

TOM	729.89	915.51	185.62	▲25.43%	FLR	660.27	745.28	85.01	▲12.88%
HUM	749.73	924.29	174.56	▲23.28%	UVD	155.59	181.57	25.98	▲16.70%
DMW	833.72	1004.01	170.29	▲20.43%	QUV	440.55	540.21	99.66	▲22.62%
YZJ	903.49	1127.46	223.97	▲24.79%	HZT	285.51	344.98	59.47	▲20.83%
GLY	982.07	1219.39	237.32	▲24.17%	PCW	811.44	1029.66	218.22	▲26.89%
VDA	113.74	143.41	29.67	▲26.09%	AIK	361.77	451.39	89.62	▲24.77%
UVV	468.08	535.41	67.33	▲14.38%	ZJJ	858.36	994.57	136.21	▲15.87%
HIS	545.49	659.05	113.56	▲20.82%	RHJ	894.79	1046.68	151.89	▲16.97%

Introduction to the Course and Financial Statement Analysis

MOT111A Financial Management: Lecture 1

Textbook: Chapters 1 & 2

Dr.ir. Zenlin Roosenboom-Kwee

Email: Z.Roosenboom-Kwee@tudelft.nl

Teaching Team MOT111A (2023-2024)



- Zenlin Roosenboom-Kwee (Z.Roosenboom-Kwee@tudelft.nl)
- Course Manager and Instructor (Lectures 1, 2, 4, 5, 6, 7)



- Aleksandrina Ralcheva (A.A.Ralcheva@tudelft.nl)
- Instructor (Lectures 3 & 7 and Workshops 1, 2, 3, 4)



- Wesley Kool (W.L.A.Kool@student.tudelft.nl)
- Teaching assistant

“What is a master but a master student? And if that's true, then there's a responsibility on you to keep getting better and to explore avenues of your profession.”

(Neil Peart: Canadian-American musician, songwriter, and author)



**Use weekly
checklist!**



Read the Course Manual in Brightspace



Prepare for the lecture → Do the pre-lecture activities



Active during the lectures and workshops



And do the post-lecture activities



Questions? Use discussion board in Brightspace

Course Communication



For content-related questions, please use Discussion Board in Brightspace



Answers will also be given in the discussion board



This allows information sharing to all students



Please do not send any email

Course Outline & Schedule

- MOT111A: Financial Management

All lectures and workshops are mandatory and are held at 10:45-12:30 hours
Coffee hours are informal and voluntary and are held at 10.45-11.45 hours

Activity	Instructor [*]	Date	Location [^]	Topic	Material
Lecture 1	ZK	Tue 5 Sept	Flux Hall A	Introduction and financial statement analysis	Book chapters 1 (all) & 2 (all)
Workshop 1	AR	Thu 7 Sept	Flux Hall A	Exercises based on lecture 1	Lecture 1
Lecture 2	ZK	Tue 12 Sept	Echo-Hall B1	Evaluating investment opportunities	Chapters 3(3.1-3.4), 4 (all), 5(all) & 7 (all)
Coffee Hour	ZK/AR/WK	Thu 14 Sept	TPM Canteen		
There is no activity in the week of 18-22 September 2023 due to the MOT Introduction Week					
Lecture 3	AR	Tue 26 Sept	Echo-Hall B1	Long-term financing and financial markets Valuing bonds	Slides + Chapter 6 (all)
Workshop 2	AR	Thu 28 Sept	Flux Hall A	Exercises based on lectures 2 & 3	Lectures 2 & 3
Lecture 4	ZK	Tue 3 Oct	Echo-Hall B1	Valuing stocks Risk analysis and portfolio investment	<ul style="list-style-type: none"> • Chapter 9 (9.1-9.2) • Chapters 10: 10.1-10.3, 10.6-10.8 • Chapter 11: 11.1-11.2, 11.4 (until Example 11.9, p.404), 11.7-11.8
Workshop 3	AR	Thu 5 Oct	Flux Hall A	Exercises based on lecture 4	Lectures 4
Lecture 5	ZK	Tue 10 Oct	Echo-Hall B1	Cost of capital and Capital structure	<ul style="list-style-type: none"> • Chapter 12: 12.1, 12.5-12.7 • Chapters 14 (all) & 15 (all)
Coffee Hour	ZK/AR/WK	Thu 12 Oct	TPM Canteen		
Lecture 6	ZK	Tue 17 Oct	Echo-Hall B1	Financial distress and payout policy	Chapters 16 (16.1-16.4) & 17 (17.1-17.4)
Workshop 4	AR	Thu 19 Oct	Flux Hall A	Exercises based on lectures 5 & 6	Lectures 5 & 6
Guest Lecture	To be announced	Tue 24 Oct	Echo-Hall B1	To be announced	Slides
Coffee Hour	ZK/AR/WK	Thu 26 Oct	TPM Canteen		
Lecture 7 (Final)	ZK & AR	Thu 31 Oct	Echo-Hall B1	Q&A + Practice Exam	All materials discussed in Lectures 1-6

* ZK = Zenlin Roosenboom-Kwee; AR = Aleksandrina Ralcheva; WK = Wesley Kool

[^] Locations can be viewed at: <https://esviewer.tudelft.nl/>

Why study financial management?



