

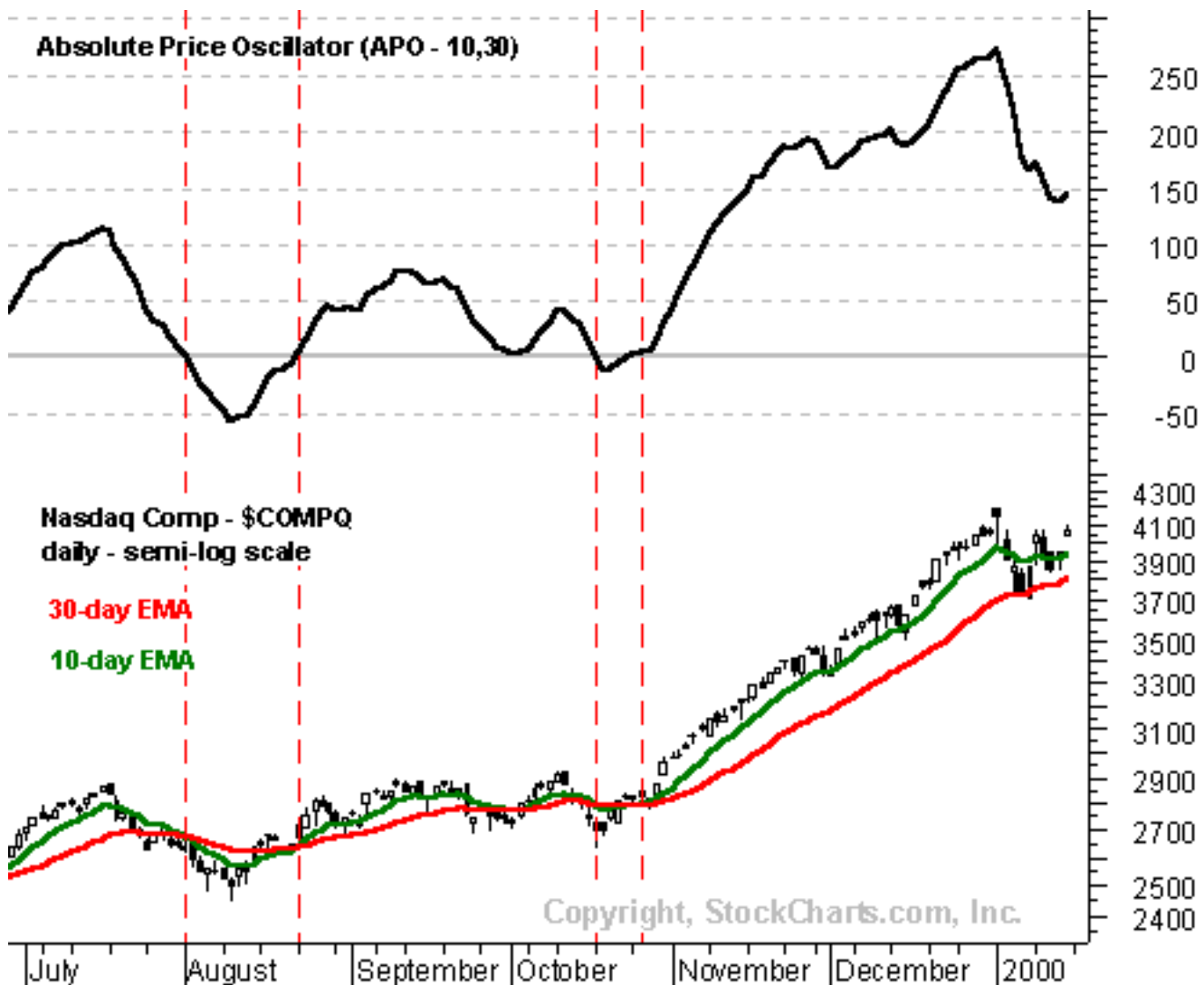
Price Oscillator

Introduction

The Price Oscillator is an indicator based on the difference between two moving averages, and is expressed as either a percentage or in absolute terms. According to user preferences, the moving averages used to calculate the Price Oscillator can be exponential, weighted or simple and the number of time periods can vary. For daily data, longer moving averages might be preferred to filter out some of the randomness associated with daily prices. For weekly data, which will have already filtered out some of the randomness, shorter moving averages may be deemed more appropriate. In addition, a moving average of the ensuing plot can be overlaid to act as a trigger line, much like is done with MACD. In our charts and commentary, we will use the abbreviation PPO to refer to the Percentage Price Oscillator and APO to refer to the Absolute Price Oscillator.

