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A New Way to Analyse Range Expansion/Contraction

THE CHARTMILL BULL/BEAR INDICATOR – PART 1

Divergency isn't by a long shot a new focal point of technical analysts anymore. The deviating behaviour between different aspects, indicators if you will, in a certain analysis can point the way to imminent trend changes. As always, the biggest problem in technical analysis, which is all about measuring probabilities rather than forecasting a certain future, is the quantification of concepts like this. Most attempts get stuck in an algorithmic approach trying to capture certain graphical setups, result in mediocre results at best. This article series will try to provide a statistical framework which results in a particular indicator.

Intrinsic divergence is pointing to divergence of time series with itself.

➔ Apart from the use of derivatives perhaps, the only way to make money in the markets is by a difference between the price at which a position was opened and the price at which it was closed. Buying not necessarily needing to come first, as it is by the first selling that short positions are initiated. It is every technical analyst's wildest dream to be able to predict price moves. As that is impossible, the next best thing is try to find high probability setups and handle them with correct position sizes and the right aptitude for risk management. One way to find high probability setups has always been by looking for what's called divergences.

EXPANSION AND CONTRACTION

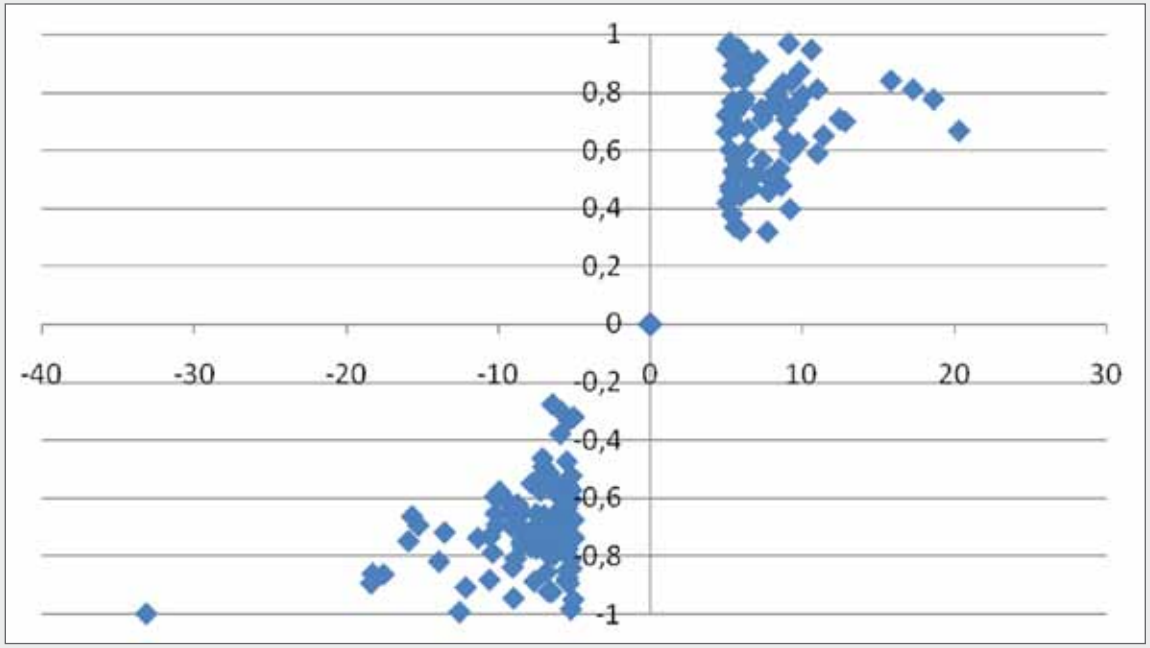
Before we start to look at divergences, we have to realise that they are closely connected with the contraction and expansion of market prices. Ever noticed price ranges contract before they expand? Any technical analyst having been around for even just a few months, probably has. We call this the tsunami effect, referring to how a sea recedes prior to all hell breaking loose by the devastating tidal wave that follows. In the same way, volatility and daily range seem to shrink before a stock starts running, thereby sucking all liquidity out of a market. Tsunamis, however, are far more rare than price expansion and often subsequent trends. So can we detect a tsunami before it floods us?

