

Integrated Trend Analysis

with

Triple Trend Oscillator

Technical Insights

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Section 1

1. Introduction

The Triple Trend Oscillator (TTO) is a trend following oscillator devised to identify the exact technical strength of a stock or indices over multiple timeframes and can also be used as a trend and momentum indicator. The sole purpose of this indicator is to keep positions on the right side of trend and at the same time indicate trend quality.

Like many other technical indicators, TTO oscillates around a zero line but with a difference. It incorporates trend oscillators which mimic the trend momentum across three timeframes, plotting them simultaneously, thus giving an overall view of the trend position. Thus it provides a better indication of trend strength which is not possible when trends are viewed in isolation.

Just like visual interpretation is better with two eyes than one, the Triple Trend Oscillator provides a three dimensional view for better understanding of trends.

2. Components of TTO

The main components of TTO are the three trend oscillators, which plot the three trends : Major, Intermediate and Minor trend. As indicated by TTO, a stock would be extreme bullish when all the three trend lines are above zero and extreme bearish when they are below zero. Between the extreme bullish/bearish phases, TTO exhibits varying degree of trend quality depending on the position of the three trend oscillators. Each sub-trend oscillates around its main trend, denoting the period of uptrend/downtrend in the main trend. Thus if the sub-trend rises above the main trend and remain there for an extended period, it has the effect of pulling up the main trend upward and vice-versa.

TRIPLE TREND OSCILLATOR – Technical Insights

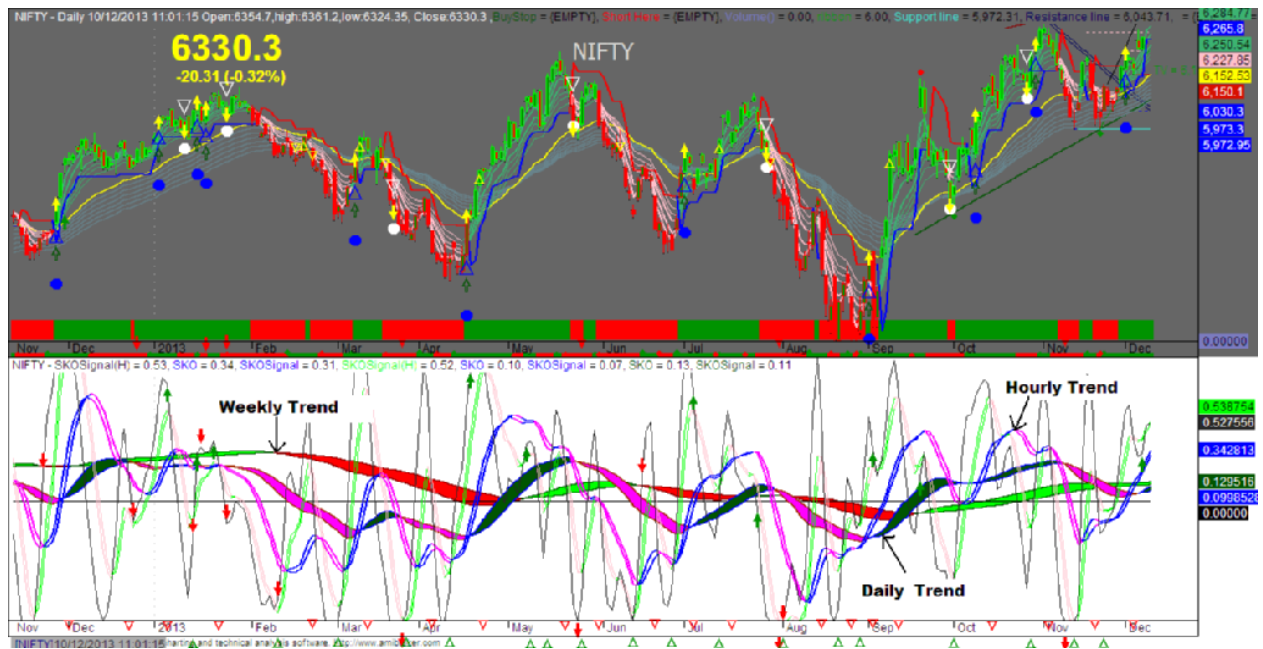


Chart 1 : Multiple Trends on Daily Chart

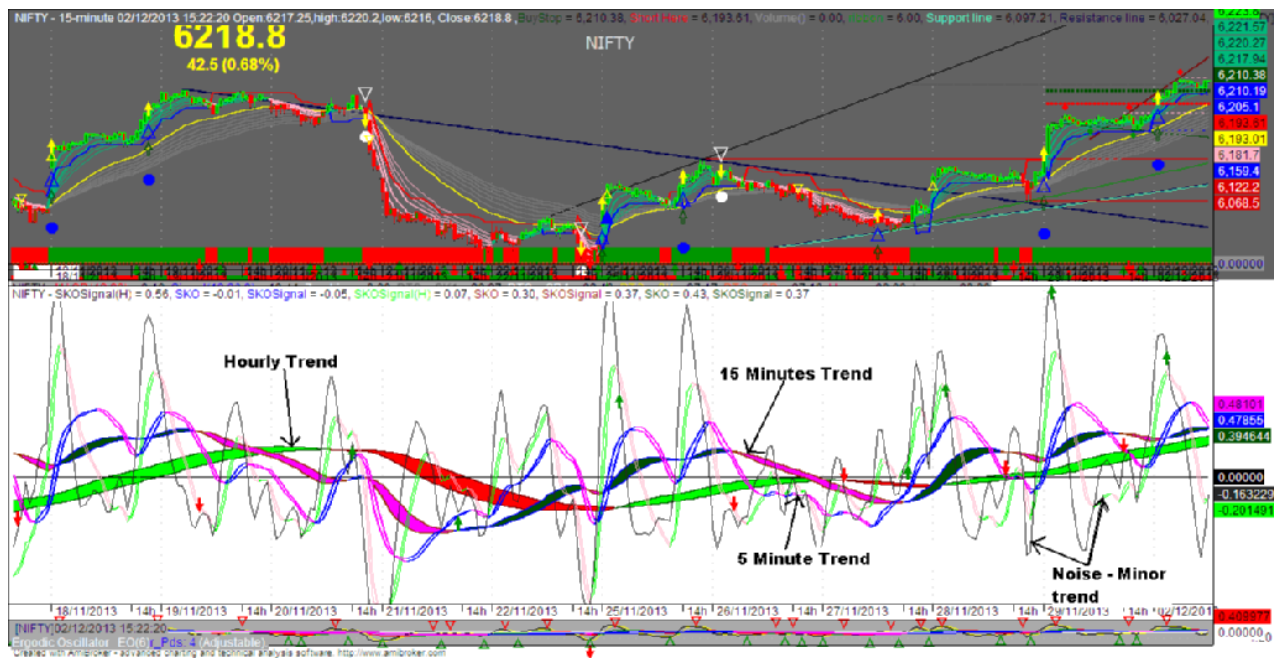


Chart 2 : Multiple Intraday Trends

Within the major and intermediate trends, TTO shows trend swings which are indicated by the trigger line, which acts as a leading indicator. Trading position can be taken in the direction of the larger trend based on the zero crossover of the trigger line. When trigger line crosses zero from bottom, a buy signal is generated and vice versa. An increasing value of the trigger line would depict increasing momentum and topping or reversal when it starts approaching zero line. One

should be prepared to exit his position on zero crossover. Also, divergences between price and trigger line may indicate a reversal of trend.

Unlike other oscillators, TTO does not have an overbought or oversold zone as these zones tend to over-extend and may remain in overbought or oversold territory for a long period till the trend is reversed. TTO relies on the trend reversal which is indicated by crossover of the shorter term trend lines. What it means is if the shorter term trend line crosses the longer term trend, a reversal is indicated. In the absence of such a crossover, the trend is assumed to continue. This logic applies to all the three time frames included in the TTO. If a lower degree trend line falls below or moves above a higher degree trend line, either the trend is weakening and reversal is impending.

What TTO effectively does is, it plots the trend transition, as it flows from a lower timeframe to a higher timeframe i.e. 5 min-15min-hourly-daily-weekly-monthly. At any time three time frames can be plotted simultaneously, depending on its use for- day trading, positional trade, short term trade or investment. A look at the table will explain this :

		TRENDS DISPLAYED		
CHARTS	15 min	5	15	Hourly
	Hourly	15	Hourly	Daily
	Daily	Hourly	Daily	Weekly
	Weekly	Daily	Weekly	Monthly

TTO uses exponential, double exponential and triple exponential moving averages of the momentum in each trend cycle to eliminate the lag effect. This makes the three trend cycles more responsive to price change which when viewed together gives a much clearer trend position and early indication of trend reversal.

As momentum precedes the price, TTO acts as a leading indicator because it calculates the difference between exponentially smoothed momentum in different timeframes and plotting the same as a single indicator. In a single window it shows the major trend along with its intermediate, minor and sub-minor trend.

3. TTO Calculations

The TTO is an indicator based on the momentum. As momentum precedes price, any changes in momentum are reflected in the TTO.

TTO uses EMA, DEMA and TEMA of the momentum and their differential to calculate the change in trend across the multiple timeframes.

The position of the trend oscillators (TO) across different timeframes indicate the relative strength or weakness in a trend. As momentum originates in the lowest timeframes and moves into the higher timeframe (trend transition) the trend flow and direction can be easily viewed when all the TO are displayed simultaneously.

4. Interpretation

On the CNX Nifty hourly chart the following three trends are plotted :

1. Red and Green thick lines – Daily trend
2. Pink and Dark Green thick lines – Hourly trend
3. Pink and Blue parallel lines – 15 minute trend

Along with the above the indicator also shows the black dotted lines (trigger line) which mimics the minor trend and its crossover is used as entry and exit signal.

Notice how the daily trend carries with it the various sub trends which can be used to make precise entries/exits. The hourly trends tries to keep itself above the daily trend, showing continuous trend strength. The 15 minute trend whipsaws around the hourly trend giving an early indication of trend change. The trigger line (smoothed) shows the relative strength/ weakness of the 15 minute trend.

The indicator also shows divergences across the various trend cycles which indicates that a change in the trend direction is just around the corner. So apart from the daily and hourly trend, one can see the developments happening in the 15 minute and even 5 minute time frame which is crucial for a trader and result in better risk management.

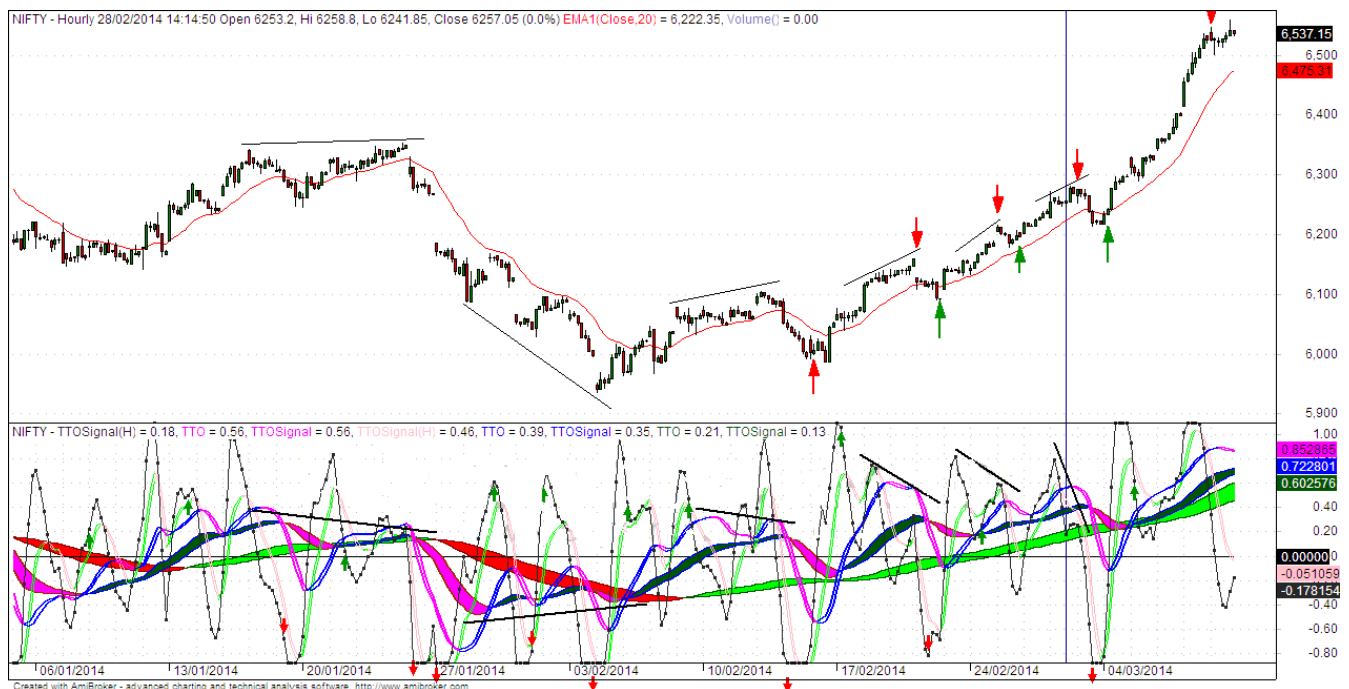


Chart 3 : Nifty Hourly – Understanding TTO

On the daily chart of CNX Nifty below, which shows the weekly, daily and hourly trends, one can spot the trend change taking place on the pink and blue twin parallel line, much before the daily signal comes on, virtually giving the best entry signal one can have for the trade. This is possible because the lower timeframe trend is being monitored and used for entry/exit on zero crossover.

The chart gives information about not only weekly and daily trends, but also hourly trend, which can be used to make an informed trading decision, without waiting for the daily signals, which could be significantly delayed due to the leg effect. This can increase the profitability of the trading position considerably.

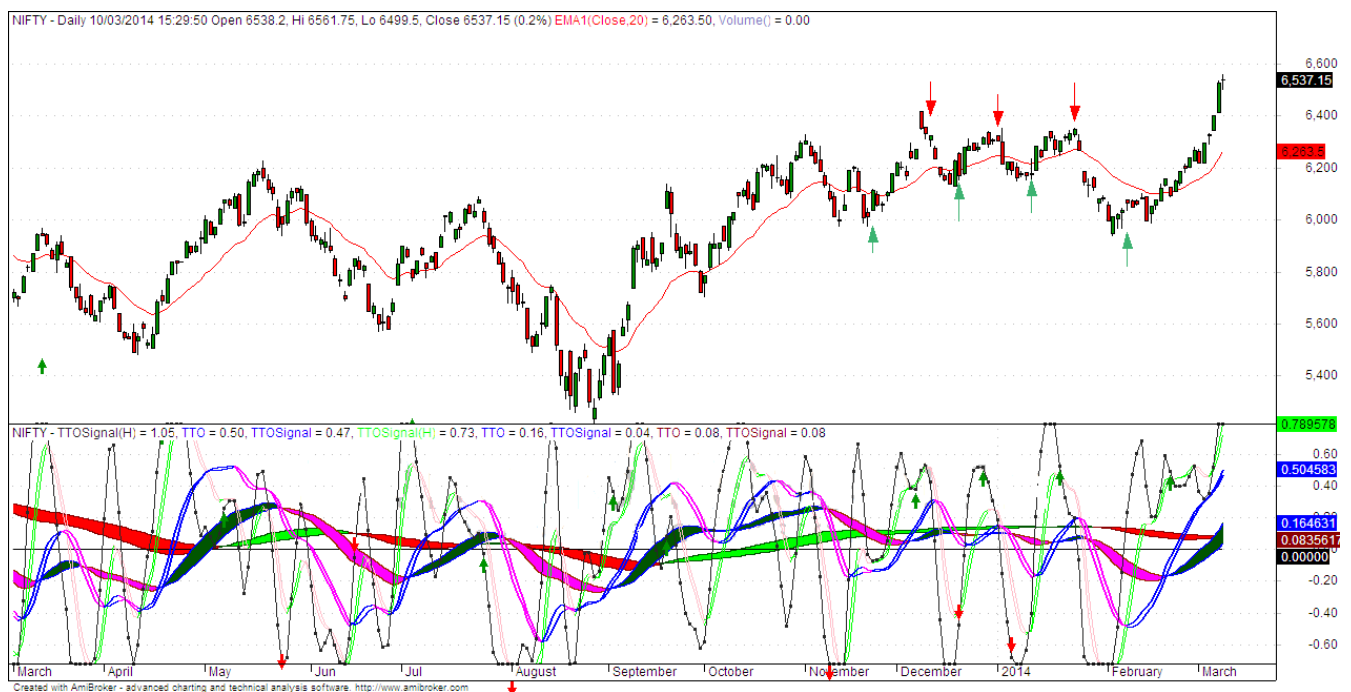


Chart 4 : Nifty Daily – TTO Explained

5. Bullish & Bearish Alignment

TTO creates patterns which can help identify trend strength in a security. These patterns can be used to initiate directional trade with a very high probability of success with the trending moves in the security. The further the trend oscillators are placed from the zero line, the more impulsive the move is likely to be. The impulsive price action witnessed is the result of alignment of longer term oscillators. In such a scenario, the trigger lines crossover results in rapid price movement in the direction of the larger trend.

