



Financial Statement Analysis

PURPOSE: The goal of financial analysis is to predict the future performance of a business based on its past performance. The ability to use financial data to evaluate a company is important for managers, investors and creditors. There are three types of financial analysis: horizontal analysis, vertical analysis, and trend index numbers.

Horizontal Analysis: Involves two sets of financial statements. The dollar amount of change and percentage change for line items (like sales, expenses, net income, cash, loans, etc.) in the income statement or balance sheet are found. Percentage change is more useful than the dollar amount of change.

$$\text{Percentage change} = \frac{\text{Dollar amount of change}}{\text{Base year amount}} \times 100$$

Vertical Analysis: Involves one financial statement. Each item in a balance sheet is expressed as a percentage of total assets. Each item in an income statement is expressed as percentage of total sales revenue EXCEPT the costs of food sold and beverage sold. These are taken as a percentage of their respective sales revenue: sales revenue-food and sales revenue-beverage.

Trend analysis: Involves financial data from multiple years. Trend index numbers are determined for the line item of interest. Index numbers allow us to quickly compare the percentage change of an item to its value in a base year and make it easier to see performance trends.

An index number for trend analysis is calculated by assigning a value of 100 (or 100%) to a base period, usually the first (oldest) period in time. For other periods of time, the index number is determined by dividing the dollar amount for each period by the base dollar amount and multiplying by 100.

$$\text{Trend index} = \frac{\text{Selected period}}{\text{Base period}} \times 100$$

Example 1: Determine the sales revenue index for years 1, 2, and 3 given:

Year	Sales Revenue	Sales Revenue Index
1	\$30,000	
2	\$35,000	
3	\$38,000	



Solution: The first period (year 1) is the base period so its index is 100. For year 2, we take the sales revenue of year 2 divided by sales revenue of year 1 (our base period) and multiply by 100:

$$\text{Trend index for year 2} = (35,000/30,000) \times 100 = 116.7$$

$$\text{Trend index for year 3} = (38,000/30,000) \times 100 = 126.7$$

These numbers show that revenue increased by 16.7% from year 1 to 2, and 26.7% from year 1 to 3.

We can use these index numbers to compare dollar values in time. As inflation and deflation affect the value of money, we need to convert money amounts into current period dollars to provide a more meaningful analysis of changes over time. To convert historic dollars into current dollars, use the following formula:

$$\text{Historic dollars} \times \frac{\text{Index number for current period}}{\text{Index number for historic period}} = \text{Current dollars}$$

This conversion is easy to remember if you can think of it like a simple unit conversion where we need the units we start with (historic dollars) to cancel out. To do this, we create a conversion fraction with the unit we want on top (current dollars), and the unit we want to eliminate on the bottom (historic dollars).

Example 2: Convert the sales revenue above into current period dollars given the following trend index numbers. Round to the nearest whole dollar.

Solution: The first step is to take the period sales revenue for year 4 (which is the current period) and transfer it to the current dollars column. As this is the period we are in now, the dollar value stays the same.

To convert sales revenue into current dollars for year 1:

$$\$410,000 \times (139/106) = \$537,642$$

Repeat the process for years 2 and 3:

Year	Sales Revenue	Trend Index	Current Dollars
1	\$410,000	106	\$537,642
2	\$440,000	118	\$518,305
3	\$455,000	127	\$497,992
4	\$473,000	139	\$473,000

The current dollar values indicate that sales revenue has generally declined from Year 1 to 4. This is not a desirable trend. If we relied on the historic value amount, we would mistakenly believe that revenue was increasing over the four year period.



Practice Problems

1. A double room had an average room rate of \$88.00 the first year, \$85.00 in Year 2, \$92.00 in Year 3, and \$96.00 in Year 4. Establish a trend index using Year 1 as the base year.
2. Sales revenue for a café operation is given for May, June, July, and August of 2010. The index numbers are also provided. Convert sales revenue to current dollars and round to the nearest dollar.

Month	Sales Revenue	Trend Index
May	\$57,000	104.0
June	\$56,000	106.0
July	\$60,000	110.0
August	\$62,000	113.0

3. The sales revenue, food cost of sales, and number of guests served for a sushi restaurant for the past 5 months are given below.
 - (a) Calculate the average check and average costs of sales-food.
 - (b) Determine the trend index numbers for both average check and average cost.
 - (c) Use these index numbers to convert sales revenue and cost of sales food from historic to current dollars. Round to the nearest dollar.
 - (d) Comment on the results of the trend index calculation and current dollar calculation.

