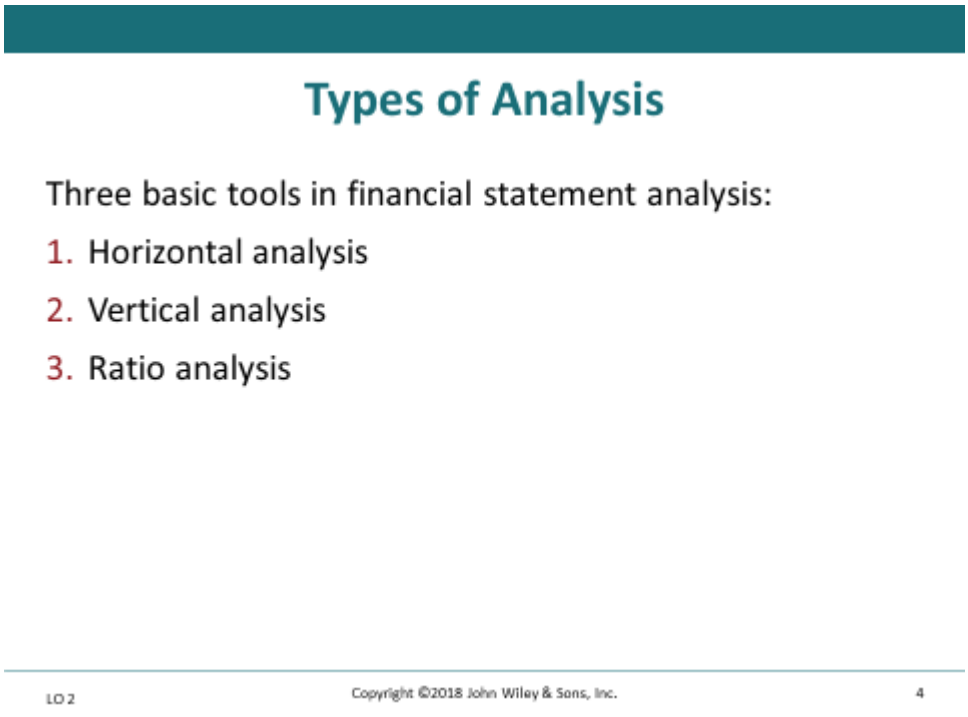
Investor Analysis Tools
Created by Dr. Nkansa
Spring 2022 Financial Fitness Program



The analyses offer different ways to interpret numbers/information.

Applying horizontal analysis and vertical analysis

Investors are interested in:

- Core or sustainable earnings of a company
- Making comparisons from period to period
  - Three types of comparisons:
    - Intracompany basis
    - Intercompany basis
    - Industry averages

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Intracompany → Within the same company
Intercompany → Comparing companies to each other
Industry → To an aggregate of companies in the industry

Horizontal Analysis

Also called trend analysis, is a technique for evaluating a series of financial statement data over a period of time.

Purpose is to determine

- Increase or decrease
- Expressed as either an amount or a percentage

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Horizontal Analysis

Horizontal analysis of balance sheets

Condensed Balance Sheets
December 31 (in thousands)

			Increase (Decrease)	
Assets	2020	2019	Amount	Percent
Current assets	$ 2,717	$ 2,427	$ 290	11.9
Property assets (net)	2,990	2,816	174	6.2
Other assets	5,690	5,471	219	4.0
Total assets	$11,397	$10,714	683	6.4
Liabilities and Stockholders' Equity				
Current liabilities	$ 4,044	$ 4,020	24	0.6
Long-term liabilities	4,827	4,625	202	4.4
Total liabilities	8,871	8,645	226	2.6
Stockholders' equity				
Common stock	493	397	96	24.2
Retained earnings	3,390	2,584	806	31.2
Treasury stock (cost)	(1,357)	(912)	(445)	48.8
Total stockholders' equity	2,526	2,069	457	22.1
Total liabilities and stockholders' equity	$11,397	$10,714	$ 683	6.4