A Bullish Alignment, occurs when all the three trend oscillator are in positive zone which results in quick up move in the price of the security. The trigger (black dotted) line can be used to initiate the long/ buy trade.

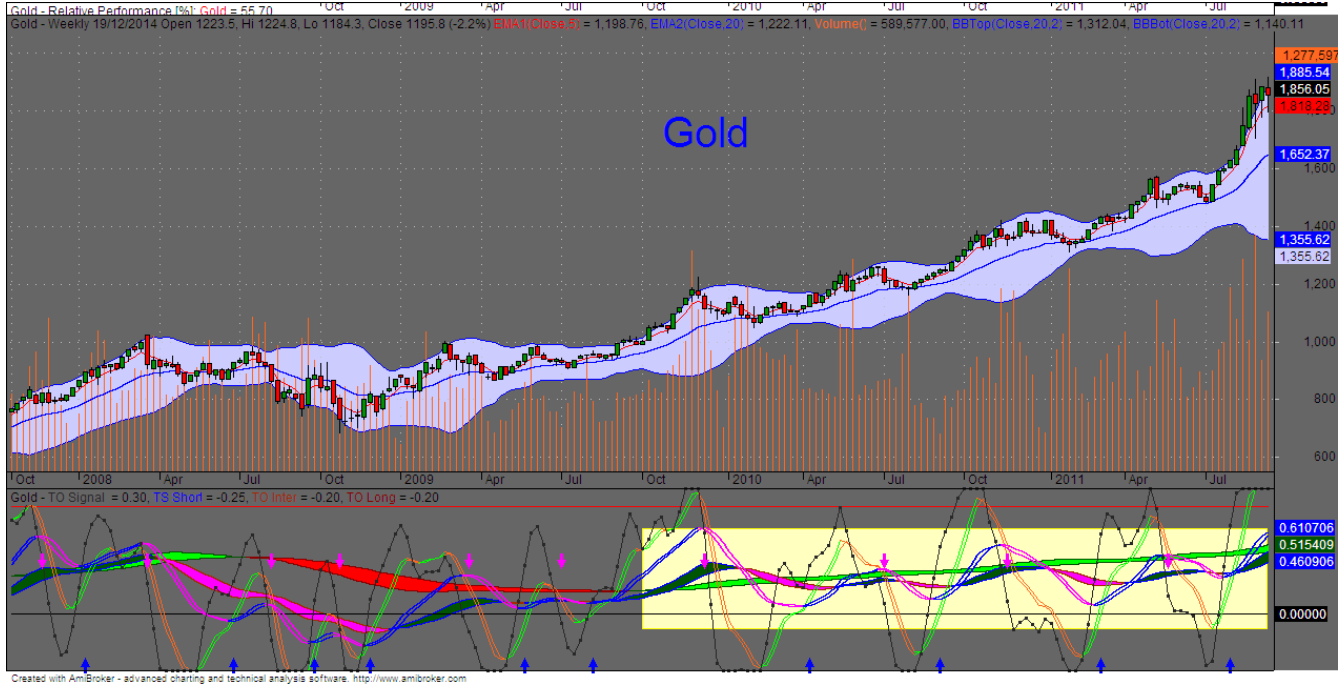


Chart 5 : Gold – Bullish Alignment

Conversely, in a Bearish Alignment, the three trend oscillators are placed below zero line to initiate a short/sell trade on trigger crossover.

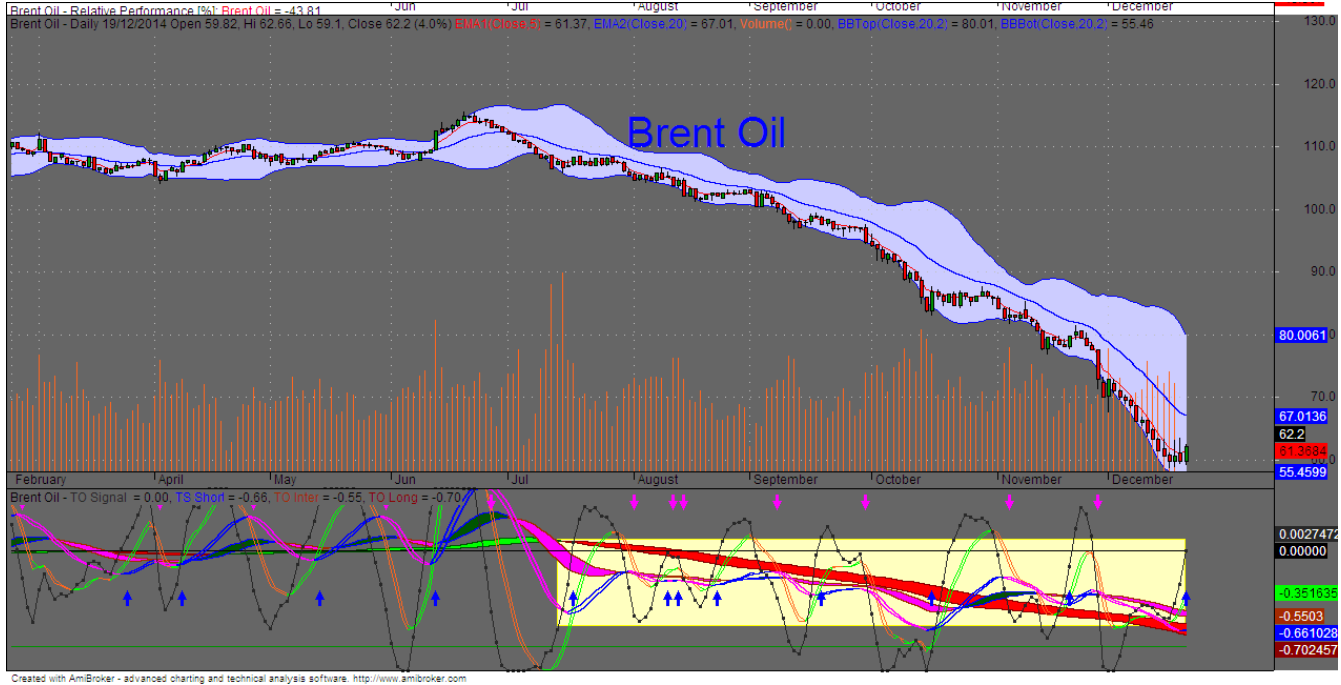


Chart 6 : Brent Oil – Bearish Alignment

6. Anatomy of a Trend

Every trend carries within itself several sub-trends of various lower degree, though hidden, but play an important role in shaping the trend quality. The need is to identify these sub-trends and view them in conjunction with the main trend, so as to get an overall technical position of the security.

Integrated Trend Analysis is an attempt to study and analysis these diverse forces which affect the price of a security. What Triple Trend Oscillator does is, it puts the multiple trend on the screen simultaneously, to present an overall picture.

The position of the trend oscillators, play an important role in determining the trend strength. In case, all the trend oscillator remain above the major trend and continue to oscillate above it, the security would exhibit highly bullish impulse and rise rapidly. Reverse is true for a highly bearish security, when all the trend oscillators fall below the major trend and continue to oscillate below it.

A trader intending to take a long position in a security would be cautioned by the headwind, in the form of a short term weakness in security, and would wait till the short term momentum has again turned positive to minimize his risk and a possible stop loss trigger.

The following hourly chart of ICICI Bank shows a fairly long bullish daily trend, along with the sub trends. A trader can, by avoiding the short term down tends, perfectly time his entry and ride the uptrend with minimum risk.

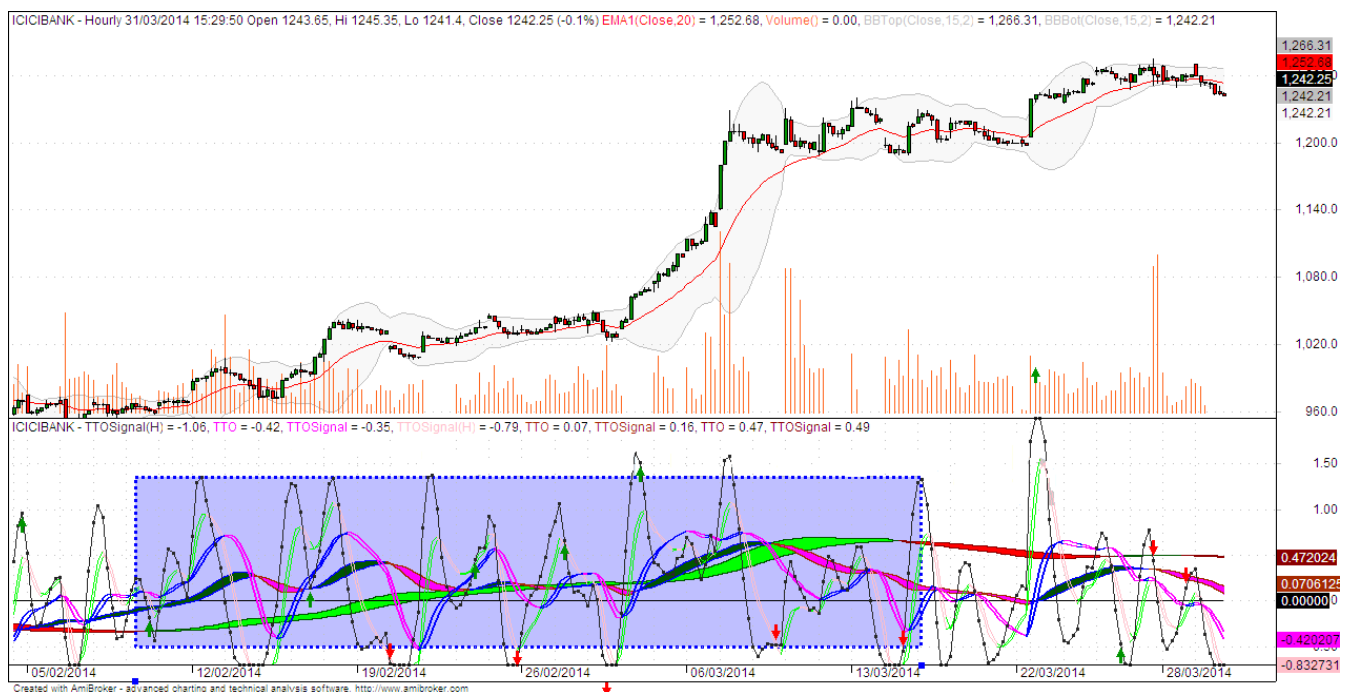


Chart 7 : ICICI Bank -Trend within Trend

7. Trading Futures & Options using TTO

High leveraged trades in Futures & Options can be tricky. Stop losses can be used for risk management but a few stop loss triggers can take away a substantial part of your capital. What is important is the entries are timed precisely and once an entry is made, ride on the position till exit.

Equally important is the stock selection which can give the best trending position. Using TTO one can analyze the long term trend and take position in a shorter time frame with a precision entry using a minor trend, all this information available on the same indicator.

An advanced option trader has highly sophisticated tools to trade in options where each of the factors affecting option pricing is analyzed. However, for a trader it boils down to managing the intrinsic and time value of an option. Hence it is important for an option trader to know the trend force and direction before trading in options. A strong trending move can negate the effect of theta (time value erosion), keeping the option trader in profit, even when close to expiry.

Trading naked options, if timed correctly, can become a relatively risk free, simple and high profit strategy. An option trader using the Triple Trend Oscillator will be in a position to judge the trend quality. The position of trend oscillators close to zero indicates sideways moves which can kill an option trader. The best trend structures would be when the trends are placed away from the zero line indicating strong trending move in either direction. Again the position of the intermediate and minor trend would indicate the trend strength and the trigger line could be used to take position in the direction of the major trend.

Notice in the following chart, how the thin black line zero crossover can be used to make precise entry in the direction of a larger trend. Even if you miss the first entry or are not confident, one can always use the second crossover for a good directional trade.

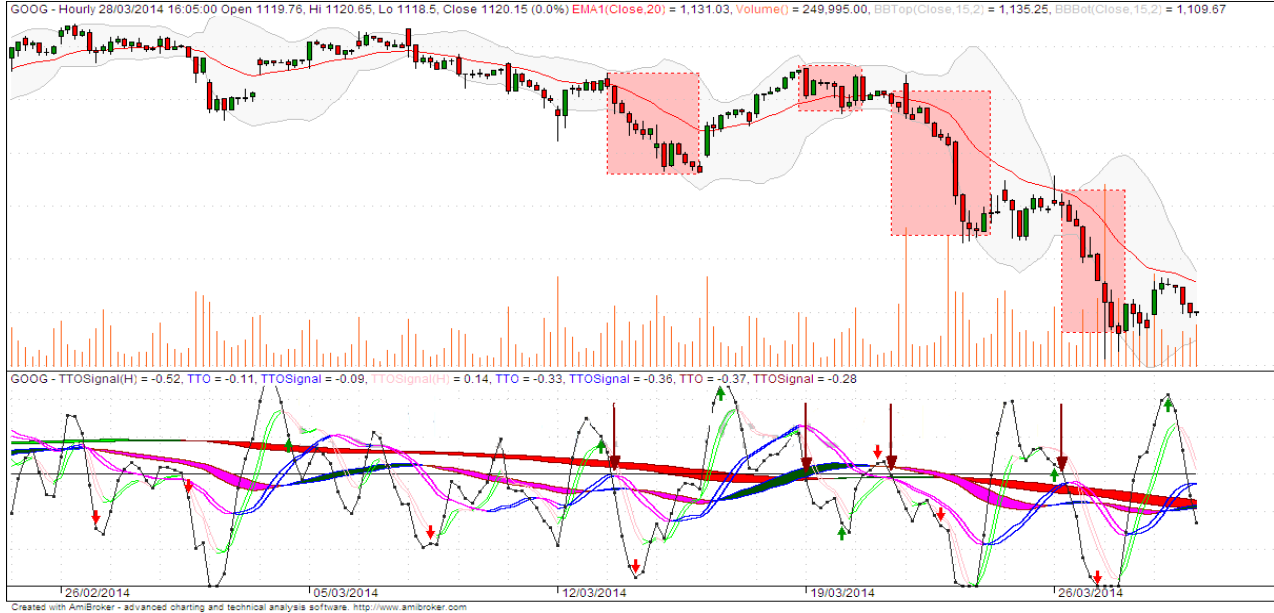


Chart 8: Google - Short Trade

8. Predicting Directional Breakout

Bollinger Band squeeze indicates an impending breakout move but the direction remains uncertain. Sometimes there are false breakouts, to be followed by a reversal and a powerful move in the opposite direction.

With TTO it maybe possible to anticipate the direction of the breakout move as can be see in the weekly chart of USDJPY below. The placement of medium and short term oscillator above the long term oscillator during December 2012 and October 2013 and a trigger crossover indicated an up word breakout. However, during July 2014 breakout all the three oscillators are placed above zero indicating positive breakout on trigger crossover.

