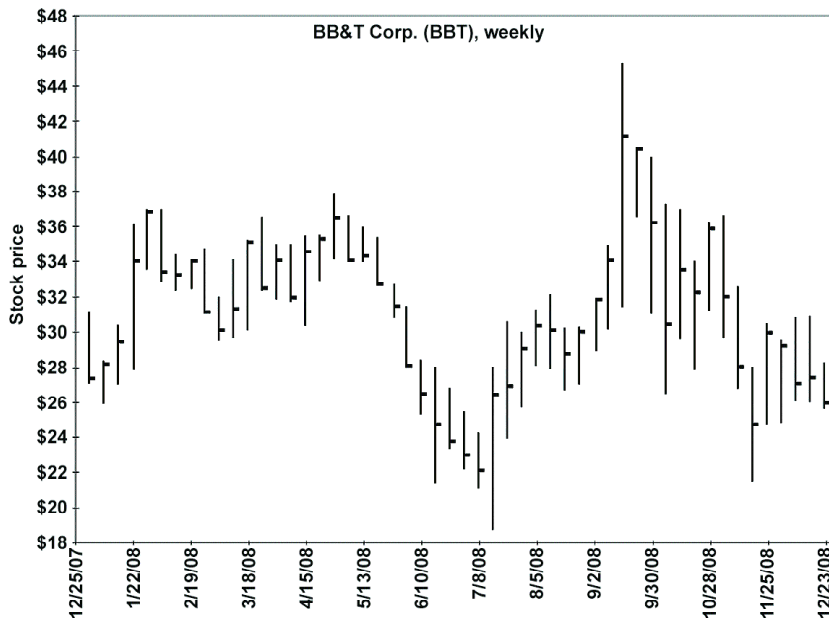


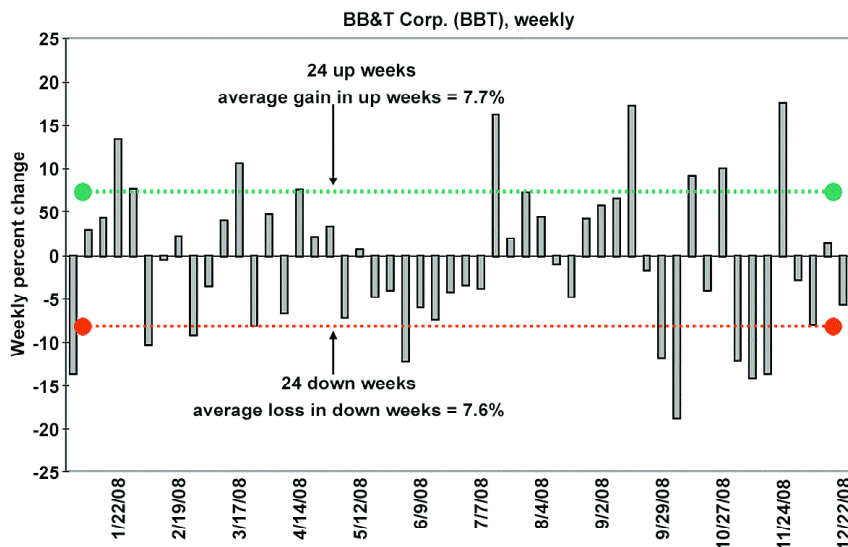
A simpler volatility measure

FIGURE 1: BB&T CORP



BBT seems fairly volatile on a weekly basis as it traded between \$19 and \$45 in 2008.

FIGURE 2: WEEKLY MOVES, BBT



BB&T gained ground during 24 of 52 weeks and it fell during 28 of those weeks. Its gain-loss spread was 7.65 percent during this period.

A recent academic study offers a simpler, more intuitive volatility calculation for traders and investors.

BY GEORGE HOEKSTRA

Volatility as a general concept is straightforward enough, but depending on the specific type of volatility you're analyzing, in practice it can quickly devolve into complex mathematical formulas — especially in academic circles.

However, in a recent academic article, Professor Javier Estrada from the IESE Business School in Spain proposed a new, easy-to-understand measure of volatility: the gain-loss spread (GLS), a simpler and more intuitive measure of volatility than standard deviation. Estrada argues GLS measures investment risk better than standard deviation and merits a close look from traders and

KC For more information about the following concept, go to "Key concepts" on p. xx.

- Correlation
- Standard deviation
- Variance
- Volatility

investors. (You can download the full article at: http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1308103.)

