ACC 1701X: Accounting for Decision Makers
Lecture 12

Lecturer: Dr. Hanny Kusnadi

11 weeks of accounting gone in a flash!

Your accounting adventure is almost complete…

All the good stuff we have learnt so far…
(Lecture 1-11 Quick Refresher)

1) Assets = Liabilities + Equity
2) Debit (left) /Credit (right) : T-accounts & journal entries
   - Asset increase on debit, Liabilities & Equity increase on credit
   - Revenue increase on credit, expenses increase on debit
3) Accrual accounting : adjusting journal entries (AJEs) to put revenues & expenses in the right period
4) Preparing FS using adjusted trial balance & Closing the books:
   - Income Statement → Statement of Changes in Equity → Statement of Financial Position
   - Close temporary accounts (revenues, expenses & dividends) to Retained Earnings
5) Financial Statements Integrity
   - Fixing errors in financial statements
   - Internal Controls

All the good stuff we have learnt so far…
(Lecture 1-11 Quick Refresher)

6) Receivables, allowance for impairment loss & bad debt expense
   - Target ending balance of allowance account (AR aging analysis)

     → Use movements in the allowance account (beg bal, write-offs) to figure out the period's bad debt expense.
   - Write-offs reduces allowance account – does not affect NI!

7) Cash & Current Liabilities:
   - Bank reconciliation: follow the 9 simple steps in bank rec!
   - Known liabilities, estimated liabilities (warranty), contingent liabilities

8) Merchandising Inventory:
   - Perpetual (directly record purchases/discounts/COGS etc… into Inventory)

   vs. Periodic (COGS is calculated at period end using COGS equation)
   - Cost of inventory methods: FIFO, Units of production, Average weighted

All the good stuff we have learnt so far…
(Lecture 1-11 Quick Refresher)

9) PPE (Long Term Assets):
   - Tangibles: Depreciate using straight line, units of production & declining balance
   - Change in depreciation estimates – recalculate depreciation moving forward.
   - Intangibles: Amortize using straight line for intangibles with definite life

10) Equity:
   - Issuance of shares: Ordinary shares & Preferred shares
   - Par value vs No Par value shares
   - Repurchase shares → Treasury shares
   - Dividends: cash & stock.

11) Statement of Cash Flows
   - Cash Flows from Operations (CFO) – Indirect Method
   - Cash Flows from Investing (CFI) -
   - Cash Flows from Financing (CFF)

Chapter 15

Financial Statement Analysis (FSA)

Bringing it all together!

We are going to learn how to use all the good stuff that we have learnt from the last 11 lectures to analyze financial statements!

Goals for Lecture 10

Financial Statement Analysis

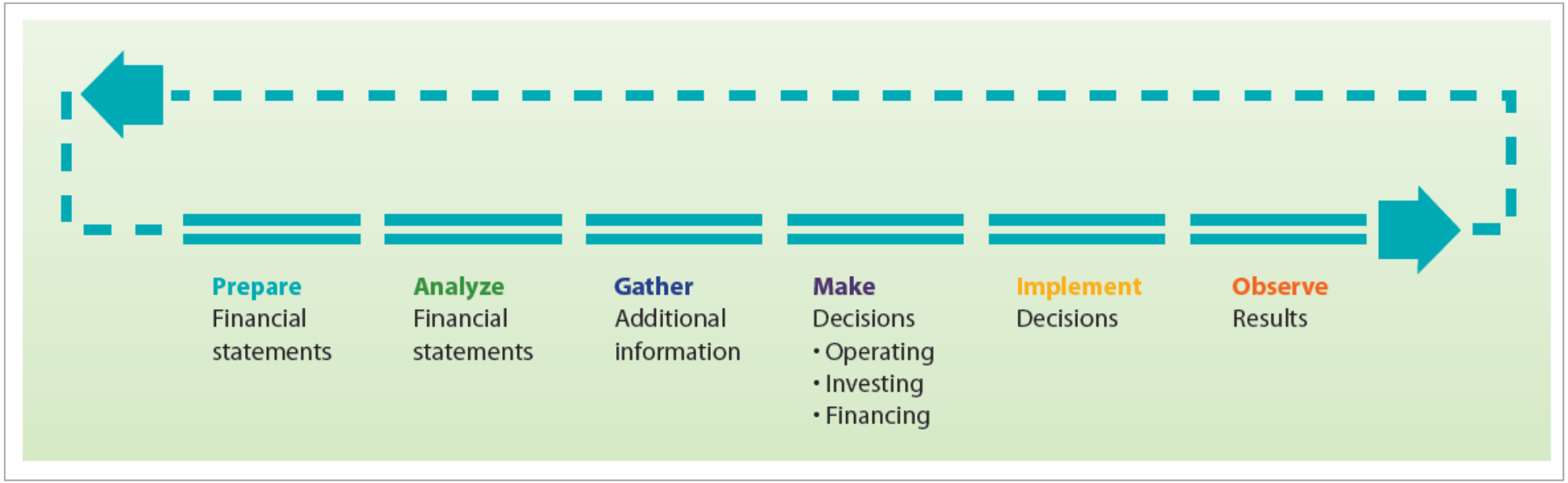
- Why do we need FSA? (LO1)
  - Building blocks of analysis
- Types of Analysis:
  - Vertical Analysis (LO2)
  - Horizontal Analysis (LO2)
  - Financial Ratios Analysis (LO3)
  - DuPont Analysis (LO4)
- Limitation of FSA (LO5)

Why analyze financial statements?

- Why do companies spend billions of dollars every year preparing, auditing and publishing financial statements?

→ **Because financial statements helps users make better economic decisions!**

- External users: Investors (current stockholders & potential investors), Financial analysts, Creditors, Customers
- Internal users: Management



What is Financial Statement Analysis (FSA)?

- Financial statements are not created from a void - it is a reflection of a company's strategy and decisions and the results of implementing those decisions.
- Analyzing financial statement involves:
  - Examining relationship between the financial numbers and the trends of those numbers
  - Examining relationship between various financial statement amounts
- FSA is used for:

(1) Diagnostic purposes – helps users to evaluate and identify problems in a company

(2) Prognostic purposes – helps users to predict future performance of a company based on its part performance

Building Blocks of Financial Analysis

- 4 main elements of a company's financial performance for analysis:

Standards for Comparison

- **Financial statements cannot be evaluated in isolation.**
- It needs to be compared to appropriate benchmarks/standards:

(1) Intracompany - Time series analysis

- Examines a single company to identify trends **over time**. Comparing to its own prior performance.
- E.g. Looking at the trend of sales growth from year to year

(2) Comparison with similar companies (competitors)

- Comparing to a competitor in the same industry can provide insights concerning a company's relative performance, because companies in the same industry are exposed to the same industry factors.

(3) Industry benchmarks

- Industry statistics can provide standards of comparisons (e.g. Dun & Bradstreet, Standard & Poor's, and Moody's)

FSA Analysis Tools

3 common types of financial statement analysis:

(1) **Vertical analysis** – compares company's performance to a base amount

(2) **Horizontal analysis** – compares company's performance across time

(3) **Ratio analysis -** measures the proportional relationship between two or more financial statement numbers.

- DuPont Analysis – a framework used to decompose ROE ratio.

#1 Vertical Analysis
Common-size Statements

- Common-size Statements express each item on the financial statement as a percentage of a single base amount.
  - Also known as Component Percentages

$$\textbf{Common-size Percent} = \frac{\textbf{Analysis amount}}{\textbf{Base amount}} \times 100$$

- For the **balance sheet**, the base amount is **total assets** (i.e. each balance sheet item is thus divided by the total assets)
- For the **income statement**, the base amount is **net sales revenue**.

