

Research Summary:

The Index Trend Reversal Strategy (ITRS)

The Investment Landscape and ITRS in Context

Investors typically look towards alternative investments in seeking diversification from the traditional asset classes of stocks and bonds. The first step in this space are Liquid Alternatives that have come about as a result of growing research into the use of futures and options strategies to profit from the commodity, interest rate (bond), equity and currency asset classes since the early 1980's. The development of useful indices within these classes has improved uptake in activity over the years as have the emergence of ETFs in more recent times, the latter to facilitate alternate avenues for accessibility to options and the improvement in overall liquidity in these instruments. This area offers much appeal to investors as loss of liquidity is the Achilles heel within Alternatives but this space typically offers just as much transparency and price discovery as the traditional asset classes.

There are many trading strategies and investing models backing them that have gained traction over the years. Earliest among them have been Managed Futures strategies deployed by Commodity Trading Advisors with the help of Trend Following models implemented on commodities futures contracts. By and large the models proliferating this space are overwhelmingly technically driven charting models as opposed to those that are fundamental, economic or purely mathematical, although these other approaches can be used in combination with the former and Momentum models can be considered as an example.

Trend Reversal or Countertrend models came about as a next evolutionary step in the technical charting category of models.

The key allure to this area and method of investing among institutional investors and hedge funds is the low and often negative correlations the return streams generated, have to the traditional equity and fixed income asset classes.

The ITRS Concept

The technically driven managed futures strategies bank on the basic premise that markets do not sit still. They either move up at varying rates or they move down, even if the time-period is momentary. At certain junctures they switch around from going up and head down or vice versa. The shorter the time period, the more random the choice of direction as markets chase an ever changing equilibrium of perceived fair value, with new information continuously streams in. Over longer periods, markets may pick up on stronger factors that drive them to meander upwards, downwards or in a flat range.

A "Trend" represents the direction in which a market is going. A market price will move in a zig-zag fashion creating peaks and troughs. The trend or direction of a market price will be determined by the direction of those peaks and troughs. An uptrend can be defined as a continuing series of peaks and troughs higher than the previous peaks and troughs. In the simplest of terms, if this pattern does not continue, a trend reversal may be occurring. Conversely, if a series of declining peaks and troughs are illustrated, a downtrend is established.

In general, the longer a trend has been moving in that trending direction, the more significant that trend is. The direction of a trend will be either up, down, or sideways. This corresponds to bullish, bearish and sideways markets. In the context of time, trends can also be categorized as major, intermediate and near-term.

A trend following system aims to invest in the direction of the long term trend of a commodity, interest rate, exchange rate, or equity index. A trend is considered the dominant direction of movement for a market over a specified

timeframe. Trends can be defined many ways. A common approach is to use a price based system such as a moving average crossover. If a market's trend is up (market's price is above its moving average), then a trend following system will be long that market and vice versa.

Trend Reversal or Countertrend models offer an equivalent systematic framework for trading that is as effective as trend following, but complementary in methodology. The majority of countertrend models look to sell short term overbought levels and buy short term oversold levels. This objective can be visualized as waiting for a rubber band to be stretched to its limits and then betting on it snapping back to its normally relaxed form. This behavior allows countertrend models to thrive in directionless but volatile markets and to react quickly to market turning points.

There are several compelling reasons that make trend reversal or counter trend models a more compelling use for generating alpha than its more intuitively straightforward trend following counterpart. Countertrend systems generally have shorter duration trades, a higher percentage of winning trades, but a smaller win/loss ratio than their trend following counterparts. An experimental¹ countertrend strategy implemented using futures, trades more frequently than a trend following strategy and produces 55% to 60% winning trades with a winning trade to losing trade ratio of 1.5. While the latter ratio is less compelling than the over 2.0 win/loss ratio for trend following systems², its lower winning trades percentage of 25 to 45% coupled with a lower trading frequency prove to be larger handicaps to overcome.

The short-term nature of countertrend models and their contrarian objective gives them low correlation to other managed futures strategies, as well as low correlation to markets they are traded on. Low correlation is achieved by taking many short duration trades, both long and short, in the underlying market. When aggregated, the directionality of these positions nets out, yielding a return series that has low correlation to the underlying asset.