Let's look at how to calculate and interpret the GLS spread, compare it to standard deviation, and show why it is especially helpful for options traders who study the relative volatilities of multiple stocks to find expensive options to sell and cheap options to buy. Although the following examples focus on stocks, the concept is applicable to any market.

Calculating the gain-loss spread

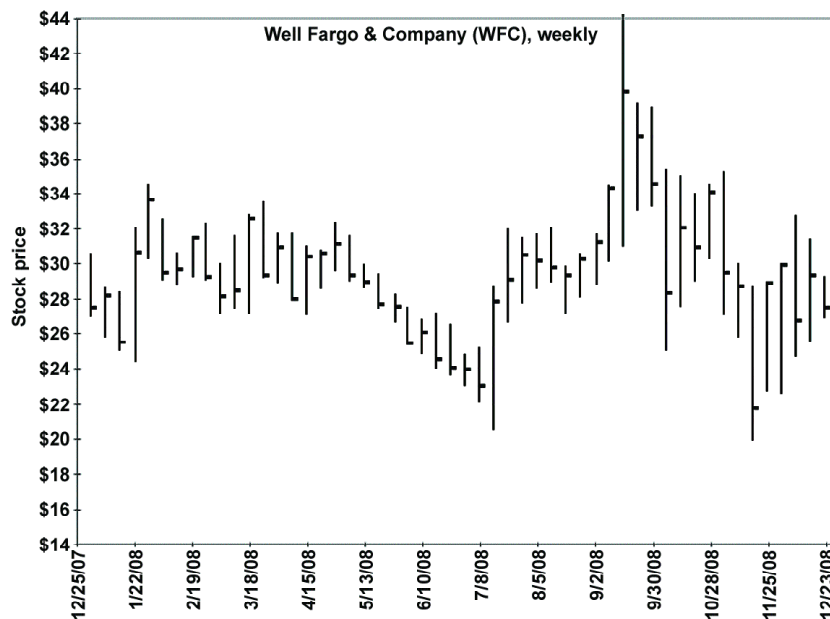
To calculate the GLS for a stock, first select a historical time period — say, one year. Next, break the time period into intervals, such as 52 weeks. Then, ask four simple questions:

1. In how many of the 52 weeks did the stock go up?
2. In how many of the 52 weeks did the stock go down?
3. For the up weeks, what was the average percentage gain?
4. For the down weeks, what was the average percentage loss?

The gain-loss spread is calculated directly from these four numbers:

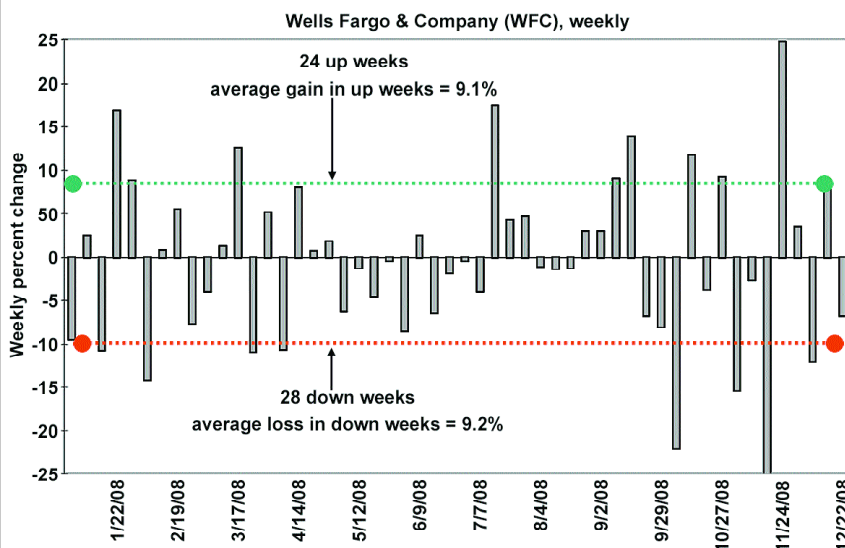
1. The probability of gain is estimated as the number of up weeks divided by 52.
2. The probability of loss is estimated as the number of down weeks divided by 52.
3. The gain-loss spread is the size of the average percentage gain multiplied by the probability of gain, minus the size of the average percentage loss multiplied by the probability of loss.

FIGURE 3: WELLS FARGO



Wells Fargo was slightly more volatile than BB&T in 2008 as it traded between \$20 and \$44.