Absolute Price Oscillator (APO)

The Absolute Price Oscillator is calculated by subtracting the longer moving average from the shorter moving average. For example:



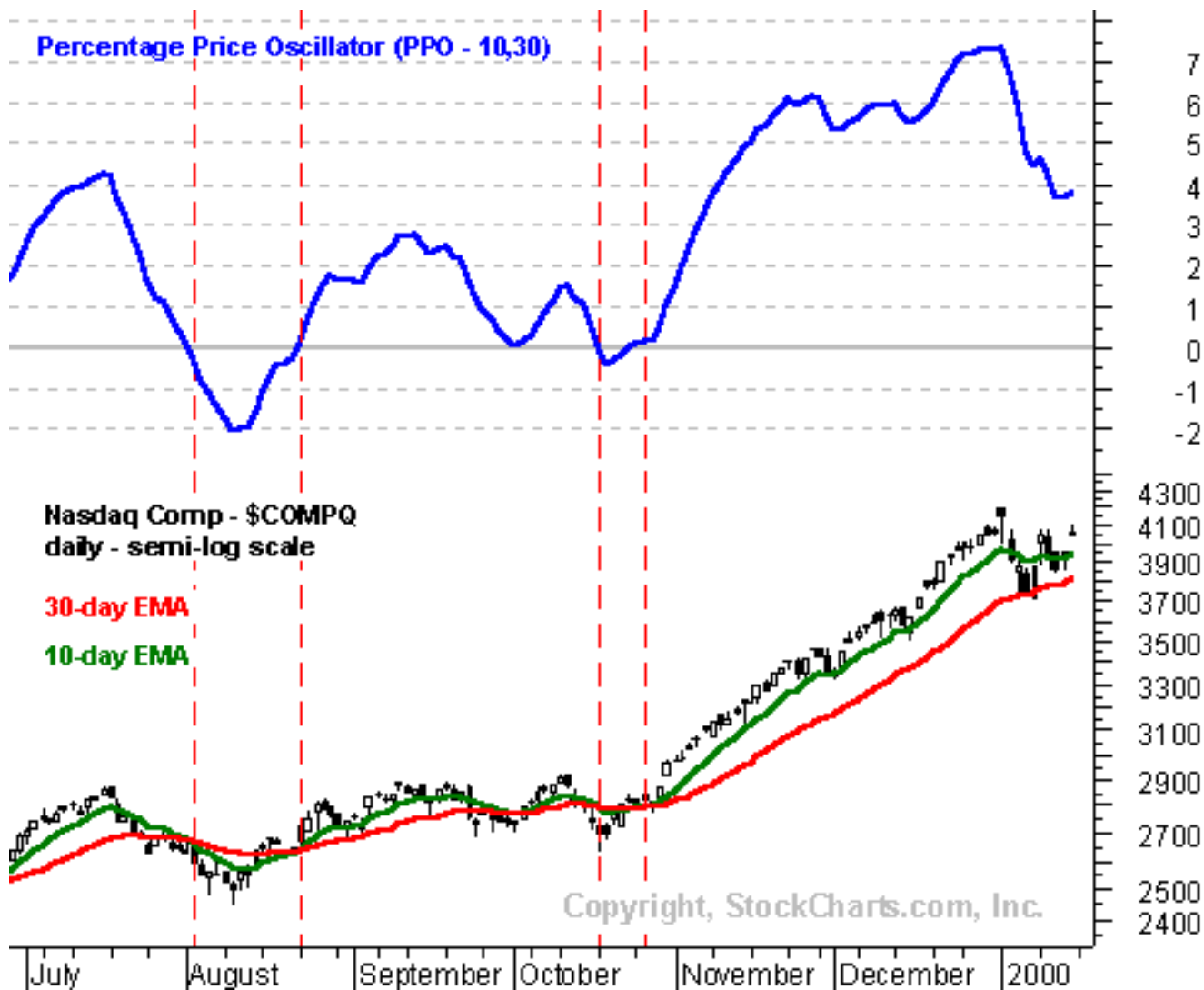
10-period exponential moving average (EMA) minus 30-period EMA