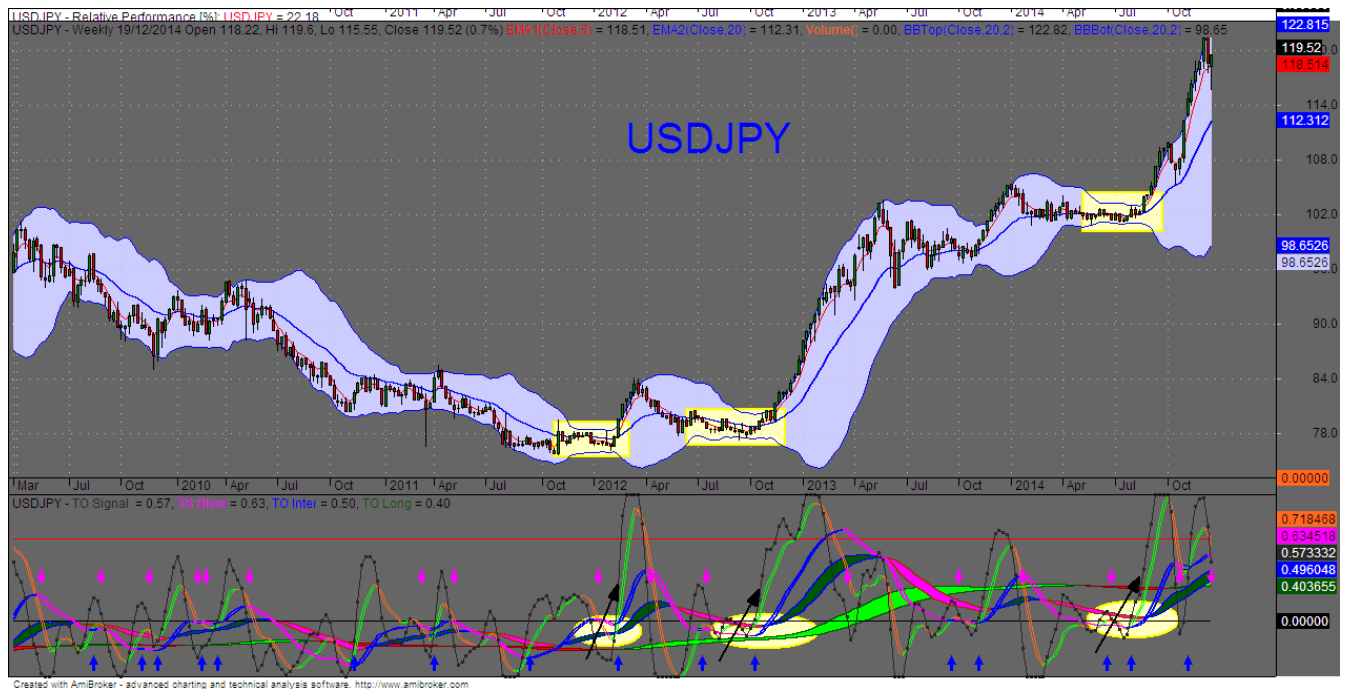


Chart 9 : Predicting Directional Breakout

9. How TTO Differs

There are other well known indicators using multiple timeframes in its calculations. This study does not get into the details to analyze the difference between the indicators, but notice that usually weights are assigned to ROC for different timeframes. Whereas in TTO, there are no weights assigned to the trend oscillators of different time frames and each of them is plotted independently and simultaneously. The idea being, one should be able to keep a watch the trend prevailing under different timeframes so as to monitor the strength or weakness of the trends as it originate from the lower time frame and flows into the larger time frame.

Once the confirmation of trend change is established, the lower timeframe can be used to get a precise entry point into a well established trend. TTO can foresee the approaching strength/ weakness and thus give an edge to the trader. Thus the visual interpretation skill can help and make TTO more responsive the trend change.

10. Other Chart Examples

APPLE

In the following hourly chart of APPLE Inc. (APPL-NYSE) subsequent to Apple trading at 500 levels, the 15 min trend starts to rise above the hourly trend and crosses over the zero line. It maintained itself above the hourly trend till about 535-540 levels, where it starts falling below the hourly trend, thereby giving an early signal of the trend weakening. It also started developing divergence and the price broke the trend line and EMA(20). One could safely join this uptrend at several points as indicated by the zero crossover of the trigger line.

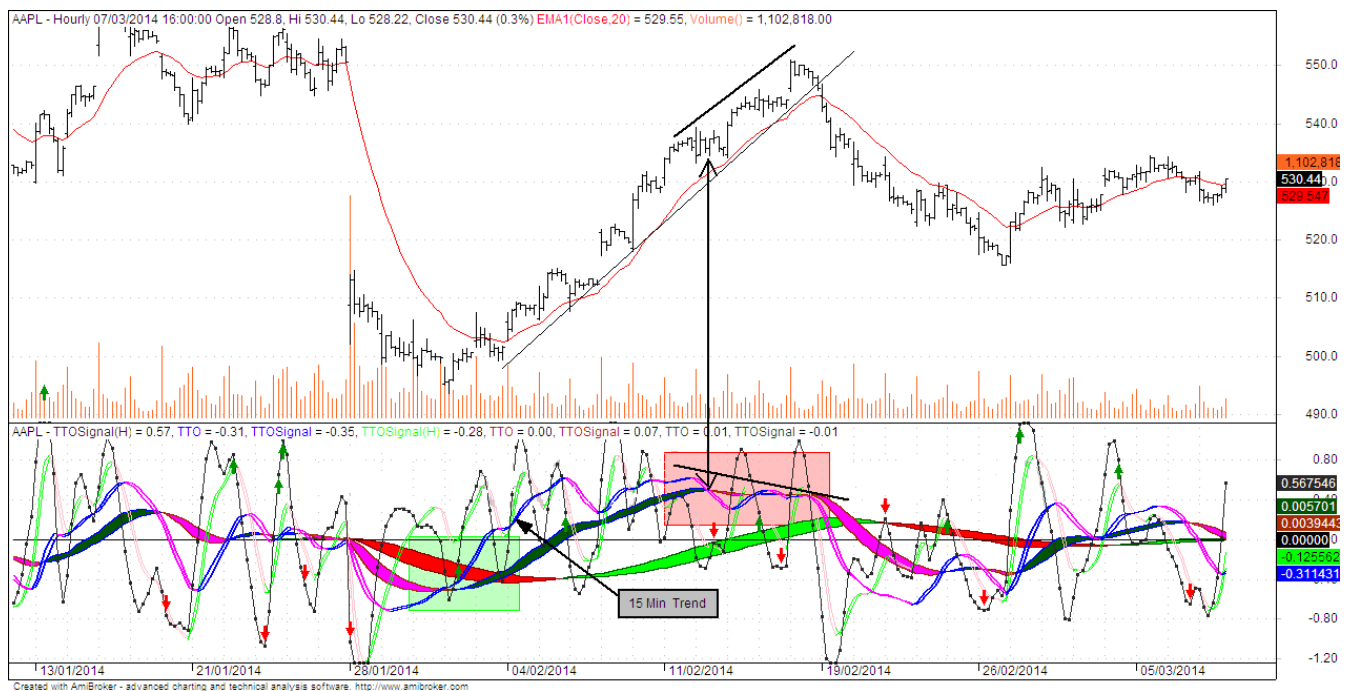


Chart 10 : Apple Hourly

INFOSYS

The daily chart of Infosys Ltd. (INFY-NSE) suggested sell as indicated by the trigger line crossover. The buy was indicated at 3580. Once the stock touched 3760, the indicator was showing continuous loss of momentum.



Chart 11 : Infy

11. Elliott Wave & TTO

The principles of Integrated Trend Analysis when used with the other well renowned technical theories like Elliott Wave, which can enrich the trading experience. There are numerous possibilities of using TTO alongside and in conjunction with the Elliott Wave theory. For example, the blow off rally in wave three can be associated with a synchronized bullish alignment in TTO.

The following chart is a perfect example of trend behavior in each of the five waves. It is important to notice the position of the various trends, i.e. major, intermediate and minor trend as they emerge during the five Elliott waves.

The bullish alignment of the three trends is a clear indication of the third wave in progress. The extreme reading in TTO correspond with the high made by wave three. During this period, the sub trend continue to oscillate above the main trend, and a fall below it indicating the beginning of the fourth wave. Again, during wave five, the trend remain subdued, as the sub trend fails to rise above the main trend, thereby indicating progression of wave five and a reversal thereafter.

In the following hourly chart, CNX Nifty seems to have completed the fifth wave which would be followed by a three wave (A-B-C) retracement.



Chart 12 : TTO with Elliott Wave

12. Fibonacci Levels & TTO

Fibonacci retracements and extensions are important trading tools which how ever do not work as a standalone system. TTO can be integrated with Fibonacci levels to identify important support, resistance and price targets and thus evolve as a cohesive and effective component of ones trading strategy. This study does not go into the details of integrating TTO and Fibonacci, but preliminary research shows that when Fibonacci levels are viewed in conjunction with TTO, a lot more information could be available to the trader to make an informed judgment about most probable price target zones.

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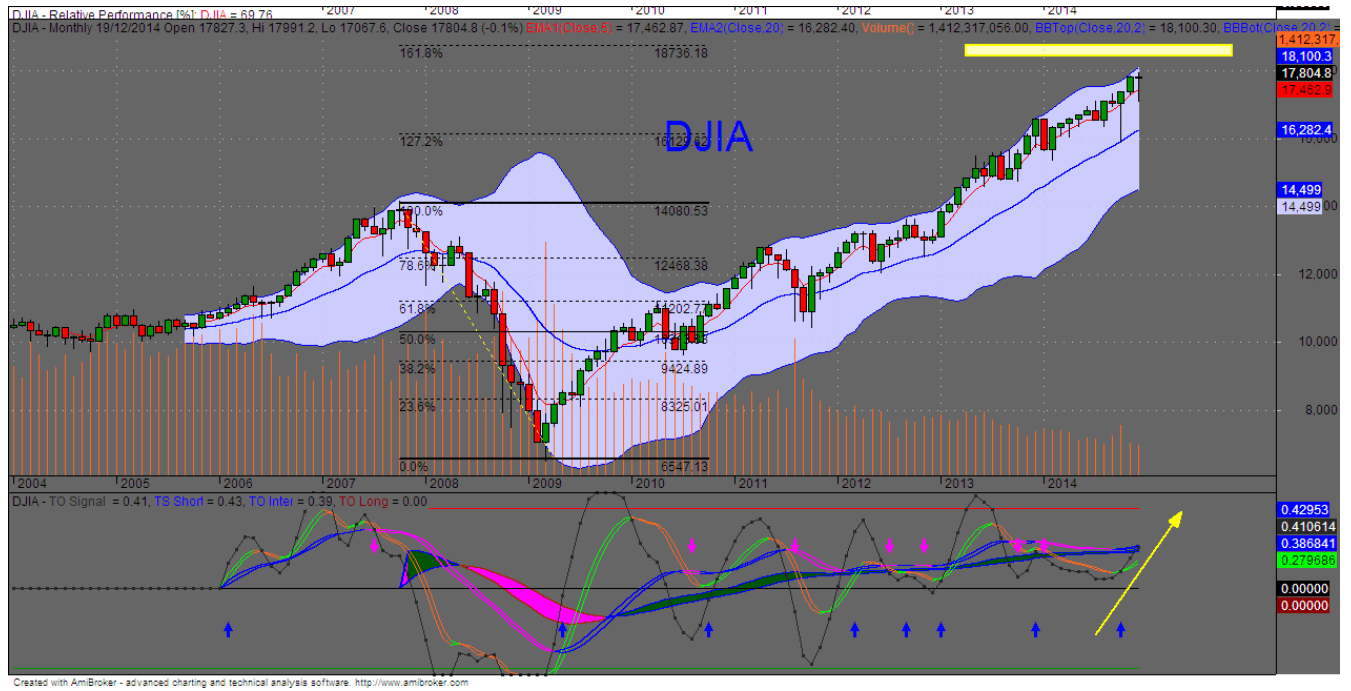


Chart 13 : DJIA - Fibo Target

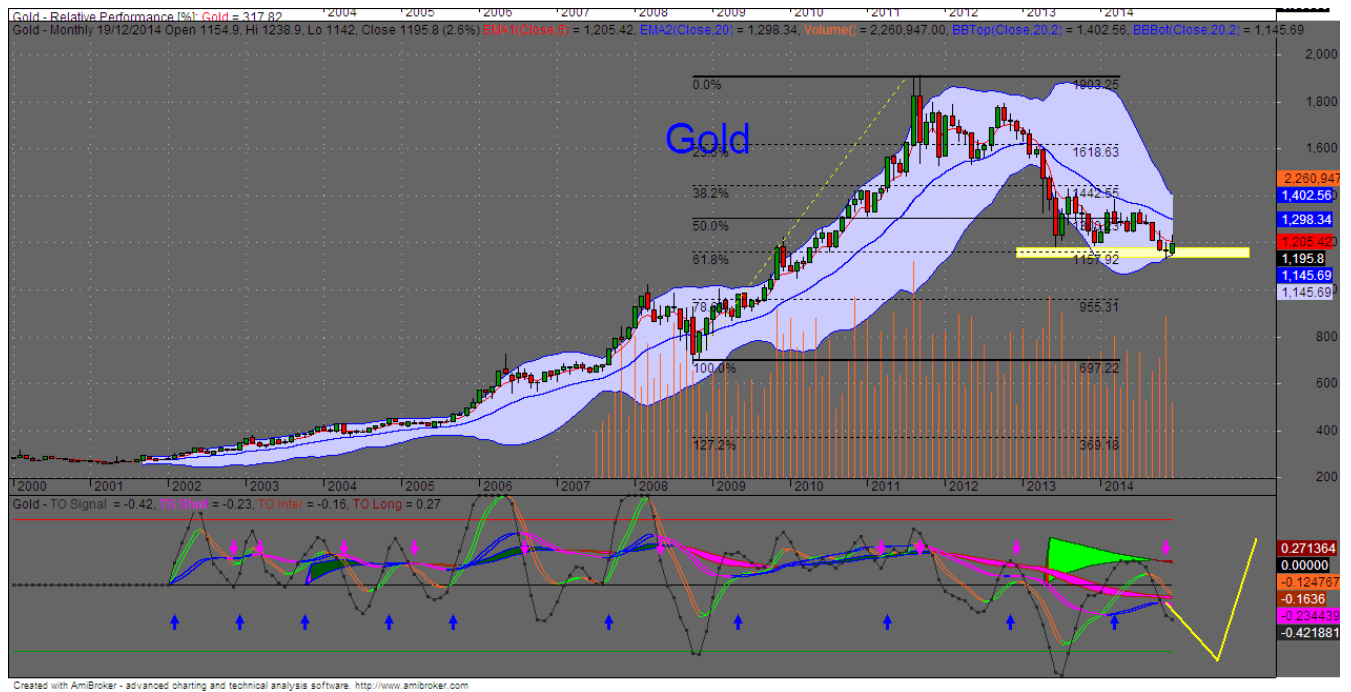


Chart 14 : Gold Monthly- Fibo Support

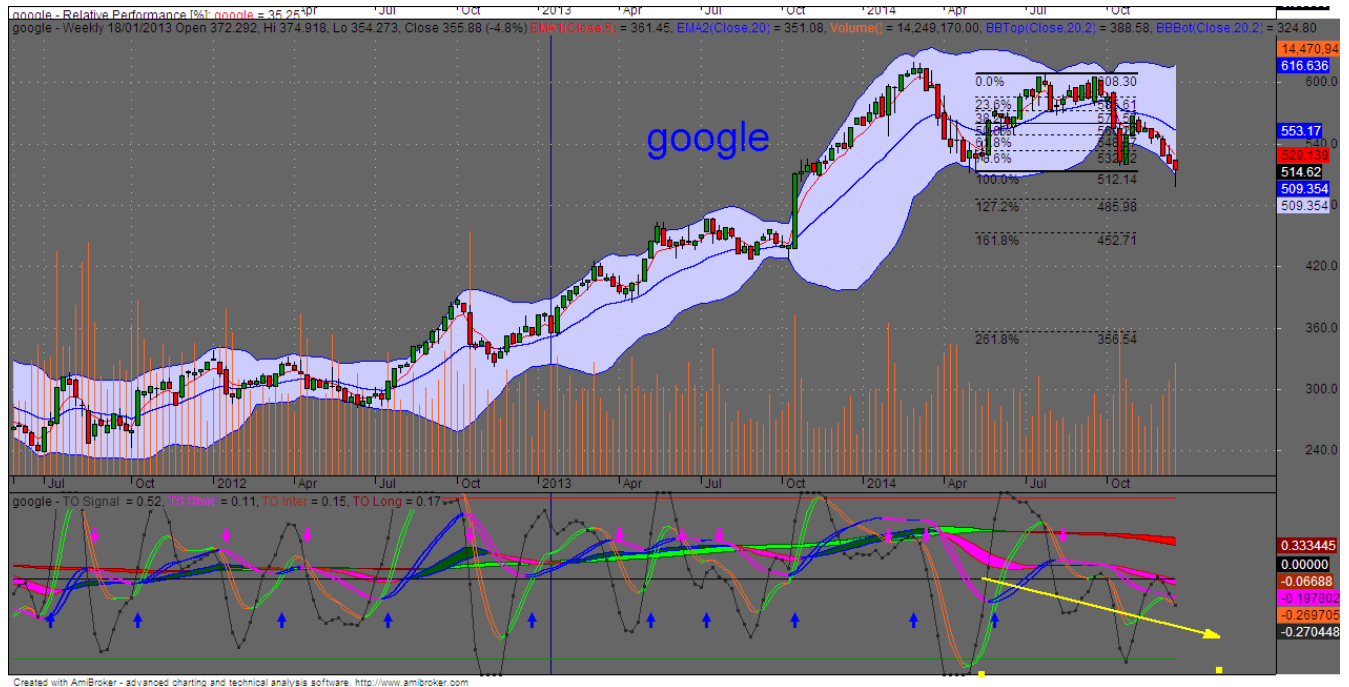


Chart 15 : Google - Retracement

13. Synchronized Bullish Alignment = Super Profits

A trader would normally focus on a single timeframe and take positions accordingly. However, the price plays a tug of war with the pulls and pushes of the three time frame. The resultant force would determine the quality of a trend.

