

## VOLATILITY IN PERSPECTIVE

By Ed Easterling

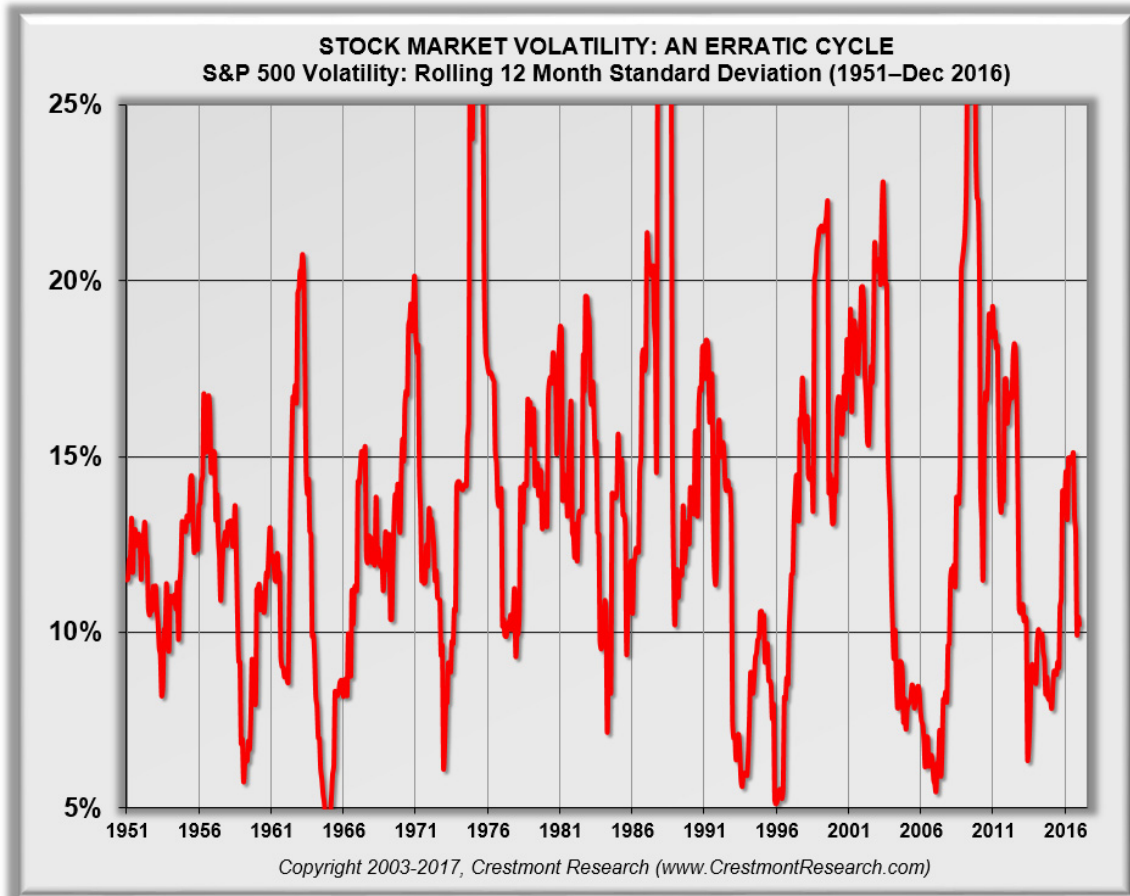
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Who or what is rocking the boat? Is the current level of volatility “normal” or is it extreme in either direction? The purpose of this presentation is to graphically put volatility into historical perspective. This report will be updated periodically as volatility is just too volatile to be ignored.

The first look at volatility uses the common measure of standard deviation. For this analysis, the monthly percentage changes in the S&P 500 Index are used and then the result is annualized to reflect a measure of the amount of variability in the market. This measure is often used by financial market professionals as an indication or measure of risk in models that assess risk versus return. It’s not important for this discussion to go into detail about the statistic—it is only necessary to appreciate that it is the most common measure of volatility and to recognize that a higher value means higher volatility.

