Insights
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Asset Rebalancing in the Time of COVID-19

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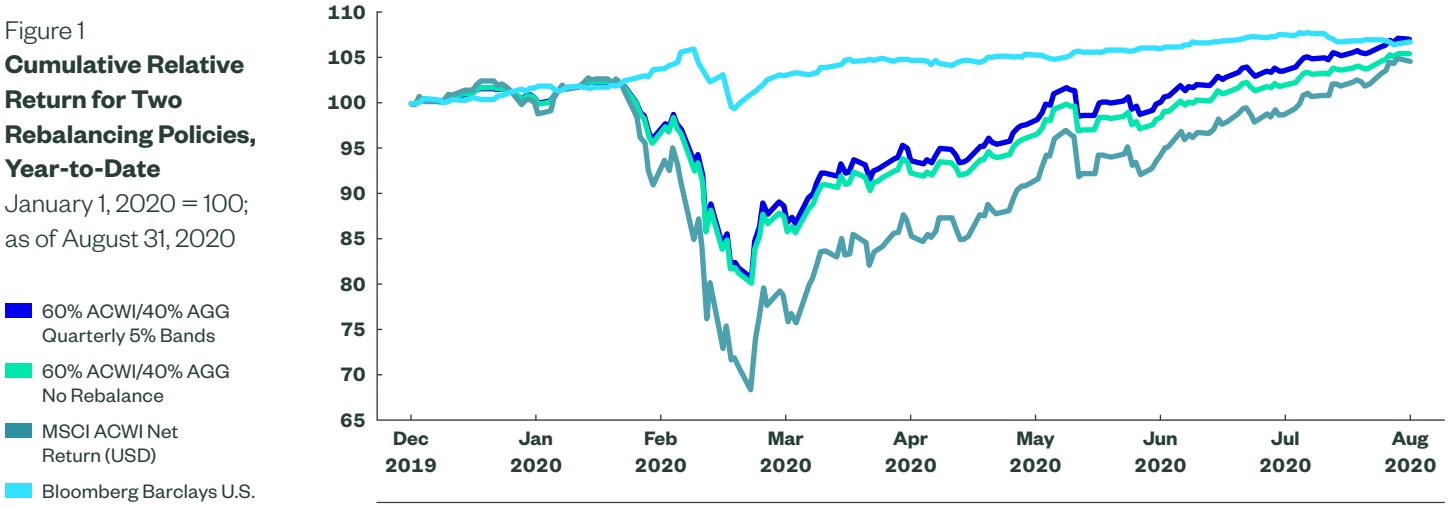
- The "right" rebalancing policy is likely to vary by investor return objectives, risk tolerance, sensitivity to turnover, and desire to manage implementation complexity.
- Our research suggests that regular portfolio rebalancing is additive compared to a buy-and-hold strategy, and generates modest excess return while controlling active risk relative to a strategic benchmark.

Investors spend a considerable amount of time determining the appropriate asset allocation weights to apply to their portfolios, including consideration of risk tolerances. The purpose of having a rebalancing policy is to recapture the portfolio's intended asset allocation after a period of market movement and prevent a potentially undesirable outcome if no action is taken. Rebalancing is not done necessarily to maximize returns, but rather to produce a risk-return outcome that aligns with an investor's long-term investment goals. There are a wide variety of rebalancing policies employed by investors, ranging from simple and straightforward calendar-based approaches to more complex methodologies based on market timing indicators. Throughout this piece we will examine some of the most common rebalancing policies and evaluate their impact on portfolio performance, various risk parameters, and turnover.

Extreme Volatility Challenges Asset Allocation Policies

As 2020 began, volatility in the capital markets had started to creep up off lows, but not enough to cause a significant disruption to investors' asset allocation policies. All that changed in the first half of 2020, as equity markets plummeted more than 30% by March 23, 2020, only to rebound sharply, gaining more than 35% over the following five months. This resulted in a wide disparity between an investor's actual asset allocation and their benchmark investment policy allocation, exposing them to significant risk. For times like these, investors typically rely on an established rebalancing policy (as part of their investment guidelines) to maintain a reasonable adherence to their strategic benchmark and minimize the negative impact should markets abruptly reverse course.

