

Working with the RSI

by John Hayden

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Our Goals

- An understanding of:
 1. The nature of the marketplace.
 2. The determination of the dominant trend.
 3. The end of a contra-trend, allowing a:
 - New entry in the direction of the dominant trend.
 - Increasing our position size.
 4. The use of a trend determination checklist with precise rules for trend identification.
- Increasing our profitability!

What is the “nature” of the stock market?

- If the marketplace was s a living entity named “Miss Market” what information does she require to live?
 - Order flow (buy and sell orders).
- Does “Miss Market” know anything else?
 - No, she only understands order flow.
- Once “Miss Market” has processed the information contained within the order flow, is it still valuable?
 - No, it has been discounted.

“Miss Market” & Google

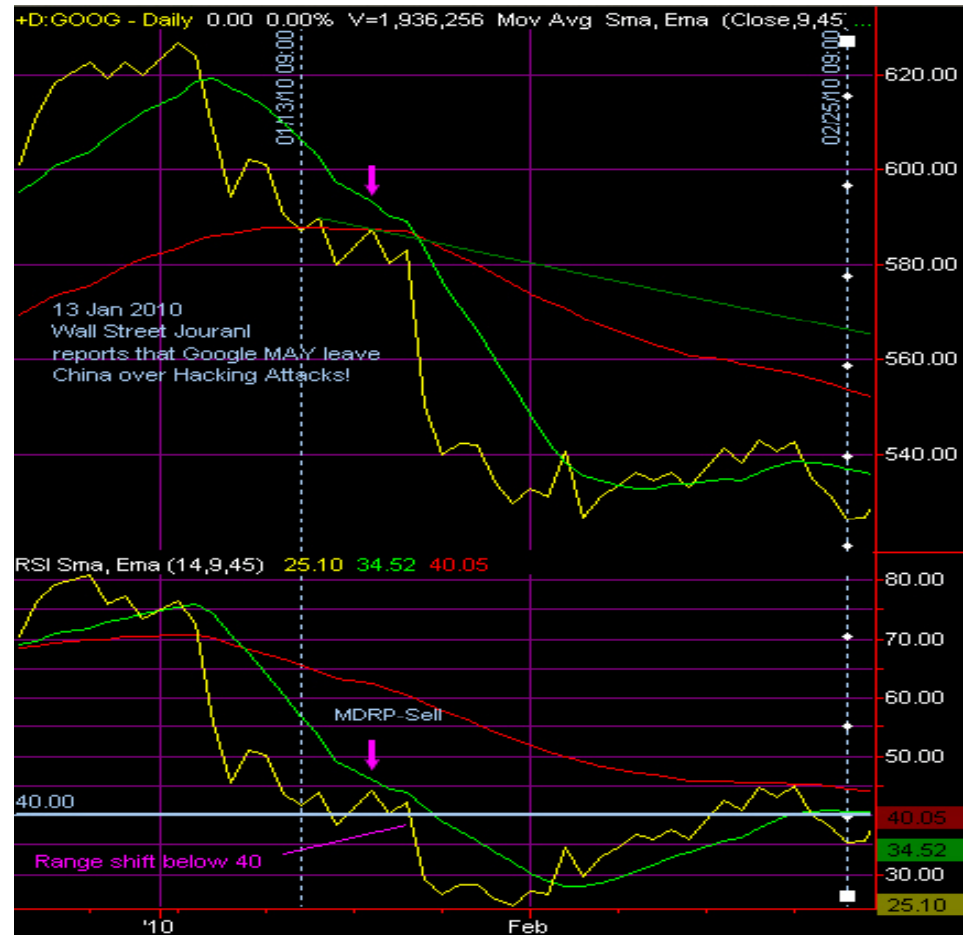
- An Example:
 - Jan 1 2010, there are 100 traders in China that know that Google will no longer be complying with their censoring arrangement of the Chinese Communist.
 - Does “Market” know this now (1/1/2010)? No. Why? These 100 traders are not acting on this knowledge – yet.
 - As these 100 traders begin selling (1/5/10) “Miss Market” begins to understand that the order flow from China is bearish.
 - The value of “Miss Market’s” knowledge decreases as she sees ever increasing amounts of sells entering into her system.
 - If you are lucky you hear a “rumor” (Jan 12) and can take action (remember “buy the rumor and then sell the fact”).
 - Once all of the order flow is done the knowledge has been widely disseminated and is worthless (Jan 29).
 - Only then will you read (March 13) about how Google is indeed quitting China.