In the earlier sections, we talked about synchronized bullish alignment of major, intermediate and minor trends. An alignment of trends in the three time frames can result in a major impulse move in a relatively short period of time. High leveraged and safe trading positions can be created if the exact timing of such a move can be identified.

The main requirement for such an impulse would be :

1. All the three trend i.e. major, intermediate and minor should be placed above the zero line.
2. The three trends should be bullish i.e. rising.
3. The minor trend should be placed above the intermediate trend and the intermediate trend should be placed above the major trend.
4. The trigger line should have crossed zero to generate a buy signal.

In the following hourly charts with TTO, the bullish alignment satisfying the above conditions is clearly visible with the resultant quick price movement.

TRIPLE TREND OSCILLATOR – Technical Insights

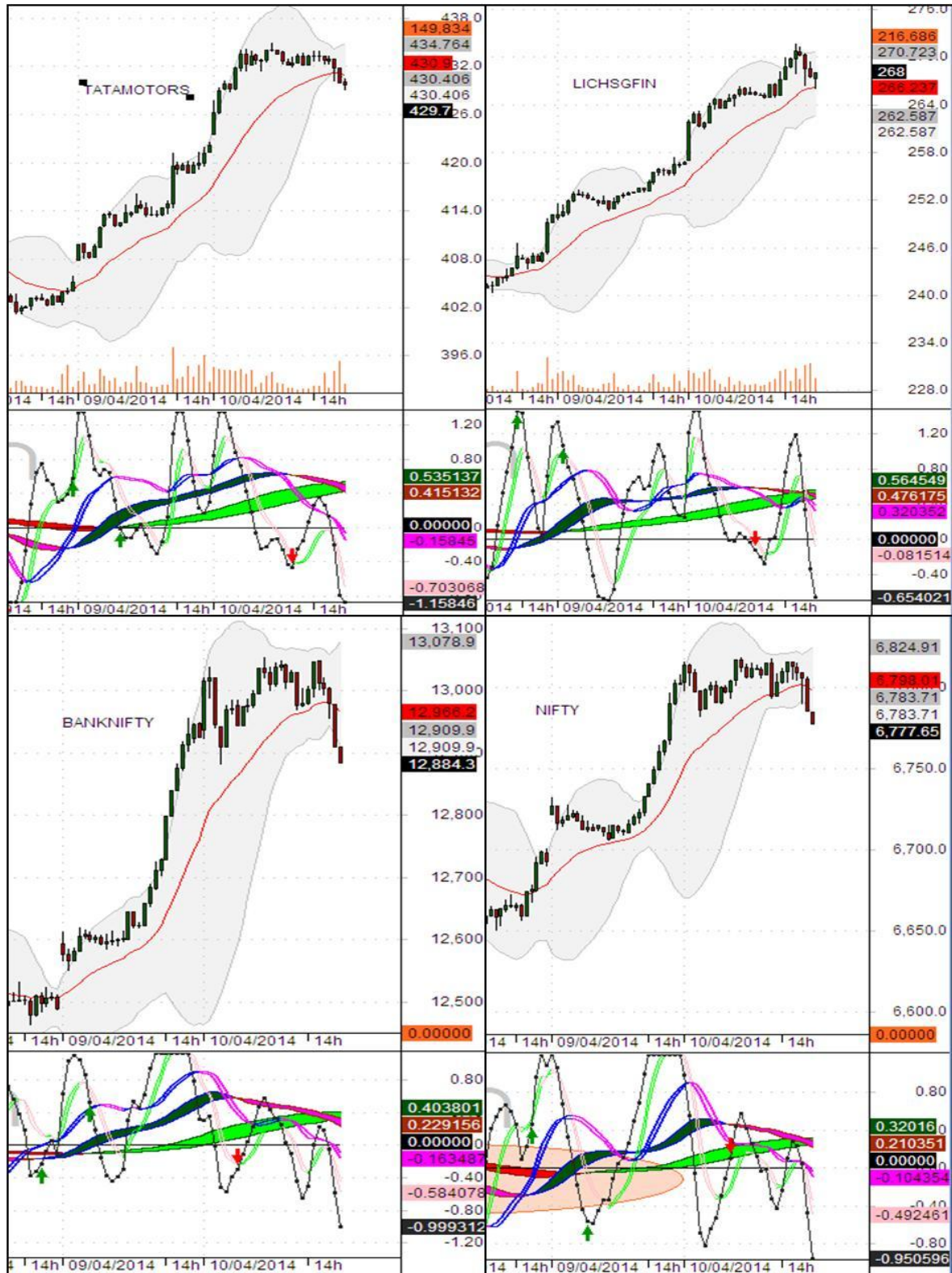


Chart 16 : Synchronized Bullish Alignment

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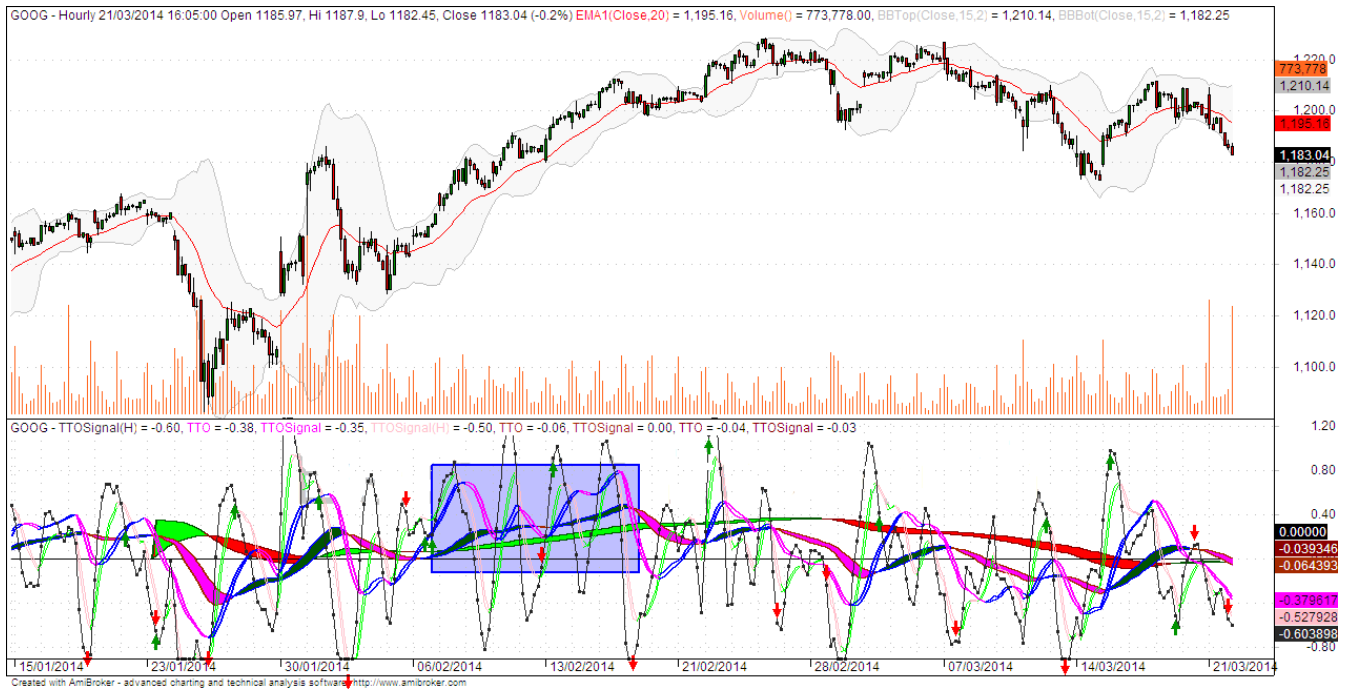


Chart 17 : Google - Bullish Alignment

One of the most recent examples of bullish alignment pattern at work can be seen in the following weekly chart of CNX Nifty as on May 8, 2014 which identified the major impulse that followed. The indices on that day was at 5648, having corrected from the previous up move. However, TTO was showing considerable strength and hinting at an explosive move in near future.



Chart 18: Impulse Move

In the following week, on May 16, 2014, Nifty touched a high of 7557 coinciding with the results of the general election in India.

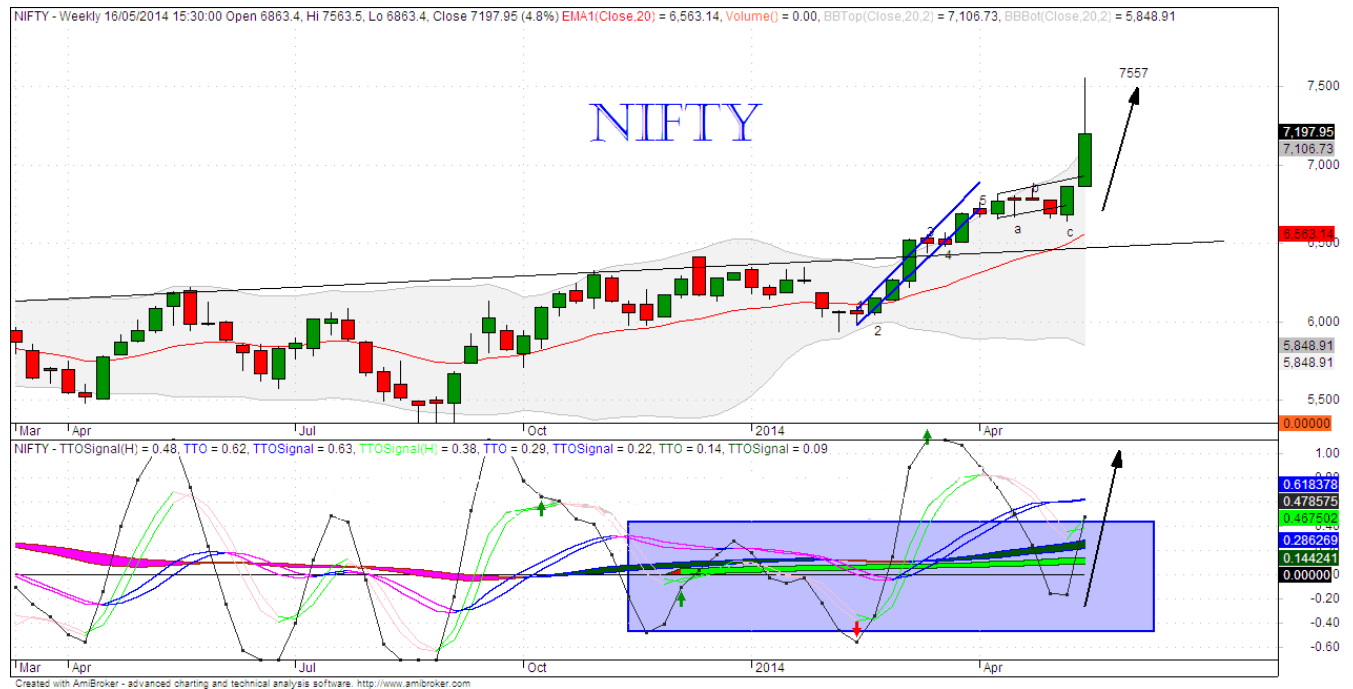


Chart 19: Nifty – Alignment of Trend Oscillators

14. The Financial Crises : 2008

The following weekly chart captures the peak and bottom of DJIA during the financial crises of 2008. On both the occasions the trend oscillators positioned themselves to create divergence indicating that a reversal was in the offing.

Towards the end of 2007, the medium term trend oscillator fell below the long term oscillator and finally went below the zero line marking the beginning of a bear phase. As the fall accelerated the long term oscillator was also dragged below zero. Towards the beginning of 2009 the oscillators had started moving north while DJIA continued to make new lows clearing indicating a weakening of downtrend momentum. In the later half of 2009 the oscillators had crossed over above zero marking the beginning of a new bull phase. The entire 2008 provided several shorting opportunities when the trigger line crossed below zero.

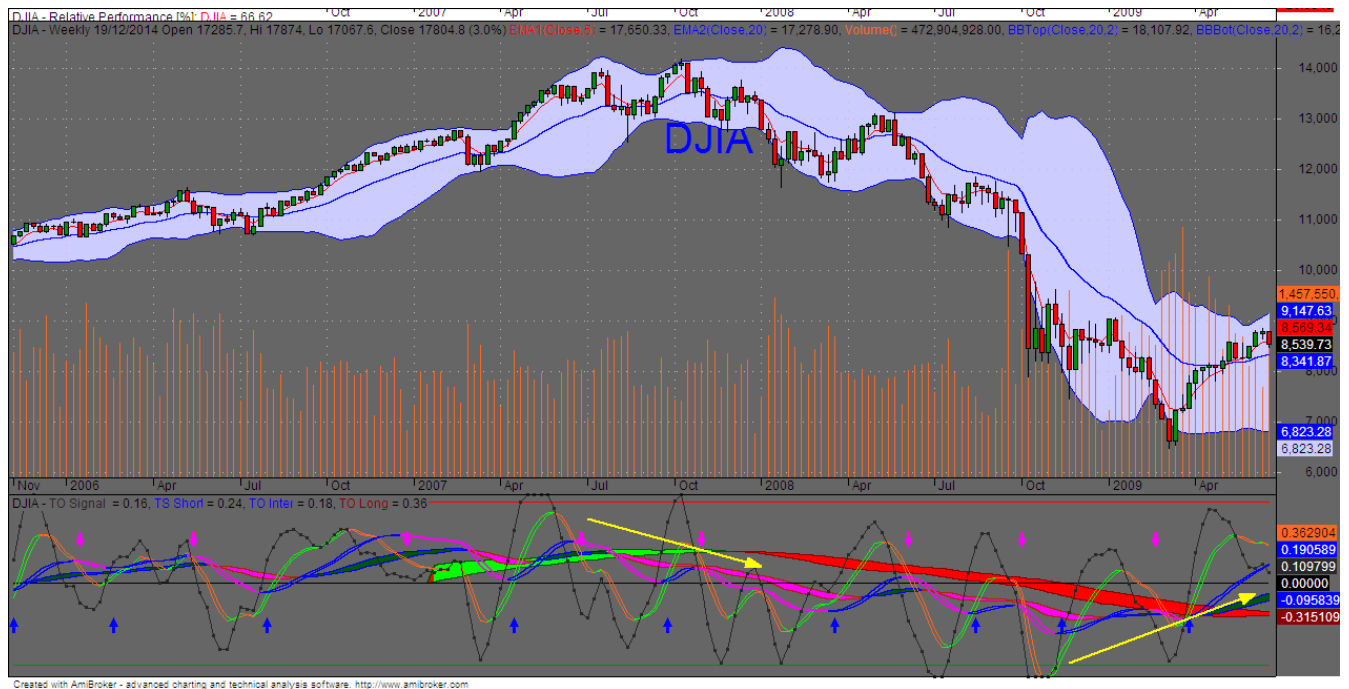


Chart 20 : DJIA - Trend Transition

15. Medium and Long Term Investing

Medium and long term investing is normally associated with daily, weekly and monthly charts. TTO provides some critical information to position oneself quickly to take advantage of the trend change. Not that this information is not available otherwise, but TTO presents these data points in a much easier way which could be quickly analyzed and acted upon.

