

Multicollinearity of Technical Indicators

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- ***All my best thoughts were stolen by the ancients.***
— **Ralph Waldo Emerson**
- ***Originality is nothing but judicious imitation. The most original writers borrowed one from another.***
— **Voltaire**

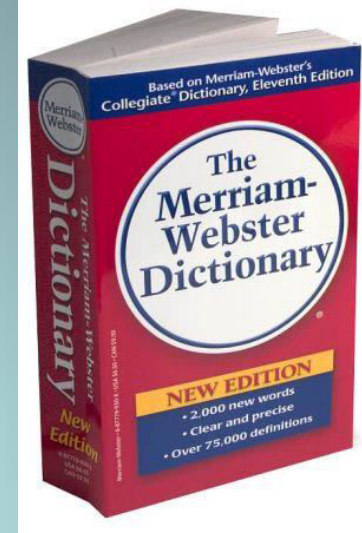
- *Pure price systems are close enough to the North Pole that any departure tends to bring you farther south.*

- William Eckhardt

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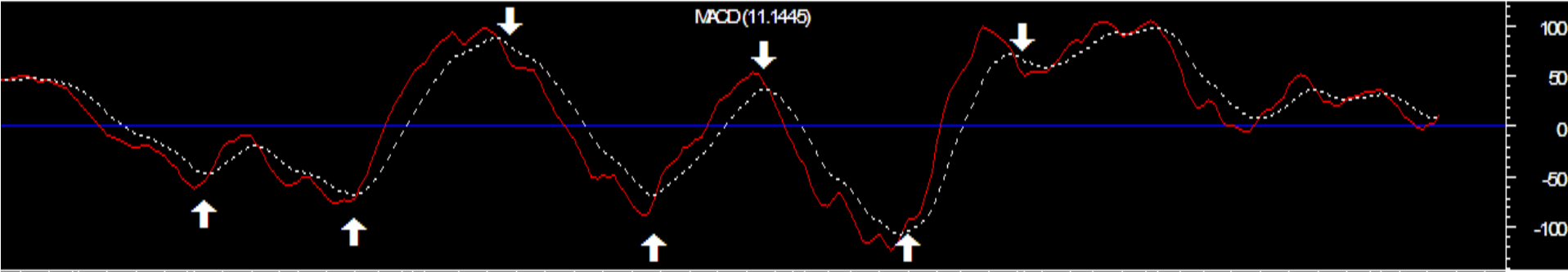
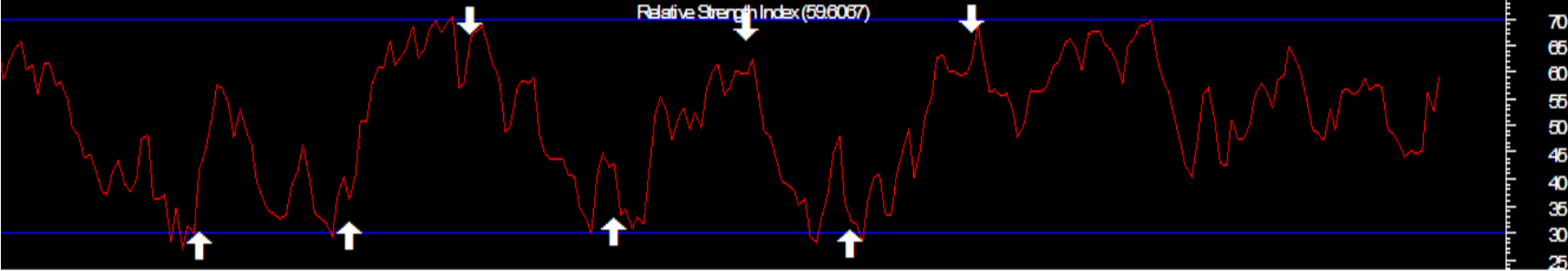


The existence of such a high degree of correlation between supposedly independent variables being used to estimate a dependent variable that the contribution of each independent variable to variation in the dependent variable cannot be determined.

John Bollinger

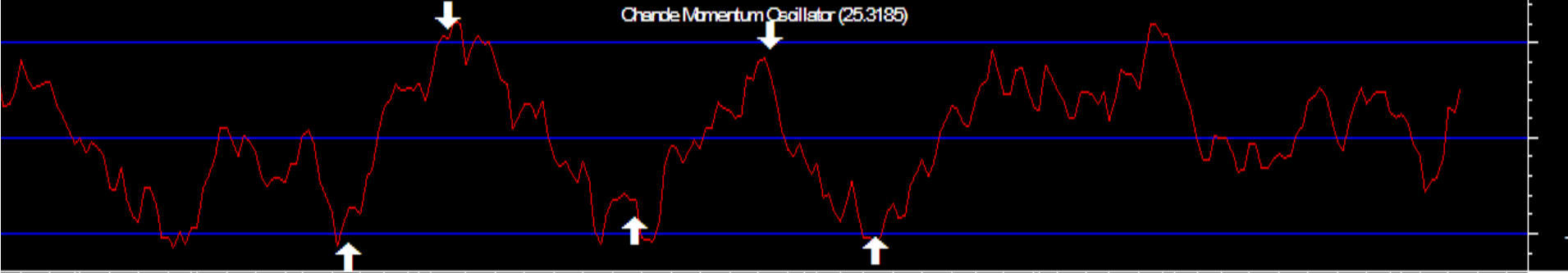
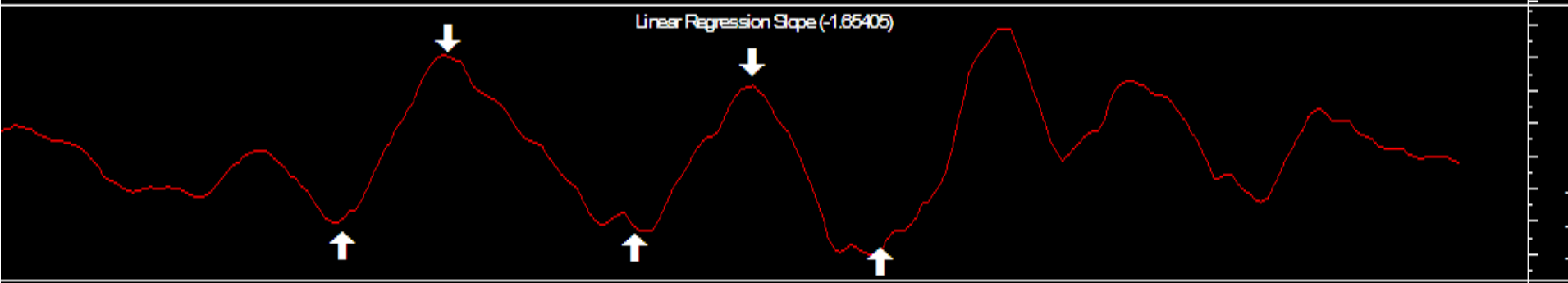
"A cardinal rule for the successful use of technical analysis requires avoiding multicollinearity amid indicators. Multicollinearity is simply the multiple counting of the same information. The use of four different indicators all derived from the same series of closing prices to confirm each other is a perfect example."

