

Myths and facts of equity curve trading

BY KEVIN J. DAVEY

Equity markets will head for important support and resistance levels that can lead to big moves in either direction. Pivot points help you find those levels.

Most traders have heard the concept of turning a trading strategy on and off – or increasing/decreasing size – when the equity curve rises above or falls below a specified moving average, breaks to a certain new low (or high), or has a specified number of consecutive losing days. The fact is every trader does some sort of equity curve trading, whether they realize it or not. Once a trader makes a decision based on the equity curve, he is in effect equity curve trading.

One specific and popular method of equity curve trading deals with the use of an indicator as an overriding switch.

Equity curve analysis Trading the curve

A moving average switch on the equity curve is the most popular method. The premise is to trade only when the equity curve is above its moving average. Of course, proponents of this equity curve trading technique typically show glowing examples that “prove” the usefulness of the technique. But, does it really work? How do you set it up and evaluate it?

This two-part series will examine the pros and cons of equity curve trading. In this first part, we’ll establish defini-

tions and some baselines for the analysis. In the second installment, we’ll examine equity curve trading for some real life trading systems.

Trading the curve

In its simplest form, equity curve trading is a methodology where the strategy is turned on and off based on the characteristics of the equity curve. This is typically done by applying an indicator (such as a moving average or a breakout to the equity curve), or by employing a trigger as the switch (for example, the trigger could be turning off the strategy after X days of consecutive losses).

An example of equity curve trading is shown in “Above average” (right). In this case, the strategy is turned off when the “always on” equity curve dips below its 25-period moving average. When the “always on” equity is above the moving average curve, the strategy is allowed to take trades. Consequently, trading is allowed for the trades in blue, and trading ceases (that is, the trader is net flat) for the red trades.

Note that after following the above rules, there is one blue trade taken below the equity curve and one red trade taken above it. This is not an error and actually



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highlights an important mistake many people make. The blue trade below the moving average is taken because the equity curve does not drop below the moving average line until after the trade is completed. Before that trade (that is, after the previous trade), the equity curve is above the moving average, which indicates that the next trade should be taken. When using an equity curve switch, you need to be careful in making sure that trade decisions are made only with prior knowledge.

“Reaping rewards” (right) shows the net effect of this particular equity curve trading, with a comparison to the original curve. As seen in the chart, in this case the performance improves due to the equity curve technique.

Of course, using a moving average calculation on an equity curve has all the disadvantages that a traditional moving average has on market price data: It has a built-in lag by definition. Its performance also suffers in whipsaw-type situations, and the moving average can be over-optimized on historical data. Because of this, it may be useful to look at other types of equity curve triggers.

One trigger could be an n-bar breakout. In this application, the system would stop trading when an n-bar low of the equity curve occurred. Trading would cease until the original equity curve turned back above the n-bar low. This indicator, though, also could be over-optimized by varying the value of n until a good “fit” was discovered.

Another possible trigger is to turn off the strategy after so many days or trades of consecutive losses. From a psychological point of view, such an approach might have appeal for many traders. It would not work in cases where consecutive losing days tend to be followed by winning days (a reversion-to-the-mean situation), which in fact does occur with many trading systems.

Equity curve trading can get very complicated, because just about any indicator or trigger could be applied to it. In effect, it becomes its own trading strategy, but instead of buy/sell decisions being made on the instrument price data, the decisions are made on the equity curve.

When does it work?

To determine if and when equity curve trading can be useful, it is instructive to look at some different possibilities for the technique’s performance. This is shown in “Scenario comparison” (page 42).

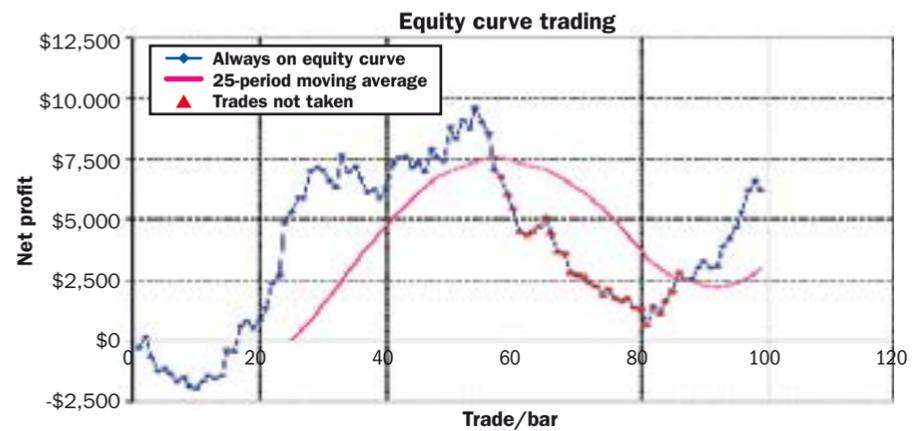
For a strategy that goes completely “bad,” with its equity curve nose-diving toward negative territory, the utility of equity curve trading is obvious. This technique can stop you from trading a strategy that is no longer performing at all. This is the top chart in the chart.