Common-size Sample
SFP

ADIDAS
Comparative Statements of Financial Position
December 31, 2018 and December 31, 2017

(in EUR millions)	2018	2017	Common-Size Percents 2018	Common-Size Percents 2017
Cash and cash equivalents	2,629	1,598	16.8%	11.4%
Short-term financial assets	6	5	0.0%	0.0%
Accounts receivable	2,418	2,315	15.5%	16.5%
Other current financial assets	542	393	3.5%	2.8%
				26.3%
				0.5%
Other current assets	725	498	4.6%	3.6%
Assets classified as held for sale	0	72	0.0%	0.5%
Total cur				
Property, p				
Goodwill	1,245	1,220	8.0%	8.7%
Trademarks	844	806	5.4%	5.7%
Other intangible assets	196	154	1.3%	1.1%
Long-term financial assets	276	236	1.8%	1.7%
Other non-current financial assets	256	219	1.6%	1.6%
Deferred tax assets	651	630	4.2%	4.5%
Other non-current assets	94	108	0.6%	0.8%
Total non-current assets	5,799	5,374	37.1%	38.3%
Total assets	15,612	14,019	100.0%	100.0%

(2,629 ÷ 15,612) × 100 = 16.8%

(1,598 ÷ 14,019) × 100 = 11.4%

Common-size Sample IS

ADIDAS
Comparative Income Statements
For Years Ended December 31, 2018 and December 31, 2017

(in EUR millions)	2018	2017	Common-Size Percents 2018	Common-Size Percents 2017
Net sales	21,915	21,218	100.0%	100.0%
Cost of sales	10,552	10,514	48.1%	49.6%
Gross profit	11,363	10,703	51.9%	50.4%
Royalty and commission income	129	115	0.6%	0.5%
Other operating income	48	17	0.2%	0.1%
Other operating expenses	9,172	8,766	41.9%	41.3%
Mark				.8%
Dist				.3%
Gen				.4%
Sundry expenses	105	130	0.5%	0.6%
Impairment losses (net) on accounts receivable and contract assets	41	37	0.2%	0.2%
Operating profit	2,368	2,070	10.8%	9.8%
Financial income	57	46	0.3%	0.2%
Financial expenses	47	93	0.2%	0.4%
Income before taxes	2,378	2,023	10.9%	9.5%
Income taxes	669	668	3.1%	3.1%
Net income from continuing operations	1,709	1,354	7.8%	6.4%
Losses/gains from discontinued operations, net of tax	5	254	0.0%	1.2%
Net income	1,704	1,100	7.8%	5.2%
Net income attributable to shareholders	1,702	1,097	7.8%	5.2%
Net income attributable to non-controlling interests	3	3	0.0%	0.0%

(10,552 ÷ 21,915) × 100 = 48.1%

Percents are rounded to tenths and thus may not exactly sum to totals and subtotals.

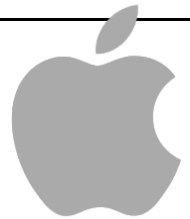
Real FS – Dell
Common Size Income Statement

	Income Statement				Common-size Income Statement			
	31-Jan-21	31-Jan-20	1-Feb-19	2-Feb-18	31-Jan-21	31-Jan-20	1-Feb-19	2-Feb-18
Revenue								
Products	69,911	69,918	70,707	60,898	74.2%	75.9%	78.0%	77.0%
Services	24,313	22,236	19,914	18,142	25.8%	24.1%	22.0%	23.0%
Total Revenue	**94,224**	**92,154**	**90,621**	**79,040**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Cost of Revenue								
Products	55,347	54,525	57,889	51,433	58.7%	59.2%	63.9%	65.1%
Services	9,460	8,696	7,679	7,070	10.0%	9.4%	8.5%	8.9%
Total Cost of Revenue	64,807	63,221	65,568	58,503	68.7%	68.6%	72.4%	74.0%
Gross profit	**29,417**	**28,933**	**25,053**	**20,537**	**31.3%**	**31.4%**	**27.6%**	**26.0%**
Selling, general & admin expenses	18,998	21,319	20,640	18,569	20.2%	23.1%	22.8%	23.5%
R&D	5,275	4,992	4,604	4,384	5.6%	5.4%	5.1%	5.5%
Operating Profit	**5,144**	**2,622**	**(191)**	**(2,416)**	**5.5%**	**2.9%**	**-0.3%**	**-3.0%**
Interest expense & other	1,474	2,626	2,170	2,353	1.6%	2.8%	2.4%	3.0%
Income Tax Expense (benefit)	165	(5,533)	(180)	(1,843)	0.2%	-6.0%	-0.2%	-2.3%
Profit for the year	**3,505**	**5,529**	**(2,181)**	**(2,926)**	**3.7%**	**6.1%**	**-2.5%**	**-3.7%**

