



Applying a simpler volatility measure

A close look at the gain-loss spread demonstrates how it can pinpoint volatility patterns that standard deviation might miss.

BY GEORGE HOEKSTRA

In the wake of last year's stock market collapse, everyone seems to be talking about volatility. However, few investors really understand what volatility is and how to calculate it. Volatility is typically measured by standard deviation, a somewhat abstract concept for most investors. Luckily, there are more tangible ways to measure volatility including a new calculation introduced by Professor Javier Estrada from the IESE Business School in Spain.

Professor Estrada's volatility measure is called the gain-loss spread (GLS), which is easier to understand and is explained in a recent issue of *Active Trader* (see "A simpler volatility measure," April 2009). This discussion reviews how the GLS is constructed and shows how it can uncover

subtle differences between the volatilities of two underlying markets that options traders focusing on standard deviation may overlook. In short, the gain-loss spread can help you uncover trading opportunities that the options-trading crowd neglect. (Estrada's study can be downloaded from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1308103.)

Gain-loss spread basics

To calculate the gain-loss spread for a stock, first select a historical time period — one year, for example. Next, break the time period into intervals of 52 weeks. Finally, ask four simple questions:

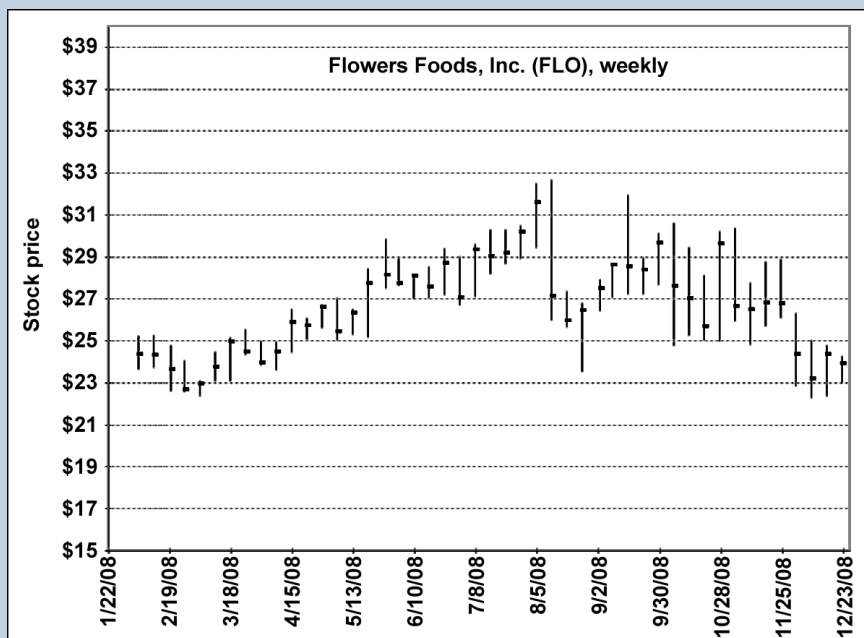
1. In how many of the 52 weeks did the stock go up?
2. In how many of the 52 weeks did the stock go down?
3. For the up weeks, what was the average percentage gain?
4. For the down weeks, what was the average percentage loss?

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

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

FIGURE 1 — FLOWERS FOODS

Flowers Foods ranged from roughly \$23 to \$33 over the past year, but more definitive conclusions about its volatility are hard to draw from this weekly price chart.



Is the gain-loss spread useful?

Figure 1 shows a weekly chart of Flowers Foods, Inc. (FLO) for the 52-week period ending Jan. 30. Figure 2 shows FLO's weekly percentage price changes over the same period as well as its average weekly percentage gain (green line) and loss (red line).

Flowers Foods increased in 23 of the 52 weeks, and it dropped in 29 of those weeks. The average gain for the 23 up weeks was 4.0 percent, and the average loss for the 29 down weeks was 4.2 percent. In calculating the GLS, the average upside gain is weighted by the fraction 23/52, which is an estimate of the probability of gain; the average downside loss is weighted by the fraction 29/52, which is an estimate of the probability of loss. The GLS is calculated as follows:

$$\text{Weekly GLS} = 23/52 * (4.0\%) - 29/52 * (-4.2\%) = 4.1\%$$

Estrada's article provides convincing evidence that the gain-loss spread is at least as good — and in some ways better — than standard deviation as a measure of stock-price volatility. One of its big benefits is simplicity.

