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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.

Boomerangs v. 2

Investment Strategy Testing Summary

The Boomerangs v.2 strategy is a short-term **trend-reversal** system that utilizes the "breakout trap" phenomenon, but also filters signals using **volume.** In the classic setup, the market is in **a dominant trend and establishes a new, multi-session high** (e.g., 100-day). It then transitions into **a multi-day consolidation,** attracting participants expecting a continuation. When a candlestick breaks **a new high/low consistent with the trend,** the system doesn't join the breakout but **prepares a trade in the opposite direction** —assuming that some breakouts end in an immediate reversal and a move in the opposite direction. In version v.2, an additional requirement is that **the volume of the breakout candle be lower by a specified percentage than the volume of the candlestick forming the consolidation high,** which is intended to suggest weakening market engagement and reduced credibility of the breakout. The entry is executed with a stop order below/above the extreme of the breakout candle and is active for several days, while the exit is short-term (time-exit).

Although the strategy is based on **rational assumptions** and attempts to exploit **the stock market effect,** its **effectiveness in real-world trading remains questionable.** It has not even passed **preliminary testing,** meaning **it is not recommended for use in real-world trading.**

Our goal is to have a strategy that remains **profitable and effective across a wide range of parameters,** because the market is a volatile organism, and optimal parameters can change over time. **I can't** emphasize enough that for **a strategy to work** in real-world conditions, it must also perform under **suboptimal parameters** and **conditions.** In short, **it must be stable** to changing market conditions.

I don't know who said these words, but they perfectly capture 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

The Boomerangs v.2 strategy identifies markets that **are trending** and have reached a **new price extreme (e.g., 100 sessions). This stage confirms that the instrument is on market participants' radar and that a clear trend has been dominant** recently. After such an extreme is established, the market **often enters a consolidation phase** – several or a dozen sessions with a relatively narrow range compared to the previous impulse. This is a typical environment in which **the number of orders awaiting a breakout and continuation of the trend increases.**

A key element of the strategy is the assumption that **some breakouts from narrow consolidations do not lead to continuation, but rather generate a "trap" movement:** the price breaks out, triggers breakout orders, then returns to the range and begins a pullback. **The strategy doesn't attempt to predict this pullback at the moment of the breakout itself** – instead, it uses the candle breaking out of the consolidation as a reference candle, entering only when the market shows real weakness/strength through a breakout of the opposite extreme of that candle. In version v.2, **lower volume on the breakout candle relative to the candle that previously established the high/low of the consolidation is used as additional confirmation of the breakout's weakness.** This means that the market technically breaks out, but does so with less market participation, increasing the likelihood of a quick pullback.

For **a short position,** a setup is created when:

- the market is in **an upward trend** and is setting a new **multi-session high,**
- then **consolidates,**
- **a candle appears breaking upwards** in line with the trend,
- **the volume of this candle is lower by the Threshold value** than the volume of the candle forming the high of the consolidation,
- after which the system sets **a sell stop order below the low of the breakout candle** to enter only when the breakout starts to reverse.

For **a long position,** the conditions are mirrored:

- the market is in **a downtrend** and is setting a new **multi-session low,**
- then **consolidates,**
- **a candle appears breaking down** in line with the trend,
- **the volume of this candle is lower by the Threshold value** than the volume of the candle forming the low of the consolidation,
- after which the system sets **a buy stop order above the high of the breakout candle** to enter only when the breakout starts to reverse.

Entry doesn't occur "at the close of the signal day." Instead, the strategy forces **direction confirmation:** after a breakout signal, we set a stop order at the breakout extreme of the signal candle (for shorts: below its low, for longs: above its high). This ensures **that the position is activated only when the market actually begins to move in the direction of the negated breakout.**

The strategy uses:

- **Trend and extremum context** – the market creates a new, multi-session high/low earlier (e.g. 100 sessions);
- **Consolidation** – a period of stabilization of several days after the establishment of an extreme;
- **Breakout candle** – a breakout from consolidation in the direction of the trend, treated as a reference candle;
- **Volume filter** – the volume of the breakout candle is lower than the volume of the candle forming the consolidation extreme by a set percentage threshold;
- **Trigger stop T+1** – entry only after breaking the minimum/maximum of the signal candle;
- **Initial stop on the signal candle** – risk defined on the opposite side of the setup;
- **Time-exit** – short horizon of maintaining the position (5 days).

Characteristics of the strategy and its strengths and weaknesses:

- **the Donchian filter** limits trading in the middle of the range and forces an "extreme" context;
- uses the common **"breakout trap" mechanism** after a narrow consolidation;
- **entry after confirmation** (breakout of the opposite extreme of the breakout candle) limits some hasty transactions;
- **an additional volume filter** improves selectivity and eliminates some of the strong, "healthy" breakouts;
- **a narrow, single-candle stop** simplifies risk control;
- **short horizon (time-exit)** limits long-term exposure to the market;
- **the volume filter may reduce the number of signals,** but at the same time cause you to miss some good opportunities;
- **The strategy is market dependent:** it works best where false breakouts and quick pullbacks are common.

