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To rebalance, or not to rebalance? That is the question...

One of the topics that hedge fund investors debate is the potential benefits and costs of portfolio rebalancing. In this snapshot, we take an initial look at the impact of the frequency of rebalancing a portfolio of managers. Our finding was not what we would have intuitively expected. Instead it appears that there is little to gain from regularly rebalancing a portfolio rather than rebalancing only when portfolio weights deviate significantly from the policy allocation, or when rebalancing can be done at little or no cost, as is the case when an investor has new money to allocate.

Our use of the word “rebalancing” in this context is to describe the (normally relatively small) re-setting of weights to individual managers in order to maintain a perceived “optimal” portfolio. This process is thus distinct from a material change in allocation size to a given manager relative to that investor’s portfolio that may occur (e.g., due to a shift in investment policy).

First look with an “ideal” portfolio

In our first look at this question, we considered an abstract, or theoretical, scenario whereby we consider five hypothetical assets each with the same mean return (10%) and volatility (20%), and each having a zero correlation to the other four. In such a world, the optimal weights are 20% for each asset. We simulated 10,000 portfolios over a 10-year period, with the portfolio weightings reset to equal weights on a daily, weekly, monthly, quarterly, and annual basis. Exhibit 1 shows the results of this analysis.

This scenario should have provided the ideal circumstances to illustrate the importance of rebalancing; a small number of assets meaning that the individual weights could vary significantly, and zero correlation between the assets implying significantly different return streams. We expected that regularly rebalancing a portfolio of these five assets would produce measurably better outcomes when considered in terms of risk-adjusted returns, and we were **greatly** surprised to find this was not the case.

Exhibit 2 shows the results of our delving into the question of why the rebalancing frequency seems to have little impact. The left hand axis of this chart shows the distribution of the deviations from the “optimal” equal weighted portfolio for different rebalancing frequencies. The right hand side shows the portfolio volatility scaling factor, which illustrates how much the portfolio volatility will change based on a given deviation for all assets from the optimal weights. This chart illustrates that as the rebalancing frequency slows, there is an increased probability of further deviations from the optimal portfolio. The effect of the unbalancing that occurs in the normal course of events, however, has only a very small effect on risk adjusted returns as the change in the portfolio volatility scaling factor is minimal; particularly in the case of our initial example where each of the five assets had identical volatility characteristics.

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Exhibit 1

Theoretical Scenario Results

Rebalancing Frequency	Annualised		Sharpe Ratio (0%)	Manager Weighting	
	Average Return	Volatility		Minimum	Maximum
Daily	9.56%	8.94%	1.069	20.00%	20.00%
Weekly	9.60%	8.94%	1.074	18.45%	21.61%
Monthly	9.63%	8.95%	1.077	16.90%	23.45%
Quarterly	9.60%	8.96%	1.071	15.21%	25.69%
Annually	9.62%	9.01%	1.067	12.43%	30.08%

Source: Newedge Prime Brokerage Research

Prime Brokerage | Investor Research

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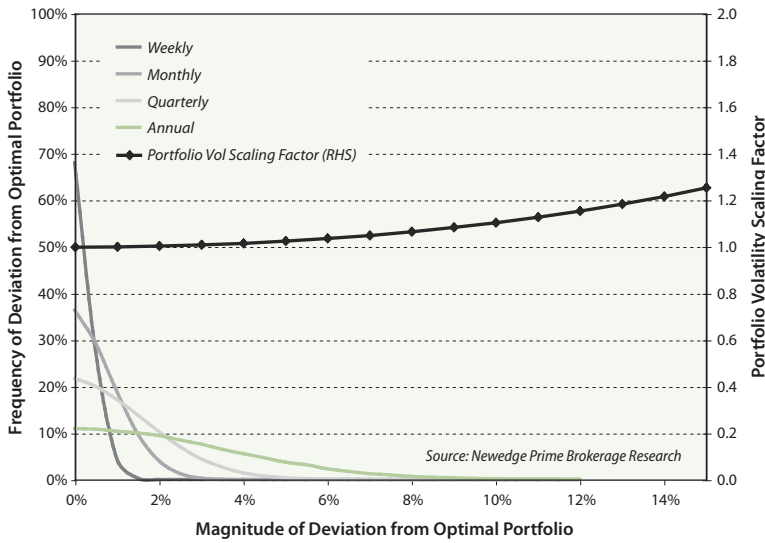
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Exhibit 2

