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## Methodology

[TradingEdge.Pro's](#) methodology describes a multi-step process for building and validating trading strategies, structured into two parts: strategy development and testing, and practical use. In the testing phase, a strategy is defined as a set of objective rules, validated through initial tests, optimised, and assessed for stability (robustness), and then evaluated using Walk-Forward Analysis. The detailed testing assumptions (including the instrument universe, in-sample/out-of-sample periods, data sources, transaction costs, and execution rules) are described in the "[Testing Specification](#)" document. The full methodology and metric definitions are available on the TradingEdge.Pro "[Methodology](#)" page.



# Crash v.1

## Investment Strategy Testing Summary

**Crash strategy** is a **trend reversal investment technique** that uses the **ConnorsRSI** (Relative Strength Index) and **historical volatility** to identify situations in the market where **prices are rising very strongly in a short period of time, causing a run on the money of many market participants**. Despite the prevailing bullish trend in the market, this strategy aims to **identify moments when the price is driven by irrational investor enthusiasm**, which often leads to rapid price declines.

The strategy was tested on **parameters suggested by the strategy creator, Larry Connors**:

- **Historical Volatility Period:** 100 days;
- **Historical Volatility Value:** 100%;
- **ConnorsRSI (CRSI):** RSI Bars (3), Streak Bars (2); Rank Bars (100);
- **Entries ConnorsRSI (CRSI):** 90;
- **Exit ConnorsRSI (CRSI):** 30;
- **Stop loss:** none;
- **Position opening method:** sell limit 1 x ATR(40) away from the previous day's closing price;
- **Position sizes:** corresponding to a risk of 1.0% of total capital, with a hypothetical stop loss order placed 2 x ATR (40 days) away from the position opening position;
- **Position direction:** short positions (sell) only.

Although the strategy is based on **rational assumptions** and tries to use **the sheep-mover effect**, its **effectiveness in real transactions remains questionable**. It has not even passed preliminary tests, which means that it is not recommended for use in real trading.

Our goal is to have a strategy that remains **profitable and effective over a wide range of parameters**, because the market is a changing organism and the optimal parameters can change over different periods. **I cannot emphasize enough that for a strategy to work in real conditions, it must also work on suboptimal parameters and in suboptimal conditions.** In a word - **it must be stable** to changing market conditions.

I don't know who said these words, but they perfectly reflect the problem of many optimizations:

*"I've never seen a strategy that didn't work in backtests."*

**We don't know the future**, we don't know future market conditions, but if we know that our strategy **has historically generated acceptable results** in various market conditions and across various parameter ranges, then we are **one step ahead of other** market participants.



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## Step 1: Formulate an investment strategy

**Crash Strategy** is a **short -selling strategy** invented by Larry Connors that aims **to take advantage of extreme states of greed in the market**. It involves identifying instruments that are **overbought and are likely to reverse their uptrend soon**. Despite the prevailing uptrend in the market, this strategy aims to **identify the moment when the price is driven by irrational investor enthusiasm**, which often leads to rapid price declines.

For the purposes of this test, **short positions on stock indices, bonds, gold and the US dollar index were used**, which allows us to assess the strategy's effectiveness across a broad spectrum of asset classes.

The basic version of the strategy uses:

- **Historical Volatility** – The stock must have a 100-day historical volatility of at least 100%. We focus on the most volatile instruments that are prone to sharp price movements.
- **ConnorsRSI (CRSI) Indicator** – CRSI must be 90 or above at closing, indicating extreme overbought. The parameters for CRSI are: RSI Bars (3), Streak Bars (2); Rank Bars (100).
- **Entering a short position** – we place a sell order with a price limit higher by 3% or 5% than the previous day's closing price. This means that we are waiting for an even greater price increase before entering a short position. **Comment:** since we will be testing the strategy on futures contracts, the price of which may be negative as a result of adjustment for the rollover value, the price limit will be set at a distance of  $1 \times \text{ATR}(40)$ .
- **Exiting a position** – we close the position when the CRSI at closing falls below 30. This indicates a trend reversal and the potential beginning of declines.

**The strategy is simple and is based on specific, defined rules**. However, it requires **a lot of discipline and mental toughness**, because it involves selling instruments that are in a strong upward trend and often enjoy great interest from the media and individual investors.

