

# The VIX fix

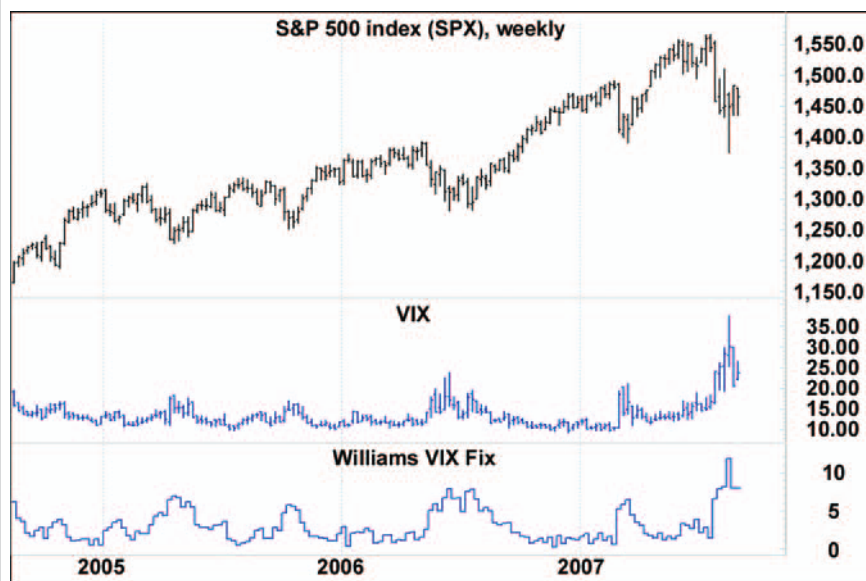
A “synthetic” VIX calculation can be used in any market to reproduce the performance of the well-known volatility index.

**BY LARRY WILLIAMS**

**W**hen it comes to describing what markets do, Bernard Baruch said it best: “Markets fluctuate.”

That idea is embodied in the Chicago Board Options Exchange (CBOE) Volatility Index (VIX), which has become a very popular measure of market risk since it was introduced in 1993. The VIX, which is derived from the implied volatility of stock index options, is intended to represent traders’ expectations of volatility over the next 30 days. (See “Key concepts” on p. 88 for background information on implied volatility and the VIX.)

Essentially, the VIX reflects investor fear — high readings are associated with high-volatility conditions (and market bottoms) while low readings are associated with low-volatility conditions (and market tops).



**FIGURE 1: SYNTHESIZING THE VIX** The behavior of the actual VIX (middle) and the Williams synthetic VIX (bottom) are nearly identical.

Source: TradeNavigator.com

Unfortunately, the VIX is calculated only for the S&P 500 index, Nasdaq Composite index, and the Dow Jones Industrial Average. What about other markets?

Luckily, it is easy to duplicate the VIX for any market — Treasury bonds, gold, silver, soybeans, even individual stocks — with a simple formula.

First, let’s look at some market examples.

## Parallel behavior

Figure 1 shows the S&P 500 index with the actual VIX in the middle panel and the Williams synthetic VIX (the “Williams VIX Fix,” or WVF) in the bottom panel. The two indicators’ swings, levels, timing,

and magnitude are almost identical. Figure 2 shows how closely the VIX and the WVF paralleled one another from 1994 to 2000.

