In This Issue

1. Learn how to run ***Risk Simulator's*** JS Curves module.

"What's the difference between a J curve and an S curve?"

Theory

The J curve, or exponential growth curve, is one where the growth of the next period depends on the current period's level and the increase is exponential. This phenomenon means that over time, the values will increase significantly, from one period to another. This model is typically used in forecasting biological growth and chemical reactions over time.

The S curve, or logistic growth curve, starts off like a J curve, with exponential growth rates. Over time, the environment becomes saturated (e.g., market saturation, competition, overcrowding), the growth slows, and the forecast value eventually ends up at a saturation or maximum level. The S-curve model is typically used in forecasting market share or sales growth of a new product from market introduction until maturity and decline, population dynamics, growth of bacterial cultures, and other naturally occurring variables.

Procedure

- Start Excel and select *Risk Simulator | Forecasting | JS Curves*.
- Select the J- or S-curve type, enter the required input assumptions (see Figures 1 and 2 for examples), and click *OK* to run the model and report.

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J-Curve Exponential Growth Curves

In mathematics, a quantity that grows exponentially is one whose growth rate is always proportional to its current size. Such growth is said to follow an exponential law. This implies that for any exponentially growing quantity, the larger the quantity gets, the faster it grows. But it also implies that the relationship between the size of the dependent variable and its rate of growth is governed by a strict law, of the simplest kind: direct proportion. The general principle behind exponential growth is that the larger a number gets, the faster it grows. Any exponentially growing number will eventually grow larger than any other number which grows at only a constant rate for the same amount of time. This forecast method is also called a J curve due to its shape resembling the letter J. There is no maximum level of this growth curve. Other growth curves include S-curves and Markov Chains.

To generate a J curve forecast, follow the instructions below:

1. Click on **Risk Simulator | Forecasting | JS Curves**
2. Select Exponential J Curve and enter in the desired inputs
   (e.g., Starting Value of 100, Growth Rate of 5 percent, End Period of 100)
3. Click OK to run the forecast and spend some time reviewing the forecast report

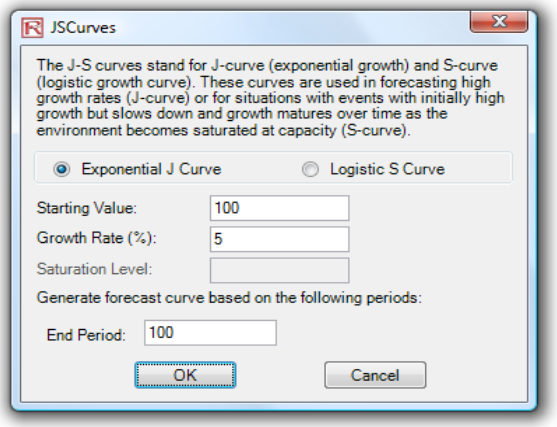
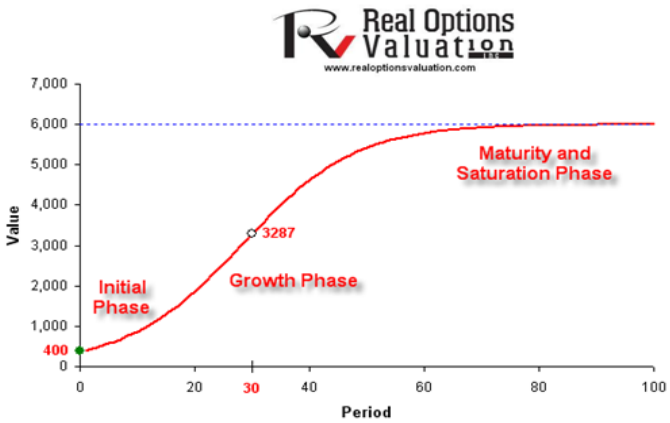


Figure 1. J-Curve Forecast

Logistic S Curve

A logistic function or logistic curve models the S-curve of growth of some variable X. The initial stage of growth is approximately exponential; then, as competition arises, the growth slows, and at maturity, growth stops. These functions find applications in a range of fields, from biology to economics. For example, in the development of an embryo, a fertilized ovum splits, and the cell count grows: 1, 2, 4, 8, 16, 32, 64, etc. This is exponential growth. But the fetus can grow only as large as the uterus can hold; thus other factors start slowing down the increase in the cell count, and the rate of growth slows (but the baby is still growing, of course). After a suitable time, the child is born and keeps growing. Ultimately, the cell count is stable; the person's height is constant; the growth has stopped, at maturity. The same principles can be applied to population growth of animals or humans, and the market penetration and revenues of a product, with an initial growth spurt in market penetration, but over time, the growth slows due to competition and eventually the market declines and matures.



1. Click on **Risk Simulator | Forecasting | JS Curves**
2. Enter in the required inputs (see below for an example)
3. Click **OK** and review the forecast report

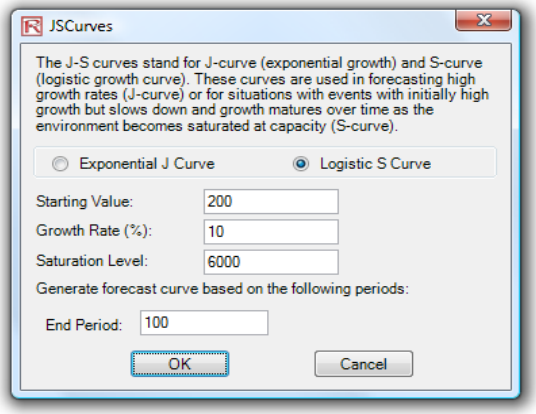


Figure 2. S-Curve Forecast