

The p-Indicator

A Technical Analysis Indicator Based on Price Patterns

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Introduction

In technical analysis the term indicator refers to a formula or set of conditions that can be used as an indication of price direction. Although an indicator can be as simple as a calculation of the average of the closing prices of a number of bars on a chart, in its most general form it can involve any combination of algorithms, technical analysis studies, such as chart patterns, support & resistance levels, price and volume patterns, etc. However, most popular indicators are mathematical equations that are very simple to calculate even in real-time. The MACD, RSI, DMI and ADX are examples of popular technical analysis indicators.

In essence, every trading system is some kind of an indicator. When one combines two moving averages, a fast and a slow, the resulting moving average crossover trading system can be considered an indicator. This indicator can be programmed in the form of a function $F(n,f,s)$ that returns +1 when the fast moving average crosses to the upside, -1 when it crosses to the downside and 0 everywhere else. In this example, n is the current bar count, f is the fast moving average period and s the slow moving average period. For example, if $F(0,5,30) = 1$ then this can be taken to indicate an upward price move. It is important to understand that any signals obtained from indicators have probability equal to 1 because the conditions that trigger have already happened. Any event that has already occurred has probability equal to 1. This is just one reason most indicators are not useful in trading without further analysis. In the example of the moving average crossover, if the function returns a value of -1, this means that the fast moving average has just crossed the slow one to the downside. This is an event that has already happened and has probability equal to 1.

Many traders not familiar with this fundamental axiom of Probability theory, i.e. the axiom that $P(\alpha) = 1$ when α is the certain event, try to use indicators for the purpose of market timing. However, no indicator can be useful and profitable unless it indicates the market direction with a sufficiently high rate of success. The minimum rate of success that it must have depends on the risk/reward parameters employed. Use of indicators without knowledge of specific risk/reward parameters can only lead to random trading. For example, going long when the RSI value is lower than 30 is an action that is based on certain events that generated the value of 30 but tells nothing about the probability of success of a trade (see [Gambler's fallacy](#)). In order to get a measure of that probability, technical traders perform backtests of the indicator with specific risk/reward parameters that establish exit price levels for the trades signaled by an indicator value. If the generated sample of trades is sufficiently

high, the success rate can be considered as a measure of the probability of a signal to generate a profitable trade for the specific risk/reward parameters.

Therefore, indicators without an associated success rate mean little and although this is understood by those who are familiar with the axioms of probability theory, many traders still use them in a discretionary way for market timing, with limited or no success potential of course. However, there is a large class of technical traders who understand the significance of a prior probability and will not use any indicator unless it fits within the context of a well-tested strategy. These traders have an edge over those who base trading decision on arbitrary and untested indicator values.

To summarize, an indicator is useful in trading when it is combined with specific risk/reward parameters in such a way as to make it possible to obtain a measure of the probability of success of trading signals and its statistical significance.

The p-Indicator

The motivation behind the development of the p-Indicator was to design a trading indicator for intraday and short-term trading which indicates the probability of success of either long or short positions at any given point in time. According to the discussion in the introduction of this paper, this requirement implied that the p- indicator value should be equal to a success rate of some kind of a trading strategy. This further implied that the p-indicator calculation would require a sufficient sample of historical trades and thus a sufficiently long price history. It is also understood that this requirement would be met only if specific risk/reward parameters were used for its calculation. Therefore, the p-Indicator differs from traditional indicators in two important aspects:

- (1) The p-indicator calculation at any given point depends on the price history of a security
- (2) The p-Indicator value calculation depends on user defined trade exit levels.

In addition:

- (3) The p-indicator is based on price patterns (pure price action with no optimization applied)
- (4) The p-indicator is an oscillator and its value lies in the range 0 to 100%.

Formulas:

$$P\text{-long}=100\times\frac{\sum_{i=1}^N PL_i T_i}{\sum_{i=1}^N T_i}$$

$$P\text{-short}=100\times\frac{\sum_{i=1}^N PS_i T_i}{\sum_{i=1}^N T_i}$$

where

P-long and P-short are the long and short values of the p-Indicator, respectively. PL_i and PS_i are the success rates for long and short positions of i th price pattern involved in the calculation, respectively; T_i is the number of historical trades of the i th pattern and N the number of price patterns used in the calculation.

Thus, in the formula of the p-Indicator the success rates PL_i and PS_i of each of the N price patterns is weighted by the corresponding number of historical trades and then the sum is divided by the total number of trades.

The p-indicator values P-long and P-short range between 0 and 100%. The trigger levels for long and short positions are:

Long signal when: $P\text{-long} - P\text{-short} > L$

Short signal when: $P\text{-long} - P\text{-short} > S$

Where L and S are positive numbers and should be greater than the level of winning bias desired. For example, if $L = 10$, then this is equivalent to having a winning bias of 10% (60% success rate in using the indicator). The higher these numbers are set the less frequent will be the values that trigger a position.

In addition to P-long and P-short values, one could use a measure of their statistical significance in order to avoid cases where the trade sample is not large enough. Such a significance measure is very useful.

When using the p-Indicator, all trades should have the same risk/reward parameters as those used in the calculation of the indicator.

