Global Investment Committee | June 12, 2024

Active-Passive Framework 2.0: Sharpening Its Objectives and Streamlining Its Recommendations

This Special Report updates the version published on June 21, 2023. The original report was published on April 13, 2020.

Since the financial crisis, active managers, particularly in US large-cap equities, have largely struggled to deliver value over low-cost passive strategies. With this evidence as a backdrop, investors have increasingly shifted allocations to passive vehicles. For US equities, passive strategies' assets under management surpassed that of active strategies in August 2019, marking a key milestone for the investment management industry. Nonetheless, we seek an open-minded and opportunistic approach to determining weightings to active and passive strategies. As the Global Investment Committee has consistently relayed, each market environment and each asset class present unique circumstances for active-passive decisions. In March 2015, we introduced an Active-Passive Framework to provide strategy guidance.

Lisa Shalett
Chief Investment Officer
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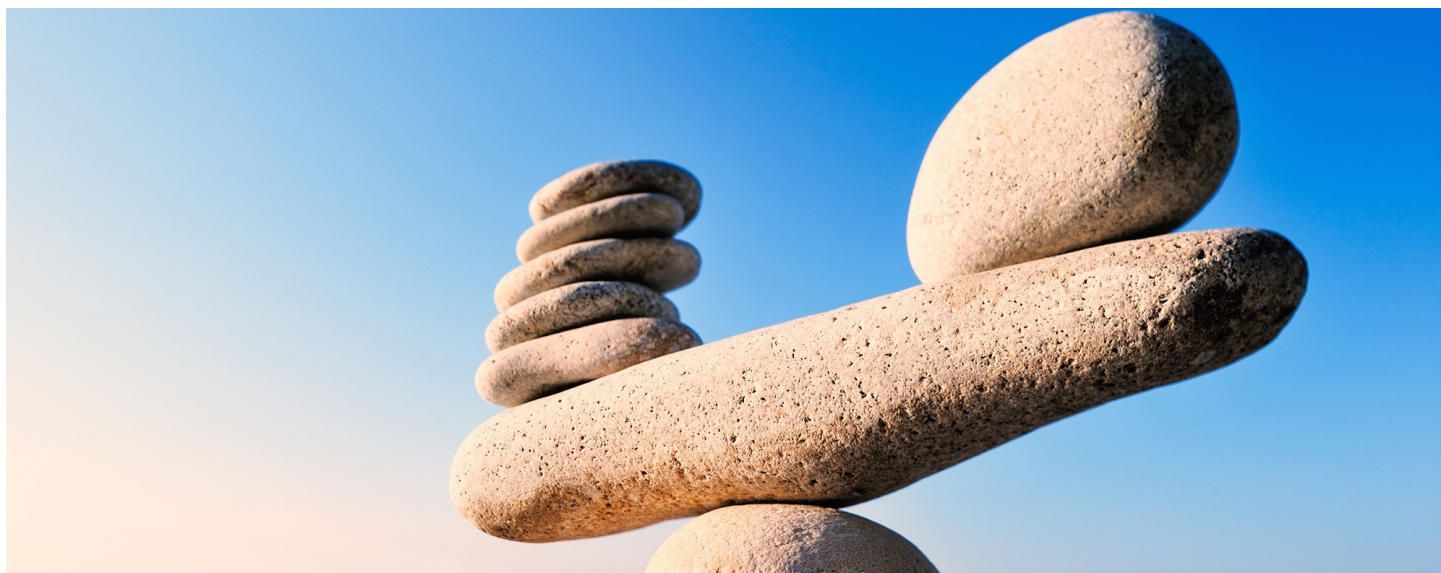**Daniel Hunt, CFA**
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In these pages, we introduce significant updates, tailored to sharpen the framework's objectives and streamline its recommendations, all while covering the breadth of asset classes that investors could include in well-diversified portfolios. Before addressing the question of "When and where is active good?" we first asked: "What is good active?" Building on our Manager Scoring tools, we developed a means of separating managers within each asset class into higher- and lower-quality halves and discovered that the higher-quality halves generated more attractive risk-adjusted returns. To build our active-passive signals, we studied the longer-term opportunities and shorter-term environments for these higher-quality active managers within each asset class. We combine these longer- and shorter-term views into a single recommendation, with the goal of reducing turnover in client portfolios. While useful as stand-alone signals, we also may apply them as part of the construction of a balanced portfolio. These opportunistic, asset class-specific signals have historically added absolute and risk-adjusted value over a static 50/50 allocation to active and passive strategies. Given the focus on higher-quality managers, this active-passive framework ties together closely with our qualitative and quantitative manager due-diligence efforts.

Active-Passive Decisions in a Holistic Portfolio Construction Process

We believe that a successful long-term investment strategy includes capitalizing on multiple opportunities. Beyond selecting and maintaining an appropriate asset allocation, investors may further benefit from the three elements of portfolio implementation: active-passive decisions, manager selection and portfolio construction. Exhibit 1 highlights the potential value-added from these drivers of portfolio returns.

In its March 2024 Annual Update to GIC Capital Market Assumptions, the GIC highlights that expected seven-year returns for major asset classes appear modest, below realized returns for the previous 14 years. This lower-return environment underscores the value of seeking to improve portfolio returns through each component of the investment process, including rigorous manager selection and thoughtful portfolio construction. To that end, we have developed and enhanced the firm's proprietary capabilities, in the form of analytical tools and frameworks, for delivering risk-adjusted value in constructing client portfolios.

As illustrated in Exhibit 1, the GIC recommends separating the decision of active-passive allocations from manager selection: First determine what mix of active and passive strategies for each asset class and then select the underlying investment strategies. These decisions involve distinct drivers. Consequently, from a modeling perspective, we believe that considering these components separately allows for more targeted treatment and potentially more useful advice.

Our historical analysis points out that, across many asset classes, neither active nor passive strategies are categorically better over time and across market environments. Moreover, active and passive strategies can complement one another at the portfolio level, and combining them may often lead to better outcomes versus an exclusively active or passive approach.

Furthermore, we have found that the relative attractiveness of active or passive strategies depends, in large part, on the investment environment. Based on our historical analysis, we recommend a dynamic, hybrid approach to investing in active and passive strategies.

Exhibit 1: A Holistic Investment Process Seeks Value From Each Driver of Portfolio Returns

Client Goal | **1 Asset Allocation** Strategic blend of assets seeks to align with client goals | **2 Active and Passive** The right mix of active and passive may optimize fees and may beat single-style strategies | **3 Manager Selection** Selectivity ensures managers meet our quality standards | **4 Portfolio Construction and Risk Management** Risk is managed efficiently by combining and weighting managers | **Benefits of Best Thinking** | **Client Goal**

Source: Morgan Stanley Wealth Management GIC

Exhibit 2: Quantitative Markers for Identifying Higher-Quality Active Managers

MARKER	CALCULATION	WHAT IT MEASURES
ACTIVE MANAGEMENT	$(1 - R^2)$, divided by tracking error	Discipline and consistency in active management
FEES-TO-TRACKING ERROR	Rolling expense ratios, divided by tracking error	Prospective hurdle to overcome, defining the minimum gross information ratio for achieving positive net alpha
PERFORMANCE IN ADVERSE PERIODS	Ranked performance in challenging periods for total returns	Demonstrated ability to handle tough setups for the underlying asset class
UP-DOWN CAPTURE	Percentage spread between the manager's beta-adjusted up and down capture figures	Consistency of excess returns

Source: Morgan Stanley Wealth Management Global Investment Office (GIO)

By hybrid, we prefer an approach that considers the complete opportunity set of potential allocations for each asset class—from completely passive to fully active, and everywhere in between—to identify the optimal combination for each asset class. The approach should also be dynamic, adjusting allocations over time in response to changing market conditions, while minimizing turnover. In order to implement this opportunistic approach to active-passive allocation, we recommend leveraging Morgan Stanley Wealth Management's portfolio construction capabilities, such as the Active-Passive Framework signals, published on *ChartBook*, and our monthly *Topics in Portfolio Construction* publication.

Choosing Between High-Quality Active or Passive

In our initial framework, we sought to identify the percentage of outperforming managers for the next 12 months. This analysis assumed that investors faced a single decision—active or passive—without discriminating at all among active managers. Our work on Manager Scoring underscores that, using quantitative markers, we may rank managers within each asset class by quality. Higher-quality managers have historically notched higher alpha, which measures value-added after considering benchmark-relative risk. Please see our "Risk Score" [special report](#) for more details.