Using the GLS, Flowers Foods' volatility can be expressed as follows: In a typical week, Flowers Foods is expected to vary by 4.1 percent (up or down) from the prior week's close. That is a simple, tangible statement about volatility.

Using standard deviation, Flowers Foods' volatility is harder to grasp: The square root of the average quadratic deviation from Flowers Foods' arithmetic mean return is expected to be 36 percent.

Painting a volatility picture

Unlike Figure 1, Figure 2 reveals a fingerprint of Flowers Foods' volatility. What can be learned from studying this

FIGURE 2 — WEEKLY MOVES (FLO)

The gain-loss spread for Flowers Foods indicates it is expected to vary by 4.1 percent (up or down) in any given week.

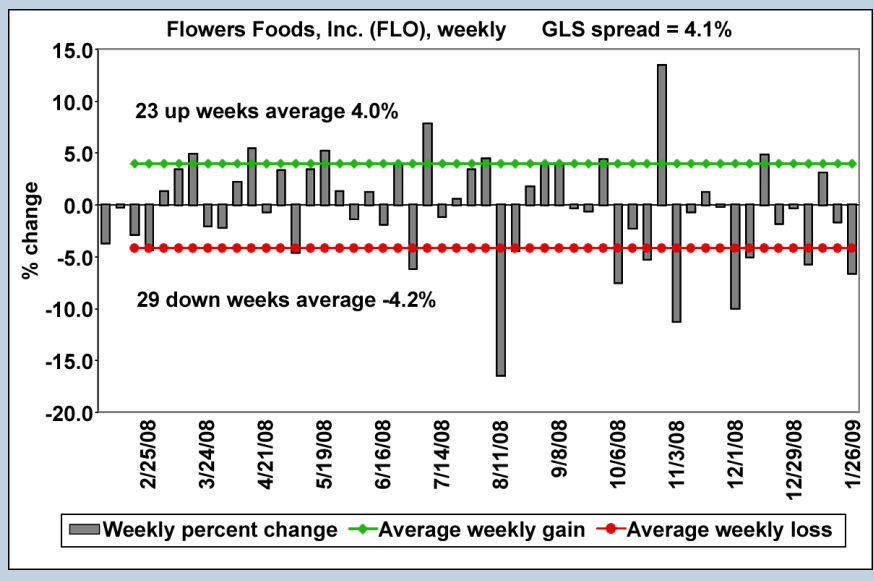
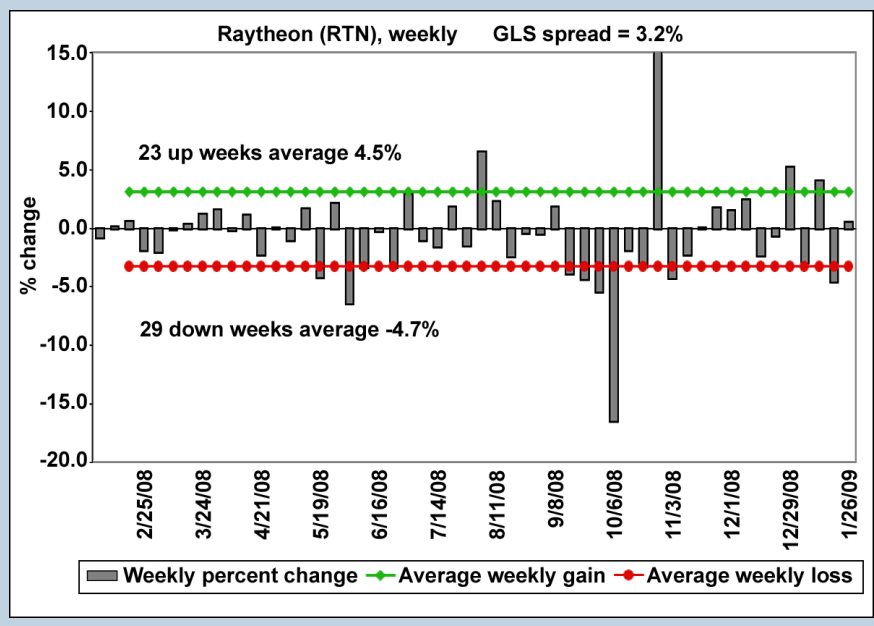


FIGURE 3 — WEEKLY MOVES (RTN)

Raytheon has a much different volatility pattern than Flowers Foods (Figure 2). In early 2008, RTN's volatility was low, but it increased steadily during the year, climaxing with a 17-percent weekly loss in October and a 16-percent gain three weeks later.



chart? First, the distance between green and red lines is a simple indicator of average volatility — the farther apart these lines are, the higher the volatility.