Reasoning the Efficacy of Counter Trend or Trend Reversal Systems

Trend Reversal models work because they are founded on the theory that financial markets are not efficient in the short run. This may be due to a variety of reasons that include investors with different return objectives, risk appetites, varying timing of participation, inefficient access to information and misestimation or subjectivity or emotion in the assessment of fair value, to mention a few. At a more macro level or over longer time horizons, markets are transient due to the entry and exit of market participants, shifting capital flows from changing allocations, the emergence of new technologies and investment strategies and many more factors. This confluence of variable factors leads to a perpetual cycle of short term market extremes where prices wander too high or too low and then snap back to more reasonable levels as participants self-correct.

This often results in markets reacting to actionable information by decisively moving in one direction or another before attempting to settle at a new higher or lower level in a wave-like alternate up and down motion much like ripples formed on a calm surface of water once the surface is disturbed. The longer the period of initial disturbance and/or the greater the magnitude of the disturbance, the higher the likelihood of the snapback or Trend Reversal. The snapback and any subsequent ripple motions reflect a temporarily indeterminate market and can be construed as "market noise," and a contributor to market volatility. Studies have shown that the correlation of countertrend model performance and market noise is consistent across the four major stock markets confirming the thesis that the more noise-rich a market environment with enough choppy price action in market movements, the more viable and profitable it is for countertrend trading and Trend Reversal models.

The counter intuitive nature of the Trend Reversal model is a key reason this approach consistently makes profitable trades. An investor that always buys when everyone else is buying and sells when everyone is selling, finds it harder to beat the markets. To get an edge over the markets, one needs to invert one's instincts and trade against "the herd." Systematic countertrend models provide an objective, mechanical approach for doing this and thrive on market volatility.

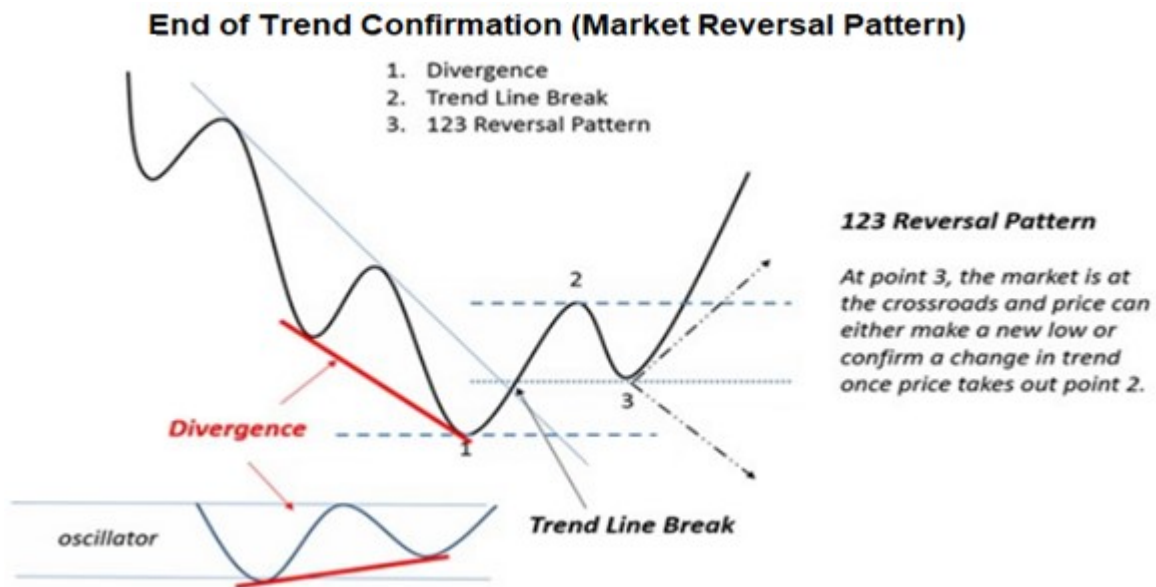
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1. "The Trend Isn't Your Only Friend" Murray A. Ruggiero Jr., *Futures Magazine*, October 2010: A static implementation of the countertrend system goes short on new 10 day highs and goes long on new 10 day lows.
 2. "Following the Trend Followers," *Managed Futures Today*, May 2010: A static implementation of the trend following (momentum) model goes long on the close of the session making 10-day highs and holds the position until the next trading day's close, trying to profit from the upward momentum of the market. It effects the converse on a new 10 day low.