Personal perspective

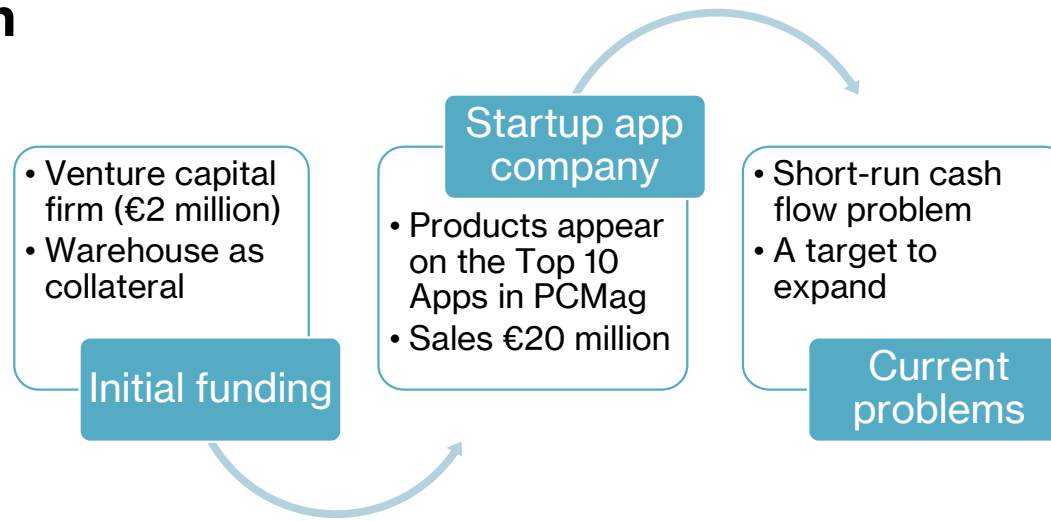
- Financial literacy is useful for personal finance decisions, a.o.:
 - How to evaluate the terms of your car loan/lease, credit card, mortgage?
 - When to start saving for retirement?
 - To invest or not to invest in certain financial instruments?



Business/career perspective

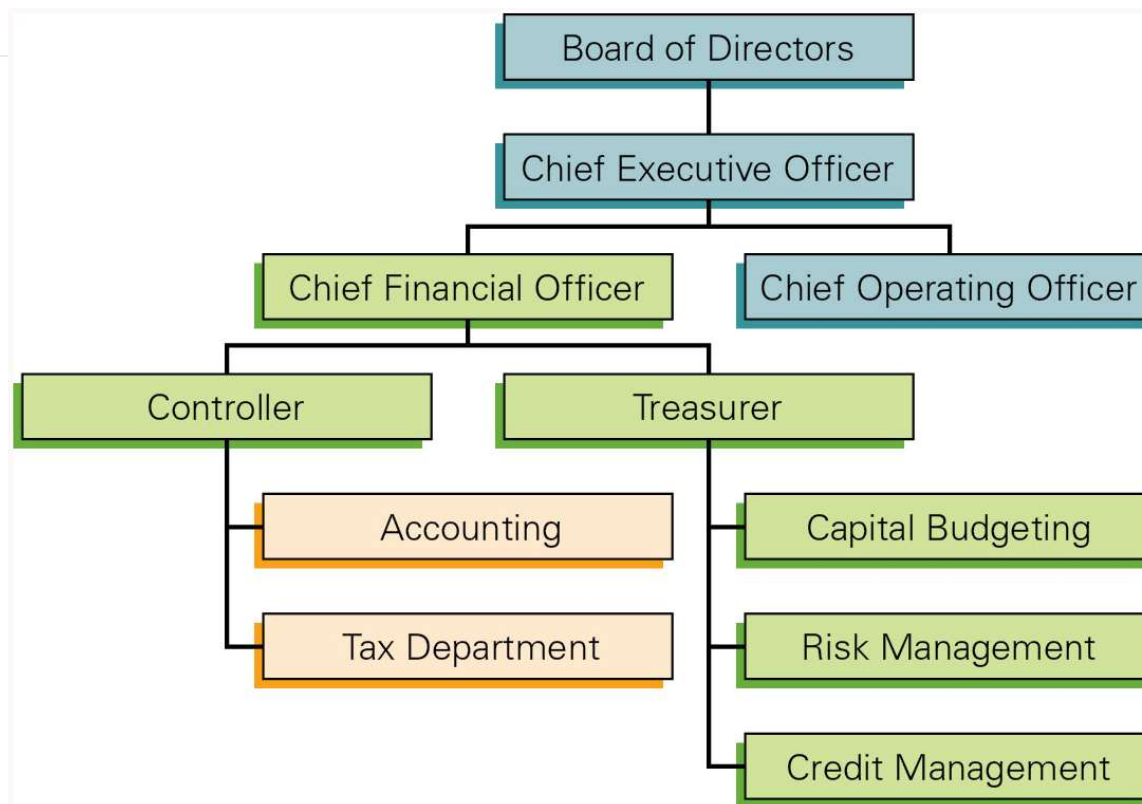
- Help strategic decision makings such as:
 - To improve an existing product or to launch a new product?
 - Keep the production in house or outsource?
 - How to fund the company?

Three Key Issues of Financial Management: An illustration



- What long-term investment strategy to take on?
- How can fund be raised for the required investments?
- How much short-term cash flow does a company need to pay its bills?

Finance Role in Organizational Chart



Lecture 1 Learning Goals



Identify, describe and differentiate the major characteristics of four major types of firms. (VIDEO: Types of Firms and Agency Problem)



Discuss the agency problem, i.e. division of ownership vs control of corporations (VIDEO: Types of Firms and Agency Problem)



Discuss stock markets (2 VIDEOS: The Stock Market Explained! and What's a dark pool? + Lecture 1 Slides)

