TECH SPEAK 101

ARITHMETIC AND LOGARITHMIC CHARTS

Reference Guide

SUTTMEIER
TECHNICAL STRATEGIES

Introduction

Arithmetic and logarithmic scales differ fundamentally in how they represent numerical changes, with arithmetic scales showing equal spacing for equal values and logarithmic scales representing equal spacing for equal percentage changes.

Bottom line:

- Use **arithmetic charts** when focusing on **price levels and short-term moves**.
- Use **logarithmic charts** when analyzing **long-term trends, percentage growth**, or **compounding returns** — such as secular bull and bear markets.

Arithmetic (Linear) Scale Charts

Definition:

An arithmetic or linear scale assigns **equal spacing** to **equal absolute price changes** on the vertical axis.

How it works:

- Each unit of price change (e.g., $1 or $10) occupies the same distance on the y-axis, regardless of the underlying price level.
- For example, on a stock chart:
  - The move from $10 to $20 (a $10 gain) looks the same as $100 to $110 (also a $10 gain).

Visual effect:

- Large price moves at higher price levels appear **exaggerated** because the chart doesn't account for percentage changes — only absolute ones.
- This scale is useful for visualizing data where the absolute differences are important, such as in short-term trading scenarios or when prices remain within a relatively narrow range.

Logarithmic (Log) Scale Charts

Definition:

A logarithmic scale assigns **equal spacing to equal percentage changes** rather than absolute dollar changes.

How it works:

- Each interval on the vertical axis corresponds to a fixed percentage change (e.g., +10%, +50%, +100%), not a fixed dollar change.
- Thus, a 100% gain (e.g., $10 to $20 or $100 to $200) occupies the same vertical distance.

Visual effect:

- Helps normalize price action across different price levels.
- Large price moves at higher levels are **visually compressed**, while lower-level moves are expanded.
- Reveals **consistent growth trends** and **true rate of change** over long periods.

Summary of arithmetic and logarithmic scale features

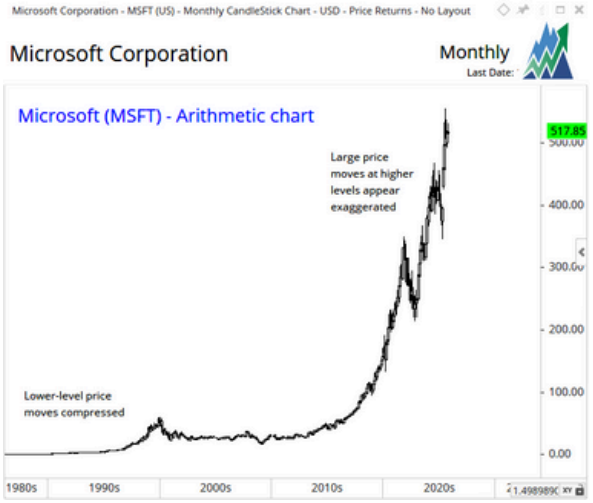
Feature	Arithmetic Scale	Logarithmic Scale
Measures	Absolute price changes	Percentage changes
Y-axis spacing	Equal for each $1	Equal for each %
Best for	Short-term, low-volatility charts	Long-term, high-volatility charts
Trendline accuracy	Distorted over long term	More realistic over long term
Example ($10 → $20 vs $100 → $200)	Unequal visually	Equal visually

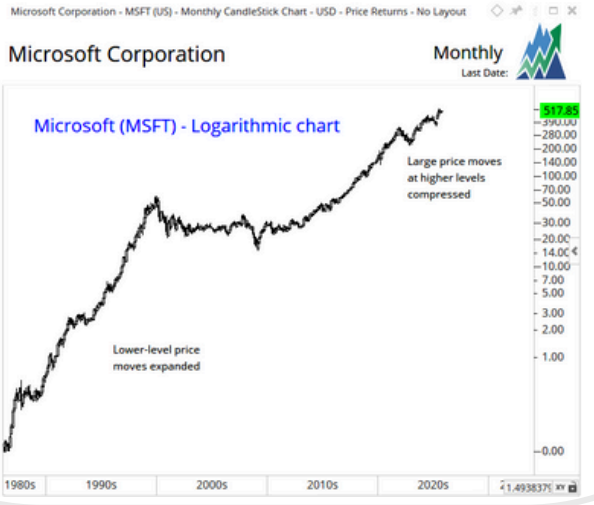
Use cases for arithmetic and logarithmic charts

Use Case	Preferred Scale	Reason
Short-term analysis	Arithmetic	Easier to see small dollar changes, especially within a narrow price range. Price levels and breakouts from short-term tactical setups are more intuitive in absolute terms.
Long-term analysis	Logarithmic	Reflects true growth rate. Trends appear linear if growth is exponential. Provides more accurate representation of trendlines and trend channels over long timeframes.

Case study: Microsoft

Microsoft (MSFT): Arithmetic chart (top) and Logarithmic chart (bottom)





TECH SPEAK 101

SUTTMEIER
TECHNICAL STRATEGIES

Case study: Microsoft

(cont'd)

Microsoft (MSFT): Arithmetic chart with big base and price projection

Microsoft (MSFT): Logarithmic chart with big base and price projection