Predictive Relationship: Exponential Trading Rule - Two factor

Contents

1 Trading Strategy Description

These representations have the position dependent on an exponentially weighted average of the prior values of research and price. The lookback length, L, determines how far back the rule looks. The decay rates, ϕ_1 and ϕ_2, and amplitudes, κ_1 and κ_2, coefficients determine the contribution from each exponential. The expression is normalised to be dimensionless by division by the weighting factors and current price.

2 Rule Parameters

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

Parameter Name	Default Value	Description	Symbol
Window size	10	This is the number of time steps over which exponential contributions are sourced.	L
1^{st} Exponential decay rate for price	0.0	This is the 1^{st} decay factor that reduces older contributions from the price series.	ϕ_1^p
1^{st} Exponential decay rate for research	0.0	This is the 1^{st} decay factor that reduces older contributions from the research series.	ϕ_1^r
Amplitude of price 1^{st} contribution	-0.1	This factor scales the 1^{st} contribution from past values of price.	κ_1^p
Amplitude of research 1^{st} contribution	0.1	This factor scales the 1^{st} contribution from past values of research.	κ_1^r
2^{nd} Exponential decay rate for price	0.0	This is the 2^{nd} decay factor that reduces older contributions from the price series.	ϕ_2^p
2^{nd} Exponential decay rate for research	0.0	This is the 2^{nd} decay factor that reduces older contributions from the research series.	ϕ_2^r
Amplitude of 2^{nd} price contribution	-0.1	This factor scales the 2^{nd} contribution from past values of price.	κ_2^p
Amplitude of 2^{nd} research contribution	0.1	This factor scales the 2^{nd} contribution from past values of research.	κ_2^r

3 Equation

$$\lambda^p(n,m) = \sum_{l=1}^{m} e^{-\frac{n}{e^{-\phi_l^p}}} \tag{1}$$

$$\lambda^r(n,m) = \sum_{l=1}^{m} e^{-\frac{n}{e^{-\phi_l^r}}} \tag{2}$$

$$\Lambda_{mp} = \kappa_m^p \frac{\sum_{n=0}^{L} p_{t-n} \lambda^p(n,m)}{\sum_{n=0}^{L} \lambda^p(n,m)} \tag{3}$$

$$\Lambda_{mr} = \kappa_m^r \frac{\sum_{n=0}^{L} r_{t-n} \lambda^r(n,m)}{\sum_{n=0}^{L} \lambda^r(n,m)} \tag{4}$$

$$z_t = (\Lambda_{1p} + \Lambda_{1r} + \Lambda_{2p} + \Lambda_{2r})/p_t \tag{5}$$

where p_t is the price at time t, r is the value of the research series, κ_1 and κ_2 are the amplitude coefficients, ϕ_1 and ϕ_2 are the decay rate coefficients and z is the resultant fractional portfolio investment.
Intuitively, the λ are the exponential weightings for each historical value in the lookback period, with Λ the normalised sum of all the contributions, scaled by the amplitude coefficient. The total contributions are then scaled by the current price to give a dimensionless fraction of the portfolio to invest.

4 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`