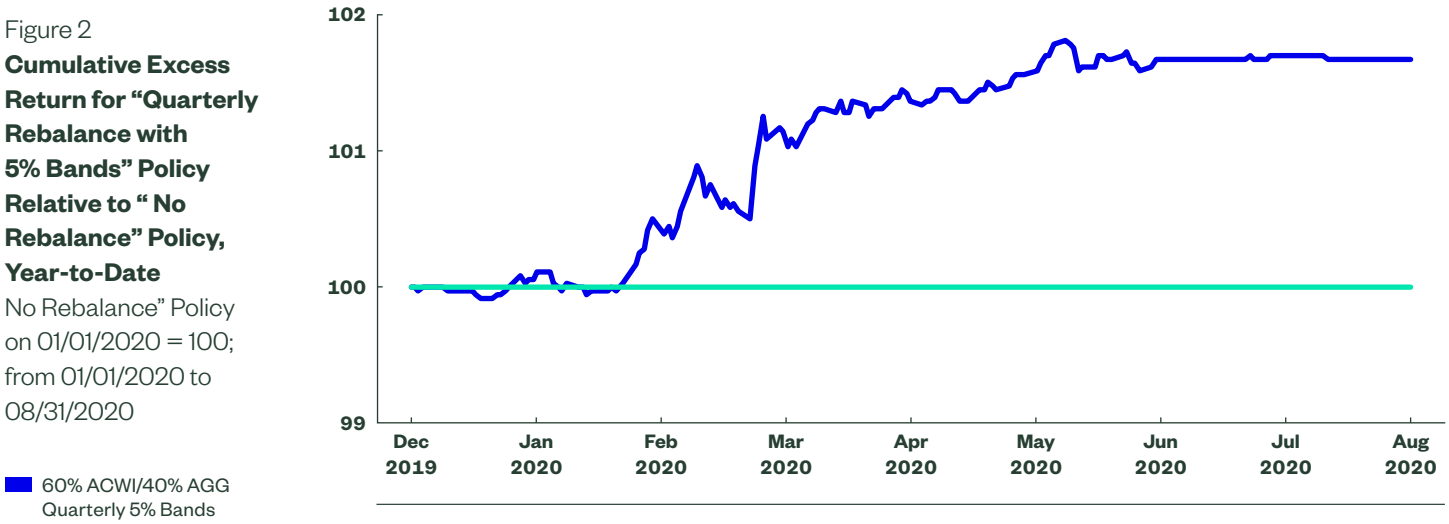
Figure 1
Cumulative Relative Return for Two Rebalancing Policies, Year-to-Date
January 1, 2020 = 100; as of August 31, 2020



Source: State Street Global Advisors and FactSet.
Past performance is not a reliable indicator of future performance. Index returns do not reflect the deduction of any fees or expenses. Returns do not represent those of a fund and were achieved by mathematically combining the actual index performance data of the MSCI ACWI Net Returns (USD) and Bloomberg Barclays U.S. Aggregate Bond Index (USD). The performance assumes no transaction and rebalancing costs, so actual results may differ.

An investor with a simple 60/40[1] balanced allocation who did not employ a rebalancing policy and chose a buy-and-hold approach in 2020 would have experienced a return of 5.51% for the first eight months of 2020. See Figure 1. But that investor's equity allocation percentage would have ranged from close to 64%[2] on January 1, 2020 to a low below 55% on March 23, 2020 and then back to over 63% by August 31, 2020. However, if a quarterly rebalancing policy with bands around the benchmark allocation weights had been employed, the return would have been 7.20%, with lower variability of the range of the weights and a positive contribution relative to the "no rebalance" policy from being overweight equities during the second quarter rally. This investor benefitted from what is known as the rebalancing premium,[3] which is a direct result of allocating from an asset that has appreciated on a relative basis to one that has declined and gaining from a reversal of the returns for one or more of those assets. The amount of the premium is dependent on both the correlation and the volatility of the assets being rebalanced.

