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Financial Planning Perspectives
Getting back on track:
A guide to smart rebalancing

A portfolio's asset allocation reflects an investor's goals and temperament—the need for return and ability to withstand the financial markets' inevitable turbulence. Over time, as the returns of higher- and lower-risk assets diverge, a portfolio can take on exposures that are inconsistent with the investor's risk and return objectives. Rebalancing from one asset class to another can put the portfolio back on track.

We review the benefits of rebalancing, analyze the impact of different rebalancing frequencies and thresholds, and highlight strategies to minimize rebalancing costs. Our analysis suggests three best practices when setting expectations for and executing a rebalancing strategy:

■ **Rebalance to manage risk and emotion.**

The purpose of rebalancing is to maintain a portfolio's risk and return characteristics, not to maximize returns. Once you construct the appropriate allocation for your goals, remove yourself from difficult decisions by implementing an easy-to-follow, consistent rebalancing rule.

■ **Set a rebalancing "trigger."**

Generally, more frequent rebalancing will ensure tighter tracking to your target asset allocation, but this potentially comes at the cost of lower returns, increased turnover, and a heavier tax burden in the current period. We find that, over the long term, no one rebalancing strategy is dominant. Selecting and sticking with a reasonable rebalancing approach is better than not rebalancing at all.

■ **Minimize the transaction and tax costs of rebalancing.**

Frequent rebalancing can be costly from a tax perspective, but there are ways to minimize taxes while maintaining an appropriate risk profile. Once you've determined your rebalancing strategy, consider your overall tax situation to make strategic decisions such as which accounts to rebalance, which could improve your after-tax returns and reduce your overall tax liability.

Rebalance to manage risk and emotion

When investors select an asset allocation, they choose a mix of assets that is expected to produce returns that can help them meet their goals with a level of risk they can tolerate. Over time, this allocation will begin to drift away from the target in favor of better-performing yet typically riskier assets. The resulting allocation alters the return and risk expectations of the portfolio, usually in the form of a higher expected return but with higher volatility. Rebalancing plays a large role in ensuring that the portfolio maintains its appropriate risk and return posture. **Figure 1** depicts the distribution of historical returns for various asset allocations of a stock and bond portfolio.

The objective of rebalancing is to manage risk rather than maximize return.

Figure 1. Increased return brings along increased risk
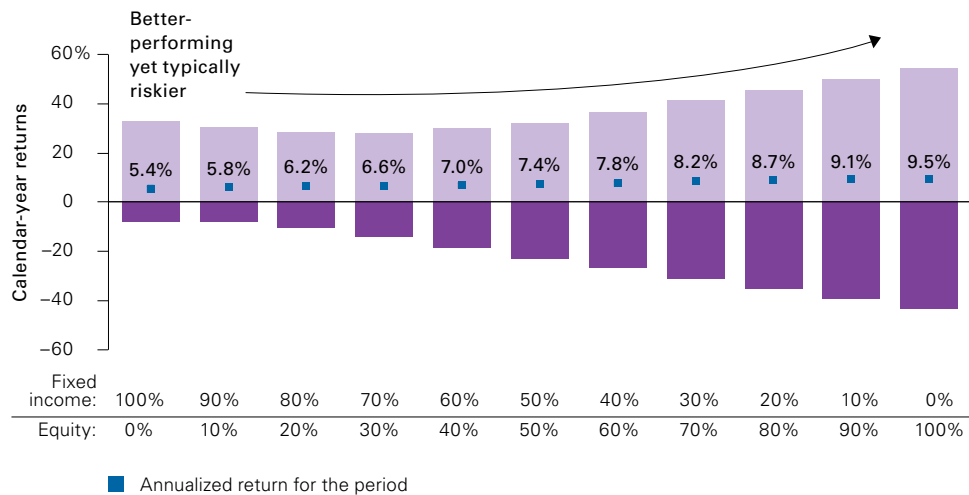
Notes: Return data are from January 1, 1926, through December 31, 2018. The figure shows the maximum and minimum annual returns for a given asset allocation portfolio over the time horizon. The portfolios were rebalanced monthly. Results are displayed on a pretax basis.
Sources: Vanguard calculations, based on data from FactSet.

