Trading Divergences



a technical indicator is a popular form of visual market analysis. The problem with the approach is its high degree of subjectivity: some divergences appear after the fact, others literally seem to vanish. When a divergence is found, its validity is often a matter of opinion. The following article deals not only with finding divergences, but also with systemising a trading approach around them.

Divergences occur when the trend of a security's price does not correspond with the trend of an indicator. Frequently used indicators in divergence analysis include the RSI, the CCI, Stochastics, and the MACD. Divergence analysis serves to indicate an impending change in trend. Trend changes are announced by the indicator's failure to confirm a price move. The failures can be interpreted as inherent price weakness or strength preceding a rapid directional change in price trend. It's implicitly assumed that indicators are always right and price misleading.

A classic example is when an indicator fails to confirm a new price high by not making a new high of its own.

An Example

This can be seen with the RSI(14) in the upper window of figure 1: Whilst the index clearly makes a new high, the RSI makes a lower high (red circles). This kind of "negative" divergence is interpreted as a sign of impending price weakness, and is in fact followed immediately in this case by a slight decrease in prices.

The blue circles in figure 1 show the opposite. Here the index



The red circles show a negative divergence between the RSI (upper window) and the Dax (lower window). This indicates a weakness in the underlying. The blue circles are showing a positive divergence, which indicates rising prices.

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makes a low followed by a lower low. The RSI forms a double bottom at this point, failing to confirm price weakness. The formation is then followed by a picture perfect trend reversal.

A Divergence Isn't Always a Divergence

If you examine the examples in figure 1 closely, you will notice that in the first case the price trend and indicator run counter to one another, whilst in the second example the indicator merely forms a double bottom. Might this indicate various degrees of divergence strength and ultimately different types of divergences? This can be answered with a definite yes! Organising divergences into categories not only helps classify them, but also helps to use them in a practical way strong divergences lead to strong price moves.

The following classifications includes examples of both positive and negative forms of the same divergence type:

A-Class Divergences: strongest type of divergence

- Example 1: Prices form a new low. The indicator forms a low, higher than its previous low. (Rising prices expected)
- Example 2: Prices make a new high. The indicator forms a high, lower than its previous high. (Falling prices expected)

B-Class Divergences: medium strength divergences

- Example 1: Prices form a double bottom, whilst the indicator marks a low, higher than its previous low. (Rising prices expected)
- Example 2: Prices form a double bottom, whilst the indicator marks a low, lower than its previous low. (Decreasing prices expected)

C-Class Divergences: weakest form of divergence

- Example 1: Prices reach a low, lower than the previous low. The indicator forms a double bottom. (Rising prices expected)
- Example 2: Prices reach a high, higher than the previous high. The indicator forms a double top. (Falling prices expected)

According to their strength, A-Class divergences should be closely monitored, whilst C-Class divergences can be considered relatively unimportant. With a second glance at figure 1, it's clear the example circled in red is a bearish A-Class divergence, confirming our definition: "Prices make a new high.

The indicator forms a high lower than the previous high. (Falling prices expected)." The second example in blue on the other hand is a C-Class divergence that, in this case, indicates rising prices: "Prices reach a low, lower than the previous low. The indicator forms a double bottom. (Rising prices expected)."

Why should divergence analysis work?

So what's the theory behind divergence analysis? How can you be certain that divergences aren't just the random behaviour of indicators, or even hocus-pocus?

The fundamental idea behind divergences is the assumption that technical indicators show market behaviour and psychology more objectively then prices do. After all, indicators do nothing more than put price behaviour into perspective, making it comparable.

Whilst prices can never be too high or too low, indicators (at least oscillators) actually have well defined limits, indicating that prices may



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F2) Comparison of RSI and Momentum

divergences appear too often in the momentum indicator, they are not really useful.

have moved too far too fast. This hints that the masses may be too optimistic or too pessimistic.

When prices reach a new low, but the indicator marks a higher low, its assumed investor sentiment has shifted. This positive divergence indicates that despite the new price low, investors are less "shocked" than they were at the previous low. The positive turn in sentiment is the first sign of a potential trend change. A negative divergence indicates the opposite. On a purely technical level, however, an indicator failing to confirm new price highs or lows indicates nothing other than a decrease in price dynamic.

