Fibonacci Fans [ChartSchool]

Table of Contents

Fibonacci Fans

Introduction

Fibonacci Fan lines are trend lines based on Fibonacci retracement points. Rising fan lines extend up from a trough and pass through retracement based on the advance (trough to peak). These fan lines can then be used to estimate support levels or potential reversal zones. Falling fan lines extend down from a peak and pass through retracements based on the decline (peak to trough). These fan lines can then be used to estimate resistance levels or potential reversal zones. This article will explain the Fibonacci ratios and provide examples using Fibonacci Fans to project support and resistance.

The Sequence and Ratios

This article is not designed to delve too deep into the mathematical properties behind the Fibonacci sequence and Golden Ratio. There are plenty of other sources for this detail. A few basics, however, will provide the necessary background for the most popular numbers. Leonardo Pisano Bogollo (1170-1250), an Italian mathematician from Pisa, is credited with introducing the Fibonacci sequence to the West. It is as follows:

0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233, 377, 610……

The sequence extends to infinity and contains many unique mathematical properties:

- After 0 and 1, each number is the sum of the two prior numbers (1+2=3, 2+3=5, 5+8=13 8+13=21 etc…).
- A number divided by the previous number approximates 1.618 (21/13=1.6153, 34/21=1.6190, 55/34=1.6176, 89/55=1.6181). The approximation nears 1.6180 as the numbers increase.
- A number divided by the next highest number approximates .6180 (13/21=.6190, 21/34=.6176, 34/55=.6181, 55/89=.6179 etc.…). The approximation nears .6180 as the numbers increase. This is the basis for the 61.8% retracement.
- A number divided by another two places higher approximates .3820 (13/34=.382, 21/55=.3818, 34/89=.3820, 55/=144=3819 etc.…). The approximation nears .3820 as the numbers increase. This is the basis for the 38.2% retracement. Also, note that 1 - .618 = .382

1.618 refers to the Golden Ratio or Golden Mean, also called Phi. The inverse of 1.618 is .618. These ratios can be found throughout nature, architecture, art, and biology. In his book, *Elliott Wave Principle*, Robert Prechter quotes William Hoffer from the December 1975 issue of Smithsonian Magazine:

….the proportion of .618034 to 1 is the mathematical basis for the shape of playing cards and the Parthenon, sunflowers and snail shells, Greek vases and the spiral galaxies of outer space. The Greeks based much of their art and architecture upon this proportion. They called it the golden mean.

Calculation and Drawing

Rising Fibonacci Fan

- Fan Line 1: Trough to 38.2% retracement
- Fan Line 2: Trough to 50% retracement
- Fan Line 3: Trough to 61.8% retracement

Chart 1 shows the S&P 500 ETF with rising Fibonacci Fan lines. The lines are based on the March 2009 trough (low) and the April 2010 peak (high). The horizontal pink lines show the Fibonacci Retracements Tool extending from trough to peak. It takes two points to draw a line. The first point for each fan line is based on the low. The second points are based on the Fibonacci retracements. Notice how the Fibonacci Fan lines start from the trough and pass through these Fibonacci retracements (blue arrows).

Falling Fibonacci Fan

- Fan Line 1: Peak to 38.2% retracement
- Fan Line 2: Peak to 50% retracement
- Fan Line 3: Peak to 61.8% retracement

Chart 2 shows the S&P 500 ETF with falling Fibonacci Fan lines. The lines are based on the April 2010 peak (high) and the July 2010 trough (low). The horizontal pink lines show the Fibonacci Retracements Tool extending from peak to trough. It takes two points to draw a line. The first point for each fan line is based on the high. The second points are based on the Fibonacci retracements. Notice how the Fibonacci Fan lines start from the peak and pass through these Fibonacci retracements (blue arrows).

Interpretation

After an advance, the Fibonacci Fan lines can be drawn to identify potential support or reversal areas. Once a pullback starts, the fan lines provide chartists with key levels to watch as prices correct. After a decline, the Fibonacci Fan lines can be drawn to identify potential resistance or reversal areas. Once the bounce starts, the fan lines provide chartists with key levels to watch as prices bounce. As with regular trend line, support or resistance zones extend as the Fibonacci Fan lines extend, which makes them dynamic, not static.