* SBPCNK\NFTY(6,285.95, 6,325.20, 6,285.30, 6,320.90, +79.0488), DT TmDline Dn (longer term) <manual>, DT TmDline Dn (shorter term) <manual>



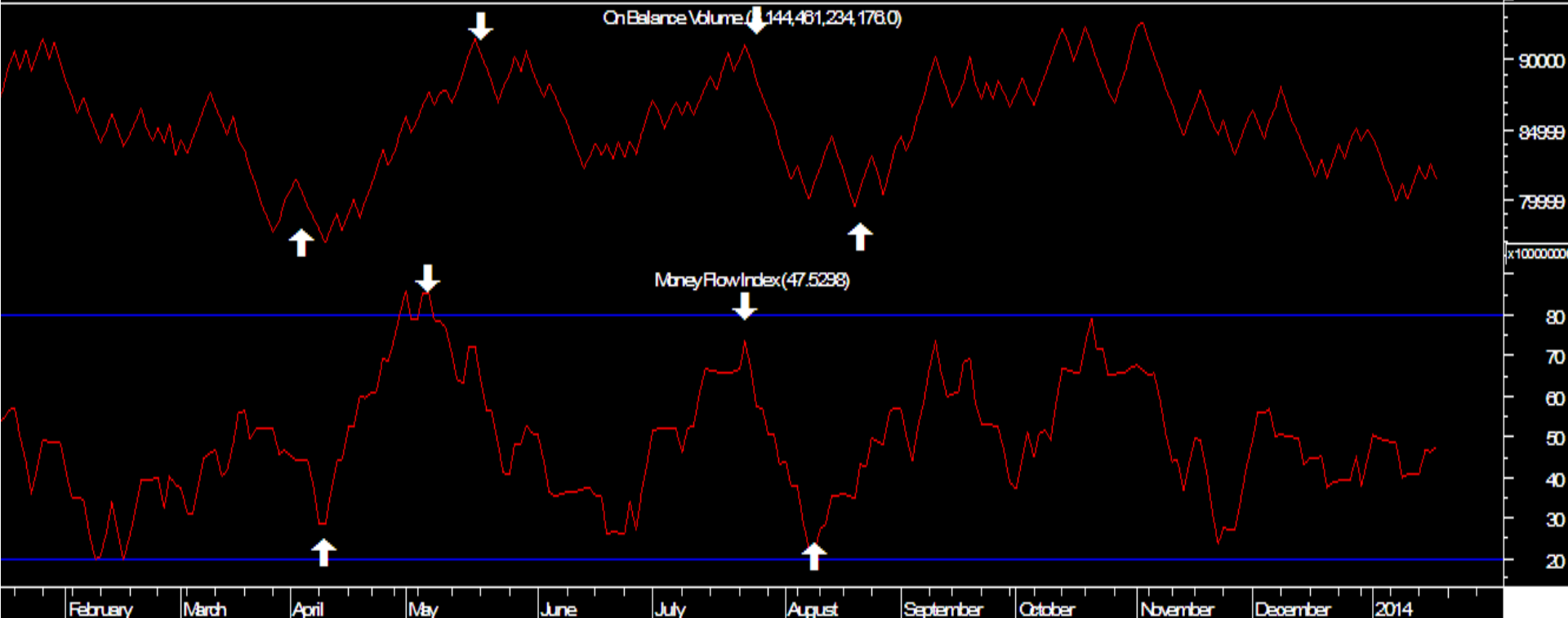
February March April May June July August September October November December 2014

* S&P CN/NIFTY (6,285.95, 6,325.20, 6,285.30, 6,320.90, +79.0488)



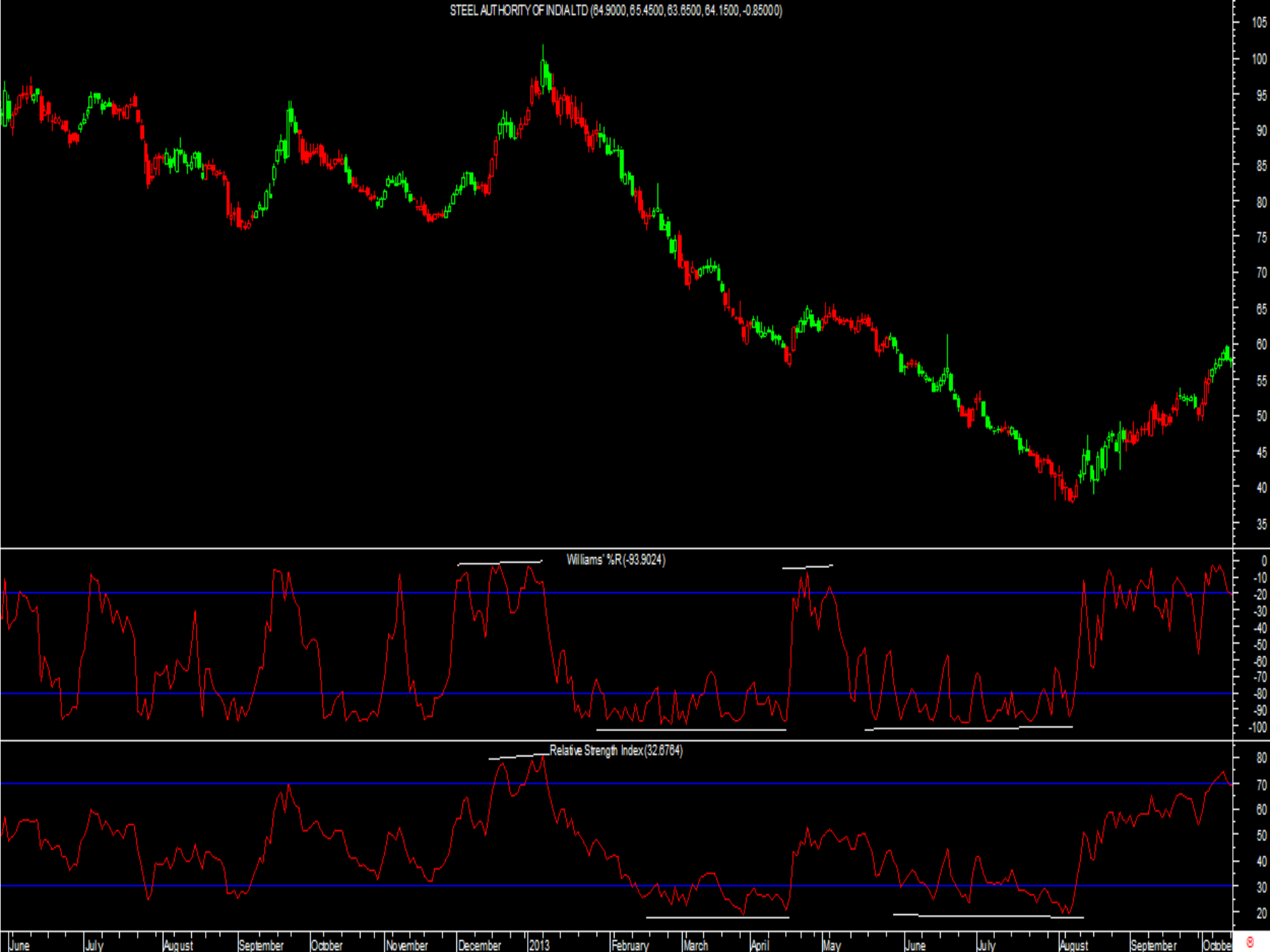
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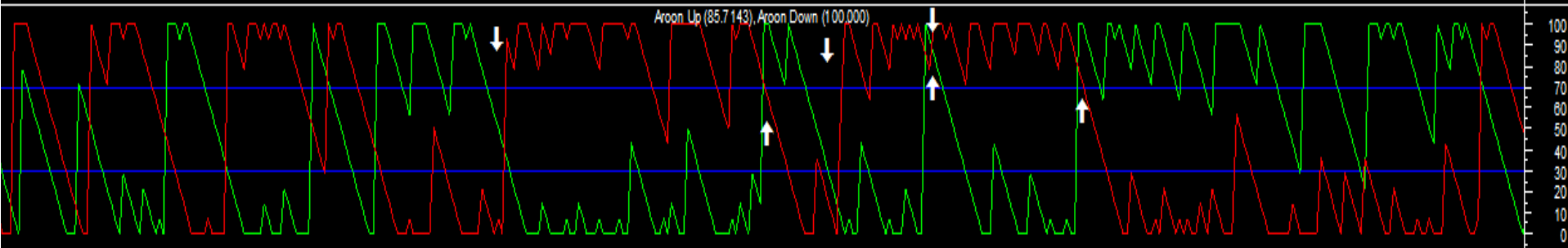
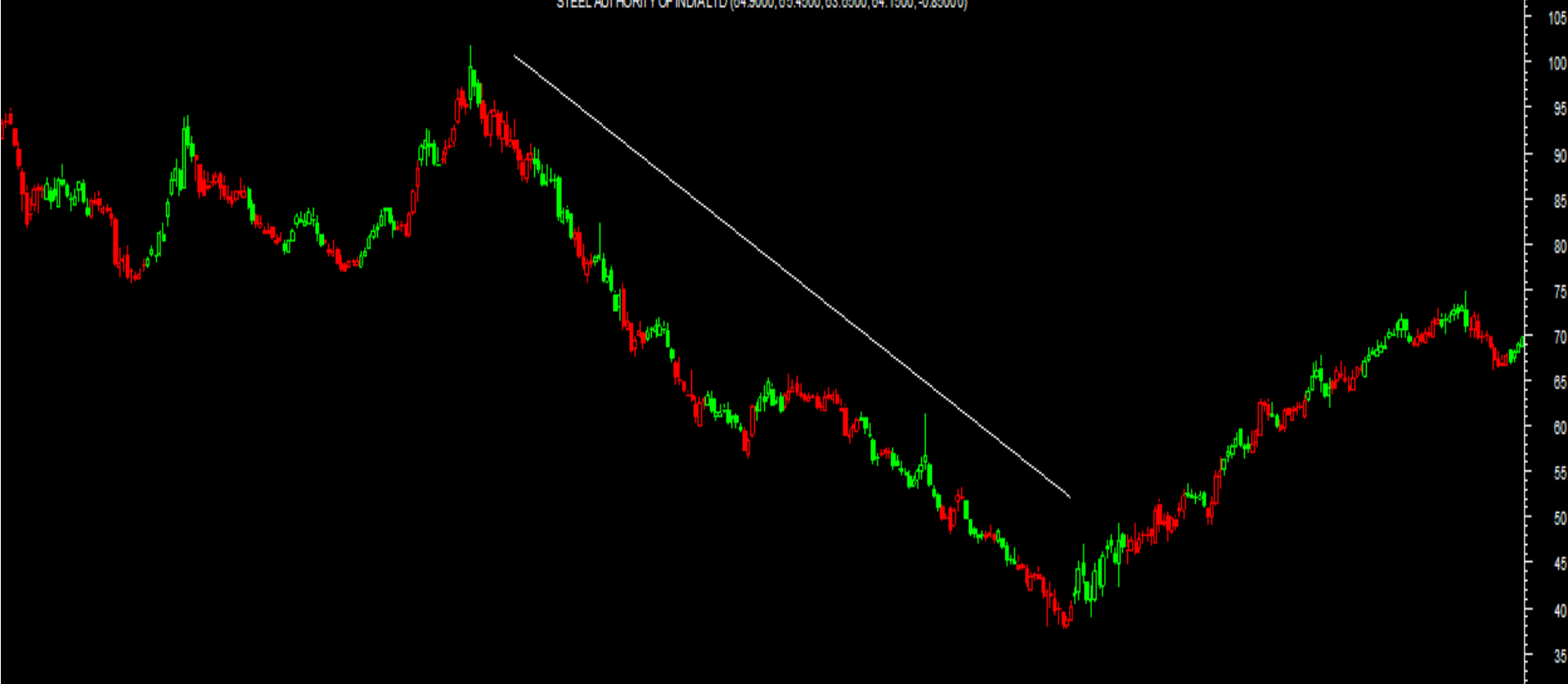
* SBPCNKNTFY(6,341.35, 6,346.50, 6,299.85, 6,318.90, -2.00000)