Selling a well-performing asset and buying an investment with lower returns may seem counterintuitive, but the objective of rebalancing is to manage risk rather than maximize return. **Figure 2** illustrates these risk-control benefits. We project 30 years of hypothetical returns using 10,000 market return scenarios. Figure 2a shows the distribution for the projections with no rebalancing in gray and quarterly rebalancing in blue. The gray distribution has fatter tails, meaning a greater possibility of a higher return but also a greater possibility of a lower return relative to a rebalanced portfolio. Figure 2b depicts, in gray, that a nonrebalanced portfolio is typically more volatile. That means the median volatility of the rebalanced portfolio, in blue, is lower. Figure 2c combines these risk and return results into a single statistic known as the Sharpe ratio.[1] As our simulations show, rebalancing quarterly increases the portfolio's Sharpe ratio, meaning that the rebalanced portfolio produces more return per unit of risk than the nonrebalanced portfolio.

Notes on risk

All investing is subject to risk, including the possible loss of the money you invest. Be aware that fluctuations in the financial markets and other factors may cause declines in the value of your account. There is no guarantee that any particular asset allocation or mix of funds will meet your investment objectives or provide you with a given level of income. Past performance is not a guarantee of future returns. We recommend that you consult a tax or financial advisor about your individual situation.

1 The Sharpe ratio measures the excess return of a portfolio above a risk-free asset relative to the volatility in the portfolio. The higher the ratio, the better, because this means the portfolio is generating a higher return with less risk exposure relative to a portfolio with a lower ratio.
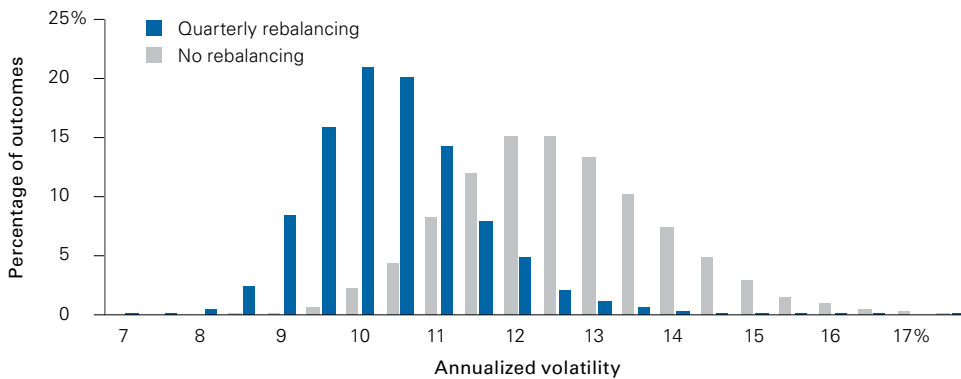
Figure 2. Rebalancing typically improves risk-adjusted returns

