Excel – Trend Lines

BY MARK GILLAN
Similar to the line of line charts, but unlike line charts it does NOT precisely connect every data point.

Used to represent ALL the data, with fluctuations taken into consideration.

Minor exceptions or statistical differences will not distract from displaying a trend or indeed the correct formula.

In some instances, a trend line can be used to forecast future data.
Excel – Trend Lines Support

- Chart types supporting trend lines within Microsoft Excel:
  - Area
  - Bar
  - Bubble
  - Column
  - Line
  - Scatter
  - Stock

- Trend lines cannot be added to:
  - 3D charts
  - Radar
  - Pie
  - Doughnut
Excel - adding a trend line

- Insert the chart
- Design > Add Chart Element
- Trendline > Type of trend line
- More options available
- Also, right hand clicking can assist with a shortcut to adding a trend line to a chart
Double clicking on the trend line allows for advanced options

Display R-squared value on chart

This represents the variance in $y$ attributable to the variance in $x$

Notice the ‘Display Equation on chart’ option to show the calculation for the variance in $y$ attributable to the variance in $x$

The forecast either backwards or forwards by a given amount of periods
Adding the regression formula to a chart trend line:

- Returns the square of the product moment correlation coefficient through data points in y's and x's.

The r-squared value can be interpreted as the proportion of the variance in y attributable to the variance in x.

- So, if a trend line is aligned exactly along the path of plotted values for x and y upon a chart, there is a direct correlation coefficient between the values meaning a return of 1. Close to 1 would be a close correlation, in other words, it would mean one set of values has a direct impact upon the other set of values across the path.
Excel – Types of Trend Lines

- **Linear** - Best fit straight line. Useful for showing steady increase or decrease.
- **Logarithmic** - Best fit curved line. Useful when the rate of change in the data increases or decreases quickly and then levels out.
- **Polynomial** - Curved line that is used when data fluctuates. Useful for analysing gains and losses over a large data set. The order of the polynomial can be determined by the number of fluctuations in the data or by how many bends (hills and valleys) appear in the curve. An Order 2 polynomial trend line generally has only one hill or valley. Order 3 generally has one or two hills or valleys. Order 4 generally has up to three.
- **Power** - Curved line. Best used with data sets that compare measurements that increase at a specific rate — acceleration at one-second intervals. You cannot create a power trend line if your data contains zero or negative values.
- **Exponential** - Curved line. Most useful when data values rise or fall at increasingly higher rates. You cannot create an exponential trend line if your data contains zero or negative values.
- **Moving average** - Tends to smooth out fluctuations in data to show a pattern or trend more clearly.
Linear

- Best fit straight line
- Useful for showing steady increase or decrease
Logarithmic

- Best fit curved line
- Useful when the rate of change in the data increases or decreases quickly and then levels out
Polynomial

- Curved line that is used when data fluctuates
- Useful for analysing gains and losses over a large data set
- The order of the polynomial can be determined by the number of fluctuations in the data or by how many bends (hills and valleys) appear in the curve
- An Order 2 polynomial trend line generally has only one hill or valley
- Order 3 generally has one or two hills or valleys
- Order 4 generally has up to three
Power

- Curved line
- Best used with data sets that compare measurements that increase at a specific rate — acceleration at one-second intervals
- You cannot create a power trend line if your data contains zero or negative values
Exponential

- Curved line
- Most useful when data values rise or fall at increasingly higher rates
- You cannot create an exponential trend line if your data contains zero or negative values
Moving Average

- Tends to smooth out fluctuations in data to show a pattern or trend more clearly
- Excel calculates the moving average of a certain value set by a period option with the default as 2 periods
- Increasing the period value, would mean Excel calculating from more data points allowing the line to be even smoother