Chapter 13

Course Outline #10
Financial Statement Analysis

Learning Objectives

1. Perform horizontal analysis; Trend Percentages
2. Perform vertical analysis
3. Use Financial ratios to make business decisions
4. Red flags in financial statement analysis

https://www.youtube.com/watch?v=HTwtxLtl3Fw

Why do businesses conduct financial statement analysis

- Financial statement analysis is the **process** of analyzing a company's financial statements for decision-making purposes.
- External stakeholders use it to understand the overall health of an organization as well as to evaluate financial performance and business value.

- Three basic tools for financial statement analysis
  1. horizontal analysis
  2. Vertical analysis,
  3. financial ratios

1. What is Horizontal Analysis?

What is Horizontal Analysis?

- The study of **percentage changes from year to year** is called horizontal analysis.

Why perform Horizontal Analysis?

- Many decisions depend on the **trend of revenues, expenses, income from operations,** and so on.
- Horizontal analysis Looks at amounts on the financial statements over the past years– **trends.** (Study of percentage changes from year-to-year）
- tell you more to **improve** the evaluation or decision.

Steps in PERFORMING HORIZONTAL ANALYSIS

- Two steps:
  1. Compute dollar amount of change from one period to the next
  2. Divide dollar amount of change by base-period amount

Perform Horizontal Analysis

- **Computing a percentage change takes two steps:**

1. **Compute the dollar amount** of the change from one period (the base period) to the next.

Formula For Variance in Amount

Variance = Amount of later period - Amount of base period

2. **Divide** the dollar amount of **change by the base-period amount.**

Formula For Variance in Percentage

$$\text{Variance \%} = \frac{\text{Variance Amount}}{\text{Amount of Base year}} \times 100.$$

Illustration: Amazon.com, Inc.

Amazon.com's net sales (in millions) increased by 27.1% during 2012, computed as follows:

			Increase (Decrease)	
	2012	2011	Amount	Percentage
Net sales.....	$61,093	$48,077	$13,016	27.1%

Step 1 Compute the dollar amount of change from 2011 to 2012

Step 2 Percentage change for the period

Perform Horizontal Analysis

- The Same analysis will be done for each item on the **balance sheet** and for each item on the **income statement**.

- Horizontal analysis is also referred to **as trend analysis.**

Perform Horizontal Analysis (2016 is base year)

ExcelDataPro.com				
Horizontal Ananlysis of Comparitive Balance Sheets				
For Years Ended March 31, 2017 and 2016				
Description	2017	2016	Horizontal Variance	
	Amount	Amount	Amount	Percentage
Assets				
Cash	₹ 330,000	₹ 280,000	50,000	17.9%
Securities	₹ 200,000	₹ 220,000	(20,000)	-9.1%
Accounts Receivable - AR	₹ 50,000	₹ 30,000	20,000	66.7%
Notes	₹ 500,000	₹ 560,000	(60,000)	-10.7%
Stock/Inventory	₹ 700,000	₹ 430,000	270,000	62.8%
Prepaid Expenses	₹ 60,000	₹ 40,000	20,000	50.0%
Current Assets	₹ 1,840,000	₹ 1,560,000	280,000	17.9%
Fixed Assets (Property, Plant, Equipment	₹ 4,100,000	₹ 3,100,000	1,000,000	32.3%
Total Assets	₹ 5,940,000	₹ 4,660,000	1,280,000	27.5%
Liabilities and Stockholder's Equity				

Liabilities and Stockholder's Equity				
Liabilities				
Accounts Payable - AP	₹ 410,000	₹ 380,000	30,000.00	7.9%
Staff Salaries	₹ 50,000	₹ 35,000	15,000.00	42.9%
Accrued Liabilities	₹ 12,000	₹ 15,000	(3,000.00)	-20.0%
Short -term borrowings	₹ 123,000	₹ 86,500	36,500.00	42.2%
Taxes	₹ 40,000	₹ 20,000	20,000.00	100.0%
Current Liabilities	**₹ 635,000**	**₹ 536,500**	**98,500.00**	**18.4%**
Loans	₹ 300,000	₹ 250,000	50,000.00	20.0%
Other long terms debt	₹ 142,000	₹ 186,000	(44,000.00)	-23.7%
Total Liabilities	**₹ 1,077,000**	**₹ 972,500**	**104,500.00**	**10.7%**
Stockholder's Equity				
Preferred Stock	₹ 400,000	₹ 400,000	₹ -	0.0%
Common Stock	₹ 1,750,000	₹ 1,450,000	₹ 300,000	20.7%
Retained Earnings	₹ 1,620,000	₹ 1,370,000	₹ 250,000	18.2%
Total Stockholder's Equity	**₹ 3,770,000**	**₹ 3,220,000**	**₹ 550,000**	**17.1%**
Total Liabilities and Stockholder's Equity	**₹ 4,847,000**	**₹ 4,192,500**	**₹ 654,500**	**15.6%**