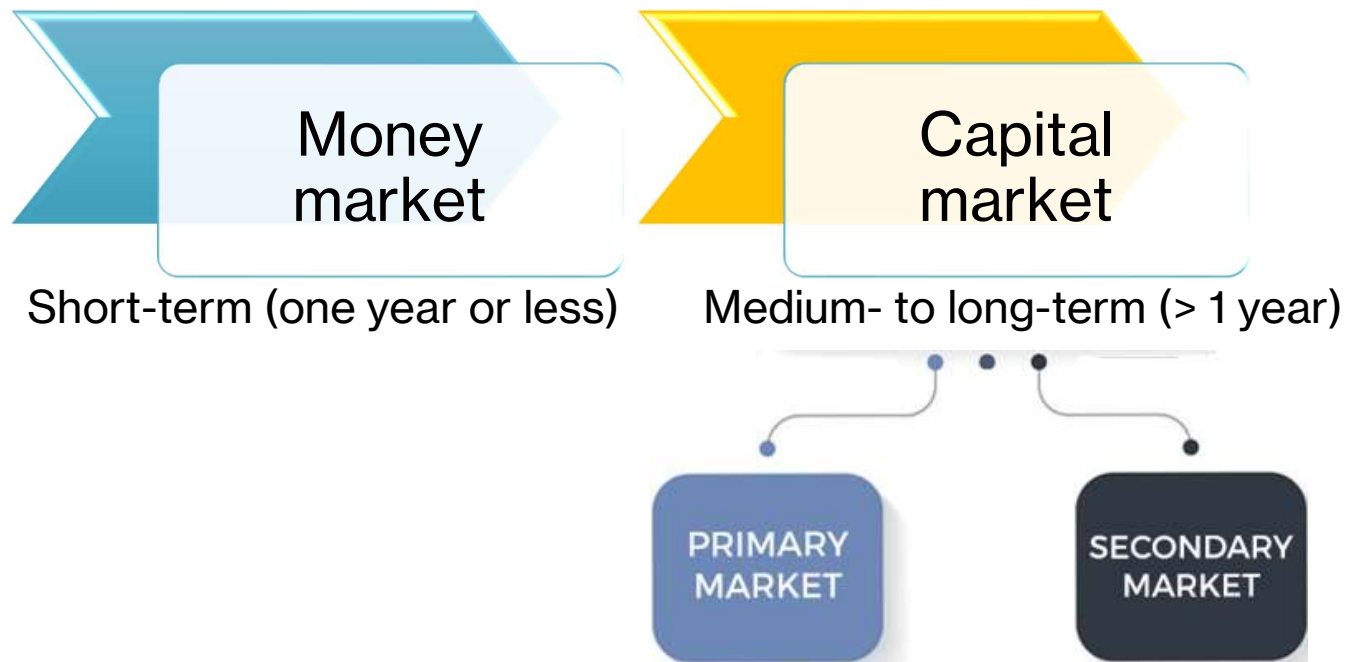


List three key financial statements → (VIDEO: How to Read Company Financial Statements + Lecture 1 Slides)



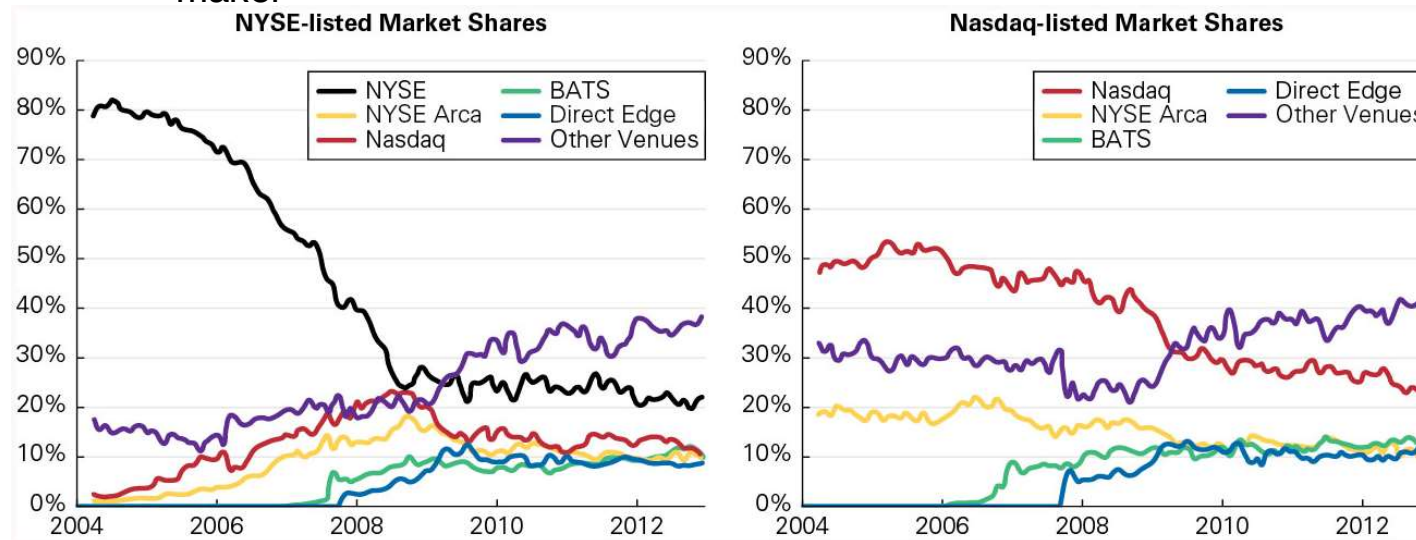
Evaluate financial performance of companies through financial statement analysis (ratio analysis) → Lecture 1 Slides

Financial Markets



NYSE, NASDAQ and New Traders

- New York Stock Exchange (NYSE)
 - Market Makers/Specialists
 - Each share has only one market maker
- NASDAQ (an over-the-counter market)
 - Does not meet in a physical location
 - May have many market makers for a single share



Source: J. Angel, L. Harris, and C. Spatt, "Equity Trading in the 21st Century: An Update," *Quarterly Journal of Finance* 5 (2015): 1-39.

Bid-ask price and spread: What is the bid-ask spread of NFLX?

