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The endowment approach: An investing mindset

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Foreword

In this paper, "The endowment approach: An investing mindset," we lay out the investment principles and building blocks of one of the most successful approaches to long-term investing over the past 30 years. This approach has been widely discussed and to an extent mimicked, but rarely beaten over longer-term timeframes. "Mindset" may be the best way to describe the overall investment philosophy, since asset allocation, diversification and vehicle selection can be applied by any investor without the same investment success, suggesting there is more to the thought process than meets the eye.

If there is a formula for success required by long-term, higher-return-seeking investors, such as foundations, endowments and multigenerational families, diversification and allocations are the starting point. But the full and maximizing embrace of risk must include the savvy to choose investment managers that are investor aligned, disciplined to the styles that generated their track records of investment success and, of course, skillful in their executions. A prosaic description to be sure, but as the authors point out, this basic formula produces the widest dispersion of investment success across the capital markets. The importance of execution selection is often overlooked as a critical component of the historical success of the endowment model (i.e., the ability to access managers in the top quartile of their peer group). Materially superior returns versus the average manager, together with an allocation that maximizes diversification, are the key ingredients. Maybe the simplest expression of the endowment mindset is to diversify thoroughly and execute well.

The so-called endowment model of investing, initially developed by David Swensen and Dean Takahashi at Yale University, is now employed by many of the world's largest nonprofits and family offices. But what characterizes this investment model? How flexible is it? And can the approach be adapted to support the investment objectives and policies of your organization?

About J.P. Morgan Outsourced Chief Investment Office

The J.P. Morgan Outsourced Chief Investment Office is a dedicated team of investment professionals leveraging the firm's global resources to provide customized investment strategies and advice for nonprofits, institutional families and family offices. As of September 30, 2022, the team managed more than $34.3 billion in assets on behalf of clients around the world.

The views expressed in this paper are as of April 2023.

The endowment investment challenge and the need for appropriate risk-taking

Endowments, in general, have a distinctive investment challenge, driven by what Harvard University Professor of Economics John Y. Campbell called their promise of "vigorous immortality."[1] In short, an endowment's goal is to spend enough to make a visible impact on advancing its chosen mission—and to do so indefinitely.

In financial terms, that objective translates to earning a real rate of return on the endowment's assets equal to its annual spending goal, while keeping the purchasing power of its principal amount intact. In the case of a U.S. private foundation, a "vigorous" minimum spending rate of 5% per annum is required to maintain its tax-exempt status.[2] That, in turn, implies that the foundation is able to earn an equivalent 5% real rate of return on its assets. For foundations in other parts of the world, a spending rate of 3% is more typical. In the current investment environment, achieving even this more modest real rate of return can represent a challenge.

Based on our return expectations across capital markets over the next 10–15 years, vigorous immortality cannot be achieved without taking risk. Here, an endowment's immortality—or relatively long-term investment horizons—can be advantageous. That brings us to the endowment approach to investing.

Defining the endowment approach

The endowment approach has the following characteristics at its core:

- A long-term investment horizon
- Acceptance of increased risk to achieve a potential higher return
- Diversification through uncorrelated assets

Critical to the success of the approach are the resources and skills required for effective implementation, including:

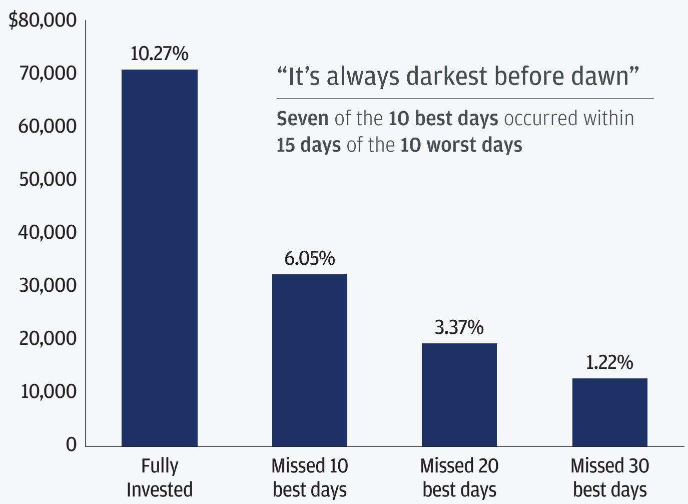
- Efficient portfolio construction
- Access to the best-performing investment funds

Long-term investment horizon

Universities and similar institutions aspire, at least, to exist forever; hence, their endowment capital is effectively being invested for perpetuity. Such institutions are generally inclined to stick to an investment strategy and avoid the common mistake of repeatedly changing tack either out of fear, greed or in an effort to time the market. **Exhibit 1** shows how inconsistent market participation—even missing just a few good days—can hurt long-term performance. An investment in the S&P 500 Index in February 2003 held continuously until February 2023, delivered a return of 10.27% per annum; missing the best 30 days over the same period delivered a return of 1.22%.

