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The author may hold positions in the instruments discussed or may apply a similar approach in practice. The information contained in the reports may change without prior notice.

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.

Expansion Range Double Sticks v.1

Investment Strategy Testing Summary

Expansion Range Double Sticks Strategy **(ERDS) v.1** is a short-term **reversal** technique that utilizes **a sequence of two consecutive candles with increased volatility** ("double sticks "). In the first step, the market forms a candle in the direction of the trend near **a local extreme** (the highest high or lowest low in the last 100 sessions) and at the same time, it is a candle with a relatively wide range. Then, a second candle appears – **opposite in direction,** also with an above-average range – which is interpreted as a signal of a possible short-term "overload" of the movement and **a readiness for a correction.** Entry is executed only after confirmation by price movement: **the position is opened with a stop order on the breakout of the low/high of the signal candle.** Risk is defined by a narrow, single-candle stop on the opposite side of the signal candle, and exit occurs with a pre-defined **time-exit** or earlier on the stop.

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

Expansion Range Double Sticks Strategy **(ERDS) v.1** it looks for moments when the market quickly transitions from a strong impulse phase to a phase of rapid sentiment change. Its core is **a two-day candlestick pattern,** where both sessions are range-bound (high-low) compared to recent days, but the second candlestick is **a reversal of direction** relative to the first. This sequence often occurs when the market "stretches" volatility: **first, it accelerates toward an extreme** (the first candlestick), **followed immediately by a strong reaction in the opposite direction** (the second candlestick). From a market mechanics perspective, this can mean profit-taking after an impulsive move, aggressive closing of positions by latecomers, and the emergence of counter-orders, which promotes **a multi-session correction.**

In practice, the strategy builds context in the following way:

- **Day 1 (setup):** the candle is directional and falls at **a local extreme** (for a short: yesterday's high is the highest in 100 days; for a long: yesterday's low is the lowest in 100 days). Additionally, the Day 1 candle must have a distinctive range relative to the last 10 sessions.
- **Day 2 (signal):** the candle changes direction (for short: a bearish candle after a bullish one; for long: a bullish candle after a bearish one) and must also have **an above-average range** compared to the last 10 sessions.
- **Entry** takes place only after confirmation: the position opens when the market breaks **the minimum (for short)** or **maximum (for long)** of the day 2 candle, which forces the market to continue in the direction of the assumed reversal.

The strategy uses:

- **Price extreme** – the day 1 candle must establish a local high/low within the 100-day window;
- **Double range expansion** – both the Day 1 and Day 2 candles must be relatively wide relative to the last 10 sessions;
- **Volatility + Reversal** – Day 2 is a directionally opposite candle to Day 1, which creates a logical context of “exhaustion”;
- **Price trigger** – entry via a stop order on the breakout of the extreme of the candle of day 2;
- **Simple risk** – stop loss on the opposite side of the day 2 candle;
- **Timed exit** – a position that closes after a specified number of sessions if the stop does not trigger earlier.

Characteristics of the strategy and its strengths and weaknesses:

- **High selectivity** – the signal requires both an extreme and two candles with an increased range;
- **reversal logic** – the strategy naturally targets corrections after a “congested” movement;
- **Clear, repeatable rules** – easy to test and automate on daily data;
- **Narrow, technical stop** – initial risk is clearly defined with one candle;
- **Risk of trend continuation** – in strong trends, day 2 is only a short pause and the market may return to the direction of day 1, breaking the stop;
- **Sensitivity to price gaps** – stop entries/exits can generate slippage;

Expansion Range Double Sticks Strategy **(ERDS) v.1** It's a tool for traders who want to capitalize on **sudden supply-demand imbalances** and **extreme price impulses** that occur after periods of strong trends. While its premise is simple, effective use requires **disciplined rule execution,** consistent **risk management,** and an awareness that trades are executed **against the prevailing trend.** Due to the specific setup and 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 Expansion Range Double Sticks (ERDS) v.1 strategy** on daily charts:

1. **Calculating Indicators:**
    a. **HighestHigh (XX)** – the highest high of the last XX sessions (including yesterday's);
    b. **LowestLow (XX)** – the lowest low of the last XX sessions (including yesterday's);
    c. **LargestRange (Y)** – information whether the daily range (high– low) of a given session is the largest compared to the last Y sessions;
    d. **ExitBars (Z)** – number of sessions to hold the position (timed exit);
2. **Identifying the Double Sticks sequence – prerequisites:**
    a. **Day 1 (yesterday)** – directional candle at the extreme:
        i. **for a short position:** yesterday's high is the highest of the XX days and yesterday's candle is bullish;
        ii. **for a long position:** yesterday's low is the lowest of the 20 days and yesterday's candle is bearish.
    b. **Day 1 (yesterday)** – range expansion: yesterday's candle range is one of the largest in relation to the last Y sessions.
    c. **Day 2 (today)** – opposite direction candle:
        i. **For short:** today's candle is bearish;
        ii. **For long:** today's candle is bullish.
    d. **Day 2 (today)** – range expansion: today's candle range is one of the largest in the last Y sessions.
3. **Generating Entry Signals – Short Position:**
    a. short are met, then for the next session set a sell stop order one tick below the minimum (low) of today's candle (day 2).
    b. The order only activates the position when the market actually breaks down below the low of the signal candle.
4. **Generating Entry Signals – Long Position:**
    a. long are met, then for the next session set a buy stop order one tick above the maximum (high) of today's candle (day 2).
    b. The order only activates the position when the market actually breaks above the high of the signal candle.
5. **Loss Management:**
    a. **Short position:** set stop loss one tick above the high of the signal candle (day 2).
    b. **Long position:** set stop loss one tick below the low of the signal candle (day 2).
6. **Generating Output Signals:**
    a. **Timed exit:** if the stop loss has not been activated earlier, close the position at the opening of the session falling after Z sessions from the entry date.
    b. **Stop Exit:** If the market reaches the stop loss level, close the position according to that order.
7. **Daily Monitoring:**
    a. Every day, check if yesterday's candle meets the conditions of day 1 and if today's candle meets the conditions of day 2 (direction + range expansion).

b. When the conditions are met, set an appropriate buy stop or sell stop order for the next day and prepare a stop loss order on the opposite side of the signal candle.

c. For active positions, run a session counter to ExitBars and enforce a timed exit if the stop has not been violated.

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

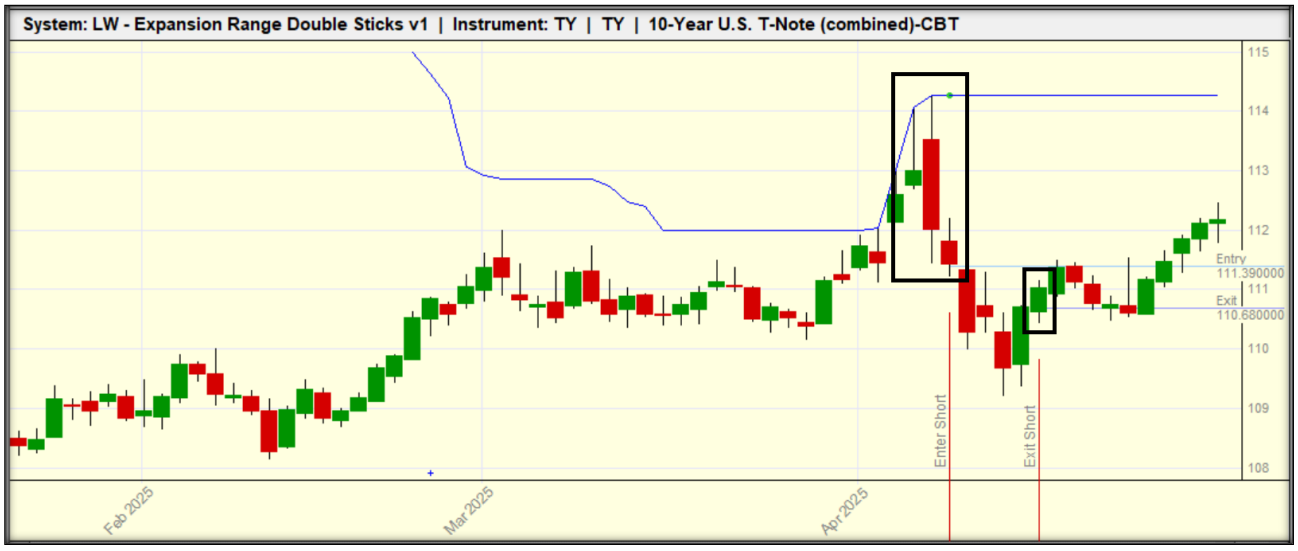
Below are some purchase and sale transactions that allow you to verify the following aspects:

- **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.

The first transaction was conducted on a **10-year US Treasury bond futures contract (TY).** In early April 2025, **the Day 1 candle** (the first candle in the large rectangle) appeared, which was a bullish candle, established a local high in the **Donchian window (100)** and at the same time had **the largest daily range (high– low) of the last 5 sessions.** The next day, the market formed **the Day 2 candle** (the second candle in the large rectangle) – a bearish candle, also with the largest range of the last 5 sessions, which **fully met the "double sticks" formation condition for a short position.**

After confirmation of the trade, the system placed a **sell stop order one tick below the low of the Day 2 candle.** The order was activated the next day, which opened a short position (third candle – the "Enter Short" line). The **initial stop loss was set one tick above the high of the Day 2 candle** (the green dot above the opening day), in accordance with the stop rule on the opposite side of the signal candle. The position was then **held according to the timed exit rule:** if the stop was not violated earlier, the trade is closed after 5 trading sessions from entry. In this case, the position was closed at the open of Day 6 (the small rectangle – the "Exit Short" line). **The system worked properly.**



One more example. The transaction was made on a **natural gas futures contract (Henry Hub Natural Gas, NG).** In early April 2023, **a candle appeared Day 1** (the first candle in the left rectangle), which established **a local extreme in the Donchian window (100)** and simultaneously had **the largest daily range (high– low) of the last 5 sessions.** The next day, the market formed **Day 2** (the second candle in the right rectangle) – a candle with the opposite direction to Day 1, also being the largest candle in the last 5 sessions, **which met the "double sticks" formation condition for a long position.**

After confirmation of the trade, the system placed a **buy stop order one tick above the high of the Day 2 candle.** The order was activated the next day, which opened a long position (the "Enter Long" line). The initial **stop loss was set one tick below the low of the Day 2 candle,** in accordance with the stop rule on the opposite side of the signal candle. The position was then held **according to the timed exit rule:** if the stop was not violated earlier, the trade is closed after 5 trading sessions from entry. In this case, the position was closed with a defensive stop loss order (the "Exit Long" line). **The system worked properly.**

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.