Netflix, Inc. (NFLX)

NasdaqGS - NasdaqGS Real Time Price. Currency in USD

[★ Add to watchlist](#)**558.92** +8.80 (+1.60%)

At close: August 27 4:00PM EDT

[Summary](#) [Chart](#) [Conversations](#) [Statistics](#) [Historical Data](#) [Profile](#) [Financials](#) [Analysis](#) [Options](#) [Holders](#) [Sustainability](#)

Previous Close	550.12	Market Cap	247.376B
Open	551.60	Beta (5Y Monthly)	0.75
Bid	557.00 x 1100	PE Ratio (TTM)	57.91
Ask	558.92 x 1100	EPS (TTM)	9.65
Day's Range	549.50 - 563.86	Ex-Dividend Date	Oct 18, 2021 - Oct 22, 2021
52 Week Range	458.60 - 593.29	1y Target Price	611.49
Volume	3,252,595		
Market Volume	3,264,368		

Investors
buy at
\$558.92

Investors sell
at \$557.00



Bid-ask spread = 558.92 – 557.00 = \$1.92

Fintech: Finance and Technology



Telecommunication

- Telegraph (1840s-1970s)
- Digital CRT technology systems, computers and the Internet
- Microwave technology



Security and Verification

- Blockchain
- Cryptocurrency



Automation of Banking Services

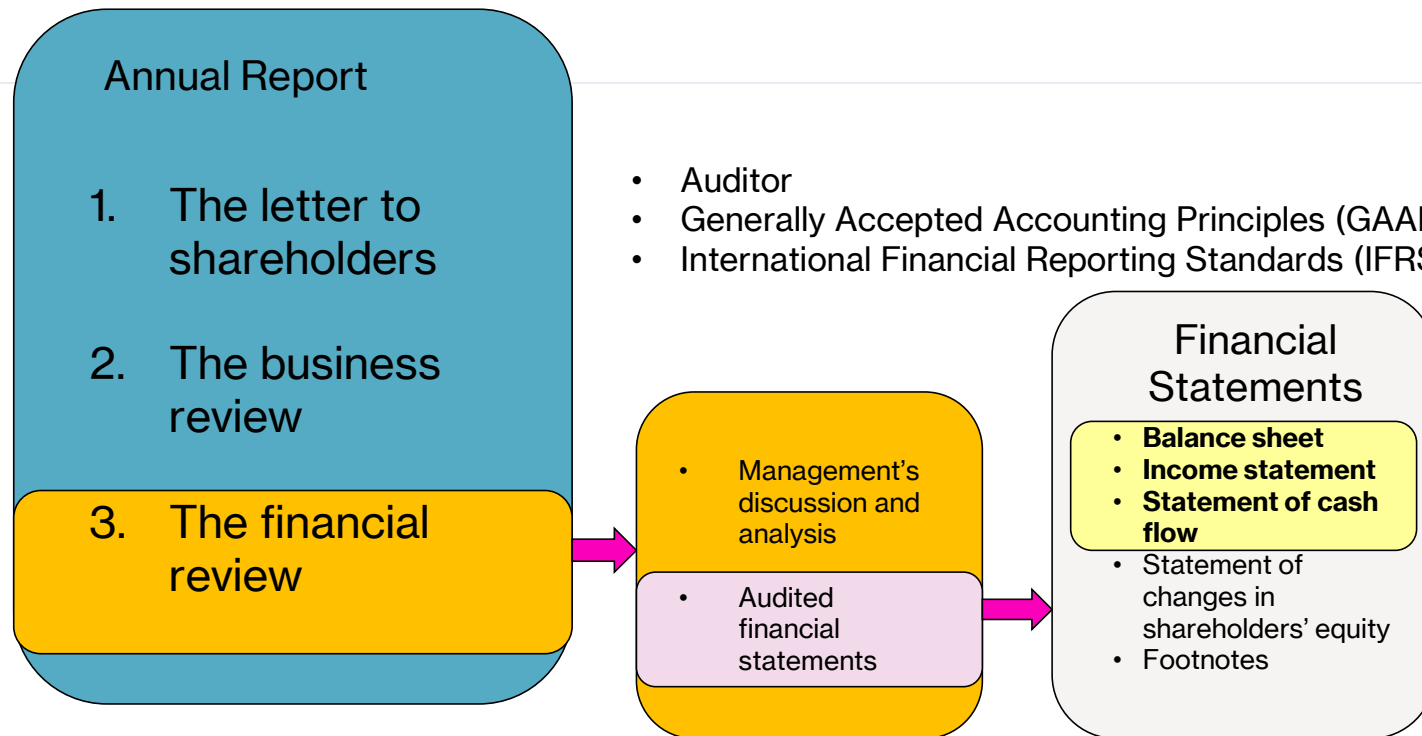
- ATM
- Robo-advisors



Big Data and Machine Learning

- Pattern recognition
- Smart algorithms

Annual Report & Financial Statements



Financial Statement Analysis in this course is NOT about

- Details of financial reporting rules
- Financial statement preparation
- Double-entry bookkeeping (T-accounts and journal entries)

Three Financial Statements

- Internally for firms, there are two main purposes of analyzing financial statements:
 - Evaluating performance
 - Understanding the levers of management control → the influence of operating decisions
- Information source for evaluating the financial health of a company
 1. **Balance sheet:** what a firm owns and owes at a point in time
 2. **Income statement:** how much a firm earned in the period of analysis
 3. **Statement of cash flow:** cash inflows and cash outflows to the firm during the period of analysis

