



Rebalancing

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Institutional investors adopt long-term asset allocation targets to pursue specific objectives within a defined tolerance for risk. Those targets, together with the investor's liquidity needs and other constraints, are typically set out in an investment policy statement (IPS). Because asset allocation is a primary determinant of a portfolio's risk and return, keeping the actual portfolio reasonably close to its policy targets is a central task of regular portfolio management. Portfolio weights drift away from their targets through normal market movement as asset classes produce different returns. Left unmanaged too long, this drift can lead to a different risk-return profile than that expressed in the IPS.

This paper frames rebalancing primarily as a tool for maintaining fidelity to the investment policy statement. It examines why portfolios drift, compares common rebalancing approaches using a simple two-asset illustration, and then turns to the harder questions that arise in complex multi-asset portfolios, particularly those that hold a large share of illiquid private market assets.

Key Takeaways

- › **The purpose of rebalancing is fidelity to policy, not higher returns.** Rebalancing keeps a portfolio aligned with the objectives, risk tolerances, and constraints set out in the investment policy statement. Any effect on return tends to be a byproduct of that discipline rather than its goal.
- › **The clearest and most consistent benefit of rebalancing has been risk control.** Across a range of transaction cost assumptions, rebalanced versions of a simple 60/40 portfolio held volatility well below a comparable buy and hold portfolio, even in periods when buy and hold produced a modestly higher return.
- › **Less frequent and less aggressive rebalancing tended to be more cost-efficient.** Wider bands and lower frequencies generally reduced trading and preserved cost-adjusted returns, provided the range stayed narrow enough to keep the portfolio's risk posture reasonably close to its target.
- › **In multi-asset portfolios, aggregate exposures matter more than individual weights.** The exposures that determine whether a portfolio remains within its policy risk tolerance, such as its overall sensitivity to equity markets and interest rates, and its liquidity, deserve more attention than the precise weight of any single substitutable component.
- › **A large illiquid allocation changes the nature of the problem.** Private market assets cannot be traded to target on demand, so investors generally manage them through commitment pacing and by adjusting the liquid portfolio. This approach can introduce trade-offs, particularly during market stress, that do not have a clean resolution.

What Is Rebalancing?

Rebalancing is the process of restoring a portfolio to its target asset mix after changes in asset values cause portfolio weights to shift. Investors establish strategic asset allocations to reflect their objectives and risk tolerance, but those allocations do not remain static. Rebalancing provides a disciplined framework for maintaining a portfolio's intended risk profile over time.

Consider an investor who determines that approximately 60% of a portfolio should be invested in equity-like assets and 40% in bonds. Maintaining that balance over time becomes an important objective. Allowing the equity weight to drift materially below its target could diminish the portfolio's return prospects, while allowing it to drift above its target could raise volatility beyond the level the investor intended.

Left unmanaged, market movements can cause a portfolio to deviate from its intended asset mix (see Figure 1). This drift may result in a portfolio that no longer reflects the investor's desired balance between risk and return. For example, Figure 1 shows how a blended portfolio that starts with 60% in public equities changes over time: equities exceeded 65% of the portfolio in 85% of months and 70% in 66% of months. Rebalancing seeks to restore that balance

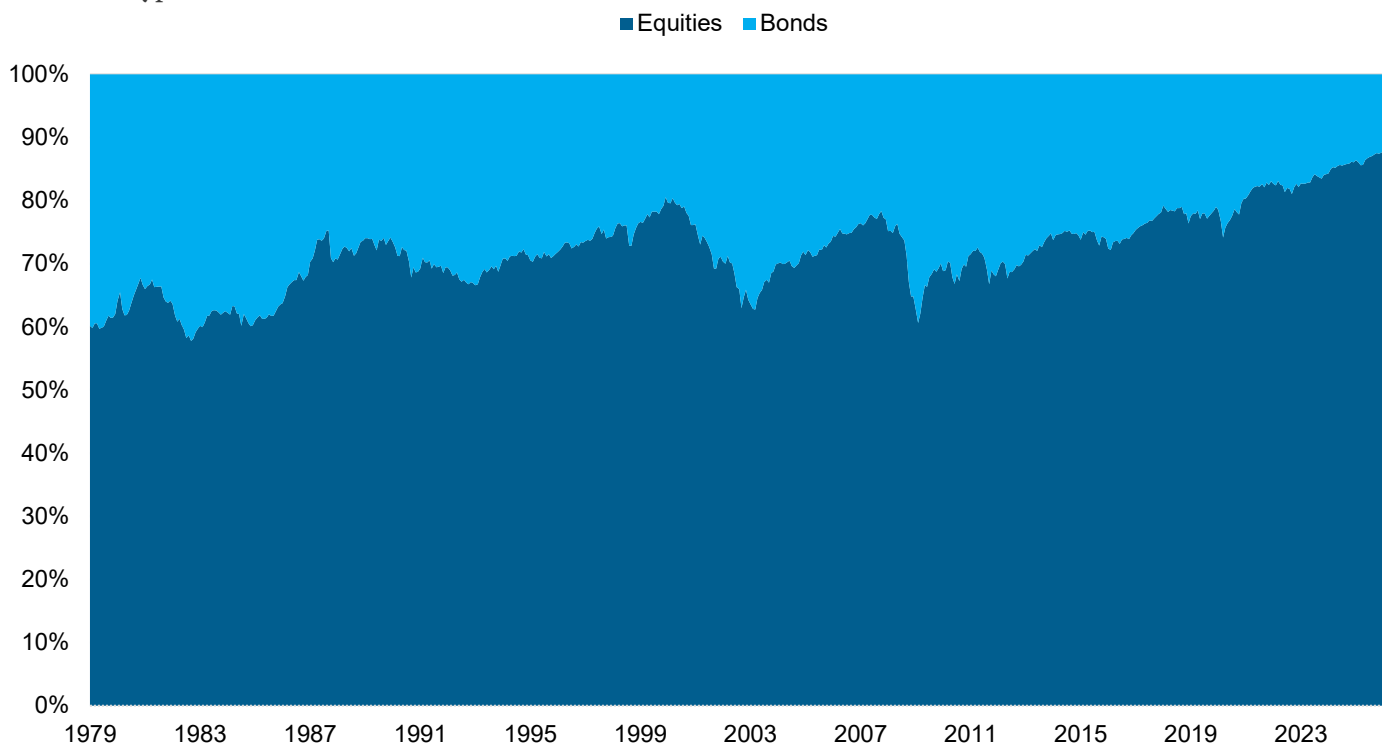
by periodically adjusting portfolio allocations back toward their target weights.

Is Rebalancing Necessary?

Not all investors rebalance. A strategy that allows investments to drift freely is known as a buy-and-hold strategy. Buy and hold generally produces the highest returns when markets move in a single direction with relatively little volatility, such as when equities steadily outperform bonds over a number of years. In such a trending market, the portfolio steadily comes to be dominated by the asset class with the highest returns.

Leadership between equities and bonds has shifted repeatedly throughout history, notwithstanding periods of sustained outperformance by a single asset class (see Figure 2). For example, the years following the Global Financial Crisis (GFC) featured an unusually prolonged stretch of equity outperformance. Historical experience suggests, however, that market leadership is likely to change eventually, so periods that appear favorable for buy and hold investors may not persist indefinitely. Moreover, cyclicity in returns appears to be a standard feature of markets, as other asset classes have likewise exhibited substantial cyclicity.

