FIN401 ADVANCED FINANCIAL MANAGEMENT
NOTE: TREND ANALYSIS

Trend analysis is used to detect patterns over multiple time periods. In Financial Statements, trend analysis can be used to analyze past performance as well as to forecast future performance. Whereas variance analysis is generally used to compare performance of one period against a standard (budget, previous year, or forecast), trend analysis is used to analyze performance over multiple periods. Often, graphs are helpful in trend analysis to detect trends or patterns.

Financial Statement trend analysis can vary depending on the information that is needed, but below are 3 common methods of trend analysis:

1. $ change Year over Year (or Period over Period)
2. % change Year over Year (or Period over Period)
3. CAGR change for all of the Years (or Periods)

Let's assume we want to analyze Revenue over several years, with the following information:

	2019	**2020**	**2021**	**2022**	**2023**
Revenue	$1,100,500	$1,200,000	$1,315,000	$1,295,000	$1,400,000

1. **$ Change Year over Year** would be calculated by measuring the $ change each year from the previous year. These changes would be calculated as follows:

	2020 vs 2019	**2021 vs 2020**	**2022 vs 2021**	**2023 vs 2022**
Revenue	+$99,500	+$115,000	-$20,000	+$105,000

2. **% Change Year over Year** would be calculated by measuring the % change each year from the previous year. The changes would be calculated as follows:

	2020 vs 2019	**2021 vs 2020**	**2022 vs 2021**	**2023 vs 2022**
Revenue	+9.0%	+9.6%	-1.5%	+8.1%

3. **CAGR (Compound Annual Growth Rate)** is a formula that calculates the "smoothed" change % rate over multiple periods of time. In the above example, instead of showing the % change year over year with multiple numbers, a CAGR calculates the average change each year over the multiple years. Using the same example, we see that revenue increased from $1,100,500 in the first year (2019) to $1,400,000 in the fifth year (2023). Thus, over a 4-year period (Year 5 minus Year 1), revenue increased by $299,500 ($1,400,000 - $1,100,500). The CAGR of the change is calculated to be 6.2024%. This can be tested as follows:

Year 1 Change	$1,100,500 x 1.062024 = $1,168,758
Year 2 Change	$1,168,758 x 1.062024 = $1,241,249
Year 3 Change	$1,241,249 x 1.062024 = $1,318,237
Year 4 Change	$1,318,237 x 1.062024 = $1,400,000

In other words, revenue of $1,100,500 in the first year (2019) grew at a CAGR of 6.2024% (or on average 6.2024% per year) for 4 years, finishing at $1,400,000 in that fifth year (2023). Note that each year's ending balance does not match the actual balance for the year but that over time, at the calculated CAGR, it will end up at the same ending value in the final year.

In Excel, there are a couple of ways to calculate CAGR:

1. Use the RRI formula: =RRI(# of periods of change, PV (first year), FV (last year). In this case, the formula would look like this:

   =RRI(4,1100500,1400000)

2. Use the following formula: (Ending value/Beginning value)^(1/periods of change) – 1. In this case the formula would look like this:

   =(1400000/1100500)^(1/4)-1

   In both cases, the CAGR is calculated as 6.2024%

Trend analysis is a very useful tool to help understand past performance as well as to help predict, or forecast, future performance.