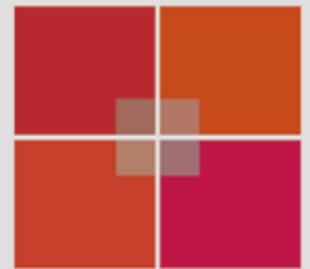


Best practices for portfolio rebalancing



Key points

- Asset classes produce different returns that change the portfolio's asset allocation over time. Rebalancing helps recapture the portfolio's original risk-and-return characteristics.
- The primary goal of rebalancing is minimising risk relative to a target asset allocation, not maximising returns.
- There is no optimal rebalancing strategy; however, there's a meaningful difference between a rebalanced and non-rebalanced portfolio.
- Annual or semi-annual monitoring, with rebalancing at 5% thresholds, is likely to produce a reasonable balance between risk control and cost minimisation for most investors.

Investors spend significant time selecting an asset allocation that falls in line with their investment goals and tolerance for risk. However, a portfolio's investments produce different returns over time, causing the portfolio to drift from its target asset allocation and acquire risk-and-return characteristics that may not align with an investor's goals and preferences. By rebalancing, investors can bring their portfolio's risk back to an appropriate level.

This brief, based on research by The Vanguard Group, Inc.,¹ shows that rebalancing helps investors minimise risk relative to their target asset allocation. Minimising risk can help investors endure market downturns and be in a better position to meet their long-term financial goals.

The benefit of rebalancing

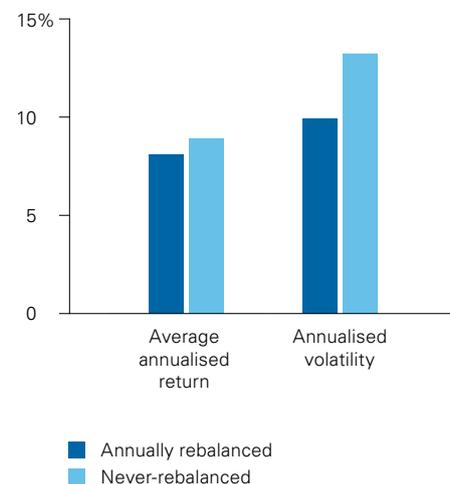
Rebalancing can be an emotional decision for some investors; it involves selling outperforming assets and reallocating to lagging assets.

But riskier assets (equities) often grow faster than less risky assets (bonds) over long periods. This causes a portfolio to "drift" from its target asset allocation. While a higher allocation to equities increases a portfolio's expected return, it also exposes a larger portion of the portfolio to a potential equity market correction. During times of high volatility,

investors may be tempted to abandon their investment plans, which may jeopardise their chances of meeting their financial goals.

Figure 1 compares two hypothetical portfolios, each with a target asset allocation of 50% global equities/50% global bonds from 1926 to 2014. The first portfolio is rebalanced annually; the second is never rebalanced.

Figure 1. Comparing a hypothetical 50% global equities/50% global bonds annually rebalanced portfolio versus a 50%/50% never-rebalanced portfolio: 1926 to 2014



Notes: This illustration is hypothetical and does not represent the returns of any particular investment. We assumed a portfolio of 50% global equities/50% global bonds. All returns in nominal US dollars. There were no new contributions or withdrawals. Dividend payments were reinvested in equities; interest payments were reinvested in bonds. There were no costs. All statistics were annualised. **Sources:** Calculations by The Vanguard Group, Inc., based on data from FactSet.

¹ Best practices for portfolio rebalancing, Yan Zilbering, Colleen M. Jaconetti, and Francis M. Kinniry Jr., October 2015.

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The never-rebalanced portfolio's equity allocation gradually drifted upwards, maxing out at 97%. As expected, the increase in equity exposure caused the never-rebalanced portfolio to display a higher average annualised return than the annually rebalanced portfolio (8.9% versus 8.1%). But there's a trade-off: the never-rebalanced portfolio showed a higher risk level than the annually rebalanced portfolio (13.2% annualised volatility versus 9.9%).

The main benefit of rebalancing a portfolio is minimising a portfolio's risk level relative to the target asset allocation, not maximising returns. If an investor's sole objective is to maximise return regardless of risk, then that investor should select a 100% equity portfolio.²

Selecting a rebalancing strategy

An investor can determine when to rebalance using a variety of strategies. Our research focused on three: time-only, threshold-only and time-and-threshold.