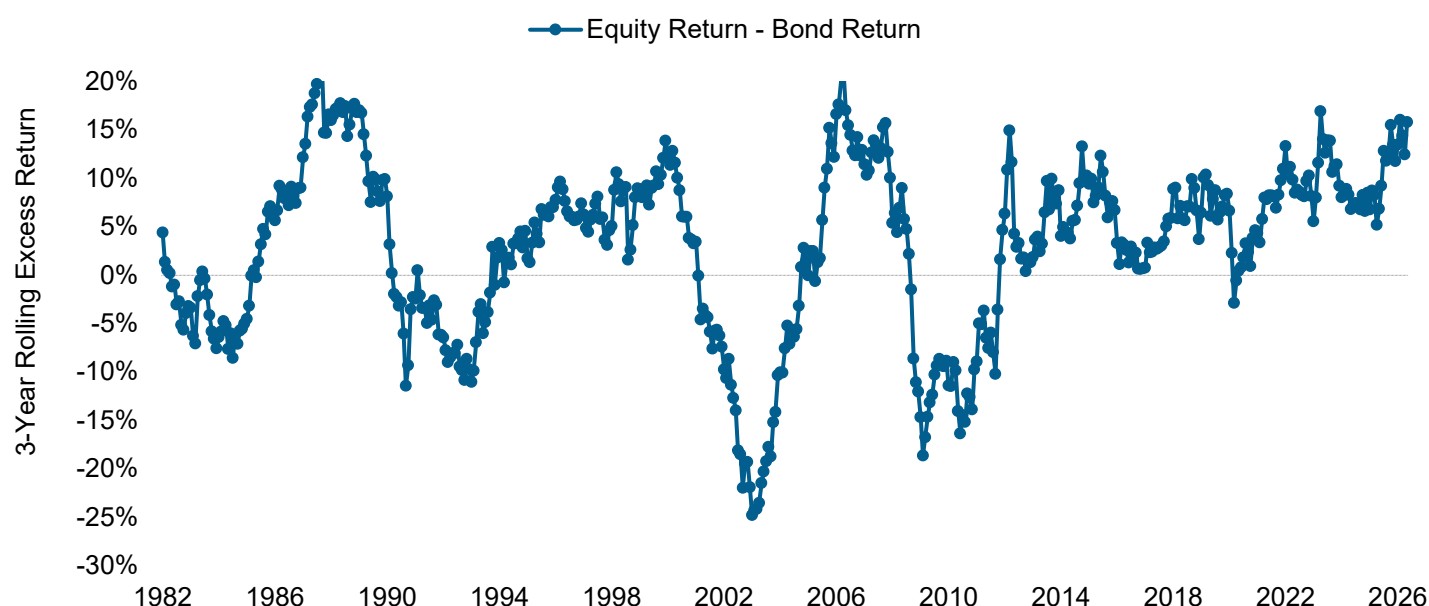
Figure 1
Drift in a Hypothetical 60/40 Stock/Bond Portfolio



The hypothetical portfolio represents a 60% Equities (MSCI ACWI) and 40% Bonds (Bloomberg Aggregate) mix allowed to drift over time (i.e., no rebalancing) for the period January 1979 through May 2026. MSCI ACWI is backfilled with MSCI World prior to inception of the ACWI in 1988.

Figure 2

Historical Cycles of Equity and Bond Outperformance



MSCI ACWI and Bloomberg Aggregate used respectively. MSCI ACWI is backfilled with MSCI World prior to 1988.

Rebalancing tends to be most effective when markets experience repeated reversals, for example when equities sharply outperform and then sharply underperform bonds. Frequent changes in market leadership create opportunities to systematically restore target weights, whereas prolonged trends generally favor buy and hold investors. For this reason, many investors regard rebalancing chiefly as a risk-management tool. The act of rebalancing helps maintain the portfolio's overall risk exposure, whether by limiting the natural drift toward riskier assets or by supporting more consistent risk-adjusted results across volatile market environments.

Rebalancing versus Market Timing

Active rebalancing, meaning the maintenance of prudent asset allocation levels, is not the same as market timing. Rebalancing is an adjustment back toward an agreed-upon asset allocation in response to market-induced changes. Market timing is a deliberate adjustment of the asset allocation in anticipation of a market shift. For example, an investor who expects equities to decline might exchange stocks for bonds or cash in advance of the anticipated decline. If equities do decline, that investor's returns improve. If equities instead rise, that investor's returns suffer.

Academic researchers have studied market timing strategies extensively over the past several decades. This body of work indicates that successful market timing is very difficult to implement.¹ Few investors can identify market shifts in advance with sufficient accuracy and consistency to recover the costs of the extra turnover and the losses associated

with incorrect judgments.² The governance structures of many institutional investors add a further obstacle, because reaching a timely consensus on the direction of the market can be difficult.³ By the time a decision is implemented, the anticipated opportunity may already have passed. Given these challenges, investors should weigh carefully whether the potential benefits of market timing justify deviating from a disciplined, systematic rebalancing approach.

Rebalancing Strategies

Investors can choose among many customizable rebalancing strategies that reflect different risk tolerances, time horizons, and liquidity constraints. Most rebalancing strategies fall into one of the categories described below.

Passive Capital-Based Rebalancing

In passive capital-based rebalancing, the rebalancing decision is determined systematically by the capital share of the component asset classes. In the simplest case, allocations are adjusted periodically to maintain preset targets. The more common variation uses target ranges, which allow allocations to fluctuate within predetermined bands before rebalancing occurs. For example, if the equity target is 60% of the portfolio with a range of plus or minus 5%, the equity allocation would require adjustment only if it exceeded 65% or fell below 55%.

There are several approaches within this method. Under target rebalancing, if the equity allocation moves above 65%, the investor would sell sufficient stocks to restore equity to the target of 60%. Under endpoint rebalancing, an allocation that grows above 65% would be reset to the endpoint of the range, in this case 65%. Under midpoint rebalancing, assets would be rebalanced halfway back to target once they moved outside the range.

Most styles of target-range rebalancing are designed to allow some drift before rebalancing occurs. By avoiding an immediate adjustment to every change in asset values, these approaches can reduce trading activity and allow the portfolio to participate in market trends.

Passive Risk-based Rebalancing

In passive risk-based rebalancing, the rebalancing decision is determined systematically by the volatility of the portfolio or of its component asset classes. In risk-based rebalancing, a “risk budget” is determined in advance that targets an acceptable level of volatility, and then assets are adjusted (i.e., bought or sold) either periodically or when overall portfolio volatility moves appreciably outside a predetermined range, so that overall volatility is maintained.⁴ This approach is relatively complex and assesses risk after the fact. As a result, it is less common than capital-based approaches.

Tactical Rebalancing

Some investors prefer to rebalance tactically or opportunistically rather than following a fixed set of systematic rules. In tactical rebalancing, an investor rebalances periodically based on shorter-term expectations for asset class returns, which is essentially tactical asset allocation. In opportunistic rebalancing, an investor reviews asset classes periodically and makes changes only when they perceive an attractive opportunity. Either approach can be conducted in the risk space or the capital space.

Systematic versus Discretionary Implementation

Beyond the choice of methodology, investors must decide how a rebalancing policy will operate in practice. An investor that adopts a passive approach must decide whether to make rebalancing required, as memorialized in an investment policy statement, or discretionary. Making the action required removes the psychology from the decision, including the potential for irrational behavior, generally to the benefit of the portfolio.⁵ A systematic framework reinforces long-term decision-making and encourages investors to resist hasty actions, such as locking in losses or chasing returns, in response to short-term volatility.

Some investors prefer to rebalance systematically by default while retaining control over the decision if they perceive unusual circumstances. Flexibility in the pace of rebalancing can also be useful. For example, an investor may implement rebalancing trades gradually over several weeks or even months to reduce market-timing risk and limit the effect of short-term price fluctuations.

Because passive capital-based strategies are the most common and the simplest to analyze, the next section evaluates them more closely.

Comparative Analysis: Periodic Rebalancing

To evaluate different passive capital-based techniques, we constructed a policy portfolio of 60% global equities and 40% core bonds, using the MSCI ACWI and Bloomberg US Aggregate indices, respectively.⁶ The data spans January 1979 through May 2026 and includes a wide variety of market and economic conditions.