Real FS – Samsung
Common Size Income Statement

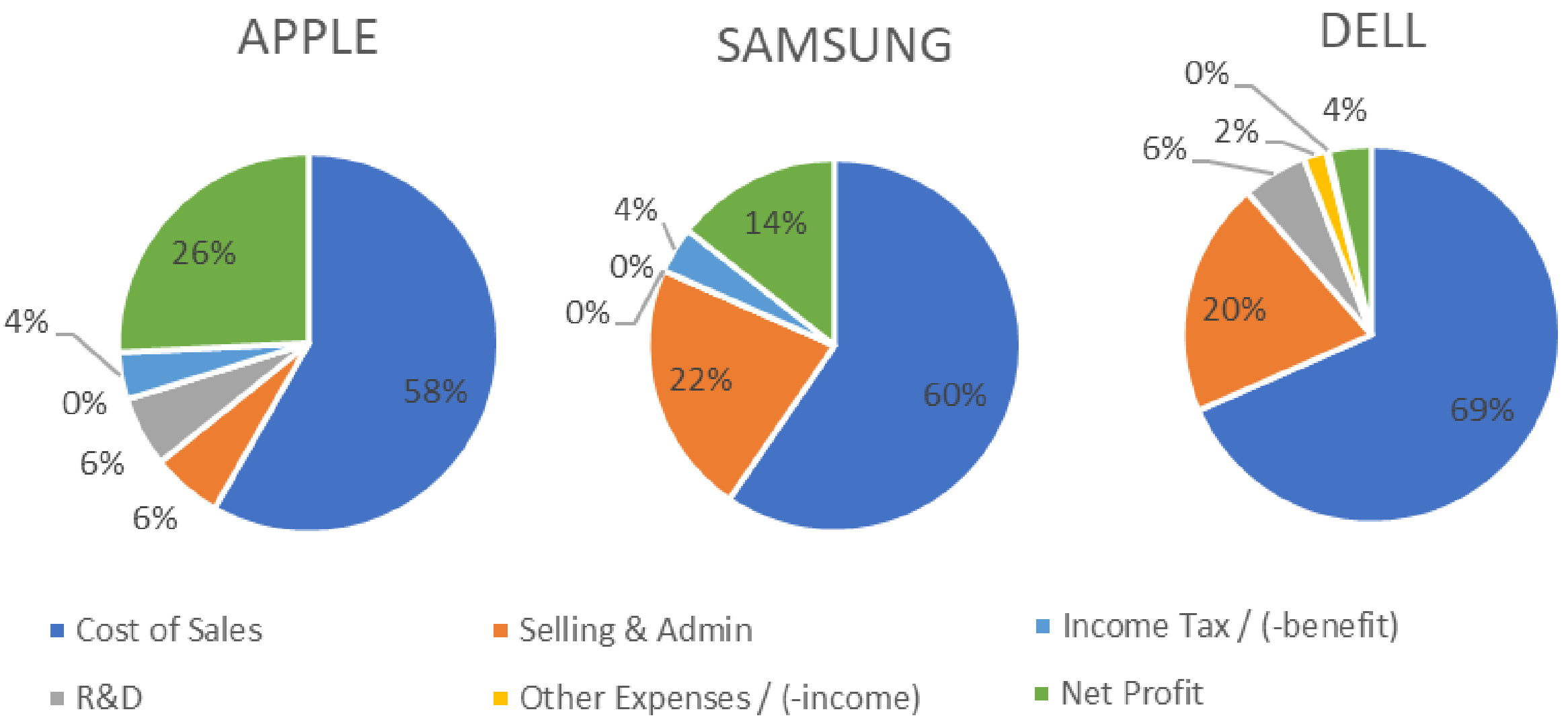
In KRW	Income Statement				Common-size Income Statement			
	31-Dec-21	31-Dec-20	31-Dec-19	31-Dec-18	31-Dec-21	31-Dec-20	31-Dec-19	31-Dec-18
Total Revenue	**279,604,799**	**236,806,988**	**230,400,881**	**243,771,415**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Cost of Sales	166,411,342	144,488,296	147,239,549	132,394,411	59.5%	61.0%	63.9%	54.3%
Gross profit	**113,193,457**	**92,318,692**	**83,161,332**	**111,377,004**	**40.5%**	**39.0%**	**36.1%**	**45.7%**
Selling and admin expenses	61,559,601	56,324,816	55,392,823	52,490,335	22.0%	23.8%	24.0%	21.5%
Operating Profit	**51,633,856**	**35,993,876**	**27,768,509**	**58,886,669**	**18.5%**	**15.2%**	**12.1%**	**24.2%**
Other non-operating income	2,205,695	1,384,068	1,778,666	1,485,037	0.8%	0.6%	0.8%	0.6%
Other non-operating expense	2,055,971	2,488,902	1,414,707	1,142,018	0.7%	1.1%	0.6%	0.5%
Share of associates & jv net profit	729,614	506,530	412,960	539,845	0.3%	0.2%	0.2%	0.2%
Financial income	8,543,187	12,267,600	10,161,632	9,999,321	3.1%	5.2%	4.4%	4.1%
Financial expense	7,704,554	11,318,055	8,274,871	8,608,896	2.8%	4.8%	3.6%	3.5%
Income tax	13,444,377	9,937,285	8,693,324	16,815,101	4.8%	4.2%	3.8%	6.9%
Profit for the year	**39,907,450**	**26,407,832**	**21,738,865**	**44,344,857**	**14.4%**	**11.2%**	**9.4%**	**18.2%**

Real FS – Apple
Common Size Income Statement



	Income Statement				Common-size Income Statement			
	25-Sep-21	26-Sep-20	28-Sep-19	29-Sep-18	25-Sep-21	26-Sep-20	28-Sep-19	29-Sep-18
Revenue								
Products	297,392	220,747	213,883	225,847	81.3%	80.4%	82.2%	85.0%
Services	68,425	53,768	46,291	39,748	18.7%	19.6%	17.8%	15.0%
Total Revenue	**365,817**	**274,515**	**260,174**	**265,595**	**100.0%**	**100.0%**	**100.0%**	**100.0%**
Cost of Revenue								
Products	192,266	151,286	144,996	148,164	52.6%	55.1%	55.7%	55.8%
Services	20,715	18,273	16,786	15,592	5.7%	6.7%	6.5%	5.9%
Total Cost of Revenue	212,981	169,559	161,782	163,756	58.3%	61.8%	62.2%	61.7%
Gross profit	**152,836**	**104,956**	**98,392**	**101,839**	**41.7%**	**38.2%**	**37.8%**	**38.3%**
Selling, general & admin expenses	21,914	19,916	18,245	16,705	6.0%	7.3%	7.0%	6.3%
R&D	21,973	18,752	16,217	14,236	6.0%	6.8%	6.2%	5.4%
Operating Profit	**108,949**	**66,288**	**63,930**	**70,898**	**29.7%**	**24.1%**	**24.6%**	**26.6%**
Other income	258	803	1,807	2,005	0.1%	0.3%	0.7%	0.8%
Income Tax	14,527	9,680	10,481	13,372	4.0%	3.5%	4.0%	5.0%
Profit for the year	**94,680**	**57,411**	**55,256**	**59,531**	**25.8%**	**20.9%**	**21.3%**	**22.4%**

Common Size Graphic - IS
Dell vs. Samsung vs. Apple



Real FS – Dell
Common Size SFP

	Statement of Financial Position			Common-size SFP		
	31-Jan-21	31-Jan-20	1-Feb-19	31-Jan-21	31-Jan-20	1-Feb-19
Assets						
Cash and marketable securities	14,201	9,302	9,676	11.5%	7.8%	8.7%
AR	12,788	12,484	12,371	10.4%	10.5%	11.1%
Inventories	3,402	3,281	3,649	2.8%	2.8%	3.3%
Other Current Assets	13,176	11,801	10,442	10.7%	9.9%	9.3%
PPE	6,431	6,055	5,259	5.2%	5.1%	4.7%
Goodwill & Intangibles	55,258	59,798	62,359	44.8%	50.3%	55.8%
Other Non Current Assets	18,159	16,140	8,064	14.6%	13.6%	7.1%
Total Assets	**123,415**	**118,861**	**111,820**	**100.0%**	**100.0%**	**100.0%**
Current Liabilities	54,132	52,456	44,972	43.9%	44.1%	40.2%
Non Current Liabilities	61,258	62,621	66,594	49.6%	52.7%	59.6%
Total Liabilities	115,390	115,077	111,566	93.5%	96.8%	99.8%
Total Shareholders Equity	8,025	3,784	254	6.5%	3.2%	0.2%
Total Liabilities & Equity	**123,415**	**118,861**	**111,820**	**100.0%**	**100.0%**	**100.0%**

Food for thoughts:

- Is Dell a manufacturing company? Where are its PPE?
- Why is its intangibles so high?
- Look at Dell's capital structure, is it healthy?

Real FS – Apple
Common Size SFP

	Statement of Financial Position			Common-size SFP		
	25-Sep-21	26-Sep-20	28-Sep-19	25-Sep-21	26-Sep-20	28-Sep-19
Assets						
Cash and marketable securities	62,639	90,943	100,557	17.8%	28.1%	29.7%
AR	26,278	16,120	22,926	7.5%	5.0%	6.8%
Inventories	6,580	4,061	4,106	1.9%	1.3%	1.2%
Other Current Assets	39,339	32,589	35,230	11.2%	10.1%	10.4%
PPE	39,440	36,766	37,378	11.2%	11.4%	11.0%
Goodwill & Intangibles	0	0	0	0.0%	0.0%	0.0%
Other Non Current Assets	176,726	143,409	138,319	50.4%	44.1%	40.9%
Total Assets	**351,002**	**323,888**	**338,516**	**100.0%**	**100.0%**	**100.0%**
Current Liabilities	125,481	105,392	105,718	35.7%	32.5%	31.3%
Non Current Liabilities	162,431	153,157	142,310	46.3%	47.3%	42.0%
Total Liabilities	287,912	258,549	248,028	82.0%	79.8%	73.3%
Total Shareholders Equity	63,090	65,339	90,488	18.0%	20.2%	26.7%
Total Liabilities & Equity	**351,002**	**323,888**	**338,516**	**100.0%**	**100.0%**	**100.0%**

Food for thoughts:

- > 50% of marketable securities, is it a bank or a high-tech company?
- Why do you think there are no intangibles?
- With so much cash, why doesn't Apple pay down its long term liabilities?