The resulting plot forms an oscillator that fluctuates above and below zero according to the differences in the moving averages. If the shorter moving average is above the longer moving average, then the indicator will be positive. If the shorter moving average is below the longer moving average, then the indicator will be negative.

Note: [MACD](#) is also calculated by finding the absolute difference. Theoretically, MACD can be calculated with any two user-defined moving averages. However, it is typically calculated by subtracting the 26-day exponential moving average from the 12-day exponential moving average.

Percentage Price Oscillator (PPO)

The Percentage Price Oscillator is found by subtracting the longer moving average from the shorter moving average and then dividing the result by the shorter moving average. For example:



([Click here](#) to see a live example of PPO)

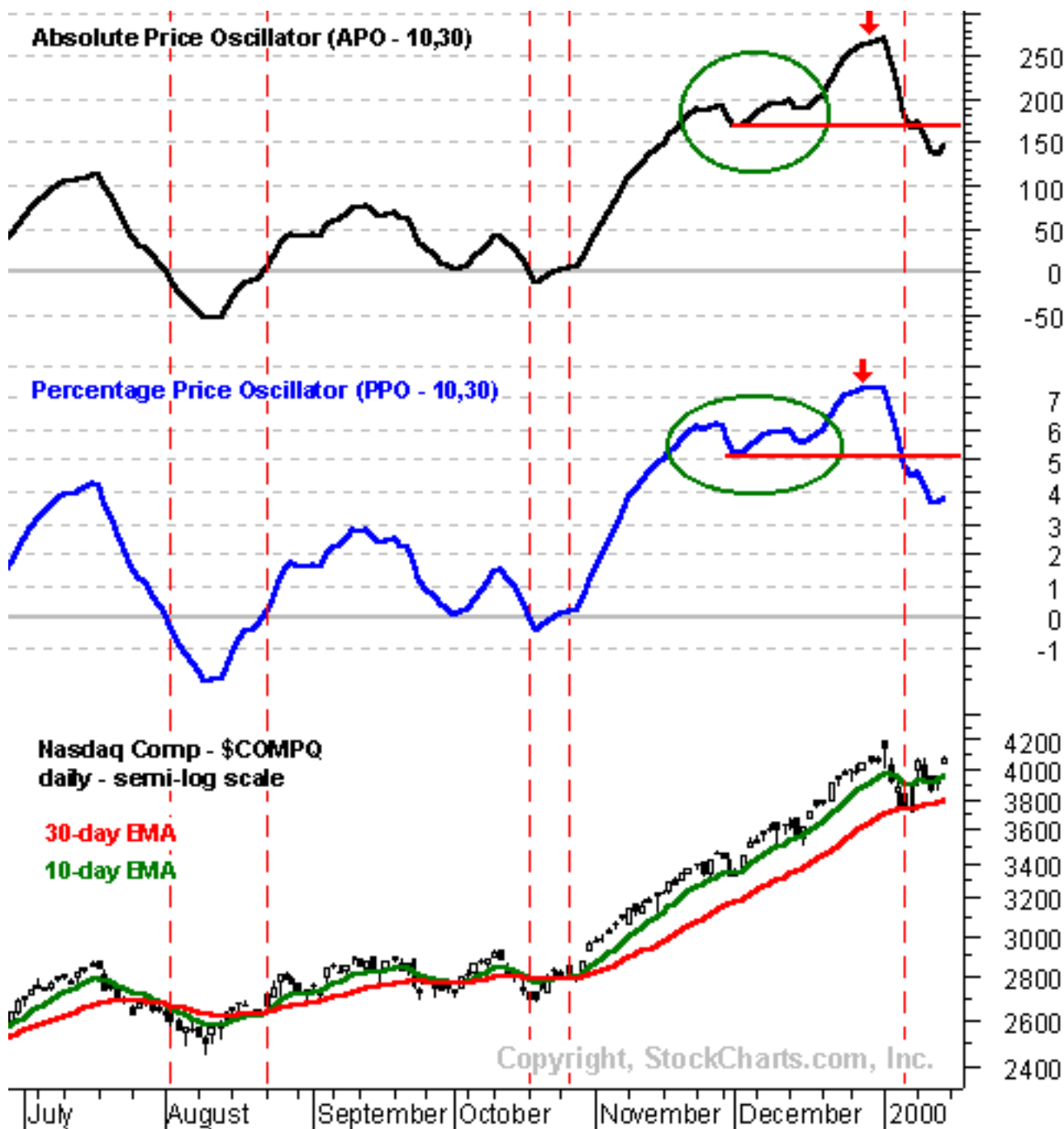
{ (10-period EMA minus 30-period EMA) divided by the 10-period EMA }