FIGURE 4: WEEKLY MOVES, WFC



Wells Fargo posted 24 up weeks and 28 down weeks in the past year. Its gain-loss spread was 9.15 percent during this period — higher (and more volatile) than BBT.

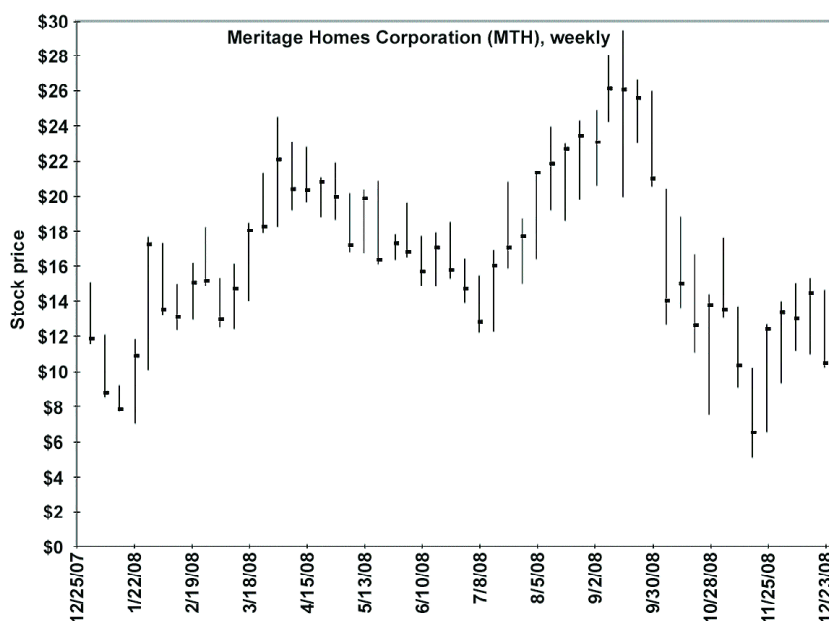
Figure 1 shows a weekly bar chart of BB&T Corp. (BBT) for the 52-week period ending Dec. 26, 2008. Figure 2 shows BBT's weekly percentage close-to-close price changes. BB&T gained ground in 24 of the 52 weeks and fell during 28.

The average gain for the 24 up weeks was 7.7 percent and the average loss for the 28 down weeks was 7.6 percent.

When calculating the gain-loss spread, the average upside gain is weighted by

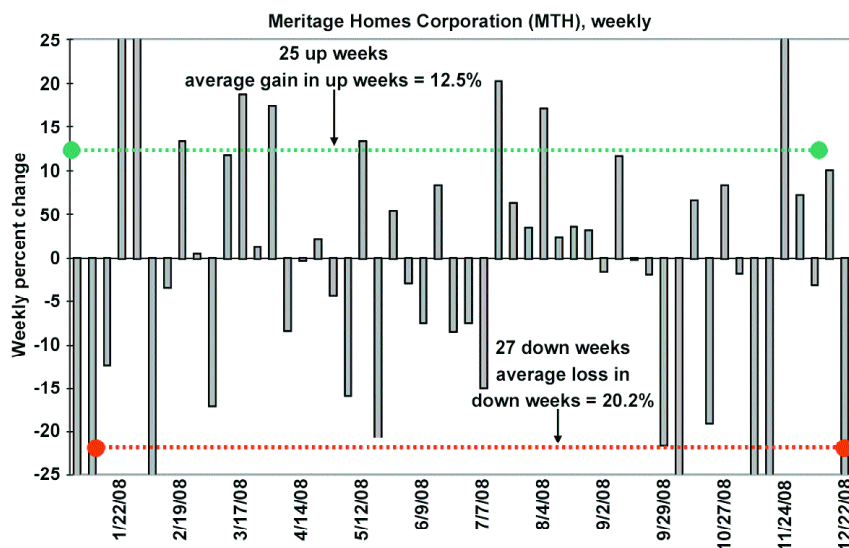
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FIGURE 5: MERITAGE HOMES



Meritage Homes was more volatile than BB&T and Wells Fargo in 2008, bouncing between \$5 and \$29.

FIGURE 6: WEEKLY MOVES, MTH



Meritage Homes had a gain-loss spread of 16.5 percent in 2008 — nearly twice as large as BB&T and Wells Fargo.

the fraction 24/52, an estimate of the probability of gain; the average downside loss is weighted by the fraction 28/52, an estimate of the probability of loss. The resulting gain-loss spread is:

$$\text{Weekly GLS} = 24/52 * (7.7\%) - 28/52 * (-7.6\%) = 7.65\%$$

Figure 2 (p. xx) provides an intuitive

picture of a stock's volatility over a year — the larger the distance between the green and the red lines, weighted by the number of up and down weeks, the larger the GLS value. The variation in the weekly bars' moves shows how BB&T's volatility changed in 2008.

