Dimensional

RESEARCH

Developing Dimensional Core Plus ETF Wealth Models

April 2023

Dimensional applies robust investment principles to asset allocation. Our approach starts with defining an investment goal and identifying the key risks relevant to this goal. Then we build a set of asset allocations that aim to help investors achieve their goals by systematically and cost-effectively pursuing reliable sources of higher expected returns while managing risks and costs efficiently.

The Dimensional Wealth Models are designed for investors with a broad range of wealth goals, ranging from aggressive wealth growth to preservation of capital and purchasing power. The Core Plus ETF Models use Dimensional's core equity strategies and apply a stronger emphasis on securities with higher expected returns.

The following is an outline of the key decisions incorporated in our wealth-focused asset allocation approach: the split between equity and fixed income, global diversification, and the emphasis on known drivers of higher expected returns.

I. ALLOCATION BETWEEN EQUITY AND FIXED INCOME

Fixed income can serve many roles in a portfolio to help investors achieve their goals, including managing overall portfolio volatility or managing liabilities. For example, adding fixed income to an equity portfolio is one of the most effective tools an investor can use to balance the expected volatility and returns of the total portfolio. Determining the appropriate amount of fixed income to include in a portfolio should be based on an investor's goals, needs, preferences, and constraints.

For investors focused on the growth of assets, we have designed all-equity and equity-heavy allocations.

For investors seeking to dampen some of the volatility in their portfolios, we incorporate a greater allocation to fixed income. The 60/40 Wealth Model (60% equity/40% fixed income), for example, seeks total return consisting of capital appreciation and current income.

For investors who first and foremost seek the preservation of capital, we have designed conservative allocations invested predominantly in fixed income securities. The all-fixed income and 20/80 (20% equity/80% fixed income) Wealth Models seek to constrain potential losses in the event of poor equity market performance.

II. REGIONAL ALLOCATIONS

The global market portfolio's allocations to various regions are a sensible starting point for an equity investor. The global market portfolio is a theoretical basket of investments that holds all securities in the investment universe, and therefore all industries and countries, according to their market capitalization weights. It incorporates the aggregate forward-looking expectations of all market participants and provides a continuously updated, instantaneous snapshot of global diversification.

We believe global diversification is an effective way to manage country-specific risks and provides a good rationale for investors to hold the equity and fixed income securities of US and non-US firms. While both regions offer the potential to earn positive expected returns in the long run, they may perform quite differently over short periods, though there is no reliable evidence that the relative performance of one country or region relative to another can be predicted in advance.

There may, however, be sensible reasons to deviate from that global market portfolio and allocate more than the market cap weight to the US to incorporate a home bias. Those reasons could be related to differences in implementation costs. For example, foreign dividend tax withholding can create a performance drag on international investments held in non-taxable or tax-deferred portfolios.

For these reasons, the Core Plus ETF Wealth Models have a US home bias within the equity allocation.

The Core Plus ETF Wealth Models also invest in globally diversified fixed income and REITs. In the 100% equity model, the allocation to the Dimensional Global Real Estate Securities Portfolio is close to the market cap weight of REITs.

III. DRIVERS OF HIGHER EXPECTED RETURN

Dimensional believes prices in global competitive capital markets reflect the aggregate expectations of market participants. We therefore use information contained in market prices to identify systematic differences in expected returns across securities in equity and fixed income markets.

a. Equities

Valuation theory provides a framework about the drivers of expected stock returns, linking expectations about a firm's future cash flows to its current value through a discount rate (or, equivalently, the expected return on the stock). While an approximation, this framework provides useful insights. One insight is that, all else equal, the lower the price paid for a security, the higher the expected return. Another insight is that, for a given price, the higher the expected future cash flows, the higher the expected return.

Market capitalization and relative price contain information about the prices investors pay. Profitability contains information about the cash flows they expect to receive.[1] Using the valuation framework, we can identify systematic differences in expected stock returns along the company size, relative price, and profitability dimensions. That is, we expect small cap stocks to have higher expected returns than large cap stocks (size premium); stocks with low relative price—as measured, for instance, by the price-to-book ratio—to have higher expected returns than high relative price stocks (value premium); and high profitability stocks to have higher expected returns than low profitability stocks (profitability premium).