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FIGURE 4 — RAYTHEON

Raytheon had a bad year in 2008 as it plunged 34 percent from mid-September to mid-October.

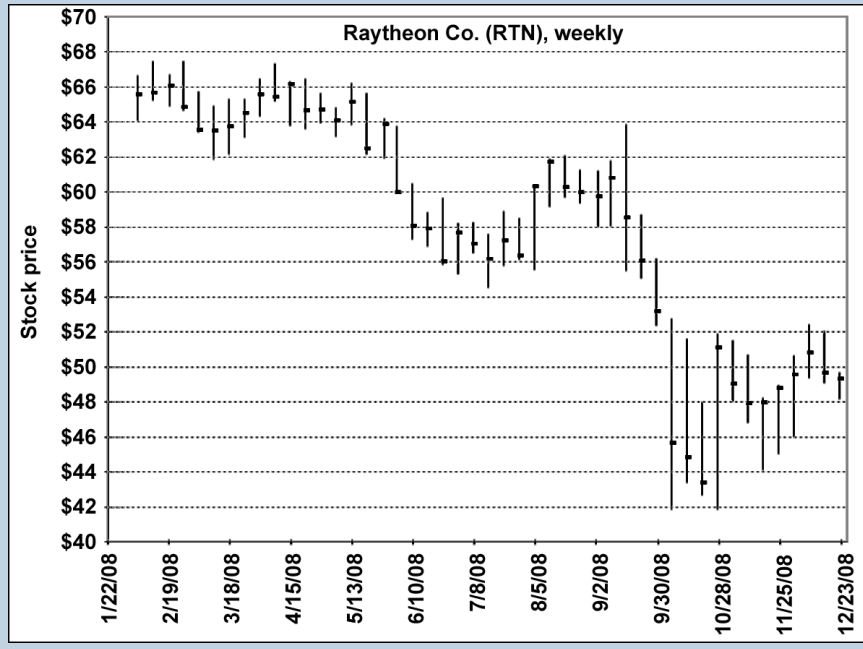


FIGURE 5 — TIM HORTONS

The difference in GLS percentage values for FLO and THI is relatively large (4.1 vs. 4.6 percent, respectively), a discrepancy that doesn't appear in their standard deviations.

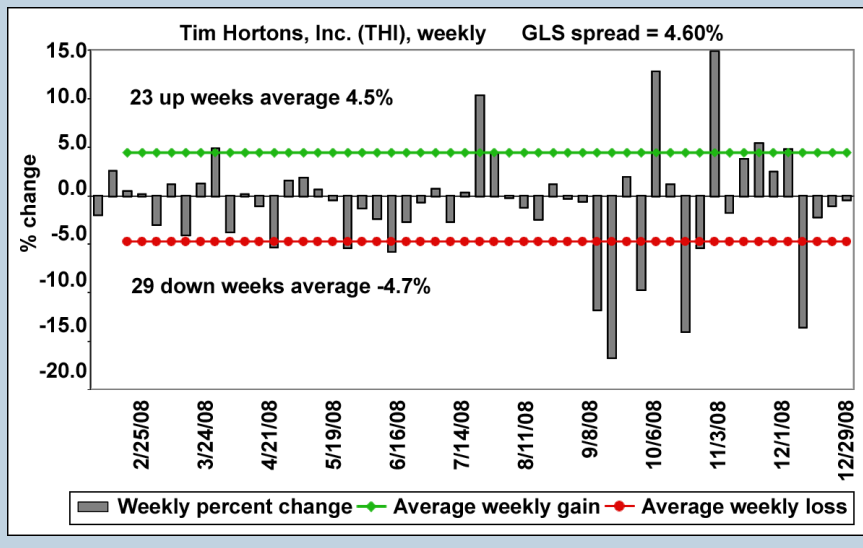


TABLE 1 — MEASURING VOLATILITY – FLO VS. THI

The standard deviations for Flowers Foods and Tim Hortons are about the same, but their weekly GLS percentages are wider apart.