Problems with multicollinearity

- In some sense, the collinear variables contain the same information about the dependent variable. If nominally "different" measures actually quantify the same phenomenon then they are **redundant**.
- A principal danger of such data redundancy is that of **over-fitting** in regression analysis models.





What indicators to choose?

1000+ collection of Technical indicators for trading needs to be simplified and made clear.

Types of indicators (Source: Metastock)

- **Trend indicators**
- **Volatility indicators**
- **Momentum indicators**
- **Cycle indicators**
- **Market strength indicators**
- **Support and resistance indicators**

(Few indicators may fall in more than one category.)

Trend Indicators (Source: Metastock)

Indicator	Creator
Aroon	Chande
Commodity Selection Index	Wilder
DEMA	Mulloy
Directional Movement	Wilder
Forecast Oscillator	Chande
Linear Regression Indicator	
Linear Regression Slope	
Linear Regression Trendline	
MACD	Appel
Moving Averages (all calculation methods)	
Parabolic SAR	Wilder
Performance	
Polarized Fractal Efficiency	Hannula

Indicator	Creator
Price Oscillator	
Qstick Indicator	Chande
r-squared	
Raff Regression Channel	Raff
Standard Deviation Channel	Equis
Standard Error	
Standard Error Bands	Equis (Andersen)
Standard Error Channel	Equis
TEMA	Mulloy
Time Series Forecast	
Trendlines	
Vertical Horizontal Filter	White
Zig Zag	Merril

Volatility Indicators (Source: Metastock)

Indicator	Creator	Reference
Average True Range	Wilder	Average True Range
Bollinger Bands	Bollinger	Bollinger Bands
Commodity Selection Index	Wilder	Commodity Selection Index
Moving Average (variable)	Chande	Variable
ODDS™ Probability Cones	Fishback	ODDS Probability Cones
Relative Volatility Index	Dorsey	Relative Volatility Index
Standard Deviation		Standard Deviation
Standard Error Bands	Equis (Andersen)	Standard Error Bands
Volatility, Chaikin's	Chaikin	Volatility, Chaikin's
Volatility, Option	Bookstaber	Option Volatility

Momentum Indicators (Source: Metastock)

Indicator	Creator	Reference
Accumulation Swing Index	Wilder	Accumulation Swing Index
Chande Momentum Oscillator	Chande	Chande Momentum Oscillator
Commodity Channel Index	Lambert	Commodity Channel Index
Dynamic Momentum Index	Chande	Dynamic Momentum Index
Intraday Momentum Index	Chande	Intraday Momentum Index
Linear Regression Slope		Linear Regression Slope
MACD	Appel	MACD
Mass Index	Dorsey	Mass Index
Momentum Indicator		Momentum
Price Oscillator		Price Oscillator
Price Rate-Of-Change	Appel	Price Rate-Of-Change

Indicator	Creator	Reference
Random Walk Index	Poulus	Random Walk Index
Range Indicator	Weinberg	Range Indicator
Relative Momentum Index	Altman	Relative Momentum Index
Relative Strength Index	Wilder	Relative Strength Index
Stochastic Momentum Index	Blau	Stochastic Momentum Index
Stochastic Oscillator	Lane	Stochastic Oscillator
Swing Index	Wilder	Swing Index
TRIX	unknown	TRIX
Ultimate Oscillator	Williams	Ultimate Oscillator
Williams' %R	Williams	Williams' %R
Williams' Accumulation/Distribution	Williams	Williams' Accumulation/Distribution

Cycle Indicators (Source: Metastock)

Indicator	Creator	Reference
Cycle Lines		Cycle Lines
Detrended Price Oscillator		Detrended Price Oscillator
Fibonacci Time Zones		Time Zones
Fourier Transform		Fourier Transform
MESA Sine Wave Indicator	Ehlers	MESA Sine Wave

Market Strength Indicators (Source: Metastock)