“Market’s” Knowledge

- “Miss Market” is aware of bearish order flow:



- “Market” has fully digested Google vs. China – knowledge is worthless.



Understanding “Miss Market”

- Consider the following –
 - Heavy selling from Asia is impacting a particular stock -
 - A story is being communicated.
 - What is the “story”? → What information is Miss Market telling you?
Hint: the market reaction is reflecting the information left behind.
 - Price – some prices can be bearish, some bullish – pending analysis
 - E.g.. 10year Treasury increasing to 1% yield – bearish or bullish? Depends right?
 - Volume
 - Falling prices, rising volume vs. falling prices and falling volume ?
 - Timing
 - Is this on the opening, closing, during lunch or after hours?
 - Market cap value change
 - Is vast amounts of market cap being wiped out? Ex. BP
- Technical Analysis attempts to determine this information.

What is the Story?

- The market has “knowledge” – translate it!
- Once all of the order flow is done
 - Is the knowledge & experience “lost” → No!!!
 - It is captured in the history/RSI's!
 - Footprints in time, ready for understanding & interpretation
 - To interpret & understand in a probabilistic framework.
- Central point is that this information can tell you a lot about your objective/prey –
- Retracing price, volume, time & economic value change
 - What are the tools? Computers, technical analysis, news, horoscopes, palm readers, tea leaves, moon phases, etc..

What is “Technical Analysis”?

- Is this it?



Is this "Technical Analysis"?

- Trendline's & Patterns



Is this "Technical Analysis"?

A Program:

inputs:

```
FastLength( 3 ),
SlowLength( 10 ),
AlertLength( 14 ),
ColorNormLength( 14 ),
UpColor( Yellow ),
DnColor( Red ),
GridForegroundColor( Black );
```

variables:

```
ApplicationType( 0 ),
ChaikinOscVal( 0 ),
AnyVol( 0 ),
ColorLevel( 0 );
```

if CurrentBar = 1 then

```
ApplicationType = GetAppInfo( aiApplicationType );
```

if BarType >= 2 then

```
AnyVol = Volume
```

else

```
AnyVol = Ticks ;
```

```
ChaikinOscVal = ChaikinOsc( AnyVol, FastLength, SlowLength );
```

```
Plot1( ChaikinOscVal, "ChaikinOsc" );
```

```
Plot2( 0, "ZeroLine" );
```

A Math Formula:

The beginnings of the Black–Scholes model:

Define

S , the price of the stock .

$V(S,t)$, the price of a derivative as a function of time and stock price.

$C(S,t)$ the price of a European call and $P(S,t)$ the price of a European put option.

K , the strike of the option.

r , the annualized risk-free interest rate, continuously compounded.

μ , the drift rate of S , annualized.

σ , the volatility of the stock; this is the square root of the quadratic variation of the stock's log price process.

t a time in years; we generally use now = 0, expiry = T .

Π , the value of the portfolio.

R , the accumulated profit or loss following a delta-hedging trading strategy.

$N(x)$ denotes the standard normal cumulative distribution function.

$$N(x) = \frac{1}{\sqrt{2\pi}} \int_{-\infty}^x e^{-\frac{z^2}{2}} dz.$$

$N'(x)$ denotes the standard normal probability density function.

$$N'(x) = \frac{e^{-\frac{x^2}{2}}}{\sqrt{2\pi}}$$

Technical Analysis is:

- An attempt by a trader to simplify a complicated reality.
- An attempt to quickly grasp the “reality” of what we are focusing our attention upon.
- Technical analysis binds the trader to using numbers – he is not permitted to use non-subjective criteria.

Technical Analysis is:

- Technical analysis is the creation of a mathematical construct based upon multiple factors in a time series, which allows our minds to quickly grasp the reality of the situation.