Consistency pays. Even missing a few good days in the market can negatively impact long-term performance

EXHIBIT 1: PERFORMANCE OF A $10,000 INVESTMENT IN THE S&P 500, FEBRUARY 2003 THROUGH FEBRUARY 2023



Outlooks and past performance are no guarantee of future results. It is not possible to invest directly in an index. Please refer to "Definition of Indices and Terms" for important information.

Source: J.P. Asset Management analysis using data from Morningstar Direct. Returns are based on the S&P 500 Total Return Index, an unmanaged, capitalization-weighted index that measures the performance of 500 large capitalization domestic stocks representing all major industries. **Past performance is not indicative of future returns.** An individual cannot invest directly in an index. Analysis is based on the J.P. Morgan Guide to Retirement. Data as of February 28, 2023.

[1] "Investing and Spending: The Twin Challenges of University Endowment Management," Forum for the Future of Higher Education Symposium, Aspen, CO, June 8, 2011.
[2] Footnote for IRS rule instituted in 1981.

Acceptance of increased risk

As long-term investors, endowments in general are relatively well positioned to choose from among a broad range of asset classes and strategies, both traditional and nontraditional, taking on certain risks that have the potential to enhance returns over time, such as market and illiquidity risk. How can acceptance of these risks potentially play out in endowment investing?

Market risk: Take the case of emerging markets, for example. A long-term investing mindset can allow an endowment to look through the short-term volatility of these markets and avail itself of their potential to enhance long-term returns. Our 2023 Long-Term Capital Market Assumptions (LTCMAs) outlook that over the next 10 to 15 years, emerging market (EM) equities can be expected to potentially return 10.01% versus an expected 8.4% for developed market (DM) equities—this equates to a potential aggregate returns over the next 15 years of over 323% (EM) versus 235% (DM).

Illiquidity risk: Illiquidity is one of the strongest tools within the endowment approach for potentially improving returns. Logic suggests that a successful endowment should never need to liquidate its whole portfolio and, therefore, should have room for illiquid assets, given their more attractive return potential. To quote Yale University's Investment Office, "The Endowment's long time horizon is well suited to exploiting less liquid and less efficient asset classes."[3] Such assets generally fall into the category of alternative assets or strategies, and include, for example, private equity, private credit, hedge funds, real estate, infrastructure, and "hard" assets such as commodities and timber.

Consider illiquidity in the context of private equity—highly illiquid investments that require a long-term commitment to a strategy and, importantly, to an execution vehicle or manager, often through an entire economic or market cycle. Here, illiquidity should be viewed as a positive attribute that enables skilled managers to improve their companies' portfolio operations so much that they can potentially drive alpha (the excess return above a given benchmark) and deliver "fair" compensation for locking up some portion of an investor's assets for an extended period. In fact, holding too large an allocation to liquid assets can have an opportunity cost. Endowments that are able to take on additional illiquidity risk should ask whether they might be unduly denying themselves the potential to earn higher returns from an appropriately sized allocation to less liquid assets.

Diversification through uncorrelated assets

The endowment approach is not all about taking on risk to enhance returns over the long term. Another key characteristic of the approach is diversification—allocating to a wider set of asset classes and return streams—particularly those that do not simply move in line with broad markets **(Exhibit 2)**. Many of these uncorrelated and idiosyncratic returns are derived from alternative assets (including core real estate, infrastructure and certain hedge fund strategies). The fact that returns from these assets may "zig" when those from more traditional assets "zag" means that a well-diversified, carefully constructed mix of assets can reduce the overall volatility of a portfolio, increasing its ability to generate better compound returns over a long period. Embracing the endowment's "multi-asset" approach and using the full suite of asset classes and sub-asset classes available (the entire range of hedge fund strategies, for example) provides provides a scope for achieving optimal diversification.

[3] "The Yale Investments Office," Yale University, accessed April 19, 2021, https://investments.yale.edu/.