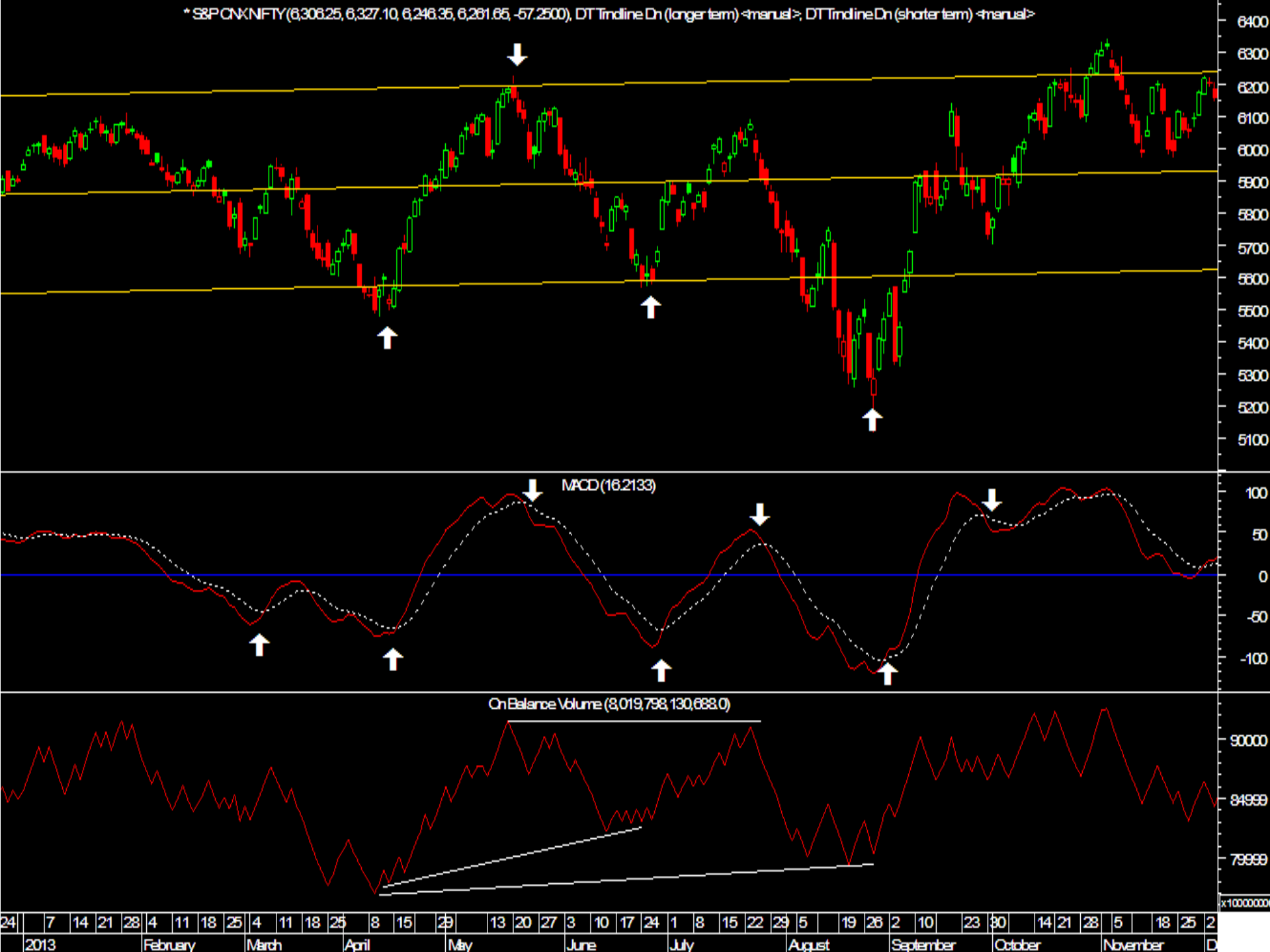
Indicator	Creator	Reference
Accumulation/ Distribution	Williams	Accumulation/ Distribution
Demand Index	Sibbet	Demand Index
Chaikin Money Flow	Chaikin	Chaikin Money Flow
Chaikin Oscillator	Chaikin	Chaikin A/D Oscillator
Ease of Movement	Arms	Ease of Movement
Herrick Payoff Index	Herrick	Herrick Payoff Index
Klinger Oscillator	Klinger	Klinger Oscillator
Money Flow Index	Quong/Soud ack	Money Flow Index
Moving Average (volume adjusted)	Arms	Moving Average Calculation Methods

Indicator	Creator	Reference
Negative Volume Index	Fosback	Negative Volume Index
On Balance Volume	Granville	On Balance Volume
Open Interest		Open Interest
Positive Volume Index	Fosback	Positive Volume Index
Price Volume Trend		Price Volume Trend
Trade Volume Index	Equis (Slauson)	Trade Volume Index
Volume		Volume
Volume Oscillator		Volume Oscillator
Volume Rate-Of- Change		Volume Rate-Of- Change

Support & Resistance Indicators (Source: Metastock)

Indicator	Creator	Reference
Andrews' Pitchfork	Andrews	Andrews' Pitchfork
Envelope		Envelope
Fibonacci Arcs, Fans, Retracements		Fibonacci Studies
Gann Lines, Fans, Grids	Gann	Gann Studies
Projection Bands	Widner	Projection Bands
Projection Oscillator	Widner	Projection Oscillator
Quadrant Lines		Quadrant Lines
Speed Resistance Lines		Speed Resistance Lines
Tirone Levels	Tirone	Tirone Levels
Trendlines	-	Trendlines

* S&P CNK NIFTY (6,308.25, 6,327.10, 6,246.35, 6,281.65, -57.2500), DT Tndline Dn (longer term) <manual>, DT Tndline Dn (shorter term) <manual>



Advantages of unrelated indicators

- The best regression models are those in which the predictor variables each correlate highly with the dependent (outcome) variable but correlate at most only minimally with each other.
- Such a model is often called "low noise" and will be **statistically robust** (that is, it will predict reliably across numerous samples of variable sets drawn from the same statistical population).

