RSI 2 System
for Shorter term SWING trading
and Longer term TREND following

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Use all information presented at YOUR OWN RISK.
Objectives

As discussed at the end of last season,

- investigate simple but potentially profitable systems, both for shorter term swing trading and longer term trend following approaches,

- once systems vetted, the group might want to follow a select few as “anchor” systems,

- track the system signals as a basis for what the market is currently doing, and,

- track the system signals for possible timely opportunities.
RSI 2

The RSI 2 System
The RSI 2 System is a system designed by Larry Connors and Cesar Alvarez and focuses on...

- a short-term oversold condition in an uptrend, or
- a short-term overbought condition in a downtrend.
  - Buy the dip (in an uptrend)
  - Sell the rally (in a downtrend)
- For this presentation we will only focus on buying pullbacks in an uptrend because it is much harder to short stocks (availability of stock, liquid options etc.)
- Mean reversion (entry) method.
RSI 2

-- Let's watch this short video overview --

- https://www.youtube.com/watch?v=i_h9P8dqN4Y
Key Points of the RSI 2

- Trend Trading strategy or method, for trending markets.
- Finds a short term oversold condition in an uptrend where the expectation is that the uptrend will continue after the minor pullback/oversold condition has completed.
- Defines an entry condition only.
- **This system we are covering is not exactly the same as the RSI 2 Strategy that Larry Connors developed. In fact, he advocates not using any stops. The concept or philosophy is the same, but many of the rules and implementation have been modified for Systems 3+.**
- We will look at different exit strategies so that the RSI 2 system can be used for both shorter term or longer term trading horizons and rate or rank these approaches.
RSI Trading Strategy

Entry Rules
Original System
Entry Rules on DAILY CHART

• Instrument is trading above 200 EMA.

• **Liquidity** - stock trading over $10.00 and minimum volume 250,000 shares.

• **Position Sizing** - $100,000 account size, 10 maximum positions – position size = $10,000 each.

• **NO Market Timing**.

• **Oversold** - RSI 2 period goes “over sold” below a key level (15-25).

• **Position Score** – open portfolio positions needing to be filled are ranked based on Rate of Change (30) and Relative Strength versus the SPY.
Original System Example Long
Trade on DAILY CHART
Modified System
Entry Rules on DAILY CHART (1)

- **Daily Bars** are being used.
- **Liquidity** - stock trading over $2.00 and minimum volume 50,000 shares.
- **Position Sizing** - $100,000 account size, 10-20 maximum positions – position size = $5,000 - $10,000 each.
- **Market Timing** - SPY is trading above it's 90 SMA.
- **Valid Uptrend** –
  - defined by upsloping long term EMA above a trend “threshold” reading.
  - previous close is above long term moving average.
Modified System

Entry Rules on DAILY CHART (2)

- **Oversold** - RSI 2 period goes “over sold” below a key level (15-25).

- **Entry trigger** – entry occurs within 4 bars of the above conditions, and then when the current price bar closes above the high of the last bar (entry on close of current bar). This candlestick condition is used as an indication that the market has stopped pulling back and a possible “floor” or “pivot point” has been put in and provides some confirmation.

- **Position Score** – open portfolio positions needing to be filled are ranked based on Rate of Change (30) and Relative Strength versus the SPY.
Modified System Example Long
Trade on DAILY CHART

Entry close > previous high
Positive Slope of Exponential MA
Pullback
Why 2 Variations of the System?

- Using different parameters and slight approach differences will flush out if changes to some of the parameters will cause the system to break or stop working -- “sensitivity”.
  - Gives a sense of robustness.
- Different approaches – confirmation versus non-confirmation.
Tools Being Used
Tools Being Used

- Amibroker with free Yahoo Historical Data going back in some cases to 1979(?)
  - AFL programming language native to Amibroker.
  - Amibroker is a true Portfolio-level backtesting system.
- Fast Trading Computer with a solid state drive, lots of RAM and i7 processor.
- Back testing is pretty fast... optimizations can be pretty slow though.
Portfolio
Trading
Approach
A portfolio approach is used to get best results, rather than just trading 1 instrument over time.

Assumes that when “spots” open up, the next available trade setup matched (and ranked) fills that available spot in the portfolio.

Diversifies among many different trading symbols (stocks, ETFs) and backtesting results simulate “what would have happened” from a certain point in time considering what the market actually did.

Less chance of curve fitting on a specific symbol, more robust.

More trading opportunities since larger trading universe.

RANKING can be used to select the best candidates from multiple choices when spots open up in the portfolio.

Larger sample sizes, more opportunities and more “robust”.
RSI Trading Strategy

SWING Exit Rules
SWING Trading Exit Rules

- **Hard Stop Exit** – 1.2% Stop, or, 2 \( \times \) ATR with a 20 period, i.e. \( 2 \times \text{ATR}(20) \).

- **Profit Target Exits** –
  - A factor \( \times \) hard stop amount (i.e. risk 1 to make 2, risk 1 to make 3).
  - Stock indices have an approximate 20 day cycle, so exit at a re-test of the previous 20 day high.
  - RSI overbought level > 80.
  - A close above a specific moving average.

- **Other possible Profit Target Exits** --
  - A fib extension from the prior high to low – 127.2%+.
RSI Trading Strategy
TREND FOLLOWING Exit Rules
TREND FOLLOWING Exit Rules

- **Hard Stop Exit** – $2 \times \text{ATR}$ with a 20 period, i.e. $2 \times \text{ATR}(20)$.