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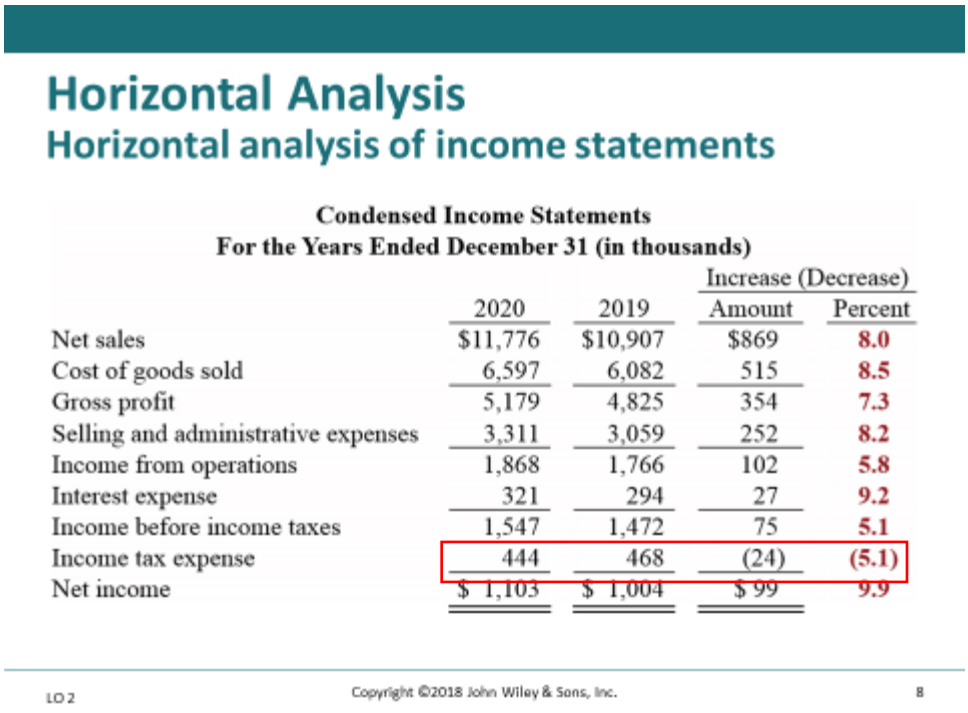
The balance sheet shows a company's financial position.

Type of comparison? Intracompany
From? 2019 to 2020

Base year is 2019

For current assets → $2,717 - $2,427 = $290 → $290/$2,427 = 0.1194 = 11.9%

For long-term liabilities → $4,827 - $4,625 = $202 → $202/4,625 = 0.0436 = 4.4%



Horizontal Analysis

Horizontal analysis of income statements

Condensed Income Statements
For the Years Ended December 31 (in thousands)

			Increase (Decrease)	
	2020	2019	Amount	Percent
Net sales	$11,776	$10,907	$869	8.0
Cost of goods sold	6,597	6,082	515	8.5
Gross profit	5,179	4,825	354	7.3
Selling and administrative expenses	3,311	3,059	252	8.2
Income from operations	1,868	1,766	102	5.8
Interest expense	321	294	27	9.2
Income before income taxes	1,547	1,472	75	5.1
Income tax expense	444	468	(24)	(5.1)
Net income	$ 1,103	$ 1,004	$ 99	9.9

The income statement shows a company's revenues, expenses and net income (loss).

Base year is 2019

For income tax expense → $444 - $468 = -24 → -24/468 = -0.0512 = -5.1%

Vertical Analysis

Also called common-size analysis, is a technique that expresses each financial statement item as a percentage of a base amount.