The endowment approach diversifies across a broad spectrum of traditional and alternative asset and strategy classes to enhance compound returns over time

EXHIBIT 2: PUBLIC AND PRIVATE MARKET CORRELATIONS (QUARTERLY RETURNS)

	2008-2021	Global Bonds	Global Equities	U.S. Core RE	Europe Core RE*	APAC Core RE	Global Core Infra	Transport	Timber	Direct Lending	Venture Capital	Private Equity	Equity Long/ Short	Relative Value	Macro	Bitcoin
Financial assets	Global Bonds	1.0														
	Global Equities	0.4	1.0													
Global real estate	U.S. Core RE	-0.2	0.0	1.0												
	Europe Core RE*	-0.2	0.2	0.8	1.0											
	APAC Core RE	-0.1	0.1	0.8	0.7	1.0										
Real assets	Global Core Infra	-0.1	-0.1	0.3	0.1	0.2	1.0									
	Transport	-0.2	-0.1	0.5	0.3	0.4	0.0	1.0								
	Timber	-0.2	-0.1	0.3	0.2	0.2	0.2	0.1	1.0							
Private markets	Direct Lending	0.1	0.7	0.3	0.4	0.3	0.2	0.1	-0.1	1.0						
	Venture Capital	0.2	0.6	0.3	0.5	0.2	0.1	0.0	0.0	0.5	1.0					
	Private Equity	0.3	0.9	0.3	0.5	0.4	0.1	0.0	-0.1	0.8	0.8	1.0				
Hedge funds	Equity Long/Short	0.3	0.9	-0.1	0.2	0.0	0.0	0.0	-0.1	0.7	0.7	0.9	1.0			
	Relative Value	0.2	0.9	-0.1	0.1	0.0	0.0	-0.1	-0.2	0.9	0.5	0.8	0.9	1.0		
Cryptocurrency	Macro	0.1	0.3	0.0	0.1	-0.1	0.0	-0.2	0.1	0.1	0.2	0.2	0.4	0.3	1.0	
	Bitcoin	0.1	0.1	0.1	-0.1	0.1	0.5	0.1	0.0	0.1	0.2	0.2	0.1	0.1	0.0	1.0

Source: MSCI, Bloomberg Finance LP, Burgiss, NCREIF, Cliffwater, HFRI, J.P. Morgan Asset Management. *Europe Core RE includes continental Europe. Private Equity and Venture Capital are time weighted returns from Burgiss. RE—real estate. Global equities: MSCI AC World Index. Global Bonds: Bloomberg Global Aggregate Index. U.S. Core Real Estate: NCREIF Property Index—Open End Diversified Core Equity component. Europe Core Real Estate: MSCI Global Property Fund Index—Continental Europe. Asia Pacific (APAC) Core Real Estate: MSCI Global Property Fund Index—Asia-Pacific. Global infrastructure (Infra.): MSCI Global Quarterly Infrastructure Asset Index (equal-weighted blend). U.S. Direct Lending: Cliffwater Direct Lending Index. Timber: NCREIF Timberland Property Index (U.S.). Hedge fund indices include equity long/short, relative value, and global macro and are all from HFRI. Transport: returns are derived from a J.P. Morgan Asset Management index. All correlation coefficients are calculated based on quarterly total return data for the period 6/30/2008-9/30/2022, except correlations with Bitcoin which are calculated over the period 12/31/2010-9/30/2022. Returns are denominated in USD. **Past performance is not indicative of future results. It is not possible to invest directly in an index.**
Data is based on availability as of February 28, 2023.

Diversification may prevent portfolios from experiencing severe declines that can be difficult to recover from, given the multiperiod impact of a loss in portfolio value. Regaining the loss from a 20% decline in value requires that the remaining 80% of assets work even harder (i.e., they have to earn 25% just to get back to the starting portfolio value). Conversely, tempering these drawdowns by diversifying through uncorrelated assets can have a compounding effect that may help improve long-term portfolio outcomes. For example, a more modest 10% decline in value would only require earning 11% to return to the starting portfolio value.

Increasing allocations to alternatives, then, has the potential to work in two ways: by dampening the downside while also potentially enhancing the upside to improve long-term portfolio outcomes. As Swensen, one of the developers of the endowment model, observed, "Substantial allocations to alternative assets offer a level of diversification unavailable to investors in traditional assets, allowing the creation of portfolios with superior risk and return characteristics."[4] He backed up this view with action: When he was appointed CIO in 1985, Yale's endowment portfolio had more than 70% in U.S. equities and bonds; by 2021, that figure was less than 10%.

Implementing the endowment approach

These three characteristics of the endowment approach—a long-term investment horizon, the acceptance of higher risk and full portfolio diversification—assume a broad opportunity set of traditional and nontraditional assets and strategies. But that is not the end of the story. Realizing the advantages of the endowment approach requires efficient portfolio construction as well as access to, and selection of, the best-performing managers. Whether you have the required resources in-house or need to reach out to external partners, skillful implementation is critical to success.