The following weekly chart of Wockhardt Ltd. (NSE:WOCKPHARMA) shows, apart from the weekly trend, monthly, daily as well as hourly trends. The hourly and daily trend information can be used to take quick long term positions without having to wait for the weekly price signals.

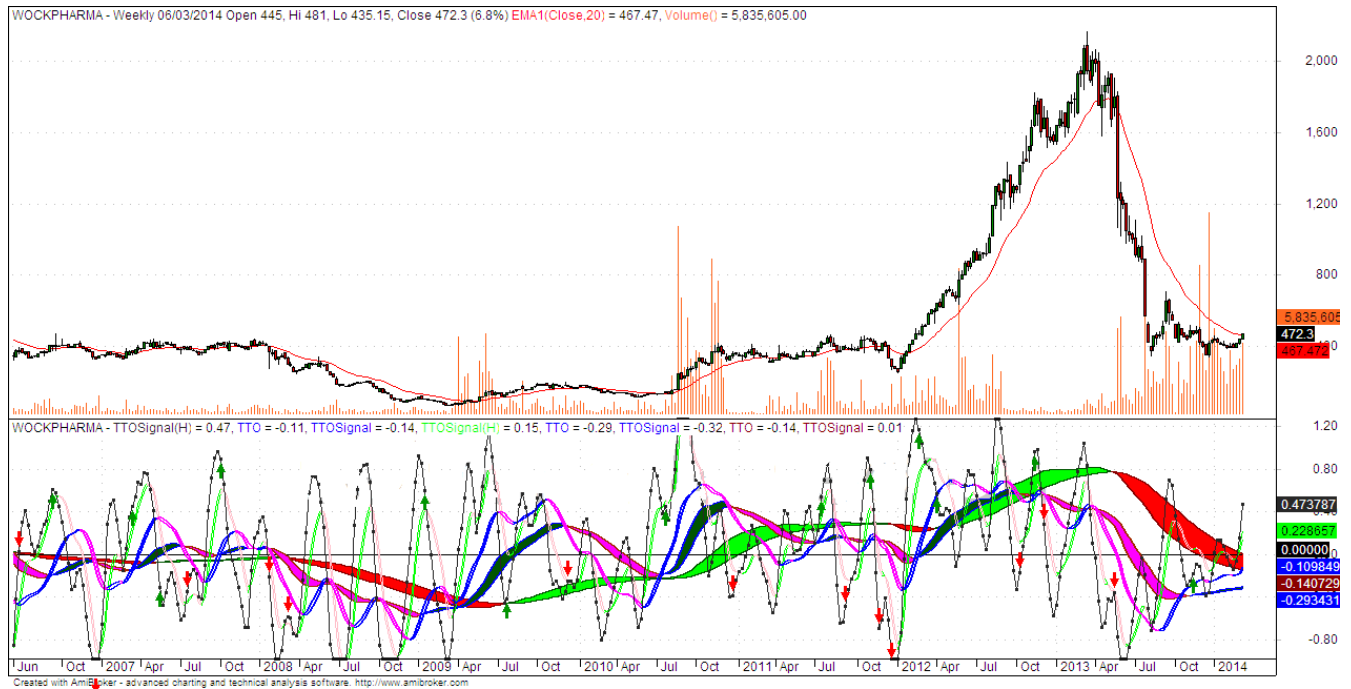


Chart 21 : Trend Change

16. Advantages of TTO

1. Early spotting of trend- a leading indicator.
2. Keeps you on the right side of trend, helps you ride on the trend.
3. Filters market noise associated with short term to its advantages by using it as entry and exit signals.
4. Stop loss may be used but not necessary.
5. Back tested and optimized parameters.
6. Higher percentage of successful trades.
7. Indicates trend strength and quality.
8. Can be used intraday, short term, positional and long term trading in indices, stocks and commodities.
9. Acts as a complete navigation system for the technical trader/ investor.

17. TTO - A Complete Trading System

TTO is akin to a navigation system in the maze of diverse trends. Whether trading or investing in equity or futures & options, TTO can prove to be a reliable tool in providing a comprehensive analysis of trends under different time frames. Moreover, it is a complete trading system and a risk management tool.

TTO is a trend following system which is highly responsive to price change, keeps you on the right side of the trend as well as helps identifying high quality trends. The indicator parameters have been optimized, back tested using historical data and in live market conditions. However, the indicator does not predict any levels or sets any price targets. Since the indicator can provide trading solutions for a trader with precise entries and exits, it can be used as a complete trading system.

18. Conclusion

There are several aspects of technical analysis study like patterns and channels which can be integrated with TTO. The impact and analysis of such integration has not been covered under this study. The oscillator can be used as stand alone indicator or an additional tool by a trader to negotiate the market trends.

TTO is an oscillator which gives a bird eye view of the prevailing trend for a scrip across three time frames. Though the indicator may look complex with its several trend oscillator , but once properly understood can be used advantageously to stay ahead of the market. Equipped with the TTO, a trader would be better placed to deal with the short term noise and whipsaws.

TTO can be used in all time frames for equities, indices, commodities and forex for short terms, positional and swing trades as well as for long term investing. It is the culmination of extensive research carried out by me and could be a potential wealth creator for the investors.

“Triple Trend Oscillator” or “TTO” is the term coined and used the author to describe the process of carrying out an Integrated Trend Analysis using multiple timeframes. The above observations are part of the study during the research carried out by the author, with the objective to develop an instrument which can aid and enhance technical trading/investment.

Section 2

1. Back Test Results : Summary

The following are the back test results for both long and short trades for varying time periods which show reasonably high number of successful trades. The test was performed using TTO crossover signals based on the closing prices of the current bar. These test results were achieved during back test and under optimum parameters, but may vary during normal trading. However, it would be safe to assume that TTO shows high reliability as a trend following system.

The simulations incorporated trading 100 shares/index/units on both long and short trades. The trade profits have been calculated at gross levels without taking into account commission, brokerage and interest. The profit net profit % has been calculated on an initial investment of 100,000 currency units.

Across all timeframes and asset classes, where the back test simulations were performed, results showed the successful trades accounted for a minimum of 73% to maximum of 97% of the total trades. The ratio of successful trade to unsuccessful trades was much higher when tested in hourly and daily timeframes as compared to 15 minutes timeframes. Based on the visual trade selection by the trader, the quality of trade can be improved, thereby giving higher average profit per trade.

Table 1.1

SUCCESSFUL TRADES % (on daily charts)

Year	GOLD	DOW	CNX NIFTY
2005	78.26%	93.33%	86.67%
2006	86.36%	81.82%	87.50%
2007	84.62%	84.85%	76.92%
2008	75.00%	91.91%	85.19%
2009	73.08%	78.13%	82.76%
2010	82.14%	79.17%	83.33%
2011	86.96%	79.41%	80.65%
2012	91.89%	74.19%	77.78%
2013	93.10%	96.30%	73.53%
2014	97.06%	89.29%	76.92%

Highest

Lowest

The maximum systems drawdown varied as per the volatility as shown in the table below.

Table 1.2

MAXIMUM SYSTEM DRAWDOWN % (on daily charts)			
Year	GOLD	DOW	CNX NIFTY
2005	-0.86%	-11.04%	-4.53%
2006	-2.37%	-10.81%	-8.72%
2007	-2.12%	-12.07%	-12.35%
2008	-4.44%	-22.43%	-17.14%
2009	-2.09%	-26.59%	-12.57%
2010	-4.63%	-18.32%	-7.77%
2011	-3.57%	-15.70%	-10.08%
2012	-3.56%	-11.78%	-8.76%
2013	-3.76%	-10.43%	-7.79%
2014	-1.89%	-12.62%	-6.52%

2. DOW - Monthly Charts, Ten Years (2005-2014)

Table 2.1 : Dow- Backtest Result

Statistics			
	All trades	Long trades	Short trades
Initial capital	100000.00	100000.00	100000.00
Ending capital	2050871.00	1441377.00	709494.00
Net Profit	1950871.00	1341377.00	609494.00
Net Profit %	1950.87 %	1341.38 %	609.49 %
Exposure %	21.35 %	15.74 %	5.61 %
Net Risk Adjusted Return %	9138.12 %	8523.47 %	10862.01 %
Annual Return %	35.62 %	30.88 %	21.85 %
Risk Adjusted Return %	166.84 %	196.21 %	389.39 %
All trades	10	5 (50.00 %)	5 (50.00 %)
Avg. Profit/Loss	195087.09	268275.41	121898.81
Avg. Profit/Loss %	16.79 %	24.62 %	8.97 %
Avg. Bars Held	12.30	17.80	6.80
Winners	9 (90.00 %)	5 (50.00 %)	4 (40.00 %)
Total Profit	1962563.00	1341377.00	621186.06
Avg. Profit	218062.56	268275.41	155296.52
Avg. Profit %	18.78 %	24.62 %	11.49 %
Avg. Bars Held	13.11	17.80	7.25
Max. Consecutive	5	5	2
Largest win	552067.00	493393.06	552067.00
# bars in largest win	19	25	19
Losers	1 (10.00 %)	0 (0.00 %)	1 (10.00 %)
Total Loss	-11691.99	0.00	-11691.99
Avg. Loss	-11691.99	N/A	-11691.99
Avg. Loss %	-1.10 %	N/A	-1.10 %
Avg. Bars Held	5.00	N/A	5.00
Max. Consecutive	1	0	1
Largest loss	-11691.99	0.00	-11691.99
# bars in largest loss	5	0	5
Max. trade drawdown	-143740.00	-87781.00	-143740.00
Max. trade % drawdown	-9.58 %	-7.92 %	-9.58 %
Max. system drawdown	-143740.00	-87781.00	-143740.00
Max. system % drawdown	-12.48 %	-12.19 %	-19.31 %

TRIPLE TREND OSCILLATOR – Technical Insights

Table 2.2 : Dow - Portfolio Equity & Drawdown

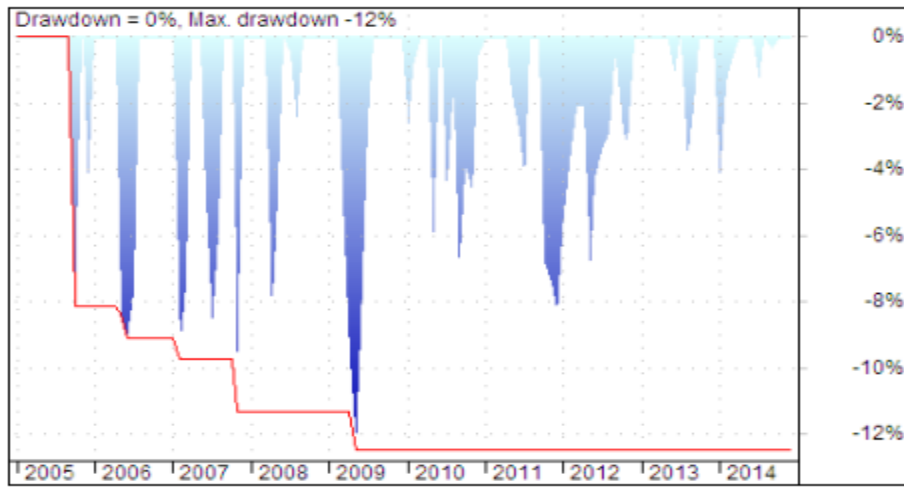
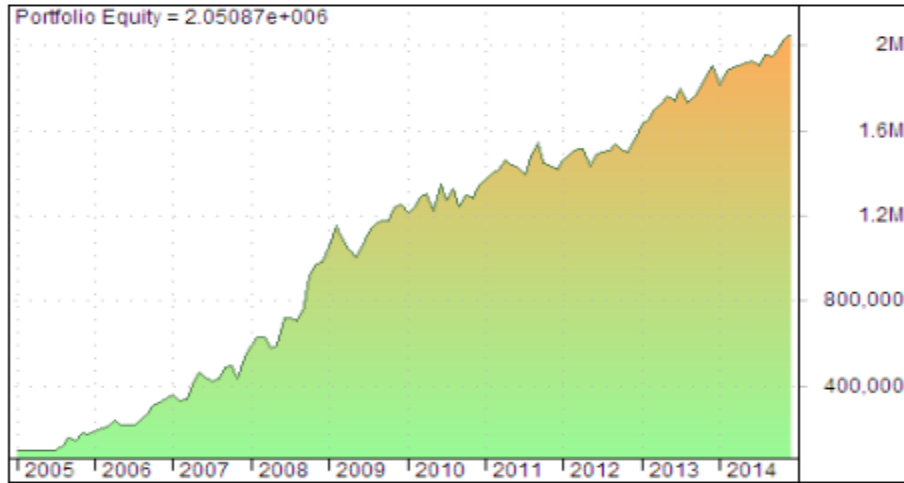


Table 2.3 : Dow - Profit Table

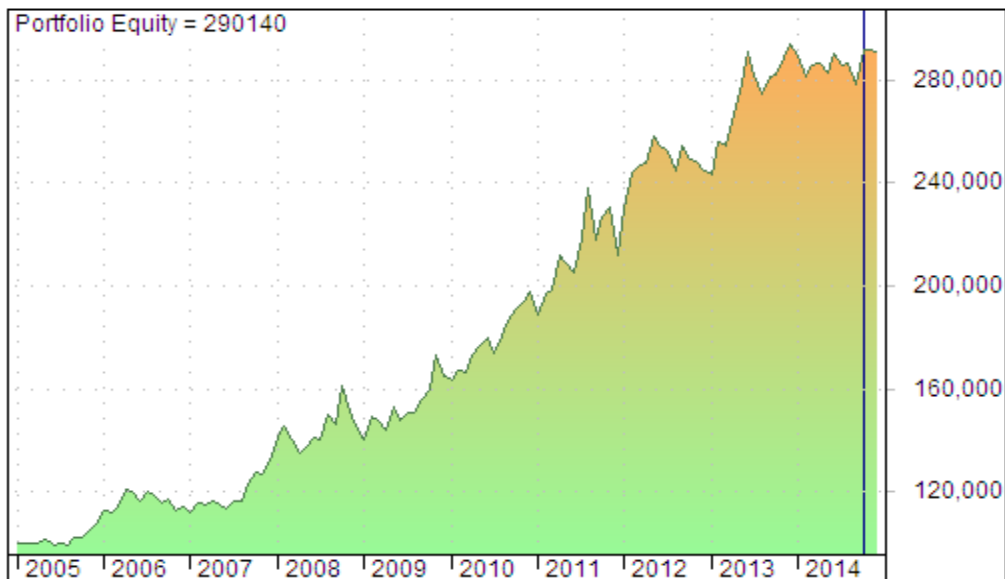
(in%)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	MDD
2005	N/A	N/A	N/A	N/A	N/A	N/A	23.8	26.1	-8.1	25.1	-4.8	8.5	88.2	-8.1
2006	6.8	5.8	12.1	-8.3	-0.8	1.6	8.9	12.4	14.9	4.6	7.4	4.6	93.3	-9.1
2007	-9.7	2.6	21.0	13.8	-4.7	-4.4	3.4	12.3	0.7	-11.3	21.0	11.6	62.9	-11.3
2008	6.5	0.1	-8.8	3.2	21.7	-0.4	-2.3	9.8	19.7	5.4	0.5	7.9	78.4	-8.8
2009	8.9	-4.7	-5.1	-3.2	4.3	6.9	2.9	1.9	0.0	5.4	0.7	-2.9	14.6	-12.5
2010	2.1	4.3	1.2	-6.7	10.5	-5.1	3.5	-5.8	3.9	-0.9	4.5	2.3	13.1	-7.5
2011	2.4	0.7	3.5	-1.6	-1.1	-1.9	5.8	4.7	-6.7	-0.6	-1.2	2.9	6.3	-8.4
2012	2.2	1.7	0.0	-5.4	3.4	0.9	0.5	2.3	-2.2	-0.5	4.0	4.9	12.0	-5.4
2013	1.2	3.2	1.5	1.6	-1.2	3.4	-3.8	1.8	2.4	3.0	2.6	-4.6	11.3	-4.6
2014	3.4	0.7	0.7	0.7	0.6	-1.4	2.8	-0.3	1.8	2.2	1.0	N/A	12.9	-1.4
Av Mx	2.4	1.4	2.6	-0.6	3.3	-0.0	4.6	6.7	2.6	3.2	3.6	3.9	35.6	-12.5

