**A10Wa Types of trends**

Fitting a line to a time series is identical to establishing a regression line between two variables. The only difference is that in the case of time series analysis, one of the variables is time. In Chapter 9 we reviewed different types of curves that can be used to describe relationships between two variables. Before we go any further, let’s remind ourselves of all the options that Excel gives us. We can fit the following **types of trends** (or curves) to any data set: (a) **linear trend**, (b) **logarithmic trend**, (c) **polynomial trend**, (d) **power trend**, (e) **exponential trend**, and (f) **moving average trend**.

We already know that **linear trend** is defined by equation (1).

y = mx + b (1)

**Logarithmic curve** is defined by equation (2).

y = c ℓn x + b (2)

Here c and b are constants and ℓn is the natural logarithm function. The picture in Excel dialogue box indicates that this trend has a form of an inverse exponential curve. The one that quickly reaches some high value, and then continues to grow, but much more slowly.

**Polynomial curve** comes in several degrees, for example, a polynomial equation of degree 6 would be written as defined by equation (3).

y = b + c1x + c2x2 + c3x3 +c4x4 +c5x5 + c6x6 (3)

In this case also b and c1 to c6 are constants. If you experiment with these curves, you will see that some of them translate into very dynamic curves making multiple turns and ups and downs.

**Power function** has a very simple equation, with c and b as constants, as defined by equation (4).

y = cxb (4)

This trend is a **parabolic trend** that will continue to grow forever.

**Exponential trend** also has two constants, c and b, as defined by equation (5).

y = c*e*bx (5)

The symbol *e* is used for the basis of natural logarithms. Unlike the power trend which continues to grow at a constant rate, exponential trend moves slowly at the beginning and then resumes very fast change typified by exponential growth.

**Moving averages trend** is a special type of trend that we will cover in the next chapter, due to its special way of deployment.