Rethinking Rebalancing

Geoff Considine, Ph.D.

There are a number of concepts in investing that are treated as though they are as well thought out as gravity—simple, inexorable, and undeniable. The basic idea of rebalancing as it is typically put to investors seems reasonable. Over time, certain parts of a portfolio will out-perform and certain parts will under-perform. At the end of some period of time, those assets that have done really well will make up a higher fraction of your portfolio and vice versa. If you are shooting for a portfolio with a specific allocation to sectors or individual positions, you will then sell some fraction of the better-performing assets and buy more of the under-performing assets to bring the percentages back to the original target. A nice summary of the logic for rebalancing is given here by David Jackson:

http://etf.seekingalpha.com/article/15261

This sounds fine, but is it well supported? In a more recent article by David Jackson, he notes that John Bogle has come out with the proposition that periodic rebalancing does not justify its costs:

http://etf.seekingalpha.com/article/41119

Mr. Bogle's analysis suggested that annual re-balancing adds no net value. He looked at a portfolio with a target allocation 50% S&P500 / 50% bonds for all 25-year periods from 1826 to the present. He also looked at a portfolio with a target allocation that is 48% S&P500, 16% small cap, 16% international, and 20% bonds over the past 20 years. In both cases, he found no value added by annual re-balancing. Consider, however, the powerful intuitive case in favor of rebalancing—albeit anecdotally. If you were riding the dot-com wave and had annually re-allocated by selling some of your high fliers and buying under-performing assets that exhibited low correlation to tech stocks (like utilities or REIT's), you would certainly be better off today than if you did not rebalance. How do we reconcile the commonsense perspective from the dot-com era with Mr. Bogle's results?

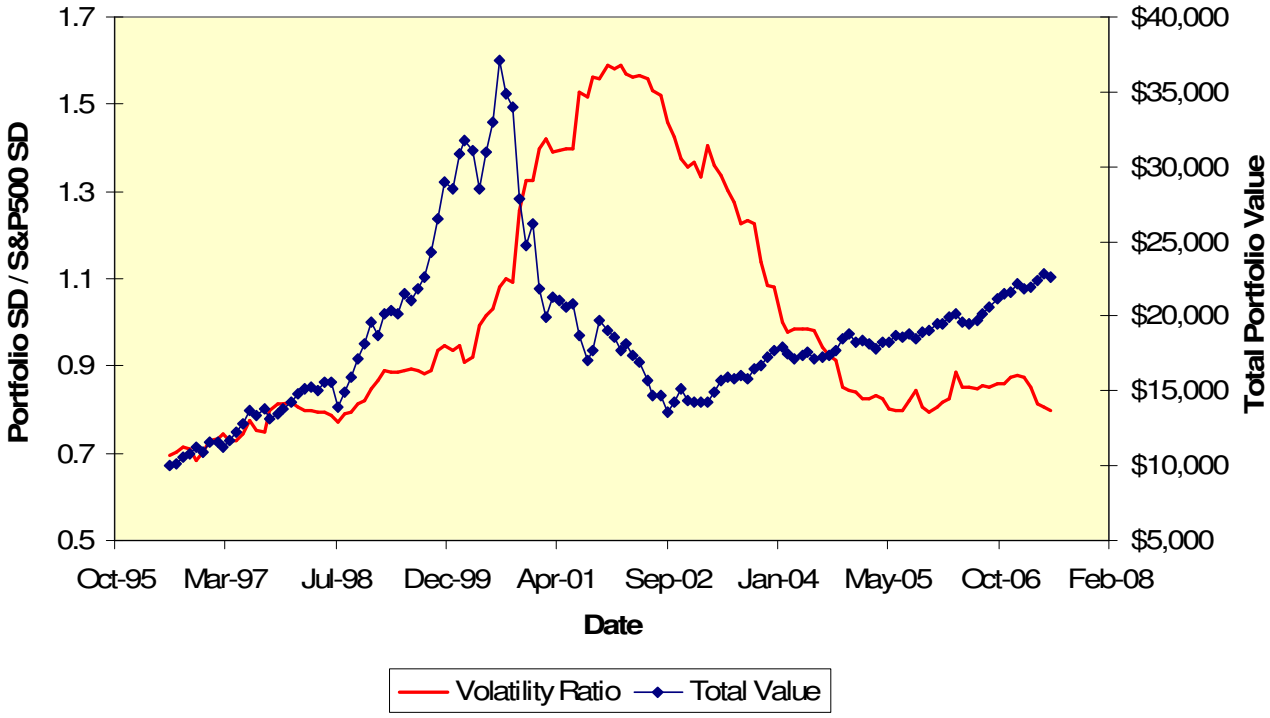
Actually, these two lines of reasoning can be brought together if we look at re-balancing differently. Is there any theoretical reason, based on financial theory, why specific allocations to specific sectors are preferable to letting the allocations weights drift? No. There is, however, a case to be made that it is a reasonable idea to re-balance your portfolio when its risk-return profile has drifted substantially from target levels. If your portfolio volatility gets substantially higher over time, you may consider selling some high risk assets and buying some lower risk assets to replace these. On the other hand, if your portfolio volatility declines substantially, you may want to re-balance to bring the risk/return balance up to your desired levels. Let's call this approach to re-balancing by the name ***risk-based rebalancing***.