- On a balance sheet we might express current assets as 22% of total assets (total assets being the base amount)
- On an income statement we might say that selling expenses are 16% of net sales (net sales being the base amount)

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Vertical Analysis

Vertical analysis of balance sheets

Condensed Balance Sheets
December 31 (in thousands)

	2020		2019	
Assets	Amount	Percent	Amount	Percent
Current assets	$ 2,717	23.8	$ 2,427	22.6
Property assets (net)	2,990	26.2	2,816	26.3
Other assets	5,690	50.0	5,471	51.1
Total assets	$11,397	100.0	$10,714	100.0
Liabilities and Stockholders' Equity				
Current liabilities	$ 4,044	35.5	$ 4,020	37.5
Long-term liabilities	4,827	42.4	4,625	43.2
Total liabilities	8,871	77.9	8,645	80.7
Stockholders' equity				
Common stock	493	4.3	397	3.7
Retained earnings	3,390	29.7	2,584	24.1
Treasury stock (cost)	(1,357)	(11.9)	(912)	(8.5)
Total stockholders' equity	2,526	22.1	2,069	19.3
Total liabilities and stockholders' equity	$11,397	100.0	$10,714	100.0

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Type of comparison? Intracompany
From? 2019 to 2020

Base amount is Total assets

For 2020 property assets → $2,990/$11,397 = 0.2623 = 26.2%

2019 to 2020 comparison?

Vertical Analysis

Vertical analysis of income statements

Condensed Income Statements
For the Years Ended December 31 (in thousands)

	2020		2019	
	Amount	**Percent**	**Amount**	**Percent**
Net sales	$11,776	**100.0**	$10,907	**100.0**
Cost of goods sold	6,597	**56.0**	6,082	**55.8**
Gross profit	5,179	**44.0**	4,825	**44.2**
Selling and administrative expenses	3,311	**28.1**	3,059	**28.0**
Income from operations	1,868	**15.9**	1,766	**16.2**
Interest expense	321	**2.7**	294	**2.7**
Income before income taxes	1,547	**13.2**	1,472	**13.5**
Income tax expense	444	**3.8**	468	**4.3**
Net income	$ 1,103	**9.4**	$ 1,004	**9.2**

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Base amount is Net sales

Even though the gross profit amount is higher in 2020, its percentage of net sales was higher in 2019.

Vertical Analysis

Intercompany comparison by vertical analysis

Condensed Income Statements
For the Years Ended December 31, 2020

	Chicago Cereal (in thousands)		Giant Mills, Inc. (in millions)	
	Amount	**Percent**	**Amount**	**Percent**
Net sales	$11,776	100.0	$17,910	100.0
Cost of goods sold	6,597	56.0	11,540	64.4
Gross profit	5,179	44.0	6,370	35.6
Selling and administrative expenses	3,311	28.1	3,474	19.4
Non-recurring charges and (gains)	0	-	(62)	(0.3)
Income from operations	1,868	15.9	2,958	16.5
Other expenses and revenues (including income taxes)	765	6.5	1,134	6.3
Net income	$ 1,103	9.4	$ 1,824	10.2

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Type of comparison? Intercompany

Ratio Analysis

Analyze a company's performance using ratio analysis

Ratio analysis expresses the relationship among selected items of financial statement data.

Financial Ratio Classifications

Liquidity	Profitability	Solvency
Measure short-term ability of the company to pay its maturing obligations and to meet unexpected needs for cash	Measure the income or operating success of a company for a given period of time	Measure the ability of the company to survive over a long period of time

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From the financial accounting perspective - A ratio is a relationship between two numbers/amounts.

Ratio Analysis

A **single ratio** by itself is **not very meaningful**.

We will use the following types of comparisons.

1. **Intracompany comparisons** for two years for Chicago Cereal.
2. **Industry average comparisons** based on median ratios for the industry.
3. **Intercompany comparisons** based on Giant Mills as Chicago Cereal's principal competitor.

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Liquidity Ratios

Measure the short-term ability of the company to pay its maturing obligations and to meet unexpected needs for cash.

Short-term creditors such as bankers and suppliers are particularly interested in assessing liquidity.