a. A rebalanced portfolio generally exhibits a tighter return distribution
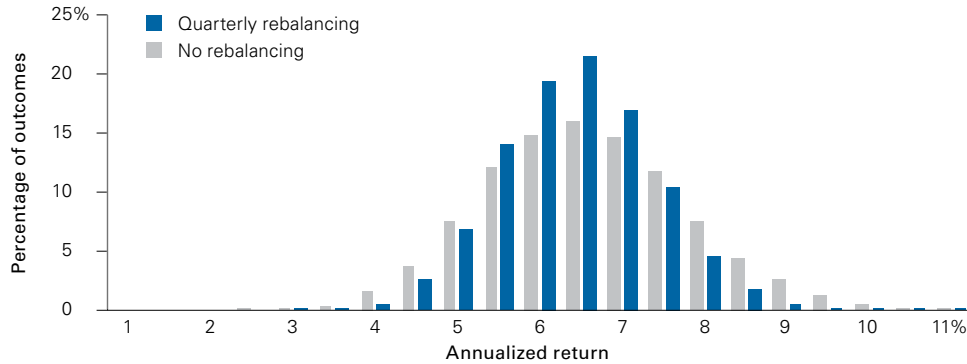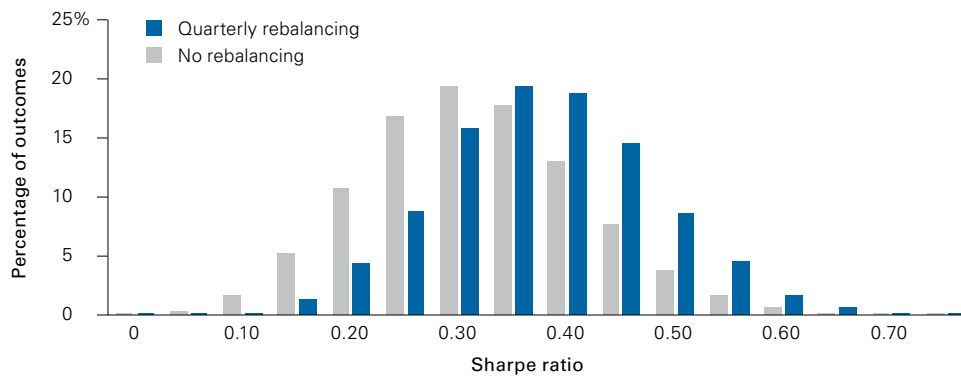

Rebalancing tends to increase a portfolio's Sharpe ratio, improving risk-adjusted returns.

b. A nonrebalanced portfolio is typically more volatile

c. A rebalanced portfolio usually produces more return per unit of risk

Note: Distributions over 10,000 return paths (5th–95th percentiles) are produced by the Vanguard Capital Markets Model® using 30-year forecasts for global equity, fixed income, and risk-free rates.
**Source:** Vanguard.

IMPORTANT: The projections and other information generated by the Vanguard Capital Markets Model regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. Distribution of return outcomes from the VCMM are derived from 10,000 simulations for each modeled asset class. Simulations are as of December 31, 2018. Results from the model may vary with each use and over time. For more information, see the Appendix on page 8.

Rebalancing can help with discipline and emotional control in volatile markets. **Figure 3** shows the equity allocations and portfolio value of a rebalanced portfolio and a nonrebalanced portfolio leading up to and several years after the global financial crisis.[2] In this case, investors who didn't rebalance might have enjoyed success in the run-up to the crisis but would have found themselves overallocated to equities during the correction (yellow box), precisely when being overexposed would have hurt them the most. Similarly, they would have found themselves underexposed to equities during the recovery (green box). At the bottom of the crisis, many investors were bearish and may have lacked the confidence to rebalance toward equities without a consistent rules-based approach. In the case shown in Figure 3, the nonrebalanced portfolio's return would have trailed that of the rebalanced portfolio by 5 percentage points after tax over the ten years.[3]

