Measuring Financial Performance

TU-A1300 - Introduction to Industrial Engineering and Management

Jouko Karjalainen

Aalto University
School of Science
Industrial Engineering and Management

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Learning Objectives

- Elementary capabilities to describe a company using financial ratios
- Explain the main principles that separate periodic profit and cash flow
  - Revenue recognition, Accrual Basis, Matching principle
- Articulate the main structure and key interdependencies of the financial statements
  - The Income Statement (a.k.a the profit and loss account)
  - The Balance Sheet
  - The Statement of Cash Flows

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Key Financial Ratios

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General Properties

- Financial ratios concentrate the financial data available of a company
  - Easier to analyze a company
  - Different aspects of financial performance
  - Comparing companies of different size (but within the same industry)
- Most of the ratios are defined using the line items of
  - The Income Statement (a.k.a. The Profit and Loss Account)
  - The Balance Sheet
- The principles used to prepare these statements affect the values of the ratios

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The Income Statement

REVENUE (Net Sales)

– OPERATING EXPENSES

- Material expenses (Cost of goods sold or Cost of sales)
- Personnel costs
- Cost of external services
- Depreciation

OPERATING PROFIT — EBIT = Earnings Before Interest and Taxes

– FINANCIAL EXPENSES

PROFIT BEFORE TAXES

– INCOME TAXES

NET PROFIT

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From EBIT to Earnings

REVENUE	
– OPERATING EXPENSES	
OPERATING PROFIT	EBIT = Earnings Before Interest and Taxes
– FINANCIAL EXPENSES	Interest paid for debt
PROFIT BEFORE TAXES	≈ Taxable income of the firm
– INCOME TAXES	Apply corporate tax rate to Profit Before Taxes
NET PROFIT	Earnings

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The Balance Sheet

The firm's financial position at the closing of the financial year

The Balance Sheet Equation

ASSETS = LIABILITIES + SHAREHOLDER'S EQUITY

ASSETS:
- A resource (thing, item) owned by a firm
- has some future economic value
- can be used in current or future period to generate revenues

LIABILITIES:
- The firm's obligations to creditors

SHAREHOLDER'S EQUITY:
- An accounting measure of the firm's net worth to its owners

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Assets

- NON-CURRENT ASSETS (Long-term assets)
  - Intangible Assets
  - Tangible Assets (Fixed Assets)
  - Other Non-Current Assets
- CURRENT ASSETS
  - Inventories → *Elements of Working Capital*
  - Accounts Receivable → *Elements of Working Capital*
  - Other Current Assets
  - Cash (and cash equivalents)

PRINCIPLES OF VALUING ASSETS

MARKET VALUE

ACQUISITION VALUE

FAIR VALUE

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Liabilities

- CURRENT LIABILITIES
  - Accounts Payable *(Non-Interest Bearing)*
  - Other Current Liabilities *(Non-Interest Bearing)*
  - Short-Term Debt
- LONG-TERM LIABILITIES
  - Long-Term Debt
  - Other Long-Term Liabilities

Element of Working Capital

Interest-bearing Debt

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Shareholder's Equity

- SHAREHOLDERS' EQUITY
  - Shareholders' Capital
  - Retained Earnings (closing value)
    - Retained Earnings (opening value less dividends)
    - Net Profit of the Financial Year

The bottom line of the Income Statement

- *Shareholders are residual claimants*
  - *Termination, bankruptcy*
  - *Asset – Liabilities = Equity*

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Profitability

PROFIT MARGINS [%]

$$Operating\ margin = \frac{Operating\ income}{Revenue}$$

RETURN ON EQUITY [%]

$$ROE = \frac{Net\ Income}{Equity}$$

RETURN ON ASSETS [%]

$$ROA = \frac{Net\ Income}{Assets}$$

RETURN ON INVESTED CAPITAL [%]

$$ROIC = \frac{EBIT \cdot (1 - tax_{rate})}{Equity + Debt_{interest-bearing}}$$

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Capital Structure

$$Debt\ to\ Capital\ Ratio = \frac{Debt}{Equity + Debt}$$

$$Debt\ to\ Equity\ Ratio = \frac{Debt}{Equity}$$

$$Gearing = \frac{Net\ Debt}{Equity} = \frac{Debt - Cash}{Equity}$$

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Liquidity

$$Current\ Ratio = \frac{Current\ Assets}{Current\ Liabilities}$$

$$Quick\ Ratio = \frac{Cash + Accounts\ Receivable}{Current\ Liabilities}$$

$$Cash\ Ratio = \frac{Cash}{Current\ Liabilities}$$

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The System of Financial Information

$$ROE = \frac{Net\ Income}{Equity}$$

$$= \frac{Net\ Income}{Revenue} \times \frac{Revenue}{Assets} \times \frac{Assets}{Equity}$$