Imagine that you set up a portfolio to meet your needs with a specific risk and return. One year later, a very volatile sector in your portfolio has grown so much that your portfolio's risk and return no longer match your desired level. This is a reason to re-balance—you want to get back to the risk-return balance that you have determined is right for you. This is a very different criterion for rebalancing than simply looking at the specific sector allocations. In Mr. Bogle's analyses, he discusses re-balancing purely in terms of drift from somewhat arbitrary specified allocations into sectors/asset classes. From the perspective that I am taking, we would look at whether the risk/return profile of the portfolio had shifted substantially. In an index portfolio that consists of an S&P500 index fund, a bond index fund, and other broad indices, the risk/return profile of the portfolio is not likely to shift strongly in a single year. In a portfolio that contains substantial concentrations into a high volatility stock, the total portfolio volatility can swing dramatically. The key point that I am making is that **it makes sense to assess the importance of allocation drift in terms of how this drift impacts your total portfolio volatility and, thereby, the risk/return profile of your total portfolio.**

Consider the following case. At the end of July 1996, I have a portfolio with 10% in Sun Microsystems (SUNW), 54% in SPY (the S&P500 ETF), and 36% in VFSTX (Vanguard Short-Term Investment Grade bond fund). At the end of July 1996, my portfolio has trailing three-year volatility that is about 70% of the volatility in the S&P500 over that

same period. How far can this volatility shift due to my static allocation before I will want to adjust it—i.e. how far will I allow my portfolio to shift in terms of risk profile before I need to consider a rebalance?

The chart below shows the value of my portfolio from Jul 1996 forward (with no rebalancing) along with the trailing three year volatility of the portfolio relative to the S&P500 (left hand vertical axis). The volatility of the portfolio is measured in terms of the Standard Deviation (SD) in return over the trailing three years.

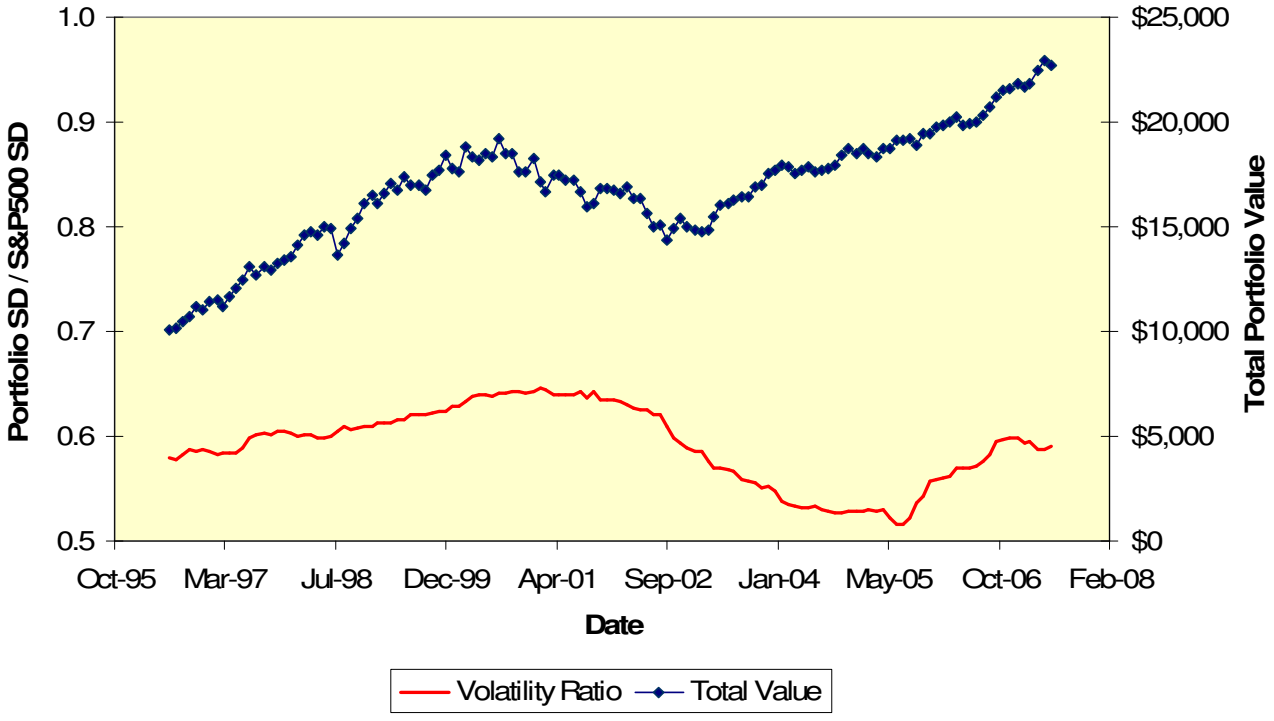


Portfolio volatility relative to the S&P500 vs. total portfolio value for initial allocation of 10% SUNW / 54% SPY / 36% VFSTX (no rebalancing).