Before tackling the question of when investors should consider active strategies, we therefore first wish to ask: "Which active strategies should we even consider as an alternative to passive strategies?" While naturally active managers become attractive when they are likely to outperform passive strategies, we may improve the odds of positive outcomes by first sharpening the focus on higher-quality active managers.

Leveraging our Manager Scoring tools, we separate managers into a top half and bottom half within each asset class. Using four equally weighted quantitative markers, we identify the top- and bottom-half managers as of each year end and then study those cohorts' forward-looking alpha generation by taking the median alpha for each subsequent month. Exhibit 2

details those quantitative markers, which we apply over a trailing three-year period:

By applying these four markers, we split managers into halves, based on their percentile-based scores as of any year-end. Exhibit 3 displays the cumulative alpha generation of those previously identified top- and bottom-half managers on an ex post basis, concentrating on the US large-cap value equity cohort. We find this notable split between the top- and bottom-half managers across each asset class that we have studied, underscoring the value of avoiding lower-quality managers and their unattractive alpha.

The resulting split in the active manager universe may help to sharpen the active-passive question by removing lower-quality managers from our decision-making purview. With the relentless decrease in expense ratios for passive strategies, properly considering the alternatives for this active-passive decision has become even more important. In each asset class, we find that the bottom-half managers have delivered much less attractive alpha generation. With Morgan Stanley Wealth Management's leading open-architecture platform—powered by the Global Investment Manager Analysis (GIMA) team's quantitative and qualitative due diligence and our Manager Scoring tools—we believe that investors' active-passive decisions involve a choice between higher-quality active managers or low-cost passive strategies. This updated Active-Passive Framework provides insights on this actionable, well-defined choice.

While managers' excess returns do clearly matter, we believe that success on that score depends heavily on their benchmark-relative risk, called beta. Within the four-part portfolio construction process described above, we recommend including beta levels as part of asset allocation rather than manager selection. That is, investors should consider where to take risk—and how much—independent of their manager selection decisions. Our Manager Scoring tools, including those deployed for this Active-Passive Framework, seek to identify higher-quality managers across the beta spectrum within each asset class. Practically speaking, we find that individual managers' betas tend to remain relatively consistent over time.

Exhibit 3: From Our Four-Metric Sorting System, the Top 50% of Managers Have Generated Greater and More Consistent Alpha Than the Bottom 50%
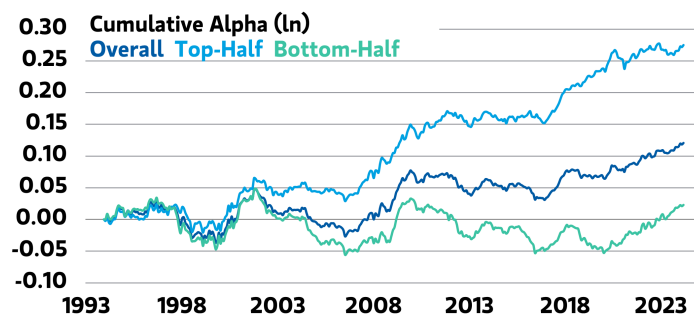
Source: Morningstar, Morgan Stanley Wealth Management GIO as of March 31, 2024

Streamlining Recommendations for More Asset Classes

In March 2015, we introduced a framework for making opportunistic tactical and strategic allocations among active and passive strategies, with tactical recommendations driven by market conditions. This framework provided guidance primarily for US equities' nine style boxes. In 2016, we rolled out an updated version with refinements to both the factors and methodology.

In the intervening time, we have received helpful feedback from Financial Advisors and our colleagues focused on building discretionary multimanager strategies for our clients. With this update, we are pleased to introduce several additional improvements, with the goal of streamlining, strengthening and broadening our recommendations. Altogether, we believe that this streamlined approach will allow Financial Advisors and our Firm-discretionary teams to maximize clients' risk-adjusted returns.

Manager Universe. Earlier, we discussed that investors may benefit from seeking out higher-quality active managers and avoiding their lower-quality counterparts. To that end, we concentrate our efforts in identifying favorable environments for only those managers that fall in the top half of each asset class's universe. In the section above, we detailed the Manager Scoring methodology for separating the manager universe into two halves. We therefore eliminate the cohort of apparently unattractive managers, which we have found to be less likely to deliver positive alpha.

Modeling Objective. In the initial version of the Framework, we set out to estimate the percentage of active managers that would outperform in the following 12-month period. We have adjusted the objective for this updated version by looking to determine whether the top-half managers in each asset class would generate alpha in the following one- to 12-month period. We observed that estimating the

forward-looking percentage of outperforming managers implicitly requires predicting index-level returns, which poses inherent difficulties. By considering alpha instead, we have reduced the framework's reliance on market calls, thereby allowing for more effective and targeted analysis on alpha itself.

Factor Mix. We have revamped our factor inputs in order to gather a wider set of signals. While we continue to study intramarket fundamentals, such as breadth and dispersion, we have expanded our focus to include intermarket, macro and technical factors. Importantly, our analysis suggests that trend-following indicators may help flag more or less favorable environments for alpha generation. These fundamental and technical factors follow economic intuition, do not overlap materially and have historically proved effective in predicting managers' alpha generation, especially when combined with other manager selection and due-diligence resources.

Factor Aggregation. In the previous construction, we used a multivariate regression model, fitting standardized factor values against the percentage of outperforming managers. This updated Framework does not involve regression. Instead, for the cycle-sensitive component (described below), it employs a dynamic weighting scheme that considers each factor's long- and short-term effectiveness, giving higher weights to those factors with demonstrated success in forecasting forward-looking alpha generation. We compute the cycle-sensitive component as a weighted average of the underlying factors' signals.

Recommendation Horizon. The previous version included recommendations on two time horizons: strategic and tactical. Based on feedback we have received, we have narrowed the Framework's published recommendations to a single horizon. To determine the signal for each asset class, we combine two intermediate signals: (1) a base component, which captures the longer-term efficacy of active managers; and (2) a cycle-sensitive component, which gauges active managers' likeliness of generating alpha over the next three to six months. Exhibit 4 (see page 5) presents the interplay between these components as well as the analogue in the previous version.

Lower Turnover. In addition to shifting to a single recommendation horizon, this updated version limits the implied turnover of those recommendations. To do so, we took care to establish an appropriate base component signal. The cycle-sensitive component pays attention to the strength of the underlying signals and responds more when conditions look particularly favorable or unfavorable for active managers. This approach allows us to express appropriate conviction where active managers are more likely to add value, while reducing unnecessary switching between active and passive strategies.

Exhibit 4: The Active-Passive Framework's Signal Components for Each Asset Class

OVERALL WEIGHT	=	BASE WEIGHT	±	CYCLE-SENSITIVE OVERLAY

	OVERALL WEIGHT	BASE WEIGHT	CYCLE-SENSITIVE OVERLAY
TIME HORIZON	Three to 12 months	Five to 10 years	Three to six months
DRIVER	Balancing the base weight and signals from the cycle-sensitive overlay	Intuitive review of historical alpha generation capabilities and underlying asset class's market efficiency	Intermediate-term fundamentals (intermarket, intramarket and macro) and technicals (momentum and other), tailored for each asset class's unique dynamics

Source: Morgan Stanley Wealth Management GIO

Broader Asset Class Coverage. Finally, we expanded our recommendations to cover 27 asset classes across equities, fixed income and alternatives, more than doubling our previous coverage. As a result, each asset class in the GIC's models and our Firm-discretionary portfolios now have tailored active-passive recommendations.

Base Component: Gauging Long-Term Alpha Generation

As introduced above, this methodology computes an active-passive signal for each asset class by adding together a base component and a cycle-sensitive component. The base component anchors our opportunistic active-passive approach, providing the pivot around which to incorporate the short-term insights from the cycle-sensitive component.

The base component emerges from our views on the prospective opportunity set for active managers in each asset class. To assess this opportunity set for each asset class, we reviewed top-half managers' historical alpha generation, both in terms of the level and consistency thereof.

Each asset class provides a unique opportunity set, defined by its market efficiency and the breadth of its underlying securities. By efficiency, we refer to the degree to which analysts and portfolio managers can scope out the fundamentals behind underlying constituents. As an example, the US large-cap equity universe is typically considered one of the most efficient markets, given the depth of analyst coverage and the widespread attention paid to its underlying

securities. Breadth speaks to the degree to which the asset class features a higher number of less closely related securities. Asset classes with securities domiciled in multiple countries often feature greater breadth, given economic and governance diversity.