Any good divergence indicator therefore will need to monitor contraction as a precursor to expansion. For it is in the contraction prior to an expansion that will lead us to detect the price movement to be.

A GOOD DIVERGENT LOOK AT DIVERGENCE

Divergence mostly is looked for in two ways. First there's the graphical way in which an analyst looks for price, volume or any indicator to put down higher

F1) EXPANSIVE URGE ON TRENDING DAYS



Scatterplot of high return days on random stocks in function of their expansive urge. It seems both measures are closely related. Strong percentage gains/losses correlate with high/low expansive urge.
Source: www.chartmill.com

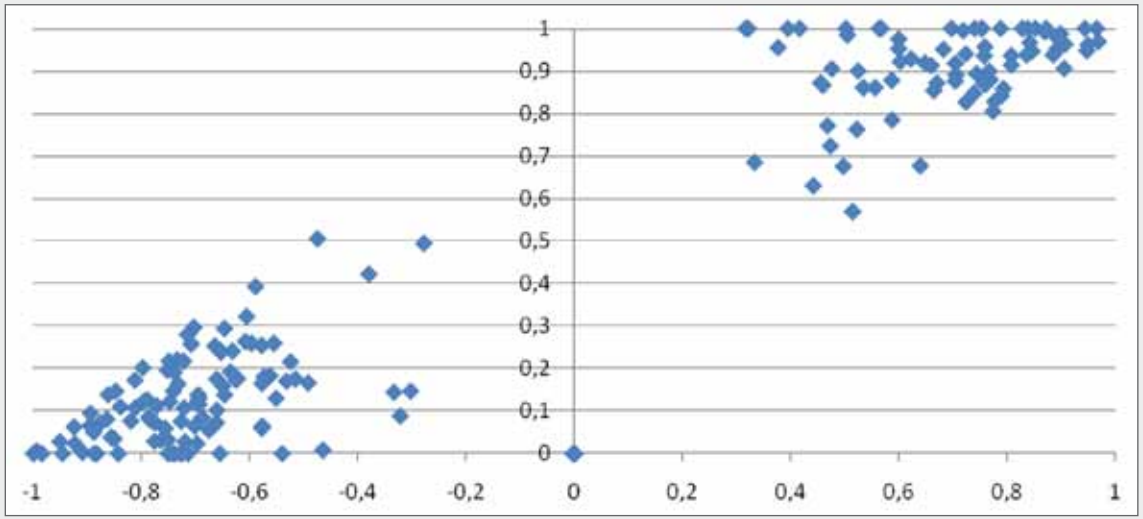
or lower tops or bottoms, while another indicator, volume or price, does the exact opposite. For a very easy example, price going to a new high while volume declines, is considered a negative divergence. In the same way, when price takes out a previous low, while an oscillator at the same time shows a higher bottom, this is generally considered bullish and called a positive divergence. The second way divergence detection is done is by using a differential indicator, typically an oscillator, that brings with it the promise to measure divergence in its own right, needing to compare two different time series. The difference will grow in the case of a negative divergence and shrink in the case of a positive divergence. All kind of tricks are than applied to this difference, like mirroring it around its x-axis to show an increase in the case of 'positive' divergence, or a decrease with negative divergences.

Of course there's a lot wrong with merely aiming for the difference between two time series. For one thing, both can go higher, but one of them can go higher more quickly. That way the difference would increase as well.

Secondly, this points to the fact that divergence and correlation are two totally different things altogether. Measuring one well doesn't necessarily imply measuring the other in a correct fashion.

For a third matter, though a minor issue, there's something odd with how a divergence is called a positive or negative one. It instills a directional dimension that doesn't necessarily have to exist. Why should a divergence be either good or bad? Of course it will always be so from the viewpoint of one's position. But no one indicator can be aware of one's position. So we could have an indicator for bull signals, but then we should have another one for the bear signals. This means there should be a pair of indicators, not just one.