Figure 2
Cumulative Excess Return for "Quarterly Rebalance with 5% Bands" Policy Relative to " No Rebalance" Policy, Year-to-Date
No Rebalance" Policy on 01/01/2020 = 100; from 01/01/2020 to 08/31/2020



Source: State Street Global Advisors and FactSet.
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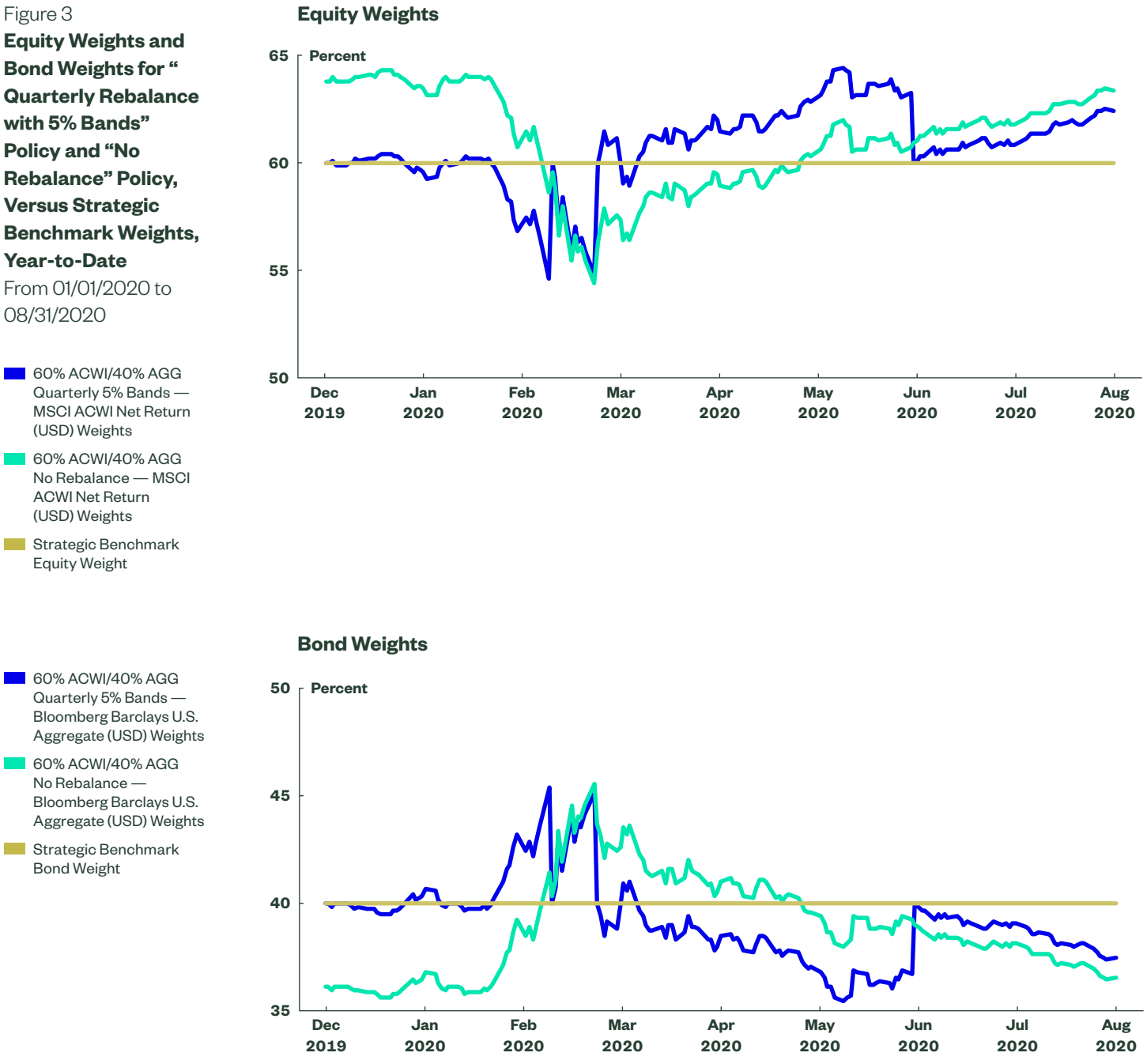
Figure 3

Equity Weights and Bond Weights for " Quarterly Rebalance with 5% Bands" Policy and "No Rebalance" Policy, Versus Strategic Benchmark Weights, Year-to-Date

From 01/01/2020 to 08/31/2020



Source: State Street Global Advisors and FactSet.
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Rebalancing Policy Impact on Performance

For this paper, using the 60/40 balanced allocation, we looked at a number of rebalancing policies[4] over a nearly 20-year period and made some observations on performance returns, risk statistics, and turnover related to each. See Figures 4 and 5.