1. Balance Sheet: General Format

TOTAL ASSETS = TOTAL LIABILITIES + EQUITY

Current assets

- Cash
- Marketable securities
- Accounts receivable
- Inventories

Noncurrent assets

- Net property, plant and equipment
- Goodwill and intangible assets

Net working capital

Current liabilities

- Accounts payable
- Notes payable
- Other short-term debts

Long-term liabilities

- Long-term debt
- Capital leases
- Deferred taxes

Shareholders' equity

- Stock
- Retained earnings

Balance Sheet: An Example

GLOBAL CONGLOMERATE CORPORATION			GLOBAL CONGLOMERATE CORPORATION		
Consolidated Balance Sheet Year Ended December 31 (in \$ million)			Consolidated Balance Sheet Year Ended December 31 (in \$ million)		
Assets	2018	2017	Liabilities and Stockholders' Equity	2018	2017
Current Assets			Current Liabilities		
Cash	21.2	19.5	Accounts payable	29.2	24.5
Accounts receivable	18.5	13.2	Notes payable/short-term debt	3.5	3.2
Inventories	15.3	14.3	Current maturities of long-term debt	13.3	12.3
Other current assets	2.0	1.0	Other current liabilities	2.0	4.0
Total current assets	57.0	48.0	Total current liabilities	48.0	44.0
Long-Term Assets			Long-Term Liabilities		
Land	22.2	20.7	Long-term debt	99.9	76.3
Buildings	36.5	30.5	Capital lease obligations	—	—
Equipment	39.7	33.2	Total debt	99.9	76.3
Less accumulated depreciation	(18.7)	(17.5)	Deferred taxes	7.6	7.4
Net property, plant, and equipment	79.7	66.9	Other long-term liabilities	—	—
Goodwill and intangible assets	20.0	20.0	Total long-term liabilities	107.5	83.7
Other long-term assets	21.0	14.0	Total Liabilities	155.5	127.7
Total long-term assets	120.7	100.9	Stockholders' Equity	22.2	21.2
Total Assets	177.7	148.9	Total Liabilities and Stockholders' Equity	177.7	148.9

2. Income Statement: General Format

Total sales

-Costs of sales

Earnings Before Interest, Taxes, Depreciation, Amortization (EBITDA)

-Depreciation, Amortization

Earnings Before Interest and Taxes (EBIT)

-Interest

Earnings before taxes (EBT)

-Taxes

Net income

-Dividends

Addition to retained earnings

Earnings per share

$$\text{EPS} = \frac{\text{Net Income}}{\text{Shares Outstanding}}$$

Income Statement: An Example

GLOBAL CONGLOMERATE CORPORATION

Income Statement Year Ended December 31 (in \$ million)

	2018	2017
Total sales	186.7	176.1
Cost of sales	(153.4)	(147.3)
Gross Profit	33.3	28.8
Selling, general, and administrative expenses	(13.5)	(13.0)
Research and development	(8.2)	(7.6)
Depreciation and amortization	(1.2)	(1.1)
Operating Income	10.4	7.1
Other income	—	—
Earnings Before Interest and Taxes (EBIT)	10.4	7.1
Interest income (expense)	(7.7)	(4.6)
Pretax Income	2.7	2.5
Taxes	(0.7)	(0.6)
Net Income	2.0	1.9
Earnings per share:	\$0.556	\$0.528
Diluted earnings per share:	\$0.526	\$0.500

3. Cash Flow Statement

- Detailed look at changes in a company's cash balance over time
- Focus: solvency → ensure that there is enough cash to pay bills as they come due
- An elaboration of a simple sources-and-uses statement by placing each source or use into one of three broad categories:
 - Cash flows from operating activities
 - Cash flows from investing activities
 - Cash flows from financing activities

Cash Flow Statement: An Example

GLOBAL CONGLOMERATE CORPORATION		
Statement of Cash Flows		
Year Ended December 31 (in \$ million)		
	2018	2017
Operating activities		
Net income	2.0	1.9
Depreciation and amortization	1.2	1.1
Other non-cash items	0.2	1.0
Cash effect of changes in		
Accounts receivable	(5.3)	(0.3)
Accounts payable	4.7	(0.5)
Inventory	(1.0)	(1.0)
Other net operating assets	(3.0)	(2.0)
Cash from operating activities	(1.2)	0.2
Investment activities		
Capital expenditures	(14.0)	(4.0)
Acquisitions and other investing activity	(7.0)	(2.0)
Cash from investing activities	(21.0)	(6.0)
Financing activities		
Dividends paid	(1.0)	(1.0)
Sale (or purchase) of stock	—	—
Increase in borrowing	24.9	5.5
Cash from financing activities	23.9	4.5
Change in cash and cash equivalents	1.7	(1.3)

Three cash flows

- Cash from operating activities
 - Operating cash flow = NI + Depreciation - inc in AR + inc in AP - inc in INV
- Cash from investing activities
 - Adjustment of acquisition and sales (divestiture) of fixed assets
 - Capital expenditures and acquisitions & other investing activities
 - Also includes acquisitions of other firms
- Cash from financing activities
 - Adjustment of issue and repurchase of equity, issue and repayment of debt and after dividend payments
 - Financing cash flow = – dividends paid + sale (or – purchase) of shares + increase (or – decrease) in ST borrowing + increase (or – decrease) in LT borrowing



Rule of thumb:

The sum of CF from operating, investing, financing activities should equal change in cash and marketable securities (e.g. see Table 2.3)