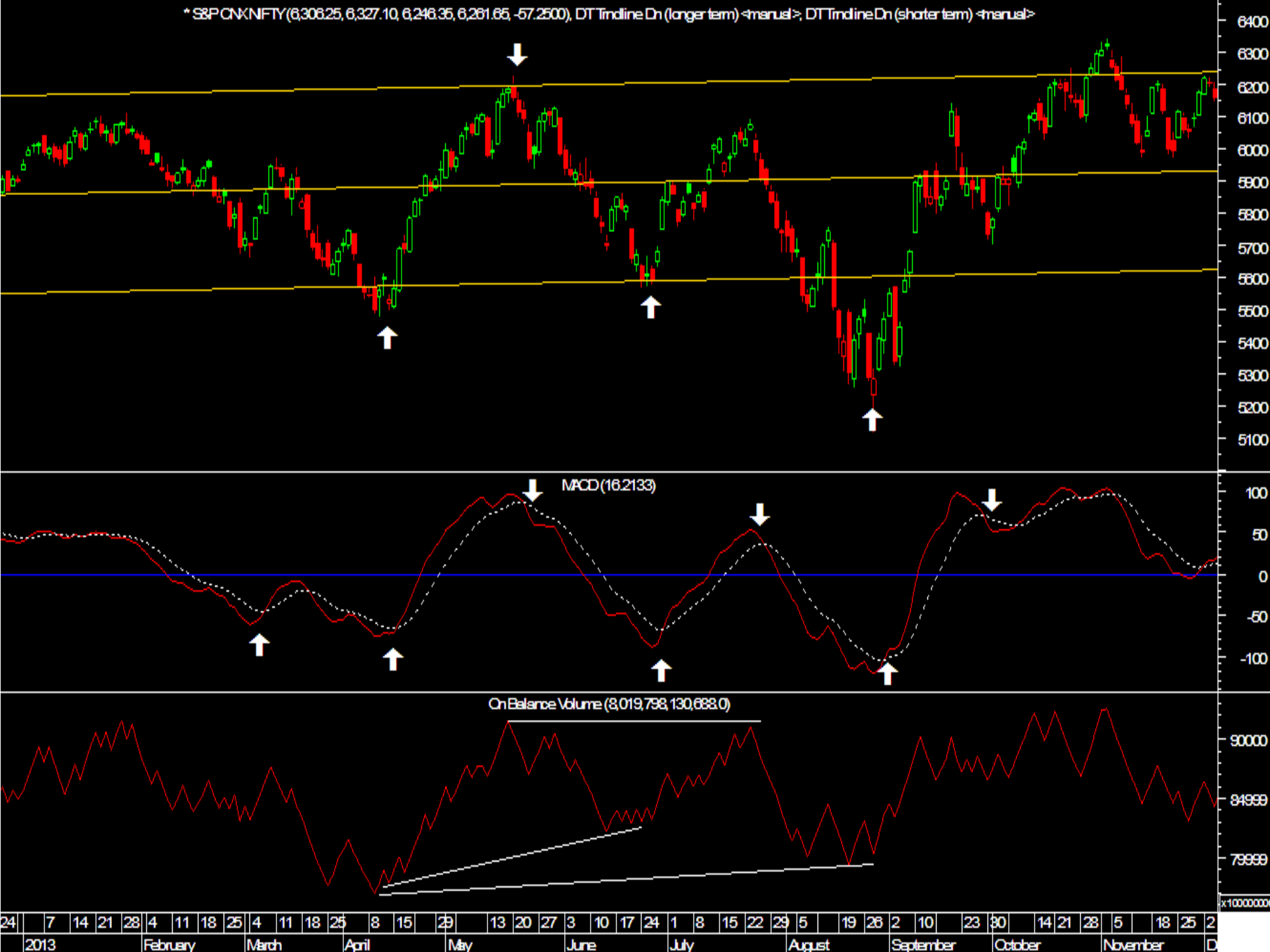
Use complimentary indicators

- To avoid the problems associated with multicollinearity, traders should select indicators that work well with, or complement, each other without providing redundant results.

Few combinations suggested

- Standard deviation
 - +
 - MACD
 - +
 - OBV

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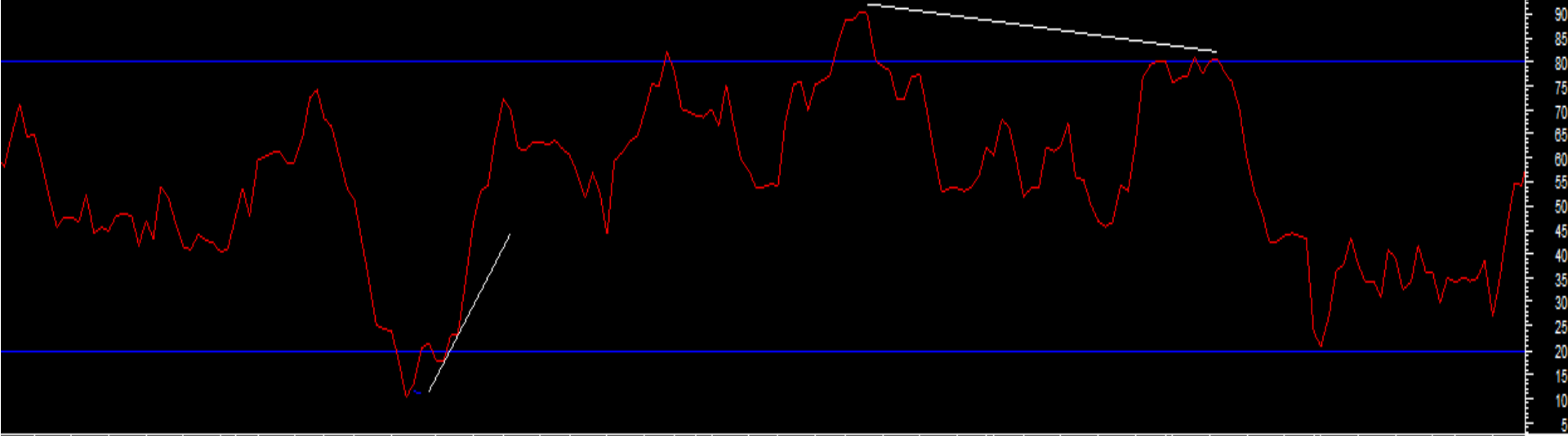


Few combinations suggested

- MA crossover
- +
- MFI

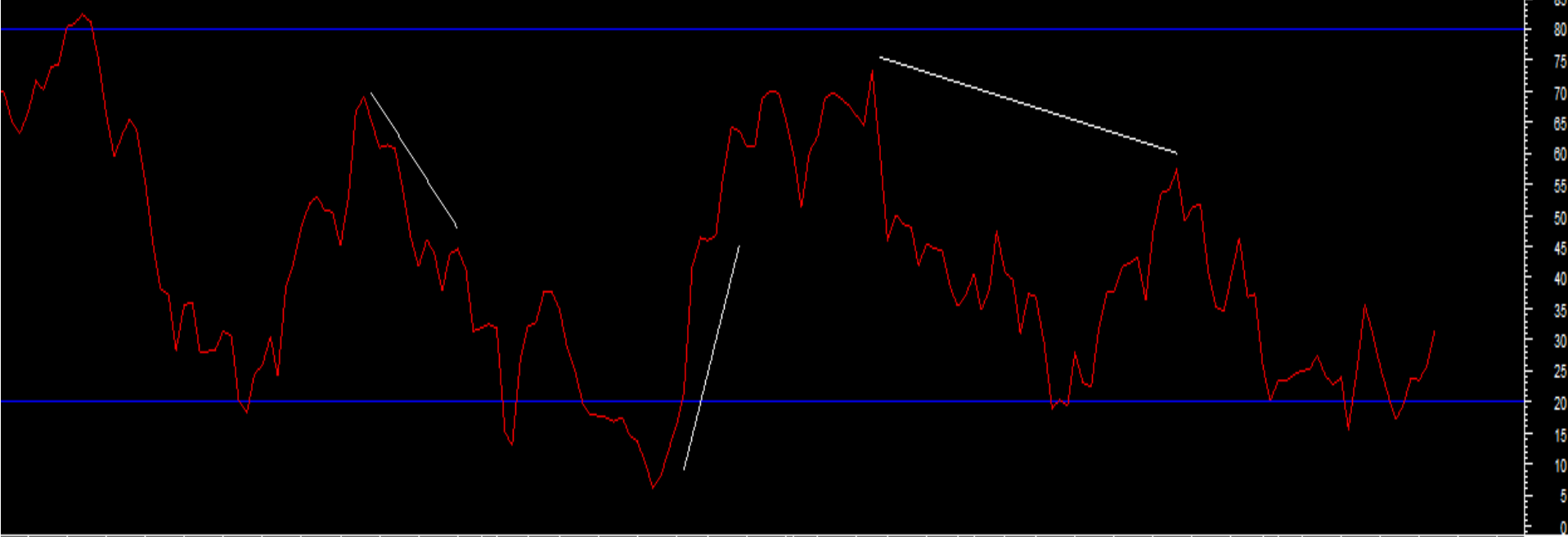


MoneyFlow Index(42.6387)