No rebalancing, or letting allocations drift along with market movements, resulted in a risk-return of 0.64, as measured by efficiency ratio,[5] a compounded annual return of 5.34%, and a tracking error of close to 145 bps annually relative to a monthly rebalanced benchmark made up of the same underlying indexes. Our analysis suggests that regular portfolio rebalancing is additive compared to a buy-and-hold strategy, and generated modest excess return while controlling active risk relative to a strategic benchmark.

Calendar-Based

Annual rebalancing policies generated a risk-return of 0.66 with a compounded annual return of 5.88% and tracking error of 82 bps annually. For the period analyzed, annual rebalancing produced the highest efficiency ratio of the calendar-based approaches, but this came at the expense of heightened tracking error, which was more than double the tracking error of the next closest calendar rebalancing policy.

In between those two policy types were the performances of quarterly rebalancing and monthly rebalancing. It is interesting to note that the efficiency ratio varied modestly across all policies, and the tracking error was reduced steadily as the frequency approached the strategic benchmark monthly rebalancing policy. Frequent rebalancing increased volatility and minimized tracking error.

However, the maximum drawdown occurred with monthly rebalancing, as the reset of the weights increases exposure to that declining asset and increases the drawdown when experienced over multiple periods. This effect is reversed in the subsequent rally, and monthly rebalancing will have the quickest recovery. Monthly rebalancing also limits the upside opportunity during an extended rally compared to less frequent rebalancing policies for the very same reasons, and experiences the same benefit when that trend reverses.

Bands

Another type of rebalancing policy uses threshold levels by applying bands around the benchmark weights and only rebalancing when the threshold is exceeded. This type of approach offers a reasonable balance between risk control and turnover. And so, taking a different tack and using bands of +/-5% with annual rebalancing, the compounded annual return increased to 5.88% with a tracking error of 36 bps annually. The maximum drawdown increased as it did for some of the calendar policies, driven by the rebalancing due to the bands being exceeded.

Figure 4

Historical and Forward-Looking Performance for Various Rebalancing Policies: Return, Risk, and Other Statistics

From 01/04/2001 to 08/31/2020

Historical	# of Rebalances	Compounded Annual Return (%)	Annualized Standard Deviation (%)	Efficiency Ratio	Annualized Tracking Error (%)	Maximum Drawdown (%)	Average Annualized Turnover (%)
Calendar							
No Rebalance	0	5.34	8.34	0.640	1.43	-34.49	–
Monthly	235	5.67	9.28	0.612	–	-38.64	10.28
Quarterly	77	5.82	9.14	0.637	0.37	-37.96	6.88
Annually	19	5.88	8.86	0.663	0.82	-36.31	3.72
Regime-Based	27	5.75	8.80	0.654	1.13	-33.36	3.58
Regime-Based Modified	75	5.65	9.06	0.624	0.64	-36.67	6.16
+/- 5% Bands*							
No Rebalance	16	5.79	9.45	0.612	0.38	-38.09	4.20
Quarterly	87	5.88	9.33	0.631	0.30	-37.83	7.99
Annually	34	5.88	9.37	0.627	0.36	-37.82	5.88
Regime-Based	39	5.82	9.37	0.621	0.35	-38.00	5.50
Forward Looking							
60/40 Balanced							
No Rebalance	0	4.32	10.14	0.426	2.18	-25.64	–
Monthly	233	3.83	8.76	0.437	–	-22.35	10.49
Quarterly	77	3.84	8.74	0.439	0.19	-22.32	6.03
Annually	19	3.87	8.81	0.439	0.44	-22.29	3.02
60/40 Diversified Balanced							
No Rebalance	0	4.79	9.35	0.512	2.44	-22.17	–
Monthly	233	4.24	8.13	0.522	–	-19.32	13.96
Quarterly	77	4.27	8.09	0.528	0.20	-19.35	8.03
Annually	19	4.30	8.15	0.528	0.47	-19.28	4.01

* Monthly frequency for +/- 5% Bands has been omitted since the bands were never exceeded in any month during the period, and the results are the same as Calendar Monthly.

Source: State Street Global Advisors and FactSet.