Consist mainly of long-term marketable securities!

Real FS – Samsung
Common Size SFP

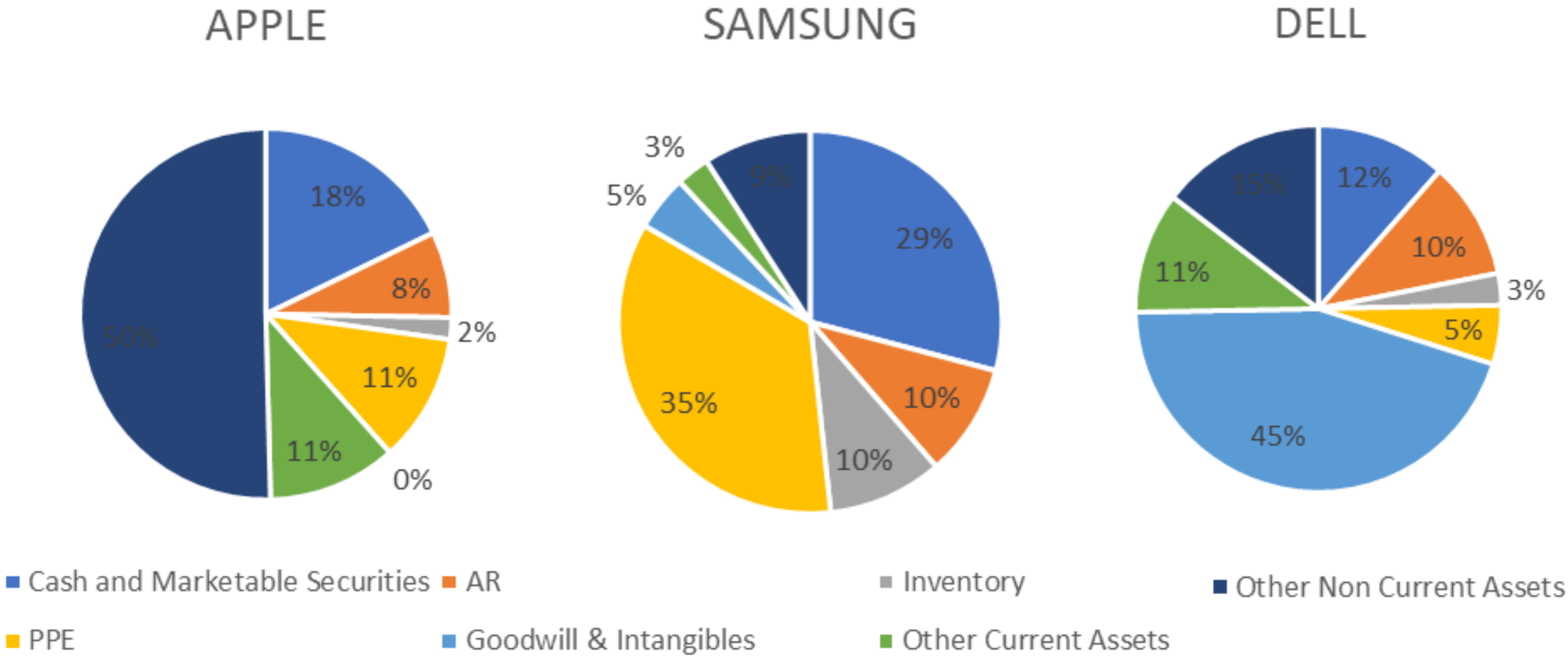
	Statement of Financial Position			Common-size SFP		
In KRW	31-Dec-21	31-Dec-20	31-Dec-19	31-Dec-21	31-Dec-20	31-Dec-19
Assets						
Cash and marketable securities	124,150,192	124,652,843	108,779,703	29.1%	33.0%	30.9%
AR	40,713,415	30,965,058	35,131,343	9.5%	8.2%	10.0%
Inventories	41,384,404	32,043,145	26,766,464	9.7%	8.5%	7.6%
Other Current Assets	11,915,174	10,554,533	8,507,750	2.8%	2.8%	2.4%
PPE	149,928,539	128,952,892	119,825,474	35.1%	34.1%	34.0%
Goodwill & Intangibles	20,236,244	18,468,502	20,703,504	4.7%	4.9%	5.9%
Other Non Current Assets	38,293,190	32,598,745	32,850,259	9.1%	8.5%	9.4%
Total Assets	**426,621,158**	**378,235,718**	**352,564,497**	**100.0%**	**100.0%**	**100.0%**
Current Liabilities	88,117,133	75,604,351	63,782,764	20.7%	20.0%	18.1%
Non Current Liabilities	33,604,094	26,683,351	25,901,312	7.9%	7.1%	7.3%
Total Liabilities	121,721,227	102,287,702	89,684,076	28.6%	27.1%	25.4%
Total Shareholders Equity	304,899,931	275,948,016	262,880,421	71.4%	72.9%	74.6%
Total Liabilities & Equity	**426,621,158**	**378,235,718**	**352,564,497**	**100.0%**	**100.0%**	**100.0%**

Food for thoughts:

- How would you interpret the difference in Dell's, Apple's and Samsung's PPE %?
- What can you infer from its capital structure?

Common Size Graphic – SFP: ASSETS
Dell vs. Samsung vs. Apple

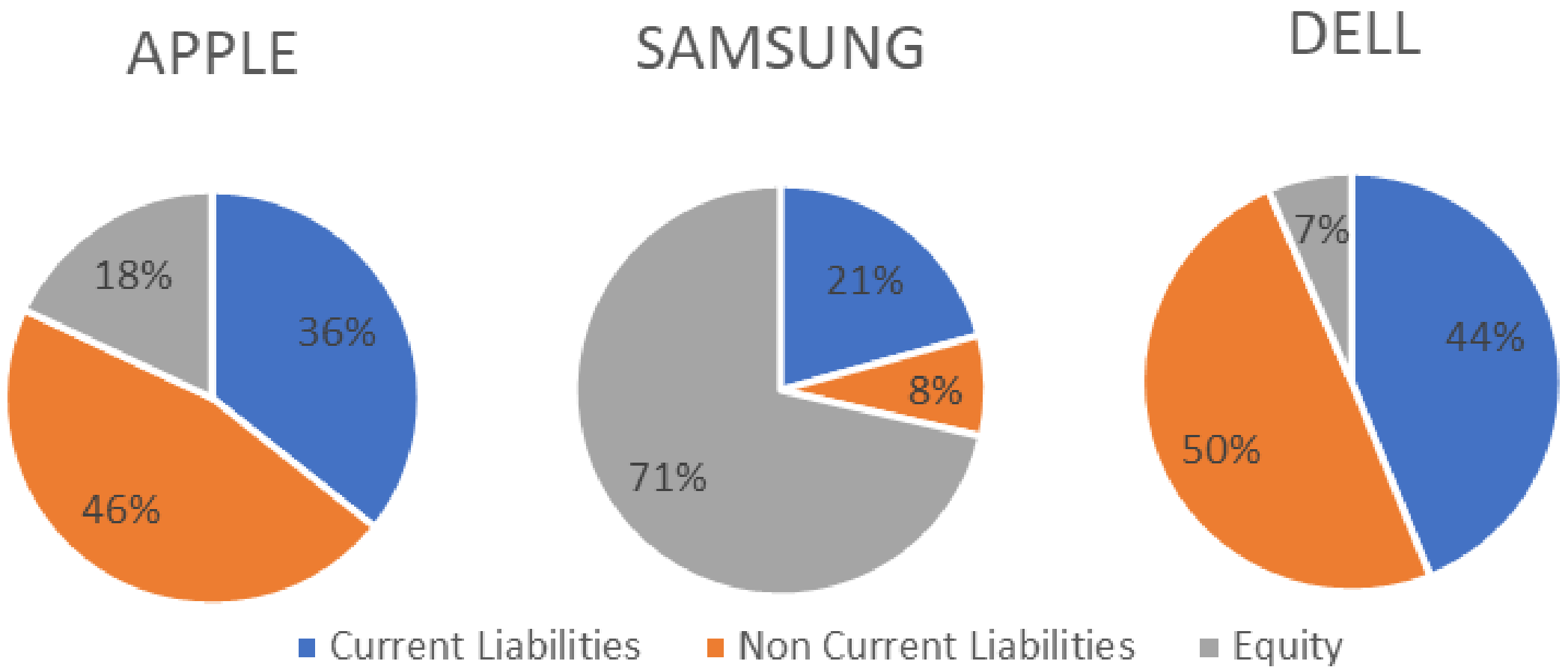
- 3 companies in the same industry with very different asset composition!