Cash Flow Statement: Sample Format

Cash Flow from Operations

Net profit after taxes

+ Depreciation

+ Decrease in accounts receivable

+ Decrease in inventories

+ Increase in accounts payable

+ Decrease in accruals

Cash provided by operations

Cash Flow from Investments

Increase in fixed assets

Change in business ownership

Cash provided by investment activities

Cash Flow from Financing Activities

– Decrease in notes payable

+ Increase in long-term debt

+ Changes in shareholders' equity

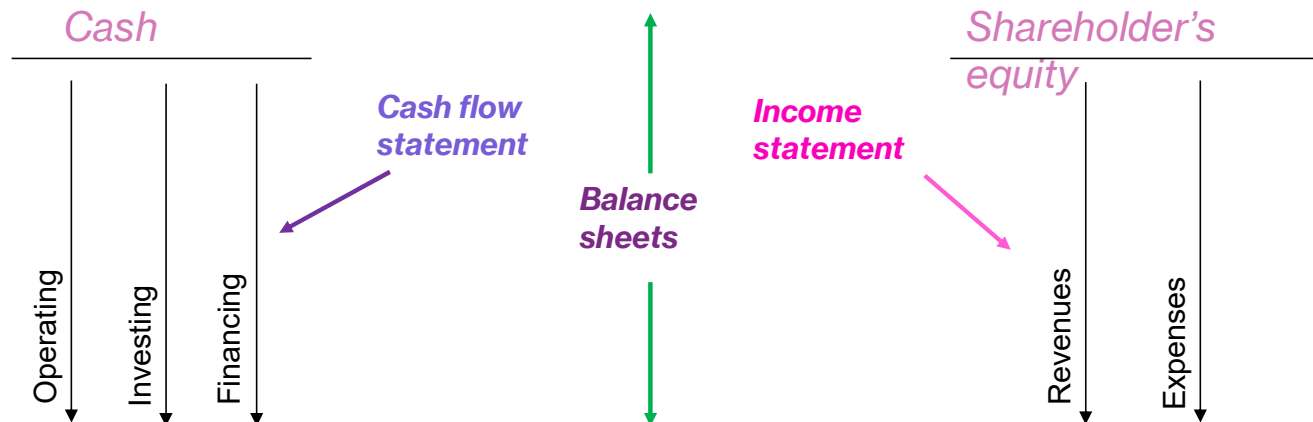
– Dividends paid

Cash provided by financing activities

Net increase/decrease in cash and marketable securities

Ties among the three financial statements

Assets at beginning = **Liabilities** at beginning + **Equity** at beginning



Assets at end = **Liabilities** at end + **Equity** at end

Financial Statement Analysis: What Do Investors Use It For?

- Compare the firm with **itself** by analyzing how the firm has changed over time (**time series analysis**)
- Compare the firm to other **similar firms** using a common set of financial ratios (**Cross sectional analysis**)

Two Most Frequently Used Techniques to Analyze Financial Statements

1. Common-size analysis
2. Financial ratio analysis

1. Common-Size Analysis

Common-size analysis is done by expressing financial data in the financial statements, in relation to a single financial statement item (vertical) or base year (horizontal).

- a. Horizontal common-size analysis** is useful when comparing growth of different accounts over time.
 - Highlights items that have changed unexpectedly or have unexpectedly remained unchanged.
- b. Vertical common-size analysis** highlights composition and identify what items are important.
 - Balance sheet: Aggregate amount is total assets.
 - Income statement: Aggregate amount is revenues or sales.

a. Horizontal Analysis (Balance Sheet)

Quality Department Store Inc. Condensed Balance Sheets December 31				
	2019	2018	Increase or (Decrease) during 2019	
			Amount	Percent
Assets				
Current assets	\$1,020,000	\$ 945,000	\$ 75,000	7.9%
Plant assets (net)	800,000	632,500	167,500	26.5%
Intangible assets	15,000	17,500	(2,500)	(14.3%)
Total assets	<u>\$1,835,000</u>	<u>\$1,595,000</u>	<u>\$240,000</u>	<u>15.0%</u>
Liabilities				
Current liabilities	\$ 344,500	\$ 303,000	\$ 41,500	13.7%
Long-term liabilities	487,500	497,000	(9,500)	(1.9%)
Total liabilities	<u>832,000</u>	<u>800,000</u>	<u>32,000</u>	<u>4.0%</u>
Stockholders' Equity				
Common stock, \$1 par	275,400	270,000	5,400	2.0%
Retained earnings	727,600	525,000	202,600	38.6%
Total stockholders' equity	<u>1,003,000</u>	<u>795,000</u>	<u>208,000</u>	<u>26.2%</u>
Total liabilities and stockholders' equity	<u>\$1,835,000</u>	<u>\$1,595,000</u>	<u>\$240,000</u>	<u>15.0%</u>

Changes suggest that the company expanded its asset base during 2019 and **financed this expansion primarily by retaining income** rather than assuming additional long-term debt.

a. Horizontal Analysis (Income Statement)

Quality Department Store Inc. Condensed Income Statements For the Years Ended December 31				
	2019	2018	Increase or (Decrease) during 2019	
			Amount	Percent
Sales revenue	\$2,195,000	\$1,960,000	\$235,000	12.0%
Sales returns and allowances	98,000	123,000	(25,000)	(20.3%)
Net sales	2,097,000	1,837,000	260,000	14.2%
Cost of goods sold	1,281,000	1,140,000	141,000	12.4%
Gross profit	816,000	697,000	119,000	17.1%
Selling expenses	253,000	211,500	41,500	19.6%
Administrative expenses	104,000	108,500	(4,500)	(4.1%)
Total operating expenses	357,000	320,000	37,000	11.6%
Income from operations	459,000	377,000	82,000	21.8%
Other revenues and gains				
Interest and dividends	9,000	11,000	(2,000)	(18.2%)
Other expenses and losses				
Interest expense	36,000	40,500	(4,500)	(11.1%)
Income before income taxes	432,000	347,500	84,500	24.3%
Income tax expense	168,200	139,000	29,200	21.0%
Net income	<u>\$ 263,800</u>	<u>\$ 208,500</u>	<u>\$ 55,300</u>	<u>26.5%</u>

Overall, gross profit and net income were up substantially. Gross profit increased by 17.1%, and net income, 26.5%. Quality's profit trend appears favorable.

b. Vertical Analysis (Balance Sheet)