[4] "The Yale Investments Office," Yale University, accessed April 19, 2021, https://investments.yale.edu/.

Efficient portfolio construction

The first step toward efficient portfolio construction is investing the considerable time and resources needed to establish a strategic investment policy (i.e., a strategic asset allocation) that will govern the management of the portfolio. This policy, aligned with the endowment's investment policy statement, provides the foundation for investment decisions and typically incorporates macroeconomic insights, capital market return assumptions, and asset class considerations across the spectrum of traditional and alternative investments. Studies show that the strategic asset allocation is arguably the most important determinant of a portfolio's long-term performance, accounting for 75%–95% of the return.[5] This strategic allocation is then supplemented by shorter-term, tactical decisions.

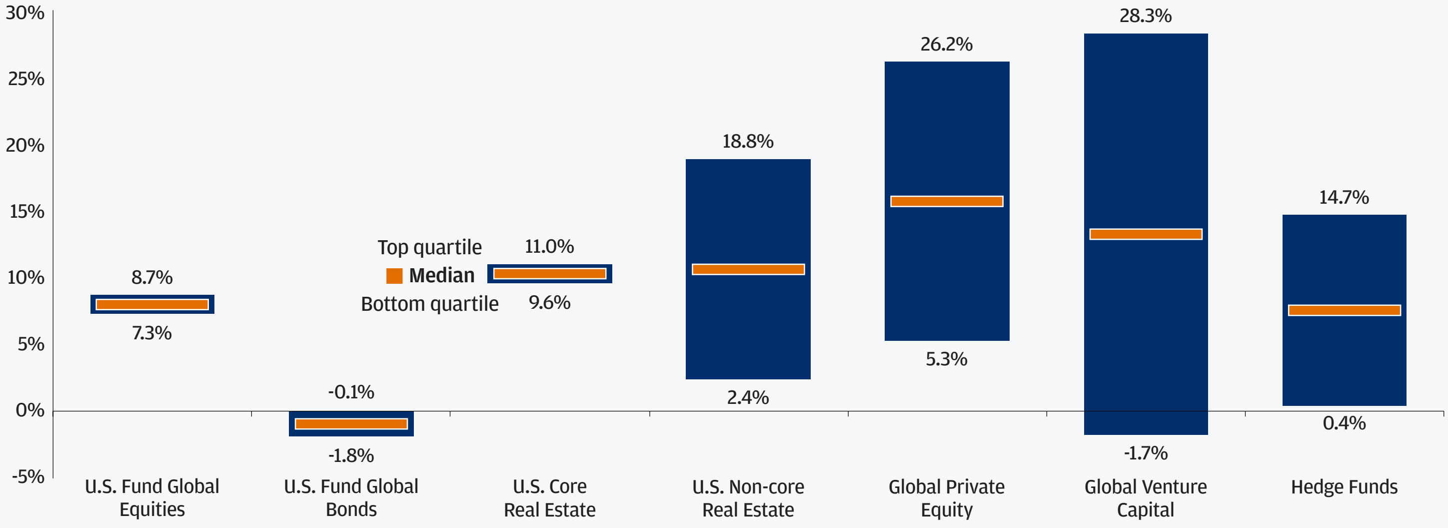
Access to the best-performing investment funds

Even the most skillfully determined strategic allocation doesn't guarantee success in meeting an endowment's objectives; the next challenge is to fill those allocations with the right managers. Finding and accessing the best-performing investment funds is perhaps the least recognized pillar of the endowment approach. Investing in alternative assets broadens the available investment universe considerably—but much of that universe is hard to access and closed to many investors. Additionally, manager selection requires extensive research and in-depth analysis to discern whether returns are attributable to manager skill or simply market exposure, and whether managers' results appear sustainable.

Exhibit 3 clearly illustrates why manager selection is so important to achieving the desired results from alternative investing. First, the dispersion of returns is much wider across alternatives versus traditional asset managers. This is especially true in the case of private equity and venture capital, which have been strong contributors to the performance of many large endowments. Over the past 10 years, the difference in return between the top and bottom 25% of managers was 21 percentage points (26.2% versus 5.3%) for private equity and 30 percentage points (28.3% versus -1.7%) for venture capital. What's more, merely investing in a median private equity fund has not provided the incremental returns over public equities that most investors likely anticipate as compensation for taking on the additional risks of private equity—higher leverage, execution risk and illiquidity. As seen here, materially additional return has been achieved only by the best-performing funds.