3. GOLD - Monthly Charts, Ten Years (2005-2014)

Table 3.1 : Gold Backtest Result

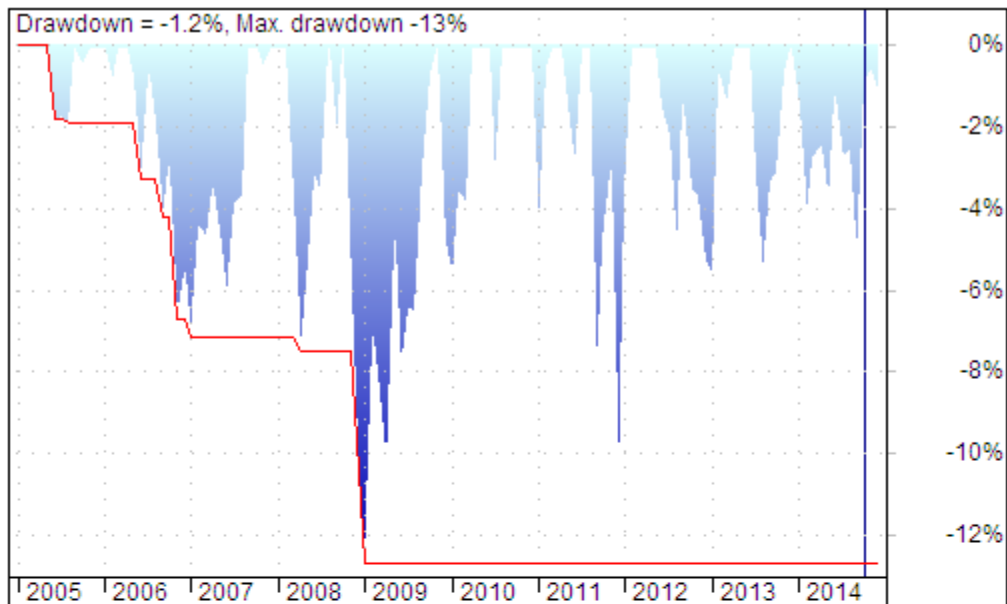
Statistics			
	All trades	Long trades	Short trades
Initial capital	100000.00	100000.00	100000.00
Ending capital	290140.00	232495.00	157645.00
Net Profit	190140.00	132495.00	57645.00
Net Profit %	190.14 %	132.49 %	57.65 %
Exposure %	10.19 %	8.40 %	1.80 %
Net Risk Adjusted Return %	1865.29 %	1577.65 %	3210.78 %
Annual Return %	11.34 %	8.88 %	4.70 %
Risk Adjusted Return %	111.26 %	105.76 %	261.66 %
All trades	11	5 (45.45 %)	6 (54.55 %)
Avg. Profit/Loss	17285.46	26499.00	9607.50
Avg. Profit/Loss %	19.43 %	36.26 %	5.41 %
Avg. Bars Held	11.55	16.80	7.17
Winners	8 (72.73 %)	4 (36.36 %)	4 (36.36 %)
Total Profit	196930.00	135235.00	61695.01
Avg. Profit	24616.25	33808.75	15423.75
Avg. Profit %	27.86 %	45.86 %	9.85 %
Avg. Bars Held	13.63	19.00	8.25
Max. Consecutive	6	4	4
Largest win	90225.00	90225.00	40265.00
# bars in largest win	37	37	14
Losers	3 (27.27 %)	1 (9.09 %)	2 (18.18 %)
Total Loss	-6790.00	-2740.00	-4050.00
Avg. Loss	-2263.33	-2740.00	-2025.00
Avg. Loss %	-3.04 %	-2.14 %	-3.49 %
Avg. Bars Held	6.00	8.00	5.00
Max. Consecutive	1	1	2
Largest loss	-3500.00	-2740.00	-3500.00
# bars in largest loss	5	8	5
Max. trade drawdown	-25800.00	-25800.00	-20490.00
Max. trade % drawdown	-18.20 %	-14.14 %	-18.20 %
Max. system drawdown	-25800.00	-25800.00	-20490.00
Max. system % drawdown	-12.72 %	-10.82 %	-17.66 %

Table 3.2 : Gold - Portfolio Equity



TRIPLE TREND OSCILLATOR – Technical Insights

Table 3.3 : Gold - Drawdown & Profit Table



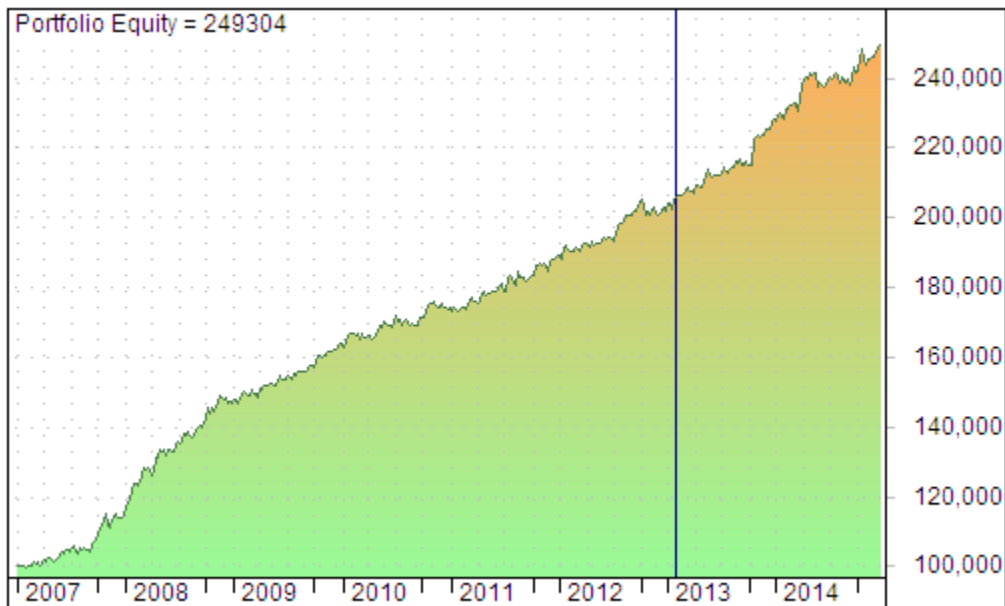
(in%)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	MDD
2005	N/A	N/A	N/A	1.6	-1.8	0.1	-0.2	3.0	-0.4	3.0	2.1	5.0	12.8	-1.9
2006	-0.8	2.0	6.0	-0.7	-2.6	2.7	-1.1	-2.5	1.4	-3.9	1.2	-1.7	-0.4	-7.2
2007	3.0	-0.3	1.2	-1.4	-1.3	2.4	0.2	5.8	3.7	-0.5	3.8	6.8	25.8	-2.7
2008	3.3	-3.6	-4.0	1.9	2.8	-0.4	6.6	-2.2	9.9	-5.8	-4.1	-3.3	-0.5	-12.7
2009	6.4	-1.4	-2.2	6.3	-3.4	1.7	-0.1	3.7	2.4	8.4	-4.8	-1.0	16.4	-5.7
2010	2.2	-0.2	3.9	2.2	1.4	-3.3	3.8	3.4	2.6	1.5	1.8	-4.5	15.4	-4.5
2011	4.2	1.0	6.6	-1.3	-1.7	6.2	9.0	-8.3	3.9	1.8	-8.1	8.2	21.5	-10.8
2012	6.4	1.2	0.2	4.2	-1.4	-0.7	-3.0	3.9	-2.1	-0.1	-1.6	-0.5	6.0	-5.6
2013	5.3	-0.7	4.7	3.4	5.6	-3.1	-2.6	2.4	0.2	2.6	1.6	-1.4	19.0	-5.5
2014	-2.8	1.6	0.2	-1.5	2.8	-1.5	0.2	-2.8	4.7	0.2	-0.6	N/A	0.2	-4.1
Av Mx	2.7	-0.1	1.7	1.5	0.0	0.4	1.3	0.6	2.6	0.7	-0.9	0.9	11.3	-12.7

4. Google - Weekly Charts, Eight Years (2007-2014)

Table 4.1 : Google Backtest Result

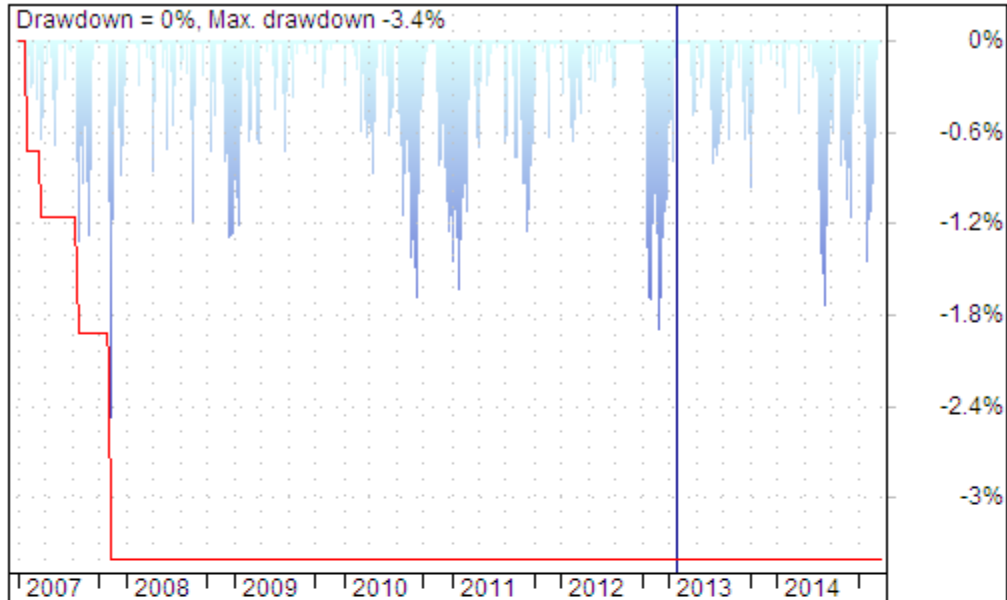
Statistics			
	All trades	Long trades	Short trades
Initial capital	100000.00	100000.00	100000.00
Ending capital	249303.61	188089.09	161214.53
Net Profit	149303.61	88089.09	61214.53
Net Profit %	149.30 %	88.09 %	61.21 %
Exposure %	2.34 %	1.36 %	0.98 %
Net Risk Adjusted Return %	6392.33 %	6493.99 %	6251.50 %
Annual Return %	12.15 %	8.25 %	6.18 %
Risk Adjusted Return %	520.15 %	608.36 %	630.87 %
All trades	42	21 (50.00 %)	21 (50.00 %)
Avg. Profit/Loss	3554.85	4194.72	2914.98
Avg. Profit/Loss %	11.70 %	15.06 %	8.35 %
Avg. Bars Held	10.88	12.05	9.71
Winners	37 (88.10 %)	18 (42.86 %)	19 (45.24 %)
Total Profit	152114.72	89434.79	62679.92
Avg. Profit	4111.21	4968.60	3298.94
Avg. Profit %	13.56 %	17.84 %	9.51 %
Avg. Bars Held	11.70	13.33	10.16
Max. Consecutive	15	8	11
Largest win	17508.33	17508.33	13840.46
# bars in largest win	23	23	27
Losers	5 (11.90 %)	3 (7.14 %)	2 (4.76 %)
Total Loss	-2811.12	-1345.70	-1465.42
Avg. Loss	-562.22	-448.57	-732.71
Avg. Loss %	-2.05 %	-1.62 %	-2.68 %
Avg. Bars Held	4.80	4.33	5.50
Max. Consecutive	2	1	2
Largest loss	-947.65	-550.10	-947.65
# bars in largest loss	7	5	7
Max. trade drawdown	-4490.00	-4337.18	-4490.00
Max. trade % drawdown	-11.18 %	-11.18 %	-10.50 %
Max. system drawdown	-4615.02	-4337.19	-5501.00
Max. system % drawdown	-3.41 %	-3.47 %	-3.50 %

Table 4.2 : Google Portfolio Equity



TRIPLE TREND OSCILLATOR – Technical Insights

Table 4.3 : Google Drawdown & Profit Table



(in%)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	MDD
2007	-0.3	1.8	0.3	-0.0	1.5	1.9	-0.1	-0.8	4.4	5.4	0.2	1.5	16.8	-3.4
2008	6.1	3.4	-1.5	5.7	-0.5	2.1	2.6	0.9	2.1	2.0	1.6	-0.2	26.7	-1.8
2009	1.7	0.1	0.2	0.8	1.7	0.1	0.6	0.1	0.8	2.1	1.1	0.5	10.2	-1.3
2010	2.3	-1.0	0.6	1.8	-0.2	1.9	-0.6	-1.0	1.2	2.9	-0.5	-1.3	6.2	-1.8
2011	0.3	0.8	0.3	1.6	0.3	0.1	1.4	0.7	0.3	1.8	0.7	0.8	9.4	-1.5
2012	1.0	0.2	0.3	0.5	0.7	-0.4	2.7	1.6	1.5	-2.0	0.1	1.4	7.8	-2.3
2013	0.9	0.8	1.0	0.5	0.8	0.3	0.3	0.8	-0.2	4.0	1.0	0.8	11.5	-1.0
2014	1.6	0.8	2.8	0.5	-1.2	1.1	-0.8	-0.2	1.7	1.4	1.0	0.5	9.6	-1.9
Av Mx	1.7	0.8	0.5	1.4	0.4	0.9	0.8	0.3	1.5	2.2	0.6	0.5	12.1	-3.4

5. CNX Nifty - Weekly Charts, Eight Years (2007-2014)

Table 5.1 : CNX Nifty Backtest Result

Statistics			
	All trades	Long trades	Short trades
Initial capital	100000.00	100000.00	100000.00
Ending capital	1893824.88	1217644.88	776180.00
Net Profit	1793824.88	1117644.88	676180.00
Net Profit %	1793.82 %	1117.64 %	676.18 %
Exposure %	6.01 %	3.89 %	2.12 %
Net Risk Adjusted Return %	29830.23 %	28710.01 %	31886.58 %
Annual Return %	44.51 %	36.73 %	29.24 %
Risk Adjusted Return %	740.11 %	943.62 %	1378.88 %
All trades	50	25 (50.00 %)	25 (50.00 %)
Avg. Profit/Loss	35876.50	44705.80	27047.20
Avg. Profit/Loss %	7.59 %	10.01 %	5.16 %
Avg. Bars Held	9.34	11.04	7.64
Winners	41 (82.00 %)	21 (42.00 %)	20 (40.00 %)
Total Profit	1825175.00	1134350.00	690825.00
Avg. Profit	44516.46	54016.67	34541.25
Avg. Profit %	9.39 %	12.05 %	6.59 %
Avg. Bars Held	10.22	12.29	8.05
Max. Consecutive	11	11	6
Largest win	180750.00	180750.00	155245.02
# bars in largest win	19	19	14
Losers	9 (18.00 %)	4 (8.00 %)	5 (10.00 %)
Total Loss	-31349.97	-16705.03	-14644.95
Avg. Loss	-3483.33	-4176.26	-2928.99
Avg. Loss %	-0.63 %	-0.72 %	-0.56 %
Avg. Bars Held	5.33	4.50	6.00
Max. Consecutive	2	2	1
Largest loss	-7500.00	-7500.00	-6160.01
# bars in largest loss	3	3	5
Max. trade drawdown	-56465.00	-48690.03	-56465.00
Max. trade % drawdown	-12.96 %	-12.96 %	-11.39 %
Max. system drawdown	-66325.00	-48690.00	-56465.03
Max. system % drawdown	-16.14 %	-9.43 %	-23.91 %