Transaction costs are a key determinant of rebalancing decisions. When incorporated into portfolio decisions, transaction costs influence which thresholds are optimal for rebalancing. These costs are not static, however. Turbulent markets typically generate higher transaction costs and therefore raise the expense of frequent rebalancing, while lower transaction costs generally improve the net benefit of a rebalancing strategy. To examine this effect, we applied a range of transaction cost assumptions to the historical data.

Figure 3 presents results under illustrative transaction-cost assumptions of 2, 5, 20, and 30 basis points applied to the amount traded. These assumptions are not intended to represent precise implementation costs for all investors. Rather, they are sensitivity levels designed to show how rebalancing outcomes change across different implementation environments, ranging from liquid and stable markets with relatively low trading costs to periods of elevated volatility and market stress, when liquidity deteriorates and transaction costs can increase meaningfully, particularly for larger transactions.⁷

The results reveal several consistent patterns. Among the frequencies tested, monthly rebalancing was by far the most sensitive to transaction costs, which illustrates how higher costs fall disproportionately on more frequently traded strategies. More important, every rebalancing frequency held volatility substantially below that of buy and hold, regardless of the transaction cost assumption (see Figure 4). This is the central point: rebalancing reliably kept the portfolio's risk near its intended level, which is precisely what a policy allocation is meant to do.

Figure 3

Cost-Adjusted Return by Rebalancing Frequency and Transaction Costs

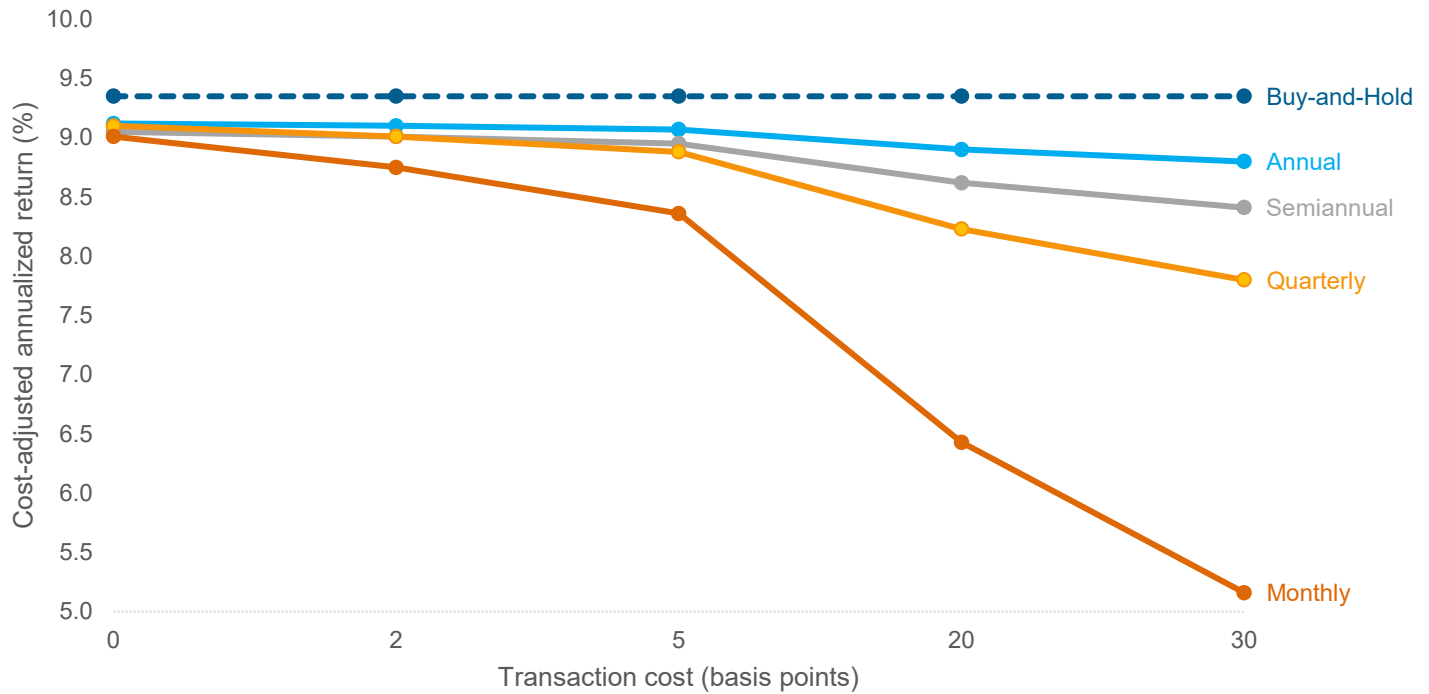


Figure 3 is based on a hypothetical 60% MSCI ACWI / 40% Bloomberg US Aggregate portfolio measured from January 1979 through May 2026. MSCI ACWI backfilled with MSCI World prior to 1988. Transaction costs are applied to the amount traded at each rebalance event and reflected in the cost-adjusted return calculations. These results are hypothetical and do not represent the actual performance of any Meketa strategy or client account; no investor achieved these returns. Hypothetical performance has inherent limitations, including that it does not reflect actual trading or real-time decision-making and is calculated with the benefit of hindsight, so actual results would differ. Figures 4 through 16 and the appendices are subject to the same limitations.