Making Money with Technical Analysis

- Remember the nature of the market – it only values unknown information.
 - This is why trading with just moving averages or just candlesticks will put you in the poor house! Using moving averages does not reveal unique information.
 - In other words Miss Market has made these methods ineffective because they are widely known.
- Unique & Unknown Information Requires that:
 - Your mathematical construct MUST be unique!
 - OR
 - Your interpretation of a non-unique mathematical construct MUST be unique. This is our goal!

Do you want the “red” pill or the “blue” pill?

- How “deep” do you really want to go down this rabbit hole?
- If you take the “red” pill you will see “reality”. However there is no bottom, no exoteric mathematical formula that will ever give you the certainty you desire.
- If you take the “blue” pill you will remain ignorant of “reality”. Your life will be much simpler.
- In either case your profitability may or may not be stellar.
- There is no correct answer regarding this. It's a personal decision.

The Goal of Technical Analysis

- The discovery of unique information.
- The forecasting of the more probable “event”.
- In the end it is the desire to decrease uncertainty, and increase profitability.
- Is the ability to hear Miss Market before everyone else.

Definition of a Profitable Trader:

- They interpret market information better (and earlier) than other traders!
- They must have the ability to gain the knowledge of “Miss Market” before she has fully discounted “this” knowledge.
- A trader who takes profits and min. loss.
- A trader that can gain “Market’s” knowledge in a predictable manner, apply it consistently and have infinite number of trades.
- Ability to apply unique knowledge & skills.
- A trader that has a lot of self-discipline.

Definition of a Profitable Trader:

- You must either have:
 - Inside knowledge – often illegal.
 - Unique knowledge – not illegal.
- You must act on this knowledge!

The “Relative Strength Index “ (RSI) by W. Wilder

- Created in: 1978
- A very widely used indicator.
- Available in almost all charting applications.
- It is a momentum based indicator, based upon the use of a time series of price data.
- It is the only “public” indicator I still use.
 - However, I use it in a very unconventional way.

The “Relative Strength Index “ (RSI)

by W. Wilder

- It is a “bounded” indicator – (0 to 100).
- Its value is based upon the momentum of the ratio of higher closes to lower closes.
- It is important to remember that the RSI value acts logarithmically. As its value approaches its upper or lower bounds it moves less in relation to the movement of the underlying price.



Bullish & Bearish Divergence

- Any momentum based indicator will have instances where the indicator under-performs price behavior creating either a bullish/bearish divergence.
- In other words, if price action is making a new low (a lower low) but yet the value of the indicator (RSI) is not making new lows then we can say that the behavior of the RSI is diverging from that of the price behavior, i.e. its' underperforming.
- If this diverging behavior is seen while price is making new lows then it is said that the "RSI is showing a Bullish Divergence".
- Likewise if the behavior of the indicator (RSI) is diverging from price action as price is making new highs then it is said that the "RSI is showing a Bearish Divergence".

Bullish Divergence

- A “Bullish” Divergence implies a “Bull” market – yes?



Bearish Divergence

- A “Bearish” Divergence implies a “Bear” market – yes?



1 on our Trend Determination Checklist:

Bullish & Bearish Divergence

- Remember that:
 - “Bullish Divergence’s” – come in a Bear Market!
 - “Bearish Divergence’s” – come in a Bull Market!
 - A divergence is only a “detour” in the primary trend. It is indicating a contra-trend.
 - The smaller the period is between the bars – the more significant the divergence becomes!
- Prove it to yourself:
 - Identify a long term Bull trend, then look for a “bullish divergence” – there are none!
 - Identify a long term Bear trend, then look for a “bearish divergence” – there are none!

Moving Averages

- A moving average is based on past prices and defines the current trend, but does not indicate the future trend.
- It is very effective at removing “noise”, or a price which exceeds one standard deviation from the data stream.
- Because of their mathematical formula there is a time lag from when prices change direction and the moving average changes direction.

Common Moving Averages Formula's

- There are several mathematical constructs used by traders. The most common are:
 - **Simple Moving Averages (SMA)**
 - Calculates the total closing price over 'n' days then divide by 'n'.
 - **Weighted Moving Averages (WMA)**
 - Calculated by assigning a varying 'weight' to each closing price over prior 'n' days, then obtain the average. The 'weight' is greater for 'yesterdays' close vs. and the decreases arithmetically to zero on the n'th day.
 - **Exponential Moving Average (EMA)**
 - Calculated similarly to the weighted moving average, however the weight assigned is to the entire data series is done exponentially.