Figure 1. S&P 500 Index Volatility: Rolling Volatility (1950 to Present)



Let's look at six decades of volatility...to put volatility into perspective. To present a view of volatility and its change over time, Figure 1 presents the twelve-month rolling standard deviation for the S&P 500 Index. The concept of rolling periods just means that the value that is used for each month is the 'standard deviation' for the most recent twelve months. So as the market goes through periods of higher and lower volatility, the measure reflects those changes.

As you can see in Figure 1, volatility tends to average near 15% (the average that many models and academics use for stock market volatility). Yet one of the most interesting aspects of the history of volatility is that it tends to move around a lot. Although most periods generally fall within a band of 10% to 20% volatility, there have been periods when volatility was unusually high and periods when it was unusually low...and often extreme periods in one direction are followed by oppositely extreme periods. The time between the light grey vertical bars on the graph represent four-year periods. So some of the extreme periods can last for a while, yet few last a long time.

For most of the mid-2000s, volatility had been unusually low—and by late 2006 and early 2007, volatility fell into the lowest three percent of all periods since 1950. No wonder that investors and market spectators had become complacent to market volatility...or maybe complacency about risk led to the low volatility. Nonetheless, the waters of the market were unusually calm.

Then, in 2008, volatility surged to startling and anxiety-producing levels. This longer-term measure (which is a little slow to react since it requires twelve months of information) increased to more than 25%—fairly high by historical standards, yet not without precedent. Soon after, volatility settled back within the typical range—the midrange that acts as a holding pattern until volatility again breaks in either direction.

Across most of 2013 and 2014, an eerie calm returned to the stock market. Volatility plunged to near 2006/2007 levels. As history has shown, a surge to higher volatility was not far away. As 2015 progressed, volatility rose—albeit only to levels near average. The market's rallies in 2016 have tamped down volatility, for now. And so, which way from here?

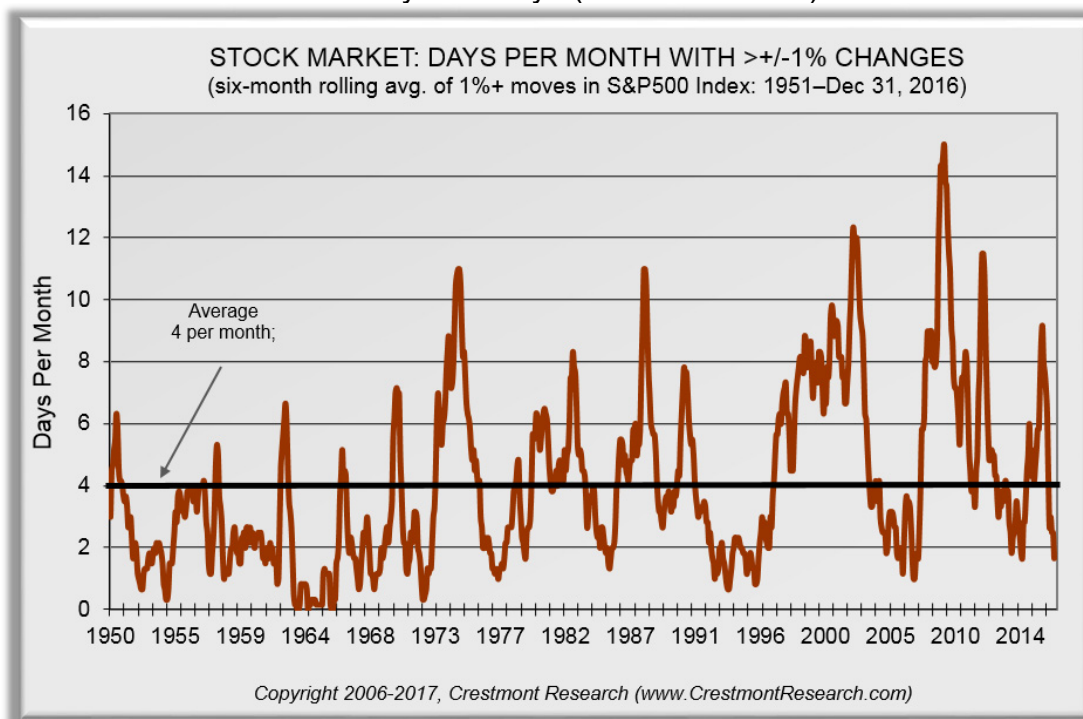
For a better reflection of near-term changes and trends in volatility, we can look at two other measures: the frequency of days each month that close up or down by more than 1% and the intra-day range expressed as a percentage. The first of these measures reflects the "six o'clock news summary" of daily volatility—since significant moves in the market often make the news—and the second reflects the "rollercoaster" that many professionals experience. For example, there are days when the market opens higher or lower and stays there—so measuring 1% days reflects the magnitude of daily changes. Therefore, with only a week or month of trading days, we can quickly see emerging changes in the overall level of volatility.