Time-only: The portfolio is rebalanced according to a schedule – daily, monthly, quarterly, annually and so on – regardless of how far the portfolio's asset allocation has drifted from its target.

Threshold-only: Investors don't factor in time when using a threshold-only strategy. Instead, investors rebalance when their portfolios drift from the target asset allocation by a certain amount (such as 1%, 5% or 10%). Daily monitoring is required when using a threshold-only strategy.

Time-and-threshold: This strategy combines time-only and threshold-only. Investors monitor their portfolios on a scheduled basis but rebalance only if their current asset allocation has drifted from its target by a predetermined amount.

Our research found that there's no optimal rebalancing strategy but there are meaningful differences between a rebalanced and a non-rebalanced portfolio. **Figure 2** shows that risk-adjusted returns and annualised volatility are not meaningfully different whether a portfolio is

rebalanced monthly, quarterly or annually – regardless of threshold. But there is a meaningful difference compared to a portfolio that is never rebalanced.

Choosing a rebalancing strategy comes down to personal preference. An investor must decide how far they are willing to let the portfolio drift from their target asset allocation and how much they are willing to pay in costs.

In our analysis, we used the number of rebalancing events and the annual turnover as proxies for costs. A rebalancing strategy that used monthly monitoring and a 1% threshold was more costly to implement (423 rebalancing events) than one that included annual monitoring and 10% rebalancing thresholds (19 rebalancing events). High transaction costs and taxes (when applicable) can potentially undermine the risk-control benefits of rebalancing.

Implementing a rebalancing strategy

There are several strategies investors can use to minimise the cost of rebalancing. Our research focused on redirecting cash flows and being mindful of the size of rebalancing trades.

Redirecting cash flows involves sweeping a portfolio's taxable cash flows (dividends, interest payments, etc.) into a money market or bank account. Then an investor puts these flows back into the most underweighted asset class in the portfolio. Doing this reduces the number of rebalancing events and, in turn, minimises costs.

Figure 3 illustrates the impact of rebalancing with portfolio cash flows for several hypothetical portfolios.

The decision to rebalance to or short of the target asset allocation depends on the type of rebalancing costs.

If trading costs are fixed regardless of the size of the trade, then it's best to rebalance all the way back to the target asset allocation. But if trading costs are determined by the size of the trade, investors should consider rebalancing as close to the target asset allocation as possible to avoid the cost of a large trade.

Return data for Figures 1, 2 and 3 of this paper are based on the following equity and bond benchmarks, as applicable: Equities are represented by the Standard & Poor's 90 from 1926 through 3 March 1957; the S&P 500 Index from 4 March 1957 through 1969; the MSCI World Index from 1970 through 1987; the MSCI All Country (AC) World Index from 1988 through 31 May 1994; and the MSCI AC World IMI Index from 1 June 1994, through 2014. Bonds are represented by the S&P High Grade Corporate Index from 1926 through 1968; the Citigroup High Grade Index from 1969 through 1972; the Lehman Long-Term AA Corporate Index from 1973 through 1975; the Barclays U.S. Aggregate Bond Index from 1976 through 1989; and the Barclays Global Aggregate Bond Index (USD hedged) from 1990 through 2014. Except as noted, the portfolios are weighted 50% equities/50% bonds.

² This assumes a portfolio of equity and fixed income investments; allocations to alternative asset classes or investments were not considered. Readers are referred to Vanguard research titled *The allure of the outlier: A framework for considering alternative investments* (Wallick et al., 2015), for further details on the implications of rebalancing when using alternatives.