This formula displays the difference between the two moving averages as a percentage of the shorter moving average.

Absolute versus Percentage

The Percentage Price Oscillator (PPO) and the Absolute Price Oscillator (APO) generate many of the same signals and have basically the same shape. All centerline crossovers, which represent the shorter moving

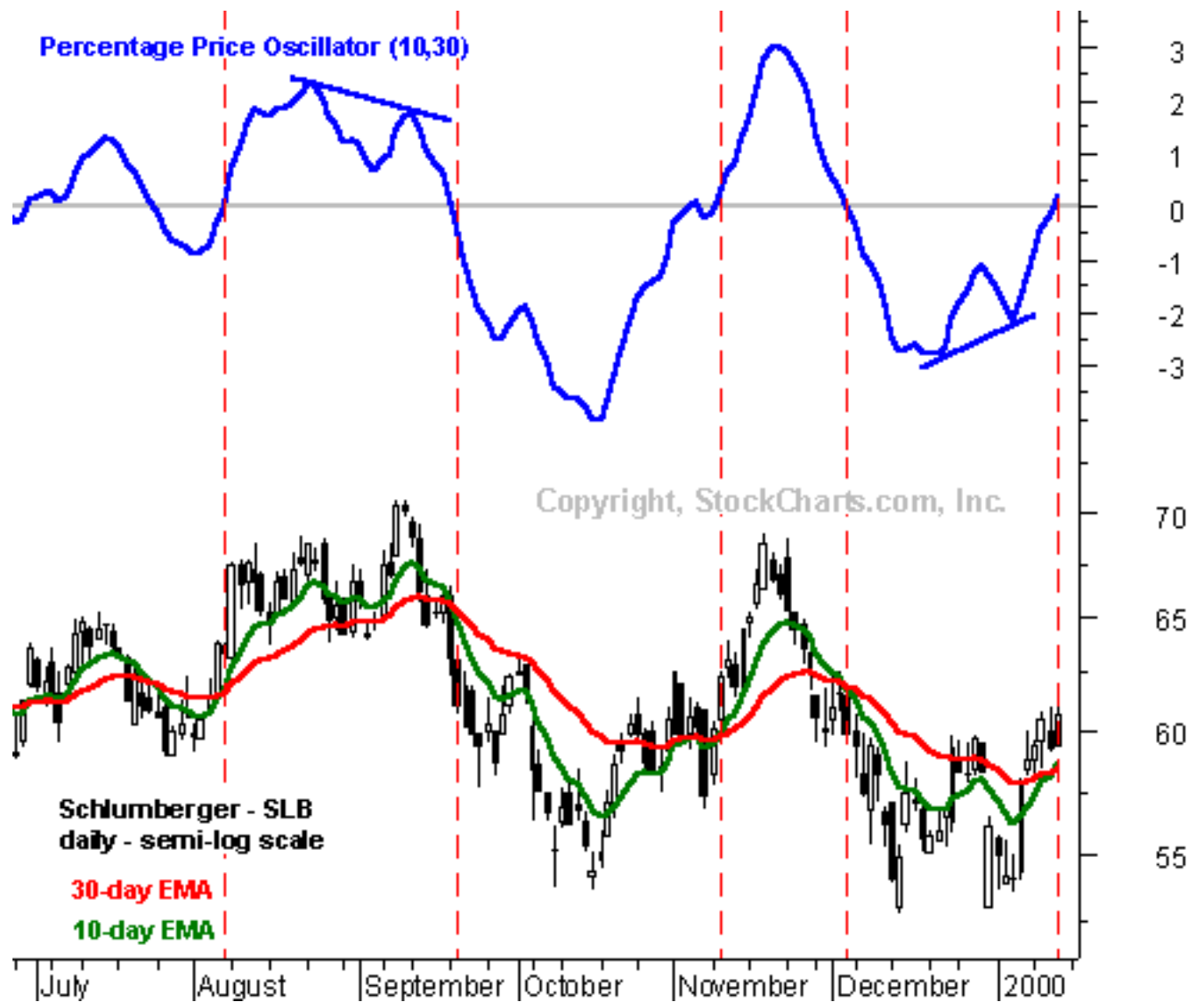
average crossing above or below the longer moving average, occur at the same time. However, because the shape of the lines are not exactly identical, there will likely be discrepancies. This analysis of the Nasdaq Composite illustrates some of the differences that may crop up.



