Debt and taxes

- Free cash flow must either be used to reduce corporate net debt or to make distributions to shareholder → C – I = d + F

Enterprise multiplies

- The value of equity is the value of the operations minus the value of the net financial obligations. So the intrinsic price-to-book (P/B) ratio can be expressed as

$$\frac{V_0^E}{\text{CSE}_0} = \frac{V_0^{\text{NOA}} - V_0^{\text{NFO}}}{\text{NOA} - \text{NFO}}$$

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- Differences in firm's P/B ratios can derive from their financing even though price equals book value for financial items
- To avoid this confusion we should focus on the value of the operations relative to their book value. The ratio of the value of the net operating assets to their book value is the **enterprise P/B ratio** or the **unlevered P/B ratio:**

$$\text{Enterprise P/B ratio} = \frac{\text{Value of net operating assets}}{\text{Net operating assets}} = \frac{V_0^{\text{NOA}}}{\text{NOA}_0}$$

-
- Net operating assets = equity + net financial obligation
- The standard price-to-book ratio for the equity is referred to as the levered P/B ratio

$$\text{Levered P/B ratio} = \text{Enterprise P/B ratio} + [\text{Financial leverage} \times (\text{Enterprise P/B ratio} - 1)] \quad \textbf{(14.9)}$$

$$\frac{V_0^E}{\text{CSE}_0} = \frac{V_0^{\text{NOA}}}{\text{NOA}_0} + \text{FLEV}\left(\frac{V_0^{\text{NOA}}}{\text{NOA}_0} - 1\right)$$

-
  - FLEV → book financial leverage (NFO / CSE)
- The difference between enterprise P/B and levered P/B, increases with leverage, and the distance that the unlevered P/B is from 1.0
  - The levered P/B is the most common

Enterprise price-earnings ratios

- Levered P/E is the most common
- A levered *P/E* ratio anticipates earnings growth. However, earnings growth is affected by leverage, and anticipated growth from leverage is not growth to be valued because it creates no abnormal earnings growth
- The enterprise *PIE* ratio or unlev- ered P/E ratio prices the operating income on the basis of expected growth in operating income.
- Forward enterprise P/E is the value of the operations relative to the forecasted one-year-ahead operating income
  - Forward enterprise P/E = $\frac{Value\ of\ operations}{Forward\ operating\ income} = \frac{V_0^{NOA}}{OI_1}$
- An increase in leverage → drop in levered P/E → due to increase in the required rate of return due to leverage
- Trailing enterprise P/E
  - Compares the value of the operations to current operating income

$$\text{Trailing enterprise P/E} = \frac{\text{Value of operations} + \text{Free cash flow}}{\text{Current operating income}} = \frac{V_0^{\text{NOA}} + \text{FCF}_0}{\text{OI}_0}$$

  -
  - The value of the operations is reduced by free cash flow (paid out to the financing activities) so, as the value of the operating income is independent of the cash paid out, free cash flow must be added to the numerator.
- The forward levered and unlevered P/E ratios

$$\text{Levered forward P/E} = \text{Unlevered P/E} + [\text{Earnings leverage} \times (\text{Unlevered P/E} - 1/\text{Net borrowing cost})] \quad \textbf{(14.10)}$$

$$\frac{V_0^E}{\text{Earn}_1} = \frac{V_0^{\text{NOA}}}{\text{OI}_1} + \text{ELEV}_1\left(\frac{V_0^{\text{NOA}}}{\text{OI}_1} - \frac{1}{\text{NBC}_1}\right)$$

  -
  - Earnings leverage is the extent to which net financial expenses affect earnings
  - ELEV = NFE / Earnings
  - NBC → net borrowing cost
  - If the operating income yield, OI_1/V_0^{NOA}, is higher than the borrowing cost, the levered *PIE* is lower than the unlevered *P/E,* with the amount of the difference depending on the amount of earnings leverage, ELEV
  - The two ratios are the same when the operating earnings yield is equal to the net borrowing cost
- Levered and unlevered earnings-to-price ratios

$$\frac{\text{Earn}_1}{V_0^E} = \frac{\text{OI}_1}{V_0^{\text{NOA}}} + \frac{\text{NFO}_0}{V_0^E}\left[\frac{\text{OI}_1}{V_0^{\text{NOA}}} - \text{NBC}_1\right] \quad \textbf{(14.11)}$$

  -
- Relationships between enterprise traded P/E ratios and equity P/E ratios

$$\frac{V_0^E + d_0}{\text{Earn}_0} = \frac{V_0^{\text{NOA}} + \text{FCF}_0}{\text{OI}_0} + \text{ELEV}_0\left(\frac{V_0^{\text{NOA}} + \text{FCF}_0}{\text{OI}_0} - \frac{1}{\text{NBC}_0} - 1\right) \quad \textbf{(14.12)}$$

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- Typically levered P/E ratios are less than unlevered P/E ratios, though the opposite is the case when unlevered P/E ratios are very high

- Relationships between levered and unlevered measures

TABLE 14.7 Relationships between Levered and Unlevered Measures

Concept	Levered Measure	Unlevered Measure	Relationship
Profitability	ROCE	RNOA	$ROCE = RNOA + FLEV\,(RNOA - NBC)$
Cost of capital	ρ_E	ρ_F	$\rho_E = \rho_F + \frac{V_0^D}{V_0^E}(\rho_F - \rho_D)$
P/B ratio	V_0^E/CSE_0	V_0^{NOA}/NOA_0	$\frac{V_0^E}{CSE_0} = \frac{V_0^{NOA}}{NOA_0} + \frac{NFO_0}{CSE_0}\left(\frac{V_0^{NOA}}{NOA_0} - 1\right)$
Forward P/E ratio	$V_0^E/Earn_1$	V_0^{NOA}/OI_1	$\frac{V_0^E}{Earn_1} = \frac{V_0^{NOA}}{OI_1} + ELEV_1\left(\frac{V_0^{NOA}}{OI_1} - \frac{1}{NBC_1}\right)$
Trailing P/E ratio	$\frac{V_0^E + d_0}{Earn_0}$	$\frac{V_0^{NOA} + FCF_0}{OI_0}$	$\frac{V_0^E + d_0}{Earn_0} = \frac{V_0^{NOA} + FCF_0}{OI_0} + ELEV_0\left(\frac{V_0^{NOA} + FCF_0}{OI_0} - \frac{1}{NBC_0} - 1\right)$
Forward earnings yield	$\frac{Earn_1}{V_0^E}$	$\frac{OI_1}{V_0^{NOA}}$	$\frac{Earn_1}{V_0^E} = \frac{OI_1}{V_0^{NOA}} + \frac{NFO_0}{V_0^E}\left[\frac{OI_1}{V_0^{NOA}} - NBC_1\right]$

