



Doubly adaptive

Where you set stops and where you take profits shouldn't be a guessing game.

Learn about a way to use common volatility and trend indicators to improve your stops and profit targets by tying them to the current market activity.



BY CHUCK LEBEAU

In general terms there are two ways of creating an advantage or “edge” in trading. One is to make sure your gains are much larger than your losses, and the other is to have more winners than losers. To succeed as a trader you need to do your best to maximize both the amount and the value of your winners. These two worthy goals appear to be mutually exclusive.

Having well-planned profit objectives is the best way to maximize closed-out profits. The tendency is to take profits either too soon or too late and most traders tend to err on the side of taking profits too soon. Taking a quick profit always feels good and helps to maintain our winning percentage because these “nailed-down” profits will never turn into losses. However, if we fail to take some of the small profits they may well turn into losses. Wouldn't it be ideal if we could know when it was best to take small profits and when it was best to hold patiently for big profits?

It has been argued that profits in trading are possible because the distribution of the price fluctuation from one period

to the next is random. If you were to draw a distribution curve of the fluctuations, however, the tail on the right side of the curve tends to be surprisingly thick, indicating that unexpectedly large profits are possible. The opportunity for large profits also comes our way more often than one might expect. However, because major profit opportunities are still the exception rather than the rule, if we held out for these big profits on every trade we would also be making a big mistake.

True range

The first step in achieving better accuracy in our profit taking is to use profit objectives expressed in units of average

Testing profit targets

Here's a sample strategy that makes use of the ideas presented in the main story. In this case, the entry rule is to go long (using a limit order) if the market opens above yesterday's high and then falls back to test that level again. To make sure you only trade in the direction and with the strength of the intermediate trend, the market also needs to be trading above its 50-day moving average and at an increasing rate, as defined by the 14-day ADX indicator.

As long as the strength of the trend continues to increase (rising ADX), both the profit target and the stop-loss level will be four times the average true range, ATR, (as measured at the time of the entry) from the entry price. But as soon as the trend shows any signs of weakness (declining ADX), both the stop-loss and the profit target will be reduced to 1.5 times the 20-day ATR from the entry price.

This means at the time of entry the expected profit-to-loss ratio for each trade always will be one. The only thing that keeps the system from losing money or just breaking even is the entry technique, which is designed to make sure you always will enter when both the long- and short-term momentum are in your favor.

However, once in the trade, the benefits from the doubly adaptive stop-loss and profit-target technique also kick in. For example, notice in Figure 1 how the first trade this year moves against you while the ADX value also is decreasing, narrowing the stop loss from four to only 1.5 times the ATR from the entry price. But because the market is in a highly volatile state already (as indicated by the relatively high ATR reading), we still are giving it enough room to eventually resume its up trend.

FIGURE 1 SAMPLE TRADES

Sample trades triggered by a system that combines the ADX and the ATR indicators.



Source: TradeStation, Unfair advantage

When we start trading higher again, an increasing ADX value once again moves the stop-loss and the profit target farther away from the entry price. Finally, after we've been able to ride this nice up move and the trend starts to lose some of its strength again, the profit target again contracts to 1.5 times the ATR. And because we're now way past that level, the system tells us to exit immediately.

The last trade also is a good example

of how a decrease in the trend strength immediately takes us out of the market with a loss 1.5 times the ATR, although the original stop loss was placed an additional 2.5 (4-1.5=2.5) times the ATR away.

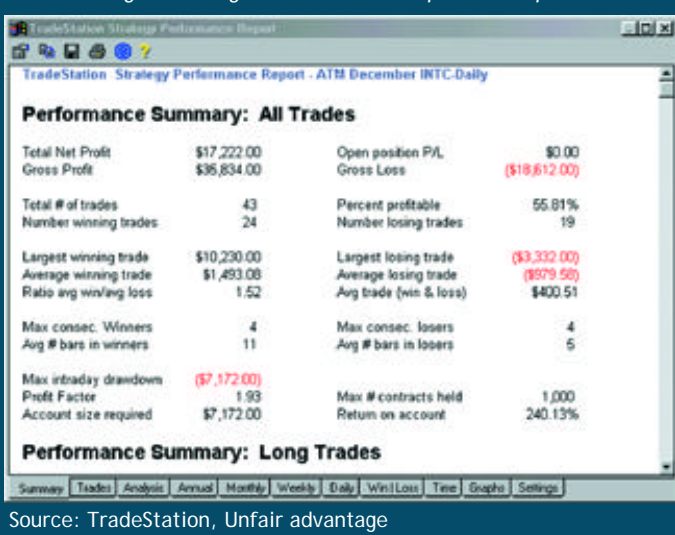
Figure 2 shows the result for this strategy, traded on Intel (INTC) from January 1988 to October 2000. \$20 was deducted for slippage and commission per transaction. As you can see, there were more than 50 percent profitable trades, with the winners lasting considerably longer than the losers, and with a profit factor of close to two. There are no more losers in a row than winners in a row, also a positive.