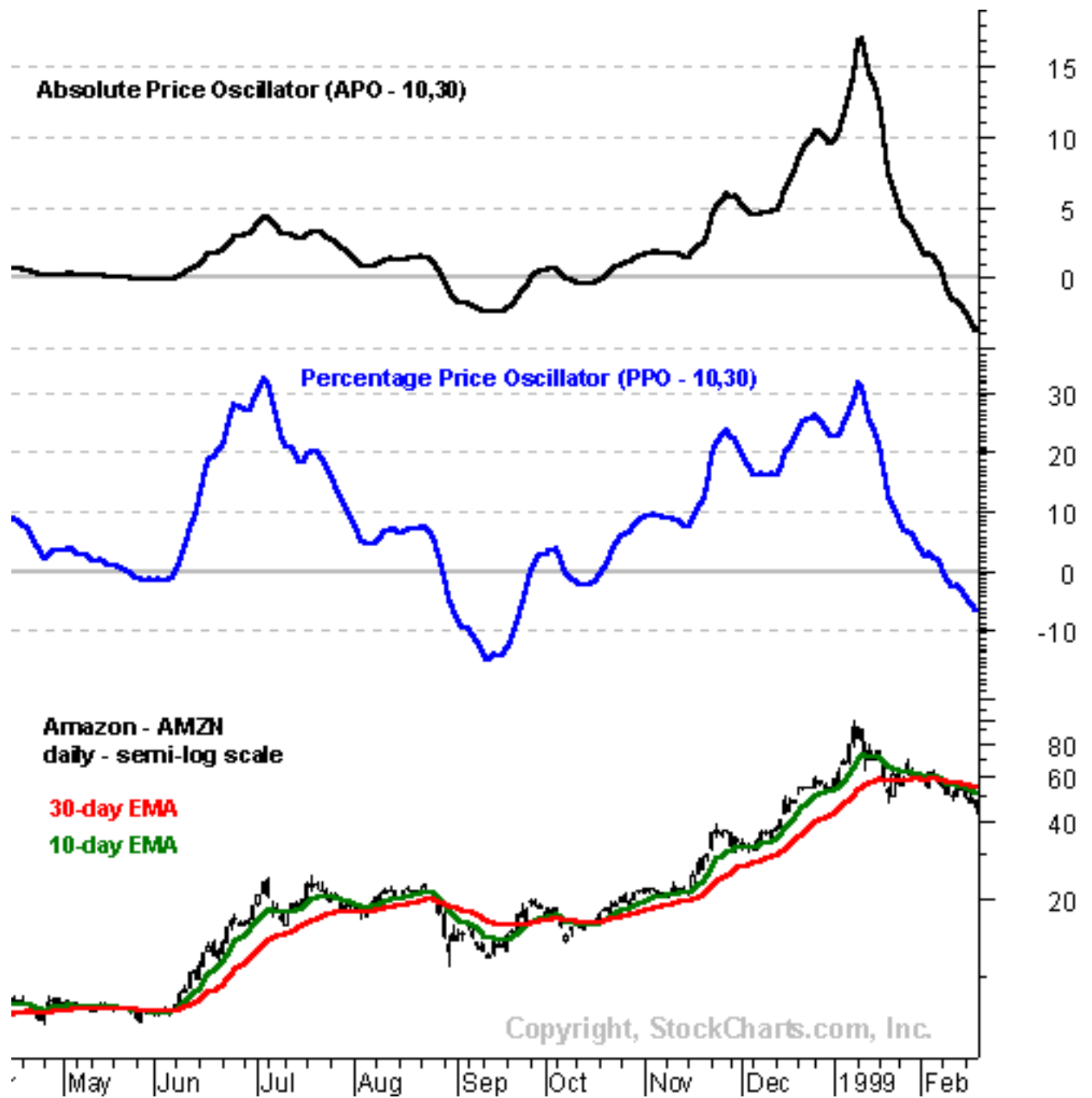
1. The green circle shows that the PPO formed a lower high in December while the APO formed a higher high.
2. Later in December, the APO continued higher and the PPO began to flatten out. (red arrows)
3. In early January, the PPO recorded a lower low, which was a day earlier than the APO.