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- The levered amount is the unlevered arn .o unt plus a premium that depends on the leverage and a spread

Finansielle aktiver (værdipapirer) og forpligtelser måles typisk til markedsværdi

- Residualoverskud = 0

Budgetterer kun driftsaktivitet I indirekte modeller

Den regnskabsmæssige værdiansættelsesmodel

Den regnskabsmæssige værdiansættelsemodel

$$V_0^E = CSE_0 + \sum_{t=1}^{T}(\overline{earn_t} - (\rho_E - 1)CSE_{t-1}) + \frac{CV_T}{\rho_E^T}$$

Værdiansættelse af egenkapitalen

- Budgetter fremtidige residualoverskud
- Beregn CV
- Beregn nutidsværdien og tillæg den bogførte værdi af egenkapitalen

Hvis poster på balancen måles til markedsværdi → perfekt balance

- Den bogførte værdi forventes at afkast afkastkravet → forventende residualoverskud er nul
- $V_0 = CSE_0$ → RE=0
- Budgetterede RE=O → $V_0 = CSE_0$

Modifikation af residualindkomstmodellen

- Residualindkomst-modellen

$V_0^E = CSE_0 + PV \text{ af RE}$

Nogle aktiver og forpligtelser har forventede RE på nul, fordi de måles til deres markedsværdi

- Den modificerede model

- $V_0^E = CSE_0 + PV$ af RE fra NOA, der ikke måles til markedsværdi

Komponenter af residualoverskud

Net Income Component	Book Value Component	Residual Earnings Component
Operating Income (OI)	Net Operating Assets (NOA)	$ReOI=OI_t - (\rho_F - 1)\, NOA_{t-1}$
Net Financial Expense (NFE)	Net Financial Obligations (NFO)	$ReNFE=NFE_t - (\rho_D - 1)\, NFO_{t-1}$
Earnings (earn)	Common Stockholders' Equity (CSE)	$RE=earn_t - (\rho_E - 1)\, CSE_{t-1}$

- Fokus på residualoverskud fra driften (ReOI) → $OI_t - (\rho_F - 1)NOA_{t-1}$
- ReOI = $OI_t - (wacc\ x\ NOA_{t-1})$
- ReOI = $(RNOA - wacc)\ x\ NOA_{t-1}$
  - $RNOA = \frac{OI_t}{NOA_{t-1}}$

Værdien af NFO

- Typisk målt til markedsværdi i balancen (eller tæt på) → forventede residualoverskud er nul

$$V_0^{NFO} = NFO_0 + \frac{\text{Re}NFE_1}{\rho_D} + \frac{\text{Re}NFE_2}{\rho_D^2} + \frac{\text{Re}NFE_3}{\rho_D^3} + \cdots \frac{\text{Re}NFE_T}{\rho_D^T} = NFO_0$$

Værdien af NOA (enterprise value)

- Måles typisk ikke til markedsværdi i balancen
-

$$V_0^{NOA} = NOA_0 + \frac{\text{Re}OI_1}{\rho_F} + \frac{\text{Re}OI_2}{\rho_F^2} + \cdots + \frac{\text{Re}OI_T}{\rho_F^T} + \frac{CV_T}{\rho_F^T}$$

CV værdier for ReOI-modellen

-

Case 1: $CV_T = 0$

Case 2: $CV_T = \frac{\text{Re}OI_{T+1}}{\rho_F - 1}$

Case 3: $CV_T = \frac{\text{Re}OI_{T+1}}{\rho_F - g}$

Værdien af egenkapitalen

$$V_0^E = V_0^{NOA} - V_0^{NFO}$$

$$V_0^E = \overbrace{NOA_0 + \frac{\text{Re}OI_1}{\rho_F} + \cdots + \frac{\text{Re}OI_T}{\rho_F^T} + \frac{CV_T}{\rho_F^T}}^{V_0^{NOA}} - \overbrace{NFO_0}^{V_0^{NFO}}$$

$$V_0^E = \underbrace{CSE_0}_{NOA_0 - NFO_0} + \frac{\text{Re}OI_1}{\rho_F} + \cdots + \frac{\text{Re}OI_t}{\rho_F^T} + \frac{CV_T}{\rho_F^T}$$

Drivere bag ReOI-modellen

- Drivere bag RE-modellen

$$RE_t = earn_t - (\rho_E - 1)CSE_{t-1} = \left[ROCE_t - (\rho_E - 1)\right]CSE_{t-1}$$

- Drivere bag ReOI-modellen

$$\text{Re}OI_t = OI_t - (\rho_F - 1)NOA_{t-1} = \left[RNOA_t - (\rho_F - 1)\right]NOA_{t-1}$$

(1) (2)

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- (1) RNOA
- (2) NOA indsat for at afkaste RNOA

AEG-modellen for egenkapital

$$V_0^E = \text{kapitaliseret}\left[\text{forward earnings + PV af AEG}\right]$$

$$= \frac{1}{\rho_E - 1}\left[\text{Earn}_1 + \frac{AEG_2}{\rho_E} + \frac{AEG_3}{\rho_E^2} + \cdot\cdot\right]$$

$$\text{AEG}_t = \text{Cum-dividend earnigns}_t - \text{normal earnigns}_t$$

$$= \left[\text{earnings}_t + (\rho_E - 1)d_{t-1}\right] - \rho_E \text{earnings}_{t-1}$$

$$= \left[\text{G}_t - \rho_E\right] \text{ x earnings}_{t-1}$$

Modifikation af AEG-modellen

$$V_0^E = \text{kapitaliseret}\left[\text{forward OI + PV af AOIG}\right] - NFO_0$$

$$= \frac{1}{\rho_F - 1}\left[\text{OI}_1 + \frac{AOIG_2}{\rho_F} + \frac{AOIG_3}{\rho_F^2} + \cdot\cdot\right] - NFO_0$$