On other days, when the market professionals get home with that worn-out-look, the market may have swung wildly yet closed with little change from the previous day. So to capture that aspect of volatility, we can measure the difference between the high and low and present it as a percentage of the previous closing price. A higher percentage reflects higher volatility.

First, let's look at the frequency of days each month that the market closed up or down by 1% or more. At times in the past, there may have been one day or none per month, while at other times, the market moved by one percent virtually every other day. Keep in mind that most months average about 21 trading days.

As reflected in Figure 2, the historical average going back almost six decades reflects approximately four "1% days" per month...thus about one per week. In the mid-2000s, it was common for volatility to be less than half of the average. Yet, as recently as 2002, there were times when "1% days" occurred more often than every other day. In June 2007, the tremors started and awakened the market. The subsequent two years or so, although somewhat erratic, were enough to drive the measure in the graph—the six-month moving average—well into above-average territory. Then over several years, volatility calmed a bit—only to surge again in 2011. By the end of 2013, and continuing into 2015, volatility returned to below-average levels. Yet, as reflected in Figure 1, volatility rose through most of 2015 and then settled down significantly across 2016.

Figure 2. S&P 500 Index Volatility: 1% Days (1950 to Present)



Next, let's look at the other shorter-term measure of volatility trends and changes: the average daily range. This one could be called the "rollercoaster factor" since it measures the trough-to-peak each day as a percent of the market index. For example, if the S&P 500 Index starts at 1015 and falls to 1000 before ending at 1014, the daily range was 15 points (i.e. 1015 minus 1000) or 1.5% (i.e. 15 divided by 1000). The intra-day information that is needed for this measure is available from 1962, providing over four decades of data. The average daily swing over more than forty years has been approximately 1.4%. At today's levels, that's about 30 points for the S&P 500 Index and the equivalent for the Dow Jones Industrial Average would be over 250 points.

Figure 3 reflects that the average daily range has been similarly variable like our other measures of volatility. As our most quickly reacting measure of volatility, the Average Daily Range rose across much of 2015, then settled back a bit by year-end. That trend continued through 2016 and this measure of volatility ended the year near historic lows.

Figure 3. S&P 500 Index Volatility: Daily Range (1962 to Present)