Active managers generate alpha by deviating from benchmark exposures and effectively constructing portfolios, with the goal of achieving positive risk-adjusted returns. We believe that less efficient markets and greater breadth both support active managers in their pursuit of alpha, as skillful managers can excel by taking positions in uncorrelated securities in which they have developed an informational edge. These considerations follow Richard Grinold and Roland Kahn's insight that active managers generate alpha from the combination of investment skill and freedom to exercise that skill.[1]

This base component forms the benchmark for active allocations for each asset class. We recommend higher active allocations for asset classes where higher-quality managers have historically delivered greater amounts and greater consistency of alpha and lower weights in asset classes that fall short on those measures. We also incorporate the typical investor allocation and spread between active and passive strategies' fees for each asset class as practical considerations. Based on these considerations, we assign five potential base component weights: 0%, 25%, 50%, 75% and 100%. Please review Exhibit 5 (see page 6) for the rationale and outcomes for several major asset classes.

Exhibit 5: Base Component Inputs for Several Major Asset Classes

| | | | | DETERMINANTS FOR BASE COMPONENT | | | FEES (ANN. %, EST.) | |
| | | | | DETERMINANTS FOR BASE | | | | |
ASSET CLASS	SECTOR	SUBSECTOR	BASE COMPONENT (%)	TYPICAL ALLOCATION	ALPHA LEVEL	ALPHA CONSISTENCY	ACTIVE	PASSIVE
ALTERNATIVES	REAL ASSETS	REAL ESTATE AND REITS, GLOBAL	50	Small	Medium	Medium	0.75	0.25
EQUITIES	GLOBAL	CORE	100	Small	High	High	0.60	0.30
EQUITIES	US LARGE-CAP	CORE	25	Large	Low	Low	0.50	0.15
EQUITIES	US MID-CAP	CORE	25	Small	Low	Low	0.60	0.15
EQUITIES	US SMALL-CAP	CORE	100	Small	High	High	0.60	0.15
EQUITIES	INTERNATIONAL	CORE	50	Large	Medium	Medium	0.60	0.15
EQUITIES	EMERGING AND FRONTIER MKTS.	CORE	75	Small	High	Medium	0.80	0.30
FIXED-INCOME	US TAXABLE	CORE	75	Large	High	Medium	0.35	0.10
FIXED-INCOME	US TAX-EXEMPT	INTERMEDIATE-TERM	0	Medium	Negative	Low	0.35	0.10
FIXED-INCOME	HIGH YIELD	US TAXABLE	75	Small	Medium	High	0.60	0.40

Source: Morningstar, Morgan Stanley Wealth Management GIO as of March 31, 2024

For US large-cap core equity, we selected 25% as its base component. US large-cap equities feature a high degree of efficiency and low degree of dispersion and internal diversification. As a result, managers face a challenging, competitive environment for alpha generation. Historically, overall alpha generation has been low and inconsistent. Our analysis has suggested that active managers typically add value during periods when the benchmark index performs poorly, which tends to correspond to increasing breadth and a positive trend in the number of outperforming securities, rewarding careful security selection.

As a second example, we assigned 75% as the base component for US taxable core fixed income. We based this assignment on a review of the higher-quality managers' historical alpha generation and the characteristics of the underlying securities. Over time, higher-quality managers have delivered a sizable amount of alpha relative to the asset class's volatility, although that alpha has lacked steady consistency. The underlying opportunity set—primarily investment grade fixed income, with small allocations to high yield, emerging market and structured credit securities—provides a relatively less efficient and more fragmented universe from which to select securities. Managers typically retain latitude in choosing duration, spread and sector positioning.

Nevertheless, the historical pattern suggests that managers' alpha depends heavily on high yield credit's relative performance. As a result, managers' alpha generation has come in spurts, with some noteworthy drawdowns.

Processing Cycle-Sensitive Inputs

In addition to the base component, the Active-Passive Framework includes a cycle-sensitive overlay. For each asset class, we seek to identify environments that may prove more or less favorable for alpha generation. As introduced above, we have expanded the pool of cycle-sensitive indicators for this updated Framework, now including a greater number of fundamental and technical signals.

We leverage techniques similar to our Dynamic Allocation Framework, introduced in an earlier special report. Rather than considering attractive environments for asset class returns, however, the Active-Passive Framework concentrates on whether or not the environment sets up well for high-quality active managers.

As a starting point, we considered the relationships between macro and market conditions and the subsequent impact on alpha generation. The initial Framework already incorporated key insights on markers of favorable periods for active equity managers: lower correlations; greater market breadth; greater dispersion in equity valuations and forecasted returns; greater returns dispersion; greater recent success for active managers; and a softening economy, as measured through the yield curve. We then expanded our search to consider additional fundamental indicators (intermarket, intramarket and macroeconomic) and technical indicators, including momentum signals and others. Overall, the indicator roster

increased from approximately 10 to 50 for each asset class. Please refer to the appendix (see page 11) for a complete list of our cycle-sensitive indicators.

For the cycle-sensitive indicators, the Framework interprets each relationship into continuous favorable-unfavorable signals, ranging from +100% (highly favorable) to −100% (highly unfavorable). To calculate the rolling signals, we compute either the level or momentum for a given indicator and translate the current value into a corresponding signal between +100% and −100%.[2] Certain technical factors, such as various price momentum or mean-reversion indicators, have prescribed interpretations. This process ensures that, on an ongoing and updated basis, the resulting signals move higher or lower depending on the perceived strength or weakness in the supporting data. In Exhibit 6 below, we display the signals for a single underlying indicator for US large-cap growth equity: pairwise correlations. This indicator follows the logic that lower pairwise correlations offer a more favorable backdrop for stock selection, while higher correlations remove that tailwind.

Exhibit 6: Changes in Pairwise Correlations Provide Useful Cycle-Sensitive Signals for US Large-Cap Growth Managers' Alpha Opportunity Set
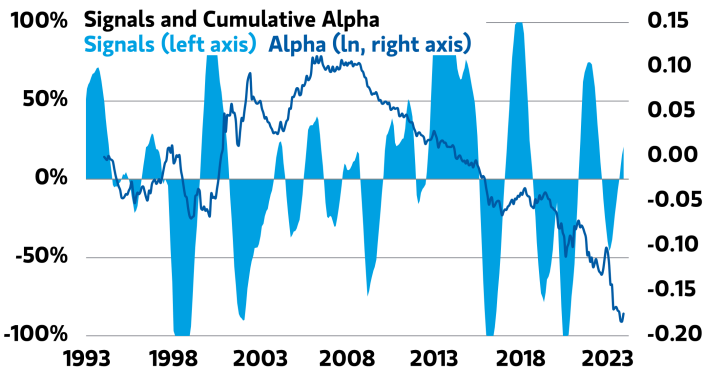
Source: FactSet, Morningstar, Morgan Stanley Wealth Management GIO as of March 31, 2024

Exhibit 7: By Combining the Underlying Cycle-Sensitive Indicators, We May Compute Aggregate Cycle-Sensitive Signals for US Large-Cap Growth Equity
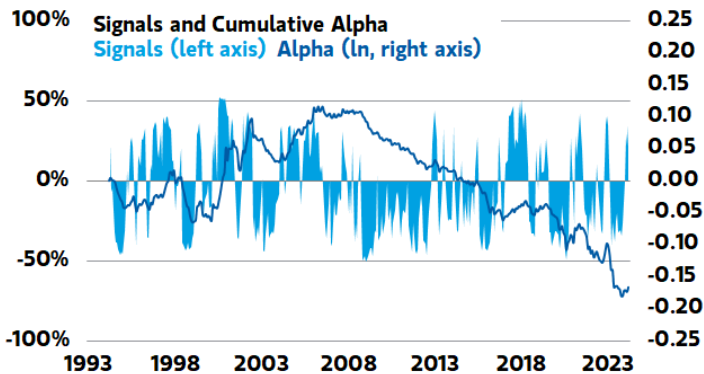
Source: FactSet, Morningstar, Morgan Stanley Wealth Management GIO as of March 31, 2024

After gathering the signals from the underlying indicators, we compute an aggregate signal. The aggregate indicator encapsulates the "weight of the evidence" for each asset class. These asset class-level signals, like the underlying factors that feed into them, will range between +100% (highly favorable) to −100% (highly unfavorable), moving higher or lower depending on the perceived strength or weakness in the supporting data.
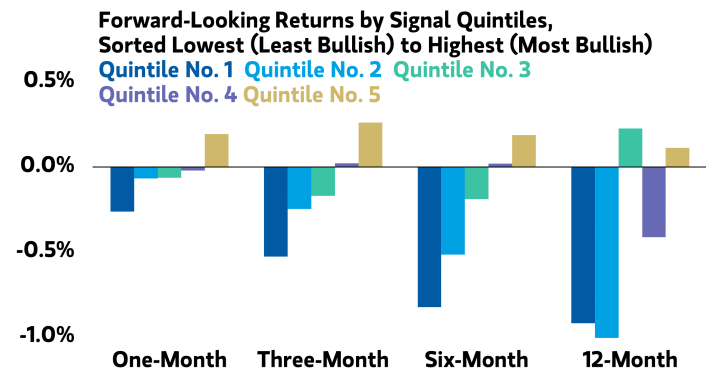
Since we consider each factor individually, we may judge their ongoing efficacy based on how well they are assessing asset class performance over a market cycle. Our dynamic weighting methodology overweights the signals from more impactful factors and underweights those from less effective factors.[3] We believe that this approach allows the Framework to focus on the most salient factors in today's environment to drive the asset class-level conclusions. We display the rolling aggregate cycle-sensitive signals for US large-cap growth equity in Exhibit 7 above.

