

## Smart ideas about wealth

### Rebalancing portfolios: science and emotion

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#### Part 2: The Optimal Approach

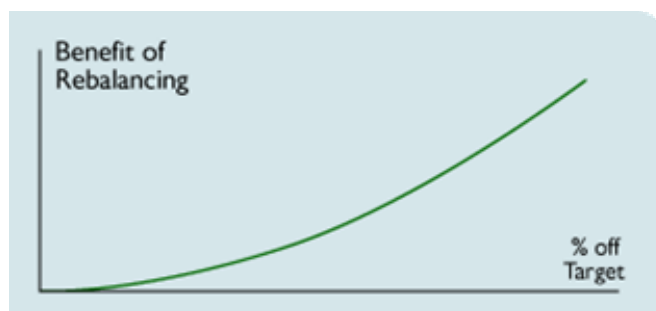
One common rebalancing method is to do it periodically—at the end of each calendar year, for instance. This might be the easiest approach, but analysis by a large American investment house, suggests it isn't the most effective. After all, the markets can move sharply in between the milestones on the calendar. For example, in nearly 30% of all months since 1960, the largest stock market in the world – the S&P 500 - has risen or fallen by at least 5%. Such a move could trigger the need for rebalancing, so a rebalancing plan needs to address it. At the same time, setting a calendar-based approach that is too short can lead to costs—for transactions and taxes—that outweigh the benefits.

The key step in creating the most effective approach to rebalancing is the assessment of trade-offs between the benefits of being on-target versus the costs of getting there. Using this framework, The American researchers' analysis indicates that the best approach is not rebalancing at regular intervals of time, but rather when a portfolio's allocation is off its target by a certain percentage.<sup>4</sup>

#### A Quantitative Framework

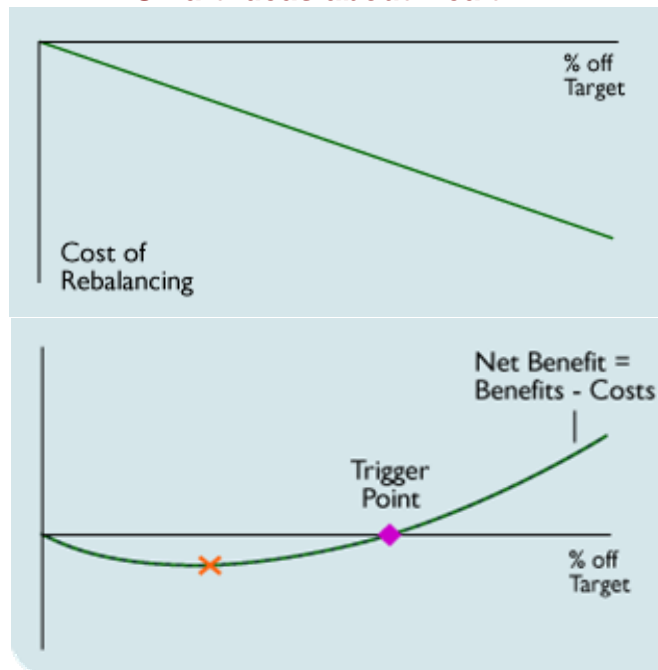
To identify the optimal moment for rebalancing to occur, we must understand at what point the investor's assets begin to veer far enough from their target that they produce unintended risks—either so much in equities, for instance, that the chance of a large loss looms, or so much in bonds that the return potential is lower than expected. The first chart in the display below shows how the potential benefits from rebalancing will vary.<sup>5</sup> Moving to the right on the horizontal axis, we see that at first the potential benefits from rebalancing grow slowly: Correcting small variations from the target won't add much value. But the more the mix varies from its target, the more risk the investor takes on, causing the benefits of rebalancing to grow quite rapidly—which is why the line curves upward. When the actual portfolio mix is very different from the target, the need to rebalance intensifies.

The further that portfolio proportions stray from their target, the greater the benefit of rebalancing...



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Add that calculation to the fees and taxes incurred...



And you get a trigger point at the place where the benefits exceed the cost

Source: Bernstein

The middle chart shows the costs of rebalancing (transaction fees and taxes).<sup>6</sup> Unlike the benefits—which accelerate as the portfolio mix gets further from its target—the costs exhibit a proportional relationship. After all, selling twice as much of an asset will basically cost twice as much. Thus, rebalancing costs are a straight line. By combining the benefits and the costs, as shown in the last chart, we can determine the optimal trigger point for rebalancing: the point at which the benefits become greater than the costs.<sup>7</sup> When the portfolio mix is not far off from the intended target, the costs outweigh the benefits (as shown by the “net benefit” line running below zero). At higher deviations from the target, the benefits take the upper hand.