Using Moving Averages

- Place a 9 period simple moving average on the close, and another one on the RSI.
- Place a 45 period weighted moving average on the close, and another one on the RSI.
- Arrange the panels so that the price action is on the top panel, and the RSI panel is on the bottom panel.

Using Moving Averages



2 on our Trend Determination Checklist:

Fast & Slow Moving Average Trends

- We can determine 2 types of trend using moving averages.
 - **Fast Trend:** Where is the 'value' which is being calculated in relationship to the 'fast' moving average (the 9 period SMA in this instance)? In other words is the close above the SMA, or below it?
 - Above it = Uptrend.
 - Below it = Downtrend
 - **Slow Trend:** Where is the faster moving average in regards to the slower moving average?
 - If the faster moving average is above the slower then it's a uptrend, or vice versa.
 - Generally I will say that the moving averages have gone "positive" (the faster is above the slower), or that they have gone "negative" (the slower is now above the faster).

Disadvantages of Moving Averages

- That there is a significant time lag in moving averages.
- That every trader in the universe has access to the same moving averages – no unique information.
- Combining moving averages on different indicators in conjunction with price and then using them together is not a significant unique advantage.
- The only way to use moving averages to your advantage is to use a moving average which is constructed uniquely – unfortunately these are very expensive and computationally intensive.

Bull/Bear RSI Range's

- Forget everything you have read, here is the real deal:
 - If the RSI is above the '60' level, the bulls are in charge!
 - The bulls stay in charge until the RSI goes under the '40' level. When this happens the bears are in charge.
 - The cycle repeats once the bulls manage to get the close above 60.

Bull/Bear RSI Range's

- The Bullish RSI Range: 40 to 80
- The Bearish RSI Range: 60 to 20
- Remember:
 - That the RSI behaves logarithmically – as the RSI becomes overbought or oversold it takes an increasing drastic price move to maintain those RSI levels.
 - The RSI can become overbought/oversold and stay there for a long time!

Bull/Bear RSI Range's



3 on our Trend Determination Checklist: What is the current RSI Range?

- Trend is up when the RSI range is: 40 to 80
- Trend is Down when the RSI is: 60 to 20

Definition of a Trend

- Definition of a Up-Trend:
 - Higher Highs & Higher Lows & most importantly what was Resistance is Now Support.
- Definition of a Down-Trend:
 - Lower Highs & Lower Lows & most importantly what was Support is Now Resistance.

Momentum Discrepancy Reversal Points (MDRP)

- This concept I learned in 1996 in a series of seminars by Andrew Cardwell a C.T.A (at the time).
 - Mr. Cardwell offered live seminars covering many aspects of technical analysis not covered in any books. One of the many concepts he taught was what I now call M.D.R.P.
 - Mr. Cardwell was in turn introduced to the concept of the RSI generating buy/sell signals while he was working as a futures broker by a client of his who trading pork bellies.
- The concept applies to ANY momentum based indicator.
- Once understood, you can use a mathematical formula to generate price targets and a risk:reward ratio.

Definition of a Momentum Discrepancy Reversal Points (MDRP)

- In any momentum based indicator there are instances where the indicator over-performs (or exceeds) price behavior (the opposite of a divergence which under-performs price action).
- In other words, if price action is not making a new low relative to a previous low i.e., a higher low, yet the value of the indicator (RSI) is making a lower low vis-a-vis the previous price low then we can say that there is a discrepancy in the behavior of the RSI. This is the opposite of a divergence.
- If this diverging behavior is seen while price is making a higher low and yet the RSI is making a lower low, then it is said that there is a bullish discrepancy in the RSI. This is often a point in time where prices then reverse higher i.e., a **MDRP-Buy** signal.
- Likewise if price is making lower lows and yet the behavior of the indicator (RSI) is making higher highs, then we can say that there is a bearish discrepancy in the RSI. Since this is often a point in time where prices reverse lower we call it a **MDRP-Sell** signal.