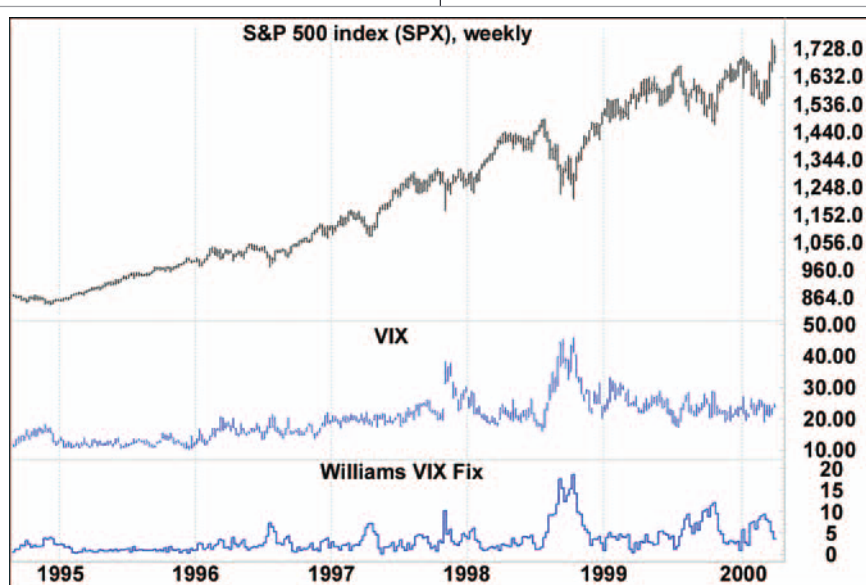
If this synthetic VIX parallels the actual VIX, then it would seem we have a tool for measuring volatility and identifying significant highs and lows in other markets, as well as individual stocks. Also, unlike the CBOE VIX, the WVF is not based on a time-consuming calculation derived from option prices.

Figure 3 shows what the WVF looks like in the 30-year T-bond futures (US) back to 2003. The chart highlights

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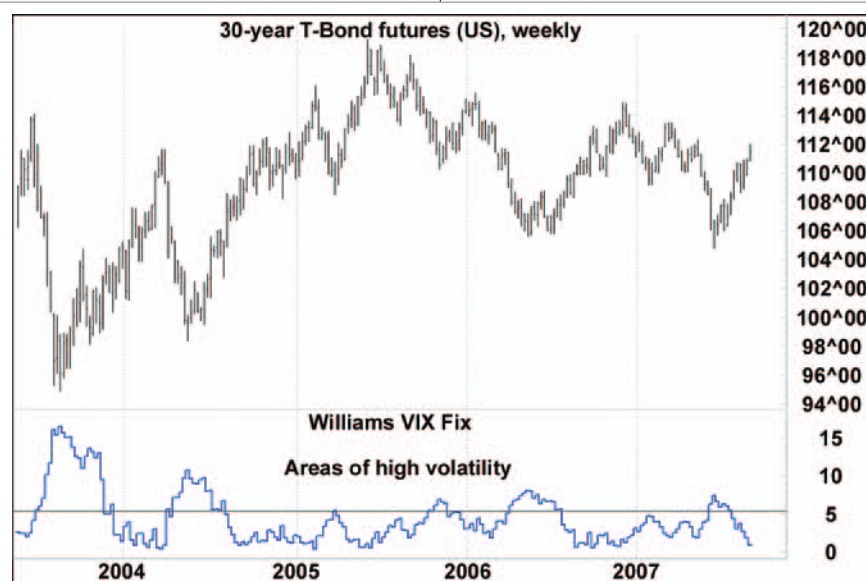
volatility's natural high-to-low cycle: Low volatility is more often associated with market peaks, while high volatility is associated with market lows — the same behavior we saw in the actual VIX relative to stock prices in Figures 1 and 2. When the WVF is particularly high, a market bottom is close at hand and the

