Table of Contents

Idea Generation

1. Types of Strategies 2
2. Types of Bars 2
3. Time Frame, Strategy Basis 3

Articulating Ideas

1. Coding 4
2. Testing Layout 4
3. Live Trading Architecture, Dos and Donts 5

Testing Your Idea

1. Data, Test Rules 6
2. Backtest 7
3. Walk Forward 8,9
4. Monte Carlo 9

Test Rules

1. Profit Factor, CPC Ratio, Sharpe Ratio 10

Monitor Live Trading

1. Rules 11

Static vs. Dynamic

1. Better Rules 11

Strategy Development

1. Start to Finish 12,13

Part One: Idea Generation

Type of Strategies

Trend Following: Attempt to ride a directional price movement

Mean Reversion: Attempt to catch a reversal of price toward some equilibrium

Momentum: Chasing good performance and selling bad performance

Seasonality: Looking for an edge based on time of year, day, etc.

Rotational: Rebalancing your portfolio based on some criteria at fixed intervals

Pairs: Betting Stock A goes up while simultaneously betting stock B goes down

Arbitrage: Looking for a market inefficiency or discrepancy to dissipate

Relative Value: one instrument's price compared to another instrument's price

Model Based: Mathematical prediction of where price could trade next

Carry: Capturing the interest rate

Market Making: buying or selling based on order flow

Type of Bars

Bars are collections of price data usually organized as open, high, low and close or OHLC. They can collect for a set time interval, say 5 minutes, before creating a new bar or create a new bar every n trades or for n traded volume. For example, create a new bar every 1,600 trades or every 2,500 contracts traded. The former is called tick bars and the latter called volume bars. There are other types of bars, but these are the most important and common.

Time: New bar every n periods. 5 minutes, for example.

Tick: New bar every n ticks/trades. 512 trades, for example. 1600 is very popular.

Volume: New bar every n shares. 1,000 shares traded, for example.

Time vs. Event Driven

5 minute bars would be time based whereas tick bars are event driven. Tick bars can remain open if no trades occur. They are only updated based on an event – in this case a trade. Tick bars will be created very quickly during fast trading, but will make very few bars if trading is slow. Time bars will be consistent through time, naturally.

Time Frame

Your strategy can trade on 5 minute bars, 30 minutes bars, 279 minute bars, daily bars, weekly bars, etc. If your strategy holds trades for more than a day it is said to be an interday strategy vs a strategy that opens and closes a position in the same day is known as intraday.

Strategy Basis

What is your strategy based on?

Price, price returns, volume, seasonal patterns, auxiliary/secondary data, relationships, indicators, transformations, combinations of any of these?

A few creative ideas:

1. $Ln(c_t/c_{t-1})$ instead of $(c_t-c_{t-1})/c_{t-1}$
2. Normalize prices to compare across markets or volatility $(c-l_{t-n})/(maximum_{t-n} – minimum_{t-n})$
3. How does price behave when VIX is > $x vs. when VIX is <= $x
4. If absoluteValue(@ES - @NQ) > @ES*x percent then buy

t = current time; t – n is time – n ago