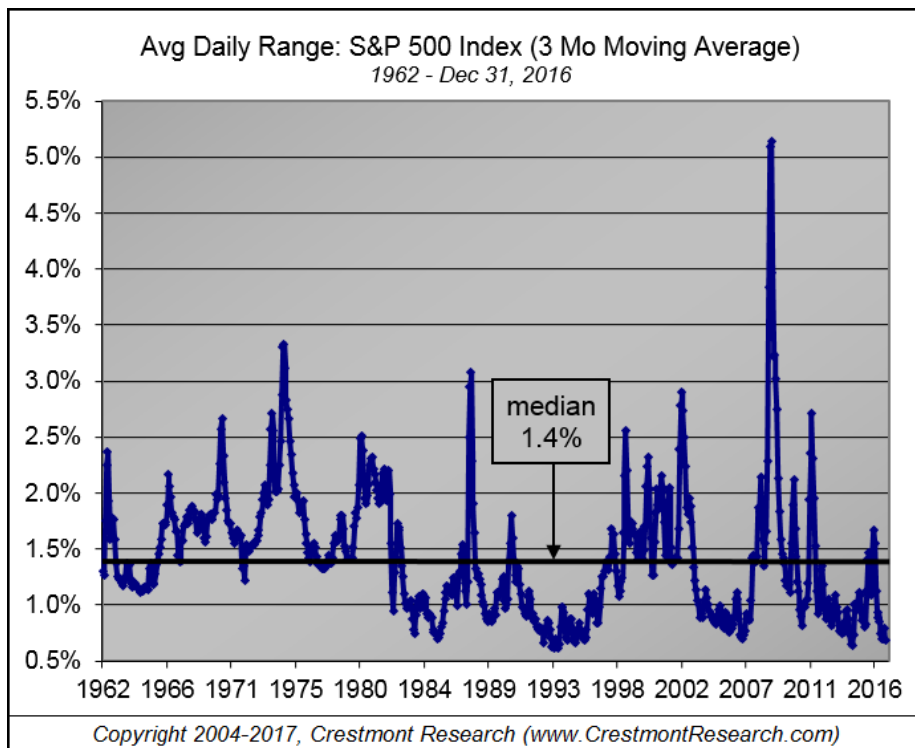


Figure 4. S&P 500 Index Volatility: Relationship To Market Returns

<b>Relationship Of Volatility &amp; Market Returns (S&amp;P 500 Index: 1962–Dec 31, 2016)</b>						
<b>MONTHLY DATA: S&amp;P 500 INDEX AVERAGE DAILY RANGE</b>						
Quartile	Volatility Range	% Chance Up Month	% Chance Dn Month	If Up Avg Gain	If Down Avg Loss	Expected Gain/(Loss)
1st	0% - 1.0%	75%	25%	2.9%	-1.7%	1.7%
2nd	1.0% - 1.3%	62%	38%	2.9%	-2.0%	1.0%
3rd	1.3% - 1.7%	56%	44%	3.1%	-3.1%	0.4%
4th	1.7% - 6.6%	43%	57%	5.1%	-4.9%	-0.6%
<b>ANNUAL DATA (1962–2014): S&amp;P 500 INDEX AVERAGE DAILY RANGE</b>						
Quartile	Volatility Range	% Chance Up Year	% Chance Dn Year	If Up Avg Gain	If Down Avg Loss	Expected Gain/(Loss)
1st	0% - 1.0%	92%	8%	15.4%	-1.5%	14.1%
2nd	1.0% - 1.4%	77%	23%	14.4%	-6.3%	9.6%
3rd	1.4% - 1.8%	79%	21%	17.9%	-7.7%	12.4%
4th	1.8% - 2.7%	43%	57%	15.1%	-19.4%	-4.6%

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In Figure 4, as an update to the information originally presented on page 48 of *Unexpected Returns* and discussed in the book, the table reflects the propensity for the stock market to perform well in lower volatility periods and perform poorly in higher volatility periods. The principles of valuation and volatility that are explored in *Unexpected Returns* are the key drivers of stock market returns and performance over multi-year periods. As a result, the current environment of lower volatility certainly suggests that defensive and/or hedged strategies are appropriate due to the risk of a shift toward higher volatility.

## CONCLUSION

From ultra-low levels of volatility to ultra-high levels and back again, the past decade has been unique—but not unprecedented. There are several ways to measure volatility, some with longer-term, bigger-picture perspective. Others provide a shorter-term, more current view of conditions. All measures currently reflect that volatility has declined, with some measures near historical lows.

An historical perspective of volatility reflects that higher volatility periods are normal and can extend for quarters or years. Many investors had anchored on the mid-2000s extreme low volatility years as a normal condition and were surprised by the subsequent period of high volatility. A true understanding of history provides a more rational perspective that can help investors take action to protect their portfolios should high volatility return...while being positioned to participate in improved market conditions as volatility abates.

High or rising volatility often corresponds to declining markets; low or falling volatility is associated with good markets. Periods of low volatility are reflections of a good market, *not a predictor of good markets in the future*. Today's favorable market conditions can be a good time to assess portfolios for their ability to weather market storms.

*Ed Easterling is the author of Probable Outcomes: Secular Stock Market Insights and the award-winning Unexpected Returns: Understanding Secular Stock Market Cycles. He is currently president of an investment management and research firm. In addition, he previously served as an adjunct professor and taught the course on alternative investments and hedge funds for MBA students at SMU in Dallas, Texas. Mr. Easterling publishes provocative research and graphical analyses on the financial markets at [www.CrestmontResearch.com](http://www.CrestmontResearch.com).*