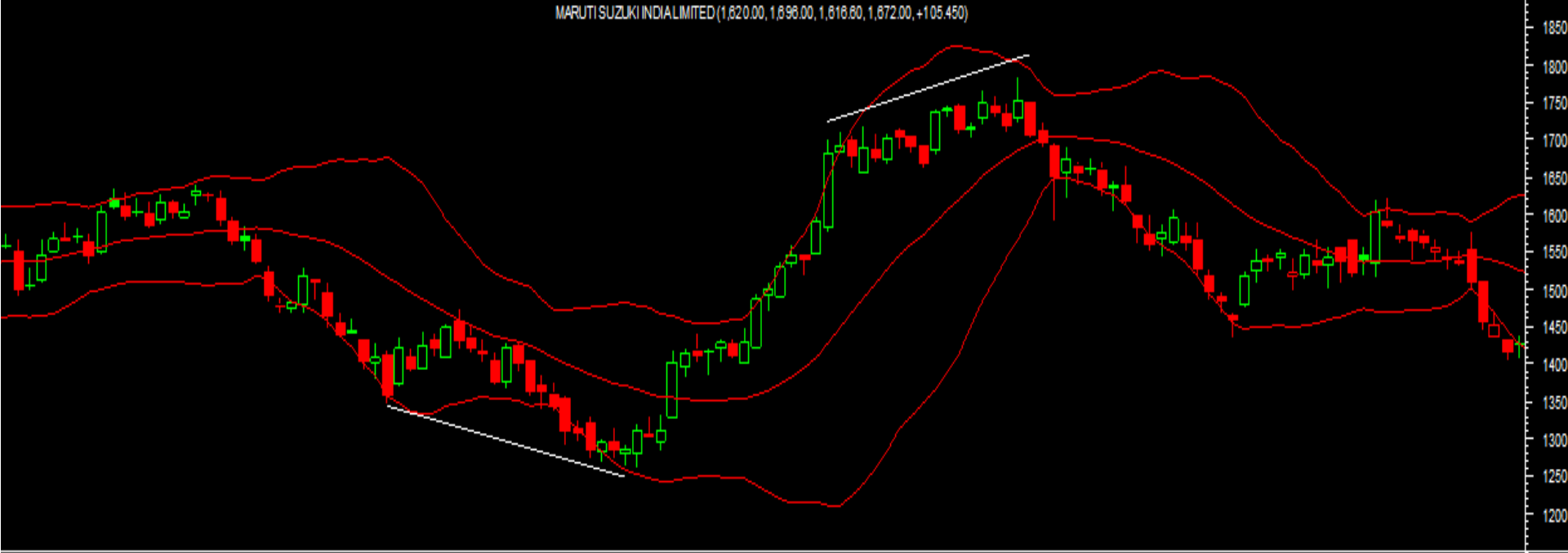


MoneyFlow Index(31.4881)

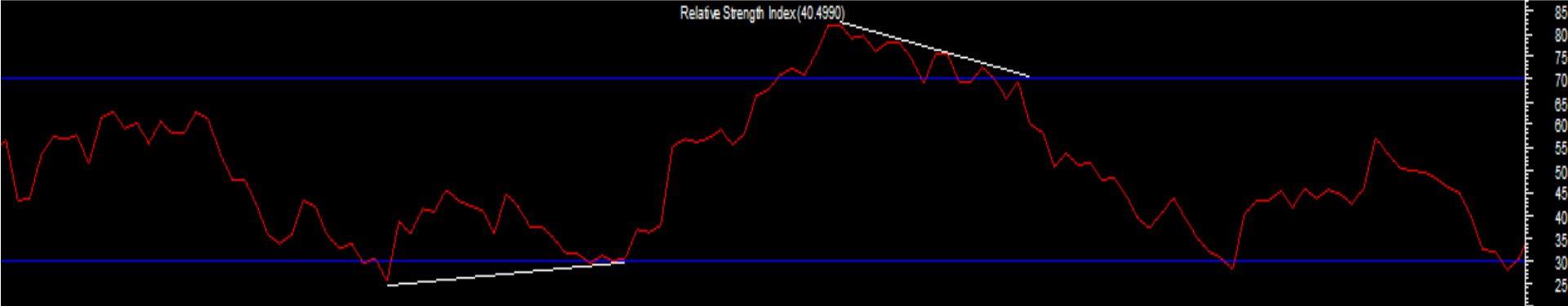


Few combinations suggested

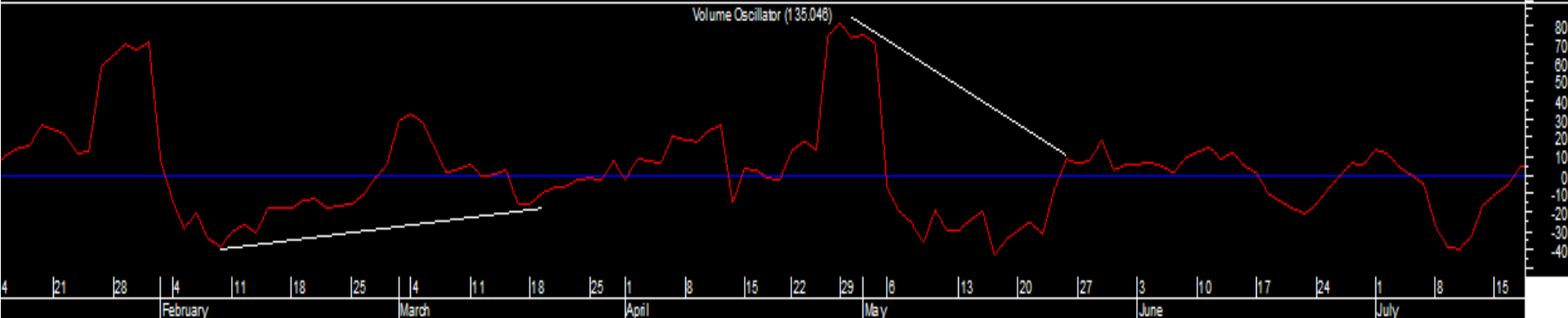
- Bollinger bands
 - +
 - RSI
 - +
 - Volume Oscillator



Relative Strength Index (40.4990)



Volume Oscillator (135.048)

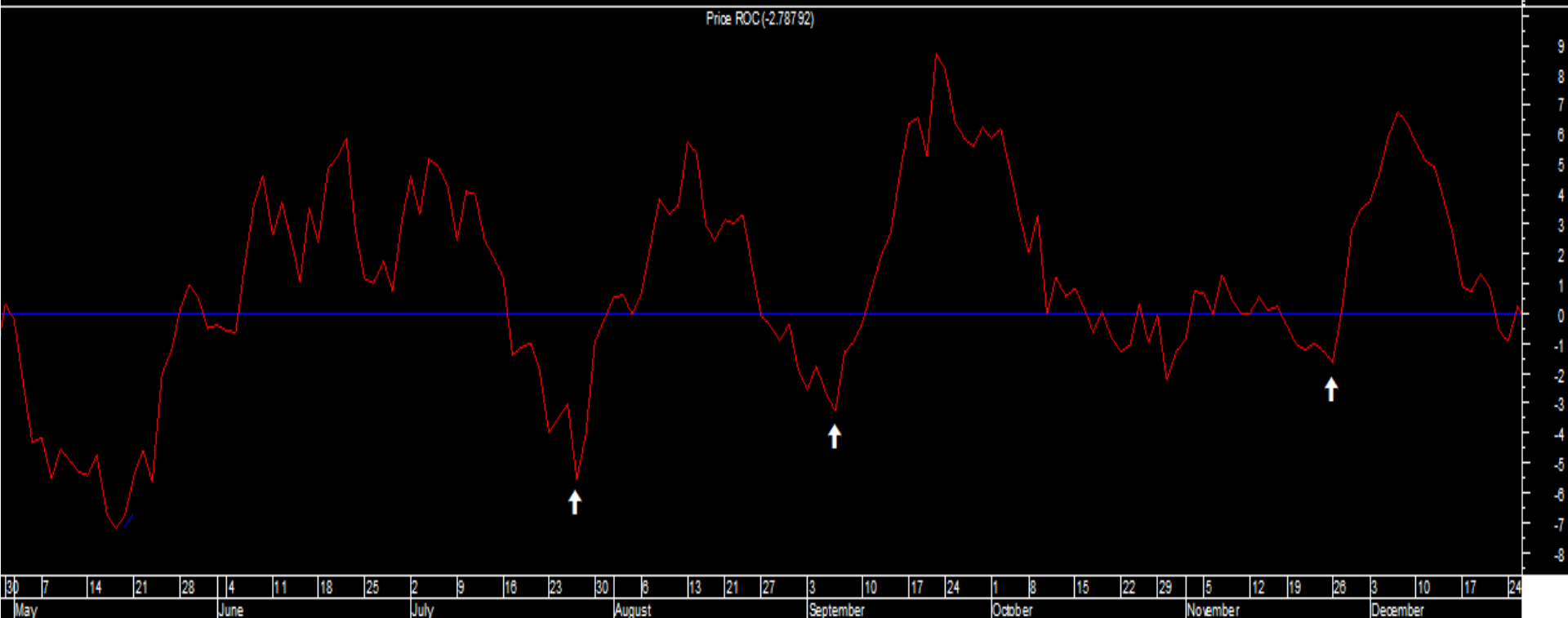


Few combinations suggested

- PSAR
 - +
 - ROC
 - +
 - Trendlines



Price ROC (-2.78792)