$$\text{AOIG}_t = \text{Cum-dividend operating}_t - \text{normal operating income}_t$$

$$= \left[\text{operating income}_t + (\rho_F - 1)FCF_{t-1}\right] - \rho_E \text{Operating income}_{t-1}$$

$$= \left[\text{G}_t - \rho F\right] \text{ x Operating income}_{t-1}$$

- "dividende" fra driftsaktiviteterne er FCF

Overskudskomponenter og sammenhørende AEG mål

Earnings Component	*Abnormal Earnings Growth Measure*
Operating income (OI)	Abnormal operating income growth: $[OI_t + (\rho_F - 1)FCF_{t-1}] - \rho_F OI_{t-1}$ $[G_t - \rho_F] \times OI_{t-1}$
Net financing expense (NFE)	Abnormal net financial expense growth: $[NFE_t + (\rho_D - 1)F_{t-1}] - \rho_D NFE_{t-1}$
Earnings	Abnormal earnings growth: $[Earn_t + (\rho_E - 1)d_{t-1}] - \rho_E Earn_{t-1}$ $[G_t^E - \rho_E] \times Earn_{t-1}$

Kapitalomkostninger

- Driftsaktiviteter har deres egen risiko, benævnt *driftsmæssig risiko*
- Denne risiko er bestemmende for afkastkravet
- Afkastkravet benævnes *kapitalomkostninger for driften* ρ_F
- Afkastkravet benævnes også *WACC*

$$\rho_F = \frac{V_0^E}{V_0^{NOA}} \rho_E + \frac{V_0^D}{V_0^{NOA}} \rho_D$$

- $r_e = wacc + \left[\frac{V^{NFO}}{V^E}\ x\ (wacc - r_d)\right]$ → markedsværdi
  - $hvis\ V^{NFO} = 0$ → $r_e = wacc$ (unlevered)
  - hvis $V^{NFO} > 0$ → $r_e > wacc$ (fordi der er gæld → risiko)
    - $$\text{Cost of equity capital} = 9.0\% + \frac{300}{1{,}200}\ x\ \left[9.0\% - 5.0\%\right] = 10.0\%$$
    - Hvor wacc=9%
    - Mere gæld → højere afkastkrav grundet risiko
  - hvis $V^{NFO} < 0$ → NFA → $r_e < wacc$ (lavere risiko ved statsobligationer end ved driften)
  - $ROCE = RNOA + \left[\frac{NFO}{CSE}\ x\ (RNOA - NBC)\right]$ → bogført værdi
  - $ROCE \uparrow \rightarrow RE \uparrow \rightarrow$
    $V^E\ samme\ fordi\ afkastkravet\ også\ stiger\ (fordi\ gearingen\ stiger)$

Kapitalomkostninger for egenkapitalen

Egenkapitalomkostningerne er reelt udledt af kapitalomkostningerne for driften (og ikke omvendt!)

$$\rho_E = \frac{V_0^{NOA}}{V_0^E}\rho_F - \frac{V_0^D}{V_0^E}\rho_D$$

eller

- $\rho_E = \rho_F + \frac{V_0^D}{V^E}(\rho_F - \rho_D)$ (sammenlign med formel for ROCE)

Afkastkrav og regnskabsmæssigt afkast

Afkastkrav egenkapital	Regnskabsmæssigt afkast
$\rho_E = \rho_F + \frac{V_0^D}{V_0^E}(\rho_F - \rho_D)$	$ROCE = RNOA + \frac{NFO}{CSE}(RNOA - NBC)$

Leverage leder til en stigning i både regnskabsmæssigt afkast (såfremt SPREAD > 0) og afkastkravet

- Hvad er nettoeffekten på PV af RE (og værdien)?

Leverage skaber vækst i EPS men ikke værdi

Intrinsic price to book (P/B ratios)

- $\frac{V_0^E}{CSE_0}$ → levered
- $\frac{V^{NOA}}{NOA_0}$ → unlevered
- $\frac{P}{E}$ → levered
- $\frac{V^{NOA}}{OI}$ → unlevered

Levered $P/B = \frac{V_0^E}{CSE_0^E}$

Unlevered $P/B = \frac{V_0^{NOA}}{NOA_0}$

Levered $P/B = \frac{V_0^{NOA} - V_0^{NFO}}{NOA_0 - NFO_0} = \frac{V_0^{NOA}}{NOA_0} + FLEV\left[\frac{V_0^{NOA}}{NOA_0} - 1\right]$

- Hvor FLEV er NFO/CSE

Levered og unlevered P/E ratio

- $$\text{Forward Enterprise P/E} = \frac{\text{Værdi af driften}}{\text{Forward OI}} = \frac{V_0^{NOA}}{OI_1}$$

$$\text{Levered Forward P/E}\left(\frac{V_0^E}{Earn_1}\right) = \frac{V_0^{NOA}}{OI_1} + ELEV\left(\frac{V_0^{NOA}}{OI_1} - \frac{1}{NBC}\right)$$

$$\text{ELEV} = \frac{\text{NFE}}{\text{Earnings}}$$

$$\text{NBC} = \frac{\text{NFE}}{\text{NFO}_{\text{primo}}}$$

Leverage effects

Simple Forecast	Levered Measure	Unlevered Measure	Relationship
Profitability	ROCE	RNOA	$\text{ROCE} = \text{RNOA} + \text{FLEV}[\text{RNOA} - \text{NBC}]$
Cost of Capital	ρ_F	ρ_E	$\rho_E = \rho_F + \frac{V_0^D}{V_0^E}[\rho_F - \rho_D]$
P/B Ratio	V_0^E/CSE_0	V_0^{NOA}/NOA_0	$\frac{V_0^E}{CSE_0} = \frac{V_0^{NOA}}{NOA_0} + \frac{NFO_0}{CSE_0}\left[\frac{V_0^{NOA}}{NOA_0} - 1\right]$
Forward P/E	$\frac{V_0^E}{Earn_1}$	$\frac{V_0^{NOA}}{OI_1}$	$\frac{V_E^0}{Earn_1} = \frac{V_0^{NOA}}{OI_1} + ELEV_1\left(\frac{V_0^{NOA}}{OI_1} - \frac{1}{NBC_1}\right)$
Trailing P/E	$\frac{V_0^E + d_0}{Earn_0}$	$\frac{V_0^{NOA} + FCF_0}{OI_0}$	$\frac{V_E^0 + d_0}{Earn_0} = \frac{V_0^{NOA} + FCF_0}{OI_0} + ELEV_0\left(\frac{V_0^{NOA} + FCF_0}{OI_0} - \frac{1}{NBC_0} - 1\right)$