The Boomerangs v.2 strategy utilizes breakout traps following a trend and narrow consolidation, but reinforces the setup with a weakening volume filter. Despite its simple logic, it requires **strict discipline and risk control,** as the trades are counter-productive to the breakout candle and are prone to gaps and quick reversals. Due to the specific nature of the setup and the operational risks, the strategy is best suited for investors who understand its profile (less frequent signals, possible quick reversals, volatile results) and can maintain consistency in conditions of increased volatility.

Step 2: Determine investment principles

Below is **the pseudocode** for the **Boomerangs v.2 strategy** on daily charts:

1. **Calculating Indicators:**
    a. **HighestHigh(XX)** – the highest high of the last XX sessions (Donchian channel);
    b. **LowestLow(XX)** – the lowest low of the last XX sessions (Donchian channel);
    c. **MaxConsolidation(Y)** – the condition that the market moves in a relatively narrow range for the maximum number of sessions (Y);
    d. **MinConsolidation(W)** – the condition that the market moves in a relatively narrow range for a minimum number of sessions (W);
    e. **ValidBars(V)** – number of sessions (V) for which the entry order remains active;
    f. **ExitBars(Z)** – number of sessions (Z) to maintain the position (time exit);
    g. **VolumeThreshold(T)** – the minimum percentage difference in volume between the breakout candle and the candle forming the consolidation extreme.
2. **Setup Identification – Short Position (sell setup):**
    a. **Extreme:** market has established HighestHigh(XX) (new multi-session high);
    b. **Consolidation:** After establishing a high, the market consolidates in a narrow range for at least W and no more than Y sessions;
    c. **Breakout candle:** after consolidation, a bullish candle appears, which breaks out of the consolidation range at the top (continuation in line with the uptrend);
    d. **Volume filter:** the volume of the breakout candle is lower, at least by **T%,** than the volume of the candle forming the high of the consolidation.
3. **Entry – Short Position:**
    a. **Order:** after the setup occurs, set a sell stop order for the next session one tick below the minimum (low) of the breakout candle;
    b. **Order validity:** the order remains active for V sessions; if it is not activated, it is canceled;
    c. **Initial stop:** set a stop loss one tick above the high of the breakout candle;
    d. **Volume filter:** the volume of the breakout candle is lower, at least by **T%,** than the volume of the candle forming the low of the consolidation.
4. **Setup Identification – Long Position (buy setup):**
    a. **Extreme:** market sets LowestLow(XX) (new multi-session low);
    b. **Consolidation:** After establishing a low, the market consolidates within a narrow range for at least W and no more than Y sessions;
    c. **Candle breakout:** after consolidation, a bearish candle appears, which breaks out from the consolidation range at the bottom (continuation in line with the downward trend).
5. **Entry – Long Position:**
    a. **Order:** after the setup occurs, set a buy stop order for the next session one tick above the high of the breakout candle;
    b. **Order validity:** the order remains active for V sessions; if it is not activated, it is canceled;
    c. **Initial Stop:** Set your stop loss one tick below the low of the breakout candle.

6. **Closing a position:**
    a. **Timed exit:** if stop loss has not been activated earlier, close the position at the opening of the session after Z sessions have passed since the entry date;
    b. **Stop Exit:** If the market touches the stop loss level, close the position as per the defensive order.
7. **Daily Monitoring:**
    a. Every day update HighestHigh(XX), LowestLow(XX) and consolidation range (MinConsolidation(W)/MaxConsolidation(Y));
    b. The system detects long/short setups, checks the volume filter, sets sell stop/buy stop orders for the next sessions (valid for V days), and for open positions runs a counter to ExitBars(Z) and controls the activation of stop loss.

The above rules are 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.

