

## Chart Scale Debate: Log vs. Arithmetic

Daniel L. Chesler, CTA

<http://www.chesler.us>

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Log scale charts offer aesthetic and visual advantages over arithmetically scaled charts IF the goal is merely to display many years of historical data in a single chart – i.e., for a presentation, for a wall decoration, etc. However, for trading and analytical purposes, such as determining the location of long-term support and resistance, log scaling is both an arbitrary and unnecessary data adjustment.

It is important to understand that chart scale does not alter the numerical result of support and resistance levels calculated via percentage retracements and extensions. Nor does chart scale effect the result of any chart value extended horizontally into the future, regardless of how the value is derived. This leaves the log versus arithmetic chart scale debate as one purely over the merits of consistent diagonal trendlines (the product of arithmetically scaled charts) versus inconsistent diagonal trendlines (the product of log scaled charts).

A diagonal trendline drawn on an arithmetically scaled chart is a mathematical construct (rise versus run), and thus serves as a momentum and swing force indicator unto itself, conveying information based on its length and slope. However a log scaled chart distorts this natural rise versus run property, by moving the diagonal trendline closer to the current price action as prices rise and further away as prices fall.

Log scale charts were conceived in the pre-computer era as a means of fitting many years of historical data into a single chart. Log scaled charts were never intended as a means of providing special benefit or advantage in the areas of trend analysis or signal generation. Moreover, no investor or trader – the real drivers of the market – thinks in terms of log scales when it comes their equity. They only think in terms of percentage won or lost.

Some argue that a rising trendline drawn on an arithmetically scaled chart is unrealistic, since it represents a perpetually diminishing return on investment. However in the real world very few people are perpetually invested. Others argue that constructing diagonal trendlines on very long-term arithmetic charts is physically impractical due to the “hockey stick” effect (observe an arithmetically scaled chart of the Dow going back 100 years and this effect is easily noticed).

What these arguments overlook is the fact that – regardless of a chart’s scale – the relevancy of any diagonal trendline spanning multiple decades is dubious at best. The reason for this is that momentum and volatility effects diminish over time i.e., returns in 1950 have little or no direct technical influence over returns in 1970. Trendlines derived from the last week or last month or last year, offer a far more realistic assumption of market dynamics than trendlines spanning decades. As well, visual inspection alone is usually sufficient to

determine whether a market's direction is rising or falling over long periods, without needing to plot decades of data.

The bottom line: for trading and technical analysis, stick with arithmetically scaled charts.