Stock	Stock price	100-day standard deviation	1-year standard deviation	Weekly gain-loss spread
Flowers Foods, Inc. (FLO)	\$21.50	54%	36%	4.1%
Tim Hortons Inc. (THI)	\$24.50	52%	41%	4.9%

Figure 2's individual bars represent weekly percentage moves that lead to a certain level of volatility; they are the spread's sole components. Bars that exceed the green line indicate unusually strong weeks. Flowers Foods had only two really strong weeks, one in July and one in October (8- and 13-percent gains, respectively).

Bars extending below the red line show losses exceeding the average weekly loss of 4.2 percent. There were 8 such weeks, all of them in the second half of 2008 (three exceeding 10 percent).

A pattern of FLO's volatility emerges over time. Flowers Foods was relatively stable in the first half of 2008 as up and down weeks were evenly distributed and mostly contained within the two average lines. By contrast, the second half of 2008 was much more volatile, especially on the downside.

Weekly GLS charts show price action through a new and different lens. Instead of simply using a standard deviation value for volatility, you are studying underlying information that drives option prices — a deeper level of detail.

Comparing volatilities of different stocks

Let's use weekly gain-loss charts to compare the volatility of Flowers Foods with Raytheon (RTN), which has a one-year standard deviation of 30 percent (similar to FLO). Figure 3 shows RTN's weekly gain-loss chart, and Figure 4 shows its weekly bar chart.

If you compare Figures 2 and 4, you will notice Raytheon has a

TABLE 2 — JULY OPTIONS DETAILS

The July calls for Flowers Foods and Tim Hortons have similar prices (if you examine their extrinsic values).

Option	Strike price	Flowers Foods Inc.			Tim Hortons Inc.		
		Amount in the money	Option price	Extrinsic value	Amount in the money	Option price	Extrinsic value
	Stock price		\$21.50		\$24.60		
July 20 call	\$20.00	\$1.50	\$3.40	\$1.90	\$4.60	\$5.70	\$1.10
July 22.5 call	\$22.50	-\$1.00	\$2.10	\$3.10	\$2.10	\$3.90	\$1.80
July 25 call	\$25.00	-\$3.50	\$1.30	\$0.00	-\$0.40	\$2.55	\$0.00
July 30 call	\$30.00	-\$8.50	\$0.40	\$0.00	-\$5.40	\$0.85	\$0.00

much different volatility pattern than Flowers Foods. In early 2008, RTN's volatility was low, but it increased steadily during the year, climaxing with a 17-percent weekly loss in October and a 16-percent gain three weeks later. Meanwhile, FLO's volatility was more consistent.

Figure 4's weekly bar chart shows both price trends and volatility — the two kinds of information are intermixed. Clues about volatility are often ignored because your attention is drawn to the stock's directional movement. For example, the first thing you probably notice about Figure 4 is that Raytheon had a very bad year. But Figure 3's GLS chart helps you focus solely on volatility.

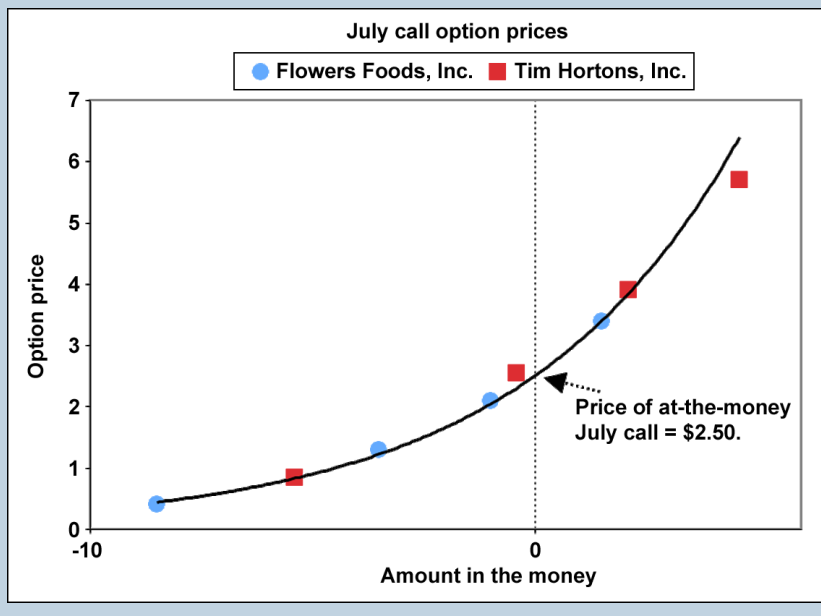
Comparing Tim Hortons (THI) to Flowers Foods makes more sense, because its stock moves and volatility were similar in 2008. Table 1 lists three measures of volatility for both stocks: 100-day standard deviation, one-year standard deviation, and weekly gain-loss spread.