Rising Fan Lines

Chart 3 shows Anadarko Petroleum (APC) with the Fibonacci Fan lines extending up from the July low to the October high (2009). The stock bounced off the 38.2% fan line in late October and then moved to the 61.8% fan line in December. APC ended its correction at the third fan line and moved back above 65. There was another pullback into February and the stock again reversed near the third fan line. This chart was drawn with an arithmetic scale.

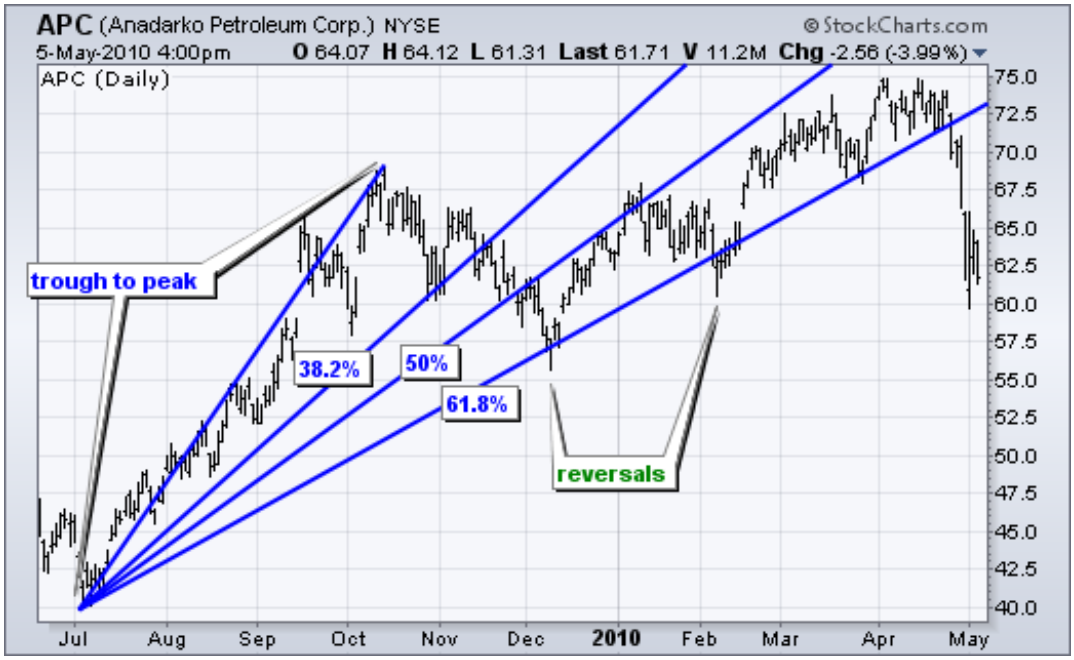
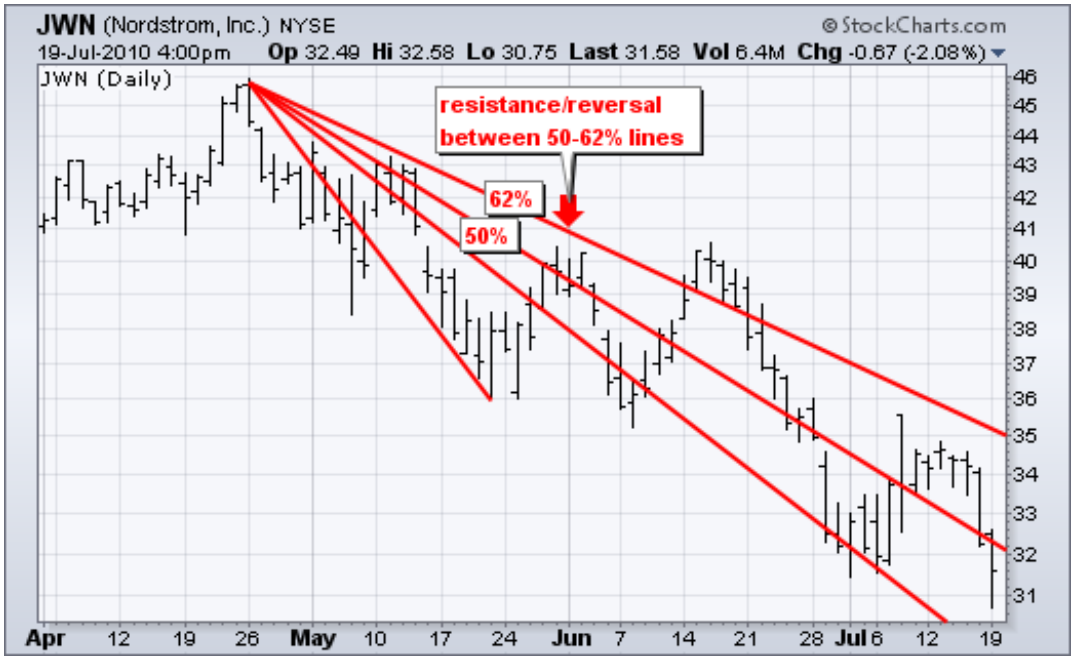
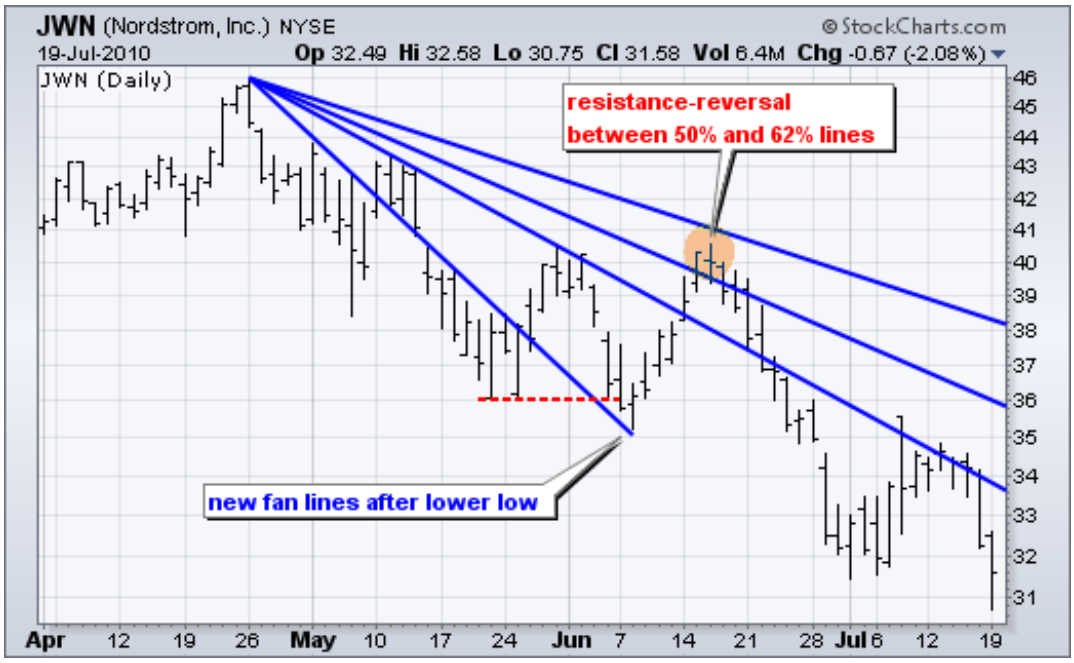


Chart 4 shows Sara Lee (SLE) with the Fibonacci Fan lines extending up from the March low to the July high (2009). The stock declined sharply in August, but found support at the 50% line later that month. The first bounce of the 50% fan line was short-lived, but the stock found support again at the 50% line in early September. This chart was drawn with an arithmetic scale.