Month	Sales Revenue	Cost of sales-food	Number of guests
1	\$178,300	\$66,900	8,400
2	180,600	70,100	8,100
3	186,500	72,500	8,300
4	190,200	75,300	8,400
5	193,400	78,200	8,500



4. Danny's Donut Shop provides the following information for the months of January and February. Provide a (a) comparative horizontal analysis and (b) common-size vertical analysis.

Sales Revenue	January	February
Sales revenue-food	\$159,800	\$173,700
Sales revenue-beverage	<u>56,600</u>	<u>60,200</u>
Total Sales Revenue	<u>\$216,400</u>	<u>\$233,900</u>
Operating Expenses		
Cost of sales-food	\$55,200	\$67,050
Cost of sales-beverage	13,180	16,200
Wages expense	60,700	69,210
Other operating expenses	<u>59,520</u>	<u>66,640</u>
Total expenses	<u>\$188,600</u>	<u>\$219,100</u>
Operating Income (BT)	<u>\$27,800</u>	<u>\$14,800</u>

Solutions

1.

Year	Room rate	Trend Index
1	\$88.00	100
2	\$85.00	96.6
3	\$92.00	104.5
4	\$96.00	109.1

2.

Month	Sales Revenue	Trend Index	Current Dollars
May	\$57,000	104.0	\$61,933
June	\$56,000	106.0	\$59,698
July	\$60,000	110.0	\$61,636
August	\$62,000	113.0	\$62,000

3.

Month	(a)		(b)		(c)	
	Avg. check	Avg. Cost	Avg. check trend index	Avg. cost of food trend index	Current revenue dollars	Current cost of food dollars
1	\$21.23	\$7.96	100.0	100.0	\$191,138	\$77,336
2	\$22.30	\$8.65	105.0	108.7	184,384	74,550
3	\$22.47	\$8.73	105.8	109.7	188,968	76,399
4	\$22.64	\$8.96	106.6	112.6	191,271	77,306
5	\$22.75	\$9.20	107.2	115.6	193,400	78,200

(d) The trend index calculation shows that the average cost of food is rising faster than the average check. However, the revenue in current dollars has increased by ~\$2260 (1.2%) from month 1 to 5. The cost of food sales using current dollars has increased by ~\$860 (1.1%). All other costs being equal, the gross margin based on current dollars increased by 1.2% so it is better now than it was 5 months ago.



4. (a) Horizontal Analysis

Sales Revenue	January	February	Dollar ▲	% ▲
Sales revenue-food	\$159,800	\$173,700	+13,900	+8.7%
Sales revenue-beverage	<u>56,600</u>	<u>60,200</u>	+3,600	+6.4%
Total Sales Revenue	<u>\$216,400</u>	<u>\$233,900</u>	+17,500	+8.1%
Operating Expenses				
Cost of sales-food	\$55,200	\$67,050	+11,850	+21.5%
Cost of sales-beverage	13,180	16,200	+3,020	+22.9%
Wages expense	60,700	69,210	+8,510	+14.0%
Other operating expenses	<u>59,520</u>	<u>66,640</u>	+7,120	+12.0%
Total expenses	<u>\$188,600</u>	<u>\$219,100</u>	+30,500	+16.2%
Operating Income (BT)	<u>\$27,800</u>	<u>\$14,800</u>	-13,000	- 46.8%

(b) Vertical Analysis

Sales Revenue	January Percentages	February Percentages
Sales revenue-food	73.8%	74.3%
Sales revenue-beverage	<u>26.2%</u>	<u>25.7%</u>
Total Sales Revenue	<u>100.0%</u>	<u>100.0%</u>
Operating Expenses		
Cost of sales-food	34.5%	38.6%
Cost of sales-beverage	23.3%	26.9%
Wages expense	28.0%	29.6%
Other operating expenses	<u>27.5%</u>	<u>28.5%</u>
Total expenses	<u>87.2%</u>	<u>93.7%</u>
Operating Income (BT)	<u>12.8%</u>	<u>6.3%</u>