Table 5.2 : CNX Nifty- Portfolio Equity

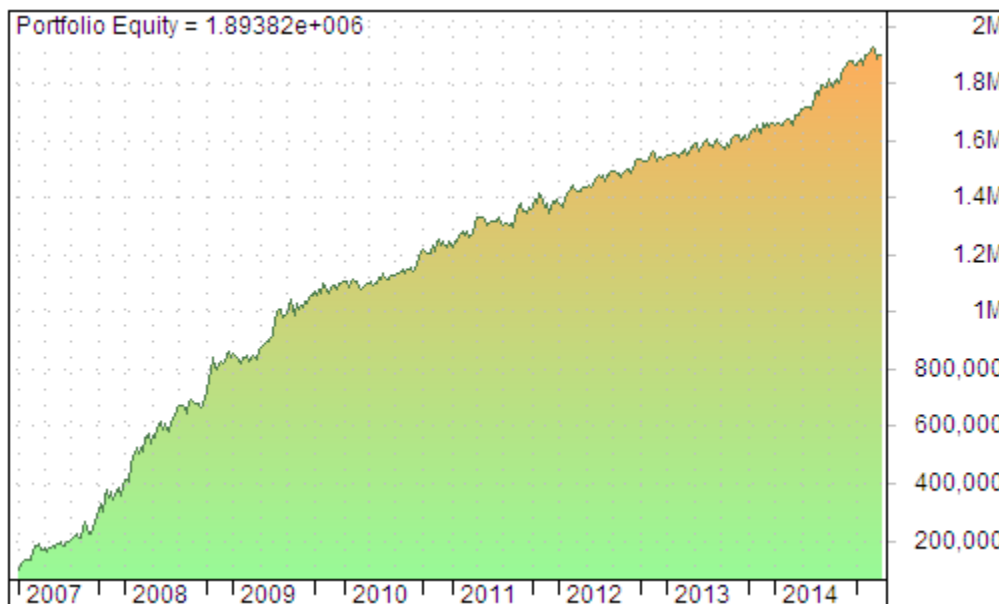
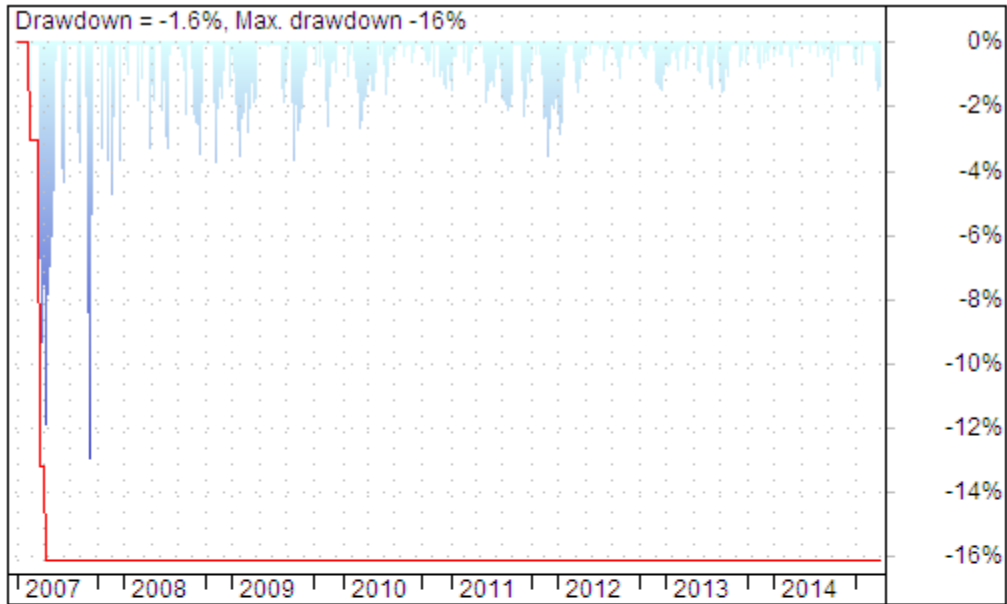


Table 5.3 : CNX Nifty - Drawdown & Profit Table



(in%)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	MDD
2007	35.0	33.0	-1.4	1.6	10.0	4.4	0.8	7.2	35.4	24.7	1.1	7.9	310.9	-16.1
2008	22.6	10.8	2.2	8.0	-0.6	10.0	1.7	-0.9	5.2	11.8	3.2	4.0	108.8	-6.4
2009	-2.4	1.6	2.5	4.7	10.6	-1.6	1.8	2.0	3.9	1.8	0.2	1.2	28.9	-5.4
2010	1.0	-3.3	1.8	2.3	-1.0	1.2	1.8	0.4	5.8	1.4	-0.1	-0.5	10.7	-3.3
2011	4.2	-1.1	5.3	-2.1	1.1	-0.8	2.3	1.3	1.1	3.0	-4.2	2.2	12.5	-4.7
2012	3.1	0.2	0.6	1.6	1.7	0.9	-0.7	0.9	2.7	-0.3	0.6	0.7	12.6	-2.0
2013	-0.1	1.4	1.1	-0.5	-0.4	0.7	0.9	-0.0	0.7	2.5	0.5	-0.3	6.5	-2.1
2014	1.2	1.0	1.0	0.0	5.2	0.9	-0.8	4.4	-0.8	2.0	1.1	-1.4	14.5	-1.9
Av Mx	8.1	5.4	1.6	2.0	3.3	2.0	1.0	1.9	6.8	5.8	0.3	1.7	44.4	-16.1

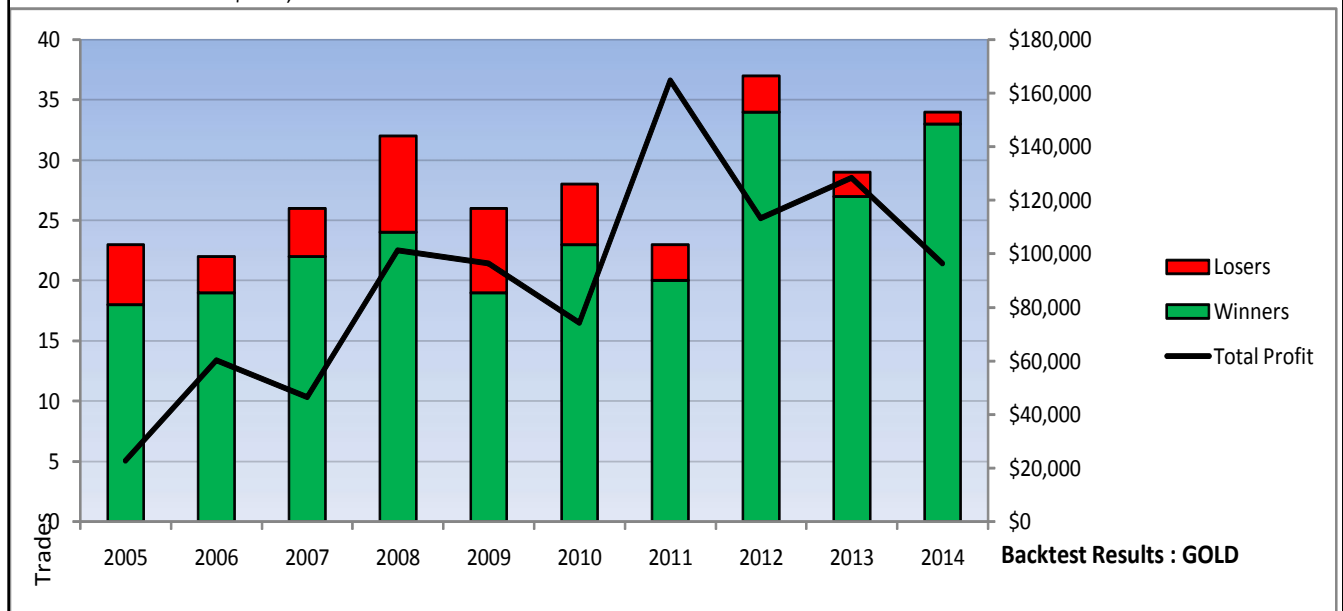
6. Gold - Daily Charts, Ten Years (2005-2014)

An analysis of long and short gold trade during the 10 year period 2005-2014 :

Table 6 : Gold Backtest Result

Year	Total Trades	Winners	Losers	Winners %	Losers %	Total Profit*	Profit %	Max System Drawdown	Drawdown %
2005	23	18	5	78.26	21.74	\$22,810	15.21	-\$1,480	-0.86
2006	22	19	3	86.36	13.64	\$60,240	40.16	-\$4,050	-2.37
2007	26	22	4	84.62	15.38	\$46,550	31.03	-\$4,090	-2.12
2008	32	24	8	75.00	25.00	\$101,280	67.35	-\$9,020	-4.44
2009	26	19	7	73.08	26.92	\$96,290	64.19	-\$3,920	-2.09
2010	28	23	5	82.14	17.86	\$74,170	49.45	\$7,210	-4.63
2011	23	20	3	86.96	13.04	\$164,645	109.76	-\$8,410	-3.57
2012	37	34	3	91.89	8.11	\$113,290	75.53	-\$7,269	-3.56
2013	29	27	2	93.10	6.90	\$128,265	85.51	-\$8,570	-3.76
2014	34	33	1	97.06	2.94	\$96,470	64.31	-\$4,570	-1.89

*On an investment of \$ 150,000



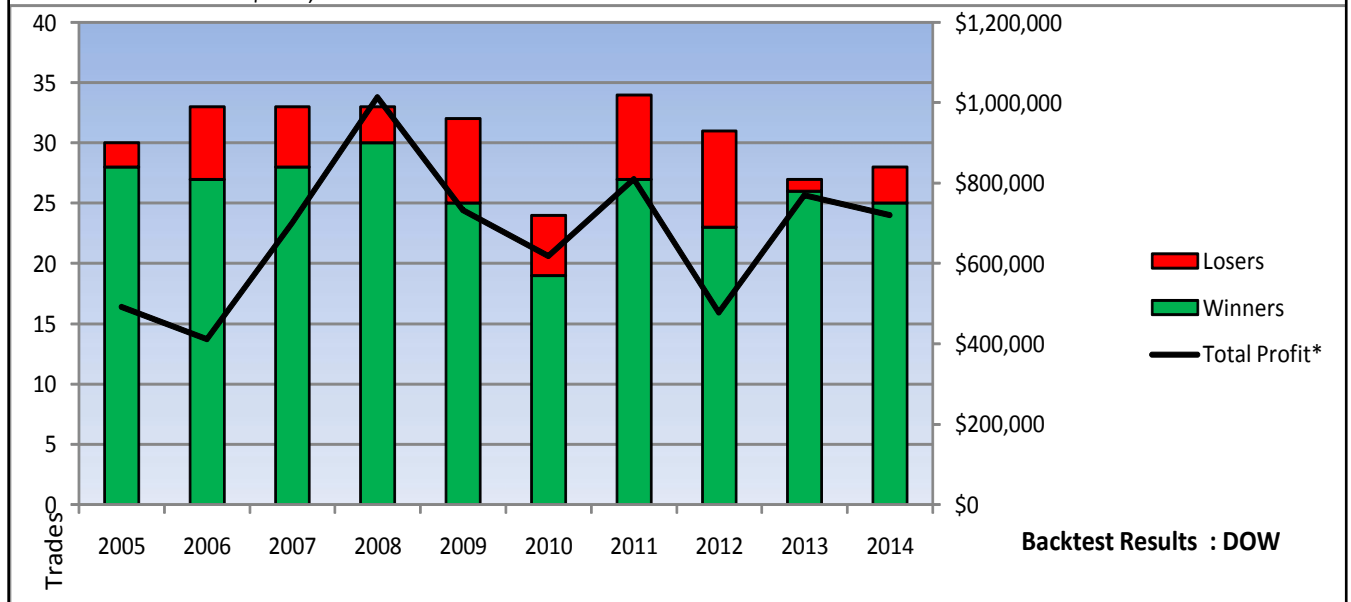
7. Dow - Daily Charts, Ten Years (2005-2014)

An analysis of long and short trade in DJIA during the 10 year period 2005-2014 :

Table 7 : Dow Backtest Result

Year	Total Trades	Winners	Losers	Winners %	Losers %	Total Profit*	Profit %	Max System Drawdown	Drawdown %
2005	30	28	2	93.33	6.67	\$493,489	328.99	-\$23,419	-11.04
2006	33	27	6	81.82	18.18	\$412,610	275.07	-\$33,740	-10.81
2007	33	28	5	84.85	15.15	\$703,289	468.86	-\$52,070	-12.07
2008	33	30	3	91.91	9.09	\$1,014,481	676.32	-\$93,642	-22.43
2009	32	25	7	78.13	21.88	\$734,068	489.38	-\$61,713	-26.59
2010	24	19	5	79.17	0.83	\$619,952	413.3	-\$54,280	-18.32
2011	34	27	7	79.41	20.59	\$810,126	540.08	-\$83,954	-15.7
2012	31	23	8	74.19	25.81	\$479,079	331.39	-\$38,136	-11.78
2013	27	26	1	96.30	3.70	\$769,941	513.29	-\$36,493	-10.43
2014	28	25	3	89.29	10.71	\$720,762	480.51	-\$70,928	-12.62