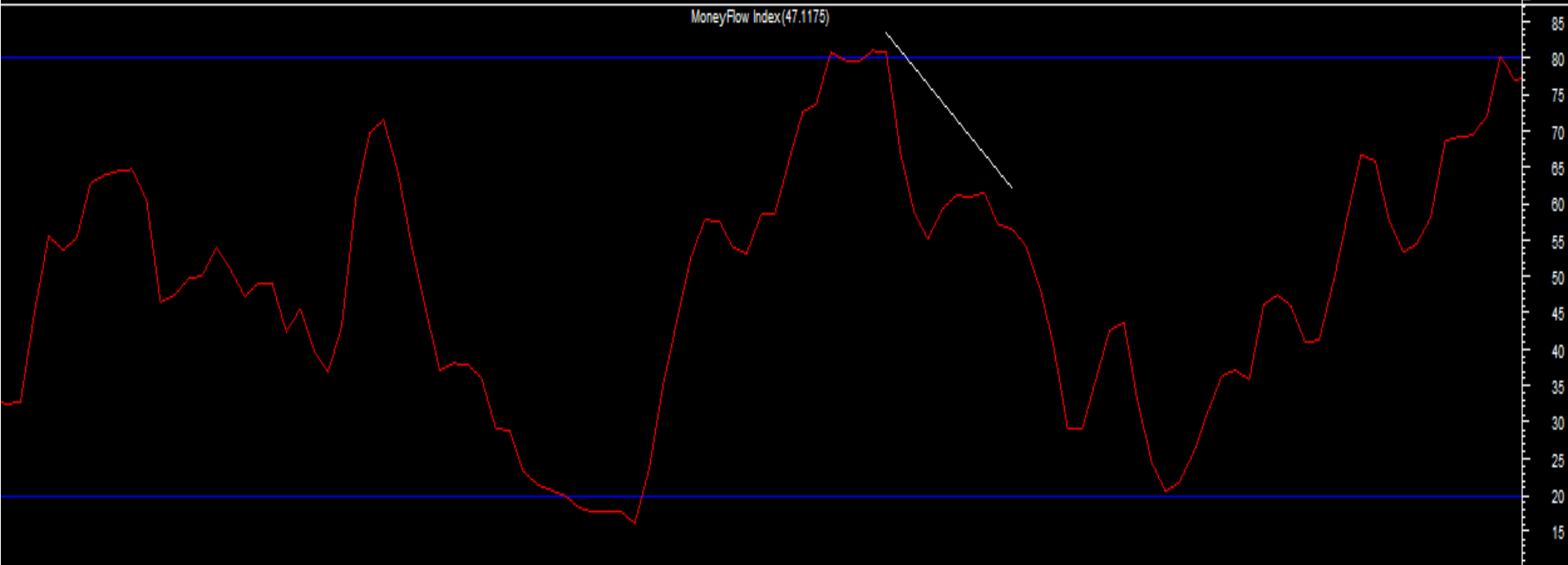


Few combinations suggested

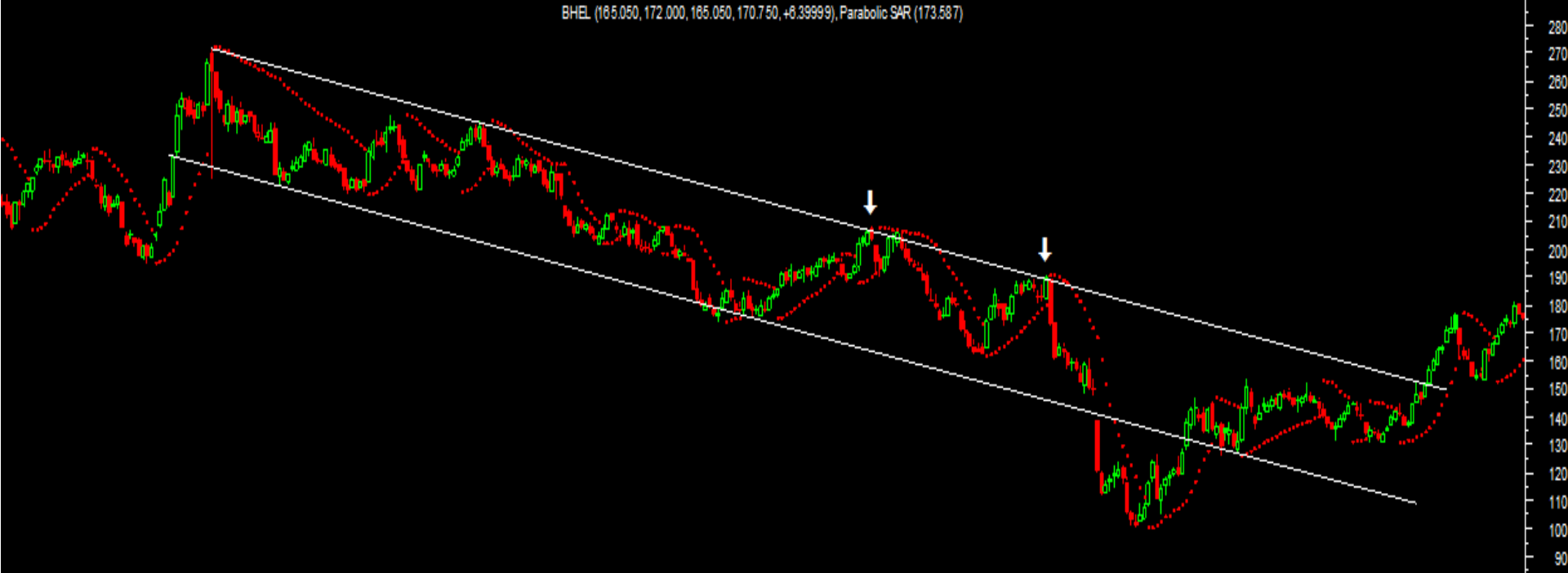
- PSAR
 - +
 - MFI
 - +
 - Trendlines



MoneyFlow Index(47.1175)



BHEL (165.050, 172.000, 165.050, 170.750, +8.39999), Parabolic SAR (173.587)