Digging deeper

Figure 3 (p. xx) shows a weekly chart of Wells Fargo (WFC) in the last year, and Figure 4 (p. xx) shows its weekly close-to-close price changes. Wells Fargo was slightly more volatile than BB&T in 2008. There were 24 up weeks with an average weekly gain of 9.1 percent, and 28 down weeks with an average weekly loss of 9.2 percent. Wells Fargo's weekly GLS was:

$$24/52 * (9.1\%) - 28/52 * (-9.2\%) = 9.15\%$$

Figures 5 and 6 show that Meritage Homes (MTH) was more volatile than Wells Fargo last year. MTH had 25 up weeks with an average gain of 12.5 percent and 27 down weeks with an average loss of 20.2 percent — a GLS value of 16.5 percent:

$$25/52 * (12.5\%) - 27/52 * (-20.2\%) = 16.5\%$$

The three weekly gain-loss charts (Figures 2, 4, 6) share the same scale, so they can be compared visually. Some of the bars in Figures 4 and 6 are off the chart, but a visual comparison is enough to clearly see the differences in volatility, as measured by the differences in weekly gains and losses.

Gain-loss spread vs. standard deviation

Estrada's study shows the gain-loss spread correlates closely with standard deviation for a wide range of industries and inter-

national equity indices. It is a good substitute for standard deviation when ranking the relative volatility of these indices. As a measure of risk, the GLS correlates better with mean returns than standard deviation does, according to the study. This suggests GLS is a better indicator of price volatility than standard deviation for purposes of assessing investment risk.

Table 1 lists the weekly GLS and standard deviations for 10 stocks in the 52 weeks leading up to Dec. 26. The GLS and standard deviation are not numerically equivalent, but they are correlated. Notice the gain-loss spread ranks the 10 stocks into exactly the same order as standard deviation. Figure 7 (p. xx) compares the two measures in an X-Y chart and shows the tight correlation. Thus, the GLS and standard deviation are similar measures of volatility for ranking volatility of different stocks.

A better measure of volatility?

It is customary to use standard deviation as the measure of an asset's volatility when calculating option prices. Standard deviation is convenient because it relates directly to a theoretical price distribution, which allows elegant and convenient mathematical treatment of risk. It is also convenient because it is widely used, and data on standard deviation is widely available. But the standard deviation is not the only useful measure of an asset's volatility, and it is certainly not the only "correct" measure.

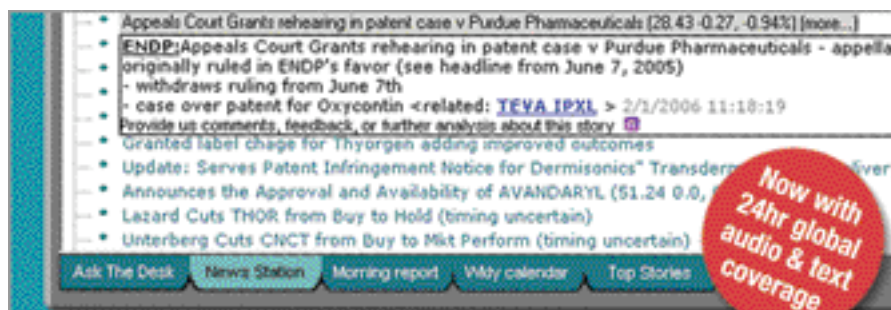
Estrada offers good arguments for why GLS might be better than standard deviation as a measure of investment risk. Investors intuitively associate risk with the size and likelihood of potential losses. Questions such as "How often does this stock go down?" and "How much does it fall when it drops?" are tangible

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TABLE 1: GAIN-LOSS SPREADS VS. STANDARD DEVIATIONS

Stock	Weekly gain-loss spread	1-year standard deviation
1. Abbott Laboratories (ABT)	3.00%	31.00%
2. Pfizer Inc. (PFE)	3.40%	34.00%
3. Qualcomm Inc. (QCOM)	5.30%	42.00%
4. BB&T Corp. (BBT)	7.60%	61.00%
5. Baker Hughes Inc. (BHI)	8.50%	69.00%
6. Wells Fargo & Company (WFC)	9.10%	72.00%
7. Comerica Incorporated (CMA)	10.50%	84.00%
8. Arena Resources Inc. (ARD)	11.90%	90.00%
9. Overstock.com Inc. (OSTK)	13.30%	109.00%
10. Meritage Homes Corporation (MTH)	16.50%	142.00%

The gain-loss spread and standard deviation are clearly correlated, but not numerically equivalent.