F2) STOCKS TEND TO CLOSE NEAR EXTREMES ON HIGH TRENDING DAYS



RCL value scattered with EU value for random stocks. Only high return periods were plotted. It's clear from the chart that stocks tend to close at their high/low on expansive periods at the end directed by the trend for that period.
Source: www.chartmill.com

INTRINSIC DIVERGENCE

The forth and biggest problem with 'classical' solutions is that they aim to measure what we will call 'extrinsic' divergences. With extrinsic divergences we're trying to capture the fact that the divergence actually takes place between two possibly totally different time series. All in all, extrinsic divergences, popular though they may be, show slender reliability. Though that may well be more because of the way we are trying to quantify them than it is due to their very nature of being 'between' two time series. But also people tend to 'look' for divergences, implying they are already in progress as we start seeing them. That's probably why extrinsic divergences are so popular.

In comparison to extrinsic divergence, very little research seems to have be done on intrinsic divergence. Intrinsic divergence is pointing to divergence of time series with itself, when looking to it from the time dimension. In this article series we're going to stick to intrinsic time divergence.

To worsen things, there's the everlasting problem of indicators needing parameters that need to be hardwired with their usage in systems. We need adaptive, parameter-less and hence totally objective indicators. The ChartMill Bull/Bear pair of indicators try to deal with all of the above problems.

RA(N)GING BULL

If we want to detect deviating behaviour under the hood, looking at intraday behaviour, we have to start by asking what is normal behaviour and how we can quantify it. Contraction springs from a lack of interest (volume) and the accompanying shrinking of daily range (volatility). Expansion is characterised by increasing volume and a surge in daily range due to illiquidity. When this happens, consensus about future value deviates far from current price, resulting in the start of a possible new trend or the reignition of a consolidating one. Keep aware that volatility can increase or decrease while prices do trend – that's exactly one of the problems described above with most approaches in detecting divergence.

FUTURE EXPANSION AND TRUE DIVERGENCE

We're not interested in seeing the divergence by its consequence, that is expansion. We actually want to spot divergences before they materialise into price movement. Trading is about catching a window of opportunity seasoned with probabilities, before it becomes clear to anyone and that window closes. To that end we want to and look for cumulating intra-period divergences. So what is 'normal' behaviour?

It seems that on trending days where there's a lot of conviction in one direction there's a strong correlation with the urge to expand and where the period closes off in the range. This is not a new idea. Oscillators like Stochastics and other indicators like Accumulation/Distribution Line, as well as several authors use some kind of principle of measuring where the close is situated in a period's range. We'll call this the 'relative close location' value (RCL). This number will be 1 in the case of a close at the true high. If the period closes at its true low, the RCL will be 0.

Furthermore, we'll define the 'expansive urge' (EU). This key performance for a period looks at what fraction of a periods true range was in fact bridged between its open and its close. Again, look at extreme values to understand this metric. If a stock's period opens at the true low and closes at the true high, the EU will be 1. If, instead, a stock opens at the true high and closes at the true low, the period's EU will be -1.

Now take a look at Figure 1, where we made a xy-chart for a random set of stocks. On the x-axis each period's return at the close against the previous period is used. On the y-axis, we off the points at their EU value. So each point on the plot represents a period given by its day-to-day return and its expansive urge. We only withheld the periods of those stocks accounting for more than five per cent return on those periods, or less than -5 per cent. So we kind of wiped clean the plot vertically in the x-interval [-5%, +5%]. The strange thing is, all points between -0.30 and +0.30 seem to have disappeared on the y-axis, as well. So on strong trending days, the close tends to be near the extreme of the period located at the same side as where the move was going. For instance, on any day raking in more than five per cent, the close tends to be at the period's true high. So is it possible that EU is an indicator of trending days, next to high returns and, with it, correlated with the RCL value?

Figure 2 shows that it is. In this chart, the same periods are scattered by their EU value on the x-axis and their RCL value on the y-axis. Once again mostly the upper right and lower left corner of the graph is populated by points. So the RCL tends towards 1 as the EU moves to 1, while it moves over to 0 when the EU is near -1. This generally means that high trending (expansive) days tend to close at the period's extreme at the end to where the trend points.

OUTLOOK

In the next article we're going to look at a moving window, looking for such expansive days and count those which are 'not normal' or diverge from what we normally could expect, to arrive at truly intrinsic divergence. Stay tuned!

References: High Probability Trading by Marcel Link and Long/Short Market Dynamics by Clive M. Corcoran.