Testing is performed assuming that **the risk of one position is 1.0% of total capital.**

Step 3: Pre-test your investment strategy

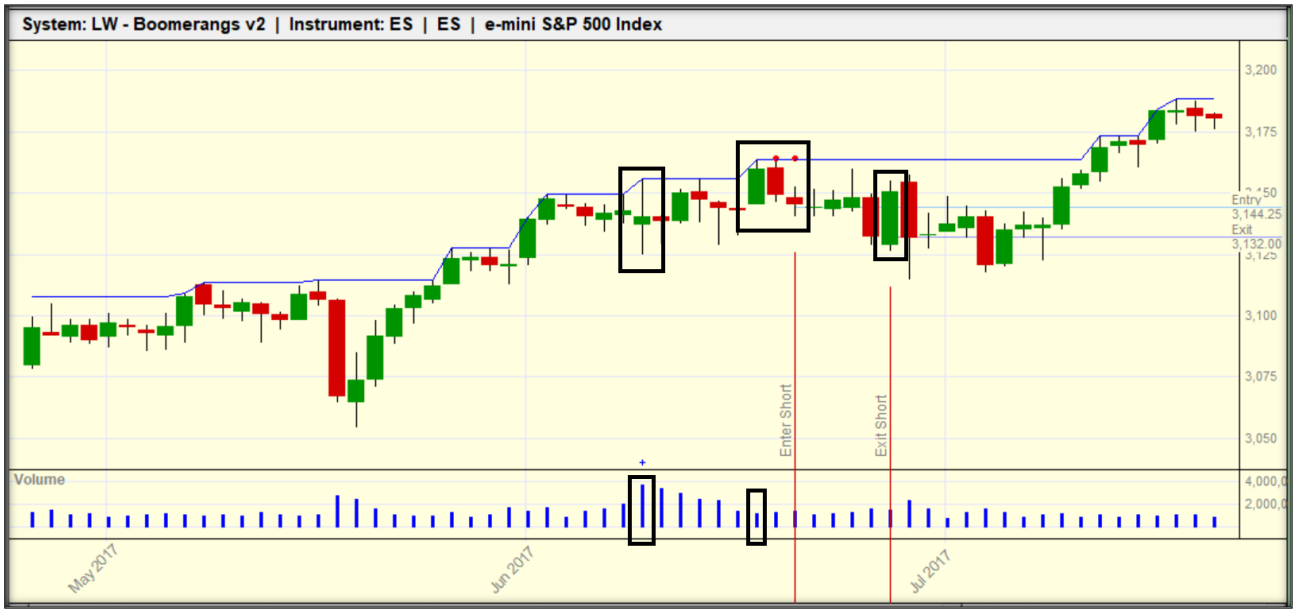
Below are some purchase and sale transactions that allow you to verify the following aspects:

- **Correctness of generated signals;**
- **Direction of opening a position;**
- **Moment of opening the position;**
- **The opening price of the position;**
- **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 doesn't matter** whether the trades are **profitable,** what **instrument was used,** or whether they occurred **recently** or **in the distant past.** The key is **to verify that the trades are generated correctly** and in line with the assumptions described in the previous step.

In early June 2017, **S&P 500 futures** established **a new 100-day high** on relatively **high volume** (first rectangle). The market then traded within a relatively narrow range (consolidation) for several sessions. This was followed by **another upside breakout candle** (second rectangle), but this time **the volume of this candle was at least 20% lower** than the volume of the candle that had previously established the 100-day high, which met an additional condition of the Boomerangs v.2 strategy and **triggered a short position setup.**

For the next session, **a sell stop was set one tick below the low of this breakout candle.** The order was not activated on the first day because the market did not break its low, and only on **the second day after the signal was generated was a short position opened** ("Enter Short" line). **The stop loss was set one tick above the high of the breakout candle.** Because the stop loss remained unbroken for the next five sessions, **the position was closed according to the time-exit rule** – at the open of day 6 (third rectangle, "Exit Short" line). **The system worked correctly.**



One more example. The trade was conducted on a **coffee futures contract.** At the end of November 2012, the coffee market established **a new 100-day low** (first rectangle), accompanied by **relatively higher volume. Then, a few days later, another downward breakout** occurred (second rectangle), but this time **the volume was significantly lower than at the previous low,** which met the additional condition of the Boomerangs v.2 strategy for a long position.

For the next session, **a buy stop was set one tick above the high of the breakout candle.** The order was **activated the next day, opening a long position** (the "Enter Long" line). **The stop loss was set one tick below the low of the breakout candle.** In the following days, the market failed to develop the expected rebound, and **after several sessions, the stop loss was activated, closing the position at a loss** (the "Exit Long" line). **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 performed on **the basic parameters,** which – according to my assessment – should correspond to the assumed goals of the strategy.

First, **we reject strategies that linearly lose capital.** If a strategy exhibits this pattern, it's a clear signal that any parameter optimization is pointless.

