

Design Philosophy	Absolute simplicity, less is better
System Objective	Best net return with highest probability to replicate performance in a continuing market

Optimisation

STI have developed, applied, tested and evaluated their systems over a four year period. Design and testing to discover the best methods of optimisation took 3 years. Systems verification included real-time walk-forward methods for a number of portfolios. Systems applied to a variety of markets consistently provided solid results 18 months after they were optimised.

Generally systems that contain variables must undergo an optimisation procedure when applied to a market. Optimisation exposes the system's signal-generating conditions to the vagaries of markets' characteristics. The basis of optimisation applies a combination of a range of values to system variables, in order to get a desired result. That may be lowest draw down, best net profit or something else.

A lot of our time has been allocated to research and assessment of optimisation procedures, settling for the one below. This procedure gives very acceptable results in profit, low drawdown, stability and robustness.

STI's optimisation procedure for daily and weekly charts is:

- select at least two out-of-sample data sets
- for each data set, optimise 3 or 4 variables for best net profit
- use a heuristic to determine the most robust and stable values and finally,
- apply the final values to in-sample-data containing latest prices and volume or open interest (includes 'today').

We also find it prudent but not essential to re-optimize daily bar chart systems after 12 to 18 months.

Common practice in choosing out-of-sample data sets is to select a period that reflects "typical market conditions" – but this is largely subjective. Instead, our preference is to objectify the task and allow rudimentary patterns to inform the result. Each period selected is one of the following:

Select from *any period* in the chart and in order of significance:

1. a trading range
2. a trend in any direction and occasionally,
3. strong trend in one direction immediately followed by one in the opposite or
4. a combination trend / trading range period

Each of the above is individually optimised and by comparing the resultant values between optimised charts, we identify which variables and their respective ranges are sensitive for that market. This information provides input into our heuristic, producing the final set of values. The objective of the heuristic is to *reduce* the influence of sensitive variables to the best net profit, with minimum effect.

Periods are usually a minimum of 2 years of daily price data. We aim for at least 30 trades within the period.

Overfitting has often been associated with optimisation. We have found that overfitting can be eliminated by,

- using developed and correct optimisation techniques
- designing stable systems that give solid results prior to optimising
- choosing markets with select characteristics
- using available dimensions of price, time and volume
- using a maximum of 4 variables that are 'sloppy', meaning they give good results when incremented by 1, 2 or 3 in a range of 15 or so and by,
- not using bar-hugging indicators like moving average in calculations

Markets

Markets	Equity, commodity and money markets
Market characteristics	Sufficient liquidity, minimal gaps over trading samples

Systems

System design	Trending and counter trending only
Position entry & exit	Last price/value just prior to closing market. Stops are not used
Signal generation	Last price/value on bar (not necessarily the close)
Time Frame	Daily, weekly charts
System basis	Three dimensions - price, time and volume
Optimisation process	At least two out-of-sample data sets optimised before application to in-sample data; four variables; final values determined by heuristic; typically 12 to 18 months between optimisations
System design objectives	Compact, robust, elimination of curve fitting, low draw down
System optimisation objective	Attain best net return with the highest probability to replicate performance in a continuing market
Other characteristics	Limited money management factored into systems Repeat number of contracts/securities per trade

Weekly-Trend Filtering

The daily chart systems that factor in the weekly trend filter produces significantly reduced draw down without a proportional reduction in net profit. That's been the experience in many cases. Less loss, less risk.

STI does not derive the weekly trend using a straight line touching two troughs or peaks etc. nor do we use the Dow principles of higher/lower peaks and troughs to signal a bull or bear trend. These work well visually but are difficult to electronically compute. Moreover, too much capital is lost waiting for confirmation.

STI trends are determined using systems. Systems respond faster to price action and are more objective than trend lines or Dow trends.

Weekly charts continually communicate their position to daily charts. Filtered daily charts respond only to positions from the *last* Friday.

Both original and weekly-trend filtered chart have the same reversal system and values applied and essentially produce the same number of signals. The filter affects daily chart positions so that on the next signal generation:

- a position will be opened only in the direction of the weekly trend, otherwise it remains flat
- an open position is closed, no reversal takes place
- a reversal will take place only if the reversal signal is coincident on both the daily and weekly chart and it is a Friday

These are the only rules that apply to weekly trend filtering.