### Characteristics of the strategy and its strengths and weaknesses:

- **Leveraging Market Psychology** – the strategy relies on investor behaviors such as greed and fear, which can create a market advantage.
- **Clearly Defined Rules** – Specific entry and exit criteria make it easier to implement and automate strategies.
- **High Profit Potential** – short positions in extremely overbought instruments can yield significant profits in a short period of time.
- **High Risk** – Short selling a stock that is rising parabolic carries the risk of potentially unlimited losses if the price continues to rise.
- **Psychological Difficulties** – trading against a strong upward trend and dominant market sentiment requires a lot of mental resilience.
- **Volatility and Liquidity** – high volatility can lead to price slippage and difficulties in executing orders at expected prices.
- **No Unlimited Loss Protection** – potential losses are theoretically unlimited if the price of the instrument continues to rise.



**Crash Strategy** is a tool for traders **wanting to take advantage of irrational market behavior** and extreme states of investor greed. Although it is **simple in concept, it requires a lot of discipline, experience and effective risk management**. Due to the high risk and potentially unlimited losses, **this strategy is recommended mainly for advanced investors** who are aware of its specifics and ready for the psychological challenges associated with trading against the dominant trend.



## Step 2: Define investment principles

Below is the **pseudocode** for the **Crash strategy** on daily charts:

1. **Calculation of Indicators and Criteria:**
  - a. **Historical Volatility:** 100-day historical volatility must be at least 100%.
  - b. **ConnorsRSI (CRSI):** CRSI must close at 90 or above, indicating extreme overbought.
2. **Generating Short Entry Signals:**
  - a. If all of the above conditions are met, get ready to enter a short position.
  - b. The day after the conditions are met, set a short sell order (Sell limit) with a price limit higher by 1 x ATR(40) than the previous day's closing price.
3. **Generating Output Signals:**
  - a. The position is closed when the closing CRSI indicator falls below 30.
  - b. The position is closed at the opening price of the next day.
4. **Loss Management:** The strategy does not specify a specific Stop Loss level.
  - a. **Daily Position Monitoring:** If a position is open, monitor the CRSI indicator daily to see if the exit condition is met. If the exit condition is met, close the position the next day at the open.
5. **Additional Notes:**
  - a. **No Long Positions:** The strategy focuses only on short positions in an uptrend.
  - b. **Financial Instruments:** For the purposes of this test, **short positions on stock indices, bonds, gold and the dollar index were used.**

The above rules have been described in a way that allows them to be directly converted into a script in the chosen testing platform, which ensures the accuracy of the historical simulation and the reliability of the test results.

Tests are performed assuming that **the risk of one position is 1.0% of the total capital, with a hypothetical stop loss order located 2 x ATR (40 days) away from the position opening point.**



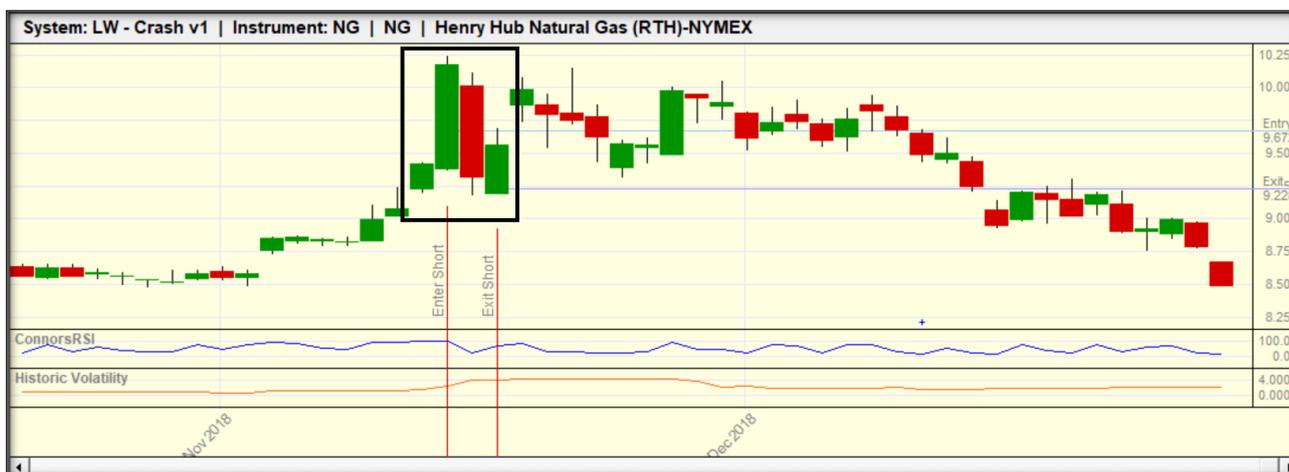
### Step 3: Conduct a preliminary test of the investment strategy