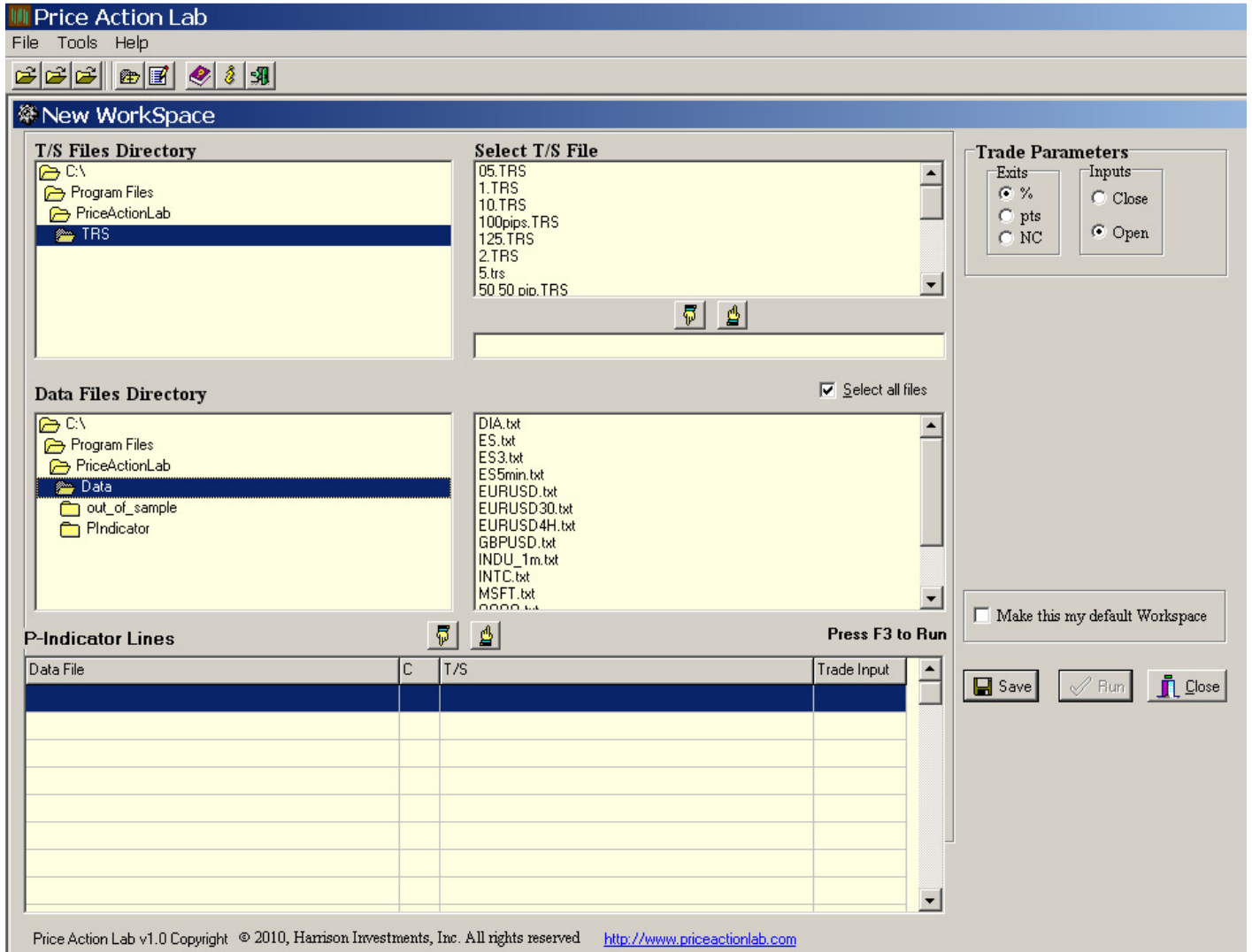
Implementation of the p-Indicator in Price Action Lab

Price Action Lab is a software program that analyzes market price action based on user-defined performance statistics and risk/reward parameters and achieves that by searching historical daily or intraday data in a fully automated way. The p-Indicator is implemented in this program so that the user can get the values for any combination of symbols and risk/reward parameters using a single workspace. The calculation is based on 10 price patterns ($N= 10$) that were selected as best indicators of price action. The selection of the patterns is a crucial step and it was based on more than 15 years of experience in applying the indicator to trade futures, stocks and forex.

In addition, a measure of significance S is calculated for each pair of values, P-long and P-short. The algorithm for the calculation of the p-Indicator and its significance is proprietary but it is essentially based on the equations presented earlier. The user can specify the risk/reward parameters either as a percentage of the entry price of each trade generated by the price patterns or as a number of points added to the entry price. Also, exit at the next close is supported so that each trade generated by a price pattern exits at the next close.

Example:


The following is an example of workspace setup for the calculation of the p-Indicator:



The following shows an example of results:

File Name	TS	Trade on	C	P-long	P-short	P-delta	S	Last Date	First Date
QQQQ.txt	PI.TRS	Open	%	46.73	47.34	-0.61	6	20100524	19921030
SFY.txt	PI.TRS	Open	%	58.37	39.18	19.19	10	20100524	19921030

Click on P-long, P-short, P-delta, S to sort values

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Each row in the results shows the p-Indicator values for the specific exits specified in the corresponding .trs file in conjunction with the entry condition C. P-delta equals P-long minus P-short and S is the significance value.

Summary

The p-Indicator combines traditional technical analysis concepts with trading system backtesting and analysis to provide signals that do not just reflect what happened in the past but also provide a measure of the probability of a directional short-term move in the range defined by the risk/reward parameters selected in the calculation of the relevant values. This dramatic departure from traditional technical analysis is much more promising and provides a new tool for developing trading systems that has the potential of offering an edge to those that will interpret it and use it in a proper way.

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