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Market Regime Indicator (MRI)

When a market timing regime indicator, such as State Street's MRI model,[6] is used as the driver of the rebalancing policy, performance is similar to that of annual rebalancing with respect to risk-return, but with a slightly lower compound annual return and higher tracking error of nearly 115 bps annualized. However, the maximum drawdown and turnover are less than all other policies.

A modified version of the MRI rebalancing policy, where the portfolio is only rebalanced half-way back during High Risk Aversion and Low Risk Aversion regimes, and fully back to benchmark weights when entering Crisis and Euphoria regimes, produced a lower return, but with tracking error and maximum drawdown similar to the longer calendar year rebalance policies. The addition of the MRI model introduces a level of complexity above calendar-based and threshold level policies, and would require additional coordination with the model results.

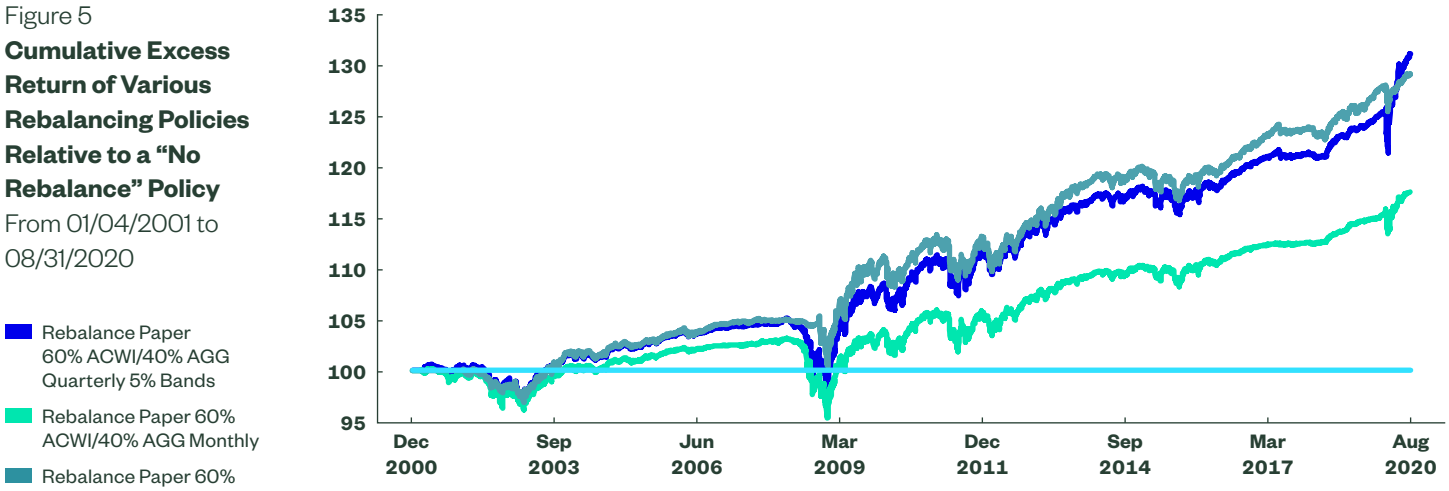
Finally, looking at a combination of rebalancing policies mentioned above, we observed similar outcomes across quarterly and annual policies with bands of +/- 5%. The inclusion of the MRI with bands did not make a meaningful difference to the outcome over the period analyzed, but may appeal to investors wanting to take a more tactical approach to rebalancing based on investor sentiment, or who want to avoid historically crowded rebalancing periods such as month or quarter end.

For comparison to our historical findings, we examined the same rebalancing strategies using simulated returns generated by a proprietary Portfolio Policy Simulator (PPS) tool[7] that leverages our long-term forecasts for return, risk, and correlation. See Figure 4. For this exercise we simulated data for the 60/40 balanced allocation, as well as for a more diversified portfolio[8] that might more closely resemble an investor's strategic asset allocation. Using our forward-looking asset class views that are not time-period specific confirmed improved efficiency ratio results, even if the returns were slightly lower. Both historical data and simulated returns reveal that each of these rebalancing policies outperforms a buy-and-hold strategy that never rebalances. This suggests that pursuing *any* of these policies is likely to lead to better outcomes than doing nothing. There are real world events, both positive and negative, that distort asset returns from their long-term averages, such as the global pandemic, that are not captured in the model and appear to have a more severe impact in the historical data than the model simulations.