Book value
vs.
Market value

Profit Margin

Asset Turnover

Capital Structure
(Assets = Equity + Debt)

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Some examples

Company	Industry	ROCE	Gearing	Equity/Assets
Kesko	Wholesale	12 %	6 %	50 %
Oriola	Wholesale	12 %	56 %	22 %
Supercell	Consumer products	151 %	- 97 %	83 %
Rovio Entertainment	Consumer products	29 %	- 63 %	77 %

The figures were published in a Finnish business magazine (Talouselämä, No 21/2018)

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Understanding Financial Ratios

- Analyzing the trend of a single company (comparison to the past)
- Financial Statement Analysis
  - Comparing different companies (Supercell vs. Rovio vs. Kesko?)
  - Companies in the same industry
  - Comparability of financial disclosures
- Systemic structure
  - Financial leverage and ROE
  - Valuation of the balance sheet items
  - You can’t fool a well-informed investor. Don’t fool yourself!

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The Main Accounting Principles

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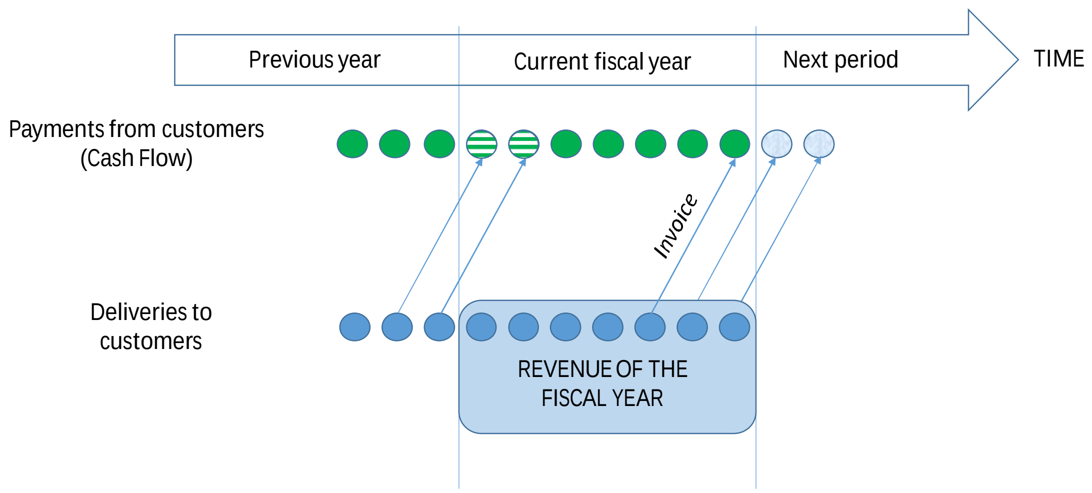
Revenue Recognition



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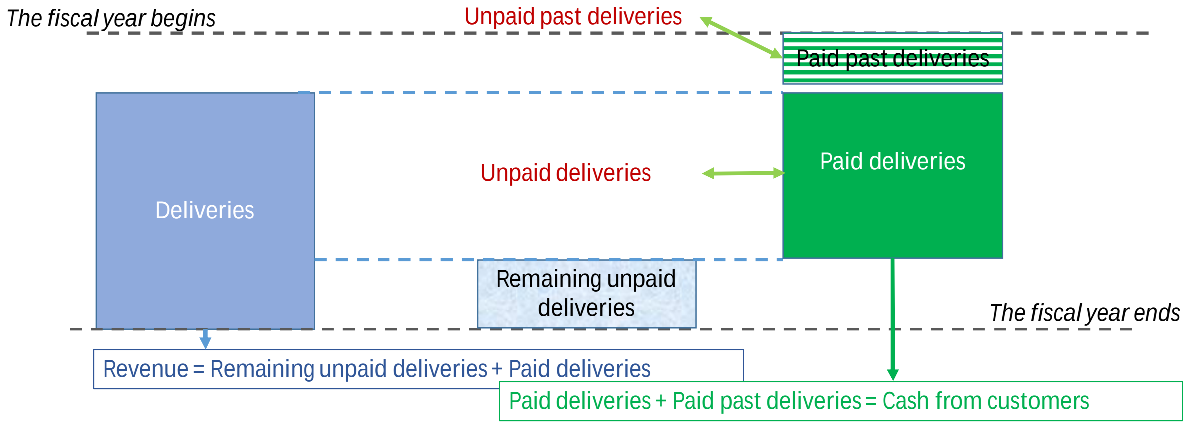
Cash versus Accrual Basis



