

Investment Analysis Toolpak

In addition to its main risk analysis program, the *RiskEase* package also includes the **Investment Analysis Toolpak**. This is a collection of add-in functions that you can use to enhance your investment appraisal models. When the Toolpak is loaded, its functions become available to your spreadsheets just like any other Excel built-in function; you can insert them in your model either by typing their name and arguments directly, by using Excel's Function Wizard, or through the **RiskEase menu selection**.

To make the Toolpak's functions available to your spreadsheets:

- From inside Excel, choose **File, Open**; select the directory where *RiskEase* was installed and open the file **INVEST.XLAM**.

To make the Toolpak's functions always available whenever you are in Excel, use Excel's add-in manager to register it as follows:

- From inside Excel, select **Tools, Add-in**
- Click on **Browse** and select the directory where *RiskEase* was installed
- Highlight **INVEST.XLAM** and click on **OK**
- The Toolpak will be added to Excel's list of add-ins. You can now enable or disable it by clicking on the option box in front of its name in the add-in list. When the box is checked, the Toolpak will be loaded automatically every time you start Excel.

Note that the Investment Toolpak functions are always available whenever *RiskEase* is loaded.

If you are using Excel's Function Wizard or the **Insert Function** command, you can find the Toolpak's functions grouped together in a function category called "Investment Analysis".

The following pages list the functions included in the Investment Analysis Toolpak and describe their arguments and usage. As the Toolpak is continually upgraded and extended, please consult the README.TXT file and the *RiskEase* on-line help system for an up-to-date list of functions. A workbook demonstrating the use of all Toolpak functions can be found under the filename TOOLDEMO.XLS in the EXAMPLES sub-directory.

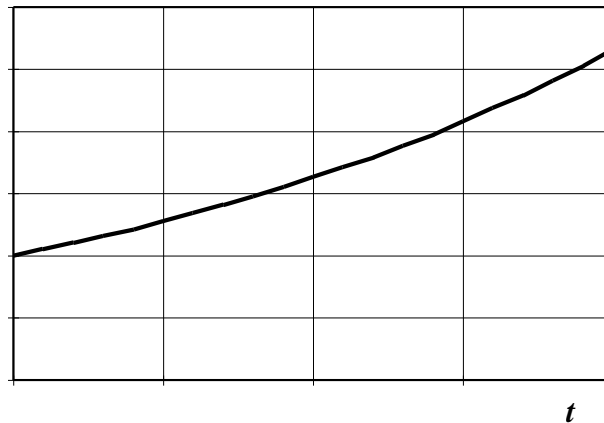
GROWTH.EXP (*t*, *base*, *growth_rate*)

ARGUMENTS

t is the time period (e.g. year)
base is the starting value of the unknown at $t=0$
growth_rate is the (constant) rate of growth per period.

DESCRIPTION

This is a simple exponential growth curve for quantities that are assumed to grow at a constant rate (percentage) every time period:



EXAMPLE

The price for a certain item is currently \$65 and is growing at 3% every year. Four years from now, the price will be:

$$\text{GROWTH.EXP}(4, 65, 3\%) = \$73.16$$

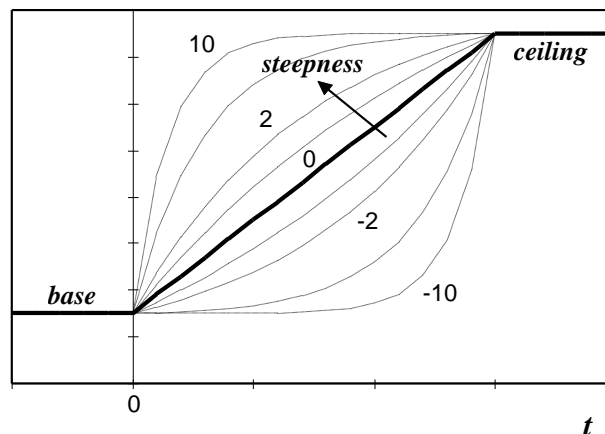
GROWTH.SMOOTH (*t, base, ceiling, duration, steepness*)

ARGUMENTS

- t* is the time period (e.g. year)
- base* is the starting value of the unknown at $t=0$
- ceiling* is the finishing value of the unknown at $t=duration$
- duration* is the number of periods in which the unknown changes from *base* to *ceiling*
- steepness* is a measure of the growth's speed.

DESCRIPTION

This function allows you to interpolate smoothly between a starting and a finishing value for a variable, such as a market share. The parameter *steepness* controls the curvature of the line joining the two values: the higher the steepness, the faster the value rises at first and the smoother it becomes near the finishing value. If you make the steepness negative, you can have a concave curve where the growth starts off slowly and gradually picks up:



Note that the finishing value need not always be higher than the starting value. In other words, you can use this function to model a gradual decrease as well as an increase. A steepness of zero will give you a straight line.