Below are some purchase and sale transactions that allow you to verify the following aspects:

- **Correctness of generated signals;**
- **Direction of opening position;**
- **Moment of opening a position;**
- **Position opening price;**
- **Moment of closing the position;**
- **Closing price of the position;**
- **Compliance of the transaction with the theoretical assumptions of the investment strategy.**

At this stage **it does not matter** whether the transactions are **profitable**, what **instrument was used** or whether they took place **recently** or **in the distant past**. The key is **to check whether the transactions are generated correctly** and in accordance with the assumptions described in the previous step.

The first transaction is on a **natural gas futures contract**. In mid-November 2018, **gas prices rose significantly**, meeting the conditions for opening a position (first candle in the rectangle; **CRSI > 90; Historical volatility > 100%**). **The next day (second candle in the rectangle), a sell limit order** was set at a distance of **1 x ATR** from the **previous day's closing price**. The order was activated and the candle that day makes a very big impression. **The next day (third candle in the rectangle), we have a strong drop in price**, which translates into a **drop in the CRSI indicator below 30**. This is therefore a **signal to close the position**, so we close it the next day at the opening (fourth candle in the rectangle). **The system worked correctly.**



Another example, this time closed with a large loss. At the end of June 2017, **wheat prices rose significantly**, meeting the conditions for opening a position (first candle in the rectangle; **CRSI > 90; Historical volatility > 100%**). **The next day (second candle in the rectangle), a sell limit order** was set, distant from the previous day's closing price by **1 x ATR**. The order was activated, **but prices rose for the next two days**. It was not until the next day (fifth candle in the rectangle) that we see a drop in price, which translates into a **drop in the CRSI below 30**. This is therefore a signal to close the position, so we close it the next day at the opening (sixth candle in the rectangle). **The system worked correctly.**



Once we are sure that the transactions are generated correctly, we can proceed to the first test of the strategy on the full **in-sample data set**. These tests are conducted on **the basic parameters** that were **proposed by the creator, Larry Connors**.

First of all, **we reject strategies that linearly lose capital**. If a strategy exhibits such a pattern, it is a clear signal that any parameter optimization does not make sense.