An Example of a MDRP-Buy Signal

- A low close (point A), followed by increasing prices, then followed by declining prices which are still more than the close at point “A’.
- Now compare the current RSI value to that at point ‘A’ – is the RSI value lower? If so then we have a potential MDRP-Buy signal.
- If after a period of declining close’s we get a up close (point B) the RSI will also increase, creating a ‘hook’. If the RSI value at the low (the day before the hook) is less than point ‘A’ and the price is greater then we have a locked in MDRP-Buy signal.
- We can determine the upside price target on either the “potential” or “locked in” signal by taking the difference between points A and B and then adding it to the highest close between points A,B.

MDRP-Buy Chart of 'GLD'

- An Example of a MDRP-Buy on 'GLD' 10/28/09
 - We have a new low on 9/25/10 @97.00 (A)
 - Followed by a rally to a high close on 10/13/10 @ 104.26 (C).
 - Followed by a decent (B) to 10/28/10 @ 100.73
 - Note the “Bear Divergence”.
 - Target = $(B - A) + C$
 - $107.99 = (100.73 - 97.00) + 104.26$
 - Note the RSI value at 'B' was 48.85 indicating the bulls were still in charge.
 - If we entered a bull trade when the high (97.81) of the 25th was negated and we used the low of the 25th (96.77) as our exit stop then our risk was \$1.06 (96.76 – 97.82) .
 - Yet our targeted gain was \$3.73 giving was a risk:reward ratio of 1:3.5 – not a bad ratio!



Momentum Discrepancy Reversal Points (MDRP)

- Things to Remember:
 - The strength of a MDRP signal depends upon the number of bars (time periods) between points A & B. The shorter the better. In other words a MDRP-Buy signal with only 1 bar (2 periods) is much stronger than a MDRP-Buy with 20 bars between A & B.
 - MDRP reversal points (B) are always significant support/resistance levels – regardless if the price target is hit or not.
 - The price target is validated only when the close exceeds the targeted level (an intra-day high/low doesn't count).
 - A MDRP signal which fails (price target is not hit) is just as significant as a signal which works.
 - The price at point 'B' is always important. It will become future support or resistance depending upon the trend!

MDRP-Sell Chart of MON)

- An Example of a MDRP- Sell on MON
 - We have a new high on 1/19/10 @ 81.42 (A)
 - Followed by a decline to a low close (C) on 2/8/10 @ 74.21
 - Followed by a rally to high close (A) 2/17/10 @ 78.10
 - Note the “Bull Divergence” at ‘C’.
 - Target = (B – A) + C
 - $74.21 = (78.10 - 81.42) + 74.21$
 - Note the low RSI value just prior to ‘C’ was 28.75 indicating the bears were now in charge.
 - If we entered a bear trade when the low of the 17th (77.61) was negated and we used the WMA of the 17th (78.80) as our exit stop then our risk was -\$1.21 (77.60 – 78.81) .
 - Yet our targeted gain was \$3.39 giving was a risk:reward ratio of 1:2.8 – not a bad ratio!
 - Note: We used the RMA value instead of the high of the 17th as the high was 78.49 very close to the RMA.



Momentum Discrepancy Reversal Points (MDRP)

- Remember:
 - That the MDRP is NOT looking for a top or a bottom.
 - **The MDRP is looking for the end of a contra-trend**, allowing you to enter into a trade with a high reward to risk ratio.
 - The best MDRP signals are:
 - Where the period is small.
 - The first signal opposite the previous trend.

4 on our Trend Determination Checklist: What MDRP Signals are we seeing?

- If we are seeing MDRP-Buy Signals then the main trend is UP.
- If we are seeing MDRP-Sell Signals then the main trend is DOWN.

Trend Determination using the RSI

- Bull Market

- A Bull trend is your friend!
- Step # 1: Are we seeing Bear Divergences?
- Step # 2: What are the moving averages telling us?
 - What are the moving averages on price telling you? Ideally both the fast trend (close > SMA) and the slow trend (SMA{close} > WMA{close}) are bullish.
 - What are the moving averages on RSI telling you? Ideally both the fast trend (RSI > SMA) and the slow trend (SMA{RSI} > WMA{RSI}) are bullish.
- Step # 3 What is the range of the RSI? Is it 40 to 80?
- Step # 4 Are we seeing only MDRP-Buy's?