Quality Department Store Inc. Condensed Balance Sheets December 31				
	2019		2018	
	Amount	Percent	Amount	Percent
Assets				
Current assets	\$1,020,000	55.6%	\$ 945,000	59.2%
Plant assets (net)	800,000	43.6%	632,500	39.7%
Intangible assets	15,000	0.8%	17,500	1.1%
Total assets	<u>\$1,835,000</u>	<u>100.0%</u>	<u>\$1,595,000</u>	<u>100.0%</u>
Liabilities				
Current liabilities	\$ 344,500	18.8%	\$ 303,000	19.0%
Long-term liabilities	487,500	26.5%	497,000	31.2%
Total liabilities	<u>832,000</u>	<u>45.3%</u>	<u>800,000</u>	<u>50.2%</u>
Stockholders' Equity				
Common stock, \$1 par	275,400	15.0%	270,000	16.9%
Retained earnings	727,600	39.7%	525,000	32.9%
Total stockholders' equity	<u>1,003,000</u>	<u>54.7%</u>	<u>795,000</u>	<u>49.8%</u>
Total liabilities and stockholders' equity	<u>\$1,835,000</u>	<u>100.0%</u>	<u>\$1,595,000</u>	<u>100.0%</u>

These results reinforce the earlier observations that **Quality is choosing to finance its growth through retention of earnings rather than through issuing additional debt.**

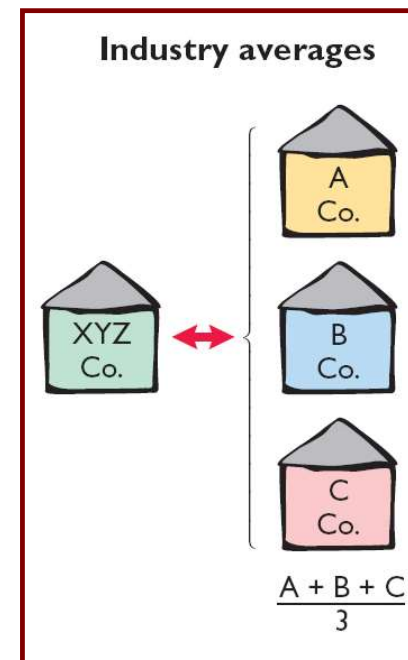
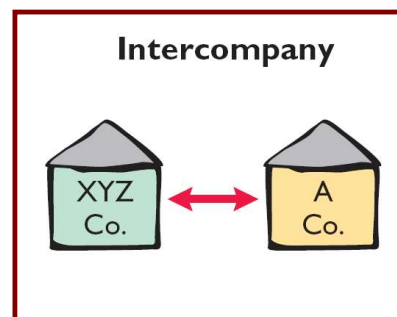
b. Vertical Analysis (Income Statement)

Quality Department Store Inc. Condensed Income Statements For the Years Ended December 31				
	2019		2018	
	Amount	Percent	Amount	Percent
Sales revenue	\$2,195,000	104.7%	\$1,960,000	106.7%
Sales returns and allowances	98,000	4.7%	123,000	6.7%
Net sales	2,097,000	100.0%	1,837,000	100.0%
Cost of goods sold	1,281,000	61.1%	1,140,000	62.1%
Gross profit	816,000	38.9%	697,000	37.9%
Selling expenses	253,000	12.0%	211,500	11.5%
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Income before income taxes	432,000	20.6%	347,500	18.9%
Income tax expense	168,200	8.0%	139,000	7.5%
Net income	\$ 263,800	12.6%	\$ 208,500	11.4%

Quality appears to be a profitable enterprise that is becoming even more successful.

2. Financial Ratio Analysis

- **Financial ratio analysis** is the use of relationships among financial statement accounts to gauge the financial condition and performance of a company.
 - The ratio analysis enables comparative analysis:



Seven types of key financial ratios (see next slide)

Types of Ratios

Ratio	Financial Statement	Description
Profitability	Income statement	How much and how is the firm achieving returns on its investments?
Liquidity	Balance sheet	How well can the firm meet its short-term obligations?
Working capital	Income statement & balance sheet	How efficient is the firm in utilizing its net working capital?
Interest coverage	Income statement	How well is the firm's ability to meet its interest obligations?
Leverage	Balance sheet	To what extent does the firm rely on debt as a source of financing?
Valuation	Balance sheet, income statement and market data	How does the firm's performance or financial position relate to its market value?
Operating returns	Income statement & balance sheet	How efficient is the firm's operating assets?

Table 2.4

Key Financial Ratios for Large U.S. Firms, Spring 2018

(Data shows quartiles [25% median, 75%] for U.S. stocks with market capitalization over \$1 billion)