Figure 3. A consistent rebalancing rule removes the emotions
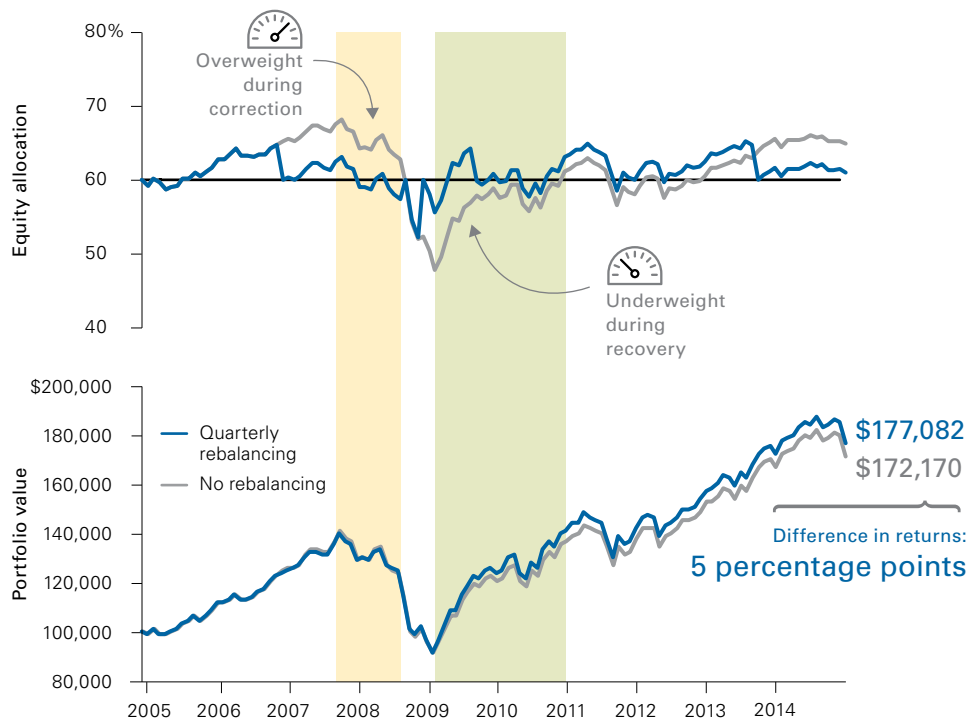
Notes: Return data cover January 1, 2005, through December 31, 2014. The shaded "Overweight during correction" area corresponds to the period from October 2007 to September 2008. The shaded "Underweight during recovery" area corresponds to the period from March 2009 to December 2010.
Source: Vanguard.

Set a rebalancing "trigger"

The ability to remain disciplined and give up potentially higher returns to limit deviations from your target portfolio can be difficult. Creating and sticking to a systematic rebalancing strategy can help by taking the emotions out of rebalancing. A set policy will trigger rebalancing events in a consistent manner, ideally balancing the needs for keeping your allocation in check and limiting the higher taxes associated with more frequent rebalancing and turnover.

2 The bottom of the crisis came in March 2009.

3 The analysis covers January 1, 2005, through December 31, 2014. The portfolio starts with $100,000 weighted 60% stocks/ 40% bonds. Stocks are represented by the MSCI AC World IMI Index. Bonds are represented by the Bloomberg Barclays Global Aggregate Bond Index (USD hedged). In one simulation, the portfolio was rebalanced to its target asset allocation on a quarterly basis if the portfolio strayed from it by 5% or more. In another simulation, the portfolio was never rebalanced.

Most rebalancing strategies consider two types of triggers: *time* and/or *threshold*. With a *time* trigger, the portfolio is rebalanced after a predetermined interval. With a *threshold* trigger, the portfolio is rebalanced only when its asset allocation has drifted from the target by a predetermined percentage. More complex strategies may consider a blend of both triggers to balance risk and turnover constraints during various levels of market volatility. **Figure 4** shows some key measures for various combinations of time and threshold rebalancing strategies.

Figure 4. Any reasonable rebalancing strategy beats not rebalancing at all

Monitoring frequency	Strategy/ threshold	Tax-adjusted annualized return	Annualized volatility	Sharpe ratio	Average equity allocation	Rebalancing events (tax lots)
Never	NA	8.74%	14.0%	0.46	85%	0
Monthly	Avoid short-term gains	8.19%	11.7%	0.50	60%	1,107
	0%	8.20%	11.7%	0.50	60%	1,116
	1%	8.20%	11.7%	0.50	60%	426
	5%	8.22%	11.8%	0.50	61%	58
	10%	8.39%	11.8%	0.51	62%	24
Quarterly	0%	8.26%	11.6%	0.51	60%	372
	1%	8.26%	11.6%	0.51	60%	233
	5%	8.31%	11.6%	0.51	61%	47
	10%	8.26%	11.7%	0.50	62%	19
Annually	0%	8.19%	11.4%	0.51	60%	93
	1%	8.19%	11.4%	0.51	60%	83
	5%	8.19%	11.4%	0.51	61%	34
	10%	8.20%	11.6%	0.50	63%	14

Notes: Return data cover January 1, 1926, through December 31, 2018. The "avoid short-term gains" strategy avoids selling at a gain any securities that have been owned for less than a year and are thus subject to ordinary income tax rates. The "strategy/threshold" column indicates that the portfolio was rebalanced to target if the asset allocation had strayed from it by more than the specified percentage when monitored.