We may then assess the effectiveness of these asset class-level conclusions from the forward-looking alpha after receiving different levels of signals, sorted into quintiles. We summarize this effectiveness for US large-cap growth equity in Exhibit 8 below. Across multiple asset classes and time horizons, we find that the greatest informational value lies in the highest and lowest quintiles, which informs how we deploy the cycle-sensitive overlay for our overall active-passive signals, discussed below.

Combining Base and Cycle-Sensitive Components for Each Asset Class

For each asset class, we compute a single active-passive recommendation by modifying the base component with the cycle-sensitive component's overlay recommendation. We determine the cycle-sensitive component's recommended overlay by considering the raw signal's percentile relative to its own history. As shown in Exhibit 9 below, we interpret the signal percentile by its quintile and then look up the resulting overlay. In this example, with the cycle-sensitive signal in the 92nd percentile, we find a recommended cycle-sensitive overlay of 15%. Combined with the 50% base component, we obtain an overall signal of 65%. Exhibit 10 provides the current overall signals, along with the base and cycle-sensitive components, for several major asset classes.

Exhibit 8: The Cycle-Sensitive Signals Have Historically Provided Meaningful Insights on More and Less Attractive Environments for US Large-Cap Growth Equity's Alpha Opportunity Set

Forward-Looking Returns by Signal Quintiles, Sorted Lowest (Least Bullish) to Highest (Most Bullish)
Quintile No. 1 Quintile No. 2 Quintile No. 3 Quintile No. 4 Quintile No. 5

Source: FactSet, Morningstar, Morgan Stanley Wealth Management GIO as of March 31, 2024

Exhibit 9: Overall Signal Example: Combining the Base and Cycle-Sensitive Components

BASE COMPONENT (%)	SIGNAL %TILE	CYCLE-SENSITIVE COMPONENT (%)					SIGNAL OVERLAY	OVERALL SIGNAL (%)
		0–20% OVERLAY	20–40% OVERLAY	40–60% OVERLAY	60–80% OVERLAY	80–100% OVERLAY		
50	92	-15	-5	0	5	15	15	65

Source: Morgan Stanley Wealth Management GIO

Exhibit 10: Current Overall Active-Passive Signals and Base and Cycle-Sensitive Components

ASSET CLASS	SECTOR	SUBSECTOR	ACTIVE-PASSIVE SIGNALS (%)		
			BASE COMPONENT	CYCLE-SENSITIVE COMPONENT	OVERALL SIGNAL
ALTERNATIVES	REAL ASSETS	REAL ESTATE AND REITS, GLOBAL	50	0	50
EQUITIES	GLOBAL	CORE	100	-5	95
EQUITIES	US LARGE-CAP	CORE	25	0	25
EQUITIES	US MID-CAP	CORE	25	15	40
EQUITIES	US SMALL-CAP	CORE	100	0	100
EQUITIES	INTERNATIONAL	CORE	50	-15	35
EQUITIES	EMERGING AND FRONTIER MKTS.	CORE	75	0	75
FIXED-INCOME	US TAXABLE	CORE	75	5	80
FIXED-INCOME	US TAX-EXEMPT	INTERMEDIATE-TERM	0	0	0
FIXED-INCOME	HIGH YIELD	US TAXABLE	75	15	90

Source: FactSet, Morningstar, Morgan Stanley Wealth Management GIO as of March 31, 2024

In determining the impact from the cycle-sensitive component, we wrestled with the inherent trade-off between the Framework's sensitivity to changing market conditions and the level of realized turnover. With signals that changed too sharply or frequently, the implementation may have become impractical and client-unfriendly, leading to disappointing outcomes. For this updated Framework, we endeavored to balance responsiveness and turnover with the quintile-based overlay approach discussed above.

We may then consider the effectiveness of these overall signals on a historical basis for any given asset class. Across the 27 asset classes, we find modest to significant benefits from these overall active-passive signals. In Exhibit 11 below, we display the overall active-passive signals for US core fixed income and their effectiveness compared to a static 50/50 blend of active and passive strategies. Between 1993 and 2024, following the active-passive signals would have generated additional alpha compared with the static 50%-active approach, with the opportunistic changes leading to higher risk-adjusted returns. The overall signal leads to an average annual turnover of 36% for this asset class, assuming a quarterly rebalancing frequency.

Exhibit 11: We Combine the Base and Cycle-Sensitive Signals to Determine Overall Active-Passive Signals for US Core Fixed Income

Active Weight and Cumulative Alpha
Active Weight (left axis) Alpha (ln, right axis)

Cumulative Alpha (ln)
Overall 50% Active
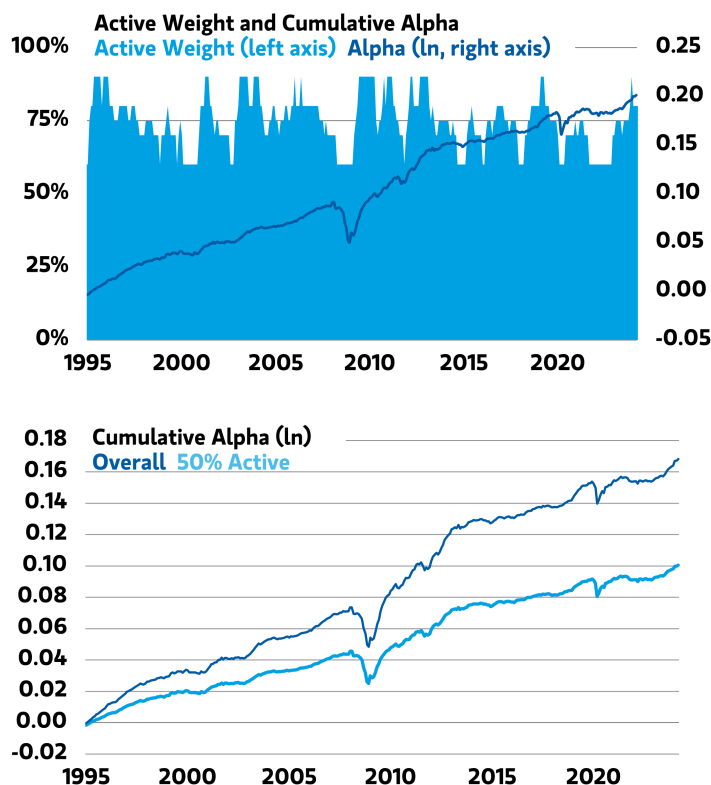
Source: FactSet, Morningstar, Morgan Stanley Wealth Management GIO as of March 31, 2024

Using Active-Passive Signals in Portfolio Construction

While each asset class's stand-alone signals carry information, we recommend applying their recommendations in the context of multiasset, multimanager portfolio construction. This Active-Passive Framework integrates well with Morgan Stanley Wealth Management's other fundamental strategy recommendations and quantitative tools, intended to add value in each stage of portfolio construction (see Exhibit 1, page 2).

To implement the Active-Passive Framework's recommendations, portfolio managers may divide total allocations to a given asset class, splitting them according the overall signals. As an example, with a 70% active-passive signal and a 10% allocation to the asset class, a portfolio manager would allocate 7% to one or more active strategies and 3% to one or more passive strategies. Morgan Stanley Wealth Management's Select UMA platform offers an efficient means of putting these recommendations into practice, having separated the asset allocation and manager weighting decisions in this manner. Financial Advisors may leverage the GIMA team's status lists and our Manager Scoring tools for insights on higher-quality managers within each asset class and connect with the ETF Research team on appropriate passive strategies.