Benefits of Horizontal Analysis

1. The Horizontal analysis performs the assessment of relative changes in different items of the balance sheet over a period of time.
2. It shows the behavior of revenues, expenses, etc of the financial statements for comparative periods.
3. With Horizontal Analysis, the impact of operational activities is visible on the company's financial condition during the period under review.
4. Helps especially when we are planning to investment or buying a business.

Trend Percentages

- Trend percentages are a form of horizontal analysis, which indicate the direction a business is taking.
  - Show Changes over time in given financial statement items
  - Help evaluate financial information of several years

➢ **Trend percentages are computed by selecting a base year whose amounts are set to 100%**

$$\text{Trend \%} = \frac{\text{Any year \$}}{\text{Base year \$}} \times 100$$

Horizontal (Trend) Computations

LOWE'S
Income Statements
(in millions)

Year Ended:	January 30, 2019 (Fiscal 2019)	February 1, 2018 (Fiscal 2018)	Increase (Decrease) Amount	Increase (Decrease) Percent
Net Sales Revenue	$48,230	$48,283		
Cost of Sales	31,729	31,556		
Gross Profit	16,501	16,727		
Operating and Other Expenses	12,715	12,022		
Interest Expense	280	194		
Income Tax Expense	1,311	1,702		
Net Income	$ 2,195	$ 2,809		
Earnings per Share	$1.51	$1.90		

Calculate the change in dollars for Net Sales Revenue between 2019 and 2018.

Illustration

Performing horizonal analysis of revenues and net income

- Fenton corporation reported the following amounts on its 2020 comparative income statement:

In thousands	2020	2019
Revenues	$ 10,473	$9,998
Total expenses	5,822	5,422

Perform a horizontal analysis of revenues and net income – both in dollar amounts and in percentages – for 2020 and 2019

Illustration

Performing horizonal analysis of revenues and net income

In thousands	2020	2019	Increase (Decrease) $	Increase (Decrease) %
Revenues	$ 10,473	$9,998		
Total expenses	5,822	5,422		
Net income	4,651	4,576		

2. Vertical (Common Size) Analysis

Vertical, or common size, analysis focuses on important relationships within financial statements.

Income Statement → Sales = 100%

Balance Sheet → Total Assets = 100%

LOWE'S
Income Statements
(in millions)

$$\frac{\text{Cost of Sales}}{\text{Net Sales Revenue}} \times 100$$

	Fiscal 2018		Fiscal 2017	
	Amount	Percent	Amount	Percent
Net Sales Revenue	$48,230	100.0%	$48,283	100.0%
Cost of Sales	31,729		31,556	
Gross Profit	16,501		16,727	
Operating and Other Expenses	12,715		12,022	
Interest Expense	280		194	
Income Tax Expense	1,311		1,702	
Net Income	$ 2,195		$ 2,809	

