

Support, Resistance, and Advanced Trendlines

Support + Resistance = Impedance

Sometimes price rises to a certain level and then seems to get stuck. Technicians often refer to this as "hitting resistance". By the same token, sometimes during a sell-off, price will drop to a certain level and then bounce back up. People say it has found a support level. The interesting thing is that once a line of resistance is crossed, that same level then acts as support. And when a support line is breached, it then becomes a resistance level.

Some people acknowledge this fact by calling them support/resistance lines or "S/R lines". I prefer using the term "impedance" because *impedance* does not carry any directional implications. To impede means to delay, to obstruct, to hinder, or to make difficult.

In technical analysis, there are three causes of impedance to price movement:

1. **Historic** - Historic impedance occurs at levels where price once made a high or low, or levels where a large number of trades have taken place in the past.
2. **Psychological** - Psychological impedance is found at prices that are multiples of 2, 5, and 10. Psychological impedance occurs because untrained traders have a tendency to place their stops at these multiples. This causes sudden anomalies in the supply/demand balance as prices hit these levels. For example, some people think, "If XYZ goes down to \$100, then I'll buy it." so they set a buy stop order at \$100. When XYZ hits \$100, then all of a sudden a bunch of buy orders flood in, consuming all available supply, and the sell-off stops or at least slows down.
3. **Trendline** - Historic and psychological impedance are always horizontal. That is, they occur at fixed levels. Trendlines are occasionally horizontal, but usually they are either rising or falling. Trendlines are sort of like magnetism because the effects are obvious but no one really knows why they work. The strength of a trendline increases with both the number of touch points and overall length.

Here is a recent example of historic impedance:



Apple has repeatedly come up and bounced back down from the \$132.50-\$13260 area. We use a relatively wide line for historic impedance because it is truly more of an area than just a line.



This chart of DISCA shows psychological impedance at the \$30 and \$40 levels. Notice how price has trouble getting past \$30, and how there is a lot of price activity around \$40. Again, these are areas rather than just lines. There is some effect of psychological impedance at the \$45 level but little at \$35 at this time.

Note: When two or more kinds of impedance occur at the same level, their effect is additive, usually creating very strong impedance.

All that being said, sometimes price will bounce off impedance like a rubber ball hitting a brick wall. At other times price will take several runs at an impedance level before finally breaking through. However, if price has sufficient impetus, it will slice through impedance levels as though they weren't even there. When price breaks through impedance after several tries, it is often followed by a sizable move in the direction of the break through.

Advanced Trendline Subjects

The two paragraphs that follow explain critical facts about trends and trendlines. The rest of the chapter discusses details, examples and exceptions.

1. The term *trend* refers to the general directional tendency of a time series during a specific period. The trend can be rising, falling, or horizontal. A *trendline* is an example of autocorrelation of critical points in the output of a complex system. *Critical points* are the locations at which the time series changes direction, in other words, the peaks and valleys.
2. Volatility expands in the direction of the trend. In other words, if the trend is rising, there will be greater volatility in the upward price movements and their resultant highs. If the trend is falling, there will be greater volatility in the downward price movements and their corresponding lows.

One of the basic rules of drawing trendlines is that a trendline must only touch price at its high points (or low points) and the trendline must not be crossed by price. This is a good rule for beginners. Once you get enough experience, you will be able to judge when (and how much) it makes sense to bend it.

The problem with being too dogmatic about rules is that sometimes market prices spike down or up and then go right back to what they were doing before. These random, anomalous moves are what makes automating market analysis so difficult.



For example, on this 2-year SPX chart, we have a trendline with 4 touch points, A, B, C, and D. Then there are the points E and F, which cross the trendline. F is a major spike. E is smaller, but if we examine it closely, it is clear that it is also a spike. Obviously, we need to apply some judgment. One way of checking to see if we are taking too many liberties is to draw a parallel line on the other side of price action.



The magenta line is parallel to the blue line and it touches the highs at 3 points, Q, R, and S. There is one little crossing at T, but between the two lines we have enclosed all but 9 out of over 500 bars. Remember, the purpose of drawing trendlines is to help us identify the overall trend, and these two lines have done that successfully.

Channels

When you draw trendlines above and below price, it is called a channel. The two trendlines that comprise a channel are not always parallel. Sometimes they diverge, getting further apart through time. Sometimes they converge, which means eventually they will cross each other.

The quality of a channel is measured by two things. One is the total number of touch points. A channel with 4 touch points (two for the lower trendline and two for the upper trendline) is not considered very strong. A channel with 5 touch points (2 above and 3 below, or 2 above and 2 below) is considered much more credible. 3 or more touch points above and 3 or more below is very strong. The other measure of channel quality is *collimation*, or how close to parallel the upper and lower trendlines are.

A subset of trendline impedance is the center line of well-formed (reasonably well collimated) channels. Price frequently hits the centerline of a channel and either bounces off of it or follows it for a while.



A well-formed channel occurs when there are (more or less) parallel instances of autocorrelation along both the upper and lower bounds of a price series. In other words, a well-formed channel is an indication of a fairly organized advance or decline. A badly-formed channel (or the absence of an identifiable channel) is an indication of a market in turmoil or transition (i.e., a change from rising to falling or falling to rising).

The primary reason for drawing trendlines and channels is to help you interpret what you are seeing. For example, as we look at the following raw price chart for EUM, it is not very easy to put our finger on exactly what is going on here.