ROCE → ejernes afkastkrav
RONA → wacc
Den estimerede værdi af egenkapital kan godt være højere end virksomhedsværdien → negativ gæld → NFA
Strategisk investering → driftstaktiv

Chapter 15

Simple Forecating and Valuation
I dette kapitel anvendes til brug for budgetteringen alene information, der er indeholdt i det nuværende regnskab (år =0)

No-Growth Forecast
Her forudsættes det, at (eventuel) vækst (DNOA) ikke er værdiskabende (dvs. vækst antages ikke at skabe residualoverskud/ReOI, idet væksten kun antages at afkaste kapitalomkostningerne).

Værdien af egenkapitalen findes som:

$$V_0^E = CSE_0 + \frac{\text{Re}OI_1}{wacc}$$

hvor $\text{ReOI}_1 = \text{ReOI}_0$. Opgaven går derfor ud på at bestemme det nuværende residualoverskud fra driften (ReOI_0).

Dette gøres som: ReOI_0 = Core OI_0 - (wacc x NOA_{-1}). Bemærk, at det er core OI_0 der anvendes!

Det forhold, at de fremtidige ReOI antages at være konstante gør,
at $\Delta ReOI = 0 \rightarrow AOIG = 0$
hvorfor værdien af egenkapitalen også kan findes som:

$$V_0^E = \frac{1}{wacc}\left[OI_1\right] - \text{NFO}_0$$

$$\text{hvor } \text{OI}_1 = \text{Core } \text{OI}_0 + \underbrace{(\text{wacc x } \Delta\text{NOA}_0)}$$

Vækst i NOA fra år -1 til år 0 antages kun afkaste kapitalkravet, dvs. denne vækst skaber ikke ReOI.

Værdien af virksomheden findes som:

$$V_0^{NOA} = NOA_0 + \frac{\text{ReOI}_1}{wacc}$$

Growth Forecast
Modsat i et 'No-Growth Forecast', hvor vækst (DNOA)forudsattes ikke at skabe værdi, kan vækst her skabe værdi.
Værdien af egenkapitalen findes som:

$$V_0^E = CSE_0 + \frac{(\text{Core RNOA}_0 \text{ - wacc}) \times \text{NOA}_0}{wacc - g}$$

Opgaven går derfor ud på at bestemme Core RNOA_0. Dette gøres som bekendt som:
Core RNOA_0= Core OI_0 / NOA_{-1}.

Vækstraten (g) findes som:

$$g = \frac{NOA_0}{NOA_{-1}} - 1$$

Alternativt, som den gennemsnitlige vækst i NOA over de seneste fem år.

Værdien af virksomheden findes som:

$$V_0^{NOA} = NOA_0 + \frac{(\text{Core RNOA}_0 \text{ - wacc) x NOA}_0}{wacc - g}$$

eller

$$V_0^{NOA} = NOA_0 \times \frac{\text{Core RNOA}_0 \text{ - g}}{wacc - g}$$

Afsluttende bemærkninger

De anvendte forecast og dermed værdiansættelser er simple…..Det er netop meningen! Inden analytiker begynder at analysere information udenfor regnskabet (Chp. 16) og tillægge spekulation til sin værdiansættelse, foretages denne ud fra, hvad som kendes.

Det er klart, at år 0 kan være et usædvanligt år, hvorfor metoden (selvfølgelig) skal anvendes med omtanke.

Budgetteringsprocedure

Step 1 – forecast salget

$Salg_t$ = $salg_{t-1}$ x (1+salgsvækstrate)

Step 2 – forecast NOA_{primo} (Husk at vi kender NOA_{primo} i det første forecastår!)

NOA_{t-1} = $salg_t$ x $1/ATO_t$

Step 3 – forecast OI_{salg} (før skat)

OI_{salg} (før skat)$_t$ = $salg_t$ x PM_{salg} (før skat)$_t$

Step 4 Beregn skat på OI_{salg}

Skat på OI_{salgt} = OI_{salg} (før skat)$_t$ x effektiv skattesats$_t$

Step 5 Beregn OI_{salg} (efter skat)

OI (efter skat)$_t$ = OI_{salg} (før skat)$_t$ – skat på OI_{salgt}

Step 6 forecast OI_{other} (efter skat)

OI_{other} (efter skat)$_t$ = $salg_t$ x [OI_{other} (efter skat) i procent af salget$_t$]

Step 7 Forecast usædvanlige poster, OI_{ui} (efter skat)

Disse budgetteres normalt ikke (de budgetteres til nul), men såfremt du kan forecaste en restruktureringsomkostning eller en gevinst, bør den indgår som en del af det samlede budgetterede driftsoverskud (OI).

Step 8 Beregn samlet OI

OI_t = OI_{salgt} + OI_{other} + OI_{ui}

Step 9 Forecast NFO_{primo}
NFO_{t-1} = NOA_{t-1} x (NFO/NOA) **(Husk at vi kender NFO_{primo} i det første forecastår!)**

Step 10 Beregn CSE_{primo} (Husk at vi kender CSE_{primo} I det første forecastår!)
CSE_{t-1} = NOA_{t-1} - NFO_{t-1}

Step 11 Forecast NFE
NFE_t = NFO_{t-1} x r_{dt}

Step 12 Beregn nettooverskud (totalindkomst)
NI_t = OI_t - NFE_t

Step 13 Beregn FCF
FCF_t = OI_t - ΔNOA_t

Step 14 Beregn nettodividende (*d*)

$$dt = NIt - \Delta CSEt$$

Step 15 Beregn nettogældsfinansiering (*F*)

$$Ft = NFEt - \Delta NFOt$$

$$RNOA_t = \frac{OI_t}{NOA_{t-1}}$$
$$ReOI = (RNOA - wacc) * NOA_{t-1}$$
$$FCF\ (Fri\ cashflow) = OI - \Delta NOA$$

Levered price/book
- $\frac{MVE}{B}$
  - MVE = Market value of equity → antal udestående aktier * aktiekursen
  - B = Book value