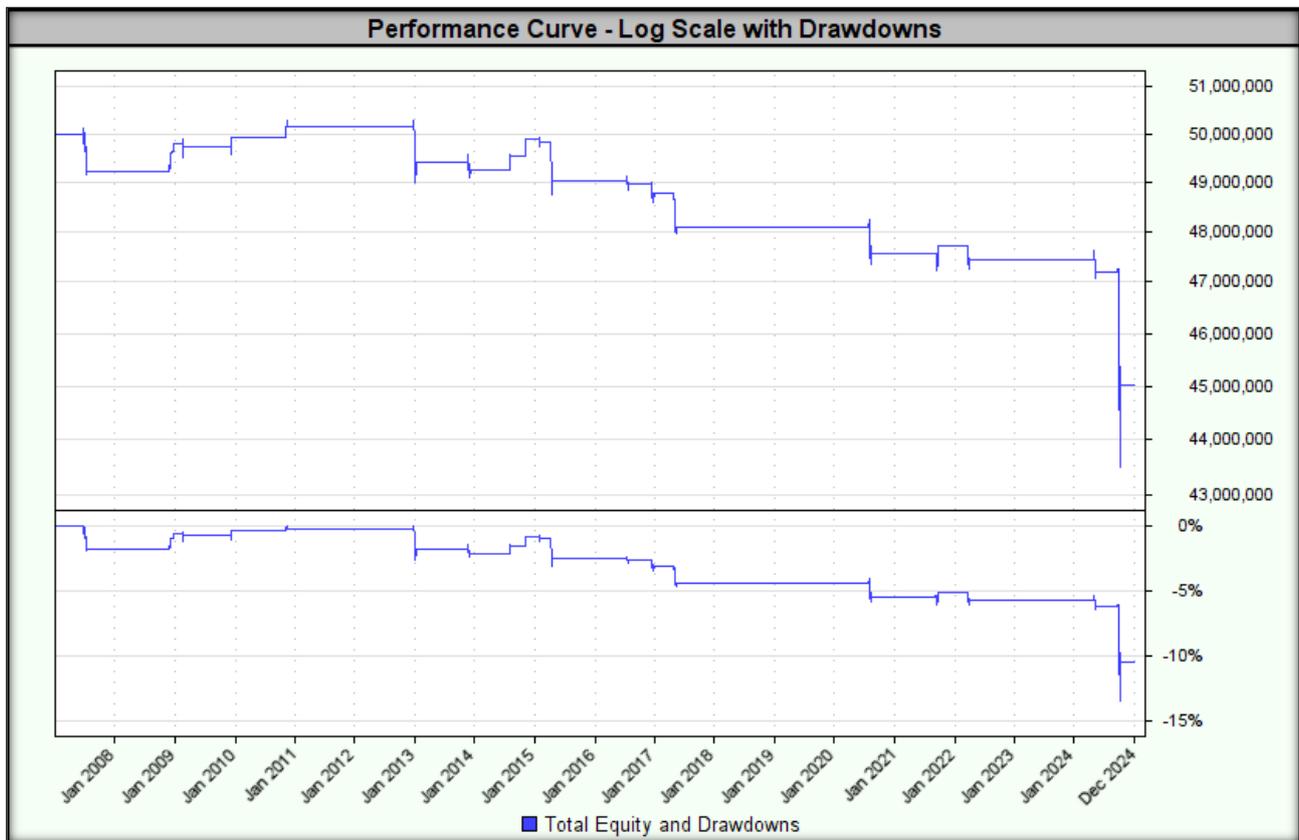
Our basic expectation is that the strategy generates **positive results**, even if they are at a low level.

Tested base parameters:

- **Historical Volatility Period:** 100 days;
- **Historical Volatility Value:** 100%;
- **ConnorsRSI (CRSI):** RSI Bars (3), Streak Bars (2); Rank Bars (100);
- **Entries ConnorsRSI (CRSI):** 90;
- **Exit ConnorsRSI (CRSI):** 30;
- **Stop loss:** none;
- **Position opening method:** sell limit 1 x ATR(40) away from the previous day's closing price;
- **Position sizes:** corresponding to a risk of 1.0% of total capital, with a hypothetical stop loss order placed 2 x ATR (40 days) away from the position opening position;
- **Position direction:** short positions (sell) only.

The test result is shown below.

*Historical or simulated results do not guarantee that similar outcomes will be achieved in the future.*



Indicators/Measures	Concluding a transaction at the opening price
CAGR%	-0.58%
MAR Ratio	-0.04
RAR%	-0.38%
R- Cubed	-0.04
Robust Sharpe Ratio	-0.27
Max Drawdown	13.5%
Wins	35.0%
Losses	65.0%
Average Win%	0.52%
Average Loss %	1.07%
Win/ Loss Ratio	0.49
Average Trade Duration (days)	12
Percent Profit Factor	0.26
SQN	-
Number of transactions	20

In summary, the system works properly and generates signals as expected. However, **tests on basic parameters have yielded poor results**. Therefore, **further testing of the strategy is not justified**, because its use in real transactions is **highly questionable**.



## Step 4: Optimization and assessment of investment strategy stability

1. **Stability across a wide range of optimized parameters**

The step was skipped due to failure of previous tests.

2. **Monte Carlo simulation**

The step was skipped due to failure of previous tests.

3. **Stability over a moving time window**

The step was skipped due to failure of previous tests.

4. **Stability long/short**

The step was skipped due to failure of previous tests.

5. **Stability in the portfolio of financial instruments**

The step was skipped due to failure of previous tests.

6. **Money Management (Position Sizing)**

The step was skipped due to failure of previous tests.

7. **Strategy Risk Management**

The step was skipped due to failure of previous tests.



## Step 5: Walk Forward Analysis

The step was skipped due to failure of previous tests.



## Step 6: Using the strategy in real time

The step was skipped due to failure of previous tests.