Profitability Ratios		Leverage Ratios (continued)	
Gross Margin [28%, 43%, 67%]	$\frac{\text{Gross Profit}}{\text{Sales}}$	Debt-to-Capital Ratio [20%, 40%, 57%]	$\frac{\text{Total Debt}}{\text{Total Equity} + \text{Total Debt}}$
Operating Margin [6%, 12%, 22%]	$\frac{\text{Operating Income}}{\text{Sales}}$	Debt-to-Enterprise Value Ratio [-3%, 10%, 25%]	$\frac{\text{Net Debt}}{\text{Enterprise Value}}$
EBIT Margin [5%, 11%, 18%]	$\frac{\text{EBIT}}{\text{Sales}}$	Equity Multiplier (book) [1.8x, 2.5x, 4.3x]	$\frac{\text{Total Assets}}{\text{Book Value of Equity}}$
Net Profit Margin [2%, 7%, 15%]	$\frac{\text{Net Income}}{\text{Sales}}$	Equity Multiplier (market) [1.0x, 1.1x, 1.4x]	$\frac{\text{Enterprise Value}}{\text{Market Value of Equity}}$
Liquidity Ratios		Valuation Ratios	
Current Ratio [1.2x, 1.8x, 2.9x]	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$	Market-to-Book Ratio [1.8x, 3.1x, 6.1x]	$\frac{\text{Market Value of Equity}}{\text{Book Value of Equity}}$
Quick Ratio [0.7x, 1.2x, 2.0x]	$\frac{\text{Cash \& Short-term Investments} + \text{Accounts Receivable}}{\text{Current Liabilities}}$	Price-Earnings Ratio [16.1x, 23.7x, 37.9x]	$\frac{\text{Share Price}}{\text{Earnings per Share}}$
Cash Ratio [0.1x, 0.4x, 0.9x]	$\frac{\text{Cash}}{\text{Current Liabilities}}$	Enterprise Value to Sales [1.5x, 2.7x, 5.0x]	$\frac{\text{Enterprise Value}}{\text{Sales}}$
Working Capital Ratios		Enterprise Value to EBIT [13.9x, 18.3x, 26.9x]	$\frac{\text{Enterprise Value}}{\text{EBIT}}$
Accounts Receivable Days [33, 51, 68]	$\frac{\text{Accounts Receivable}}{\text{Average Daily Sales}}$	Enterprise Value to EBITDA [9.9x, 13.0x, 18.3x]	$\frac{\text{Enterprise Value}}{\text{EBITDA}}$
Accounts Payable Days [26, 43, 65]	$\frac{\text{Accounts Payable}}{\text{Average Daily Cost of Sales}}$	Operating Returns	
Inventory Days [28, 59, 96]	$\frac{\text{Inventory}}{\text{Average Daily Cost of Sales}}$	Asset Turnover [0.3x, 0.6x, 1.0x]	$\frac{\text{Sales}}{\text{Total Assets}}$
Interest Coverage Ratios		Return on Equity (ROE) [3%, 10%, 18%]	$\frac{\text{Net Income}}{\text{Book Value of Equity}}$
EBIT/Interest Coverage [2.5x, 5.7x, 12.8x]	$\frac{\text{EBIT}}{\text{Interest Expense}}$	Return on Assets (ROA) [-1%, 3%, 7%]	$\frac{\text{Net Income} + \text{Interest Expense}}{\text{Book Value of Assets}}$
EBITDA/Interest Coverage [4.7x, 8.6x, 17.1x]	$\frac{\text{EBITDA}}{\text{Interest Expense}}$	Return on Invested Capital (ROIC) [6%, 12%, 20%]	$\frac{\text{EBIT} (1 - \text{Tax Rate})}{\text{Book Value of Equity} + \text{Net Debt}}$
Leverage Ratios			
Debt-Equity Ratio (book) [24%, 62%, 124%]	$\frac{\text{Total Debt}}{\text{Book Value of Equity}}$		
Debt-Equity Ratio (market) [6%, 21%, 47%]	$\frac{\text{Total Debt}}{\text{Market Value of Equity}}$		

Financial statements & the value problem

**Financial statements have the recurring problem of valuation:
Market value versus Book value**

- **Market value: forward looking**
- **Book value: backward looking (transactions-based)**

Equity: Book Value (BV) vs. Market Value (MV)

- BV of equity =
BV of assets – BV of Liabilities

- MV of equity (market capitalization) =
Number of shares outstanding *
Market price per share

Market Value Added (MVA) = MV of equity – BV of equity

Market-to-Book Ratio (Price-to-Book Ratio)

$$\text{Market-to-Book Ratio} = \frac{\text{Market Value of Equity}}{\text{Book Value of Equity}}$$

- Value stocks (low M/B ratios)
- Growth stocks (high M/B ratios)

$$\text{Enterprise Value} = \text{Market Value of Equity} + \text{Debt} - \text{Cash}$$

Return on Equity (ROE)

- A measure of the *efficiency* with which a company employs owners' capital.
- In other words, a measure of *company financial* performance

$$\text{Return on equity} = \frac{\text{Net income}}{\text{Equity}}$$

Three Determinants of ROE (DuPont Identity)

$$ROE = \underbrace{\frac{NetIncome}{Sales}} * \underbrace{\frac{Sales}{Assets}} * \underbrace{\frac{Assets}{Shareholders' Equity}}$$

ROE = Net profit margin * Asset turnover * Financial leverage (equity multiplier)

- Profit margin: the earnings squeezed out of each dollar of sales (profit per dollar of sales)
- Asset turnover: the sales generated from each dollar of assets employed (resources/assets required to support sales)
- Financial leverage: the amount of equity used to finance the assets (shareholders' equity used to finance the assets)

Example: The DuPont Identity

Suppose that an analyst has noticed that the ROE of a Company has declined from FY2020 to FY2021. Using the DuPont identity formula, explain the source of this decline.

<i>(millions)</i>	<u>2021</u>	<u>2020</u>
Revenues	\$1,000	\$900
Earnings before interest and taxes	\$400	\$380
Interest expense	\$30	\$30
Taxes	\$100	\$90
Total assets	\$2,000	\$2,000
Shareholders' equity	\$1,250	\$1,000

Ref.: CFA Institute

Example: The DuPont Identity Formula

	2021	2020
Return on equity (decrease)	0.216	0.260
Financial leverage (decrease)	1.60	2.00
Total asset turnover (increase)	0.50	0.45
Net profit margin (decrease)	0.27	0.29
Return on assets (increase)	0.135	0.130

Ref.: CFA Institute

Cautions in Using Financial Ratio Analysis

- Computation \neq Analysis:
 - Computing a ratio is not the final answer (except sometimes in the exam 😊)
 - Analysis entails computations and interpretations.
- Ratios are context dependent
 - Different users and questions (e.g., creditors, investors) focus on different ratios.
 - Some ratios are irrelevant for certain companies.
- Differences in accounting standards can limit comparability.

Post-Lecture Learning Activities

- There are exercises for you to do! (see Brightspace, use Week 1 Checklist).
- We will discuss the details of the technicality of financial statement analysis in Workshop 1 (Thursday, 7 September) (given by Aleksandrina Ralcheva)
- In Workshop 1, you also have the chance to do the first bonus question!
- See you next week (Tuesday, 12 Sept at 10.45-12.30). Thank you!