Common Size Graphic – Capital Structure
Dell vs. Samsung vs. Apple

- Which company relies more on debt? On equity?

Food for thoughts:
- If you were to run a company, which capital structure would you go for? Why?



#2 Horizontal Analysis
Comparative Statements

- Comparing two or more successive periods (e.g. compare 2021 & 2020) – helps to capture the trend of financial data in a company
- Analyzing changes in financial statements' line items:

(i) Dollar change : changes from year to year (typically prior year = base year)

$$\text{Dollar Change} = \text{Analysis period amount} - \text{Base period amount}$$

(ii) Percent change : changes from year to year in percentages

$$\text{Percent Change} = \frac{\text{Analysis period amount} - \text{Base period amount}}{\text{Base period amount}} \times 100$$

(iii) Trend Analysis : helps to reveal patterns over successive periods

$$\text{Trend Percent} = \frac{\text{Analysis period amount}}{\text{Base period amount}} \times 100$$

Horizontal Analysis Sample

ADIDAS
Comparative Statements of Financial Position
December 31, 2018 and December 31, 2017

(in EUR millions)	2018	2017	Euro Change	Percent Change
Cash and cash equivalents	2,629	1,598	1,031	64.5%
Short-term financial assets	6	5	1	20.0%
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Other current financial assets	542	393	149	37.9%
Inventories				(6.7%)
Income tax receivables				(32.4%)
Other current assets	725	498	227	45.6%
Assets classified as held for sale	0	72	(72)	(100.0%)
Total current assets	9,813	8,645	1,168	13.5%
Property, plant and equipment				
Goodwill	1,245	1,220	25	2.0%
Trademarks	844	806	38	4.7%
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Other non-current financial assets	256	219	37	16.9%
Deferred tax assets	651	630	21	3.3%
Other non-current assets	94	108	(14)	(13.0%)
Total non-current assets	5,799	5,374	425	7.9%
Total assets	15,612	14,019	1,593	11.4%

2,629 – 1,598 = 1,031

1,031 ÷ 1,598 × 100 = 64.5%

Horizontal Analysis (Year to Year)
Tencent's Income Statement

	2021	2020	*Dollar Change*	*% Change*
Revenue	560,118	482,064	*78,054*	*16.19%*
Cost of Revenues	314,174	260,532	*53,642*	*20.59%*
Gross profit	**245,944**	**221,532**	*24,412*	*11.02%*
Interest Income	6,650	6,957	*(307)*	*-4.41%*
Other gains, net	149,467	57,131	*92,336*	*161.62%*
Selling & marketing expenses	40,594	33,758	*6,836*	*20.25%*
General and administrative expenses	89,847	67,625	*22,222*	*32.86%*
Operating Profit	**271,620**	**184,237**	*87,383*	*47.43%*
Finance costs	7,114	7,887	*(773)*	*-9.80%*
Share of loss/(gain) of associates & jv	16,444	(3,672)	*20,116*	*-547.82%*
Profit before tax	**248,062**	**180,022**	*68,040*	*37.80%*
Tax expense	20,252	19,897	*355*	*1.78%*
Profit for the year	**227,810**	**160,125**	*67,685*	*42.27%*

Horizontal Analysis (Year to Year)
Tencent's Statement of Financial Position

	2021	2020	*Dollar Change*	*% Change*
Current Assets	484,812	317,647	*167,165*	*52.63%*
Non Current Assets	1,127,552	1,015,778	*111,774*	*11.00%*
Total Assets	**1,612,364**	**1,333,425**	*278,939*	*20.92%*
Current Liabilities	403,098	269,079	*134,019*	*49.81%*
Non Current Liabilities	332,573	286,303	*46,270*	*16.16%*
Total Liabilities	**735,671**	**555,382**	*180,289*	*32.46%*
Equity:				
Share Capital & Premium	67,330	48,793	*18,537*	*37.99%*
Shares held of share award	(4,843)	(4,412)	*(431)*	*9.77%*
Other Reserves	73,901	121,139	*(47,238)*	*-38.99%*
Retained Earnings	669,911	538,464	*131,447*	*24.41%*
NCI (Non controlling interests)	70,394	74,059	*(3,665)*	*-4.95%*
Total Equity	876,693	778,043	*98,650*	*12.68%*
Total Liabilities & Equity	**1,612,364**	**1,333,425**	*278,939*	*20.92%*

Trend Analysis Sample

(EUR millions)	2014	2015	2016	2017	2018
Net sales	14,534	16,915	18,483	21,218	21,915
Cost of sales	7,610	8,748	9,383	10,514	10,552

In percents	2014	2015	2016	2017	2018
Net sales	100.0%	116.4%	127.2%	146.0%	150.8%
Cost of sales	100.0%	115.0%	123.3%	138.2%	138.7%

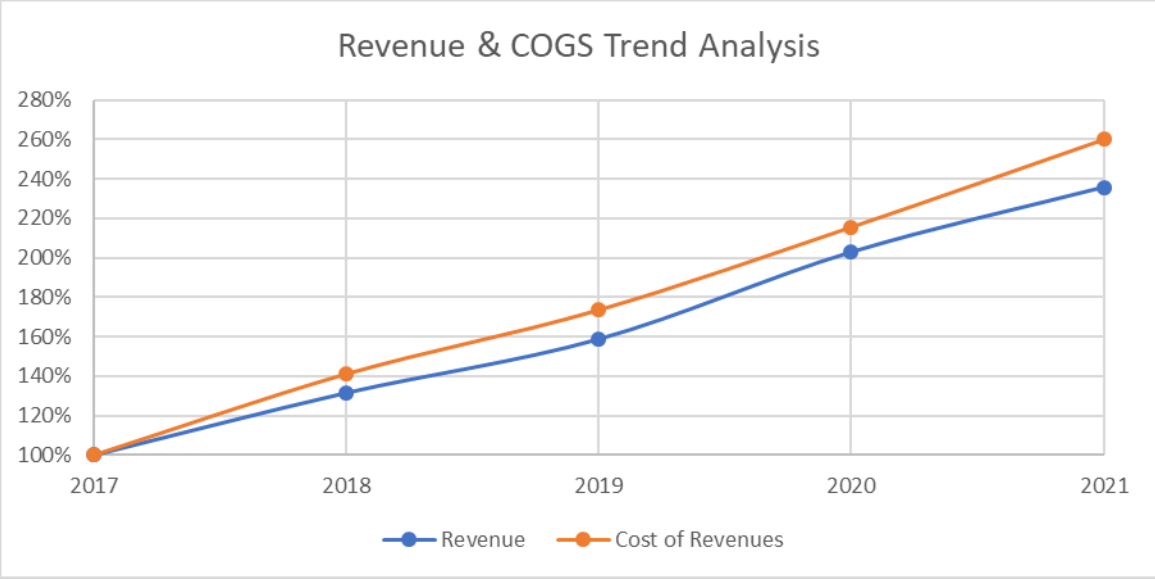
Example of 2018 Calculations for Net Sales:

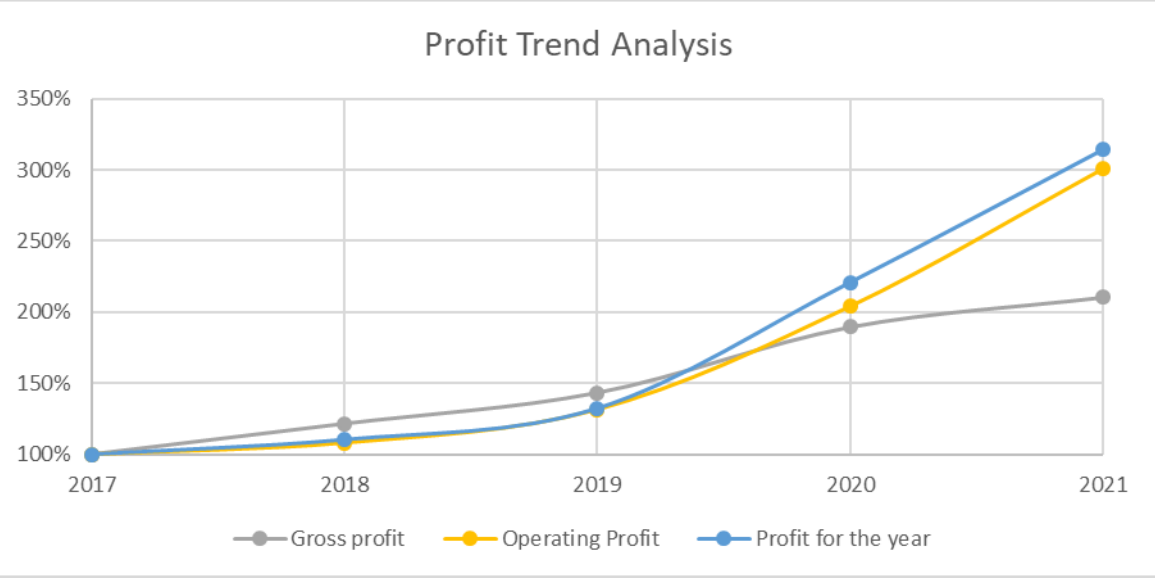
2014 is base year. Set to 100%

2018: 21,915 ÷ 14,534 × 100 = 150.8%

Tencent 5 Years Trend Analysis
(using 2017 as the base period)

	2017	2018	2019	2020	2021
Revenue	100%	132%	159%	203%	236%
Cost of Revenues	100%	141%	174%	216%	260%
Gross profit	**100%**	**122%**	**143%**	**189%**	**210%**
Operating Profit	**100%**	**108%**	**131%**	**204%**	**301%**
Profit for the year	**100%**	**110%**	**132%**	**221%**	**314%**





#3. Ratio Analysis

- Most widely used tools for financial analysis
- Helps to identify trends and uncover conditions in a company
- Usefulness depends on user's interpretation
- Based on the four building blocks of financial analysis:

A. Profitability Ratios

B. Liquidity & Efficiency Ratios

C. Solvency Ratios

D. Market Prospects Ratio

#3 Ratio Analysis
A. Profitability Ratios

- Profitability is a primary measure of a company's ability to generate an adequate return on invested capital.
- Profitability ratios compare income relative to other items on the financial statements.

i) Return on Equity (ROE)

- How much income is earned per dollar investment made by ordinary shareholders

$$\textbf{Return on Equity (ROE)} = \frac{\textbf{Net Income – Preferred Dividends}}{\textbf{Average Ordinary Shareholders' Equity}}$$

ii) Return on Assets (ROA)

- How much income is earned per dollar of assets.
- Measures how effective management is in utilizing its assets to generate income.

$$\textbf{Return on Assets (ROA)} = \frac{\textbf{Net Income}}{\textbf{Average Total Assets}}$$

#3 Ratio Analysis
A. Profitability Ratios

iii) Net Profit Margin

- How many percent of each dollar of sales is profit.
- A measure of overall efficiency of the company

$$\textbf{Net Profit Margin} = \frac{\textbf{Net Income}}{\textbf{Net Sales}}$$

- Can also calculate different types of profit margins:

(a) Gross Profit Margin = Gross profit / Net Sales

- A measure of company's efficiency in selling above its production cost)

(b) Operating Profit Margin = Operating Income / Net Sales

- A measure of company's operating efficiency of its main operations.

#3 Ratio Analysis
A. Profitability Ratios

iv) Earnings per Share

- Measures the profitability of a company: its ability to produce income for each ordinary share outstanding.

$$\textbf{Basic EPS} = \frac{\textbf{Net Income – Preferred Dividends}}{\textbf{Weighted-average Ordinary Shares Outstanding}}$$

- Required disclosure on the Income Statement!
- Companies must also disclose **diluted EPS** which assumed all convertible securities are converted into ordinary shares.

Real FS: TENCENT
Profitability Ratios

	2021	2020	2019	Trend
ROE (attributable to owners)	29.85%	28.12%	24.68%	↑
ROA (attributable to owners)	15.26%	13.98%	11.12%	↑
Net Profit Margin	40.67%	33.22%	25.42%	↑
Gross Profit Margin	43.91%	45.95%	44.40%	↔
EPS	23.60	16.84	9.86	↑

Note: Beware of jumping into conclusions when analyzing ratios – always look deeper!

#3 Ratio Analysis
B. Liquidity & Efficiency Ratios

- Liquidity is a company's ability to meet its short-term (current) obligations - focuses on relationship between current assets and current liabilities.
- Efficiency measures how productive/efficient a company uses its assets.

i) Current Ratio

- Measures a firm's ability to pay its current obligations with current assets.