Source: Vanguard.

What's remarkable is that starkly different strategies were equally successful in controlling risk. At one extreme is a monthly 0% threshold strategy. If portfolio allocations differ at all from their target at month-end, the portfolio is rebalanced. Over the past 92 years, this strategy would have rebalanced a portfolio more than 1,100 times to produce an annualized return of 8.20%. At the other extreme is an annual 10% threshold strategy. The portfolio is evaluated yearly and rebalanced only if allocations differ from their target by more than 10 percentage points. This strategy led to only 14 rebalancing events,

also producing an annualized return of 8.20%. We see that most rebalancing strategies have historically produced similar returns and Sharpe ratios on an after-tax basis. We also see this trend when projecting 30 years of VCMM returns using various rebalancing strategies. **Figure 5** illustrates that implementing any one of the possible strategies can control the breadth of potential risk-adjusted returns.

Ultimately, we believe that investors will benefit from systematic rebalancing, but we don't find a specific rebalancing threshold or frequency that consistently outperforms other forms of rebalancing. It may behoove investors not to stress about the specifics but rather to choose a rebalancing strategy they can comfortably stick with.

Figure 5. Risk-adjusted returns are improved using selected rebalancing strategies

Notes: Distributions over 10,000 return paths (5th–95th percentiles) are produced by the VCMM using 30-year forecasts for global equity, fixed income, and risk-free rates. The "avoid short-term gains" strategy avoids selling securities at a gain that have been owned for less than a year and are thus subject to ordinary income tax rates. The percentage threshold columns indicate that the portfolio was rebalanced to target if the asset allocation had strayed from it by more than the specified percentage when monitored.
Source: Vanguard.

Minimize the transaction and tax costs of rebalancing

As we found in the previous section, the frequency and threshold you choose for rebalancing are secondary to establishing a systematic rebalancing strategy at all. Once you have determined which approach suits you, there are strategies you can follow to further improve your investment performance and ability to maintain your portfolio's relative risk/return profile. Working with an advisor can be a good way to personalize these strategies to your own situation. **Figure 6** highlights various tax-efficient tactics to consider when it's time to rebalance your portfolio.

Figure 6. Tax-efficient rebalancing best practices

Tactic	Explanation	Considerations
Focus on tax-advantaged accounts	Rebalancing within tax-advantaged accounts is tax-free. (Note that any withdrawals from such accounts could be subject to income taxes, additional penalties, or both.) By applying this tactic to the analysis shown in Figure 4, we found that after-tax returns increased by 44 basis points on an annualized basis without increasing risk exposure.*	This works best if you have a mix of asset classes in your tax-advantaged account.
Rebalance with portfolio cash flows	Directing cash inflows such as lump-sum investments, dividends, and interest into your portfolio's underweighted asset classes is another way to help with rebalancing. Conversely, when withdrawing from your portfolio, start with any overweighted asset classes.	If you are 70½ or over and taking a required minimum distribution from your retirement account(s), take the distribution while rebalancing. If you don't need your RMD for spending, reinvest it in an underweighted asset class in your nonretirement account(s).
Be mindful of costs	To minimize transaction costs and taxes, you could opt to rebalance your portfolio partially to your target asset allocation. Focusing primarily on shares with higher cost basis (in taxable accounts) or on asset classes that are extremely overweighted or underweighted will limit both taxes and transaction costs associated with rebalancing.	Investors may find it difficult to quantify the trade-off between avoiding transaction costs and taxes and marginally approaching their target asset allocation. Alternatively, strategies such as rebalancing first with higher-cost-basis shares may improve portfolio after-tax returns without increasing risk exposure.
Consider charitable giving/ annual gifting	If charitably inclined, you can gift shares from your taxable account(s) or take a qualified charitable distribution (QCD) from your traditional IRA(s) to rebalance while maximizing your tax benefits.[^, ±] Similarly, you can rebalance while benefiting from the annual federal gift tax exclusion when gifting to family and friends.[†]	When gifting from nonretirement accounts, focus on low-cost-basis shares in lieu of gifting cash. Doing so means you won't owe capital gains tax on any appreciation on the holding, because the taxable basis carries to the donee.