Falling Fan Lines

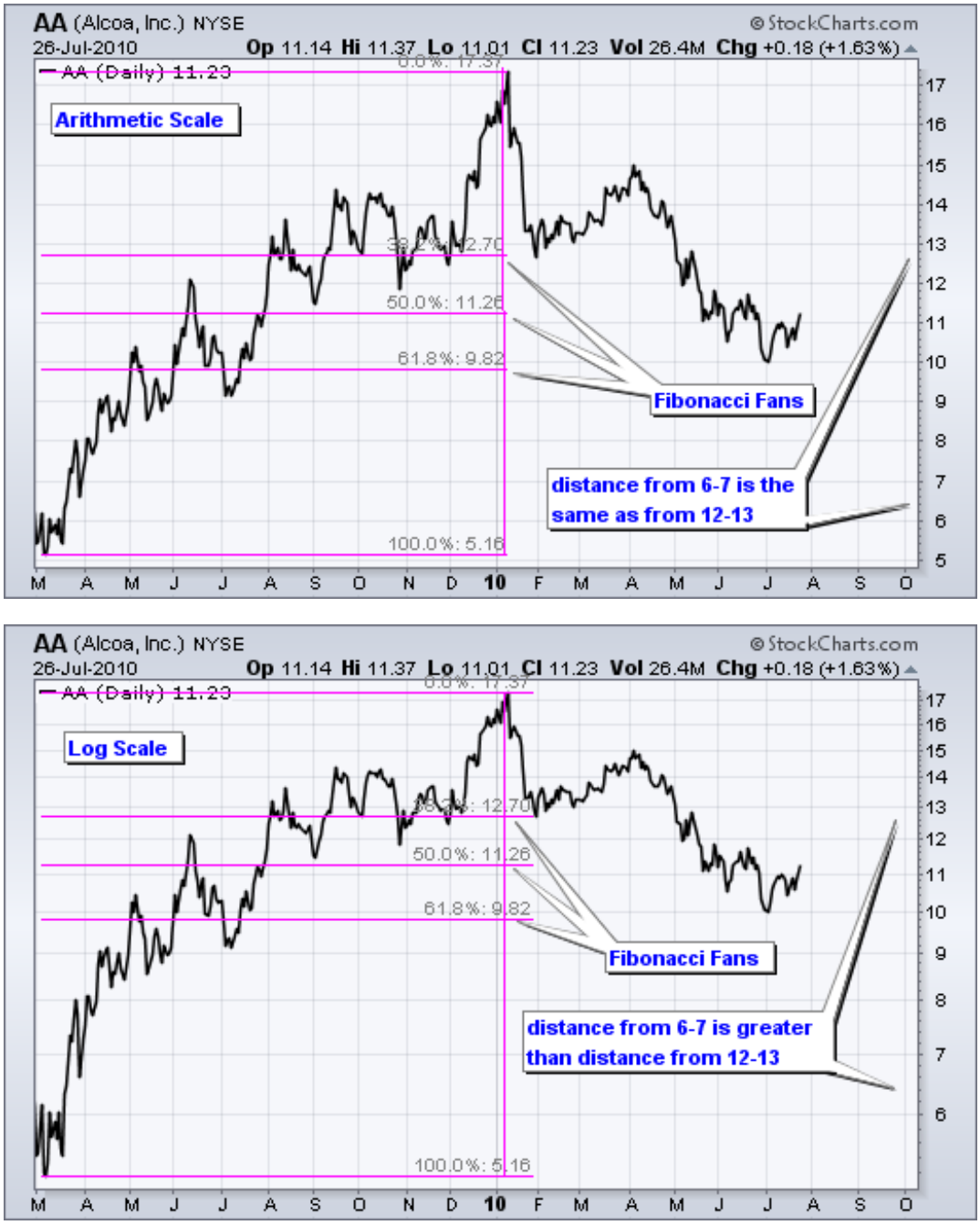
Chart 5 shows Nordstrom (JWN) with the Fibonacci Fan lines extending down from the April high to the May low. Chartists could draw the lines once JWN began its bounce in late May. JWN subsequently met resistance between the 50% and 62% fan lines. JWN moved to a new reaction low in early June. Once the prior low is taken out, it is usually necessary to redraw the Fibonacci Fan lines based on the new low. Chart 6 shows new fan lines with JWN again hitting resistance between the 50% and 62% lines. This chart was drawn with a log scale.