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indicators of loss. In this sense, the gain-loss spread is a clear way to examine a prospective investment's historical performance.

By contrast, standard deviation, which is the square root of the average quadratic deviation from the arithmetic mean return, is not very tangible to investors assessing investment risk. It makes sense that GLS, calculated directly from tangible indicators of risk of loss, would better match perceived investment risk, as it is reflected in market prices.

The options angle

Simple measures of volatility can be used in very concrete ways to aid the search for option bargains. A previous article showed some techniques with other simple volatility indicators (see "Getting a handle on volatility," *Futures & Options Trader*, September 2006).

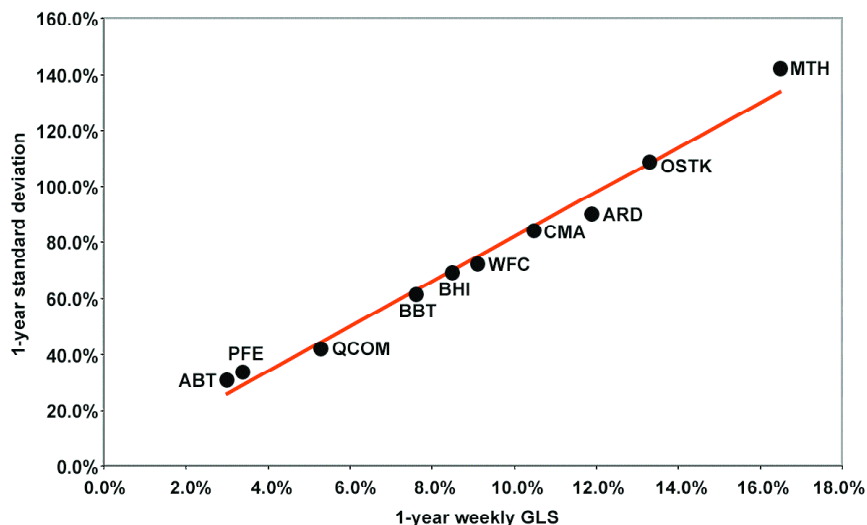
These simple volatility measures are better than standard deviation because they are more intuitive and easier to calculate. You can really simplify things if you focus your analysis on relative volatilities — for example, among a group of stocks, which one is most volatile, which is least volatile, and how do the others rank in between? These tactics can be used to visualize and scale relative volatilities without having to calculate the option's theoretical value directly.

It's similar to finding the tallest person in a group — you don't need to measure everyone's height to see who is tallest.

Estrada's analysis provides convincing evidence that his new measure, the gain-loss spread, is both more intuitive and better from a theoretical standpoint, as a measure of investment risk. 🔄

For information on the author see p. 8.

FIGURE 7: CORRELATIONS



The correlation between weekly gain-loss spreads and standard deviations is close for these 10 stocks.

Related reading: George Hoekstra articles

"Who buys options?" *Futures & Options Trader*, November 2008.

A recent academic paper analyzing who trades different types of options strategies offers clues for successful trading.

"The quest for cheap options," *Futures & Options Trader*, August 2008.

This option-buying strategy builds on a recent academic study that found a compelling edge in the options market from 1996 to 2005.

"Getting a handle on volatility," *Options Trader*, September 2006.

Want to understand volatility? Before you dive into option-pricing models and complex math, do some basic price comparison. You'll be surprised how much you can learn.

"Focusing on volatility," *Options Trader*, August 2005.

To hone in on options with the most favorable odds, structure a search that focuses on a certain stock price, exercise price, and expiration date, and then use a simple analysis approach to identify options that are the most under-priced.

"The option pricing edge," *Options Trader*, October 2005.

Buying options at a 10- to 20-percent discount can be the difference between making and losing money over time. A popular trading approach is to buy options on a stock you expect to have more volatility than the level implied by the price of its options. Higher volatility translates into higher option prices, so if your assessment of future volatility is correct, such options give you an advantage in that higher actual volatility increases the chance of a profitable trade.

"Bargain hunting options," *Active Trader*, January 2005.

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