Practically, Advisors and clients typically wish to limit the number of underlying managers within a multimanager portfolio, particularly those with sub-1% allocations. As such, we do not recommend following these signals precisely for asset classes with allocations below 4%. Instead, for such asset classes, we recommend an all-active allocation when the overall signals rise above 50%—and all-passive otherwise.

## Evaluating the Framework's Portfolio-Level Efficacy

Encouragingly, we have found that the Active-Passive Framework provides useful recommendations at the portfolio level. Using the GIC's Market Growth portfolio as an example, we applied the historical active-passive signals versus a portfolio in which we routinely allocated 50% to active strategies in all cases. To mirror reality, we incorporated the practical considerations for sub-4% allocations. Please view Exhibits 12 and 13 (see page 10) for the outcomes from this exercise.

During the 15 years ending March 31, 2024, the active-passive signals powered more than 100% increase in total alpha and more than 45% improvement in the portfolio-level information ratio, which measures the ratio of the alpha returns to the volatility required to achieve those returns. We estimate that following these signals would have involved an approximate portfolio-level turnover of 35% annually.

From this analysis, we recognize the potential overlapping benefits of the active-passive signals and Morgan Stanley Wealth Management's manager selection tools. The top-half active managers have generated quite attractive alpha, measured as net of fees; the static 50%-active case shows that directly. Then, the active-passive signals may accentuate that value by opportunistically allocating to active managers in less efficient asset classes, with more favorable conditions for alpha generation in the shorter term.

Exhibit 12: Using the Overall Active-Passive Signals Historically Provided Greater and More Consistent Alpha Than a Static 50%-Active Portfolio
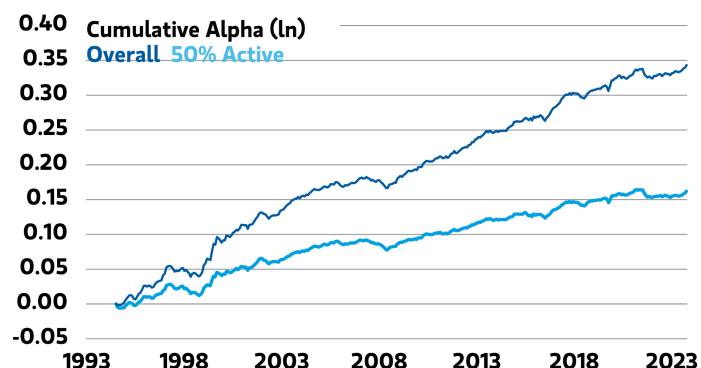
Source: FactSet, Morningstar, Morgan Stanley Wealth Management GIO as of March 31, 2024

Exhibit 13: At the Portfolio Level, the Information Ratio for the Overall Active-Passive Signals Historically Exceeded That for the Static 50%-Active Approach

	ANN. PERIOD (YEARS)	1	2	3	4	5	7	10	15	20	25	1993-2024
ALPHA (%)	50% ACTIVE	0.72	0.42	0.16	0.41	0.30	0.46	0.40	0.53	0.44	0.60	0.56
	OVERALL	1.27	0.89	0.61	0.93	0.78	1.01	0.96	1.13	0.96	1.22	1.18
INFORMATION RATIO	50% ACTIVE	1.74	1.02	0.28	0.66	0.49	0.78	0.70	1.00	0.86	1.03	0.92
	OVERALL	2.27	1.51	0.77	1.03	0.89	1.18	1.17	1.48	1.31	1.41	1.33
TURNOVER (%)	OVERALL	42	38	38	38	39	38	36	35	36	36	36

Source: FactSet, Morningstar, Morgan Stanley Wealth Management GIO as of March 31, 2024

Appendix: Underlying Cycle-Sensitive Factors in the Active-Passive Framework, Sorted by Influence

Below, we list the underlying factors that drive the Active-Passive Framework, what they seek to measure, how we treat them in the Framework's calculations (either "momentum," as measured by moving-average crossovers, or "level") and what data likely indicates bullish conditions for US large-cap core equity managers. Please note that we do not apply every indicator to each asset class. We have noted those excluded for US large-cap core equity with an asterisk (*).

This strategy is not provided as part of an investment advisory service offered by Morgan Stanley, is not available to be directly implemented as part of an investment advisory service and should not be regarded as a recommendation of any Morgan Stanley investment advisory service. All returns displayed are gross figures and as such, do not take into account fees and other expenses, including advisory fees, the deduction of which, when compounded over a period of years, would decrease returns. Information regarding Morgan Stanley standard advisory fees is available in the Form ADV Part 2, available at www.morganstanley.com/adv.

FACTOR	MEASURES	TREATMENT	BULLISH?
FUNDAMENTALS			
INTERMARKET			
Industrial Metals vs. Precious Metals*	Relative total return index performance of the Bloomberg industrial vs. precious metals indexes	Momentum	Decreasing
Morgan Stanley Global Correlation Index*	Measure of the cross-correlations between major global asset classes	Momentum	Decreasing
S&P 500 vs. 10-Year US Treasury	Relative total return index performance of the S&P 500 index vs. the 10-year US Treasury	Momentum	Decreasing
Total Returns: Growth vs. Value (level)	Relative total return of growth vs. value factor cohorts, identified by the Tactical Equity Framework	Level	Low
Total Returns: Growth vs. Value (momentum)	Relative total return of Growth vs. Value factor cohorts, identified by the Tactical Equity Framework	Momentum	Decreasing
Total Returns: Small- vs. Large-Cap (level)	Relative total return of small- vs. large-cap companies, identified by the Tactical Equity Framework	Level	High
Total Returns: Small- vs. Large-Cap (momentum)	Relative total return of small- vs. large-cap companies, identified by the Tactical Equity Framework	Momentum	Increasing
Total Returns: World vs. US (level)	Relative total return of global vs. US companies, identified by the Tactical Equity Framework	Level	High
Total Returns: World vs. US (momentum)	Relative total return of global vs. US companies, identified by the Tactical Equity Framework	Momentum	Increasing
US Deep Cyclicals vs. Defensives*	Relative total return index performance of US deep cyclical sectors vs. defensive sectors	Momentum	Increasing
US High Yield Credit*	Total return index performance of the Bloomberg Barclays US High Yield Index	Momentum	Decreasing
US High Yield vs. Investment Grade Credit*	Relative total return index performance of the Bloomberg Barclays US High Yield Index to the Bloomberg Barclays US Credit Index	Momentum	Decreasing
VIX	Index of implied volatilities on the S&P 500, based on a weighted average at a wide range of strike prices	Momentum	Increasing
INTRAMARKET			
Breadth: 12-Month (level)	Breadth of trailing 12-month returns, measured by the relative performance of equal- and cap-weighted indexes	Level	Low

ACTIVE-PASSIVE FRAMEWORK 2.0: SHARPENING ITS OBJECTIVES AND STREAMLINING ITS RECOMMENDATIONS

FACTOR	MEASURES	TREATMENT	BULLISH?
FUNDAMENTALS (CONTINUED)			
INTRAMARKET (CONTINUED)			
Breadth: 12-Month (momentum)	Breadth of trailing 12-month returns, measured by the relative performance of equal- and cap-weighted indexes	Level	Decreasing
Breadth: Excess Returns (est.) (level)	Breadth of estimated 12-month excess returns, as measured by the relative performance between equal- and cap- weighted indexes, estimated by Tactical Equity Framework	Level	High
Breadth: Excess Returns (est.) (momentum)	Breadth of estimated 12-month excess returns, as measured by the relative performance between equal- and cap- weighted indexes, estimated by Tactical Equity Framework	Momentum	Increasing
Dispersion: Excess Returns (est.) (level)	Standard deviations of one-month trailing returns of the underlying constituents	Level	High
Dispersion: Excess Returns (est.) (momentum)	Standard deviations of one-month trailing returns of the underlying constituents	Momentum	Increasing
Dispersion: Factors (level)	Standard deviation of one-month trailing factor returns, such as value, momentum, quality and beta	Level	High
Dispersion: Factors (momentum)	Standard deviation of one-month trailing factor returns, such as value, momentum, quality and beta	Momentum	Increasing
Dispersion: P/B Ratios (level)	Deviation between the book-weighted average P/B ratio for the cheapest quartile and for all underlying constituents	Level	High
Dispersion: P/B Ratios (momentum)	Deviation between the book-weighted average P/B ratio for the cheapest quartile and for all underlying constituents	Momentum	Increasing
Dispersion: P/E Ratios (level)	Deviation between the cap-weighted average forward P/E ratio for the cheapest quartile and for all underlying constituents	Level	High
Dispersion: P/E Ratios (Momentum)	Deviation between the cap-weighted average forward P/E ratio for the cheapest quartile and for all underlying constituents	Momentum	Increasing
P/B Ratio (level)*	Total market-level ratio of market capitalization to book value (assets *less* liabilities)	Level	High
P/B Ratio (momentum)*	Total market-level ratio of market capitalization to book value (assets *less* liabilities)	Momentum	Decreasing
P/CF Ratio (level)*	Total market-level ratio of market capitalization to cash flow from operation over the trailing 12 months	Level	High
P/CF Ratio (momentum)*	Total market-level ratio of market capitalization to cash flow from operation over the trailing 12 months	Momentum	Decreasing
P/E Ratio (level)*	Total market-level ratio of market capitalization to net income over the trailing 12 months	Level	High
P/E Ratio (momentum)*	Total market-level ratio of market capitalization to net income over the trailing 12 months	Momentum	Decreasing