The Hercules Investments ITRS – Description

ITRS seeks to profit from intraday and weekly trend reversals of three major US equity indices. The model trades Put and Call options on cash indices when predetermined support, resistance and retrace (S/R/R) pivot levels are realized on the S&P 500, RUSSELL 2000 and NASDAQ 100. We will illustrate the application of ITRS on the NASDAQ 100.

A trend reversal in the model is marked by a change of 1% or greater in index price direction. The ITRS capitalizes on trend reversals which occur intraday and approximately once per week (5-7 trading sessions) in normal market conditions. This frequency increases to three on average and, at times, even higher at extremes over volatile periods during which the indices navigate unforeseen market moving events.

Figure 1: A Trend Reversal



The Hercules Investments ITRS - Anticipating Index Reversals with Research and Pivots

While it cannot be determined exactly at what price a reversal will occur, patterns of historical reversals give us clues that guide our approximation by deploying a tactical methodology utilizing pivots and support and resistance levels.

The ITRS encompasses research back tested to 1995 on the three mentioned equity indices. Our research suggests the indices will experience an overbought or oversold condition every 5-7 days during 75% of all trading days. The overbought and oversold conditions occur at “pivots” which we identify as “Support”, “Resistance”, and “Retrace”. With Retrace being a failed breach of 50% of the midpoint from the previous 5-7 day high or low.

Based upon our research, the ITRS assumes that more than 85% of the time, the index will reverse direction by a minimum of 1% when it encounters support or resistance (standard deviation of 1.5 points from January 2007 to January 2008) at calculable pivots. The ITRS assumes that more than 61% of the time, the index will reverse direction by a minimum of 0.5% when it encounters support or resistance (standard deviation of 0.4 points from January 2007 to January 2008) at the 50% retracement level from the previous 5-7 day trend.

Determination of the Support, Resistance and Retrace Levels

The Approximation method of the actual trend reversal involves two primary inputs and several other secondary inputs (see ‘tools and indicators’ below).

1. **Research:** Rigorous historical analysis is the most consequential input for approximating trend reversals. Analysis of historical price behavior and the correlation between market internals and price trend reveal how and when investor psychology shifts and whether the shift is likely to lead to sustained momentum. Price history research determined that probability distributions of 1% or greater reversals were highly concentrated (85-94% probability of a 1% reversal) when the convergence of specific and observable factors were present.

The prominent factors are collected and maintained as a “Rule set” which guides trade decisions. Two simple examples of actual research based rule sets:

Short Trade: *The NASDAQ 100 index has advanced 7 consecutive sessions 4 times in the past 36 months, but has not advanced 8 consecutive sessions in 34 years. On the 5th and sixth consecutive day of advances a short position should be structured at daily resistance. (At the first instance of 8 consecutive days of advance, the rule would be removed.)*

Long Trade: *When the A/D ratio on the NASDAQ 100 is greater than 94% after the first 90 minutes of trading, 97% of the time the index will close more than 1% above the first 30% or greater retracement of the session.*