All-Weather Policies

Looking at how various rebalancing policies have historically performed, it is important to recognize that some will come out on top during certain market environments and lag in others. See Figure 5. The focus should be to find a rebalancing policy that is all-weather and closely aligned with the goals of the investor. Adherence to a structured formal policy eliminates ad hoc decisions and removes the emotional decision and fear of selling your winners and buying back your losers. During the period analyzed, there was a persistent bias toward rising or positively trending equity and bond markets, with moments of significant dislocation, such as the Tech Bubble of 2001, Great Recession of 2008/2009, and the more recent global pandemic of 2020.

Figure 5
Cumulative Excess Return of Various Rebalancing Policies Relative to a "No Rebalance" Policy
From 01/04/2001 to 08/31/2020



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It should not come as a surprise that over the full timeframe the rebalancing policies with the fewest number of rebalances would have done better than those that reset more frequently. However, in higher-volatility periods, policies that rebalance more frequently typically prevail. It is also important to remember that rebalancing is not a costless event. Higher frequency leads to turnover and higher transaction costs, reduced returns and risk benefits, and even tax implications for certain types of portfolios. The use of cash flows to aid in rebalancing, especially closer to the trigger date or level, can potentially help.

Closing

There is no optimal rebalancing policy, but history has shown the importance of having an established policy in place. The "right" rebalancing policy is likely to vary by investor return objectives, risk tolerance, sensitivity to turnover, and desire to manage implementation complexity. A broadly diversified portfolio stands to reap many of the desired benefits discussed from a quarterly rebalancing frequency with bands to provide guardrails during the period. This allows investors to participate and potentially capitalize on market trends over the three-month period, maintain a modest risk profile, limit tracking error and drawdown relative to a benchmark asset allocation with monthly rebalancing, and control costs via lower turnover.

Appendix

Overview of Representative Rebalancing Policy Strategies

Rebalancing Policy Strategy

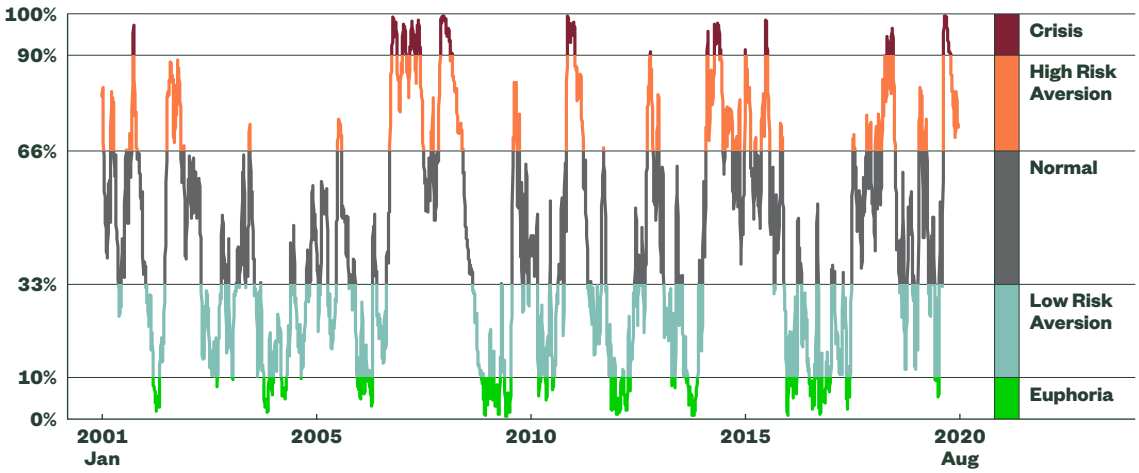
	Rebalance Trigger	Key Principles	Pros	Cons
Calendar-based	Set to specific calendar dates; monthly, quarterly, semi-annually, annually	Time dependent, with weight variance from benchmark not considered	Ease of implementation, risk control, and known turnover	Ignores asset weight intra period, may trade more frequently, deeper drawdown, higher turnover
Threshold-based	Asset weight deviates from its target by a pre-determined amount; +/- 5%.	Relative weight to the benchmark deters rebalancing, not frequency	Provides a balance between risk control, tracking error, and turnover	Daily monitoring with modest degree of complexity, deeper drawdown,medium tracking error, higher tunover
Regime-based	Regime Indicator moves into a level that dictaes a change in weights; Euphoria, Low Risk, High Risk, Crisis	Regime dependent, with no time or realative weight to benchmark considered	Forward looking sentiment indicators to drive implementation, potentially avoid crowded rebalance periods	Daily indicator signal and monitoring with high degree of complexity, higher tracking error
Combination	Dependent on rebalancing policy strategies included	Combine aspects of more than one rebalancing policy strategy	Benefits from multiple reabalancing strategies	Daily monitoring with medium to higher degree of complexity, may incur higher turnover