Trend Determination using the RSI

- Bear Market

- A Bear trend is your friend (even more so than a bull)!
- Step # 1: Are we seeing Bull Divergences?
- Step # 2: What are the moving averages telling us?
 - What are the moving averages on price telling you? Ideally both the fast trend ($\text{close} < \text{SMA}$) and the slow trend ($\text{SMA}\{\text{close}\} < \text{WMA}\{\text{close}\}$) are bearish.
 - What are the moving averages on RSI telling you? Ideally both the fast trend ($\text{RSI} < \text{SMA}$) and the slow trend ($\text{SMA}\{\text{RSI}\} < \text{WMA}\{\text{RSI}\}$) are bearish.
- Step # 3 What is the range of the RSI? Is it 60 to 20?
- Step # 4 Are we seeing only MDRP-Sell's?

Trendline's based upon MDRP

- Significantly Valid Trendline's can be drawn based upon MDRP points 'A' and 'B'.

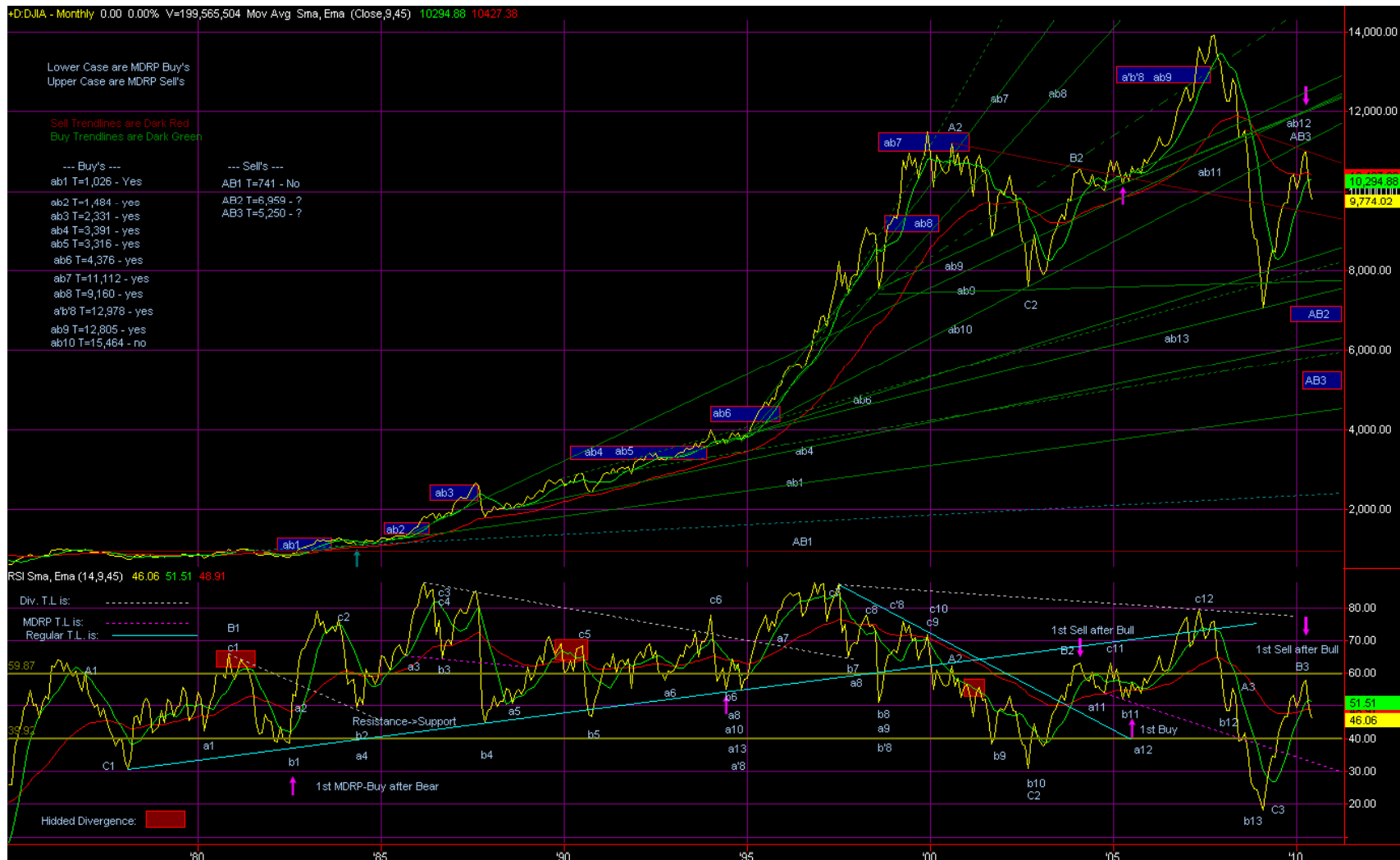


Trend Determination using the RSI

- What Symbol is this?
- Bear or Bull?



Trend Determination using the RSI



The Only Divergence that “works”!

- A Hidden Divergence Signal!
- It is nothing more than a Divergence in the middle of the chart! It is “hidden” because most traders only look for a divergence at the top or bottom of the chart.
- They “work” because almost all of the time the price will do exactly as the name implies!
- Remember that they still follow the same rule as a “regular” divergence i.e., Bullish Divergence’s come in a Bear Trend and vice versa!
- Look at the previous chart – the hidden bearish divergence’s are highlighted.

MDRP's are everywhere!

- Every momentum based indicator has divergences and MDRP signals!
- Investors Business Daily in Thursday's edition looking at commodity charts.
- Stochastic's
- MACD
- ROC and so on.

Closing Thoughts

- Using RSI Theory we can:
 1. Make the “Trend Our Friend”.
 2. We can identify the trend – using our rules.
 3. We must the patience to wait for a contra-trend to appear.
 - We patiently wait for the momentum of the RSI to overextend itself (the rubber band is now taunt) vis-à-vis a previous price and its correlated RSI value.
 - Only then do we go fishing for that bull or bear fish.
 4. Our protective stop (puke up point) is known to us at the time of entry allowing us to define our risk to reward ratio, and if we actually want to go fishing.