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Comprehensive Ratio Analysis
Chicago Cereal Company's Balance Sheets

Chicago Cereal Company
Balance Sheets
December 31 (in thousands)

Assets	2020	2019
Current assets		
Cash	$ 524	$ 411
Accounts receivable	1,026	945
Inventory	924	824
Prepaid expenses and other current assets	243	247
Total current assets	2,717	2,427
Property assets (net)	2,990	2,816
Intangibles and other assets	5,690	5,471
Total assets	$11,397	$10,714
Liabilities and Stockholders' Equity		
Current liabilities	$ 4,044	$ 4,020
Long-term liabilities	4,827	4,625
Stockholders' equity – common	2,526	2,069
Total liabilities and stockholders' equity	$11,397	$10,714

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1. Current Ratio

$$\text{Current Ratio} = \frac{\text{Current assets}}{\text{Current liabilities}}$$

Chicago Cereal

	2020	**2019**
$\frac{\$2,717}{\$4,044}$ =	0.67	0.60

Industry Average	**Giant Mills 2020**
1.06	.67

Chicago has **$0.67** of current assets for every dollar of current liabilities.

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Type of comparison? All (intracompany, intercompany and industry)

Ratio interpretation → $0.67 of current assets/$1.00 current liabilities.

Comprehensive Ratio Analysis
Chicago Cereal Company's income statements

Chicago Cereal Company
Condensed Income Statements
For the Years Ended December 31 (in thousands)

	2020	2019
Net sales	$11,776	$10,907
Cost of goods sold	6,597	6,082
Gross profit	5,179	4,825
Selling and administrative expenses	3,311	3,059
Income from operations	1,868	1,766
Interest expense	321	294
Income before income taxes	1,547	1,472
Income tax expense	444	468
Net income	$ 1,103	$ 1,004

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4. Inventory Turnover

$$\text{Inventory Turnover} = \frac{\text{Cost of goods sold}}{\text{Average inventory}}$$

Chicago Cereal		
	2020	**2019**
$\frac{\$6,597}{(\$924 + \$824) \div 2}$ =	7.5	7.9

Industry Average	Giant Mills 2020
6.7	7.4

The faster the inventory turnover, the less cash is tied up in inventory and less chance of inventory becoming obsolete.

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5. Days in Inventory

$$\text{Days in Inventory} = \frac{\text{365 days}}{\text{Inventory turnover}}$$

Chicago Cereal		
	2020	2019
$\frac{365}{7.5} =$	48.7	46.2

Industry Average	Giant Mills 2020
54.5	49.3

Measures the average number of days inventory is held.

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Solvency Ratios

Measure the ability of a company to survive over a long period of time.

- **Debt to assets ratio** and **times interest earned** provide information about debt-paying ability
- **Free cash flow** provides information about solvency and ability to pay additional dividends or invest in new projects

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6. Debt to Assets Ratio

$$\text{Debt to Assets Ratio} = \frac{\text{Total liabilities}}{\text{Total assets}}$$

Chicago Cereal		
	2020	2019
$\frac{\$8,871}{\$11,397}$ =	78%	81%

Industry Average	Giant Mills 2020
55%	55%

Provides some indication of company's ability to withstand losses without impairing the interests of its creditor.

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Ratio/% interpretation → 78% = 0.78

→ $0.78 of total liabilities/$1.00 of total assets.

Comprehensive Ratio Analysis
Chicago Cereal Company's statements of cash flows

Condensed Statements of Cash Flows
For the Years Ended December 31 (in thousands)

	2020	2019
Cash flows from operating activities		
Cash receipts from operating activities	$11,695	$10,841
Cash payments for operating activities	10,192	9,431
Net cash provided by operating activities	1,503	1,410
Cash flows from investing activities		
Purchases of property, plant, and equipment	(472)	(453)
Other investing activities	(129)	8
Net cash used in investing activities	(601)	(445)
Cash flows from financing activities		
Issuance of common stock	163	218
Issuance of debt	2,179	721
Reductions of debt	(2,011)	(650)
Payment of dividends	(475)	(450)
Repurchase of common stock and other items	(645)	(612)
Net cash provided (used) by financing activities	(789)	(773)
Increase (decrease) in cash and cash equivalents	113	192
Cash and cash equivalents at beginning of year	411	219
Cash and cash equivalents at end of year	$ 524	$ 411

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The statement of cash flows shows a company's cash inflows and outflows based on three categories.