* Applying the analysis to a portfolio with 50% allocated to tax-advantaged accounts and 50% allocated to taxable accounts, we found that a simulated portfolio that prioritized rebalancing (quarterly with a 5% threshold) with tax-advantaged assets would have outperformed a portfolio that prioritized rebalancing with taxable assets by 44 basis points on an annualized basis without increasing annualized volatility.

^ Gifting from a taxable account provides immediate tax benefits. The charity gets the full value of the gift. As a donor, you benefit from the full value of the tax deduction, if you itemize, and you realize no capital gains on the appreciated assets (which you would if you sold them and donated the cash proceeds). You may also avoid transaction costs that selling the shares might otherwise incur.

± The maximum QCD is $100,000 per IRA owner per year. It must be paid directly to the charity, which receives the full value of the donation. The QCD is excluded from your adjusted gross income, so it may also reduce costs that are based on income limits, such as Medicare Part B premiums and taxes on Social Security benefits.

† For 2019, that exclusion is $15,000 per donor per donee (or $30,000 for married donors filing jointly, per donee).

Conclusion

Although a strong case exists for regularly rebalancing your portfolio to improve its risk-adjusted return, no specific rebalancing frequency and/or threshold is optimal for all investors. Generally, more frequent rebalancing will limit the risk in a portfolio to a level suitable for the investment goal, but this potentially comes at the cost of lower returns, increased turnover, and a heavier tax burden in the current period. Just as when investors determine a target asset allocation, they must balance their willingness to accept risk against their expected returns. Investors may also be able to improve portfolio performance, without sacrificing risk control, by practicing tax-efficient rebalancing through the use of tax-advantaged accounts, rebalancing with portfolio income, incorporating tax- and cost-sensitivity awareness into their rebalancing decision, and gifting overweighted and highly appreciated securities.

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Appendix. About the Vanguard Capital Markets Model

IMPORTANT: The projections and other information generated by the Vanguard Capital Markets Model regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual investment results, and are not guarantees of future results. VCMM results will vary with each use and over time.

The VCMM projections are based on a statistical analysis of historical data. Future returns may behave differently from the historical patterns captured in the VCMM. More important, the VCMM may be underestimating extreme negative scenarios unobserved in the historical period on which the model estimation is based.

The Vanguard Capital Markets Model® is a proprietary financial simulation tool developed and maintained by Vanguard's primary investment research and advice teams. The model forecasts distributions of future returns for a wide array of broad asset classes. Those asset classes include U.S. and international equity markets, several maturities of the U.S. Treasury and corporate fixed income markets, international fixed income markets, U.S. money markets, commodities, and certain alternative investment strategies. The theoretical and empirical foundation for the Vanguard Capital Markets Model is that the returns of various asset classes reflect the compensation investors require for bearing different types of systematic risk (beta). At the core of the model are estimates of the dynamic statistical relationship between risk factors and asset returns, obtained from statistical analysis based on available monthly financial and economic data from as early as 1960. Using a system of estimated equations, the model then applies a Monte Carlo simulation method to project the estimated interrelationships among risk factors and asset classes as well as uncertainty and randomness over time. The model generates a large set of simulated outcomes for each asset class over several time horizons. Forecasts are obtained by computing measures of central tendency in these simulations. Results produced by the tool will vary with each use and over time.

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