*On an investment of \$ 150,000

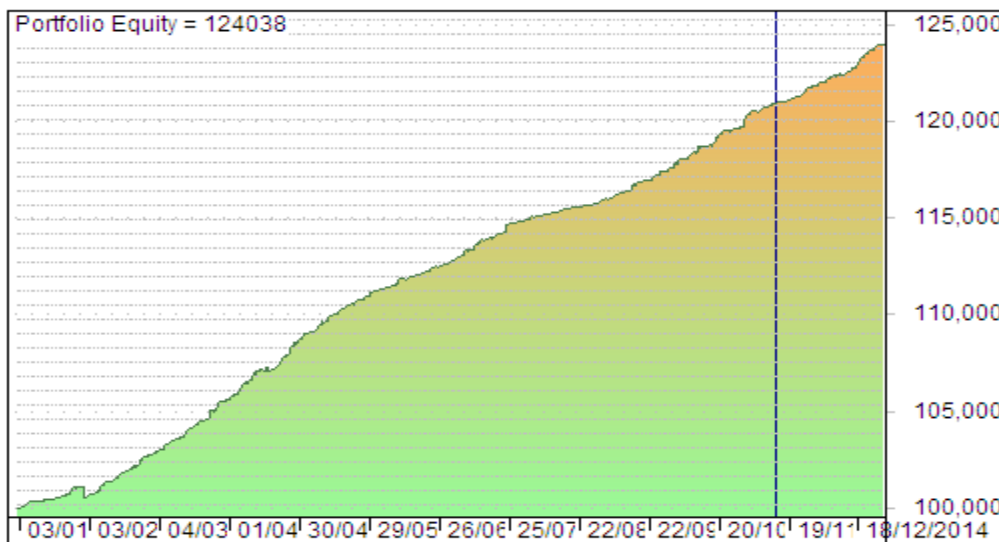


8. Facebook - Hourly Charts, One Year (2014)

Table 8.1 : Facebook Backtest Result

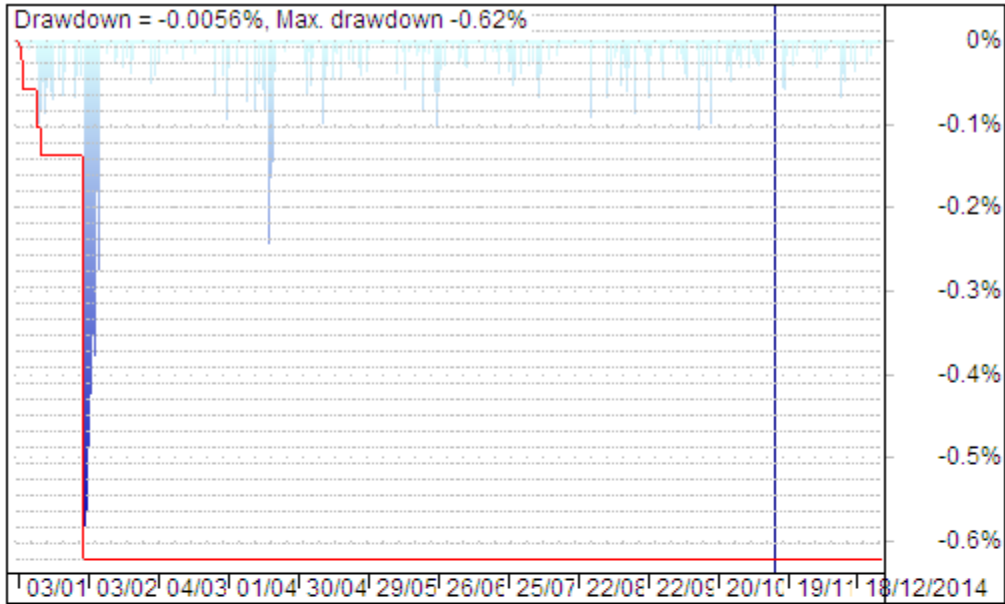
Statistics			
	All trades	Long trades	Short trades
Initial capital	100000.00	100000.00	100000.00
Ending capital	124037.79	113243.89	110793.90
Net Profit	24037.79	13243.89	10793.90
Net Profit %	24.04 %	13.24 %	10.79 %
Exposure %	0.12 %	0.06 %	0.06 %
Net Risk Adjusted Return %	19895.77 %	20571.77 %	19124.68 %
Annual Return %	24.26 %	13.36 %	10.89 %
Risk Adjusted Return %	20079.21 %	20753.15 %	19291.50 %
All trades	207	103 (49.76 %)	104 (50.24 %)
Avg. Profit/Loss	116.12	128.58	103.79
Avg. Profit/Loss %	1.71 %	1.94 %	1.48 %
Avg. Bars Held	9.36	9.67	9.06
Winners	184 (88.89 %)	94 (45.41 %)	90 (43.48 %)
Total Profit	25202.83	13423.94	11778.88
Avg. Profit	136.97	142.81	130.88
Avg. Profit %	2.03 %	2.16 %	1.90 %
Avg. Bars Held	9.89	10.13	9.63
Max. Consecutive	36	23	31
Largest win	710.00	710.00	664.00
# bars in largest win	25	25	18
Losers	23 (11.11 %)	9 (4.35 %)	14 (6.76 %)
Total Loss	-1165.05	-180.05	-985.00
Avg. Loss	-50.65	-20.01	-70.36
Avg. Loss %	-0.84 %	-0.30 %	-1.18 %
Avg. Bars Held	5.17	4.89	5.36
Max. Consecutive	2	2	2
Largest loss	-605.00	-39.00	-605.00
# bars in largest loss	7	5	7
Max. trade drawdown	-693.00	-161.10	-693.00
Max. trade % drawdown	-12.53 %	-2.58 %	-12.53 %
Max. system drawdown	-631.00	-174.00	-729.60
Max. system % drawdown	-0.62 %	-0.17 %	-0.72 %

Table 8.2: Facebook Portfolio Equity



TRIPLE TREND OSCILLATOR – Technical Insights

Table 8.3 : Facebook - Drawdown & Profit Table



(in%)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	MDD
2014	0.7	2.3	2.7	3.2	2.1	1.3	1.9	0.9	1.6	2.4	1.1	1.8	24.0	-0.6
Av Mx	0.7	2.3	2.7	3.2	2.1	1.3	1.9	0.9	1.6	2.4	1.1	1.8	24.0	-0.6

9. IBM - Hourly Charts, One Year (2014)

Table 9.1 : IBM Backtest Result

Statistics			
	All trades	Long trades	Short trades
Initial capital	100000.00	100000.00	100000.00
Ending capital	128433.40	112992.33	115441.07
Net Profit	28433.40	12992.33	15441.07
Net Profit %	28.43 %	12.99 %	15.44 %
Exposure %	0.14 %	0.06 %	0.08 %
Net Risk Adjusted Return %	20008.11 %	20417.30 %	19674.81 %
Annual Return %	28.70 %	13.11 %	15.58 %
Risk Adjusted Return %	20195.72 %	20597.13 %	19849.94 %
All trades	207	103 (49.76 %)	104 (50.24 %)
Avg. Profit/Loss	137.36	126.14	148.47
Avg. Profit/Loss %	0.76 %	0.70 %	0.81 %
Avg. Bars Held	9.15	8.88	9.42
Winners	172 (83.09 %)	81 (39.13 %)	91 (43.96 %)
Total Profit	30442.88	14556.71	15886.17
Avg. Profit	176.99	179.71	174.57
Avg. Profit %	0.97 %	1.00 %	0.95 %
Avg. Bars Held	9.93	9.85	10.00
Max. Consecutive	17	16	27
Largest win	829.00	722.99	829.00
# bars in largest win	18	17	18
Losers	35 (16.91 %)	22 (10.63 %)	13 (6.28 %)
Total Loss	-2009.51	-1564.40	-445.11
Avg. Loss	-57.41	-71.11	-34.24
Avg. Loss %	-0.32 %	-0.39 %	-0.19 %
Avg. Bars Held	5.34	5.32	5.38
Max. Consecutive	3	3	2
Largest loss	-1008.00	-1008.00	-97.00
# bars in largest loss	8	8	3
Max. trade drawdown	-1246.99	-1246.99	-269.00
Max. trade % drawdown	-6.83 %	-6.83 %	-1.41 %
Max. system drawdown	-1206.98	-1304.48	-294.60
Max. system % drawdown	-0.98 %	-1.17 %	-0.28 %

Table 10 : IBM- Portfolio Equity

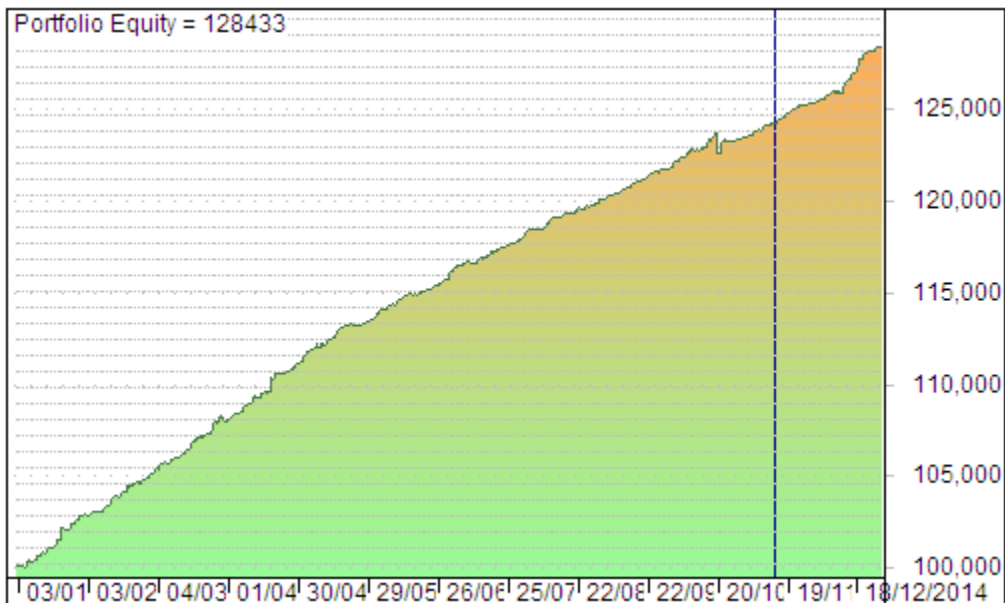
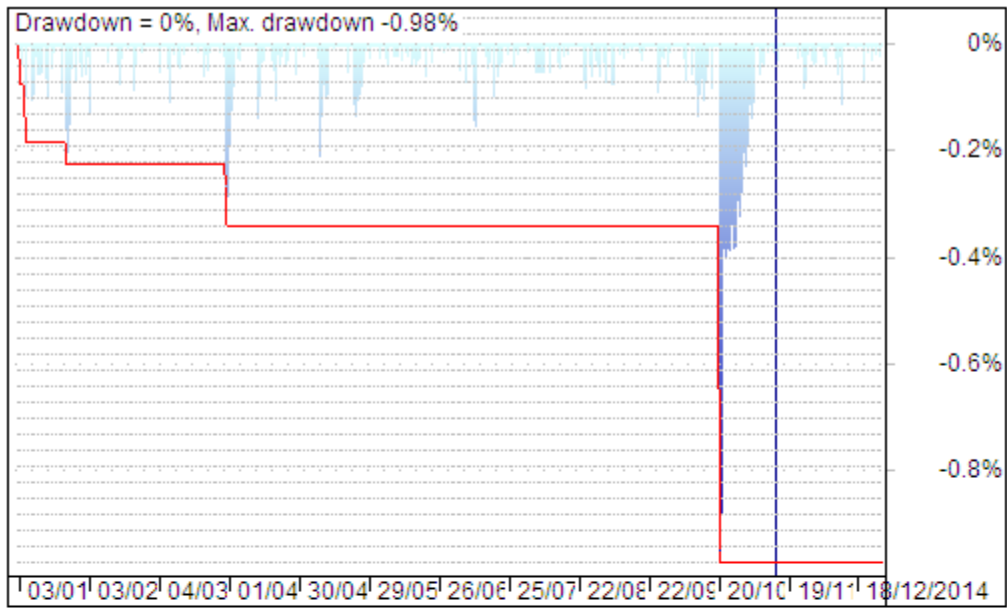


Table 9.3 : IBM - Drawdown & Profit Table



(in%)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	MDD
2014	2.8	2.4	2.7	3.1	2.1	1.9	2.0	1.5	1.6	1.4	1.3	2.4	28.2	-1.0
Av Mx	2.8	2.4	2.7	3.1	2.1	1.9	2.0	1.5	1.6	1.4	1.3	2.4	28.2	-1.0

10. CNX Nifty - Hourly Charts, One Year (2014)

Table 11.1 : CNX Nifty Backtest Result

Statistics			
	All trades	Long trades	Short trades
Initial capital	100000.00	100000.00	100000.00
Ending capital	1050874.75	672799.88	478074.94
Net Profit	950874.75	572799.88	378074.94
Net Profit %	950.87 %	572.80 %	378.07 %
Exposure %	1.55 %	0.92 %	0.63 %
Net Risk Adjusted Return %	61246.62 %	62119.75 %	59969.60 %
Annual Return %	964.58 %	579.90 %	382.21 %
Risk Adjusted Return %	62129.55 %	62890.13 %	60626.12 %
All trades	182	91 (50.00 %)	91 (50.00 %)
Avg. Profit/Loss	5224.58	6294.50	4154.67
Avg. Profit/Loss %	0.71 %	0.87 %	0.55 %
Avg. Bars Held	10.17	10.95	9.40
Winners	148 (81.32 %)	78 (42.86 %)	70 (38.46 %)
Total Profit	1017814.75	597099.75	420715.00
Avg. Profit	6877.13	7655.13	6010.21
Avg. Profit %	0.94 %	1.05 %	0.81 %
Avg. Bars Held	11.38	11.87	10.83
Max. Consecutive	19	21	11
Largest win	45260.01	45260.01	24654.98
# bars in largest win	22	22	17
Losers	34 (18.68 %)	13 (7.14 %)	21 (11.54 %)
Total Loss	-66940.39	-24300.05	-42640.33
Avg. Loss	-1968.83	-1869.23	-2030.49
Avg. Loss %	-0.28 %	-0.25 %	-0.29 %
Avg. Bars Held	4.91	5.38	4.62
Max. Consecutive	3	2	5
Largest loss	-5955.03	-3469.97	-5955.03
# bars in largest loss	2	5	2
Max. trade drawdown	-17015.00	-17015.00	-10525.00
Max. trade % drawdown	-2.26 %	-2.26 %	-1.25 %
Max. system drawdown	-17015.00	-17015.00	-13615.00
Max. system % drawdown	-9.44 %	-5.48 %	-8.57 %

Table 12: CNX Nifty - Portfolio Equity

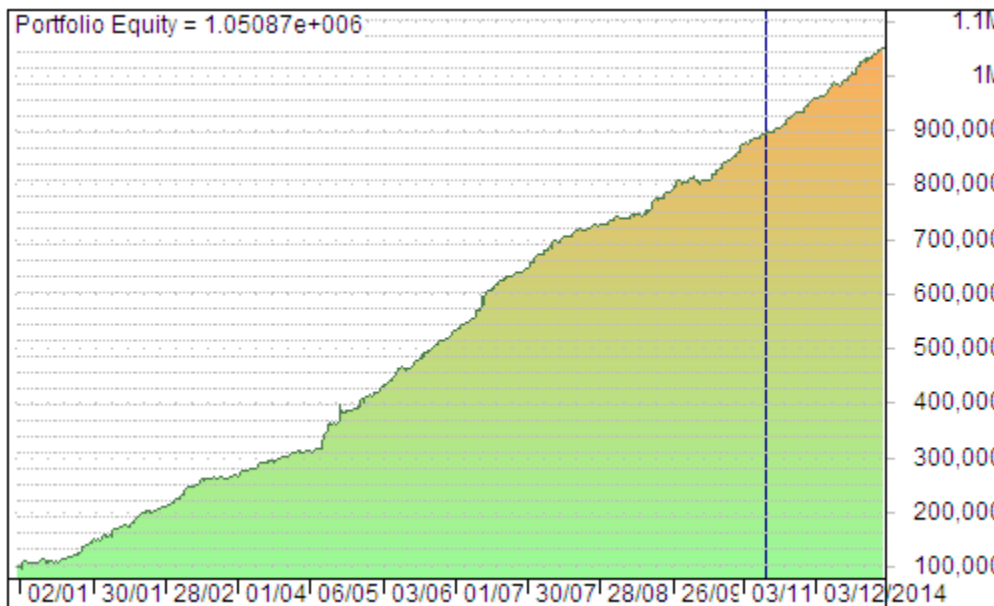
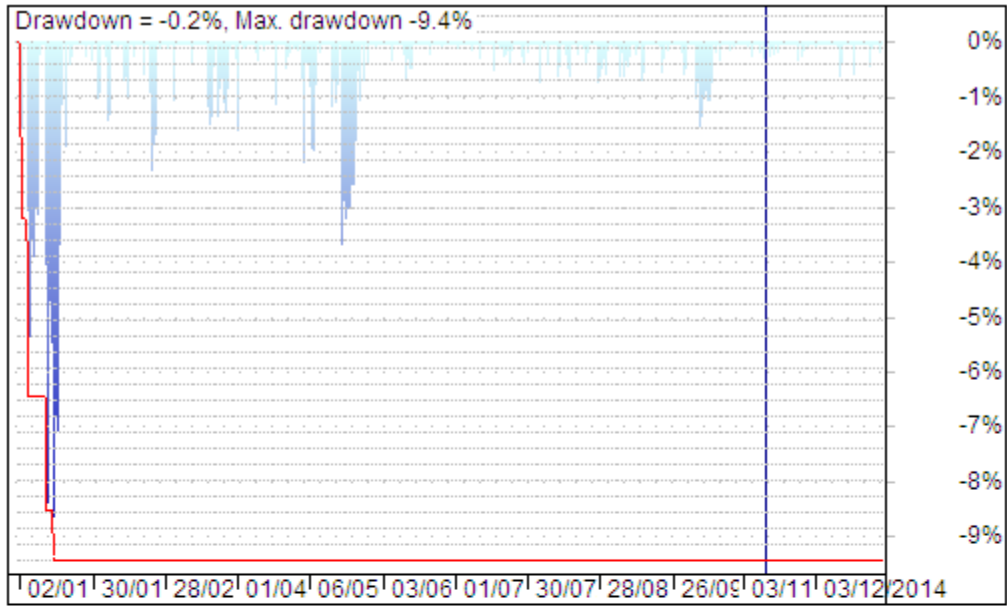


Table 13: CNX Nifty - Drawdown & Profit Table



(in%)	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Year	MDD
2014	49.6	43.6	25.4	14.5	37.0	26.9	24.8	8.5	10.7	9.1	8.0	10.9	950.9	-9.4
Av Mx	49.6	43.6	25.4	14.5	37.0	26.9	24.8	8.5	10.7	9.1	8.0	10.9	950.9	-9.4

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