For a strategy performing well, most of the time the equity curve will be above its moving average, and therefore you would continue to trade the strategy. This is also desirable. You are trading the strategy because the equity curve technique has confirmed that the strategy is doing well. This is shown in the middle chart.

Now consider the case that is in between these two extremes. This is depicted in the bottom chart. This strategy has times where it performs very well, times where it doesn’t, and times where the equity has many whipsaws. In this case, the benefit of equity curve trading is not apparent. Sure, it stops trading

ABOVE AVERAGE

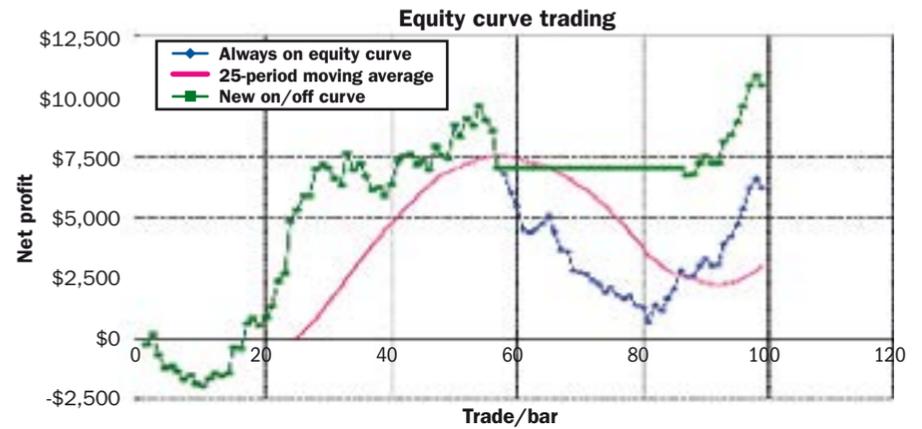
A popular form of equity curve trading directs the system to trade only when the system’s equity curve is above a moving average of the equity curve.



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REAPING REWARDS

In this example, we can see how equity curve trading is supposed to work. If all goes as planned, you will be out of the market during the system’s worst periods.



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when the drawdown gets severe, but it also misses out on a lot of the recovery.

Evaluation & goals

The best way to evaluate the equity curve trading concept is not by measuring increased profit, nor by determining the decrease in maximum drawdown. While both are important measurements, they need to be looked at simultaneously for a true evaluation. The best way, then, is to include both metrics by measuring the before and after profit/drawdown ratio.

Depending on the historical backtest trading software a trader uses, the equity curve trading switch may or may not be