Source: State Street Global Advisors as of 08/31/2020.

State Street Global Advisors Market Regime Indicator (MRI)

The MRI represents a proprietary multi-asset class model designed to characterize risk appetites with the global capital markets. It is a quantitative framework that attempts to identify the current market risk environment based on forward- looking market indicators. The factors used included equity implied volatility, bond spreads, and currency pairs implied volatility and bond spreads. These are good indicators of the current risk environment as they are responsive to real- time market impacts and in theory should include all current and forward views of those markets. These factors are combined to create a single measure and used to identify one of five risk regimes: Euphoria, Low Risk, Normal, High Risk, and Crisis.

Figure 6
Market Regime



Source: State Street Global Advisors ISG, as of August 31, 2020. The data displayed is not indicative of the past or future performance of any State Street Global Advisors product. The portion of results through 31 March 2011 represents a back-test of the MRI model, which means that those results were achieved by means of the retroactive application of the model which was developed with the benefit of hindsight. Data displayed beyond this date is not back-tested, but is still generated by the model referenced. All data shown above does not represent the results of actual trading, and in fact, actual results could differ substantially, and there is the potential for loss as well as profit. The Market Regime Indicator (MRI) is a quantitative framework that attempts to identify the current market risk environment based on forward-looking market indicators. We believe the factors used, equity implied volatility, currency pairs implied volatility and bond spreads, are good indicators of the current risk environment as they are responsive to real-time market impacts and in theory should include all current and forward views of those markets. These factors are combined to create a single measure and used to identify one of five risk regimes: Euphoria, Low Risk, Normal, High Risk, and Crisis. A slight calculation change was made as of 28 June 2019.

Endnotes

1 The 60/40 balanced asset allocation is constructed with 60% MSCI ACWI Net (USD) and 40% Bloomberg Barclays U.S. Aggregate Bond index.

2 The 60/40 balanced asset allocation with no rebalancing policy began 2020 with an equity weighting of 63.87% and bond weighting of 37.13% based on the period covered of 01/3/2001 to 08/31/2020.

3 "Rebalancing premium" refers to the additional return that long-term investors achieve through periodic rebalancing compared with a buy-and-hold approach.

4 See Appendix.

5 A measure of risk-adjusted returns, efficiency ratio is the compounded annual return per annualized standard deviation. Standard deviation is a measure of the return fluctuations of an asset or portfolio.

6 See Appendix.

7 Portfolio Policy Simulator tool is a collaboration between State Street Global Advisors and MIT research teams and was developed to simulate portfolio rebalancing effects.

8 31% S&P 500 Index, 5% Russell Small Cap Completeness Index, 18% MSCI EAFE Index, 6% MSCI Emerging Markets Index, 30% Bloomberg Barclays U.S. Aggregate Bond Index, 10% Bloomberg Barclays U.S. Very Liquid High Yield Index.

About State Street Global Advisors

Our clients are the world's governments, institutions and financial advisors. To help them achieve their financial goals we live our guiding principles each and every day:

- Start with rigour
- Build from breadth
- Invest as stewards
- Invent the future

For four decades, these principles have helped us be the quiet power in a tumultuous investing world. Helping millions of people secure their financial futures. This takes each of our employees in 28 offices around the world, and a firm-wide conviction that we can always do it better. As a result, we are the world's third-largest asset manager with US $3.05 trillion* under our care.

* This figure is presented as of 30 June 2020 and includes approximately $69.52 billion of assets with respect to SPDR products for which State Street Global Advisors Funds Distributors, LLC (SSGA FD) acts solely as the marketing agent. SSGA FD and State Street Global Advisors are affiliated.