FACTOR	MEASURES	TREATMENT	BULLISH?
FUNDAMENTALS (CONTINUED)			
INTRAMARKET (CONTINUED)			
Pairwise Correlation: 12-month (Level)	Pairwise correlations of the underlying constituents' daily returns over the trailing 12 months	Level	Low
Pairwise Correlation: 12-month (Momentum)	Pairwise correlations of the underlying constituents' daily returns over the trailing 12 months	Momentum	Decreasing
Total Returns: Deep Value (level)	Total returns of the deep value factor, identified by the Tactical Equity Framework	Level	High
Total Returns: Deep Value (momentum)	Total returns of the deep value factor, identified by the Tactical Equity Framework	Momentum	Increasing
Total Returns: Low Volatility (level)	Total returns of the low volatility factor, identified by the Tactical Equity Framework	Level	High
Total Returns: Low Volatility (momentum)	Total returns of the low volatility factor, identified by the Tactical Equity Framework	Momentum	Increasing
Total Returns: Momentum (level)	Total returns of the momentum factor, identified by the Tactical Equity Framework	Level	Low
Total Returns: Momentum (momentum)	Total returns of the momentum factor, identified by the Tactical Equity Framework	Momentum	Decreasing
Total Returns: Near-Term Value (Level)	Total returns of the near-term value factor, identified by the Tactical Equity Framework	Level	High
Total Returns: Near-Term Value (Momentum)	Total returns of the near-term value factor, identified by the Tactical Equity Framework	Momentum	Increasing
MACRO			
10-Year Government Yield*	Headline nominal interest rate for a country, from tracking constant-maturity 10-year government debt	Momentum	Decreasing
Core CPI Inflation*	Price index for a basket of consumer goods, excluding those for certain volatile commodities, such as food and energy	Momentum	Increasing
Industrial Production*	Index of total industrial production volume in a country	Momentum	Increasing
Lumber*	Price for the first-nearby US lumber contract, traded on the CME	Momentum	Increasing
Macro Sensitivity (level)	R-squared value from the regression relationship between the equity index returns and macroeconomic factors, including gold prices, oil prices, the US dollar and the two-year US Treasury yield	Level	Low
Macro Sensitivity (momentum)	R-squared value from the regression relationship between the equity index returns and macroeconomic factors, including gold prices, oil prices, the US dollar and the two-year US Treasury yield	Momentum	Decreasing
Morgan Stanley Financial Conditions Index*	Weighted index comprised of changes in equities, short- and long-term interest rates and the US dollar	Momentum	Increasing

FACTOR	MEASURES	TREATMENT	BULLISH?
FUNDAMENTALS (CONTINUED)			
MACRO (CONTINUED)			
Morgan Stanley Global Risk Demand Index*	Measure of global risk demand through studying credit spreads and key volatility gauges	Momentum	Decreasing
Morgan Stanley Global Trade Leading Indicator*	Index of global trade momentum through commodities, the US dollar, and US and German business conditions	Momentum	Decreasing
US BBB Corporate Spread*	Differential between US BBB corporate bond yields and the 10-year US Treasury yield	Momentum	Increasing
US Initial Jobless Claims*	Measure of the initial unemployment claims, tracking the inflow of people receiving unemployment benefits	Momentum	Increasing
US Leading Economic Indicator*	Index of economic variables that tend to move before changes in the overall economy	Momentum	Decreasing
US Morgan Stanley Cycle Indicator*	Measure of cyclical economic progress, from recovery to slowdown	Momentum	Decreasing
USD Index (level)	Index that measures the trade-weighted value of the US dollar	Level	High
USD Index (momentum)	Index that measures the trade-weighted value of the US dollar	Momentum	Increasing
Yield Curve (differential)	Yield differential between a country's 10-year government and three-month Treasury bill	Momentum	Increasing
TECHNICALS			
MOMENTUM			
Absolute Strength	Indicator that measures the relevant alpha stream's absolute strength vs. its long-term volatility-adjusted trend	Long-short	Positive absolute strength
Alpha Momentum	Ratio of the relevant asset class's short- and intermediate-term moving average total return index levels	Long-short	Increasing
Average Directional Index	Indicator that measures a relevant alpha stream's trend strength and the direction of that trend	Long-short	In a strong, positive trend
Breakouts	Indicator that tracks a relevant alpha stream's "breakouts" above or below recent maximum and minimum levels	Long-short	Breakout above local maximum
Chande Momentum Oscillator	Measure of overbought and oversold conditions from the ratio of recent net gains to total price movement	Long-short	Oversold or between neutral and overbought
Coppock	Indicator of the relevant alpha stream's long-term trend	Long-flat	Positive trend
Donchian Channels	Measure of the relevant alpha stream's position in channels defined by the recent highest high and lowest low	Long-short	Above channel, with positive trend

ACTIVE-PASSIVE FRAMEWORK 2.0: SHARPENING ITS OBJECTIVES AND STREAMLINING ITS RECOMMENDATIONS

FACTOR	MEASURES	TREATMENT	BULLISH?
TECHNICALS (CONTINUED)			
MOMENTUM (CONTINUED)			
Double Exponential Moving Averages	Indicator that checks whether the alpha stream's level sits above a double-smoothed exponential moving average	Long-short	Positive trend
Efficiency Ratio	Measure of the strength or effectiveness of a price trend, developed by Perry J. Kaufman	Long-short	Showing positive efficiency, pointing to a positive trend
Percentage Price Oscillator	Indicator of trend strength, determined from the relationship between two exponential moving averages in percentage terms	Long-short	Positive trend
Slope of Moving Average	Indicator of a relevant alpha stream's trend by checking whether its simple moving average has a positive slope over some trailing period	Long-flat	With a positive slope
Total Returns	Index of the asset class's total returns	Long-short	With a negative trend
True Strength Index	Measure of both trend direction and overbought-oversold conditions, meant to suggest bullish or bearish directionality for the alpha stream	Long-short	With a positive true strength and positive trend
OTHER			
Alpha Volatility	Measure of the realized volatility for a relevant alpha stream's alpha stream	Momentum	Decreasing
Bollinger Bands	Has the relevant alpha stream fallen above or below its expected channel, based on near-term volatility? Buy if below; sell if above	Positive-negative	Below volatility channel
Risk-Adjusted Alpha	Measure of the realized information ratio of a relevant alpha stream's alpha stream	Momentum	Increasing
US % of NYSE Stocks Above 200-Day Moving Average	Percentage of NYSE stocks that close above their 200-day moving average	Momentum	Increasing
US AAII Bullish vs. Bearish Investors	Spread between bullish and bearish sentiment on the American Association of Individual Investors survey	Momentum	Decreasing
US NYSE Advance-Decline Line	Index of the cumulative number of advancing less declining NYSE stocks	Momentum	Increasing

Endnotes

[1] "*Information Ratio.*" Grinold, Richard, and Roland Kahn. *Active Portfolio Management: A Quantitative Approach for Producing Superior Returns and Controlling Risk.* Second Edition. New York: McGraw-Hill, 1999.

[2] While some factors have prescribed interpretations, in most cases, we employ a straightforward calculation to interpret the factors' values. It involves calculating the values' rolling z-values or z-scores, which measure the number of standard deviations above or below the long-term average. We then divide the z-score by two to compute the signal, capping the values at +100% (highly bullish) and −100% (highly bearish).

