



Predictive Relationship: True Strength Index

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1 Trading Strategy Description

The True Strength Index (TSI) is a momentum indicator used to identify overbought and oversold signals. It can also be used to indicate trend reversals using bullish and bearish crossover of the signal line and TSI line.

2 How to Trade

In order to trade with the rules InferTrade provides, we calculate allocations for each day. We then allocate that fraction of our total portfolio value (cash and securities) to the market we are trading - to do this we buy or sell securities to reach the target allocation.

How Allocation Determines Trade Size

The allocation is the fractional amount of the portfolios value used to determine the size of the trading position. For example, if the allocation for Microsoft (MSFT) shares is 50%, and we have \$100, we invest \$50 so that the value of held stock is the same as the value of held cash.

Rule Specific Trading Details

The strategy is to identify the oversold and overbought markets and a momentum indicator.

Bullish Momentum: when the TSI line cross above signal line.

Bearish Momentum: when signal line cross above TSI line

3 Rule Parameters

Below is a table summarizing the parameters specific to this trading rule.

Parameter Name	Default Value	Description	Symbol
Window size for Exponential moving average	25	This is the number of time steps over which exponential contributions are sourced.	L
Window size for Exponential moving average	13	This is the number of time steps over which exponential contributions are sourced for smoothed momentum.	L_s
Smoothing Factor	2	Smoothing factor represents the weighting applied to the most recent period's value.	S

4 Equation

$$\Delta p_t = p_t - p_{t-1} \quad (1)$$

$$EMA(\Delta p_t, S, L) = \left(\Delta p_t * \left(\frac{S}{1+L} \right) \right) + EMA_{t-1} * \left(1 - \frac{S}{1+L} \right) \quad (2)$$

$$EMA(|\Delta p_t|, S, L) = \left(|\Delta p_t| * \left(\frac{S}{1+L} \right) \right) + EMA_{t-1} * \left(1 - \frac{S}{1+L} \right) \quad (3)$$

$$TSI = 100 \times \frac{EMA(EMA(\Delta p_t, S, L), S, L_s)}{EMA(EMA(|\Delta p_t|, S, L), S, L_s)} \quad (4)$$

where:

TSI is True Strength Index.

EMA is exponentially weighted moving average.

p_t is current stock value.

Δp_t is change in stock value.

$|\Delta p_t|$ is absolute change in stock value.

L is look back length.

L_s is look back length for smoothed momentum.

S is the smoothing factor.

5 Glossary

- **Bullish:** Positive outlook on the market. Expectation of positive returns.
- **Bearish:** Negative outlook on the market. Expectation of negative returns.
- **Allocation:** The allocation is the fractional amount of the portfolios value used to determine the size of the trading position.
- **Parameter:** Value used by the trading rule in the calculation for trading position
- **Trading Rule:** Strategy to determine when to buy, hold or sell a position.

Further Links

1. InferTrade: <https://www.infertrade.com>
2. Privacy Policy/Legal notice: <https://www.infertrade.com/privacy-policy>
3. InferStat Ltd: <https://www.inferstat.com>