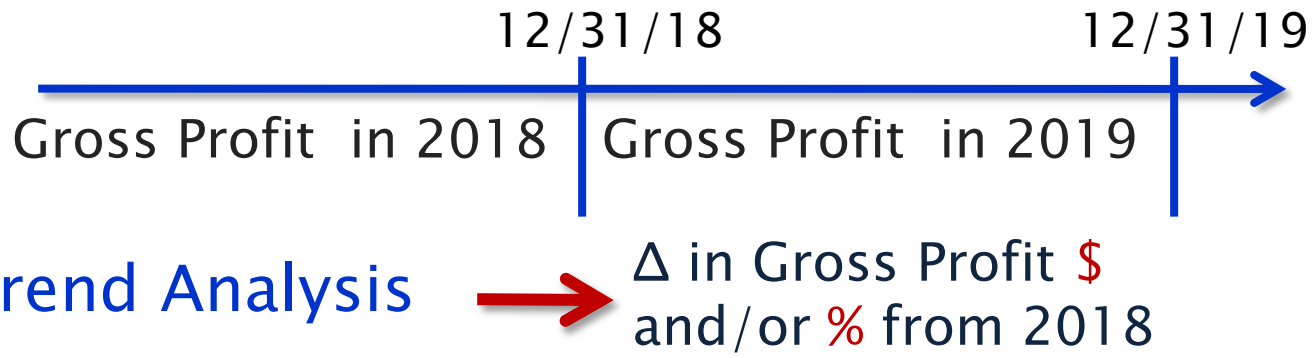
2. Vertical (Common Size) Analysis

- a method of financial statement analysis in which each line item is listed as a percentage of a base figure within the statement.

- reports each amount on a financial statement as a percentage of another item.

Differences between Horizontal Analysis and Vertical Analysis

Horizontal (trend) analyses are conducted to help financial statement users recognize important financial changes that unfold over time.



Vertical analyses focus on important relationships between items on the same financial statement.

	2019	
	Amount	Percent
Sales	$200,000	100%
Cost of Goods Sold	150,000	75%
Gross Profit	$ 50,000	25%

3. Use Financial Ratios to Make Business Decisions

- Financial ratios are mathematical comparisons of financial statement accounts or categories.
  - Help investors, creditors, and internal company management understand how well a business is performing and of areas needing improvement.
  - The most common tools used to analyze a business' financial standing.
  - Can also be sued to compare different companies in different industries.

https://www.youtube.com/watch?v=TZZFBkbC2lA

3. What are the Financial Ratios used to Make Business Decisions?

1. **Liquidity and the Current Ratio**
2. **Solvency Ratios**
3. **Profitability Ratios and Margins**
4. Efficiency Ratios
5. **Earnings per share Ratios**

3.1 Liquidity and the Current Ratio

- The most common liquidity ratio is the current ratio, which is the ratio of current assets to current liabilities.

Current Ratio

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

This ratio indicates a company's ability to pay its short-term bills, ie the ability to pay current liabilities with current asset.

3.1 Liquidity and the Current Ratio

- A high ratio indicates more of a safety cushion, which increases flexibility because some of the inventory items and receivable balances may not be easily convertible to cash.
- Companies can improve the current ratio by paying down debt, and converting short-term debt into long-term debt.
  - For example:
  - A company has Current assets of $2,400, Current liabilities of $1,200.
  - the current ratio at the end of year is 1200/2400 = 2.00

Illustration

- Charlie's Skate Shop sells ice-skating equipment to local hockey teams. Charlie is applying for loans to help fund his dream of building an indoor skate rink. Charlie's bank asks for his balance sheet so they can analysis his current debt levels.
- According to Charlie's balance sheet he reported $100,000 of current liabilities and only $25,000 of current assets.
- What is Charlie's current ratio?

3.2 Solvency Ratios償付能力比率

- Indicates whether a company's cash flow is sufficient to meet its short-and long-term liabilities.
- Solvency ratios indicate financial stability because they measure a company's debt relative to its assets and equity.
- A company with too much debt may not have the flexibility to manage its cash flow if interest rates rise or if business conditions deteriorate.

3.2 Solvency Ratios償付能力比率

- The common solvency ratios are
  - debt-to-asset and
  - debt-to-equity.

- The lower a company's solvency ratio, the greater the probability that it will default on its debt obligations.

The common solvency ratios

- The debt-to-asset ratio is the ratio of total debt to total assets.

Debt to Asset Ratio

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

- The debt-to-equity ratio is the ratio of total debt to shareholders' equity, which is the difference between total assets and total liabilities.

Debt to Equity Ratio

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

3.2.1 The debt-to-asset ratio (DTA)

- If debt to assets equals 1,
  - it means the company has the same amount of liabilities as it has assets.
  - This company is highly leveraged.

- A company with a DTA of greater than 1
  - means the company has more liabilities than assets.
  - This company is extremely leveraged and highly risky to invest in or lend to.

Illustration

- Ted's Body Shop is an automotive repair shop in the Atlanta area. He is applying for a loan to build out a new facility that will accommodate more lifts. Currently, Ted has $100,000 of assets and $50,000 of liabilities.
- What is Ted's DTA?