By comparison, keeping the ATR constant at two produced only 48 percent profitable trades for a profit factor of only 1.08, the winners did not last significantly longer than the losers and there were considerably more losers in a row than winners in a row. These otherwise completely non-optimized results underscore the usefulness of the doubly adaptive profit target theory.

— Thomas Stridsman

FIGURE 2 PERFORMANCE SUMMARY

The performance of a system that uses volatility and trend-strength readings to determine stop-loss and profit levels.



Source: TradeStation, Unfair advantage

true range (ATR). The ATR expands and contracts with the volatility of the market. The true range indicator was invented by Welles Wilder, Jr. and described in his book *New Concepts in Technical Trading Systems* (Trend Research, 1978) as the larger of the following:

- The distance between today's high and low, or
- the distance between today's high and yesterday's close, or
- the distance between today's low and yesterday's close.

The ATR is simply an average of the true range values over a specific period of time.

In a quiet market a profit objective of two ATRs might bring us a profit of \$600. In a very volatile market, two ATRs of profit might be \$1,400 or more. By expressing our profit goals in terms of ATRs instead of fixed dollar amounts we make them highly adaptive to what is going on in the market in terms of variations in volatility. However, while, volatility as measured by ATR is obviously important, daily volatility does not always relate to direction and trendiness.

It is quite possible that we can have lots of big ranges in a market that is merely going sideways, or we could have small ranges in a market that is highly directional. It is the correct combination of directional price movement and volatility that will allow us to maximize our profits in relation to what is happening in the market at any given time. Therefore, for the best possible results we want to combine our knowledge of ATR with our knowledge of the directional movement, or trendiness, of the market.

Combining trend and volatility

Over the years a great deal of research has been done using the average directional index (ADX). Because of that research, it is possible to vary most exit strategies to stay in tune with the trendiness, as well as the volatility, of the market. The ADX tells us the underlying strength of any trend. When the trend is

strong the ADX will rise. When the trend is weak the ADX will decline. This is true in downtrends as well as in uptrends. A rising ADX means the market is becoming more directional and a declining ADX means the market has become less directional.

The ADX indicator was also invented and described in Wilder's book. To calculate the ADX indicator, you first will have to calculate the so-called DMI+ and DMI- functions, which measure how much of the latest bar's price action falls outside of the previous bar's high and low readings. If most of it is above (below) the previous bar's high (low), the distance between the previous bar's high (low) and the latest bar's high (low) will make up the DMI+ (DMI-) value for that bar. The ADX indicator is an n -bar smoothed version of the difference between the summarized DMI+ and DMI- functions over n bars.

By having a doubly adaptive profit-taking strategy, that makes use of both the ATR and the ADX indicators you can happily accept small profits when that is the best the market has to offer but swiftly change the strategy and hold out for unusually large profits when those opportunities are known to be present.

Figure 1 shows the 20-day ATR for

Microsoft (MSFT). As you can see, the ATR is increasing when the market is trending higher, but also during turbulent times, such as during the spring of 2000. This means the stock also is more volatile, both when the market is sure about where the stock is heading and also when the insecurity is at its peak.

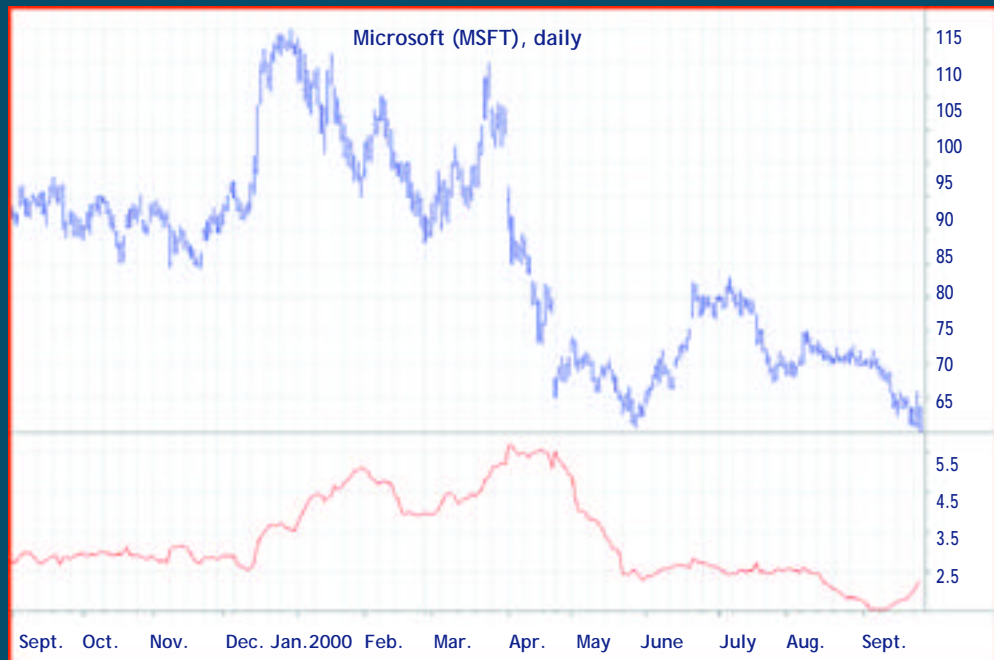
Figure 2 shows the same stock together with the 14-day ADX indicator. The stronger the trend, the higher and faster climbing the ADX reading. Note, for instance, during the turbulent downturn for the first six months of this year, the indicator was climbing when the market was on its way down, but declining when the market was on its way up, indicating that the true underlying trend was down.