In the period from July 1996 through August 2000, the value of this portfolio shot up—in no small part due to the meteoric returns from SUNW. In July 1996 (far left side of the graph), the portfolio had only 0.7 times as much volatility as the S&P500. By August 2000, the portfolio has 1.1 times as much volatility as the S&P500---this portfolio has seen its volatility grow rapidly relative to the S&P500. As the tech bubble popped, the volatility continued to increase—driven by the massive sell-off. The increasing weight of

SUNW in the portfolio during the tech boom made this portfolio increasingly risky—and this is the factor that portfolio theory tells us we need to watch. Thinking in terms of risk-based re-balancing, the red flag of seeing portfolio volatility should up by 50% and more would have indicated that re-balancing made sense.

By contrast to this portfolio, let's look at a much simpler portfolio over the same period. This portfolio starts with 52% SPY and 48% VFSTX. The portfolio value is tracked with the relative volatility of this portfolio as before (below). Our simpler portfolio shows the ratio of portfolio volatility to that of the S&P500, just as in the previous case. Now, this is the kind of portfolio for which Mr. Bogle's analysis shows no real value to re-balancing. Look at the range of scaled volatility numbers—they are actually very stable. The three-year trailing scaled volatility really doesn't drift much at all—even during a period of massive market swings (not that this chart has a much smaller vertical range for the volatility metric).



Portfolio volatility relative to the S&P500 vs. total portfolio value for initial allocation of 52% SPY / 48% VFSTX (no rebalancing).

Mr. Bogle's analysis of the low value of re-balancing in this kind of simple index portfolio is consistent with the fact that this allocation does not have massive swings in portfolio volatility due to higher growth of one asset class over another. In this kind of simple S&P500 / bond mix, we see the relative volatility of the portfolio range by a maximum of 10% around the starting value, even through the dot-com bull and bear market---quite a contrast to the 100% swing in our portfolio which contained 10% SUNW! The low in the relative portfolio volatility in June 2005 is of a larger magnitude than the increase in 2000-2001.

Let's summarize the main points here. First, while it is conventional wisdom that people re-balance annually or when their individual allocations shift from a target level by some amount, the effectiveness of this approach in building a 'better portfolio' is in question. This does not mean that re-balancing is a bad idea—but simply that it is not a foregone conclusion that periodic re-balancing will improve your portfolio. The logic of re-balancing is going to be a function of your portfolio risk/return characteristics. Second, if your portfolio is allocated to a risk/return balance that meets your needs, it is clear that you will want to pay attention to the evolution of total portfolio risk. If your portfolio becomes much riskier than you have planned for (taken in the context of broader market volatility), it is certainly smart to re-assess. Risk-based re-balancing is a different process than trying to keep specific allocations to specific sectors. The idea of risk-based re-balancing helps to reconcile Mr. Bogle's results with the obvious truth that many people with heavy concentrations in tech during the last bull market would be far better off today if they had done some re-balancing.

This analysis does not mean that I believe that investors should have some "volatility trigger point" at which they re-balance. Here is the process that I believe makes sense. Each year, every investor should look at the risk and return properties of his/her total portfolio. This 'look' should examine trailing performance but also should include a reasonable assessment of future risk and return (using a portfolio management tool such as Quantext Portfolio Planner). ***If the projected risk and return for the portfolio match your needs, who cares if you have a heavier or lighter allocation to one sector or***

another? This is the crucial point. If I look at my portfolio and it is either too aggressive or too conservative to best meet my needs, it is rational to re-balance. It is, however, unclear why it makes sense to re-balance simply to keep some fairly arbitrary weights to individual sectors. If the projected risk and return characteristics of your portfolio are not in alignment with your needs, however, it makes sense to re-allocate.

Risk-based re-balancing makes particular sense in the current market, with volatility rising (see VIX, for example). This upswing in market volatility is a normal part of the financial markets:

http://etf.seekingalpha.com/article/34635

The biggest threat to most investors in this regard is that their portfolios are going to get much riskier in the near future—potentially too risky to be optimal for their needs.

Quantext Portfolio Planner *is a portfolio management tool. Extensive case studies, as well as access to a free extended trial, are available at http://www.quantext.com*