Log versus Arithmetic Scaling

The choice of scaling can change the slope of the Fibonacci Fan lines, which in turn will alter potential support, resistance and reversal levels. Log scaling treats price changes as percentage moves. A 10% move from 6 (60 cents) looks the same as a 10% move from 60 (6 points). Arithmetic scaling focuses on the absolute change. A $1 move from 6 to 7 (+16.66%) looks the same as a $1 move from 12 to 13 (+8.33%), even though the percentage change is double. On a log scale, the 16.66% advance would appear twice as large as the 8.33% advance. Chart 7 shows Alcoa with an arithmetic scale. Notice that the price grid is equally spaced. The distance between 6 and 7 is the same as the distance from 12 to 13. Chart 8 shows Alcoa with a log scale. The price grid is longer at the bottom than the top. Notice that the distance from 6 to 7 is twice the distance from 12 to 13.



Alcoa advanced from ~5 to 12 in less than four months. This move appears sharp on the log scale because the percentage move from low levels is large. The move looks less steep on the arithmetic scale because the absolute change is the same from low levels. The scaling difference does not change the starting point for the Fibonacci Fan lines or the actual retracements. The horizontal pink lines show retracement equality. However, because of the scaling, the Fibonacci Fan lines on the log chart are steeper and Alcoa broke the 50% line in mid-April. The Fibonacci Fan lines on the arithmetic chart are less steep and Alcoa broke the 50% line at the beginning of May.

So which scale is better? Unfortunately, there is no right or wrong answer. Arithmetic versus log scaling has been a heated debate in technical analysis for many years. It really boils down to a personal preference. Scaling makes little difference with relatively small price movements over short time periods. There is, however, a clear difference with big price movements over longer time periods. Log scaling is generally preferred for long-term charts.

Extending the Dateline

Chartists sometimes need to add extra time to see future support or resistance levels. Chart 9 shows the S&P 500 ETF (SPY) from Fibonacci Fan lines extending from the April high to the July low. These lines are valid as long as the July low holds. An extra 70 bars were added to extend these lines and see future resistance levels. This can be done by going to "chart attributes" and entering the number of periods for the extension in the "extra bars" box. Notice how the resistance lines steadily work their way lower. The opposite happens with rising Fibonacci Fan lines. Support levels steadily work their way higher.

Conclusions

Fibonacci Fans are used to identify potential support, resistance or reversal points. As with the Fibonacci Retracements Tool, these reversal points assume that the move is corrective in nature. A pullback after an advance is deemed a correction that will find support well above the initial trough. A bounce after a decline is deemed a counter-trend rally that will hit resistance well below the initial peak. Fibonacci Fan lines allow users to anticipate the ending points for these counter-trend moves. Like all annotation tools, Fibonacci Fan lines are not meant as a standalone system. Just because prices approach an arc does not mean they will reverse. Prices move right through these lines in many cases. No indicator is perfect. This is why chartists must use other tools to confirm support, resistance, bullish reversals and bearish reversals.

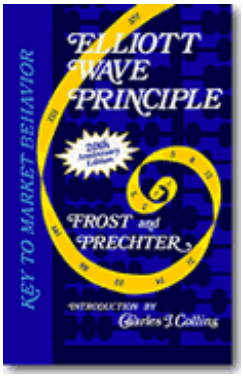
SharpCharts

You can use our ChartNotes annotation tool to add Fibonacci Fans to your charts. Below, you'll find an example of a chart annotated with a Fibonacci Fan.

To learn more about how to add this annotation to your charts, check out our Support Center article on ChartNotes' Line Study Tools.

Further Study

Elliott Wave Principle
Robert Prechter



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