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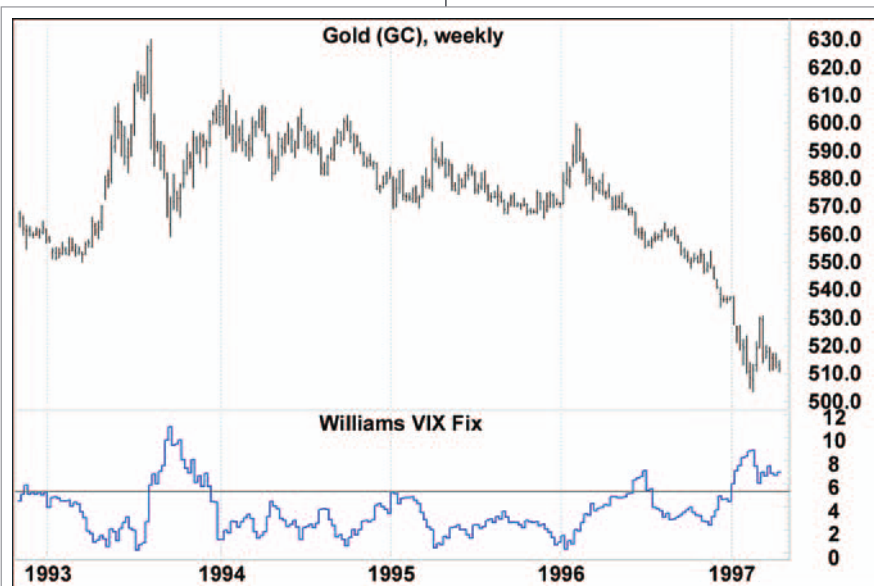
**FIGURE 2: S&P 500: 1994-2000** The synthetic VIX is based on a simple technical formula rather than option prices.

Source: TradeNavigator.com



**FIGURE 3: T-BONDS** When the WVF is particularly high, a market bottom is close at hand and the daily ranges tend to be larger.

Source: TradeNavigator.com



**FIGURE 4: GOLD** The WVF's low readings typically correspond to significant market peaks. When volatility is "hanging out" at low levels, the market is either in a rally leading to a top, or a top is about to occur.

Source: TradeNavigator.com



**FIGURE 5: RECENT GOLD** Significantly high readings are usually associated with market bottoms.

Source: TradeNavigator.com

daily ranges tend to be larger. Such times are associated with a subsequent contraction in volatility.

A weekly chart of gold (GC) from 1993 to 1997 (Figure 4) also underscores the relationship of the WVF to price. Notice the index's low readings typically correspond to significant market peaks. When volatility is "hanging out" at low levels, the market is either in a rally leading to a top, or a top is about to occur. This is true whether you are looking at a market average or an individual stock or commodity.

In a way, the actual VIX or the synthetic WVF turns price upside down — but with an important twist. Investor sentiment is more magnified at market bottoms than at tops. The VIX is much more successful at highlighting the intense investor emotion typically associated with significant lows.

Figure 5 brings the gold chart and the WVF indicator up to date. The past four years show the same behavior evident in the previous charts: Significantly high readings are usually associated with market bottoms. Even the May 2006 run-up was not associated with a massive increase in volatility as expressed by this indicator. However, the market lows in June and September were associated with high readings. This is the same pattern exhibited by the actual VIX in the stock market.

The chart of the British pound futures (BP) in Figure 6 shows how the indicator highlights significant market bottoms on

the daily time frame, as well as expansions of daily ranges. Remember, low readings indicate the market is somewhere near a top during a rally.

There are two remaining questions: Does the WVF work for individual stocks? Also, are there ways of using the index other than referencing its absolute high and low readings?