Unlevered price/book
- $\frac{EV}{NOA}$
  - EV = MVE – NFO

$$OI - \Delta NOA = FCF = d + F$$

- F = NFE - ΔNFO
- d (Nettodividende) → FCF – (NFE - ΔNFO)
  - $d = NI - \Delta CSE$
  - Budgetteres ikke direkte, fremkommer som plug

Bestemmelser for budgetperioden
- Vækstudsigter for branchen
- Konkurrencemæssig fordel
- Det er en strategisk overvejelse

Kapitel 17

Konservativ regnskabsføring → Hold værdien af aktiverne nede
- Jo lavere NOA → Jo mere konservativ regnskabsføring
- Mere konservativt at omkostningsføre end at aktivere på balancen
- Mere konservativt at afskrive over kortere periode

Clean surplus accounting
- Føres først i resultatopgørelsen → aldrig direkte i egenkapitalopgørelsen

Virksomheder kan skabe vækst med regnskabsmetoder

Renteindbetalinger og renteudbetalinger → finansieringsaktivitet
Køb og salg af kortfristede værdipapirer → finansieringsaktivitet

ReOI-modellen

Terminalværdi (TV) = $\frac{ReOI\ x\ (1+Salgsvækstraten)}{wacc - Salgsvækstraten}$
- ReOI skal være i sidste år
- Hvis wacc er 6%, skal tælleren hedde ReOI x 1,06
- Nævner skal hedde 0,06 – 0,03

EV = Enterprise value
- EV = NOA_t + PV Terminalværdi + Sum PV ReOI
- Omsætning = $Omsætning_{t-1} * (1 + salgsvækstrate)$
- Driftsoverskud fra salg før skat = $Andel\ af\ PM\ før\ skat * Omsætning$
- Skat = $Effektiv\ skatteprocent * Driftsoverskud\ fra\ salg\ før\ skat$
- Driftsoverskud fra salg efter skat = $Driftsoverskud\ fra\ salg\ før\ skat - Skat$
- Andet driftsoverskud efter skat = $Andel\ af\ andet\ driftsoverskud\ efter\ skat * Omsætning$
- NOA i t+1
  - VÆR OBS PÅ OM DER STÅR ATO ELLER 1/ATO!
  - Hvis ATO < 1: Omsætning * ATO
  - Hvis ATO > 1: Omsætning / (1/ATO)
- REOI: $Samlet\ driftsoverskud - wacc * NOA$
- Df: $(1 + wacc)^t$
- PV ReOI: $ReOI/df$
- Sum PV ReOI = $sum\ af\ PV\ ReOI\ i\ alle\ år\ op\ til\ året\ før\ terminalåret$
- Terminalværdi = $\frac{ReOI\ i\ sidste\ år\ før\ terminalår * (1+salgsvækstrate)}{wacc - salgsvækstrate}$
- PV Terminalværdi = $\frac{Terminalværdi}{df\ i\ sidste\ år\ inden\ terminalåret}$
- Enterprise value = $NOA\ i\ første\ år + Sum\ PV\ ReOI + PV\ Terminalværdi$
- Value of equity = $Enterprise\ value - NFO$
- Antal udestående aktier $= \frac{Antal\ aktier - aktier\ i\ egenbeholdning}{Enhed, f.eks. 1000\ kr.}$
- Værdi pr. aktie = $\frac{Value\ of\ equity}{Antal\ udestående\ aktier}$

- Typiske fejl/ Fejlsøgning
  - Tjek du har brugt rigtig wacc
  - Tjek skat er regnet korrekt
  - Tjek at du ikke har diskonteret med terminalværdi
  - Tjek at du ikke har regnet terminalåret med i summen af PV ReOI
  - Tjek du har brugt korrekt wacc samt salgsvækstrate i udregning af terminalværdi
  - Tjek du har brugt ReOI i året før terminalåret, ved udregning af terminalværdi
  - Tjek du har sagt NOA + Sum PV ReOI + PV Terminalværdi i udregning af Enterprise value
  - Tjek du har regnet rigtigt i antal udestående aktier ift. måleenheden i resultatopgørelsen

DCF Modellen

- Udregning af NOA
  - Hvis ATO > 1 : $\frac{Omsætning}{(\frac{1}{ATO})}$
  - Hvis ATO < 1 : $Omsætning * ATO$
- FCF = $Samlet\ Driftsoverskud - \Delta NOA$
- Df = $(1 + wacc)^t$
- PV FCF = $\frac{FCF}{df}$
- Sum PV FCF = $Summen\ af\ PV\ FCF\ i\ budgetperioden\ (til\ og\ med\ året\ før\ terminalår)$
- Terminalværdi = $\frac{FCF\ i\ sidste\ år\ før\ terminalår*(1+salgsvækstrate)}{wacc-salgsvækstrate}$
- PV TV = $\frac{Terminalværdi}{df\ i\ sidste\ år\ inden\ terminalår}$
- Enterprise value = $Sum\ PV\ FCF + PV\ TV$
- Value of equity = $Enterprise\ Value - NFO$
- Antal udestående aktier $= \frac{Antal\ aktier - aktier\ i\ egenbeholdning}{Enhed, f.eks. 1000\ kr.}$
- Værdi pr. aktie = $\frac{Value\ of\ equity}{Antal\ udestående\ aktier}$

Anbefaling til Køb/Hold/Sælg

- Sælg → Værdi pr aktie < Nuværende kurs pr aktie
- Hold → Værdi pr aktie = Nuværende kurs pr aktie
- Køb → Værdi per aktie > Nuværende kurs pr aktie

Vurder om en virksomhed er fair prisfastsat relativt til peers

- Vurderes ud fra en tommelfingerregel om at hvis virksomhedens trailing EV/OI er inden for en difference på ca. 10-20% af peers → fair prisfastsat
- Hvis virksomhedens trailing EV/OI er mere end 20% større end peers → prisfastsat for højt
- Hvis virksomhedens trailing EV/OI er mindre end 20% mindre end peers → prisfastsat for lavt