2. **Pivot Points:** There are thousands of methods professional traders use to predict support and resistance levels. The ITRS approximates potential trend reversals based on pivot points derived in conjunction with the current intermediate (0-7 days) trend. Utilizing the classic formulae, the ITRS sets pivot generated price alerts for entering/exiting a position when the intermediate trend approaches the appropriate pivot. The classic formulae are:

$$PP = (HIGH + LOW + CLOSE) / 3 ;$$

$$S1 = (2 * PP) - HIGH ;$$

$$S2 = PP - RANGE ;$$

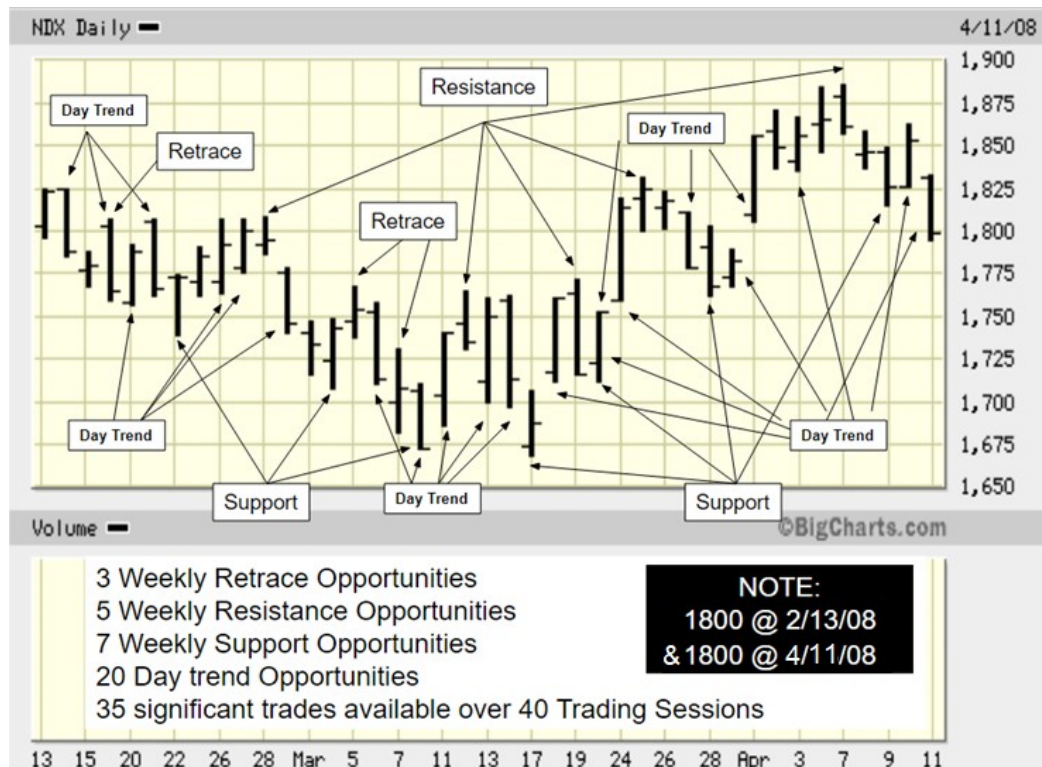
$$S3 = S2 - RANGE ;$$

$$R1 = (2 * PP) - LOW ;$$

$$R2 = PP + RANGE ;$$

$$R3 = R2 + RANGE$$

Figure 2: Identifying Support, Resistance and Retracement Levels in the NASDAQ 100



Tools and Indicators as Additional Inputs in determining Support, Resistance and Retracement Levels

We utilize several leading indicators to aid in the determination of trend reversals in equity indices. They include but are not limited to:

- Advance/Decline ratio (net change %)
- Divergence, trend line break and 123 reversal pattern
- VIX
- 5-7-day advance or decline on major indices
- Greater than 2% advance on indices within 2 sessions

Identification of trend reversals are also subject to several known risk factors They are typically discrete event driven with some examples being Fed Announcements, ISM, CPI/PPI, Earnings, breach of pivot and false signals.

Hercules Investments ITRS – Backtest Results

The Hercules Investments ITRS has back tested (01.01.07-01.01-08) rule sets for the following five intraday trades when used in conjunction with pivot points. Note, these trades were devised and back tested based on their high reliability of profitability; all work at least 7 out of 10 times.