Revenue = Cash from customers + (Remaining unpaid deliveries – Paid past deliveries)

Revenue = Cash from customers + INCREASE IN ACCOUNTS RECEIVABLE

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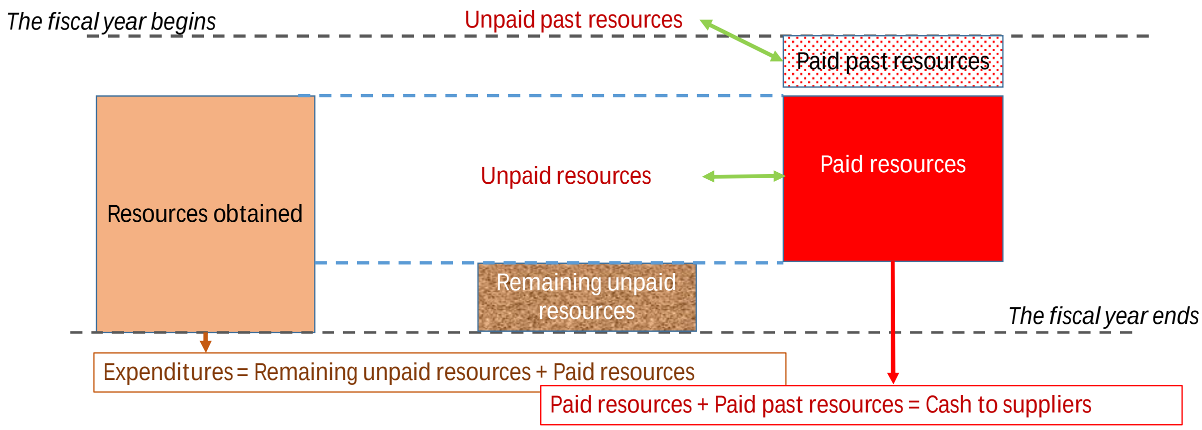
Expenditures



Expenditures = Cash to suppliers + (Remaining unpaid resources – Paid past resources)

Expenditures = Cash to suppliers + INCREASE IN ACCOUNTS PAYABLE

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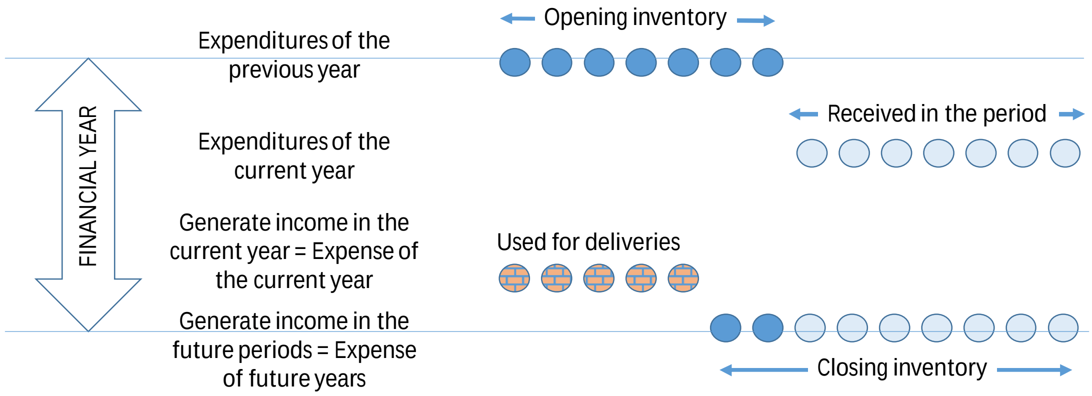
Matching Principle

Applied to Material Purchases



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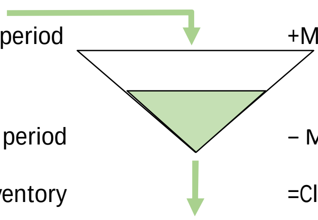
Value of Inventories

MATERIAL BALANCE OF A SINGLE SKU → MEASURED AT THE ACQUISITION PRICE

Opening Inventory	Opening Value of Inventory
+Received during the period	+Material expenditures of the period
–Delivered during the period	– Material expenses (Value of deliveries at acquisition price)
=Closing Inventory	=Closing Value of Inventory