Nøgletal formler

ROCE

$$ROCE = RNOA + \left[\frac{NFO}{CSE} * (RNOA - NBC)\right]$$

$$ROCE = RNOA + [FLEV * (RNOA - NBC)]$$

$$ROCE = \frac{Totalindkomst}{Gns.Egenkapital}$$

- ROCE SAMMENLIGNES MED EJERNES AFKASTKRAV

PM

$$PM = \frac{Driftsoverskud\ efter\ skat}{Nettoomsætning}$$

Eller

$$PM = PM_{Sales} + PM_{Other}$$

PM fra salg

$$PM_{Sales} = \frac{Driftsoverskud\ fra\ salg}{Nettoomsætning}$$

PM fra andet

$$PM_{Other} = \frac{Driftsoverskud\ fra\ andet}{Nettoomsætning}$$

RNOA

$$RNOA = \frac{Driftsoverskud}{NOA}$$

$$RNOA = PM * ATO$$

$$RNOA = \frac{Samlet\ driftsoverskud\ efter\ skat}{Gns.NOA}$$

- Både PM og ATO kan være negativ
- RNOA SAMMENLIGNES MED WACC
- Hvis der er NFA → typisk vil RNOA>ROCE

ATO

$$ATO = \frac{Nettoomsætning}{NOA}$$

NBC

$$NBC = \frac{NFE\ efter\ skat}{NFO}$$

FLEV

$$FLEV = \frac{Gns.\ NFO}{Gns.\ CSE}$$

- Lavere gearing → risikoen falder → ejernes afkastkrav falder
- Øget gearing øger risiko
- Øget gearing giver ikke højere værdi per aktie

NBC

$$NBC = \frac{Netto\ finansielle\ omkostninger\ (efter\ skat)}{Gns.\ NFO}$$

- BRUG NFE FRA REFORMULERING AF RESULTAT/TOTALINDKOMST VED UDREGNING AF NØGLETALLET

RE

$$RE = (ROCE - r_e) * CSE_{t-1}$$

- $ROCE$ op → RE op → Værdien af selskabet er uændret

Delta NOA (ΔNOA)

$$\Delta NOA = NOA_t - NOA_{t-1}$$
$$\Delta NOA = (Aktiver_t - Driftsforpligtelser_t) - (Aktiver_{t-1} - Driftsforpligtelser_{t-1})$$

ReOI

$$ReOI = Operating\ Income - (r_e - 1) * NOA$$
$$ReOI_t = [RNOA - (\rho_F - 1)]NOA_{t-1}$$
$$ReOI_{2018} = Core\ OI_{2018} - (wacc * NOA_{2017})$$

NFA

$$Hvis\ RNOA > wacc\ er\ der\ NFA$$

Trailing P/E

$$Trailing\frac{P}{E} = \frac{(1 + Required\ return)}{Required\ return}$$
$$Trailing\frac{P}{E} = \frac{Price + Dividend}{Earnings}$$

- Lave usædvanlige overskud → høj trailing P/E
- Høje usædvanlige overskud → Lav trailing P/E

Enterprise Value

$$For\ at\ EV > V^{NOA}\ skal\ RNOA > wacc$$

- Enterprise value kan være lavere end den estimerede værdi af egenkapital hvis der er NFA

Residualoverskud (RE)

$$(ROCE - Ejernes\ afkastkrav) * Bogført\ værdi\ af\ egenkapital$$
$$Kræver\ ingen\ vækst\ i\ residualoverskud: RE \rightarrow AEG = 0$$
$$AEG = \frac{1}{\rho_E - 1}\left[Earn_1 + \frac{AEG_2}{\rho_E} + \frac{AEG_3}{\rho_E^2} + \cdots\right]$$

Udregning af ejernes afkastkrav

$$Fundamental\ værdi\ pr\ aktie = \frac{1}{\rho_E - 1} * Overskud\ pr\ aktie\ (Forward\ EPS)$$
$$Fundamental\ værdi\ per\ aktie = \frac{1}{r_e} * overskud\ pr\ aktie\ (Forward\ EPS)$$
$$\rho_E = 1 + r_e$$

Eks.

$$\Leftrightarrow 400 = \frac{1}{\rho_E - 1} * 25$$
$$\Leftrightarrow 16(\rho_E - 1) = 1$$
$$\Leftrightarrow 16\rho_E = 17$$
$$\Leftrightarrow \rho_E = 1{,}0625$$
$$\Leftrightarrow \rho_E = 6{,}25\%$$

For at der er vækst i residualoverskud (AEG) skal cum-dividend earnings growth være større end ejernes afkastkrav

$$V_0^E = CSE_0 + \frac{ReOI_1}{\rho_F} + \cdots + \frac{ReOI_t}{\rho_F} + \frac{CV_T}{\rho_F^T}$$

Hvor:

$$CSE_0 = NOA_0 - NFO_0$$
$$ReOI_t = [RNOA - (\rho_F - 1)]NOA_{t-1}$$

CSE

$$CSE_0 = NOA_0 - NFO_0$$

NOA

$$NOA = Samlede\ aktiver - Driftsforpligtelser$$

- Kan godt være negativ

Growth-forecast

- I et growth forecast kan vækst i investeringer godt skabe residualoverskud

No-growth forecast

- I et no-growth forecast antages det at vækst I investeringer IKKE er værdiskabende, da det antages at væksten kun afkaster kapitalomkostningerne

Earnings per share (EPS)

$$EPS = \frac{indtjening}{udestående\ aktier}$$

P/E værdi

$$\frac{P}{E} = \frac{Pris\ per\ aktie}{EPS}$$

Spread

$$Spread = RNOA - NBC$$

FCF

$$FCF = Samlet\ Driftsoverskud - (NOA_t - NOA_{t-1})$$
$$FCF = OI - \Delta NOA$$

Dividende, d

$$dividende = Totalindkomst - Egenkapital_t + Egenkapital_{t-1}$$
$$d = Totalindkomst - \Delta Egenkapital$$

Value of equity

$$V^E_{2018} = CSE_{2018} + \frac{ReOI_{2019}}{wacc}$$

Værdiansættelse no-growth og værdien per aktie

$$ReOI_{2018} = Core\ OI_{2018} - (wacc * NOA_{2017})$$
$$V^E_{2018} = CSE_{2018} + \frac{ReOI_{2019}}{wacc}$$
$$Værdi\ pr\ aktie = \frac{V^E}{Antal\ udestående\ aktier}$$

Markedsværdi af egenkapital

$$MVE = Bogført\ værdi\ af\ egenkapital * \frac{P}{B}$$

Estimering af wacc

Markedsværdi af egenkapital (MVE) = Bogført værdi af egenkapital X P/B

= 3.495 x 1,4 = 4.893

(Pt. handles aktien til 4.893/73 = 67 kr. per aktie)

Markedsværdi af gæld (=NFO) = 1.290

Markedsværdi af NOA = 6.183 = 4.893 + 1.290

r_e = 3,5 + (1,5 x 6,0) = 12,5 pct.

r_d = 8 x (1-0,25) = 6,0 pct.

