Displaying the Growth of Assets Properly

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Editor's note: Geek Speak is a new and occasional Investments & Wealth Monitor *column that provides insight on technical and quantitative concepts in the field of finance.*

Figures 1 and 2 both illustrate the growth of $1 in the S&P 500 from January 1926 through December 2007. However, the same data produce dramatically different impressions depending on the presentation.

Figure 1 suggests the market was flat for 50 years and that all of the gain came relatively recently. The decline beginning in 1999 appears especially traumatic. In general, figure 1 suggests much larger growth and volatility in recent periods.

Figure 2 shows more consistent growth. The drop in 1999 still is visible, but it appears to compare with other dips in magnitude and duration. This figure provides a better visual display of this quantitative inform ation.[1]

The difference in these two charts arises because of the difference in vertical scaling. Figure 1's vertical scale increases by $500 each tick. Each vertical tick in figure 2 represents a 900-percent increase. In other words, two movements of the same vertical distance in figure 1 represent the same dollar growth. Two movements of the same vertical distance in figure 2 represent the same percentage growth.

Investors care about percentage growth. In the illustration of this data representing equity performance, growing from $500 to $1,000 is more impressive than growing from $2,500 to $3,000. The scaling in figure 2 causes a growth from $500 to $1,000 to appear similar to a growth from $1,500 to $3,000. This type of scaling is called logarithmic. Figure 2 is called log-linear or semi-log because one scale is logarithmic and the other is linear. These formats are available in most charting packages, such as Microsoft's Excel.

The semi-log chart should be used when illustrating the growth of a portfolio over long periods of time.

FIGURE 1: GROWTH OF $1 FROM JANUARY 1926–DECEMBER 2007

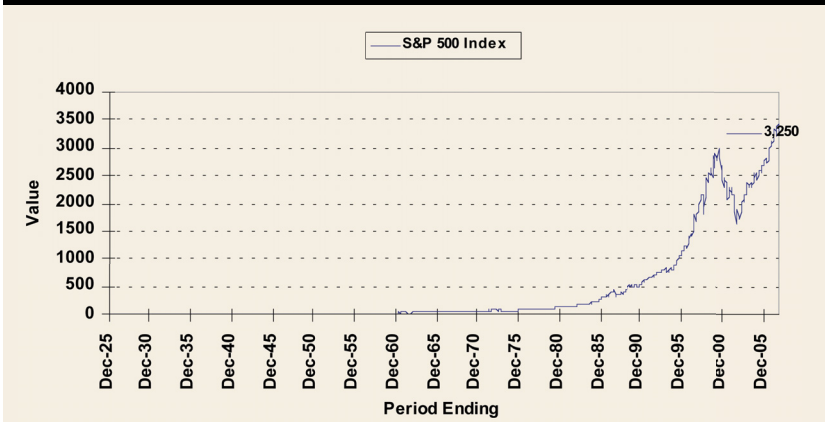
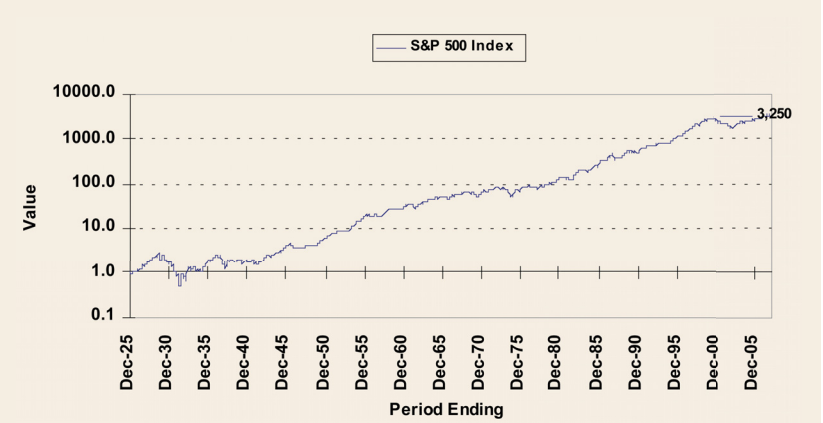


FIGURE 2: GROWTH OF $1 FROM JANUARY 1926–DECEMBER 2007



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Endnote

[1] For more on this subject, read Edward Tufte, *The Visual Display of Quantitative Information* (Cheshire, CT: Graphics Press, 2001).