3.2.2 The debt-to-equity ratio

- Each industry has different debt to equity ratio benchmarks, as some industries tend to use more debt financing than others.
  - A debt ratio of 0.5 means that there are half as many liabilities than there is equity.
  - In other words, the assets of the company are funded 2-to-1 by investors to creditors.
  - This means that investors own 66.6 cents of every dollar of company assets while creditors only own 33.3 cents on the dollar.

Illustration

- Assume a company has $100,000 of bank lines of credit and a $500,000 mortgage on its property. The shareholders of the company have invested $1.2 million.
- How you calculate the debt to equity ratio?

3.3 Profitability Ratios and Margins

- Profitability ratios indicate management's ability to convert sales dollars into profits and cash flow.
- The common ratios are
  1. Gross margin ratio
  2. Operating margin ratio
  3. Net income margin ratio / Net profit margin ratio
  4. The return-on-asset ratio: measures a company's effectiveness in deploying its assets to generate profits.
  5. The return-on-investment ratio: indicates a company's ability to generate a return for its owners.

3.3.1 Gross margin Ratio

- The calculation of Gross Margin is:

Gross Margin Ratio

$$\text{Gross Margin Ratio} = \frac{\text{Gross Margin}}{\text{Net Sales}}$$

- Gross margin ratio is a profitability ratio that measures how profitable a company can sell its inventory.
- It only makes sense that higher ratios are more favorable.
- Higher ratios mean the company is selling their inventory at a higher profit percentage.

3.3.1 Gross margin

- For example, a company has sales of $1,000,000 and cost of goods sold of $750,000, which results in a gross margin of $250,000 and a gross margin percentage of 25%.
- The gross margin percentage may be stated in a company's income statement.

Illustration

- Assume Jack's Clothing Store spent $100,000 on inventory for the year. Jack was able to sell this inventory for $500,000. Unfortunately, $50,000 of the sales were returned by customers and refunded.
- What is Jack's gross margin ratio ?

- Jack has a high ratio in the apparel industry. This means that after Jack pays off his inventory costs, he still has 78 percent of his sales revenue to cover his operating costs.

3.3.2 Operating margin Ratio

- The operating margin is calculated by subtracting all operating expenses from sales, and then dividing the result by sales. The formula is:

Operating Margin Ratio

$$\text{Operating Margin Ratio} = \frac{\text{Operating Income}}{\text{Net Sales}}$$

- A key indicator for investors and creditors to see how businesses are supporting their operations.
- If companies can make enough money from their operations to support the business, the company is usually considered more stable.
- Higher operating margin is better because this shows that the company is making enough money from its ongoing operations to pay for its variable costs as well as its fixed costs.

Illustration

- If Christie's Jewelry Store sells custom jewelry to celebrities all over the country. Christie reports the follow numbers on her financial statements:
- Cost of Goods Sold: $500,000Net Sales: $1,000,000
- Rent: $15,000
- Wages: $100,000
- Other Operating Expenses: $25,000

What is the Operating margin ratio?

3.3.3 Net income/profit margin

- Net income margin is used in ratio analysis to determine the proportional profitability of a business.

Net Profit Margin

$$\text{Net Profit Margin} = \frac{\text{Net Profit}}{\text{Total Revenue}}$$

- A higher margin is always better than a lower margin because it means that the company is able to translate more of its sales into profits at the end of the period.

3.3.3 Net income margin

- For example, ABC International has net after-tax income of $50,000 and sales of $1,000,000. Its net income margin is calculated as follows:
  - $50,000 Net income ÷ $1,000,000 Sales = 5% Net income margin

3.3.4 The return-on-asset ratio(ROA)

measures a company's effectiveness in deploying its assets to generate profits.

A higher ROA denotes a higher level of management performance.

Return on Assets Ratio

$$\text{Return on Assets Ratio} = \frac{\text{Net Income}}{\text{Average Total Assets}}$$

Illustration

- Charlie's Construction Company is a growing construction business that has a few contracts to build storefronts in downtown Chicago. Charlie's balance sheet shows beginning assets of $1,000,000 and an ending balance of $2,000,000 of assets. During the current year, Charlie's company had net income of $20,000,000.
- What is Charlie's return on assets ratio ?

3.3.5 The return-on-investment ratio (ROI)

- indicates a company's ability to generate a return for its owners.