- $wacc = \frac{4.893}{6.183}12,5 + \frac{1.290}{6.183}6,0 = 9,89 + 1,25 = 11,14$ (tillad afrunding)

Reformulering af balance

- Poster som er rentebærende (FINANSIELLE FORPLIGTELSER)
  - Banklån
  - Realkreditlån
  - Leasingforpligtelser
  - Anden gæld SOM ER SKYLDIGE RENTER
  - Øvrige kreditinstitutter
  - Kreditinstitutter
  - Obligationsbeholdning (SKAL VÆRE LIKVIDE)
  - Rentebærende gæld
  - Prioritetsgæld
  - Låntagning, både kortfristet og langfristet
  - Anden gæld, skyldige renter
  - Præferenceaktiekapital
- Poster som trækkes fra aktiver i alt til driftsaktiver
  - Likvider
  - Kapitalandele disponible for salg
  - Værdipapirer disponible for salg
  - Likvide beholdninger
  - Obligationsbeholdning
- Poster som trækkes fra driftsaktiver til NOA → DRIFTSFORPLIGTELSER
  - Udskudte skatteforpligtelser
  - Pensionsforpligtelser
  - Leverandører af varer og tjenesteydelser
  - Leverandørgæld
  - Udskudt skat
  - Skyldig selskabsskat
  - Anden gæld SOM ER F.EKS. ER FERIEPENGE OG MOMS
  - Garantiforpligtelser

- Hensatte forpligtelser
- Hensættelser
- Anden gæld eksl. Skyldige renter
- Selskabsskat
- Minoritetsinteresser (UD FRA DE ORDINÆRE AKTIONÆRERS SYNSPUNKT)

Reformulering af Pengestrømsopgørelse

- Eksamenssæt med pengestrømsopgørelse
  - Juni 2022
  - Juni 2020
  - August 2022
- Korrigeret C
  - Du skal korrigere for alle de posteringer under pengestrømme fra driftsaktivitet som ikke er tilknyttet driften → f.eks. finansielle poster
  - Find netto rentebetalinger → Beregn skatten herpå → hvis positiv netto rentebetalinger skal skatten være negativ, og hvis negativ netto rentebetaling skal skatten være positiv
  - Find summen ved: Netto rentebetalinger + Skat
  - Korrigeret C = Rapporteret pengestrøm fra driftsaktivitet – summen fra før
- Korrigeret I
  - Du skal korrigere for alle de posteringer under pengestrømme fra investeringsaktivitet som ikke er tilknyttet driften → f.eks. køb og salg af værdipapirer
  - Find Nettokøb eller nettosalg af værdipapirer
  - Korrigeret I = Rapporteret pengestrøm fra investering – Køb af værdipapirer
- Korrigeret FCF (C-I)
  - Korrigeret C – Korrigeret I
- Egenkapitalfinansiering (d)
  - Betalt udbytte
- Nettogældsfinansiering
  - Alle de posteringer som involverer virksomhedens finansiering → Skal ændre fortegn ift. den ordinære pengestrømsopgørelse UNDTAGEN ændring i likvider
    - Ændring i likvider
    - Netto renteudbetalinger efter skat
    - Provenu ved langfristet lånoptagelse
    - Afdrag på langfristet gæld
    - Afdrag på lån
    - Afdrag på gældsforpligtelser
    - Køb af værdipapirer
    - Nettosalg af værdipapirer
- Tjek det er rigtigt ved at d+F=FCF

Reformulering af Totalindkomstopgørelse/ Resultatopgørelse

- Driftsoverskud fra salg før skat
  - Posterne frem til og med driftsoverskud fra salg før skat er typisk uændrede
- Driftsoverskud fra salg efter skat

- Skat er årets resultat → (Minus der har været positivt resultat før skat, og positivt hvis der har været negativt resultat før skat)
- Skat eller skattefordel på gæld → $(Finansielle\ indtægter + finansielle\ omkostninger) * Skatteprocenten$ → Hvis der er netto finansielle omkostninger skal der være minus, og hvis der er netto finansielle indtægter skal der være plus
- Skat fra andet driftsoverskud → Hent skatten fra andet driftsoverskud nede fra "Andet Driftsoverskud" → Husk at ændre fortegnet så det er modsat af fortegnet nede fra Andet driftsoverskud
- Kan også skulle indeholde Skat af særlige poster, hvis det i resultatopgørelsen er udregnet eksplicit

- Andet driftsoverskud
  - Usædvanlige poster/ Særlige poster → Diverse nedskrivninger → F.eks.
    - IT-systemer
    - Varelageragbøder
    - Indtægter fra kapitalinteresser i associerede selskaber
    - Restruktureringsomkostninger
  - Skat af disse særlige poster → Hvis der er negativt fortegn på nedskrivningerne skal der være positiv skat, og omvendt hvis positivt fortegn på nedskrivninger
  - Ofte er der poster som enten ikke er skattemæssigt fradragsberettigede eller poster som er efter skat → læg dem til efter du har beregnet skatten → Dette er tilknyttet driften og ikke er finansielle poster, F.eks.
  - Driftsoverskud fra andet efter skat er nu summen af disse poster, Eksempler på poster:
    - Kapitalandele
    - Indtægter fra kapitalinteresser i associerede selskaber
    - Nedskrivning af koncerngoodwill
    - Indtægter fra associerede selskaber efter skat
    - Valutakursregulering vedr. Udenlandske enheder efter skat
    - Markedsværdiregulering af kapitalandele disponible for salg, efter skat
    - Indtægter fra kapitalinteresser i associerede virksomheder, efter skat,
    - Urealiseret gevinst på værdipapirer, efter skat
    - Urealiseret gevinst kapitalandele, efter skat
    - Værdiregulering kapitalandele, efter skat
- Samlet driftsoverskud
  - Sum af driftsoverskud fra salg efter skat og andet driftsoverskud efter skat
- De finansielle poster
  - Finansielle indtægter
  - Finansielle omkostninger
  - Netto finansielle omkostninger
  - Skat eller skattefordel → Hvis der er netto finansielle omkostninger skal skatten være positivt, og hvis der er netto finansielle indtægter skal skatten være negativ
  - Ofte er der andre poster som skal lægges til her som er efter skat poster, f.eks.
    - Gevinster på obligationer
    - Værdiregulering obligationer, efter skat
    - Dagsværdiregulering af værdipapirer disponible for salg efter skat,