Figure 4

Risk-Adjusted Return versus Volatility

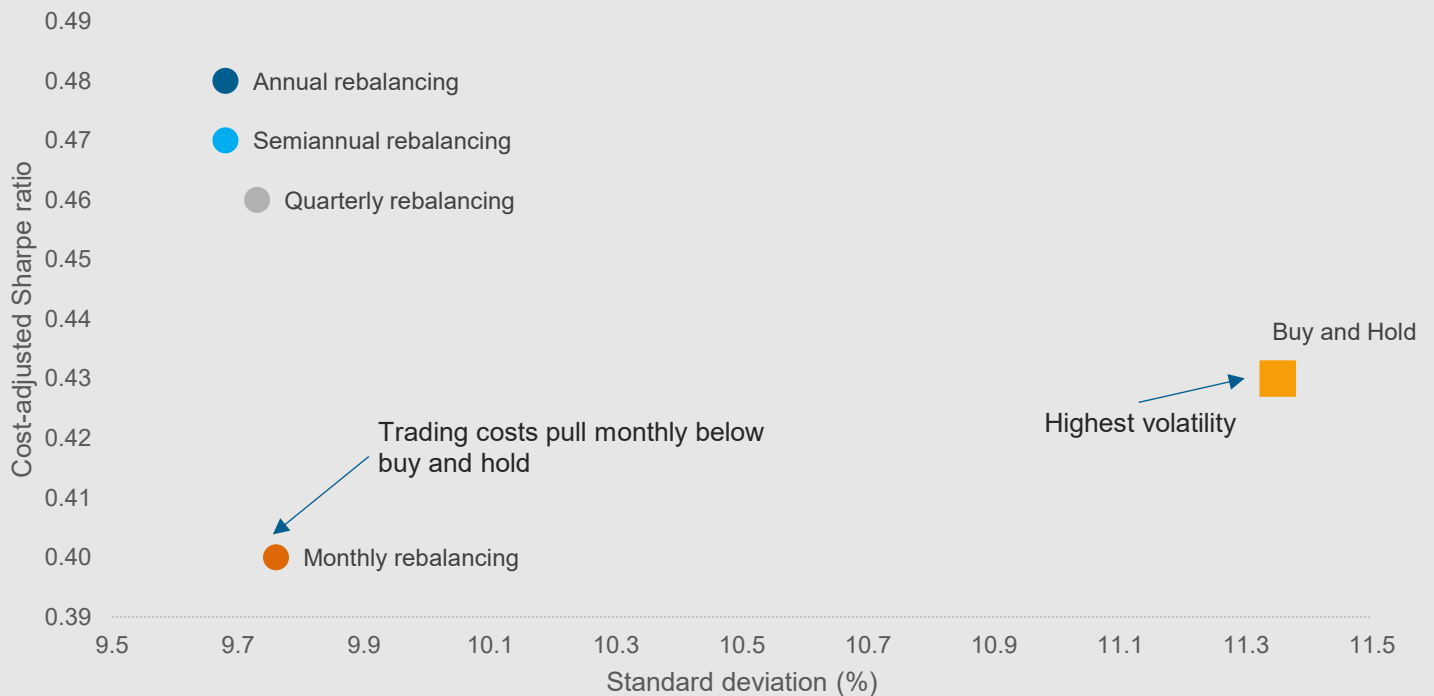


Figure 4 is based on a hypothetical 60% MSCI ACWI / 40% Bloomberg US Aggregate portfolio measured from January 1979 through May 2026. MSCI ACWI backfilled with MSCI World prior to 1988. Transaction costs are applied to the amount traded at each rebalance event and reflected in the cost-adjusted Sharpe ratio calculations. For this chart, an average of 5 basis points in transaction costs is used. See the appendix for volatility and Sharpe ratio at other transaction cost levels. See footnote 3 for important information about hypothetical performance.

Among the periodic rebalancing strategies, annual rebalancing produced the highest cost-adjusted returns and was the only one to achieve a cost-adjusted Sharpe ratio above that of buy and hold in every scenario. Buy and hold nonetheless generated the highest cost-adjusted return overall, because allowing the equity weight to rise steadily increased both risk and return over a period that favored equity investors. Viewed through the lens of policy fidelity, that higher return came at the cost of a risk posture the investor did not choose.

One caveat is the extent to which higher transaction costs reduce net returns. While it is highly unlikely transaction costs would be 30 basis points on average for a full 40+ year period, it shows that there is a reason for investors to be thoughtful about their approach to rebalancing during periods of elevated transaction costs, as typically accompanies market stress.

Comparative Analysis: Range Rebalancing

Passive range rebalancing offers another way to maintain a desired asset allocation. Its main advantage is that the investor makes portfolio adjustments only when an allocation moves outside a predetermined range.

There is an inherent trade-off between wide and narrow ranges. Smaller ranges keep allocations closer to target but generally require more frequent rebalancing and therefore entail higher transaction costs. Larger ranges reduce trading activity and associated costs, and they may allow the portfolio to benefit from broader market trends. Yet wider ranges permit portfolios to deviate further from target

allocations, altering the portfolio's risk posture to a degree that may no longer be consistent with the investor's risk tolerance or objectives.

In our range analysis, we established 5% and 10% bands for target, midpoint, and endpoint strategies. The target simulation reset assets to their target percentages whenever they fell outside the range at month end. Midpoint rebalancing reset assets to the midpoint between target and the range boundary, and endpoint rebalancing reset assets to the boundary itself. For example, within a 10% range, if equities stood at 71% at month end, the target approach would reset equities to 60%, the midpoint approach to 65%, and the endpoint approach to 70%. Figure 5 displays the results at average transaction costs of 2, 5, 20, and 30 basis points, consistent with the assumptions used in the periodic rebalancing analysis.

Wider bands generally reduced the number of rebalancing actions and helped preserve cost-adjusted returns as transaction costs increased. The 10% midpoint approach produced the highest cost-adjusted annualized return among the range-based strategies across all transaction cost assumptions. The 10% bands exhibited greater volatility than the 5% bands, but still substantially less volatility than the buy and hold approach (see Figure 6). This outcome reflects the trade-off described above: wider ranges allow the portfolio to participate in sustained trends while still imposing some discipline on drift. By contrast, the 5% endpoint approach required substantially more rebalancing actions, which made it more sensitive to higher transaction costs.

Figure 5
Cost-Adjusted Return by Range Strategy and Transaction Cost

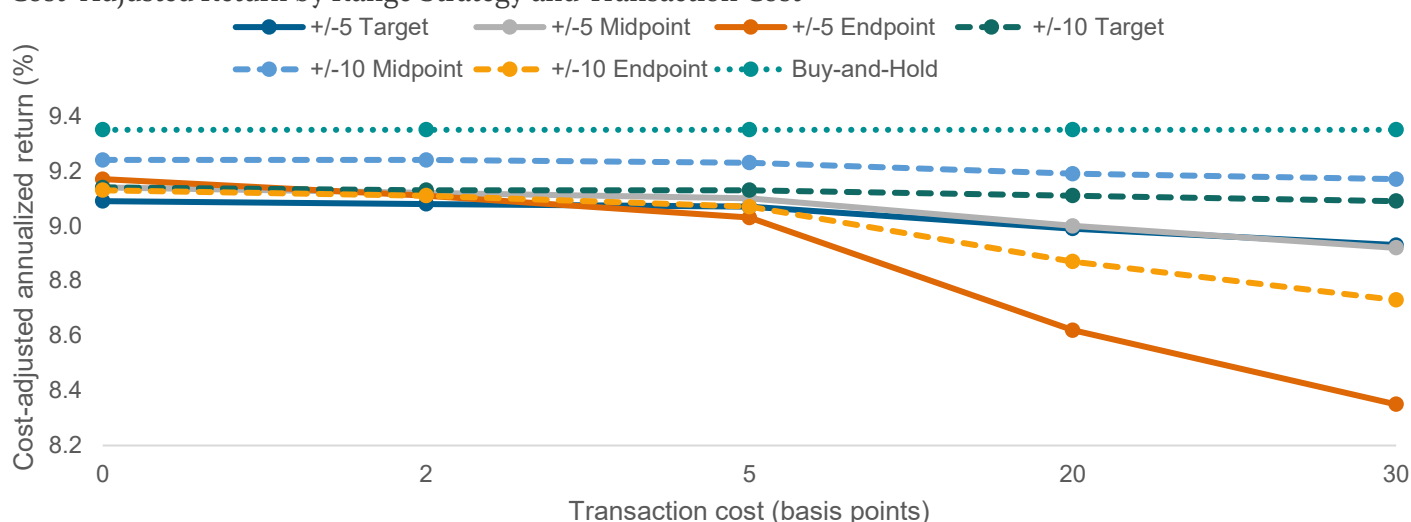


Figure 5 is based on a hypothetical 60% MSCI ACWI / 40% Bloomberg US Aggregate portfolio measured from January 1979 through May 2026. MSCI ACWI backfilled with MSCI World prior to 1988. Range-based strategies rebalance only when the portfolio weight falls outside the specified band at month end. Transaction costs are applied to the amount traded at each rebalance event and reflected in the cost-adjusted return calculations. See footnote 3 for important information about hypothetical performance.