Let's go back to our earlier example where our plan was to take our profits at the two ATR level. With this adaptation to volatility we are counting on the changes in volatility to produce large and small profits based on a constant target of two ATRs of profit.

However, if we use ADX we can go a step further and get even better results. Under our new plan, when the ADX is declining and the market is less directional we will reduce our expectations and accept profits of only 1.5 ATRs

FIGURE 1 THE AVERAGE TRUE RANGE INDICATOR

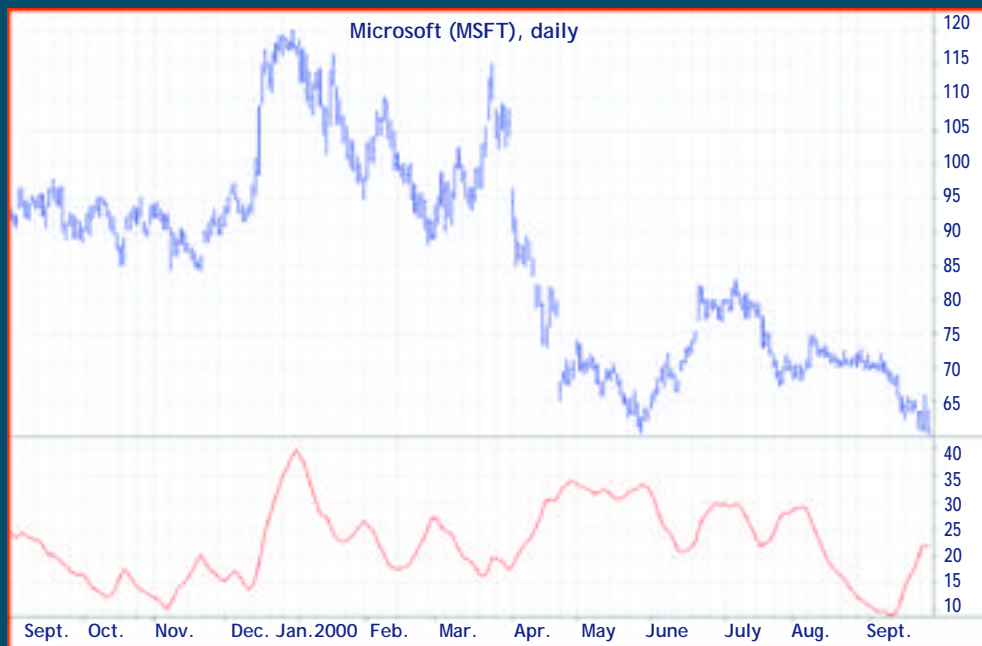
The average true range is not only a good way of measuring market volatility, you also can use it to create stop-loss and profit-target strategies that can work in any market.



Source: TradeStation, Unfair advantage

FIGURE 2 THE AVERAGE DIRECTIONAL MOVEMENT INDEX (ADX) INDICATOR

The ADX indicator measures trend strength, regardless of direction. When trend strength is high, you can give your trades a little more breathing room.



instead of two. And when the ADX is rising and telling us that the market is highly directional we will double our expectations and wait for profits of four ATRs instead of two. Now we are adapting our exit strategy to both the current

volatility and to the amount of trendiness in the market. As you might expect the difference in results is dramatic because our profit-taking strategy is doubly adaptive.

The logic of this strategy should be

obvious. When the market is not trending strongly we improve our results by reducing our profit expectations and maintaining our winning percentage. When the market is trending strongly we know it is time to abandon our small profit targets and time to take advantage of some unusually large profit opportunities.

The examples of 1.5 ATRs as a profit target in a non-trending market and four ATRs as a profit target in a strong trending market are just broad guidelines. We need to vary these parameters depending on the particular market and type of system we are operating. Short-term systems may require smaller objectives while long-term systems may require much larger objectives. A good starting point is to go with a 20-

day ATR and a 14- to 18-day ADX. Play around with the units of profit and see what a dramatic improvement you can make in your trading results by combining ADX and ATR to produce surprisingly accurate exit targets. 📈

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