Manager selection is critical to realizing the desired benefits of alternative investing

EXHIBIT 3: PRIVATE AND PUBLIC MANAGER DISPERSION (BASED ON RETURNS OVER A 10-YEAR WINDOW)



Source: Burgiss, NCREIF, Morningstar, PivotalPath, J.P. Morgan Asset Management. Global equities (large cap) and global bonds dispersion are based on the world large stock and world bond categories, respectively. *Manager dispersion is based on the annual returns for U.S. Fund Global Equities, U.S. Fund Global Bonds, Hedge Funds, and U.S. Core Real Estate are over a 10-year period ending 4Q 2022. Non-core Real Estate, Global Private Equity and Global Venture Capital are represented by the 10-year horizon internal rate of return (IRR) ending 3Q 2022. U.S. Fund Global Equities and Bonds are comprised of U.S.-domiciled mutual funds and ETFs. **Past performance is not indicative of future results**.

Data is based on availability as of February 28, 2023.

[5] See Gary P. Brinson, L. Randolph Hood, and Gilbert L. Beebower, "Determinants of Portfolio Performance," Financial Analysts Journal 42, no. 4 (1986): 39-44; Craig W. French, "Another Look at the Determinants of Portfolio Performance: Return Attribution for the Individual Investor," Portfolio Engineering Laboratory (July 29, 2003); W. Drobetz and F. Köhler, "The contribution of asset allocation policy to portfolio performance," Financial Markets and Portfolio Management 16, (2002): 219–233.

How can the endowment approach enhance performance over time?

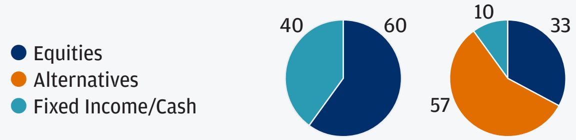
To better understand the potential value of the endowment approach, we turn to an illustrative example comparing long-term expected risk and return characteristics and a range of likely outcomes for two hypothetical allocations: a simple 60% equity/40% investment grade bond allocation—the "60/40 allocation"—and a diversified multi-asset allocation that includes alternative assets such as hedge funds, real estate, infrastructure, commodities and private equity—the "Endowment allocation." We use J.P. Morgan's 2023 Long-Term Capital Market Assumptions to drive these scenarios. Updated and published annually, our Capital Market Assumptions are forward-looking estimates of expected return, volatility and correlation for over 200 asset and strategy classes over a 10-to-15-year time horizon.

As seen in **Exhibit 4**, compared to the 60/40 allocation, the Endowment allocation is forecast to have a higher return (9.3% versus 7.7%), which is achieved with marginally higher volatility (13.1% versus 10.3%), leading to an improved (higher) long-term Sharpe ratio[6] (0.53 versus 0.51), implying greater return per each unit of risk taken. This improved return/risk tradeoff is expected because the more diversified Endowment allocation seeks to earn incremental returns from different and more diversified sources of market risk.

It is important to note that these assumptions are strategic in nature and take no account of any additional return that may be derived from shorter-term tactical positioning (over- or underweighting exposures relative to the strategic policy), or from the selection of the underlying managers that might be used in implementing these allocations. Indeed, the potential for returns above our strategic outlook ("alpha") comes from the alternatives arena, where the best opportunities for top-performing managers to exploit market inefficiencies are likely to be found.

An illustrative "Endowment allocation" is projected to provide greater return per unit of risk taken than a simple "60/40 allocation"

EXHIBIT 4: LONG-TERM RISK AND RETURN ASSUMPTIONS FOR ILLUSTRATIVE 60/40 AND ENDOWMENT ALLOCATIONS



Summary Assumptions* (based on 2023 LTCMAs)	60/40 strategy	Endowment strategy
Long-term Return	7.7%	9.3%
Long-term Volatility	10.3%	13.1%
Long-term Yield	2.5%	1.8%
Long-term Sharpe Ratio	0.51	0.53
EQUITIES	**60.0%**	**33.0%**
US	38.0%	17.0%
Europe	10.0%	5.0%
Japan	5.0%	3.0%
Emerging Markets	7.0%	8.0%
ALTERNATIVES	**0.0%**	**57.0%**
Hedge Funds	0.0%	5.0%
Private Equity	0.0%	30.0%
Private Credit	0.0%	5.0%
Global Real Estate	0.0%	5.0%
Global Infrastructure	0.0%	6.0%
Global Core Transport	0.0%	3.0%
Global Forestry	0.0%	3.0%
FIXED INCOME/CASH	**40.0%**	**10.0%**
Global Aggregate Bonds	40.0%	10.0%

For illustrative purposes only. Outlooks and past performance are no guarantee of future results. It is not possible to invest directly in an index. Please refer to "Definition of Indices and Terms" for important information.