Return on Investment

$$ROI = \frac{\text{Investment Revenue - Investment Cost}}{\text{Investment Cost}}$$

- Generally, any positive ROI is considered a good return. This means that the total cost of the investment was recouped in addition to some profits left over.
- A negative return on investment means that the revenues weren't even enough to cover the total costs.
- That being said, higher return rates are always better than lower return rates.

3.3.5 The return-on-investment ratio

- For example, an investor buys $1,000 worth of stocks and sells the shares two years later for $1,200. The net profit from the investment would be $200 and the ROI would be calculated as follows:

- **ROI = (200 / 1,000) x 100 = 20%**

3.4 Efficiency Ratios

- What Does an Efficiency Ratio Tell You?
  - Efficiency ratios, also known as activity ratios, are used by analysts to measure the performance of a company's short-term or current performance.
  - All these ratios use numbers in a company's current assets or current liabilities, quantifying the operations of the business.
- Two common efficiency ratios are
  - Inventory turnover ratio
  - Accounts Receivable Turnover Ratio

3.4.1 The inventory turnover ratio

- an efficiency ratio that shows how effectively inventory is managed by comparing cost of goods sold with average inventory for a period.

Inventory Turnover Ratio

$$\text{Inventory Turnover Ratio} = \frac{\text{Cost of Goods Sold}}{\text{Average Inventory}}$$

- Inventory turns vary with industry. For instance, the apparel industry will have higher turns than the expensive car industry.

3.4.2 Accounts Receivable Turnover Ratio

- an efficiency ratio that measures how many times a business can turn its accounts receivable into cash during a period.

Accounts Receivable Turnover Ratio

$$\text{Accounts Receivable Turnover Ratio} = \frac{\text{Net Credit Sales}}{\text{Average Accounts Receivable}}$$

- Higher ratios mean that companies are collecting their receivables more frequently throughout the year.
- For instance, a ratio of 2 means that the company collected its average receivables twice during the year. In other words, this company is collecting is money from customers every six months.

3.5 Earnings per share Ratios:

- Measures how many dollars of net income have been earned by each share of common stock during a certain time period.
- It is the amount of a company's net income per share of its outstanding common stock.
- It is a popular measure of overall profitability of the company and is expressed in dollars.

Earnings Per Share

$$\text{Earnings Per Share} = \frac{\text{Net Income - Preferred Dividends}}{\text{Weighted Average Common Shares Outstanding}}$$

Illustration

- Abraham Company had a net income of $600,000 for the year 2019. The weighted average number of shares of common stock outstanding for the year were 200,000.
- What was the earnings per share ratio of Abraham Company?

4. Red flags in financial statement analysis

A red flag is a warning or indicator, suggesting that there is a potential problem or threat with a company's stock, financial statements, or news reports. Red flags may be any undesirable characteristic that stands out to an analyst or investor.

1. **Earning problems**
2. **Decreased cash flow**
3. **Too much debt**
4. **Inability to collect receivables**
5. **Buildup of inventories**
6. **Trends of sales, inventory and receivables**

4.1 Earning problems

1. When income from continuing operations and net income decreased for several years in a row, it may mean that the company may be unable to survive.
2. Most companies cannot survive consecutive loss years.
3. If a company also suffers multiple year of losses while sales are declining, there is even more cause to be concerned.

4.2 Decreased cash flow

1. Cash flow validates earning. If net cash provided by operations is consistently lower than net income, the company may be facing a cash shortage.
2. A business long-term prospects are questionable if its cash flow statement reflects that its cash inflows period over period.

4.3 Too much debt

1. If the debt ratio is much higher than the industry average, the company may be unable to pay debts during tough times.

4.4 Inability to collect receivables

1. When days' sales in receivables are growing faster than for other companies in the industry, a cash shortage may be looming.

4.5 Buildup of inventories

1. If inventory turnover is slowing down, the company may be unable to move products, or it may be overstating inventory as reported on the balance sheet.

4.6 Trends of sales, inventory and receivables

1. Sales, inventory and receivables generally move together. Increased sales lead to higher receivables and require more inventories in order to meet demand. Strange movement among these items may mean something is not normal.

Chapter summery

1. Horizontal analysis, vertical analysis and analysis ratios are part of financial statement analysis.
2. Financial Ratios that used to Make Business Decisions.
3. Red flags in financial statement analysis help to identify underlying or hidden problems in operations.