For illustration, please consider the pairwise correlation example. Assuming a long-term average change of 0.50 and a standard deviation of 0.20, a 0.70 correlation represents a z-value of +1, and 0.30 correlation leads to a z-value of −1; the respective signals would translate to +50% and −50%, respectively.

[3] We determine the signals' effectiveness according to their rolling one-, three-, and five-year realized information ratios, calculated as the ratio of alpha to the tracking error required to achieve it.

Disclosure Section

The **Global Investment Committee (GIC)** is a group of seasoned investment professionals from Morgan Stanley & Co., Morgan Stanley Investment Management and Morgan Stanley Wealth Management who meet regularly to discuss the global economy and markets. The committee determines the investment outlook that guides our advice to clients. They continually monitor developing economic and market conditions, review tactical outlooks and recommend asset allocation model weightings, as well as produce a suite of strategy, analysis, commentary, portfolio positioning suggestions and other reports and broadcasts.

Daniel Hunt, Lisha Ge, and Spencer Cavallo are not members of the Global Investment Committee, and any implementation strategies suggested have not been reviewed or approved by the Global Investment Committee.

Index Definitions

For index, indicator and survey definitions referenced in this report please visit the following: https://www.morganstanley.com/wealth-investmentsolutions/wmir-definitions

Glossary

Alpha is the excess return of an investment relative to the return of a benchmark index.

Beta is a measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole.

Correlation This is a statistical measure of how two securities move in relation to each other. This measure is often converted into what is known as correlation coefficient, which ranges between -1 and +1. Perfect positive correlation (a correlation coefficient of +1) implies that as one security moves, either up or down, the other security will move in lockstep, in the same direction. Alternatively, perfect negative correlation means that if one security moves in either direction the security that is perfectly negatively correlated will move in the opposite direction. If the correlation is 0, the movements of the securities are said to have no correlation; they are completely random. A correlation greater than 0.8 is generally described as strong, whereas a correlation less than 0.5 is generally described as weak.

Drawdown refers to the largest cumulative percentage decline in net asset value or the percentage decline from the highest value or net asset value (peak) to the lowest value net asset value (trough) after the peak.

Excess return represents the average quarterly total return of the portfolio relative to its benchmark. A portfolio with a positive excess return has on average outperformed its benchmark on a quarterly basis. This statistic is obtained by subtracting the benchmark return from the portfolio's return.

Information Ratio (IR) is a ratio of portfolio returns above the returns of a benchmark—usually an index—to the volatility of those returns.

Mean reversion is the theory suggesting that prices and returns eventually move back toward the mean or average. This mean or average can be the historical average of the price or return, or another relevant average such as the growth in the economy or the average return of an industry.

R^2, or the coefficient of determination, is a statistic used in the context of statistical models whose main purpose is either the prediction of future outcomes or the testing of hypotheses, on the basis of other related information. It provides a measure of how well observed outcomes are replicated by the model, based on the proportion of total variation of outcomes explained by the model.

Standard deviation This statistic quantifies the volatility associated with a portfolio's returns by measuring the variation in returns around the mean return. Unlike beta, which measures volatility relative to the aggregate market, standard deviation measures the absolute volatility of a portfolio's return.

Tracking error is a divergence between the price behavior of a position or a portfolio and the price behavior of a benchmark.

Up-down capture ratio Up capture measures the percentage of market gains captured by a manager when markets are up. Down capture measures the percentage of market losses endured by a manager when markets are down.

Volatility This is a statistical measure of the dispersion of returns for a given security or market index. Volatility can either be measured by using the standard deviation or variance between returns from that same security or market index. Commonly, the higher the volatility, the riskier the security.

Manager Scoring Tools Definitions

Morgan Stanley's proprietary Risk Score methodology gauges managers' effectiveness in risk management. Based on extensive historical analysis, we evaluate over 18,000 strategies across 54 categories by ranking them according to several quantitative markers. We take a weighted average of these individual rankings to compute each manager's Risk Score, having found that managers with higher Risk Scores have historically produced more attractive subsequent risk adjusted returns, particularly under adverse conditions. For more information on Risk Score, please see the Risk Score whitepaper.

Morgan Stanley's proprietary Value Score methodology considers active investment strategies' value proposition relative to their costs. We measure perceived benefit from several quantitative markers and compute (1) "fair value" expense ratios for over 10,000 managers across 40 categories and (2) managers' perceived "excess value" by comparing the fair value expenses ratios to actual expense ratios. We then rank managers within each category by their excess value to assign a Value Score, having found that greater levels of excess value have historically

corresponded to attractive subsequent performance. For more information on Value Score, please see the Value Score whitepaper.

Morgan Stanley's proprietary Tax Score methodology evaluates investment strategies' quality and tax efficiency. The Tax Score reviews the quality of investment strategies' after-tax returns by measuring upside opportunity, downside mitigation and consistency, which have tended to correlate with strategies' subsequent risk-adjusted returns in after-tax terms. For more information on Tax Score, please see the Tax Score whitepaper.

Asset Class and Other Risk Considerations

Investing in the market entails the risk of market volatility. The value of all types of securities may increase or decrease over varying time periods.

This analysis does not purport to recommend or implement an investment strategy. Financial forecasts, rates of return, risk, inflation, and other assumptions may be used as the basis for illustrations in this analysis. They should not be considered a guarantee of future performance or a guarantee of achieving overall financial objectives. No analysis has the ability to accurately predict the future, eliminate risk or guarantee investment results. As investment returns, inflation, taxes, and other economic conditions vary from the assumptions used in this analysis, your actual results will vary (perhaps significantly) from those presented in this analysis.

The assumed return rates in this analysis are not reflective of any specific investment and do not include any fees or expenses that may be incurred by investing in specific products. The actual returns of a specific investment may be more or less than the returns used in this analysis. The return assumptions are based on hypothetical rates of return of securities indices, which serve as proxies for the asset classes. Moreover, different forecasts may choose different indices as a proxy for the same asset class, thus influencing the return of the asset class.

International securities may carry additional risks, including foreign economic, political, monetary and/or legal factors, changing currency exchange rates, foreign taxes and differences in financial and accounting standards. International investing may not be for everyone. These risks may be magnified in **emerging markets** and **frontier markets**.

Investing in currency involves additional special risks such as credit, interest rate fluctuations, derivative investment risk, and domestic and foreign inflation rates, which can be volatile and may be less liquid than other securities and more sensitive to the effect of varied economic conditions. In addition, international investing entails greater risk, as well as greater potential rewards compared to U.S. investing. These risks include political and economic uncertainties of foreign countries as well as the risk of currency fluctuations. These risks are magnified in countries with emerging markets, since these countries may have relatively unstable governments and less established markets and economies.

Equity securities may fluctuate in response to news on companies, industries, market conditions and general economic environment.

An investment in an **exchange-traded fund** involves risks similar to those of investing in a broadly based portfolio of equity securities traded on an exchange in the relevant securities market, such as market fluctuations caused by such factors as economic and political developments, changes in interest rates and perceived trends in stock and bond prices. Investing in an international ETF also involves certain risks and considerations not typically associated with investing in an ETF that invests in the securities of U.S. issues, such as political, currency, economic and market risks. These risks are magnified in countries with emerging markets, since these countries may have relatively unstable governments and less established markets and economics. ETFs investing in physical commodities and commodity or currency futures have special tax considerations. Physical commodities may be treated as collectibles subject to a maximum 28% long-term capital gains rates, while futures are marked-to-market and may be subject to a blended 60% long- and 40% short-term capital gains tax rate. Rolling futures positions may create taxable events. For specifics and a greater explanation of possible risks with ETFs, along with the ETF's investment objectives, charges and expenses, please consult a copy of the ETF's prospectus. Investing in sectors may be more volatile than diversifying across many industries. The investment return and principal value of ETF investments will fluctuate, so an investor's ETF shares (Creation Units), if or when sold, may be worth more or less than the original cost. ETFs are redeemable only in Creation Unit size through an Authorized Participant and are not individually redeemable from an ETF.

Please consider the investment objectives, risks, charges and expenses of the fund(s) carefully before investing. The prospectus contains this and other information about the fund(s). To obtain a prospectus, contact your financial advisor. Please read the prospectus carefully before investing.

Investing in smaller companies involves greater risks not associated with investing in more established companies, such as business risk, significant stock price fluctuations and illiquidity.