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

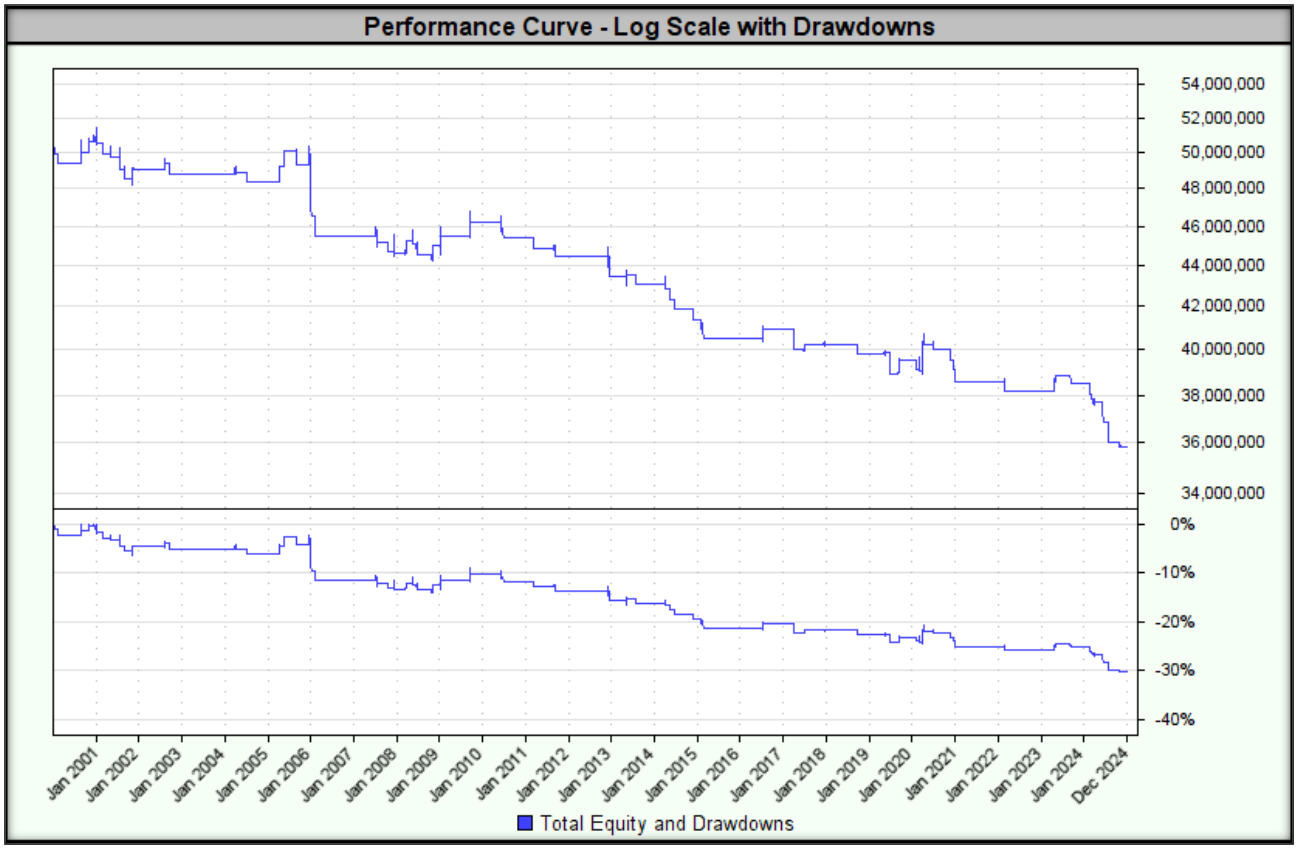
Tested base parameters:

- **HighestHigh & LowestLow:** 100 days;
- **MaxConsolidation:** 15 days;
- **MinConsolidation:** 5 days;
- **ValidBars:** 3 days;
- **ExitBars:** 5 days;
- **VolumeThreshold:** 20%;

- **Position opening method:** 1 tick below (for a short position)/above (for a long position) the extreme of the breakout candle;
- **Stop loss:** 1 tick above (for short position)/below (for long position) the extreme of the breakout candle;
- **Position Size:** Fixed Fractional; Risk Equity 1.0% of total capital;
- **Position direction:** long (buy) and short (sell) positions.

The test result is shown below.

Historical or simulated results do not guarantee similar results in the future.



Historical or simulated results do not guarantee similar results in the future.

Indicators/Measures	Concluding a transaction at the opening price
CAGR%	-1.33%
MAR Ratio	-0.04
RAR%	-1.25%
R-Cubed	-0.04
Robust Sharpe Ratio	-0.56
Max Drawdown	30.3%
Wins	32.2%
Losses	67.8%
Average Win%	1.05%

Average Loss%	1.05%
Win/Loss Ratio	1.00
Average Trade Duration (days)	5
Percent Profit Factor	0.47
SQN	-
Number of transactions	87

In summary, the system works properly and generates signals as expected. However, **tests on the underlying parameters yielded poor results.** Therefore, **further testing of the strategy is not warranted,** as its use in real-world trading **is highly questionable.**

Step 4: Optimizing and assessing the stability of the investment strategy

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. **Long/short stability**

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.**