There are two main reasons for using the PPO versus the APO.

1. With the Percentage Price Oscillator, it is possible to compare Price Oscillator levels from one security to the next. A PPO reading of +5% means that the shorter moving average is 5% higher than the longer moving average. This percentage reading is comparable against another security, regardless of the price of a security. The Percentage Price Oscillator (PPO) for SLB only reached 3% for its highs while that of the Nasdaq Composite rose above 7%.



2. The Percentage Price Oscillator is a better representation of the two moving averages relative to each other. The difference between the two moving averages is shown in relation to the shorter moving average. This allows for comparisons across time periods, regardless of the price of the stock. With the Absolute Price Oscillator, the higher the price of the stock, the greater the extremes of the oscillator. With the Percentage Price Oscillator, a comparison of Amazon over time is possible regardless of whether the stock is at 10 or 100.



PPO-Histogram

The daily Percentage Price Oscillator, using 12 and 26-day EMAs, is very similar to the standard MACD, which also uses the 12 and 26-day EMAs. The Percentage Price Oscillator measures the difference between the two moving averages as a percentage of the shorter moving average.

Because the Price Oscillator and MACD are so similar, the concept of the MACD-Histogram has been applied to the PPO. The PPO-Histogram shows the difference between the PPO and the 9-day EMA of the PPO. The plot is presented as a histogram so that centerline crossovers and divergences are easily identifiable. The same principles that apply to the MACD-Histogram are also applicable to the PPO-Histogram. The Absolute Price Oscillator (APO) is exactly the same as the MACD.

A centerline crossover for the PPO-Histogram is the same as a moving average crossover for the PPO. If the value of the PPO is larger than the value of its 9-day EMA, then the value on the PPO-Histogram will be positive. Conversely, if the value of the PPO is less than its 9-day EMA, then the value of the PPO-Histogram will be negative.



Further increases or decreases in the gap between the PPO and its 9-day EMA will be reflected in the PPO-Histogram. Sharp increases in the PPO-Histogram indicate that the PPO is rising faster than its 9-day EMA -- bullish momentum is strengthening. Sharp declines in the PPO-Histogram indicate that the PPO is falling faster than its moving average -- bearish momentum is increasing.

For the weekly charts on [StockCharts.com's StockWatch](http://www.stockcharts.com), the Percentage Price Oscillator (PPO) uses the 6 and 12-week EMAs with a 10-week EMA of the PPO as a trigger line. A PPO-Histogram has also been formulated for these charts and is shown as a histogram. Please see our Chart School article on the [MACD-Histogram](#) for more detailed description of how to use the MACD-Histogram. These guidelines are also valid for the PPO-Histogram.

For more on the interpretation of this oscillator and its signals, see our articles about [oscillators](#) and [MACD](#).

Written by Arthur Hill

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