## Individual stocks

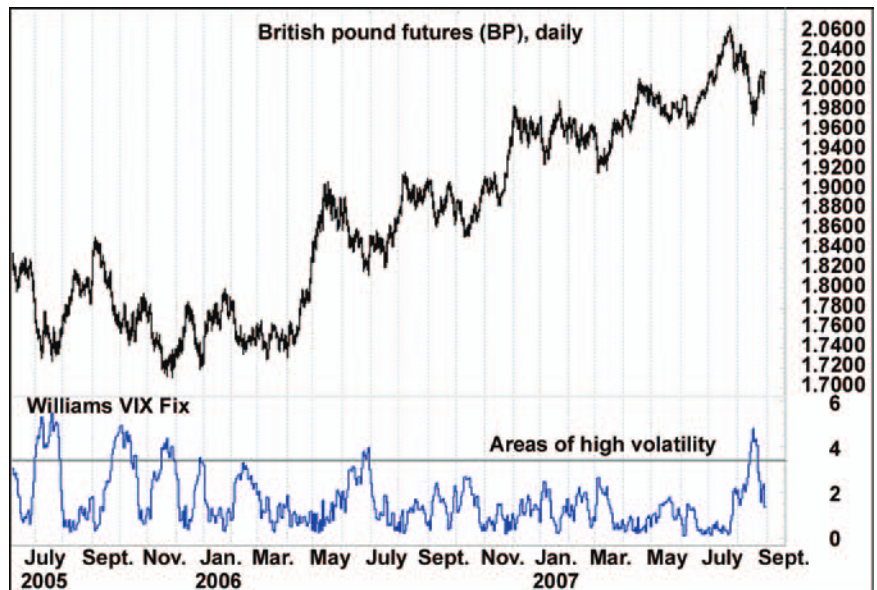
Figures 7-9 are charts of three of the most actively traded U.S. stocks. Again we see the same phenomenon — when volatility is high stocks tend to bottom; when volatility is low stocks tend to top out.

There are many ways to use this information. For example, since you can buy and sell the VIX itself, you might create a trading strategy for that purpose. Also, in terms of selling options, when the WVF indicates volatility is extremely high, you should expect a contraction in market ranges and, of course, you are given some insight into future direction.

Figure 7 is a chart of Microsoft (MSFT) — perhaps the most widely followed stock in the world. It shows the WVF's relevance on a weekly basis. Every significant market low in the stock has come at a time of increasing volatility as measured by the WVF.

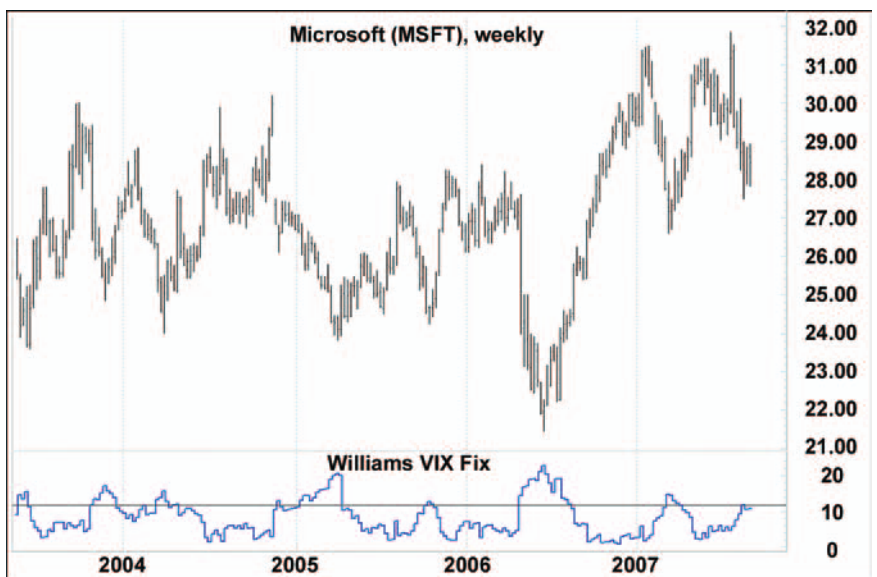
Figure 8 (General Electric) and Figure 9 (Starbucks) suggest this is a universal cycle of market activity — this is how stocks actually move. That is not to say

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**FIGURE 6: DAILY BRITISH POUND** The WVF displays the same characteristics on the daily time frame.

Source: TradeNavigator.com



**FIGURE 7: MICROSOFT** Each significant low has come at a time of increasing volatility as measured by the WVF.

Source: TradeNavigator.com



this is a be-all, end-all indicator, but it does do a pretty good job of showing the internal structure of the market and what the next cycle of market activity is most likely to be. It doesn't matter what the company does — it could make coffee or manufacture coffee makers — the volatility cycle is the same.