Source: J.P. Morgan Asset Management 2023 Long-Term Capital Market Assumptions. Estimates as of November 30, 2022.

[6] The Sharpe ratio is a measure of risk-adjusted return. It is determined by taking a portfolio's excess return over its relevant risk-free rate, and dividing by the standard deviation of that excess return.

Meeting the endowment objective

What can these two strategies teach us about the potential advantage of the endowment approach in meeting long-term spending goals while keeping the buying power of its initial principal amount intact?

We examine two $100 million portfolios that seek to maintain purchasing power into perpetuity, but with different annual spending goals:

- Portfolio A—3% annual spending goal
- Portfolio B—5% annual spending goal

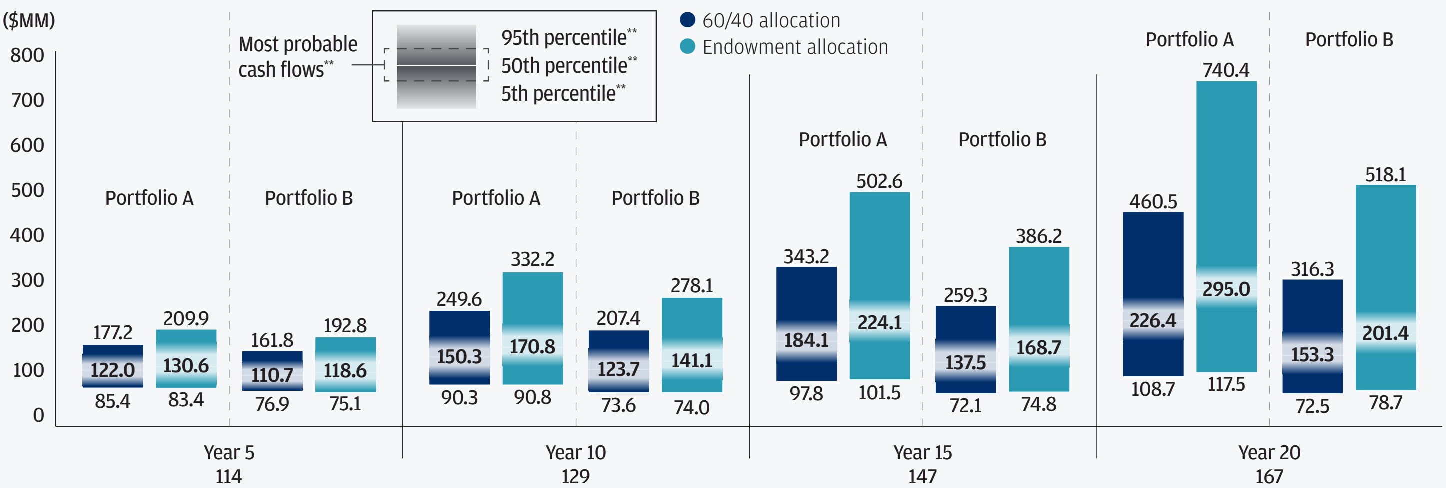
In order to test an allocation's ability to support a desired level of spending, we use our proprietary Morgan Asset Projection System (MAPS) to perform spending breakeven analysis for each portfolio. MAPS is a multidimensional Monte Carlo simulation model that incorporates many factors impacting returns over time, including asset allocation, changing asset-class correlations, rebalancing, and, of course, different annual spending, to project forward a range of possible future portfolio values. Simulating 10,000 paths for each portfolio, the output shows 90% of the possible outcomes (from 5th percentile to 95th percentile). The most probable outcome is the 50th percentile or median outcome (shown as the middle number in each column below).

The results show that the 60/40 allocation maintains long-term purchasing power for Portfolio A but falls well short of doing so for the higher-spending Portfolio B. For example, in year 20, the median outcome for Portfolio A is $226MM, above the inflation-adjusted start value of $167MM (shown below the x axis); for Portfolio B, however, a median value of $153MM is well below the inflation-adjusted start value. Meanwhile, the Endowment Allocation would be expected to deliver on the investment return objectives for both portfolios, with an expected median values of $295MM and $201MM respectively, both healthily above the inflation-adjusted start value of $167MM. Taking on more risk may be part of the answer, but selecting the right managers, especially in the case of alternatives, as well as employing tactical allocation, will be essential for accomplishing these long-term investment objectives.