1. Profitability is measured as operating income before depreciation and amortization minus interest expense scaled by book.

Empirically, extensive literature links firm size, relative price, and profitability to the cross-section of expected stock returns.[2] **Exhibit 1** shows the historical annualized compound returns across size, relative price, and profitability groups in the US, developed ex US, and emerging markets.[3] Consistent with valuation theory, size, value, and profitability premiums are sizable and have been pervasive across different markets around the world.

Dimensional's core equity strategies seek to efficiently target the size, value, and profitability premiums through a total market solution. These solutions systematically overweight stocks with higher expected returns (those with lower market capitalizations, lower relative prices, and higher profitability) relative to their market weights and underweight stocks with lower expected returns (those with higher market capitalizations, higher relative prices, and lower profitability) across the entire market in each eligible country. To do that, we use a weighting schema that integrates multiple premiums and maintains a link to price. A link to price is important because it allows us to control the level of deviation from the market in a more transparent and cost-efficient manner than many alternative approaches (e.g., rank-weighted, equal-weighted) and provides real-time information about changes in expected returns. Through this well-thought-out weighting schema approach, the strategies pursue the size, value, and profitability premiums in an integrated, broadly diversified, and cost-effective manner. Integration allows us to consider multiple sources of information about expected returns and the interactions among those sources. It also increases the probability of delivering outperformance. Broad diversification reduces stock-, sector-, and country-specific risks; allows for flexibility at the point of execution; and increases the reliability of outcomes (see Dai 2016).[4] By spreading investments across the entire market and having built-in flexibility, these strategies seek to reduce unnecessary turnover and lower implementation costs.

Dimensional's equity portfolios use a daily investment process that also allows them to incorporate short-term drivers of returns, such as investment, momentum, and information from the securities lending market. We also take into consideration differences in expected returns at an intraday horizon through Dimensional's flexible, thoughtful approach to trading.[5]

Approximately two thirds of the equity exposure of the Core Plus ETF Wealth Models is composed of core equity strategies. The Wealth Models aim to provide a deeper emphasis on the known drivers of higher expected returns by allocating the remaining one third of equity exposure to component portfolios, including the US Small Cap Value ETF, US High Profitability ETF, International Small Cap Value ETF, International High Profitability ETF, Emerging Markets Value ETF, and Emerging Markets High Profitability ETF. The incorporation of Small Cap Value and High Profitability is intended to provide a balanced exposure to the size, value, and profitability premiums.