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

ii) Acid-Test Ratio

- A more stringent test of short-term liquidity than current assets, because we are only taking into consideration "quick assets" (cash + short term financial assets + current receivables).

$$\textbf{Acid-test Ratio} = \frac{\textbf{Quick Assets}}{\textbf{Current Liabilities}}$$

#3 Ratio Analysis
B. Liquidity & Efficiency Ratios

iii) Accounts Receivable Turnover Ratio

- How effective is the company at collecting cash from its customers

$$\text{Accounts Receivables Turnover} = \frac{\text{Net Sales}}{\text{Average Net Receivables}}$$

iv) Days' Sales Uncollected

- Measures the average days it takes a company to collect cash from its credit customers.

$$\text{Days' Sales Uncollected} = \frac{365}{\text{Accounts Receivable Turnover}}$$

#3 Ratio Analysis
B. Liquidity & Efficiency Ratios

v) Inventory Turnover Ratio

- Measures number of times merchandise is sold and replaced during the year
- Used to assess if company is controlling inventory well

$$\text{Inventory Turnover} = \frac{\text{COGS}}{\text{Average Inventory}}$$

vi) Days' Sales in Inventory

- Measures the average days it takes a company to sell its inventory.
- Useful to assess company's liquidity of inventory

$$\text{Days' Sales in Inventory} = \frac{365}{\text{Inventory Turnover}}$$

#3 Ratio Analysis
B. Liquidity & Efficiency Ratios

vii) Days' Purchases in Accounts Payable

- Measures the average days it takes a company to pay cash to its suppliers

$$\textbf{Days' Purchases in AP} = \frac{\textbf{365}}{\textbf{Purchases / Average AP}}$$

#3 Ratio Analysis
B. Liquidity & Efficiency Ratios

viii) Total Asset Turnover

- Measures a company's ability to use its assets to generate sales

$$\text{Total Asset Turnover} = \frac{\text{Net Sales}}{\text{Average Total Assets}}$$

ix) Fixed Asset (PPE) Turnover

- Measures a company's ability to use its fixed assets to generate sales

$$\text{Fixed Asset Turnover} = \frac{\text{Net Sales}}{\text{Average Fixed Assets (PPE)}}$$

Working Capital

Working capital represents current assets that do not require near-term repayment.

	Current assets
–	Current liabilities
=	Working capital

More working capital suggests a strong liquidity position and an ability to meet current obligations.

Real FS: TENCENT
Liquidity & Efficiency Ratios

	2021	2020	2019	Trend
Current Ratio	1.20	1.22	1.06	
Acid Test Ratio	0.75	1.02	0.90	
AR Turnover Ratio	11.88	11.93	11.74	
Days' Sales Uncollected	30.73	30.60	31.09	
Inventory Turnover Ratio	335.34	340.12	402.60	
Days' Sales in Inventory	1.09	1.07	0.91	
Days' Purchases in AP	118.01	122.39	134.36	
Total Asset Turnover	0.38	0.42	0.45	
Fixed Asset Turnover	9.20	9.04	9.21	
Working Capital (in RMB'Million)	81,714	57,568	13,812	

What can you learn about its cash management from the AR and AP ratios?

Look into the FS for inventory

Note: Beware of jumping into conclusions when analyzing ratios – always look deeper!

Tencent 腾讯

#3 Ratio Analysis
C. Solvency Ratios

- Solvency is a company's ability to meet its long-term obligations.
- A company needs solvency to stay in business.
- Analysis of a company's capital structure is an important component of solvency analysis

i) Times Interest Earned Ratio

- Can a company meet its interest obligations from its operations?
- Indicates how many times a company is able to pay its interest with its income before interest and tax.

$$\text{Times Interest Earned} = \frac{\text{Earnings before Interest and Tax (EBIT)}}{\text{Interest Expense}}$$

#3 Ratio Analysis
C. Solvency Ratios

ii) Debt Ratio

- Measures how much liabilities a company has relative to its asset.
- Useful to assess the financial leverage of a company - how reliant a company is on debt. Remember that debt is risky, so heavy reliance on debt increases a company's risk.

$$\text{Debt Ratio} = \frac{\text{Total Liabilities}}{\text{Total Assets}}$$

iii) Debt-to-Equity Ratio

- Measures how much liabilities a company has relative to its equity
- Value of 1.0 indicates that the amount of borrowing is equal to the amount of stockholder investment

$$\text{Debt-to-Equity Ratio} = \frac{\text{Total Liabilities}}{\text{Total Equity}}$$

Real FS: TENCENT
Solvency Ratios

	2021	2020	2019	Trend
Times Interest Earned Ratio	32.33	23.83	15.37	
Debt Ratio	0.46	0.42	0.49	
Debt-to-Equity Ratio	0.92	0.79	1.08	

Note: Beware of jumping into conclusions when analyzing ratios – always look deeper!

#3 Ratio Analysis
D. Market Prospects Ratios

- Ratios that tend to measure the market worth of a share of stock - useful for analyzing public companies
- These ratios are sometimes preferred because they are based on current value of owner's investment in the company, which includes market expectation's of the company's return and risk.

i) Price-to-Earnings Ratio (P/E Ratio)

- Measures a company's current share price relative to its per-share earnings.

$$\text{P/E Ratio} = \frac{\text{Market Price per Ordinary Share}}{\text{Earnings per Share (EPS)}}$$

- Also known as the "price multiple". It shows how much the market value the company relative to the company's current earning power.
- A company with a high P/E ratio means that the market expects high growth from the company. It could also be an indication of overvaluation.

#3 Ratio Analysis
D. Market Prospects Ratios

ii) Dividend Yield Ratio

- Measures the amount of cash dividends distributed to ordinary shares relative to market value
- Useful to assess an investor's return on investment on the company based on dividends - often used to compare the dividend-paying performance of different investment alternatives

$$\text{Dividend Yield} = \frac{\text{Dividends per Share}}{\text{Market Price per Share}}$$

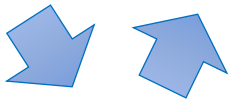
Apr 29, 2019, 04:08pm EDT | 2,781 views

Warren Buffett Should Pay Berkshire Investors Dividends Now

Source: Forbes

Alamak, stop asking me for dividends! What part of "NO DIVIDENDS EVER" do you not understand?!?!

Real FS: TENCENT
Market Prospects Ratios

	2021	2020	2019	Trend
PE Ratio	19.36	33.60	38.11	
Dividend Yield	0.35%	0.28%	0.32%	

Note: Beware of jumping into conclusions when analyzing ratios – always look deeper!

#3 Ratio Analysis
Cash Flow Ratios

- Companies need cash to operate so it is important to analyze the cash flow of companies.
- Usefulness of Cash Flow Ratios:
  - Large Non-cash Expenses – e.g. large write-offs or depreciation will cause NI to be lower, thus reflecting a less positive picture of performance.
  - Rapid Growth – e.g. burning cash operationally to grow require sufficient cash flow
  - Window Dressing – companies may manipulate net income through accrual assumptions, cash flow is less susceptible to manipulation

#3 Ratio Analysis
Cash Flow Ratios

i) Cash Flow to Net Income

- Reflects the extent to which accrual accounting assumptions and adjustments have been included in computing net income.

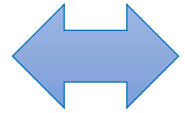
$$\textbf{Cash Flow to Net Income} = \frac{\textbf{Cash Flow from Operations}}{\textbf{Net Income}}$$

ii) Cash Flow Adequacy

- Used to assess if a company is generating enough cash flow from its operations to pay for its capital expenditures (CAPEX) in PPE and still have cash left over to either be used for paying liabilities or for its stockholders.
- A business that generates excess cash from its operations is referred to as a "cash cow".

$$\textbf{Cash Flow Adequacy} = \frac{\textbf{Cash Flow from Operations}}{\textbf{Cash paid for CAPEX}}$$

Real FS: TENCENT
Cash Flow Ratios

	2021	2020	2019	Trend
Cash Flow to Net Income	0.77	1.21	1.55	
Cash Flow Adequacy	5.98	5.70	6.53	

Note: Beware of jumping into conclusions when analyzing ratios – always look deeper!