In this chart, price is scattered all over the place and there are lots of gaps.



But when we draw some lines and figure out where the critical points line up, it is suddenly very clear that both the high and low trendlines are declining. This channel is not very well-formed (since the trendlines are converging) so the middle line may or may not tell us anything interesting.

The big rise during May and June doesn't look so impressive when we see that price came up, hit the high 2-year trendline and bounced back down. We may have been thinking that this was a good buying opportunity, but now it is clear that EUM is still in a persistent decline. As such, there is no long entry opportunity here and it is time to look elsewhere.

Price Crossing a Trendline

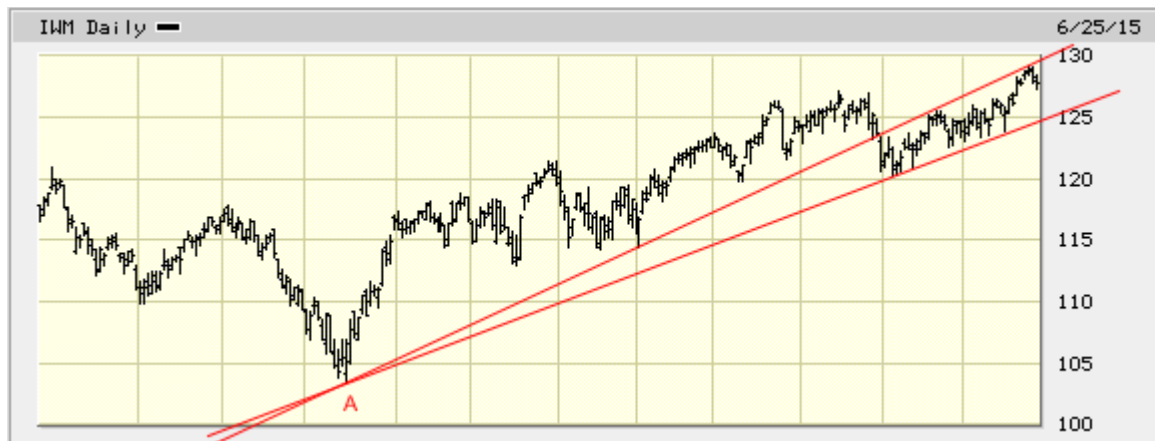


Notice here that when price crosses the "support" trendline ABC, it becomes a resistance line. The fact that a trendline still has influence even after price has crossed it has significant implications.

One of the basic tests for deciding if a trendline break is significant is if price crosses the trendline, bounces off the other side, and then passes its crossover turning point (about May 6th in this case). This did not happen for IWM, so price is not showing signs of an immediate decline.

If price starts another run in about the same direction as the previous one, and you can draw a new trendline through the same left hand touch point as the first (point A), then you are starting to see the

formation of a "fan". A fan is an advanced pattern built from 2 or more trendlines that all cross at the same point.



The presence of a fan indicates the price advance is running out of steam. A two line fan doesn't tell you much, but if a third fan line appears, then this advance is very likely doomed.

Trendline Persistence into the Future

I couldn't find a good chart to illustrate this one, but if you search through enough long charts (5 or 10 years), you will occasionally find price today bouncing off trendlines that haven't touched anything for as much as 4 years.

Drawing Channel Lines

When mapping channels, you can save a lot of time by drawing the trendline on the off-side of the trend first. In other words, if the trend is rising, draw the low trendline first. If the trend is falling, draw the high trendline first. This is because of the little-known fact that volatility expands in the direction of the trend. In other words, if the trend is rising, there will be greater volatility in upward price movements and if the trend is falling, there will be greater volatility in the downward price movements and their corresponding lows.

The off-side touch points tend to correlate better because volatility expands in the direction of the trend, so the off-side is quieter (better correlated). This means that 9 times out of 10, the off-side trendline will be closer to the true price trend.



Here is a rather remarkable channel. Since price is rising, I looked for the lower trendline first. By leaving out the low in the middle of April, I found a trendline that touched price 6 times. (The two touches near E only count as one because they are so close together.) Once I had a strong lower trendline, I started looking for an upper trendline. If the upper trendline only touched price at J, K, and L, then I would not have been very interested in it. However, the fact that it plowed through the upward bulge in January through March of 2014 and then touched price 3 more times means that the effects from this one could continue for years into the future. This is reinforced by the fact that the upper line is almost exactly parallel to the lower trendline.

Here's a note of caution: When mapping channels, don't try to find collimation where there isn't any. If you try to "invent" an on-side trendline just so it is parallel to the existing off-side trendline, you will probably end up with something useless. If your off-side trendline has 5 touch points and the on-side trendline has only 2 touch points, maybe you are forcing it.

Always follow the evidence. Don't try to coerce the evidence
to fit some preconceived notion you have come up with.



In this chart, I am happy with the lower trendline. It touches price at 5 points and seems to parallel the general trend. But I am not happy with either of the upper trendlines. They are both close to parallel to the

lower trendline. The top one only touches price twice and neither touch point seems terribly impressive. The second trendline touches price several times but it seems kind of forced.



This one is not forced. It's just following the evidence. But it still doesn't seem very satisfying.



But if we extend that new upper trendline further to the left, now we see what is really going on. Now that upper trendline has three touch points and it parallels the longer general trend of price. The lower trend shifted but the upper trendline remained unchanged. We just had to look at the bigger picture.