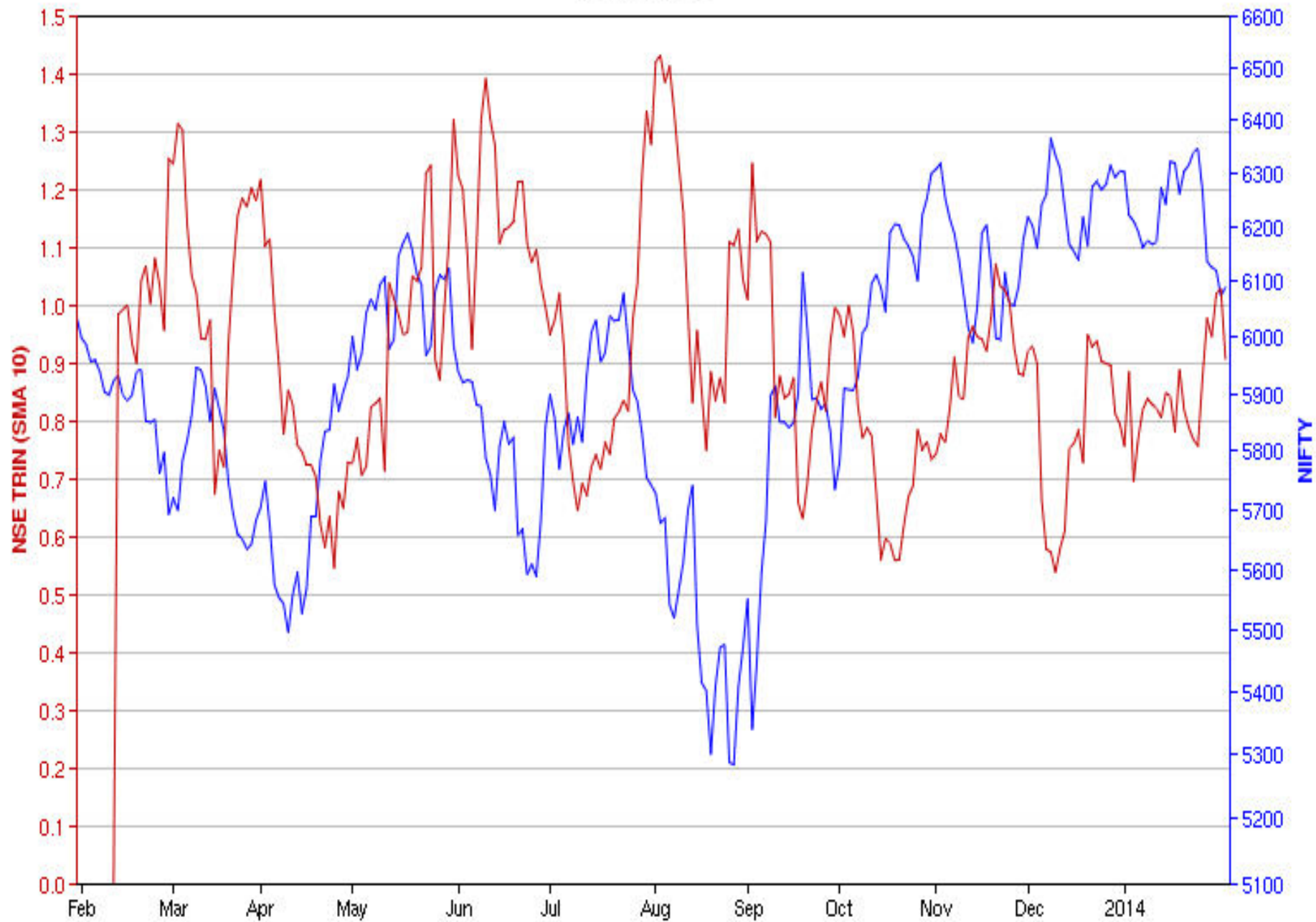
MoneyFlow Index(68.0605)



A word about Market Breadth Indicators

- Arms Index (TRIN)
- Advance-Decline Line
- Advance-Decline Volume Line
- Bullish Percent Index
- High-Low Index
- McClellan Oscillator
- McClellan Summation Index
- Net New Highs
- Percent Above Moving Average
- Record High Percent
- Volatility Index (VIX)

NSE TRIN



Eccentric indicators (Bizarre!)

Just for fun!!! (Source:CNBC)

- **Hemline/Skirt Length Indicator**
- **Super Bowl Indicator**
- **Billboard Top 100 Indicator**
- **Sports Illustrated Swimsuit Cover**
- **The Big Mac Index**
- **Lipstick Indicator/Lipstick Effect**

Take home message

- Use optimization and backtesting but **avoid overoptimization** as past never equals future.
- Technical analysis deals in **probabilities** rather than certainties. There is no combination of indicators that will accurately predict the markets' moves 100% of the time.
- While too many indicators, or the incorrect use of indicators, can blur a trader's view of the markets, traders who use technical indicators carefully and effectively can more accurately pinpoint high-probability trading set-ups, increasing their odds of success in the markets.

Suggested Reading

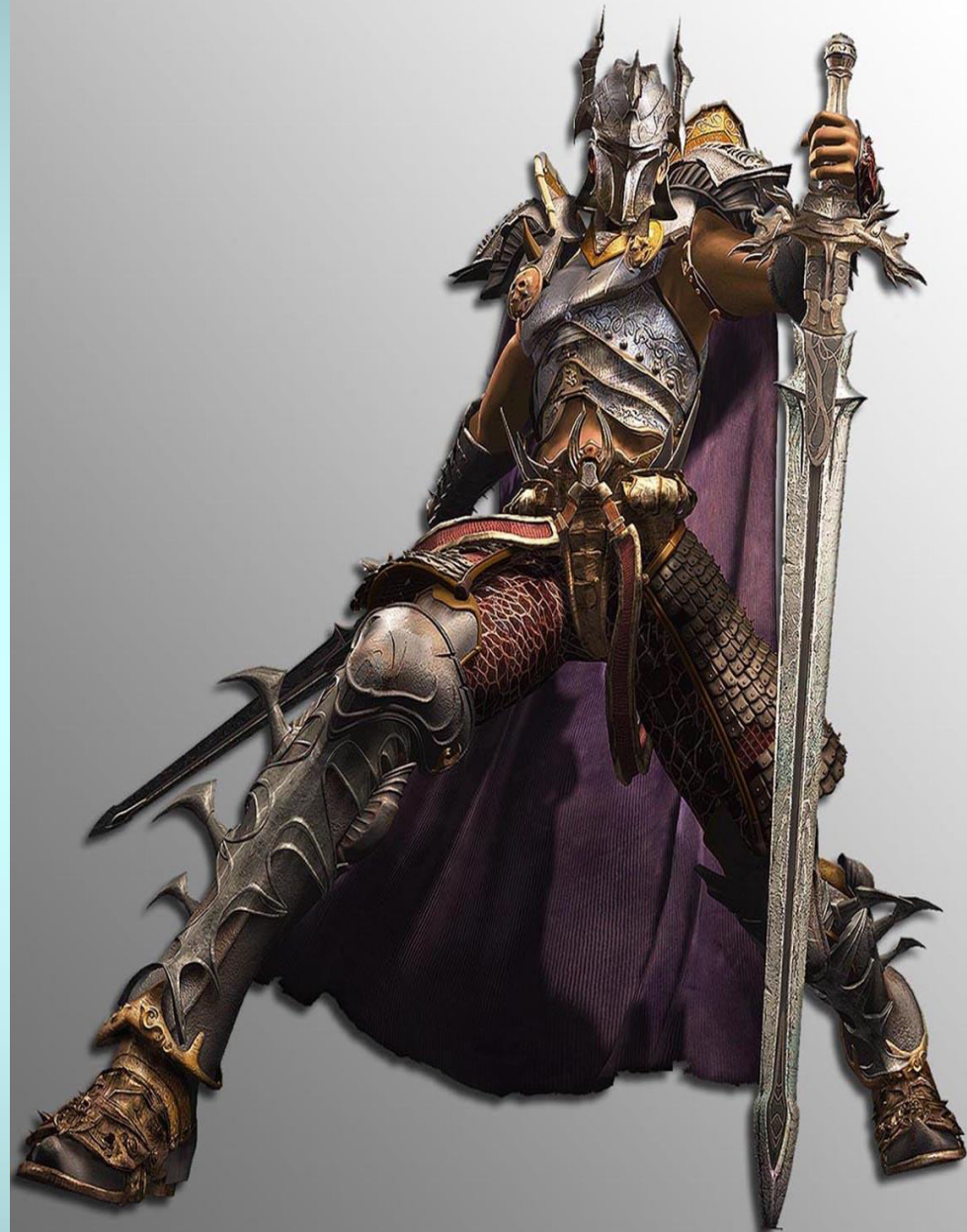
- Technical Analysis of the Financial Markets: A Comprehensive Guide to Trading Methods and Applications (New York Institute of Finance) - **John J. Murphy**
- Technical Analysis of Stock Trends - **John Magee**
- Technical Analysis: The Complete Resource for Financial Market Technicians - **Charles D. Kirkpatrick II, Julie Dahlquist**

A special thanks -

- Investrade group, Indore and my dear friends Nareshji, Deveshji and Himanshuji for their help and cooperation.
- ATMA for allowing me to speak on this platform.

*Every battle is won
before it is ever fought.*

—Sun Tzu



THANK YOU