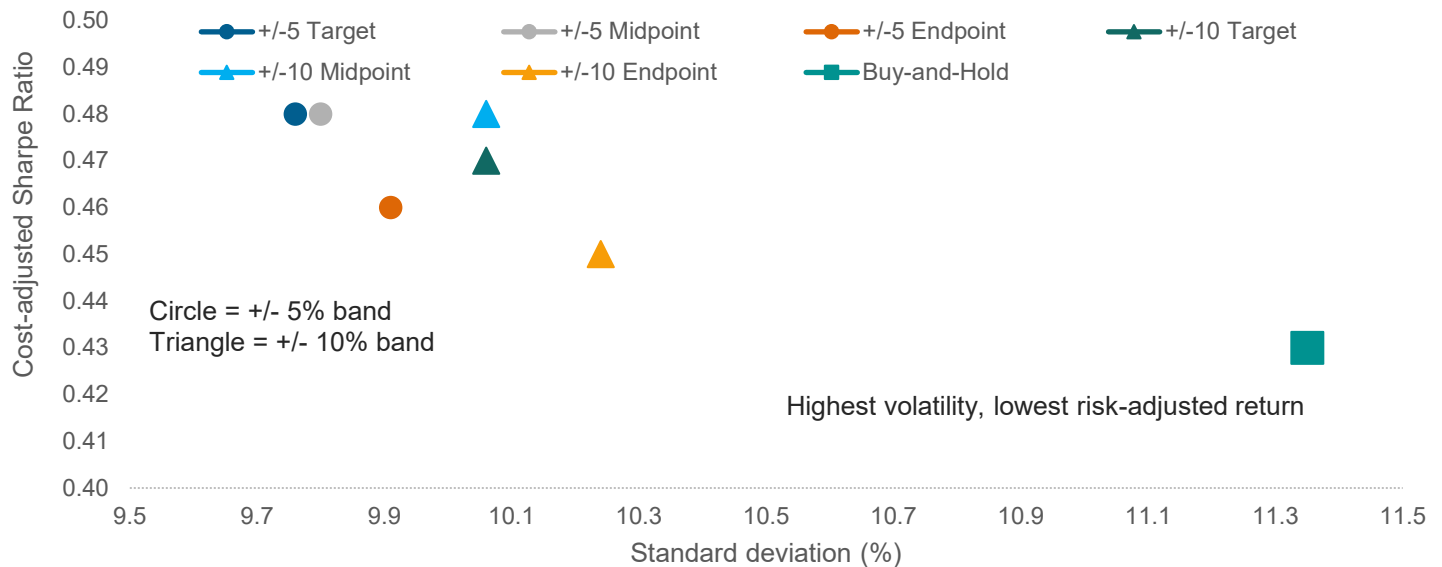
Figure 6**Risk-Adjusted Return versus Volatility**

Figure 6 is based on a hypothetical 60% MSCI ACWI / 40% Bloomberg US Aggregate portfolio measured from January 1979 through May 2026. MSCI ACWI backfilled with MSCI World prior to 1988. Range-based strategies rebalance only when the portfolio weight falls outside the specified band at month end. Transaction costs are applied to the amount traded at each rebalance event and reflected in the cost-adjusted Sharpe ratio calculations. For this chart, an average of 5 basis points in transaction costs is used. See the appendix for volatility and Sharpe ratio at other transaction cost levels. See footnote 3 for important information about hypothetical performance.

Taken together, the range-based results suggest that less frequent and less aggressive rebalancing can improve implementation efficiency. However, this comes with the trade-off of wider ranges experiencing higher volatility (though not as high as a buy and hold approach) due to the greater amount of drift permitted.

Rebalancing a Multi-Asset Portfolio

The two-asset illustration clarifies the mechanics of rebalancing, but it understates the complexity that most institutional investors face. A typical institutional portfolio holds many asset classes, including public and private equity, several segments of fixed income and credit, real estate, infrastructure, and cash. As the number of components grows, so does the number of ways a portfolio can drift. Attempting to hold every line item at its exact target would generate substantial, potentially costly, and largely unnecessary trading.

A more useful way to think about rebalancing a complex portfolio is to focus on the exposures that actually determine whether the portfolio still reflects its policy. Most of a portfolio's risk typically arises from a small number of underlying factors, usually including its overall sensitivity to equity markets (i.e., growth) and to interest rates. From this perspective, the goal of rebalancing is to keep those aggregate exposures within tolerance, rather than to hold each individual allocation at its precise target.

This distinction matters because many asset classes are close substitutes for one another in the risk they contribute. Private equity, for instance, can be viewed in broad terms as carrying an equity exposure similar to that of public equity, but typically with a higher beta and a lag in pricing.⁸ Under this view, an overweight to private equity is, in substance, an overweight to equity risk. If the private equity position cannot be reduced, an investor may be able to restore the portfolio's overall equity exposure by trimming public equity instead. The individual weights would remain away from target, but the aggregate risk posture, which is what the policy is meant to govern, would move back toward tolerance.

Two practical points follow. First, the components that are easiest to trade, such as public equity, public fixed income, and cash, tend to carry most of the burden of rebalancing, because they are the levers most readily available to the investor. Second, rebalancing a multi-asset portfolio requires judgment about which deviations matter. A drift between two similar credit strategies may have little effect on the portfolio's overall risk, whereas a comparable drift in total equity exposure may be far more consequential. Directing rebalancing effort toward the deviations that move the portfolio's aggregate risk profile, rather than toward every deviation, tends to be both more effective at maintaining fidelity with the spirit of the IPS and less costly.

Rebalancing When a Large Share of the Portfolio Is Illiquid

The most significant departure from the simple illustration arises when a portfolio holds a substantial allocation to illiquid assets, which for most institutional investors means private market strategies such as private equity, private credit, real estate, infrastructure, natural resources, and possibly hedge funds. These assets typically cannot be bought or sold quickly at a reliable price, and they are valued far less frequently than publicly traded securities. Both features change how rebalancing works.

Because private assets cannot be traded to a target on demand, rebalancing them is not a point-in-time transaction. Investors generally manage private market exposure over multiple years through commitment pacing, meaning the timing and size of new commitments together with the natural flow of capital calls and distributions. When a private allocation drifts away from target, the usual response is to adjust the pace of future commitments. This process can take years to bring a private market portfolio back in line with its target allocation. Investors who seek quicker results can buy or sell private market assets in the secondary market. For those looking to reduce an overweight position, it is worth noting that such transactions often occur at a discount, especially during periods of market stress; hence, many investors are disinclined to do so.

This has an important implication for how ranges function. For a liquid asset class, a policy band acts as a trading trigger: when the allocation breaches the band, the investor trades back toward target. For an illiquid asset class, a band cannot serve the same purpose, because breaching it does not produce an executable trade. A band around a private allocation is better understood as a pacing guardrail and a prompt for review than as an instruction to trade. Boards and staff benefit from recognizing that the same policy range can mean different things for liquid and illiquid holdings.

The Denominator Effect and a Difficult Trade-off

The interaction between illiquidity and infrequent valuation becomes most challenging during periods of market stress. Publicly traded assets are marked to market continuously, while private assets are valued periodically and with a lag.⁹ In a sharp equity market decline, public valuations fall immediately, whereas reported private valuations decline more slowly and typically by less. As a result, private assets can come to represent a larger share of the total portfolio even though their underlying economic value has also fallen. This dynamic, commonly called the denominator effect, can leave an investor appearing overweight to private assets at

the very moment public market prices have experienced large declines.

The post-pandemic and rate-hiking period illustrates the difficulty this creates. Many institutional investors entered a market decline already overweight to private equity, partly because of a prior run-up in private valuations. Once public equity prices declined, reported private marks generally did not yet reflect the deterioration visible in public markets, increasing the relative weight in private equity. Viewing private equity as a kind of higher-beta equity exposure, some of these investors concluded that their overall equity risk sat above target, and they reduced public equity to bring total equity exposure back toward policy. When public equities subsequently recovered, these investors who had sold some of their public equities near the low did not fully participate in the rebound. While this approach theoretically maintained portfolio consistency with the IPS, the outcome proved deeply unsatisfying for many of these investors, a feeling that was amplified as many private equity assets dramatically lagged the performance of public equities.

This episode does not have a clean solution, and it is worth stating plainly why. Investors faced a genuine conflict between two reasonable objectives. Maintaining fidelity to the policy risk posture argued for reducing equity exposure, because the measured overweight was real on the portfolio's own books. Avoiding the sale of liquid assets into a decline argued for patience, because the measured overweight was partly an artifact of stale private valuations that would eventually fall. No rebalancing rule can satisfy both objectives at once. An investor can only control aggregate risk through the assets that can actually be traded, and those same liquid assets tend to be the highest-returning liquid holdings and the first to recover. Any rule that mechanically offsets an illiquid overweight by cutting liquid equity will tend to sell low and forgo part of the recovery, especially in a sharp and short-lived decline.