Momentum

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Momentum measures the rate at which prices change over a given period of time by calculating the difference between two price points. For example, the standard 12-period setting subtracts the price 12 days ago from the current price. Momentum begins to recede when prices no longer rise as quickly as they did in the previous 12-day period. It also moves horizontally when prices increase at the same rate over the period.

If prices simply increase less-strongly, momentum fades. It doesn't take much to imagine the indicator tends to cause divergences to appear everywhere. This slight defect doesn't make momentum totally useless in divergence analysis, but it shows that it can never be relied upon by itself.

The Relative Strength Index (RSI)

The RSI, on the other hand, is different. In fact, there is probably no better indicator for showing divergences. It was said that divergence analysis functions because indicators make relative price strength comparisons possible. Measurable differences in price dynamics allow conclusions to be drawn about price movement strength. The RSI's ability to measure relative price strength makes it an ideal indicator for divergence analysis. However, despite its obvious advantages, exclusive use of the RSI for analysing divergences would be a mistake.

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RSI vs. Momentum

Let's examine the strengths and weaknesses of the RSI and momentum indicators with the aid of an example: Figure 2 plainly shows that momentum (middle window) quickly forms divergences toward the end of strong upward price movements. As prices continue making new highs momentum decreases gradually. On the other hand, the RSI (top window) shows no divergences where none exist. At the low prior to the trend change it did form a double bottom (justifiably so), but its progression correctly follows the subsequent upward move.

The right Setting

After choosing the appropriate indicator, the timeframe parameters need to be set. In almost all cases though, the standard settings can be used i.e., 14-period for the RSI or 12-period for momentum. Distinctly longer or shorter settings are of no added value.

Divergence Basics

Before beginning the hunt for divergences, there are a couple of points that need to be remembered.

Trading with divergences is a fascinating concept that appeals to a lot of people because of its visual and intuitive nature. Newcomers, however, should keep their enthusiasm in check. The desire to see divergences at every possible point on the chart looms large in the beginning. Perhaps the most important rule here is: "if you must ask yourself if it's a divergence, it probably isn't one!"

Divergences must be distinct and jump out of the chart at you – they are the only kind that should be considered.

Proportionality

The second fundamental rule could be described as the proportionality principle: Divergences appear often in a chart, sometimes at extreme turning points, sometimes during the middle of a low volatility market phase. Important here is the time horizon and the magnitude of the price patterns used when measuring the divergences. Divergences at major highs and lows on the chart are more significant than others.

One Divergence is Not Enough

If a divergence has been spotted, try in advance to improve the risk reward ratio. There are two ways of doing this. One is to search for multiple divergences - a row of divergences one after the other. Another is to find divergences that simultaneously appear with different indicators. Multiple divergences can be thorny, as their appearance often accompanies strong trends leading to counter-trend trading, which is naturally very risky.

Not at all risky and highly recommended is trading divergences simultaneously confirmed by multiple indicators. A confirmation in this case means, for instance, if three indicators are used, two of them should show the divergence. The majority decides.

The Choice of Means

After several indicators showing clear divergences have been found, the question arises as to how a trading strategy would be applied. When are the divergences completed? How are entry and exit points



decided? The standard indicators for divergence analysis are not well suited as entry and exit triggers. As is known, applying classic entry and exit rules in connection with indicators and their standard settings would likely lead to financial ruin.

Additionally, indicators used as signal generators often lag price action, whilst divergences usually deliver signals too early. How can that be combined sensibly? The answer is, not at all!

Divergences and Classic Technical Analysis

In contrast to indicators, classic technical analysis (support/resistance, formations, trend lines) is outstandingly compatible with divergence analysis because generated signals do not lag. Also, technical analysis' basic problem is the all to frequent false breakouts. Since divergences hail possible trend changes, they are ideal in reducing the number of false signals associated with technical analysis.

Real-life Example

True to our motto that one indicator is not enough, examine figure 3. Two indicators are laid over the underlying index: the CCI (red) and the RSI (blue). Of course, an additional indicator could be inserted, but we don't want to clutter the picture. For clarity, all relevant highs and lows in the chart are numbered.

