

ARITHMETIC AND LOGARITHMIC SCALE

There are two commonly used methods of displaying the vertical price scale on a chart. They are:

- arithmetic scale
- logarithmic (log) scale

Arithmetic Scale:

Sometimes called a linear scale, an arithmetic scale displays price movement as equal increments (in points) between each division line.

In TeleChart, the division lines are the horizontal gridlines. A number that represents the monetary change in the stock between gridlines is displayed below the price column (shown here in red).



A challenge with the arithmetic scale is that a trader may not get a true sense of the magnitude of the move, especially if a stock rises or falls fairly rapidly. For example, in the daily chart of Travelzoo Inc (TZOO) below, you can see that the stock made a parabolic rise in August-September 2004. The arithmetic scale reflects the rise as \$10 between each gridline. However, the rise from \$20 to \$30 was a 50% increase; the rise from \$30 to \$40 was a 33% increase; and the rise from \$40 to \$50 was a 25% increase. Even though the price increment change between each gridline is shown as being equal, the percentage change between each gridline is not equal. The percentage increase was more substantial during the earlier part of the stock's rise.



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Logarithmic (Log) Scale:

Sometimes called ratio or semi-log, a logarithmic displays scale the price movement between the division lines (horizontal gridlines) as an equal percentage change. In TeleChart, that percentage is displayed below the price column (shown here in red).

If price moves up or down by one gridline, that is an x percent move for that stock; with x being the percentage indicated (i.e. 1.93%).



Which is better, arithmetic or logarithmic?

The scaling method you choose is up to you; however, many seasoned traders use logarithmic for charting stocks, which is also my preference. With few exceptions, I use log scaling for all charting. One of those exceptions is when price retraces after a prior strong move. I'll shift temporarily to arithmetic to quickly gauge the extent of the price retracement.

Another exception is when viewing the Worden Market Indicators in TeleChart. In order to see the actual values of some Market Indicators, such as the McClellan Oscillator (T2106) and the McClellan Summation Index (T2118), you'll need to temporarily shift to the arithmetic scale.

The percentage change between gridlines is referenced many times throughout my courses when referring to the volatility of a stock, as well as to emphasize risk and trade management concepts.



According to John Bollinger: "The beauty of log scaling is that it draws the eye toward a proper assessment of risk and reward without regard to price level." John Bollinger is the creator of Bollinger Bands, a good technical indicator for analyzing market volatility. Bollinger Bands and other indicators covered in Tina Logan's Guide to Using Indicators. Additionally, traders interested in an in-depth study of Bollinger Bands would benefit from reading Mr. Bollinger's book, *Bollinger on Bollinger Bands*.

Changing the Scale:

In TeleChart, the scale can be changed very quickly from arithmetic to logarithmic. Simply click the letters just below the price column: A = Arithmetic and L = Logarithmic. The letters T, M and L to the right of logarithmic are custom settings. I do not use them at this time.