DuPont Framework
Breaking down ROE

$$\textbf{Return on Equity (ROE)} = \frac{\textbf{Net Income}}{\textbf{Average Total Equity}}$$

- DuPont Analysis – a systematic approach to break down (ROE) to three components:

$$\begin{aligned}
\text{Return on equity} &= \text{Profitability} \times \text{Efficiency} \times \text{Leverage} \\
&= \text{Return on sales} \times \text{Asset turnover} \times \text{Assets-to-equity ratio} \\
&= \frac{\text{Net income}}{\text{Net sales}} \times \frac{\text{Net sales}}{\text{Average total assets}} \times \frac{\text{Average total assets}}{\text{Average total equity}}
\end{aligned}$$

Profitability = The company's ability to generate net income per dollar of sales

Efficiency = The ability of the company to generate sales through the use of assets

Leverage = The degree to which a company uses borrowed funds instead of invested funds

DuPont Framework
ROE (Attributable to Ordinary Shareholders)

- Recall that ROE can also be calculated based on amounts attributable to ordinary shareholders:

$$\textbf{Return on Equity (ROE)} = \frac{\textbf{Net Income – Preferred Dividends}}{\textbf{Average Ordinary Shareholders' Equity}}$$

- Thus, the Dupont analysis can also be calculated as:

$$\textbf{Return on Equity} = \frac{\textbf{Net Income (attributable to ordinary shareholders)}}{\textbf{Net Sales}} \times \frac{\textbf{Net Sales}}{\textbf{Average Total Assets}} \times \frac{\textbf{Average Total Assets}}{\textbf{Average Equity (attributable to ordinary shareholders)}}$$

In-class activity: DuPont Analysis
Tencent vs Facebook (2020)

FY 2020

		Profitability (Profit Margin)		**Efficiency (TA Turnover)**		**Leverage (Assets to Equity Ratio)**
Return on Equity (Attributable to Owners)	=	Net Income (attributable to owners) / Net Sales	x	Net Sales / Average Total Assets	x	Average Total Assets / Average Total Equity (attributable to owners)
Tencent 腾讯	=	$159,847 / $482,064	x	$482,064 / $1,143,706	x	$1,143,706 / $568,345
	=	**0.332**	x	**0.421**	x	**2.012**
	=	**0.281**				

Return on Equity	=	Net Income / Net Sales	x	Net Sales / Average Total Assets	x	Average Total Assets / Average Total Equity
Meta	=	$29,146 / $85,965		$85,965 / $146,346		$146,346 / $114,672
	=	**0.339**	x	**0.587**	x	**1.276**
	=	**0.254**				

In-class activity: DuPont Analysis
Tencent vs Facebook (2021)

FY 2021

		Profitability (Profit Margin)		**Efficiency (TA Turnover)**		**Leverage (Assets to Equity Ratio)**
Return on Equity (Attributable to Owners)	=	Net Income (attributable to owners) / Net Sales	x	Net Sales / Average Total Assets	x	Average Total Assets / Average Total Equity (attributable to owners)
Tencent 腾讯	=	$224,822 / $560,118	x	$560,118 / $1,472,895	x	$1,472,895 / $753,142
	=	0.401	x	0.380	x	1.956
	=	**0.299**				

Return on Equity	=	Net Income / Net Sales	x	Net Sales / Average Total Assets	x	Average Total Assets / Average Total Equity
Meta	=	$39,370 / $117,929		$117,929 / $162,652		$162,652 / $126,585
	=	0.334	x	0.725	x	1.285
	=	**0.311**				

Limitations of FS and Ratio Analysis

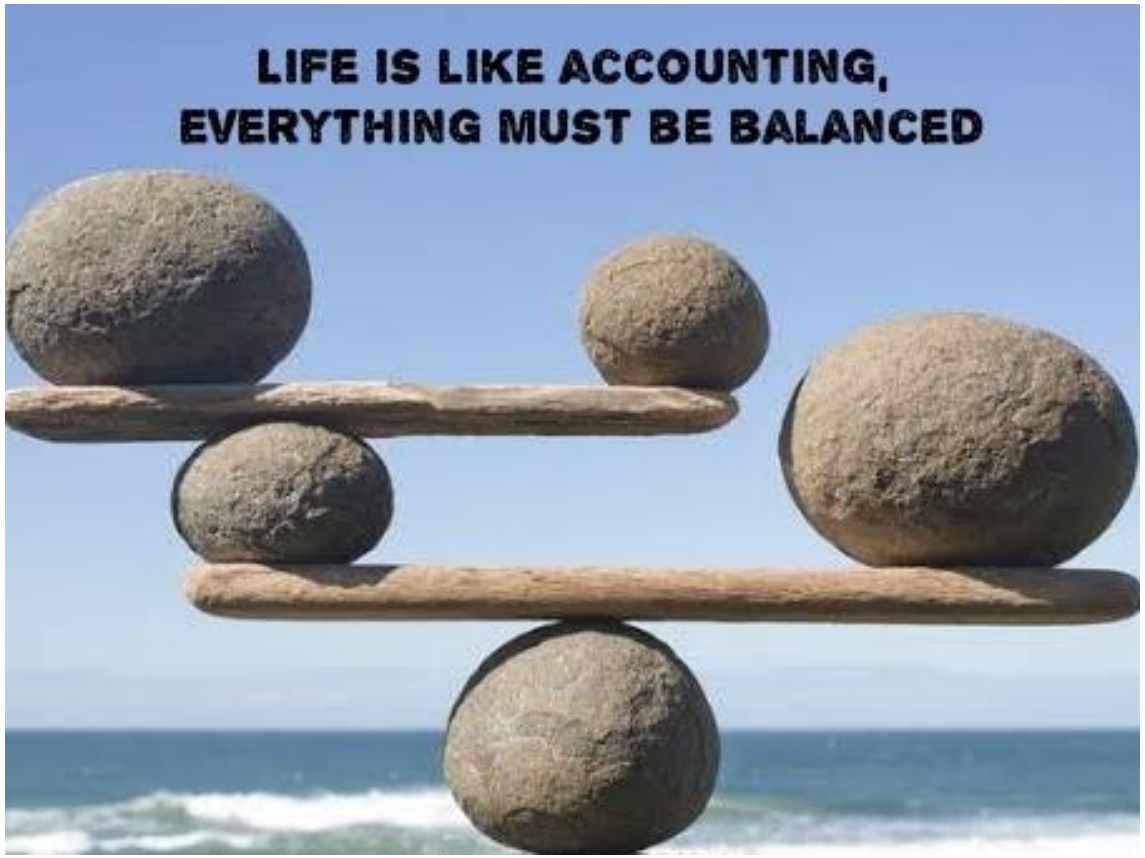
Some Cautionary Notes:

- Metrics & ratios are generally **NOT** governed by financial reporting standards, with the exception of EPS and diluted EPS and their mandatory disclosures.
- In practice, there are **many** variations of the metrics and ratios which we have learnt in this module: there is no single standard that all analysts follow.
- Analysts often also develop their own metrics to assess companies.
- Ratios can also be susceptible to "manipulation" – Companies can manipulate their financial statements in ways that generate "good" or acceptable ratios, or highlight unusual metrics in their FS in order to "fool" investors.
- In general, watch out for unexplained large changes in financial statement items that are clouded in general terms such as "other operating expenses" or "other payables".
- Be skeptical when you are analyzing FS!

And We Are DONE!!!!!!!!

It was a really enjoyable semester with you all!

Thank you for taking this accounting journey with me ☺



Post your questions on Canvas discussion forum.

All the best and stay in touch!

My email:
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See you around!