TRADE TITLE	COMMENTS	AVG POINT MOVE	SET-UP RECOGNITION RATE	STANDARD DEVIATION OF PIVOT (STOP LOSS INCREMENT)	RELIABILITY RATE OF PROFITABILITY
INTRADAY TRADES					
AM REVERSAL	When the market opens at R1, PP or S1 more than 90% of the time a 5-15pt reversal occurs within the first 30min of the trading session.	10	60% away from Pivot 80% at Pivot	1.3	>70% away from pivot >90% at Pivot
DAY TREND (This is technically a trend follow through not a reversal)	The most profitable intraday trade but the most difficult to anticipate. The best indicator for a day trend is a +/-90% or higher factor on the A/D issues	37	20%	n/a	>70%
SUPPORT/RESISTANCE	A very reliable reversal trade when the market is within 4 pts of R2 or S2	24	60%	1.1 @ R1/S1 3@R2/S/2	>70% at R1/S1 >90% within 4pts of R2/S2
DAILY RETRACEMENT	An entry point or the logical stop limit exit point on trades placed at daily support or resistance.	12	100%	1.3	>70%
DOUBLE TOP/BOTTOM	This trade works best if the bottom/top is confirmed before placing the trade.	8	50%	.7	>70%
PM REVERSAL	Occurs within 75 minutes of market close.	10	70%	n/a	>70%
WEEKLY S/R/R					
WEEKLY SUPPORT/RESISTANCE	The most profitable trade is also the most difficult to precisely time. The trade usually needs to be scaled into.	40	70%	n/a	>70%
WEEKLY RETRACEMENT	An entry point or the logical stop limit exit point on trades placed at weekly support or resistance.	20	100%	1.8	>70%

Risk Management

In addition to systematic trade signal generation and trade execution, the strategy adopts a systematic budgeting of portfolio risk capital, wherein the trade is legged into incrementally; this can be interpreted as a risk hedging measure.

Hercules Investments ITRS model trades are almost exclusively implemented using long option positions to maximize the profit outcome from systematic bets. The asymmetric payoff profile of long options positions improves the winning trade to losing trade ratio beyond the levels secured using index futures for any given trade. When trading options with a delta close to one, each trading opportunity can represent a potential price gain of approximately 50% on average.

We utilize several measures in ensuring risk mitigation to each of our trades. We typically implement trades using deep in-the-money strikes to ensure a high option delta with the underlying index and a much reduced option time premium (option value close to intrinsic) for a given trade horizon. The trade horizon includes a sufficient time margin or buffer to safely include the likelihood of the expected event and avoid premature expiration prior to the event.

More importantly, the model enforces a disciplined loss-limit management. Each trade is set with a maximum downside limit on holdings and the position is closed when that threshold is crossed. A stop loss program will determine the maximum loss-tolerance for the investor and automatically sell holdings to prevent such a loss. The stop loss program also implements a 'trailing-stop' approach which will 'protect' gains by selling holdings if markets begin to retreat from recent advances. The value of the trailing stop program is that the investor can benefit from gains when markets rise and retain those gains if the uptrend ceases or reverses.

Conclusion

Trend Reversal or countertrend models belong to a class of technical charting models that rely on the time tested observation that past behavior of market participants will repeat themselves.

The counter intuitive trade-action of Trend Reversal models is instrumental to consistently making short term profitable trades and a systematic countertrend model provides an objective, mechanical approach to achieve this objective.

Each trade extracts a modest profit out of the market, and when applied consistently, pure alpha generated from trend reversal trading adds up. Because of their short duration trades, trend reversal strategies tend to have low correlations to other managed futures strategies as well as traditional asset classes. Because these models tend to be prolific in generating alpha during periods of market volatility seen during crises, this excess return is termed "Crisis Alpha" and considered valuable in helping offset drawdowns from other allocations in an overall portfolio mix.

Lastly, the characteristic signature of the return stream from Trend Reversal strategies makes them well suited to opportunistically improve timing/efficacy of any applied hedging allocation with significant cost efficiency.

In summary, the Trend Reversal strategy offers multifaceted value as a differentiated standalone strategy, a use case for dynamic risk hedging, as well as a unique component to any overall portfolio investment allocation.

Please visit our website at <https://www.hercules-investments.com> and reach out to one of our investment advisors at 800-729-0417 or corporate@hercules-investments.com.

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