### Possible modifications

You might already have thought of ways of using the WVF or making it better, but here are a couple of suggestions. First, because volatility *does* fluctuate and may not have absolute levels of highs and lows, you could plot Bollinger Bands (see “Key concepts,” p. 88) to help identify potential over extended zones without resorting to fixed values.

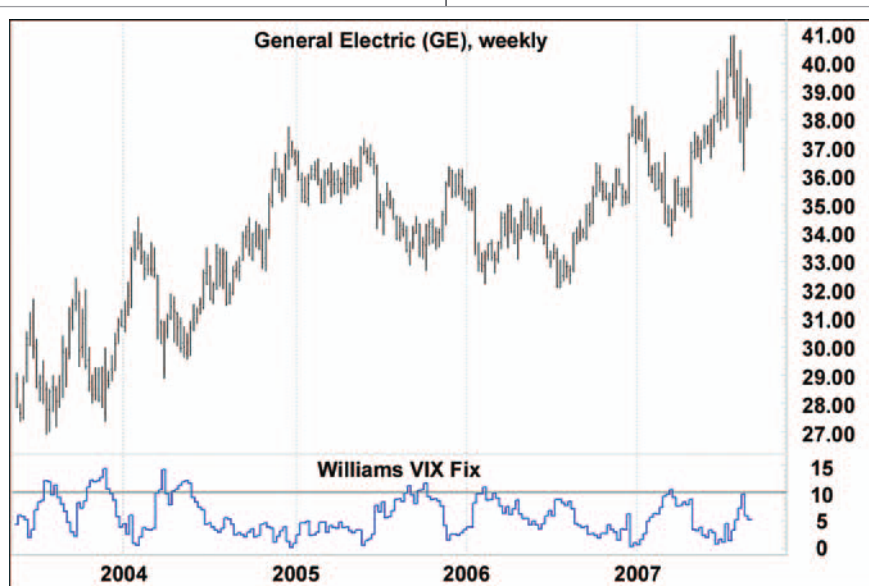
Notice in Figure 10 the VIX and the WVF hit the Bollinger Bands at just about the same time. This confirms what we've seen earlier — these indicators are essentially the same, or at least the movement is almost identical.

What works in a stock market average should work for an individual stock. With that in mind, Figure 11 shows Bollinger Bands on the daily WVF Index for Starbucks. We see pretty much the same thing as we have noted on individual stock indexes.

Another way to understand the WVF a little better would be to construct a 14-day stochastic (see “Key concepts,” p. 88) of the WVF, as shown in Figure 12. Again, although these are daily charts, the same concept occurs on weekly charts.