Stocks of medium-sized companies entail special risks, such as limited product lines, markets, and financial resources, and greater market volatility than securities of larger, more-established companies.

Growth investing does not guarantee a profit or eliminate risk. The stocks of these companies can have relatively high valuations. Because of these high valuations, an investment in a growth stock can be more risky than an investment in a company with more modest growth expectations.

Value investing does not guarantee a profit or eliminate risk. Not all companies whose stocks are considered to be value stocks are able to turn their business around or successfully employ corrective strategies which would result in stock prices that do not rise as initially expected.

Bonds are subject to interest rate risk. When interest rates rise, bond prices fall; generally the longer a bond's maturity, the more sensitive it is to this risk. Bonds may also be subject to call risk, which allows the issuer to retain the right to redeem the debt, fully or partially, before the scheduled maturity date. Proceeds from sales prior to maturity may be more or less than originally invested due to changes in market conditions or changes in the credit quality of the issuer.

High yield bonds are subject to additional risks such as increased risk of default and greater volatility because of the lower credit quality of the

issues.

Treasury Inflation Protection Securities' (TIPS) coupon payments and underlying principal are automatically increased to compensate for inflation by tracking the consumer price index (CPI). While the real rate of return is guaranteed, TIPS tend to offer a low return. Because the return of TIPS is linked to inflation, TIPS may significantly underperform versus conventional U.S. Treasuries in times of low inflation.

Yields are subject to change with economic conditions. Yield is only one factor that should be considered when making an investment decision.

Duration, the most commonly used measure of bond risk, quantifies the effect of changes in interest rates on the price of a bond or bond portfolio. The longer the duration, the more sensitive the bond or portfolio would be to changes in interest rates. Generally, if interest rates rise, bond prices fall and vice versa. Longer-term bonds carry a longer or higher duration than shorter-term bonds; as such, they would be affected by changing interest rates for a greater period of time if interest rates were to increase. Consequently, the price of a long-term bond would drop significantly as compared to the price of a short-term bond.

Investing in commodities entails significant risks. Commodity prices may be affected by a variety of factors at any time, including but not limited to, (i) changes in supply and demand relationships, (ii) governmental programs and policies, (iii) national and international political and economic events, war and terrorist events, (iv) changes in interest and exchange rates, (v) trading activities in commodities and related contracts, (vi) pestilence, technological change and weather, and (vii) the price volatility of a commodity. In addition, the commodities markets are subject to temporary distortions or other disruptions due to various factors, including lack of liquidity, participation of speculators and government intervention.

Physical precious metals are non-regulated products. Precious metals are speculative investments, which may experience short-term and long term price volatility. The value of precious metals investments may fluctuate and may appreciate or decline, depending on market conditions. If sold in a declining market, the price you receive may be less than your original investment. Unlike bonds and stocks, precious metals do not make interest or dividend payments. Therefore, precious metals may not be appropriate for investors who require current income. Precious metals are commodities that should be safely stored, which may impose additional costs on the investor. The Securities Investor Protection Corporation ("SIPC") provides certain protection for customers' cash and securities in the event of a brokerage firm's bankruptcy, other financial difficulties, or if customers' assets are missing. SIPC insurance does not apply to precious metals or other commodities.

REITs investing risks are similar to those associated with direct investments in real estate: property value fluctuations, lack of liquidity, limited diversification and sensitivity to economic factors such as interest rate changes and market recessions.

Alternative investments may be either traditional alternative investment vehicles, such as hedge funds, fund of hedge funds, private equity, private real estate and managed futures or, non-traditional products such as mutual funds and exchange-traded funds that also seek alternative-like exposure but have significant differences from traditional alternative investments. Alternative investments often are speculative and include a high degree of risk. Investors could lose all or a substantial amount of their investment. Alternative investments are appropriate only for eligible, long-term investors who are willing to forgo liquidity and put capital at risk for an indefinite period of time. They may be highly illiquid and can engage in leverage and other speculative practices that may increase the volatility and risk of loss. Alternative Investments typically have higher fees than traditional investments. Investors should carefully review and consider potential risks before investing. Certain of these risks may include but are not limited to: Loss of all or a substantial portion of the investment due to leveraging, short-selling, or other speculative practices; Lack of liquidity in that there may be no secondary market for a fund; Volatility of returns; Restrictions on transferring interests in a fund; Potential lack of diversification and resulting higher risk due to concentration of trading authority when a single advisor is utilized; Absence of information regarding valuations and pricing; Complex tax structures and delays in tax reporting; Less regulation and higher fees than mutual funds; and Risks associated with the operations, personnel, and processes of the manager. Further, opinions regarding Alternative Investments expressed herein may differ from the opinions expressed by Morgan Stanley Wealth Management and/or other businesses/affiliates of Morgan Stanley Wealth Management.

Certain information contained herein may constitute forward-looking statements. Due to various risks and uncertainties, actual events, results or the performance of a fund may differ materially from those reflected or contemplated in such forward-looking statements. Clients should carefully consider the investment objectives, risks, charges, and expenses of a fund before investing.

Alternative investments involve complex tax structures, tax inefficient investing, and delays in distributing important tax information. Individual funds have specific risks related to their investment programs that will vary from fund to fund. Clients should consult their own tax and legal advisors as Morgan Stanley Wealth Management does not provide tax or legal advice.

Interests in alternative investment products are offered pursuant to the terms of the applicable offering memorandum, are distributed by Morgan Stanley Smith Barney LLC and certain of its affiliates, and (1) are not FDIC-insured, (2) are not deposits or other obligations of Morgan Stanley or any of its affiliates, (3) are not guaranteed by Morgan Stanley and its affiliates, and (4) involve investment risks, including possible loss of principal. Morgan Stanley Smith Barney LLC is a registered broker-dealer, not a bank.

An investment in **structured investments** involves risks. These risks can include, but are not limited, to: fluctuations in the price, level or yield of underlying instruments, interest rates, currency values and credit quality; substantial loss of principal; limits on participation in appreciation of underlying instrument; limited liquidity; credit risk of the issuer; and, conflicts of interest.

Asset allocation and diversification do not assure a profit or protect against loss in declining financial markets.

Environmental, Social and Governance ("ESG") investments in a portfolio may experience performance that is lower or higher than a portfolio not employing such practices. Portfolios with ESG restrictions and strategies as well as ESG investments may not be able to take advantage of the same opportunities or market trends as portfolios where ESG criteria is not applied. There are inconsistent ESG definitions and criteria within the industry, as well as multiple ESG ratings providers that provide ESG ratings of the same subject companies and/or securities that vary among the providers. Certain issuers of investments may have differing and inconsistent views concerning ESG criteria where the ESG claims made in offering documents or other literature may overstate ESG impact. ESG designations are as of the date of this material, and no assurance is provided that the underlying assets have maintained or will maintain and such designation or any stated ESG compliance. As a

ACTIVE-PASSIVE FRAMEWORK 2.0: SHARPENING ITS OBJECTIVES AND STREAMLINING ITS RECOMMENDATIONS

result, it is difficult to compare ESG investment products or to evaluate an ESG investment product in comparison to one that does not focus on ESG. Investors should also independently consider whether the ESG investment product meets their own ESG objectives or criteria. There is no assurance that an ESG investing strategy or techniques employed will be successful. Past performance is not a guarantee or a dependable measure of future results.

Because of their narrow focus, **sector investments** tend to be more volatile than investments that diversify across many sectors and companies. **Technology stocks** may be especially volatile. Risks applicable to companies in the **energy and natural resources** sectors include commodity pricing risk, supply and demand risk, depletion risk and exploration risk.

Active or frequent trading to effectuate a dynamic allocation strategy entails greater risk and is more speculative, but also entails the possibility for above-average returns, compared with a long-term investment strategy. It may also entail more costs and fees, as well as a larger and more immediate tax liability.

Rebalancing does not protect against a loss in declining financial markets. There may be a potential tax implication with a rebalancing strategy. Investors should consult with their tax advisor before implementing such a strategy.

The **indices** are unmanaged. An investor cannot invest directly in an index. They are shown for illustrative purposes only and do not represent the performance of any specific investment. The indices are not subject to expenses or fees and are often comprised of securities and other investment instruments the liquidity of which is not restricted. A particular investment product may consist of securities significantly different than those in any index referred to herein. Comparing an investment to a particular index may be of limited use.

The **indices selected by Morgan Stanley Wealth Management** to measure performance are representative of broad asset classes. Morgan Stanley Wealth Management retains the right to change representative indices at any time.

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