Several partial responses can reduce the severity of this problem, though none completely solves it.

- › Evaluate private overweights against a more current estimate of value before acting. Because reported private market valuations lag public market prices, a reported overweight during a drawdown may overstate the true economic overweight. Adjusting private valuations toward current market conditions, whether through de-smoothing techniques or public market proxies, can give a more accurate picture of exposure. These adjustments are imprecise and model-dependent, and a reliable figure is rarely available in real time.

- › Consider liquidity needs from a whole-of-portfolio perspective. During stress, the binding constraint is often the need for cash to meet capital calls, benefit payments, and other obligations, not the precise level of measured equity exposure. As a result, investors may choose to preserve liquidity rather than immediately rebalance back to target. Some investors may also evaluate secondary-market sales of private assets to improve liquidity or reduce an overweight to private assets. While such sales often occur at a discount, they may still be attractive if they improve long-term portfolio flexibility or allow capital to be redeployed into more compelling opportunities elsewhere in the portfolio.
- › Consider tolerating a temporary and measured deviation from policy rather than trading into the decline. An investor may reasonably decide that a short-lived overweight to equity risk is preferable to selling liquid assets at a trough. This is a discretionary judgment, and it sits in tension with the discipline that systematic rebalancing is meant to provide. If the decline proves prolonged rather than brief, the decision to wait leaves the portfolio overexposed to risk for longer.
- › Moderate commitment pacing rather than eliminating commitments altogether. An investor may choose to temporarily reduce the pace of new private market commitments while portfolio weights move back toward target. This can help limit further growth in the private allocation without fully stepping away from the asset class. Completely halting commitments may improve near-term portfolio metrics, but it also increases the risk of missing attractive vintage years that often emerge during and after market downturns.
- › Anticipate the problem in the investment policy statement. The policy can address this situation before it arises, for example by setting wider or asymmetric ranges for illiquid assets, by specifying how private valuations will be assessed when a denominator effect is suspected, and by preauthorizing a defined tolerance for temporary deviations from policy. Provisions of this kind cannot anticipate every environment, and a wide band for private assets is, in effect, an acknowledgment that the portfolio will at times drift from its stated policy.

The broader lesson is that an investor cannot fully offset an untradeable exposure with a tradeable one across time without accepting some timing risk. The most an investor can do is make this trade-off deliberately, and in advance, rather than improvising under pressure. A policy that has already considered how the portfolio will behave when private and public valuations diverge places the board and staff in a far better position than one that has not.

Implementation: Minimizing the Cost of Rebalancing

It is useful to separate two decisions that are often blurred together. The first is the policy decision: what the portfolio should hold, and therefore when and how far to rebalance toward target. The second is the implementation decision: given a decision to move, how to make the necessary trades at the lowest reasonable cost. These are distinct questions, and the choice of how to trade should not drive the choice of what the portfolio should hold.

The two decisions do interact, however, and the interaction can be material. For a routine rebalancing of modest size, implementation cost is usually a secondary consideration. For a large transaction, such as one that may occur during the adoption of a new strategic asset allocation or a significant de-risking, implementation cost can become a first-order concern that legitimately shapes the pace and sequencing of the policy move. In these cases, phasing the transition over time and using transition management services may reduce both cost and market impact.

Rebalancing trades can be implemented through several mechanisms, which differ considerably in cost. Ordered roughly from least to most expensive, they include the following.

- › **Directing natural cash flows.** Ordinary portfolio cash flows, including contributions, withdrawals, benefit payments, capital calls, and distributions, can be directed to move the portfolio toward its targets. Investing new contributions in the most underweight asset classes, and funding withdrawals from the most overweight ones, accomplishes a rebalancing objective at little or no incremental cost. Because these cash flows occur anyway, using them for rebalancing is generally the most efficient mechanism available.

- › **Using pooled and index vehicles.** Index funds, commingled index vehicles, and exchange-traded funds often provide a low-cost means of shifting exposure between asset classes. Managers of these vehicles typically trade at low commission rates and with limited market impact, and commingled funds may be able to cross flows internally. A combination of equity and bond index vehicles can adjust the overall equity and fixed income balance while preserving other portfolio characteristics, such as capitalization and style exposures.
- › **Using a derivatives overlay.** An investor can direct a specialized overlay manager to buy and sell futures to maintain a target allocation or to implement a temporary adjustment.¹⁰ An overlay can be an efficient way to manage policy exposures or to bridge exposure while physical assets are repositioned. Overlays introduce their own considerations, including basis risk, because the derivative may not track the underlying assets perfectly, as well as ongoing financing costs that can reduce returns.
- › **Trading segregated mandates.** When the mechanisms above are unavailable or insufficient, the investor may need to direct trades within segregated investment mandates. This route tends to be the most expensive, particularly when it forces trading unrelated to a manager's investment process. Where it is necessary, allowing managers to implement changes over a reasonable period can help limit hasty and costly turnover.

For private market allocations, the mechanisms above generally do not apply, because these assets cannot be repositioned through ordinary trading. As discussed above, investors manage private exposures primarily through commitment pacing, while adjusting the liquid portion of their portfolio to manage total exposure. Where a more direct adjustment is required, a secondary-market sale may be possible, though the inherent trade-offs (e.g., selling at a discount) should be considered.

Finally, rebalancing need not be treated as a standalone activity. Many routine portfolio actions, such as funding a manager change or investing a new contribution, create an opportunity to move the portfolio toward its targets at the same time. Coordinating rebalancing with activity that would occur anyway is among the most reliable ways to keep implementation costs low.

Conclusion

Rebalancing is best understood as a discipline for keeping a portfolio consistent with the objectives, risk tolerances, and constraints expressed in an investor's investment policy statement. Framed this way, the central question is not whether rebalancing adds return, but whether the portfolio continues to reflect the risk posture the investor intended. Our analysis of a simple two-asset portfolio supports this framing. Rebalanced portfolios consistently held less risk than a buy and hold portfolio, and less frequent, less aggressive rebalancing generally preserved returns while limiting trading costs. Buy and hold produced a slightly higher return over the full period, but only by allowing the portfolio to drift steadily toward greater risk, which is the outcome an investment policy statement is designed to prevent.

The picture grows more complicated as portfolios become more diverse and less liquid. In a complex multi-asset portfolio, investors are generally better served by keeping aggregate exposures within tolerance than by managing every individual weight. In a portfolio with a large illiquid allocation, rebalancing becomes a matter of commitment pacing and careful use of the liquid portfolio, and it can involve genuine trade-offs during periods of stress that no rule fully resolves. In those moments, the quality of the investor's prior planning, as reflected in a thoughtful investment policy statement, tends to matter more than the choice of any particular rebalancing formula.

No single rebalancing approach is optimal for every investor. Periodic and range-based methods each have merits, and the appropriate choice depends on an investor's costs, liquidity, and governance. What evidence and experience consistently suggest is that some disciplined approach to rebalancing serves investors better than allowing a portfolio to drift without limit. Investors should select and document a rebalancing policy that fits their circumstances and revisit that policy as their portfolio and objectives evolve.