The 100-day standard deviations are essentially the same — 54 percent (FLO) and 52 percent (THI). These values are based on 100 trading days and are sometimes used in theoretical option-pricing models. The one-year standard deviation values are smaller than their 100-day counterparts, meaning the most recent 100 days have been more volatile than the entire previous year. Both calculations show similar volatilities.

Figure 5 shows a weekly gain-loss chart for THI. The difference in GLS spread values for FLO and THI is relatively large (4.1 vs. 4.6 percent, respectively), a discrepancy that

FIGURE 6 — OPTIONS PRICING — FLO VS. THI

The options prices of both stocks fall along a single trend line, showing they are equivalent.



doesn't appear in their standard deviations.

THI volatility was dominated by several explosive weeks in the fourth quarter of 2008, according to Figure 5. THI lurched at least 10 percent (up and down) in half of those weeks during that period and moved more than 15 percent at least once. This differs sharply with the first half of the year, when THI often swung less than 3 percent on a weekly basis. By contrast, Flowers Foods (Figure 2) showed a much more consistent volatility pattern.

The next step is to show how options traders can use this discrepancy to find potential trade opportunities.

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Parsing options prices


Because the standard deviations and stock prices of Flowers Foods and THI are similar, you would expect their options to be priced about the same. Table 2 lists the details of several July 2009 calls on FLO and THI and shows their extrinsic values (price minus amount [in the money](#)) roughly match.

Figure 6 plots both stocks' July call prices (y-axis) against the amount they are in the money (x-axis). The data fall along a single trend line, showing option prices are equivalent for these two stocks. This trend line crosses the x-axis at \$2.50, which represents the cost of an [at-the-money](#) (ATM) July call for both stocks.

In short, the options market doesn't care about the difference in volatility patterns of FLO and THI. Option prices reflect both stocks' average volatility as measured by the standard deviation. They are indifferent to the manner in which volatility has changed over time.

Again, the weekly gain-loss charts in Figures 2 and 5 highlight significantly different volatility patterns in FLO and THI, but their options are priced identically. How can you exploit this situation? To answer this question, dig deeper to diagnose their volatility patterns. Flowers Foods was relatively stable, but THI has been more sensitive to something going on in the market or in its business. Whatever the cause, is it likely to continue in the next few months? If you believe it will, then you would want to buy options on THI instead of FLO.

By examining recent news on a stock, you can uncover reasons why particular large moves occurred when they did. First, find out what type of news broke when FLO and THI made unusual weekly moves last year. Were these moves driven by market or company-specific events? Also, determine if other noteworthy events occurred in the same week; if so, do they tend to recur? Volume trends can also pinpoint patterns of when large price moves occur.

The goal is to figure out what is driving the volatility of these stocks. By answering these questions, you may discover clues that reveal how volatility may unfold in the future. If so, you can then enter an options position to take advantage of this forecast. 

For information on the author [see p. 5](#).

Related reading: George Hoekstra articles

“A simpler volatility measure,” *Active Trader*, April 2009.
Measuring volatility with standard deviation can be confusing for some traders. The gain-loss spread is a new volatility formula that is easier to grasp.

“Who buys options?”
Futures & Options Trader, November 2008.
An 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 underpriced.

“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.
If you get the willies every time read “standard deviation,” take heart: This volatility analysis approach and option trading strategy takes the mathematical sting out of finding inexpensive options.

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