Our proprietary Morgan Asset Projection System (MAPS) allows us to perform spending breakeven analysis for different allocations

EXHIBIT 5: ANALYSIS OF STRATEGIC RISK AND RETURN ASSUMPTIONS: INITIAL VALUE $100 MILLION, INFLATION 2.3%, TAX-EXEMPT

Range of projected cash flows*



IMPORTANT: The projections or other information generated by the Morgan Asset Projection System ("MAPS") regarding the likelihood of various investment outcomes are hypothetical in nature, do not reflect actual or estimated investment vehicle results and are not guarantees of future results. The results may vary with each use and over time. Furthermore, the material is incomplete without reference to, and should be viewed in conjunction with, the verbal briefing provided by J.P. Morgan representative. For further information, see page entitled "Understanding long-term estimates."

* Calculations based upon assumptions listed. For allocation details, see asset allocation page. Tax rates quoted are for the majority of the years in the analysis.

** "Most probable cash flows," denoted by the darkly shaded area, indicates the range in and around the 50th percentile. The "50th percentile" indicates the middle cash flow value of the entire range of probable cash flows. The "95th percentile" wealth value indicates that 95% of the probable cash flows will be equal to or below that number; the "5th percentile" wealth value indicates that 5% of the probable cash flows will be equal to or below that number.

Adopting a factor-based approach to asset allocation

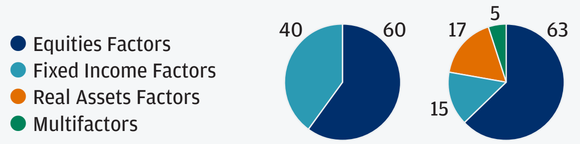
So far, both allocations have been expressed using a traditional approach to asset allocation, namely that risk exposures are categorized using standard asset class buckets (e.g., equity, fixed income, alternatives and cash). There is an intuitive appeal to this conventional approach to asset allocation, as most investors have a good grasp of the broad types of risk associated with specific asset classes. Yet this approach does not provide enough market context, or market insight, to help investors judge whether their portfolio implementation is truly aligned with the risk-return objectives set out in their investment policies. For example; By combining a broad variety of strategies across asset classes under the alternatives bucket, the conventional asset allocation framework does not fully demonstrate the actual underlying exposures, or market risks, contained in this part of the portfolio.

One path to creating greater clarity of market risk is the construction of a factor allocation, an approach increasingly embraced by leading institutional investors and asset managers. Factor allocations differ from traditional asset allocation frameworks in that risks are aggregated by market exposures, not by asset classes or management format. It's true that traditional asset allocation profiles may offer a measure of understanding around passive benchmark portfolio volatility, and assets grouped into the "alternatives" bucket do share issues around illiquidity, portfolio management tools (e.g., the ability to short or use leverage), fees and other non-quantitative defining characteristics (e.g., fees, "Key Man" and business model risks). But even as the vehicles and strategies may differ, many of these asset classes and strategies share many of the same risks. For example, an equity long-biased hedge fund strategy may have similar equity market exposures to a traditional "long-only" equity portfolio. Event-driven hedge fund strategies, such as merger arbitrage and distressed debt, have a meaningful level of equity market exposure that should likewise be aggregated as part of the total "equity risk" of a portfolio.

As shown in **Exhibit 6**, we apply the factor-based approach to the 60/40 and Endowment allocations referenced throughout this paper. What becomes abundantly clear using this approach is the almost identical allocation to equity factors across both allocations. Meanwhile, real asset factors and multifactor strategies clearly play an important role in adding diversified sources of return to the portfolio.

A factor-based approach provides greater transparency around the underlying exposures in the allocation

EXHIBIT 6: ILLUSTRATING THE FACTOR-BASED APPROACH TO ASSET ALLOCATION FOR THE 60/40 AND ENDOWMENT STRATEGIES



	60/40 allocation	Endowment allocation
Summary Assumptions* (based on 2023 LTCMAs)		
Long-term Return	7.7%	9.3%
Long-term Volatility	10.3%	13.1%
Long-term Yield	2.5%	1.8%
Long-term Sharpe Ratio	0.51	0.53
EQUITY FACTORS	**60.0%**	**63.0%**
Public Equities	60.0%	33.0%
Private Equity	0.0%	30.0%
FIXED INCOME FACTORS	**40.0%**	**15.0%**
Global Aggregate Bonds	40.0%	10.0%
Private Credit	0.0%	5.0%
REAL ASSET FACTORS	**0.0%**	**17.0%**
Global Real Estate	0.0%	5.0%
Global Infrastructure	0.0%	6.0%
Global Core Transport	0.0%	3.0%
Global Forestry	0.0%	3.0%
MULTIFACTORS	**0.0%**	**5.0%**
Macro Hedge Funds	0.0%	5.0%

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Source: J.P. Morgan Asset Management 2023 Long-Term Capital Market Assumptions. Estimates as of November 30, 2022.