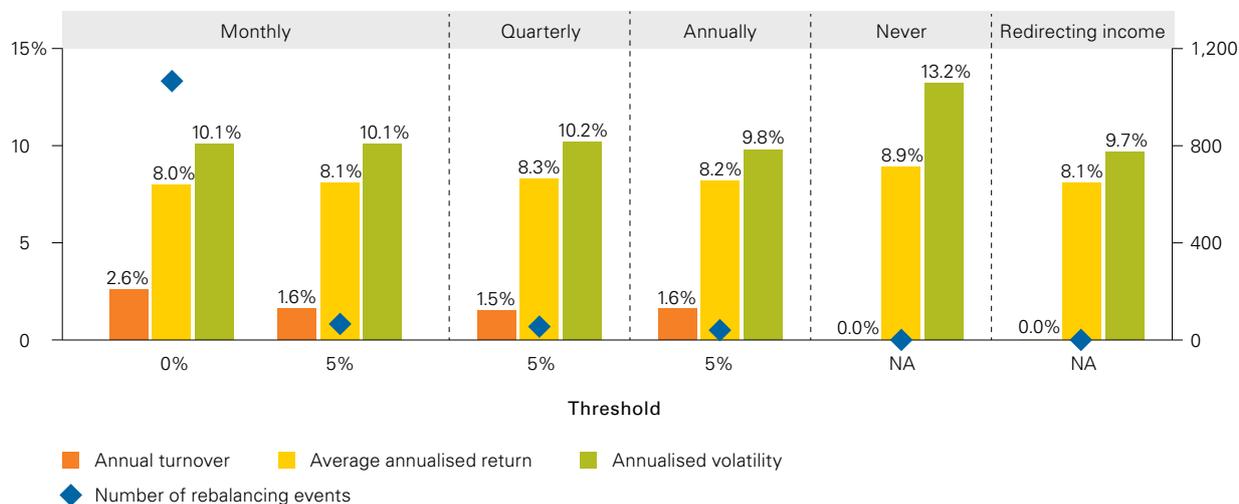
Figure 2. Comparing portfolio rebalancing results for ‘time-and-threshold’ strategy: Various frequencies and thresholds, 1926 to 2014

Monitoring frequency	Monthly				Quarterly			Annually			Never
Threshold	0%	1%	5%	10%	1%	5%	10%	1%	5%	10%	NA
Average equity allocation	50.1%	50.1%	51.2%	52.2%	50.2%	50.9%	51.0%	50.6%	51.2%	52.4%	80.6%
Costs of rebalancing											
Annual turnover	2.6%	2.3%	1.6%	1.3%	2.1%	1.5%	1.2%	1.7%	1.6%	1.5%	0.0%
Number of rebalancing events	1,068	423	64	24	227	50	22	79	36	19	0
Absolute framework											
Average annualised return	8.0%	8.0%	8.1%	8.3%	8.2%	8.3%	8.3%	8.1%	8.2%	8.3%	8.9%
Annualised volatility	10.1%	10.1%	10.1%	10.2%	10.1%	10.2%	10.1%	9.9%	9.8%	10.0%	13.2%

Notes: This illustration is hypothetical and does not represent the returns of any particular investment. We assumed a portfolio of 50% global equities/50% global bonds. All returns in nominal US dollars. For benchmark data, see box on page 2. There were no new contributions or withdrawals. Dividend payments were reinvested in equities; interest payments were reinvested in bonds. There were no costs. All statistics were annualised.

Sources: Calculations by The Vanguard Group, Inc., based on data from FactSet.

Figure 3. Impact of rebalancing with portfolio cash flows: 1926 to 2014



Notes: This illustration is hypothetical and does not represent the returns of any particular investment. We assumed a portfolio of 50% global equities/50% global bonds. All returns in nominal US dollars. There were no new contributions or withdrawals. Except in the “Redirecting income” column, dividend payments were reinvested in equities; interest payments were reinvested in bonds. The “Redirecting income” column shows a 50% equity/50% bond portfolio that was rebalanced by investing the portfolio’s dividend and interest payments in the underweighted asset class from 1926 through 2014. There were no costs. All statistics were annualised.

Sources: Calculations by The Vanguard Group, Inc., based on data from FactSet.

Conclusion

Rebalancing has one clear advantage over not rebalancing: it more closely aligns a portfolio with its target asset allocation's risk-and-return characteristics. But there's no one rebalancing strategy that fits all investors. Our research shows that risk-adjusted returns are not meaningfully different between portfolios that are rebalanced monthly, quarterly or annually – regardless of rebalancing threshold.

Ultimately, it's a trade-off between risk and cost. Investors must decide how far they are willing to let their portfolio drift from their target asset allocation while also considering how much they are willing to pay in rebalancing costs.

We believe that a rebalancing strategy that uses annual or semi-annual monitoring, with rebalancing at 5% thresholds, is likely to produce a reasonable balance between risk control and cost minimisation for most broadly diversified equity and bond portfolios.

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