Material Expenses = Expenditures – Increase in Inventories

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Working Capital

Revenue = Increase in Receivables + Cash from Customers

LESS

Expenses = Expenditures – Increase in Inventories

LESS

Expenditures = Increase in Payables + Cash to Suppliers

PROFIT

CASH FLOW

= Revenue – Expenses = Revenue + ΔInventories – Expenditures

= Cash from customers + ΔReceivables + ΔInventories – (ΔPayables + Cash to Suppliers)

PROFIT = CASH FLOW + (**Δ**Receivables + **Δ**Inventories – **Δ**Payables) = CASH FLOW + **Δ**WORKING CAPITAL

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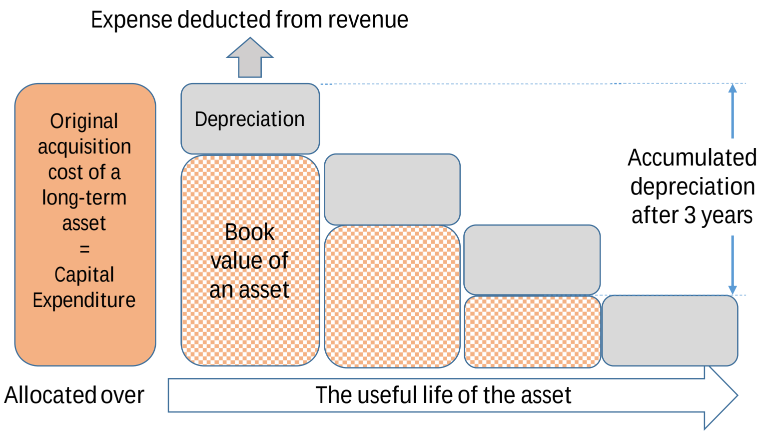
Expenses & Matching of Capital Expenditures

<u>A DISCRETE ASSET</u> (e.g. a car, a machine)



<u>MULTIPLE ASSETS</u> (e.g. all cars, or machines of the firm)

SUM OF ALL LONG-TERM ASSETS

Sum of opening book values
+ Capital Expenditures of the year
– Total Depreciation of the year
= Sum of closing book values

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How Do the Key Financial Statements Interconnect?

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Modified Balance Sheet

- NON-CURRENT ASSETS
  - Intangible Assets
  - Tangible Assets (Fixed Assets)
  - Other Non-Current Assets
- CURRENT ASSETS
  - Cash
  - Inventories
  - Accounts Receivable
  - Other Current Assets
- EQUITY
  - Share Capital
  - Retained Earnings
- LONG-TERM LIABILITIES
  - Long-Term Debt
  - Other Long-Term Liabilities
- CURRENT LIABILITIES
  - Short-Term Debt
  - Accounts Payable
  - Other Current Liabilities

Working Capital =
+ Accounts Receivable
+ Inventories
– Accounts Payable

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Changes in the Balance Sheet Values

Balance Sheet 1.1.20xx	Income Statement	Cash Flow	Balance Sheet 31.12.20xx
Fixed Assets	−Depreciation	+CapEx	= Fixed Assets
Working Capital		+ΔWC	= Working Capital
Cash		+ΔCash	= Cash
=			=
Debt		−Loan payments +New loans	= Debt
Retained Earnings	+Net Profit	−Dividends	= Retained Earnings
Share Capital		+ΔShare	= Share Capital

$$Cash = Debt + Share + Retained\ Earnings - Fixed\ Assets - WC$$

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Solving Increase in Cash

$$\Delta Cash = \Delta Debt + \Delta Share \boxed{+ \Delta Retained\ Earnings} - \Delta Fixed\ Assets - \Delta WC$$

$$\Delta Cash = \boxed{\Delta Debt + \Delta Share - Dividend} + NetProfit \boxed{- \Delta Fixed\ Assets} - \Delta WC$$

$$\Delta Cash = \boxed{CFfin} + NetProfit \boxed{- CapEx} + Depreciation - \Delta WC$$

$$\Delta Cash = CFfin \boxed{+ CFinv} + \boxed{NetProfit + Depreciation - \Delta WC}$$

$$\Delta Cash = CFfin + CFinv + \boxed{CFops}$$

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The Statement of Cash Flows

- Cash from operating activities (CF_{ops})
  - Includes income taxes and interest paid
- Cash from investing activities (CF_{inv})
  - Capital expenditures
- Cash from financing activities (CF_{fin})
  - Dividend paid (Div)
  - Increase in shareholders' capital (ΔShares)
  - Increase in borrowing (ΔDebt)
- Change in cash ($\Delta Cash = CF_{ops} + CF_{inv} + CF_{fin}$)
  - ΔCash = Increase in cash = Cash in the end – Cash in the beginning

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