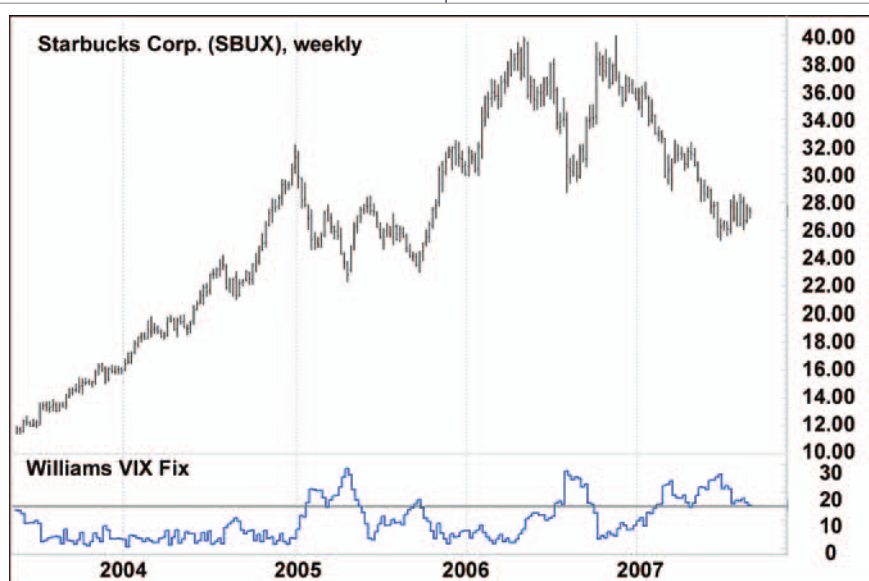
It is apparent that most of the market

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**FIGURE 8: GENERAL ELECTRIC** When the WVF indicates volatility is extremely high, you should expect a contraction in ranges.

Source: TradeNavigator.com



**FIGURE 9: STARBUCKS** The WVF highlights the internal structure of the market and what the next cycle of market activity is likely to be.

Source: TradeNavigator.com

lows come when the stochastic of the WVF posts a high reading (above 80 percent) while most of the market lows come when the index is below 20 percent.

### Synthetic VIX formula

There is no absolute trading strategy for the WVF; it is more beneficial as a reference point for understanding what volatility cycle a market is going through, and also suggesting the most obvious direction for the next move. The formula for the index is very simple:

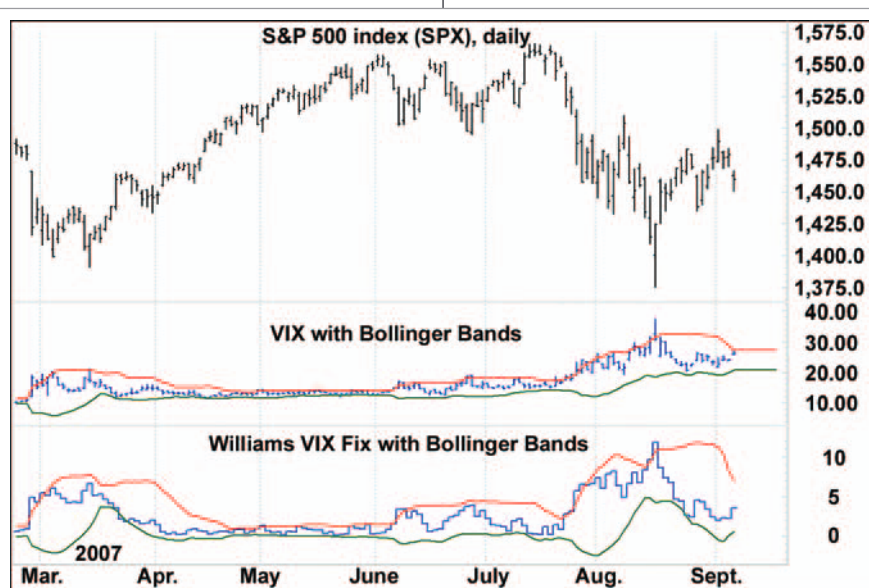
$$\text{WVF} = \frac{(\text{Highest}(\text{Close}, 22) - \text{Low})}{(\text{Highest}(\text{Close}, 22))} * 100$$

This means you find the highest close of the past 22 bars and then subtract the low of the current bar from this price. The result is divided by the highest close of the last 22 bars. Finally, the result is multiplied by 100 to normalize the indicator readings.

There was no optimization involved in selecting the indicator's 22-day period. The only reason this value was selected is that the maximum number of trading days in a month is 22. (Note: I have found that values for all moving averages, oscillators, etc., return the best results using a number between 20 and 22. I like 22 because that covers all potential months.)