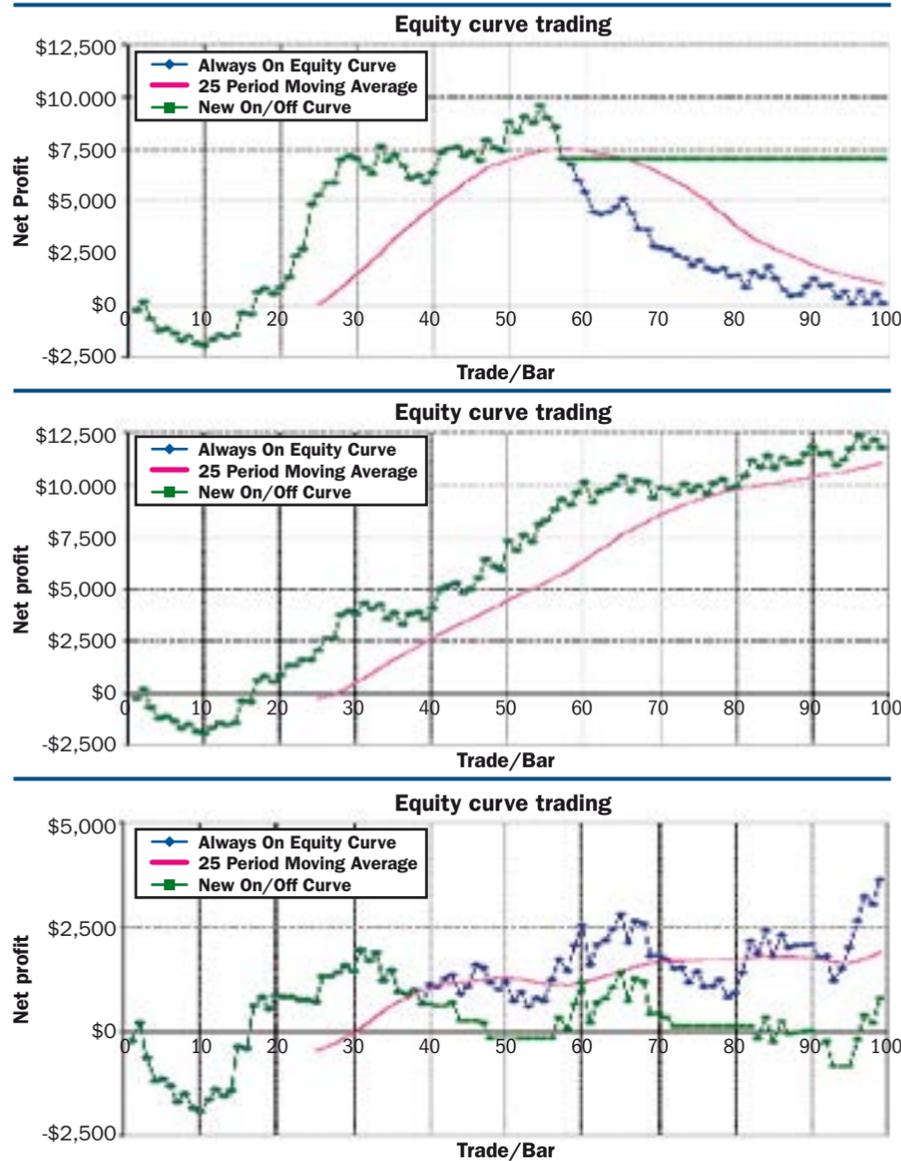
easy to implement. If your trading software cannot perform this analysis, it is relatively easy to create in Excel (just be careful not to peek at the data by using incorrect formulas).

The goals of using an equity curve switch are really two-fold. First, the switch should turn off a poorly behaving system. Second, a properly working switch will stop trading before deep drawdowns are encountered, and will resume trading before too much profit is given away. Those are ambitious goals for a single switch.

An equity curve switch can accomplish the first goal fairly easily, especially for

SCENARIO COMPARISON

The outcome of equity curve trading isn't fixed. There are some cases where it will work, some cases where it will hurt performance and some cases where it will do nothing at all.



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WHEN TO SWITCH

When you turn your system on and off based on equity curve, evaluation isn't always clear.

Method	Net Profit	Max Drawdown	Profit/Drawdown
Always On	\$4,253	\$2,128	2.0
10 ma Equity Curve Switch	\$3,945	\$2,128	1.9
20 ma Equity Curve Switch	\$1,955	\$2,245	0.9
30 ma Equity Curve Switch	\$2,475	\$2,128	1.2
40 ma Equity Curve Switch	\$1,600	\$2,605	0.6

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a poorly performing system. The table "When to switch" (below) shows that a moving average switch does a good job of turning off the system before the maximum drawdown gets too bad, regardless of length. It is reassuring for a trader, to know that there is a clear signal from the switching method to stop trading.

Unfortunately, the second goal—improving the profit/drawdown ratio—is not so easily met. The table below shows, for a sample system, that the equity curve switch doesn't necessarily increase the Net Profit, and in fact can make the system worse. The end result all depends on the choice for the moving average length.

Because the moving average length has such an impact, it should be obvious that there are some serious disadvantages with it. Trader A could use a length of 10, Trader B could use a length of 20, and they will have dramatically different results. Of course, that leads many traders to say, "Well, I'll just optimize it." But, just like optimizing parameters in a trading system, optimizing the parameter of an equity curve switch is fraught with peril, prone to every type of bias and over-fitting.

Equity curve switching is a popular technique, but it is unclear as to whether it is really beneficial. For decidedly excellent trading systems, and poor performing systems, the approach can be useful. For trading systems in the middle, which make up most systems, the benefits are not so clear.

While some of the focus has been on turning off or turning down a system after a difficult period, there is some anecdotal logic, particularly in the trend following space, that a system should be turned up after a poor period and perhaps turned down or off after extremely strong performance.

In the second part of this article, we will examine equity curve trading for some real life trading systems, and provide some recommendations on how to using the method effectively. ■

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