The right mindset and the right implementation

Accomplishing an endowment's goals demands an unwavering dedication to its mission. It also requires an investment strategy that can generate the annual distributions needed to support that mission in perpetuity. Based on expected long-term traditional market returns, such a strategy calls for a distinct mindset—one characterized by a commitment to investing for the long term and a willingness to take prudent risks to generate required returns, within the context of a well-diversified portfolio allocated across alternative and traditional asset classes and strategies.

Success also requires the right resources to design and implement the investment strategy—combining the best vehicles and managers, monitoring results and making tactical adjustments over time. Each organization needs to determine whether it has the internal resources to effectively manage its assets while continuing to advance its chosen mission.

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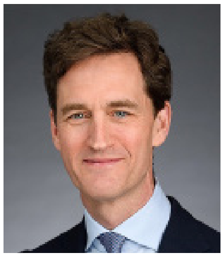

Calum Graham

Portfolio Manager
Outsourced Chief Investment Office

There can be no assurance that the professionals currently employed by J.P Morgan will continue to be employed by J.P. Morgan or that the past performance or success of any such professional serves as an indicator of such professional's future performance or success.

IMPORTANT INFORMATION

UNDERSTANDING LONG-TERM ESTIMATES

Our investment management research incorporates our proprietary projections of the returns and volatility of each asset class over the long term, as well as estimates of the correlations among asset classes. Clearly, financial firms cannot predict how markets will perform in the future. But we do believe that by analyzing current economic and market conditions and historical market trends, and then, most critically, making projections of future economic growth, inflation, and real yields for each country, we can estimate the long-term performance for an entire asset class, given current and our estimated equilibrium levels. The "equilibrium" level shows the average or central tendency of a market or macroeconomic variable such as yield or credit spread that is expected to prevail over the long-term, because the level represents the value inherent in a given market. The return assumptions are based on our proprietary process of using a building block approach for each of the asset classes. For instance, the building blocks for equity consist of our projections on inflation, real earnings growth, dividend yield and the impact of valuations. The building blocks for fixed income consist of our projections for future yields and the change in bond prices. The estimates for alternatives are driven by our historical analysis and judgment about the relationship to public markets. It is possible — indeed, probable — that actual returns will vary considerably from this expectation, even for a number of years. But we believe that market returns will always at some point return to the equilibrium trend. We further believe that these kinds of forward-looking assessments are far more accurate than historical trends in deciding what asset class performance will be, and how best to determine an optimal asset mix.

In reviewing this material, please understand that all references to expected return are not promises, or even estimates, of actual returns one may achieve. The assumptions are not based on specific products and do not reflect fees, such as investment management fees, oversight fees, transaction costs or other expenses that could reduce return. They simply show what the long-term return should be, according to our best estimates of current and equilibrium conditions. Also note that actual performance may be affected by the expertise of the person who actually manages these investments, both in picking individual securities and possibly adjusting the mix periodically to take advantage of asset class undervaluations and overvaluations caused by market trends.

For the purpose of this analysis volatility is defined as a statistical measure of the dispersion of return for a given allocation and is measured as the standard deviation of the allocation's arithmetic return. The Sharpe ratio is a return/risk measure, where the return (the numerator) is defined as the incremental annual return of an investment over the risk free rate. Risk (the denominator) is defined as the standard deviation (volatility) of the allocation's return less the risk free rate. The risk free rate utilized is J.P. Morgan's long-term assumption for Cash. Correlation is a statistical measure of the degree to which the movements of two variables, in this case asset class returns, are related. Correlation can range from -1 to 1 with 1 indicating that the returns of two assets move directionally in concert with one another, i.e. they behave in the same way during the same time. A correlation of 0 indicates that the returns move independently of each other and -1 indicates that they move in the opposite direction.

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As a general matter, we prefer J.P. Morgan managed strategies. We expect the proportion of J.P. Morgan managed strategies will be high (in fact, up to 100 percent) in strategies such as, for example, cash and high-quality fixed income, subject to applicable law and any account-specific considerations.

While our internally managed strategies generally align well with our forward-looking views, and we are familiar with the investment processes as well as the risk and compliance philosophy of the firm, it is important to note that J.P. Morgan receives more overall fees when internally managed strategies are included. We offer the option of choosing to exclude J.P. Morgan managed strategies (other than cash and liquidity products) in certain portfolios.

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