- Our goal is the discovery of “Unique Knowledge”!
- Being the first with this knowledge is our “edge”!
- Remember that large traders (the elephants) always leave footprints that we can use to either fade or go along with.

A “Sounding Board” for traders.

- It is my attempt to solve some trading problems. In particular:
 - Provide professional traders a way to solve their problem of sizing a trade.
 - Provide a way for system/program developers to check their methodology against a different time tested methodology.
 - Provide a fair way of pricing search a service .
- PlentyOfStocks.com provides a database of various trend indicators, buy/sell signals, and exit strategies all based upon unique mathematical constructs.
- Compliments a traders unique approach against my approach – a sanity check?
- Registered users have access to a free historical database which include MDRP signals and other much more advanced indicators. The only limitation is that no data is provided which is more recent than 30 days ago. Registering is free.
- Those traders who want current data may subscribe to the service.
- Access to current(today's) is limited to 100 traders.
- The monthly fee is determined by a monthly auction. The 100 traders with highest bid will each pay what the lowest bid was (out of those 100 highest bidders). This prices the service most fairly. This is the same auction used in selling Treasury debt.

Resources

- Books:
 - The 21 Irrefutable Truths of Trading: A Traders Guide to Developing a Mind to Win, by John Hayden
 - The Disciplined Trader: Developing Winning Attitudes, by Mark Douglas
 - The Zurich Axioms, by Max Gunther
 - Peaks and Valleys: Making Good and Bad Times Work For You – At Work and in Life, by Spencer Johnson
- Websites:
 - RealClearMarkets.com – News for traders – free, links.
 - FirstVolgaInvestments.com – Where I post various graphs and comments.
- Newsletters:
 - The Gartman Letter – TheGartmanLetter.com
- Programs:
 - ThinkOrSwim.com – Trading Platform
 - TradeStation.com – Trading Platform and Brokers.
 - DataSharks.biz – Download Free Stock, Futures, and other data from around the world.
 - eSignal.com – Independent real time data provider of FOREX, Stock, Options, and Futures Data.

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