

Eads & Heald Investment Counsel

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Chapter 8: Semi-log versus Linear Graph Paper

Quite possibly, you know about semi-log (i.e., logarithmic) graph paper. However, if you are not familiar with it, we should discuss it briefly since semi-log graphs are used frequently in economic, investment and finance literature.

Semi-log means just that.....a partially logarithmic scale. Typically, the horizontal “x” axis is a linear scale with equal spacing for equal units. However, the vertical “y” axis is not a linear scaling...it is a logarithmic scale. For instance, the vertical scale of a chart would be 1, 10, 100, 1000 etc. with each of these the same distance apart. The log (to base 10) of each of these is, respectively, 0, 1, 2, 3, etc. In many situations the vertical log scale gives an intuitively more natural impression of the data at hand than using a vertical linear scale.

Simply stated, the logarithmic scale allows a constant rate of growth to appear as a straight line. With a linear (non logarithmic) vertical scale a positive constant rate of growth line will bend upward over time.

See Chart 1 (semi-log) and Chart 2 (linear) where each chart plots a line beginning at 75 in the first time period and growing at a rate of 30% per year. The value reaches 1,344 in the twelfth time period. In the linear vertical scale Chart 2 the data line bends upward while in the log scale Chart 1 the 30% growth line is straight. It is often useful to be able to view a constant rate of growth as a straight line. One good example would be the annual earnings growth rate for a corporation. If the earnings growth rate is constant at, say, 30% percent per year, a line bending upward would give a misleading impression of growing faster and faster. A straight line would give the correct impression of steady growth at a constant rate.

Chart 1

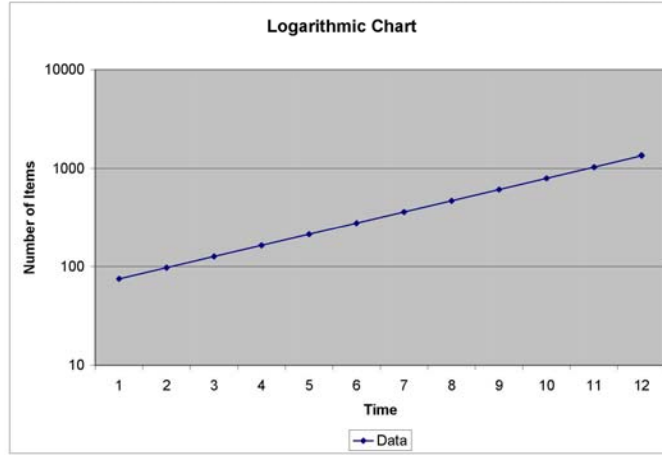
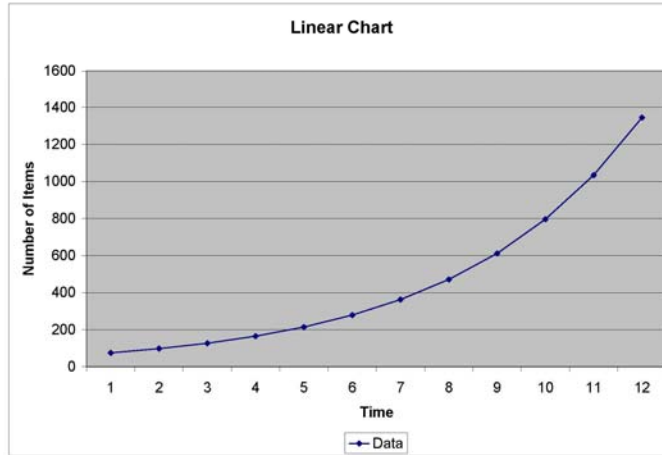


Chart 2



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