EXAMPLE

A market share is projected to grow rather smoothly (*steepness* = 2) from 10% to 45% in three years. The share in the first year is given by:

$$\text{GROWTH.SMOOTH}(1, 0.1, 0.45, 3, 2) = 0.297 \text{ or } 29.7\%$$

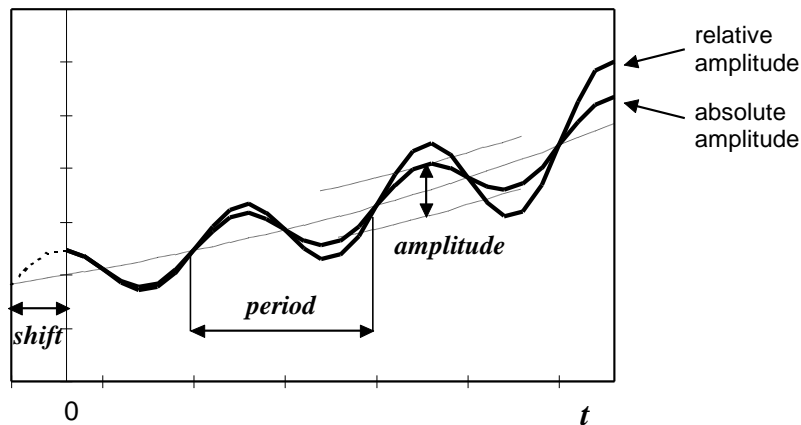
CYCLICAL (*t, base, growth_rate, amplitude, period, shift*)

ARGUMENTS

- t* is the time period (e.g. year)
- base* is the value of the mean at $t=0$ (see diagram below)
- growth_rate* is the (constant) rate of growth per period.
- amplitude* is the amplitude of the cycle, i.e. the difference between the peaks and troughs
- period* is the period of the oscillation, i.e. the time between two successive peaks or troughs
- shift* is the phase shift in time units (see the diagram below).

DESCRIPTION

This function can be used to model quantities that are known to show cyclical behavior, such as pulp prices in the paper industry.



If you want the amplitude to be a percentage of the (growing) mean value (“relative amplitude” in the figure), then enter it as a negative number.

EXAMPLE

Suppose that the figure above shows the price of pulp against time. The mean price at the start of the project ($t=0$) is 100 and grows at 3% per year; the period and shift are 10 and 3 years respectively and the amplitude is 50. Five years into the project ($t=5$), the price will be:

$$\text{CYCLICAL}(5, 100, 0.03, 50, 10, 3) = 92.15$$

If we specify instead that the amplitude is 50% of the mean price, then we use:

$$\text{CYCLICAL}(5, 100, 0.03, -0.5, 10, 3) = 88.36$$

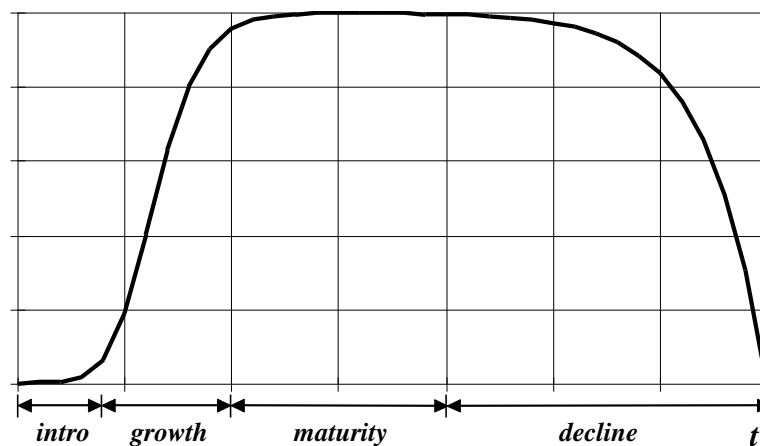
LIFECYCLE (*t, base, ceiling, intro, growth, maturity, decline*)

ARGUMENTS

<i>t</i>	is the time period (e.g. year)
<i>base</i>	is the starting value of the unknown at t=0
<i>ceiling</i>	is the maximum value of the unknown (in the maturity phase)
<i>intro</i>	is the duration of the introduction phase
<i>growth</i>	is the duration of the growth phase
<i>maturity</i>	is the duration of the maturity phase
<i>decline</i>	is the duration of the decline phase

DESCRIPTION

This function quantifies the well-known curve for a product life-cycle.



EXAMPLE

Sales of a new product are expected to reach a maximum of 100.000 units per year. The introduction period is assumed to last 4 years, the growth phase 6, the maturity phase 10 years and the decline 15 years. According to this model, sales in year 7 will be:

$$\text{LIFECYCLE}(7, 0, 100000, 4, 6, 10, 15) = 62.893$$