- **Profit Target Exits** – “Chandelier Stop” -- the current high or close minus a factor of ATR with a specific period, i.e.

  - $5 \times \text{ATR} \ (20)$
  - Position will be exited when price violates the trailing stop line.

- **Other possible Profit Target Exits** --
  - % based trailing stop from entry.
System Development Backtesting
Let's Review the Backtesting Process, Some Trade Examples on the Charts and Backtesting Report Output
Summary Results
Back Testing
Key Metrics
Back Testing

- Throw out first trade results? (as did the Turtle Traders)
Back Testing Key Metrics

- Net Profit.
- CAR – Compounded Annual Return.
- Total Trades taken.
  - Useful when optimizing strategy inputs. For example, if two optimizations have equal net profit but one has $1/3^{rd}$ the number of trades, it's more profitable per trade and probably a better optimization.
Other Back Testing Key Metrics

- **Wr** - Percent Profitable (Win Rate %).
- **Pr** – Payoff Ratio or Ratio Average Win / Average Loss.
- **Profit Factor.** “The money amount a trading strategy made for every money unit it lost (in the selected currency). This value is calculated by dividing gross profits by gross losses.”
- **KPI (JB's Metric).**
Back Testing Key Metrics

- **Expectancy $ and Expectancy %** - amount of money traded that is yours to keep.
  - Expectancy $ x Total Trades = Net Profit.
- **RRR – Risk Reward Ratio**
- **Time Analysis in trades.**
  - Gives you an idea of how long you can expect to be in (winning or losing) trades and possibly if this is an efficient use of your trading funds.
- **Equity Curve.**
  - Report level analysis.
Back Testing Key Metrics

Equity Curve Example

Equity Curve Close To Close With Drawdown

![Equity Curve Graph]

- Net Profit
- Peaks
- Close To Close Drawdown
- Close To Close Drawdown (%)
Other Back Testing Key Metrics

- Total Commissions.
- **Outliers.** Are these contributing significantly to the systems overall success?
  - Outlier Largest Win.
  - Outlier Largest Loss.
- Maximum Trade Drawdown %.
- Maximum System Drawdown %.
- **CAR/MDD** – Compounded Annual Return divided by Max Draw Down (the higher the better).
Other Back Testing Key Metrics

• Distribution of Returns via a “Frequency Distribution Table”
  • This can be helpful to see where major trades are and where losses are and via analysis, you can possibly extract other key information such as noticing a few huge losses and therefore set a Max $ loss amount.
  • “Outliers”, “Fat Tails”, “Big Trades” - are what push systems into profitability, so they should not be ignored, especially for trending systems. As well, huge loss outliers hurt. They can be analyzed and possibly eliminated with a dollar stop amount or max dollar loss amount via this type of analysis.
Observations
Observations (1)

- The system that uses confirmation performs poorly with a profit exit using a close above a specific moving average.
  - Didn't include EMA exit on Modified System because it wasn't even profitable – may be a problem with the code, I wasn't able to troubleshoot it yet.

- The best systems ranked according to Expectancy $, Profit Factor and CAR (and Pr) appear to be Trend Following (#10, 11) and Swing Trading (#2).
Observations (2)

- System #2 appears to make much more money (Net Profit) because it performs, and, has **many more opportunities** or Total Trades. There may be a rogue trade in the results due to data but it still looks decent.

- System #2 uses a tighter stop and zero confirmation to enter when the RSI becomes oversold.
  - Might be worthwhile re-testing the other systems to remove confirmation and also use tighter stops.

- Review of yearly results shows System #2 had more trades prior to 1993 probably because the other systems use SPY as a filter and SPY didn't start trading until 1993-4.
Observations (3)
Other Comments & Possible Further Study Points

- No scaling out techniques were used in this analysis. Scaling exits may (or may not) improve results. **Scaling is definitely worth investigating but a little harder to program in Amibroker.**

- Looking at the risk of System #1 vs the other Systems, where System #1 only traded the SPY ETF, the risk was much less. Consider trading only ETFs if there are enough “opportunities”, as overnight/gap risk is typically much less than with individual stocks if risk averse.
Conclusions

- Exits greatly impact the profitability and viability of this system... and likely, the profitability of all systems.
- RSI under most different rules and parameters chosen for these tests appears to have a positive expectancy and warrants further investigation as a potentially valid trading or investing approach. Results are not spectacular, but they are consistent and promising.
- RSI 2 used with different profit taking exit approaches can be modeled for shorter term and longer term trading or investing methods.
  - The System appears fairly ROBUST.
- This entire testing process may be used as a template of sorts in modeling if other systems or methods might provide positive expectancy or edge. It provides a way to find out if something may potentially actually work or not.
Cautionary Points
Cautionary Points

- Curve fitting to past data when **optimizing** back-testing inputs – or - “over optimization”.

- **Past market action does not guarantee same results in future. But you are 'betting' that markets behave similarly going forward, they “ryhme”**.

- A small change in inputs totally changing the viability of a trading system (i.e. Sensitivity) is a cautionary note.

- Try not to over-optimize systems.

- Robust systems should generally work over a more diversified set of instruments and using different settings or parameters, so portfolio-level back-testing is also an important consideration.
Any Questions?
Do you have ideas for a potentially valid trading system? Let's program and backtest it! Email me...

Thank You!

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Further Sources of Study

- https://www.youtube.com/watch?v=i_h9P8dqN4Y
- www.tradingmarkets.com
- https://www.youtube.com/watch?v=_DQBFKZ_cic
- https://www.youtube.com/watch?v=3fj76b-OEn0