The Last Three Extremes

To best determine divergences, always observe the last three extreme price points in the chart: high 1, low 2, and high 3. In the chart, high 3 is slightly lower than high 1. If we look at the indicators we ascertain that their corresponding highs are also lower at point 3 than at point 1. No divergence so far. Continuing in the chart, concentrate on low 2, high 3 and low 4. Low 4 is slightly higher than low 2; the same goes for the lows in the RSI and CCI. Again no divergence! It gets exciting as we examine high 3, low 4 and high 5. High 5 in the index is about the same level or slightly lower than high 3 and the RSI shows the same formation. The CCI is different. Its peak at high 5 is noticeably higher than the previous high...a





divergence!

As previously mentioned though, we want the confirmation of more than one indicator (in our case two) before we identify a tradable divergence. So this particular divergence in the CCI can be ignored in this case.

The indicators correctly follow all subsequent highs and lows until we reach low 8, high 9 and low 10. Low 10 is clearly lower in the index than low 8; the indicators, however, paint a different picture. The RSI forms a double bottom whilst the CCI even shows an A-Class divergence. Now the question is how can we be sure these divergences are real, as they form before and not after the fact? What's certain is we can only assume low 10 if no further price declines occur. We can also assume with relative certainty that if prices rise above low 8, we can consider low 10 to be completed.

The day that prices cross back up through low 8 is marked with a vertical blue line (figure 3). This day is decisive for the divergences. At the indicator level, the RSI's double bottom and the CCI's A-Class divergence are clearly visible. Both are now confirmed. Based on that, we go long at the closing price of the day crossing the blue horizontal line. An alternative would be to wait one more day to confirm the line's crossover.

Exiting

As previously mentioned divergences should help reduce false signals in classic technical analysis. If the entry is a success, then stops are best placed at obvious charting points. In this case, it's simple because our scenario of rising prices would be proven wrong if prices fell under low 10, so the stop is placed at or just below this point. The exit can be triggered with a profit target (ideally a few times higher than the possible loss), or placed at a technical point in the chart. In figure 3, the first price pull back following entry is used to draw a trend line whose eventual break serves as an exit trigger.

Some Warnings

The above example proves there are ways to systemise divergence trading. Unsolved, however, is how to ascertain the significance of the divergence itself. There is a lot of room for interpretation and much depends on the observer.

Further Possibilities

Luckily, the wish to fully systemise a trading approach based on divergences does not have to go unfulfilled. Here, there are two possible ways.

The most traditional way consists of continually calculating the correlation between the underlying and a divergence indicator. A correlation is a statistical measure of how two variables move in relation to each other. It's output is a number ranging between 1 and -1. A correlation of zero shows there is no relationship to the two values. 1 indicates perfect correlation and -1 indicates an exact reciprocal relationship. Divergences are strong when the underlying and the divergence indicator show a correlation value near -1. To implement this, a low enough correlation threshold must be determined in order to make an entry in the market attractive.

Correlation indicators are available in most common charting software products, but have the disadvantage of a double delay: firstly, all technical indicators lag current price because their calculations are based on historical data. The second delay results from calculating the correlation of indicator and price. This kind of approach makes it difficult to grasp current market action.

A Better Way

The other possibility avoids this double delay by making comparisons on the indicator level. Instead of comparing indicator and price, an indicator is compared with itself using various settings. Simple subtraction is all it takes. In this way, divergence analysis simultaneously becomes an analysis of various timeframes.

Example Using the RSI (3)/(10)

This approach uses the RSI(10) as a measure of price action. That is a somewhat shorter time period as the standard setting, because with increasing setting length the probability of divergences appearing increases. This first setting however is not supposed to show divergences, but should reflect current price movement as closely as possible within the RSI scale of 0 and 100.

The second RSI's parameter is set at three, allowing it to capture short term overbought and oversold conditions. Finally the RSI(10) is subtracted from the RSI(3). The resulting indicator can be seen in figure 4. Now, let's look at the entry and exit rules.

Entry

As mentioned in our correlation discussion, a threshold value must be chosen for use as a trigger. In this case it applies to the value of our combined indicator. The resulting number allows us to determine if divergences are strong enough to justify entry. The bottom range of RSI(3)-RSI(10) will be set at -15 marking the level where the RSI(3) is 15 points below the RSI(10). We want the two indicators to begin converging before a entering a trade so that the -15 level is broken through from below. This will help prevent us from trading completely against the trend.

The deviation of the two indicators with these settings should uncover probable oversold conditions. The relatively high setting of the RSI(10) should prevent entry in strong down trend conditions, whilst the comparatively low value of the RSI(3) should indicate exaggerated downward swings.