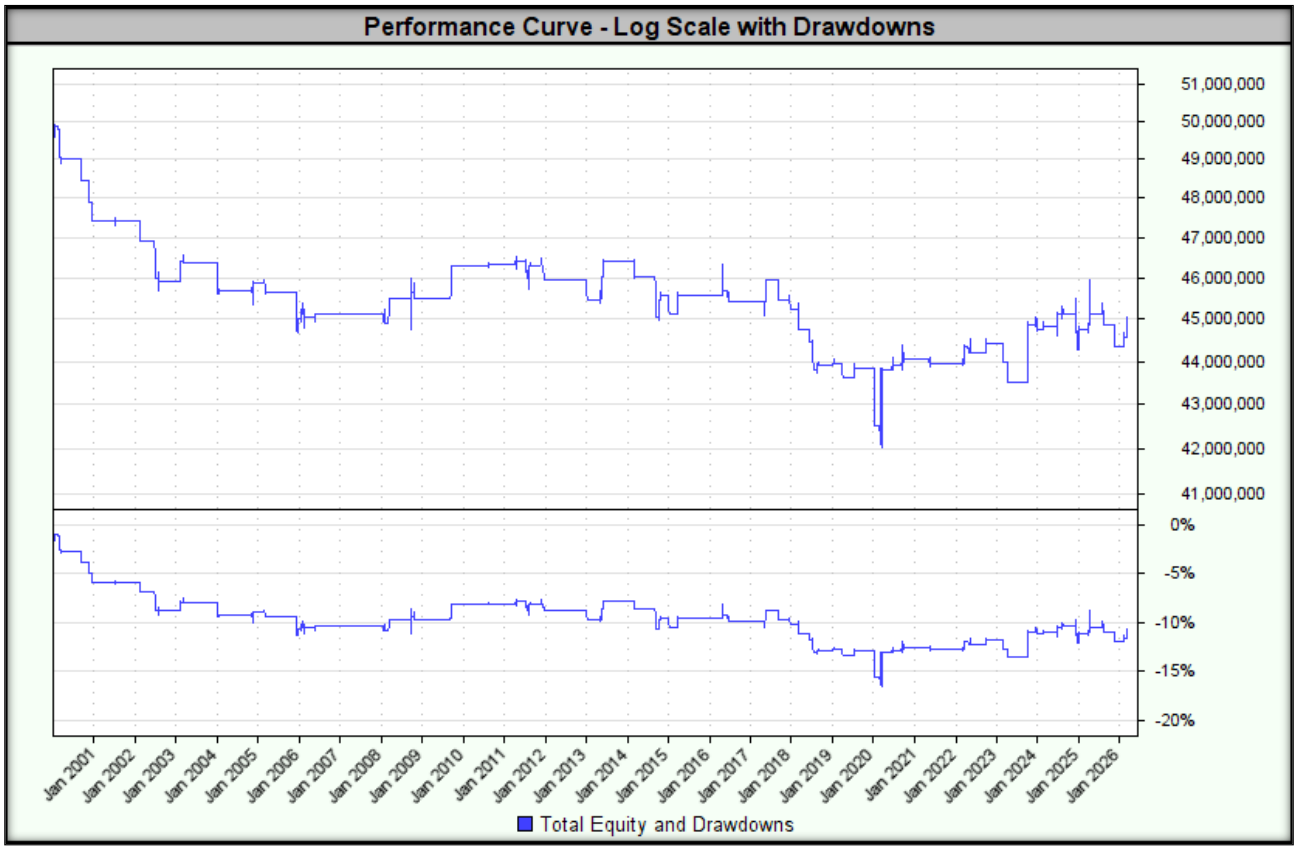
Our basic expectation is that the strategy generates **positive results,** even if they are at a low level.

Tested base parameters:

- **HighestHigh & LowestLow:** 100 days
- **LargestRange:** 10 days;
- **ExitBars:** 5 days;
- **Position opening method:** 1 tick below (for a short position)/above (for a long position) the extreme of the candle of day 2;
- **Stop loss:** 1 tick above (for a short position)/below (for a long position) the extreme of the candle of day 2;
- **Item 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%	-0.43%
MAR Ratio	-0.03
RAR%	-0.25%
R-Cubed	-0.01
Robust Sharpe Ratio	-0.14
Max Drawdown	16.5%
Wins	46.5%
Losses	53.5%
Average Win%	0.62%
Average Loss%	0.71%
Win/Loss Ratio	0.87
Average Trade Duration (days)	6
Percent Profit Factor	0.75
SQN	-
Number of transactions	114

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.**