Appendix: Detailed Rebalancing Estimates at Different Frequencies and Transaction Costs

Figure 7

Impact of 0.02% in Transaction Costs

	Annualized Return (%)	Cost-Adjusted Annualized Return (%)	Standard Deviation (%)	Cost-Adjusted Sharpe Ratio	Number of Rebalancing Actions
Monthly Rebalancing	9.01	8.75	9.76	0.44	569
Quarterly Rebalancing	9.10	9.01	9.74	0.47	190
Semiannual Rebalancing	9.05	9.01	9.68	0.47	95
Annual Rebalancing	9.12	9.10	9.68	0.48	48
Buy-and-Hold	9.35	9.35	11.35	0.43	0

Figures 7 through 10 are based on a hypothetical 60% MSCI ACWI / 40% Bloomberg US Aggregate portfolio measured from January 1979 through May 2026. MSCI ACWI backfilled with MSCI World prior to 1988. Transaction costs are applied to the amount traded at each rebalance event and reflected in the cost-adjusted return and Sharpe ratio calculations. The number of rebalancing actions represents the total number of rebalance events over the measurement period. See footnote 3 for important information about hypothetical performance.

	Annualized Return (%)	Cost-Adjusted Annualized Return (%)	Standard Deviation (%)	Cost-Adjusted Sharpe Ratio
Monthly Rebalancing	9.01	8.36	9.76	0.40
Quarterly Rebalancing	9.10	8.88	9.73	0.46
Semiannual Rebalancing	9.05	8.95	9.68	0.47
Annual Rebalancing	9.12	9.07	9.68	0.48
Buy-and-Hold	9.35	9.35	11.35	0.43

Figure 8

Impact of 0.05% in Transaction Costs

	Annualized Return (%)	Cost-Adjusted Annualized Return (%)	Standard Deviation (%)	Cost-Adjusted Sharpe Ratio
Monthly Rebalancing	9.01	6.43	9.74	0.21
Quarterly Rebalancing	9.10	8.23	9.71	0.39
Semiannual Rebalancing	9.05	8.62	9.68	0.43
Annual Rebalancing	9.12	8.90	9.68	0.46
Buy-and-Hold	9.35	9.35	11.35	0.43

Figure 9

Impact of 0.20% in Transaction Costs

	Annualized Return (%)	Cost-Adjusted Annualized Return (%)	Standard Deviation (%)	Cost-Adjusted Sharpe Ratio
Monthly Rebalancing	9.01	5.16	9.73	0.08
Quarterly Rebalancing	9.10	7.80	9.70	0.35
Semiannual Rebalancing	9.05	8.41	9.68	0.41
Annual Rebalancing	9.12	8.80	9.68	0.45
Buy-and-Hold	9.35	9.35	11.35	0.43

Figure 10
Impact of 0.30% in Transaction Costs

Appendix: Detailed Rebalancing Estimates at Different Ranges and Transaction Costs

Figure 11
Impact of Range and 0.02% in Transaction Costs

Rebalancing Range	Rebalancing Point	Annualized Return (%)	Cost-Adjusted Annualized Return (%)	Standard Deviation (%)	Cost-Adjusted Sharpe Ratio	Number of Rebalancing Actions
	Target	9.09	9.08	9.76	0.48	23
Range +/- 5%	Midpoint	9.14	9.12	9.80	0.48	31
	Endpoint	9.17	9.11	9.91	0.47	118
	Target	9.14	9.13	10.06	0.47	7
Range +/- 10%	Midpoint	9.24	9.24	10.06	0.48	11
	Endpoint	9.13	9.11	10.24	0.46	58
	Target	9.13	9.11	10.24	0.46	58
Buy-and-Hold	N/A	9.35	9.35	11.35	0.43	0

Figures 11 through 14 are based on the same hypothetical 60% MSCI ACWI / 40% Bloomberg US Aggregate portfolio measured from January 1979 through May 2026. MSCI ACWI backfilled with MSCI World prior to 1988. Range-based strategies rebalance only when the portfolio weight falls outside the specified band at month-end. Transaction costs are applied to the amount traded at each rebalance event and reflected in the cost-adjusted return and Sharpe ratio calculations. The number of rebalancing actions represents the total number of rebalance events over the measurement period. See footnote 3 for important information about hypothetical performance.

Rebalancing Range	Rebalancing Point	Annualized Return (%)	Cost-Adjusted Annualized Return (%)	Standard Deviation (%)	Cost-Adjusted Sharpe Ratio
	Target	9.09	9.07	9.76	0.48
Range +/- 5%	Midpoint	9.14	9.10	9.80	0.48
	Endpoint	9.17	9.03	9.91	0.46
	Target	9.14	9.13	10.06	0.47
Range +/- 10%	Midpoint	9.24	9.23	10.06	0.48
	Endpoint	9.13	9.07	10.24	0.45
Buy-and-Hold	N/A	9.35	9.35	11.35	0.43

Figure 12
Impact of Range and 0.05% in Transaction Costs

Rebalancing Range	Rebalancing Point	Annualized Return (%)	Cost-Adjusted Annualized Return (%)	Standard Deviation (%)	Cost-Adjusted Sharpe Ratio
	Target	9.09	8.99	9.77	0.47
Range +/- 5%	Midpoint	9.14	9.00	9.81	0.47
	Endpoint	9.17	8.62	9.94	0.42
	Target	9.14	9.11	10.06	0.47
Range +/- 10%	Midpoint	9.24	9.19	10.06	0.47
	Endpoint	9.13	8.87	10.25	0.43
Buy-and-Hold	N/A	9.35	9.35	11.35	0.43

Figure 13
Impact of Range and 0.20% in Transaction Costs

Rebalancing Range	Rebalancing Point	Annualized Return (%)	Cost-Adjusted Annualized Return (%)	Standard Deviation (%)	Cost-Adjusted Sharpe Ratio
	Target	9.09	8.93	9.78	0.46
Range +/- 5%	Midpoint	9.14	8.92	9.82	0.46
	Endpoint	9.17	8.35	9.95	0.39
	Target	9.14	9.09	10.06	0.46
Range +/- 10%	Midpoint	9.24	9.17	10.07	0.47
	Endpoint	9.13	8.73	10.25	0.42
Buy-and-Hold	N/A	9.35	9.35	11.35	0.43

Figure 14
Impact of Range and 0.30% in Transaction Costs

Appendix: Performance During the Global Financial Crisis

The preceding analyses evaluate rebalancing over a long historical period. Many institutional investors are particularly concerned, however, with how these approaches behave during periods of extreme market stress. Figure 15 presents the same strategies for the period from January 2007 through December 2009, which includes the Global Financial Crisis (GFC), the greatest period of market stress in most investors' memory.

For the GFC stress period, average transaction costs are assumed to equal 25 basis points of the amount rebalanced. This assumption reflects the significantly higher implementation costs observed during the crisis, when liquidity deteriorated across both equity and fixed income markets. Equity trading costs increased materially, while fixed income markets experienced varying degrees of liquidity stress across Treasuries, corporate bonds, mortgage-backed securities, and other securitized sectors. Because the portfolio consists of a broad 60% global equity / 40% core bond allocation rather than a single asset class, we use a blended transaction cost assumption intended to approximate average institutional implementation costs during the GFC.¹¹

Most rebalancing approaches produced higher cost-adjusted returns than buy and hold during the crisis, although the results varied meaningfully by strategy and timing. The main exceptions were monthly and quarterly calendar rebalancing. One explanation is that higher-frequency rebalancing repeatedly restored equity exposure during the prolonged equity drawdown, requiring the sale of the relatively stronger bond allocation to purchase equities that continued to decline. More frequent rebalancing also incurred higher transaction costs, which further reduced net returns. As a result, strategies that rebalanced more frequently generally produced lower returns during this period, although timing and the specific path of market returns also played an important role.

In contrast to the full-period analysis, the specific month in which annual rebalancing occurred mattered a great deal. A September 2008 rebalance added equity exposure just before the sharpest phase of the decline, whereas a March 2009 rebalance added equity exposure just before an extraordinary rally. These results highlight the role a systematic policy can play when discretionary action is difficult (i.e., deciding when the right time is to rebalance), while also underscoring that outcomes can depend heavily on timing and on implementation assumptions.