8. Free Cash Flow

$$\text{Free Cash Flow} = \text{Net cash provided by Operating activities} - \text{Capital expenditures} - \text{Cash dividends}$$

Chicago Cereal

		2020	2019
$1,503 − $472 − $475	=	$556	$507

Industry Average	Giant Mills 2020
na	$895
	(in millions)

One indication of solvency is the amount of excess cash generated after investing in capital expenditures and paying dividends.

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Profitability Ratios

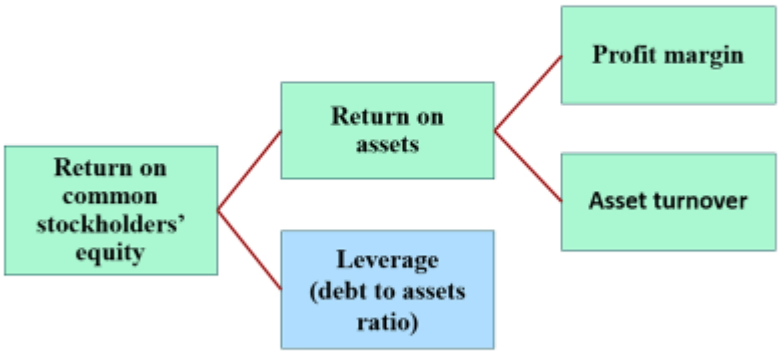
Measure the income or operating success of a company for a given period of time.

- Income affects ability to obtain debt and equity financing, liquidity and ability to grow
- Creditors and investors are interested in evaluating profitability
- Analysts use profitability as ultimate test of management's operating effectiveness

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Profitability Ratios

Relationships among profitability measures



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9. Return on Common Stockholders' Equity

$$\text{Return on Common Stockholders' Equity} = \frac{\text{Net income-Preferred dividends}}{\text{Average common stockholders' equity}}$$

Chicago Cereal

	2020	2019
$\frac{\$1{,}103 - \$0}{(\$2{,}526 + \$2{,}069) \div 2}$ =	48%	46%

Industry Average	Giant Mills 2020
19%	25%

Shows how many dollars of net income the company earned for each dollar invested by the owners.

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Ratio/% interpretation → 48% = 0.48

→ Earned $0.48 of net income/$1.00 invested by common stockholders.

11. Profit Margin

$$\text{Profit Margin} = \frac{\text{Net income}}{\text{Net sales}}$$

Chicago Cereal

	2020	2019
$\frac{\$1{,}103}{\$11{,}776}$ =	9.4%	9.2%

Industry Average	Giant Mills 2020
6.1%	8.2%

Measures of the percentage of each dollar of sales that results in net income.

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14. Earnings Per Share

$$\text{Earnings Per Share} = \frac{\text{Net income} - \text{Preferred dividends}}{\text{Weighted-average common shares outstanding}}$$

Chicago Cereal

	2020	2019
$\frac{\$1{,}103 - \$0}{418.7}$ =	$2.63	$2.40

Industry Average	Giant Mills 2020
na	$2.90

A measure of the net income earned on each share of common stock.

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16. Payout Ratio

$$\text{Payout Ratio} = \frac{\text{Cash dividends declared on common stock}}{\text{Net income}}$$

Chicago Cereal

	2020	2019
$\frac{\$475}{\$1{,}103}$ =	43%	45%

Industry Average	Giant Mills 2020
37%	54%

Measures the percentage of earnings distributed in the form of cash dividends.

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