Distributions of deviations from optimal portfolio for different rebalancing frequencies (5-asset portfolio) combined with Portfolio Volatility Scaling Factor as a function of weight deviations from optimal



quarterly rebalancing produced a better return than annual rebalancing, however it also outperformed monthly rebalancing. On the one hand, working with real return streams with varying volatilities ought to provide a more fertile ground for the impact of more frequent portfolio rebalancing to be observed. However we are also working with a larger number of managers, which produces smaller weight deviations and dilutes the effect of any imbalances that do occur. Further, many of the managers' returns were fairly highly correlated with one another, which reduces the importance of diversification and hence the impact of portfolio rebalancing.

Second look with a “real” portfolio

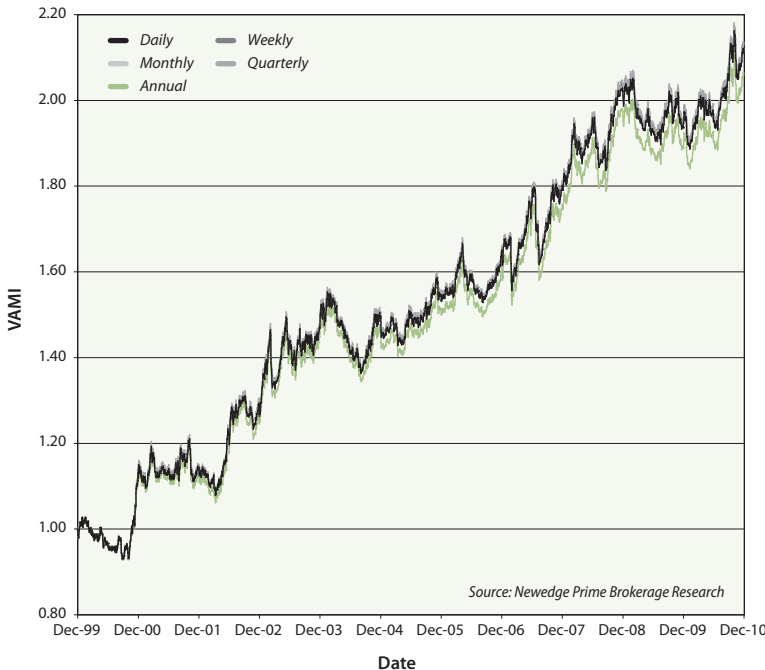
The lack of any significant improvement from rebalancing when the circumstances were ideal prepared us for what we found – or didn't find – when we performed a similar kind of exercise for a real portfolio comprising the constituent managers of the Newedge CTA Index. This portfolio contained anywhere from 17 to 23 constituent managers, equally weighted at the beginning of each calendar year. This exercise includes the period from the beginning of 2000 through the end of 2010.

Two things stand out in Exhibit 3, which provides the net asset value series produced for the various rebalancing frequencies. First, the differences in the results are small; the total return for each of the various frequencies varies by little more than six percentage points over the 10-year period analysed, and there is an almost negligible difference in the volatilities exhibited. Second, they are not consistent;

We should note, too, that in carrying out this exercise, we have assumed that all rebalancing could be done without cost and without time lags. In practice, we know that neither is true. One cannot, except possibly with managed accounts, avoid the leads and lags associated with taking money away from one manager and giving it to another. Second, we know there are costs – and not just transactions costs – involved in moving money around. In addition to the extra administrative burden, and potentially not maintaining a loss carry forward; taking money away from a manager who has been making money and giving it to one who has been making less money, or losing money, takes its own toll on the relationship between the investor and the managers involved. Hence, our conclusion at the outset that rebalancing should only be done when the portfolio is seriously out of balance, or when it can be done at minimal cost with new money.

Exhibit 3

Net asset value series for various rebalancing frequencies



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