Figure 15
Performance During the Global Financial Crisis

Rebalancing Range	Rebalancing Point	Annualized Return (%)	Cost-Adjusted Annualized Return (%)	Standard Deviation (%)	Cost-Adjusted Sharpe Ratio	Number of Rebalancing Actions
Range +/- 5%	Target	0.39	0.22	14.16	-0.13	2
	Midpoint	0.56	0.31	14.02	-0.13	3
	Endpoint	0.89	0.39	13.81	-0.12	6
Range +/- 10%	Target	0.46	0.38	13.62	-0.13	1
	Midpoint	1.20	1.03	13.54	-0.08	2
	Endpoint	0.76	0.34	13.24	-0.13	5
Calendar	Monthly	0.13	-2.75	14.24	-0.34	36
	Quarterly	0.37	-0.54	14.22	-0.19	12
	Semiannual¹²	0.69	0.28	13.87	-0.13	6

Figure 15 is based on a hypothetical 60% MSCI ACWI / 40% Bloomberg US Aggregate portfolio measured from January 2007 through December 2009. Transaction costs are assumed to equal 25 basis points of the amount rebalanced and are reflected in the cost-adjusted return and Sharpe ratio calculations. The number of rebalancing actions represents the total number of rebalance events during the measurement period. See footnote 3 for important information about hypothetical performance.

Appendix: Adding Momentum Signals to Range- Based Rebalancing

Without crossing over into discretionary tactical asset allocation, some investors have looked for ways to enhance their rebalancing strategies by incorporating rules-based approaches that might produce superior risk-adjusted results relative to traditional rebalancing methods.

One such approach uses momentum signals to complement a range-based strategy. The idea is that if an asset is experiencing positive momentum and has moved outside its target range, the investor lets the winner run, either by not rebalancing the allocation or by rebalancing only to the endpoint of the range. If the asset is not experiencing positive momentum at the moment of review, the investor rebalances back to target.

Figure 16 shows the results of adding a momentum tilt to the 5% range-based strategies reviewed earlier. For simplicity, we applied a flat fee of 2 basis points in every month that required rebalancing, to account for transaction and commission costs.

Figure 16
Impact of Combining Momentum Signal with Range Rebalancing

Rebalancing Range	Rebalancing Point	Annualized Return (%)	Cost-Adjusted Annualized Return (%)	Standard Deviation (%)	Cost-Adjusted Sharpe Ratio	Number of Rebalancing Actions
	Target	9.09	9.08	9.76	0.48	23
Range +/- 5%	Midpoint	9.14	9.12	9.80	0.48	31
	Endpoint	9.17	9.11	9.91	0.47	118
Momentum & Range +/- 5%	Varies	9.16	9.09	9.89	0.47	104
Buy-and-Hold	N/A	9.35	9.35	11.35	0.43	0

Based on the same hypothetical 60% MSCI ACWI / 40% Bloomberg US Aggregate portfolio measured from January 1979 through May 2026. MSCI ACWI backfilled with MSCI World prior to 1988. In this example, momentum is based on a 12-month moving average signal. An asset was considered to exhibit positive momentum when its current price exceeded its 12-month trailing moving average, excluding the most recent month. See footnote 3 for important information about hypothetical performance.

Returns and volatility were broadly comparable to those of the traditional range-based approaches. While the results do not indicate a clear benefit from this particular momentum enhancement, investors may still find other rules-based modifications worth considering, depending on their objectives and risk tolerance.¹³

This exercise does not imply that rules-based enhancements to rebalancing policies are inefficient. Sophisticated investors may be able to design policies that reduce risk or modestly augment returns through approaches such as momentum. We would caution, however, that realizing those benefits can prove difficult once transaction costs and other market frictions are taken into account. Investors considering rules-based enhancements may find it worthwhile to conduct their own preliminary research into best practices.

End Notes

- ¹ See Henriksson, Roy D., "Market Timing and Mutual Fund Performance: An Empirical Investigation," *Journal of Business*, Vol. 57, No. 1, 1984; Asness, Cliff, Antti Ilmanen, and Thomas Maloney, "Market Timing: Sin a Little—Resolving the Valuation Timing Puzzle," *Journal of Investment Management*, Vol. 15, No. 3, 2017; Arnott, Amy C., "Why Tactical-Allocation Funds Failed—Again," *Morningstar*, February 4, 2025.
- ² See Dai, Wei, and Audrey Dong, "We Found 30 Timing Strategies that 'Worked'—and 690 that Didn't," *Dimensional Fund Advisors*, October 31, 2023.
- ³ Many institutional investment decisions require review and approval by a committee or board of trustees. The time required to evaluate information, build consensus, and authorize portfolio changes can make it difficult to respond quickly to changing market conditions. Hence some investors delegate this decision to their investment staff or a third party (e.g., an OCIO).
- ⁴ A risk budget sets a "budget" for a portfolio's overall level of risk (usually measured as volatility) that the investor tries to stay within.
- ⁵ Behavioral finance research has found that investors often make suboptimal decisions during periods of market stress or euphoria. A predetermined rebalancing policy can help reduce the influence of those behavioral biases on portfolio decisions. Sources: Vanguard, *Getting Back on Track: A Guide to Smart Rebalancing*, 2022; Myers, Brett W., Ryan Whitby, and Jason Hsu, "Timing Poorly: A Guide to Generating Poor Returns While Investing in Successful Strategies," *Journal of Portfolio Management*, Vol. 42, No. 2, 2016; Morningstar, "The More Investors Traded, the Worse They Performed," August 18, 2025.
- ⁶ For simplicity, the analysis uses a two-asset portfolio. Institutional portfolios often include additional asset classes, such as private equity, real estate, infrastructure, credit, and cash, which may affect rebalancing outcomes.
- ⁷ Transaction costs are applied when rebalancing is required and are intended to illustrate the sensitivity of results to implementation costs. Actual costs will vary by asset class, vehicle, market environment, and trade size.
- ⁸ This is a simplifying characterization used to illustrate the point about aggregate exposure. Private equity has features that distinguish it from public equity, and the relationship between the two varies over time and by strategy, not least due to the lack of a mark-to-market mechanism for private markets.
- ⁹ Private market valuations are typically appraisal-based and reported quarterly, which tends to smooth and lag their reported returns relative to public markets.
- ¹⁰ Large investors with dedicated trading professionals may be able to implement a derivatives overlay themselves.
- ¹¹ Institutional equity trading costs increased from approximately 13 basis points in 2007 to roughly 30-35 basis points at the peak of the crisis, while institutionally sized corporate-bond trades incurred trading costs of approximately 31 basis points during the post-Lehman period. The Bloomberg US Aggregate Index also includes much more liquid sectors, such as US Treasuries and agency mortgage-backed securities. Taken together, this evidence supports the use of 25 basis points as a blended full crisis-period implementation-cost assumption for a diversified 60% MSCI ACWI / 40% Bloomberg US Aggregate portfolio. Sources: Anand, Amber, Paul Irvine, Andy Puckett, and Kumar Venkataraman, "Performance of Institutional Trading Desks: An Analysis of Persistence in Trading Costs," 2012; Dick-Nielsen, Jens, Peter Feldhütter, and David Lando, "Corporate Bond Liquidity Before and After the Onset of the Subprime Crisis," 2012; Bloomberg, Bloomberg US Aggregate Index, June 12, 2024.
- ¹² Note that the results for the annual rebalance vary by the month in which the rebalancing occurred. The table shows rebalancing during the month of December.
- ¹³ As discussed earlier, the unusually strong period for equities following the Global Financial Crisis influenced the relative performance of these strategies. Had the analysis ended approximately ten years earlier, the momentum-enhanced strategy would have outperformed buy-and-hold on a cost-adjusted basis by a margin comparable to buy-and-hold's advantage over the strategy in the full-sample analysis.

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