    - Markedsværdiregulering obligationer, efter skat
    - Urealiseret tab på kapitalandele disponible for salg, efter skat
    - Urealiseret gevinst obligationsbeholdning, efter skat
    - Præferenceaktie udbytte
- Totalindkomst
  - Samlet driftsoverskud + Sum af finansielle poster

Reformulering af egenkapitalopgørelse

- Juni 2020
- Den reformulerede egenkapitalopgørelse viser udviklingen i de ordinære aktionærers interesse i virksomheden → Derfor skal der korrigeres for præferenceaktiekapital
  - Korrigerer for præferenceaktiekapital ved at fratrække saldoen samt kun medtage det udbytte der er udbetalt til aktionærer

Rapporteret egenkapitalopgørelse

1.000 kr.	Ordinære aktier	Præference aktier	Overført overskud	Reserve for værdipapirerer disponible for salg	Total
Saldo 1.1. 2019	300	100	10.450	50	**10.900**
Nettooverskud			1.760		1.760
Urealiseret gevinst/tab på værdipapirer				15	15
Udbetalt udbytte			- 400		- 400
Saldo 31.12. 2019	300	100	11.810	65	**12.275**

- Af de samlede udbyttebetalinger på 400 tkr. Blev 50 tkr. udbetalt til ejere af præferenceaktier

Reformuleret egenkapitalopgørelse

Saldo 1.1. 2019		**10.800**
Udbetalt udbytte	-350	
Nettooverskud	1.760	
Urealiseret gevinst på VP	15	
Præfereceaktie udbytte	-50	
Totalindkomst	**1.725**	
Saldo 31.12. 2019		**12.175**

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  - Saldoen på de 10.800 Fremkommer ved at sige den samlede saldo minus saldo fra præferenceaktier (10.900-100=10.800)
  - Det udbetalte udbytte står under den rapporterede egenkapitalopgørelsen, hvor der er udbetalt samlet 400 t.kr. i udbytte, hvoraf 50 t.kr. er udbetalt til ejere af præferenceaktier
  - Nettooverskud på 1.760 er rapporteret i egenkapitalopgørelsen
  - Urealiseret gevinst på værdipapirer på 15 er rapporteret i egenkapitalopgørelsen
  - Præferenceaktie udbytte er 50 t.kr. jf. Tekst under den rapporterede egenkapitalopgørelse
  - Dette giver en totalindkomst på 1725 → Dette er beregnet ud fra nettooverskuddet fra totalindkomstopgørelsen hvor der tillægges 15 fra urealiseret gevinst på værdipapirer disponible for salg efter skat → Herefter fratrækkes udbytte til præferenceaktier på 50 → 1760+15-50=1725

- Saldoen for 31.12.2019 I den rapporterede egenkapitalopgørelse fremkommer ved at sige saldo 1.1.2019 + nettooverskud + urealiseret gevinst/tab på værdipapirer – udbetalt udbytte → 10900+1760+15-400
- Saldoen for 31.12.2019 i den reformulerede egenkapitalopgørelse fremkommer ved at sige Saldo 1.1.2019 – udbetalt udbytte (eksl. Præferenceaktie udbytte) + nettooverskud + urealiseret gevinst på værdipapirer – præferenceaktie udbytte → 10.800-350+1760+15-50=12.175
- PRÆFERENCEAKTIEKAPITALEN ER EN DEL AF FINANSIELLE FORPLIGTELSER OG SKAL DERFOR LÆGGES TIL HER
- PRÆFERENCEAKITE UDBYTTE SKAL FRATRÆKKES I REFORMULERING AF TOTALINDKOMSTOPGØRELSEN UNDER DE FINANSIELLE POSTER DA DET REGNES SOM EN FINANSIEL OMKOSTNINGER

Sammenligning af virksomheder inden for branchen ift. trailing EV/OI

- Trailing EV/OI
- Beregning af EV
  - $EV = MVE + NFO$
  - $MVE = Antal\ udestående\ aktier * aktiekurs$
- Opgørelse af OI
  - Core OI er driftsoverskud eksklusiv eventuelle usædvanlige poster da disse ikke har nogen prediktionsværdi (KORREKTION FOR USÆDVANLIGE POSTER)
  - Generelt gælder det at hvis de er indgået negativt i totalindkomstopgørelsen så skal de indgå positivt i udregning af Core OI → Hvis posten medgår positivt i udregning af Core OI skal skatten indgå negativt og omvendt hvis posten medgår negativt i udregning af Core OI → hvis posten er efter skat skal der ikke regnes skat heraf
  - Eksempler på poster der skal reguleres for
    - Dagbøder
    - Nedskrivning af varelagre
    - Skat
    - Værdiregulering kapitalandele
    - Valutakursregulering vedr udenlandske selskaber, efter skat
    - Nedskrivning på koncerngoodwill
    - Nedskrivning på varelagre og varemærker, efter skat
    - Andre driftsindtægter
    - Særlige poster
    - Varelagernedskrivning
    - Restruktureringsomkostninger
    - Tab ved salg af materielle aktiver
    - Usædvanligt tab på tilgodehavender
    - Tab ved salg af materielle aktiver
    - Nedskrivning på materielle aktiver
    - Dagsværdiregulering af kapitalandele
    - Indtægter fra kapitalinteresser efter skat
    - Andre driftsindtægter efter skat

- Hvis den udregnede trailing EV/OI er nogenlunde tæt på multiplen for peers er virksomhed fair prisfastsat
  - Hvis trailing EV/OI er markant mindre end peers → For lavt prisfastsat
  - Hvis trailing EV/OI er markant højere end peers → For højt prisfastsat
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