This research has implications not only for determining when to rebalance, but also by how much. Consider a hypothetical case in which the target mix is 60% equities and 40% bonds. Let's assume that this research on the benefits and costs of rebalancing suggests one should rebalance when the actual mix differs by four or more points from this target; therefore, we'll commence rebalancing when the equity mix hits either 64% or 56%. One might assume, therefore, that a 64% equity mix should be brought down to the 60% target. However, the American research suggests otherwise. They have found that one should rebalance only to the extent that the increased benefit exceeds the increased costs, which ceases to be true once we get halfway back to our target (marked by “X” on the third chart in display 3). In this example, therefore, bringing the portfolio from 64% equities to 62% stocks is the best approach in our view; going any further creates more cost than benefit.

### Fine-Tuning

Of course, well-crafted portfolios combine assets other than just UK equities and bonds: growth and value, UK and international and in due course real-estate investment trusts, and more. And the more different kinds of assets in a portfolio, the more complex the decision making. In quantifying when to rebalance, we must consider such factors as the correlation between the assets, their volatility, the costs of trading, and the tax impact to the investor (*display below*).

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Rebalancing decisions should be fine-tuned for several variables

Factor	Guidelines
<b>Correlation</b>	The lower the correlation between an asset and the rest of the portfolio, the lower the trigger point. (Lower correlation indicates that an asset will tend to perform differently from the rest of the portfolio, so being off-target has a greater impact.)
<b>Volatility</b>	Since deviations from target in more volatile assets add more risk, these assets should have lower trigger points.
<b>Costs</b>	The more expensive it is to trade an asset class, such as emerging markets, the higher the trigger point.
<b>Taxes</b>	The higher the tax cost, the less frequently you should rebalance—especially if short-term capital gains taxes would be incurred.

#### Putting It Into Practice

For the individual investor, any rebalancing method is better than none. In fact, either of the rebalancing methods shown in the display below provides a rare investing benefit when compared to an unbalanced portfolio: greater return and less risk.

The risk/reward profile can be optimised with rebalancing

Fully Diversified Portfolio* (1995–2003)		
	Return	Risk
Unrebalanced	9.2%	10.6%
Periodic Rebalancing	9.5	9.2
“Optimal” Rebalancing	9.9	9.4

\*21% Russell 1000 Growth, 21% Russell 1000 Value, 18% MSCI EAFE (with countries weighted by market capitalisation), 40% Lehman Aggregate Bond Index. Periodic rebalancing: On the first day of each quarter, rebalance all the way back to target allocations. Optimal rebalancing: When allocations stray 5% from their targets, rebalance halfway back. Transaction costs are assumed to be 50 basis points for each asset except international stocks, which are assumed to be 85 basis points.

Source: Frank Russell Co., Lehman Bros., MSCI, and Bernstein

But to be optimal, the approach to rebalancing should consider all the variables affecting trigger points that we’ve described, and the rebalancing should occur when the benefits

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portfolio above outperformed the others—while delivering less risk than the unrebanded portfolio and risk that was comparable to the periodically rebanded portfolio. And while the market conditions of this period were extreme, it is precisely during periods of extremes that rebalancing becomes most important to do and, without formal rules, most difficult to put into practice.

- 4 The research findings were originally published in *The Journal of Portfolio Management*, Vol. 29, No. 3.
- 5 The actual formula used to measure the benefit of rebalancing is:  $[(\text{Tracking Error})^2/2K]\Delta^2$ , where K represents the investor's risk tolerance and  $\Delta$  is the deviation from the target allocation. Since tracking error is quadratic, the benefit of rebalancing accelerates for each unit of variance from the target allocation.
- 6 The actual formula used to measure the costs of rebalancing is:  $C\Delta$ , where C is the total two-way cost of rebalancing (selling what is overweight and buying what is underweight) and  $\Delta$  is the deviation from the target allocation.
- The actual formula used to measure the net benefits of rebalancing is:  $[(\text{Tracking Error})^2/2K]\Delta^2 - C\Delta$ .

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