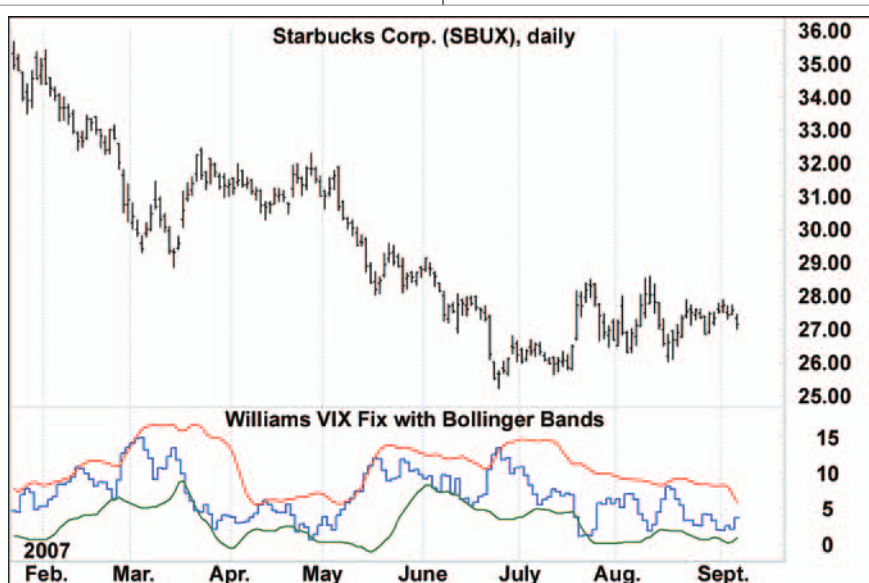
This allows us to look back on a time frame that relates to the stock market activity itself, as there are so many

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**FIGURE 10: BOLLINGER BAND COMPARISON** The VIX and the WVF hit the Bollinger Bands at just about the same time, confirming the indicators' similarity.

Source: TradeNavigator.com



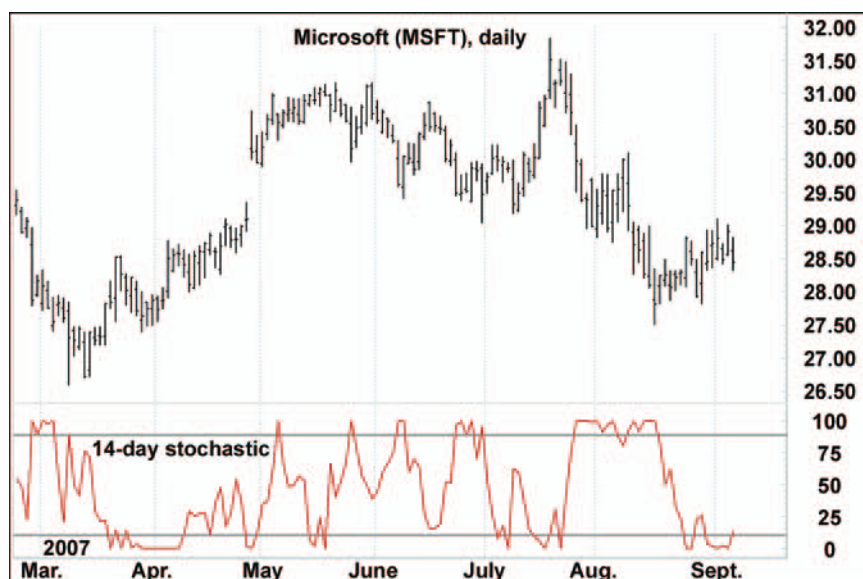
**FIGURE 11: INDIVIDUAL STOCK** The WVF's behavior appears consistent on different time frames and markets.

Source: TradeNavigator.com

monthly influences in stock and commodity prices. You might want to change the 22 setting on weekly charts to 26 weeks (six months). That was not done in these examples, as the 22 and 26 settings generally produce similar results, but from a purist view point that would seem wise.

Regardless, a simple formula that can fill in for the complicated CBOE VIX is well worth further research and experimentation. 📌

*For information on the author see p. 10.*



**FIGURE 12: WVF WITH STOCHASTICS** Most of the market lows come when the stochastic of the WVF posts a reading above 80 percent while most of the market lows come when the index is below 20 percent.

Source: TradeNavigator.com