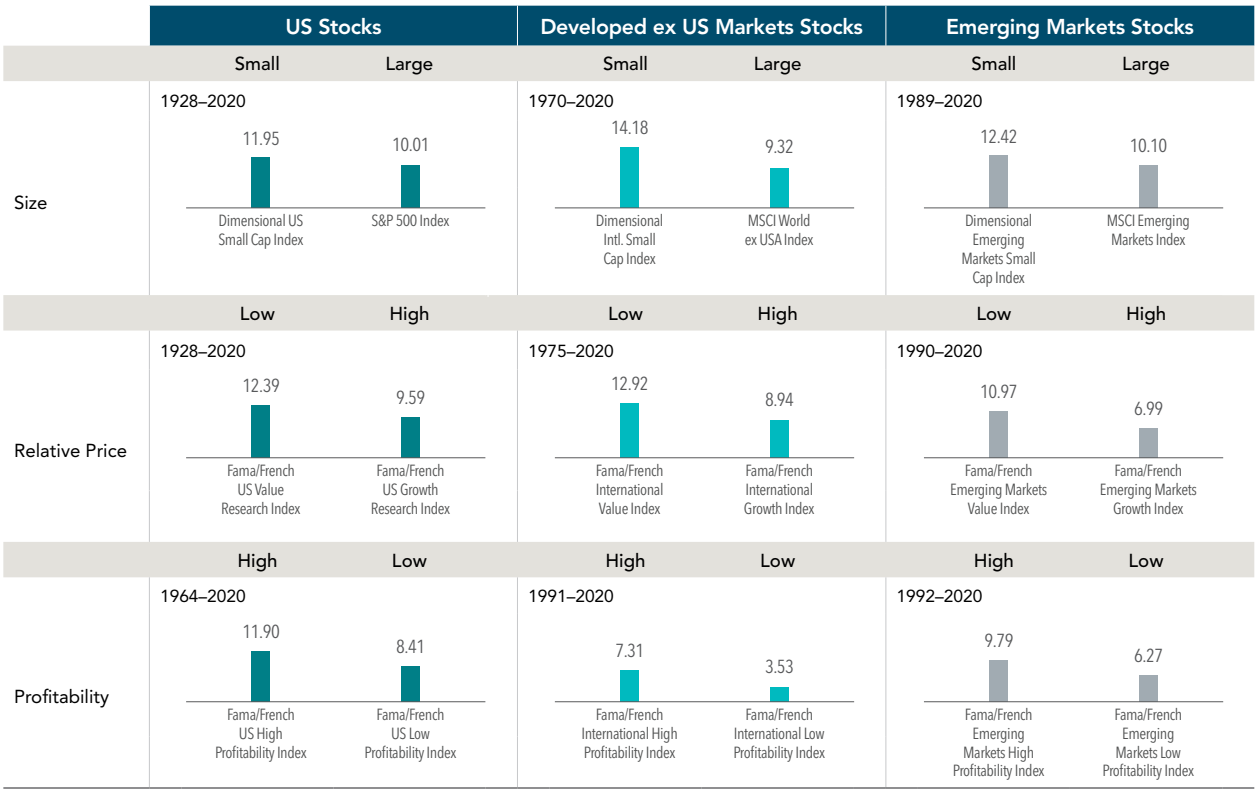
b. Fixed Income

Like in equities, we use current market prices to identify systematic differences in expected returns among fixed income securities. Across bonds, expected returns vary by duration, credit quality, and currency of issuance. We also use information in current market prices to monitor and manage risks and eliminate unnecessary trading costs. Portfolio implementation—which includes research, portfolio design, and portfolio management and trading—integrates those functions with the goal of increasing overall returns or meeting investors' goals efficiently.[6]

Dimensional focuses on the components of a bond's expected return that are known and observable. These components are the bond's current yield and expected capital appreciation over the holding period, based on the

2. For example, see: Eugene F. Fama, Kenneth R. French, "The Cross-Section of Expected Stock Returns," *Journal of Finance* 47, No. 2, (June 1992); Eugene F. Fama, Kenneth R. French, "Common Risk Factors in the Returns on Stocks and Bonds," *Journal of Financial Economics* 33, No. 1, (February 1993); Eugene F. Fama, Kenneth R. French, "Profitability, Investment and Average Returns," *Journal of Financial Economics* 82, No. 3 (December 2006); Eugene F. Fama, Kenneth R. French, "A Five-Factor Asset Pricing Model," *Journal of Financial Economics* 116, No. 1 (April 2015); Eugene F. Fama, Kenneth R. French, "International Tests of a Five-Factor Asset Pricing Model," *Journal of Financial Economics* 123, No. 3 (March 2017); Robert Novy-Marx, "The Other Side of Value: The Gross Profitability Premium," *Journal of Financial Economics* 108, No. 1 (April 2013); and Gerard O'Reilly and Savina Rizova, "Expected Profitability: A New Dimension of Expected Returns" (white paper, Dimensional Fund Advisors, June 2013).
3. Note that the time periods reported in the exhibit differ depending on the region and the dimension, based on data availability.
4. Wei Dai, "How Diversification Impacts the Reliability of Outcomes" (white paper, Dimensional Fund Advisors, November 2016).
5. For further discussion, see the following Dimensional white papers: Stanley Black, Eric Geffroy, and Lukas Smart, "Understanding the Performance of Small Cap Stocks" (June 2018); Joe Hohn, Mary Phillips, and Savina Rizova, "Applying Profitability to Large Caps" (May 2017); Namiko Saito, "The Impact of Implementing Profitability in Equity Strategies: A Four-Year Study" (September 2018); Namiko Saito, "Value and Profitability Premiums Across Sectors" (September 2018); and Savina Rizova and Namiko Saito, "Investment and Expected Stock Returns" (October 2019).
6. For further discussion, see the following Dimensional white papers: David Plecha and L. Jacobo Rodríguez, "A Market-Driven Approach to Fixed Income" (June 2016); and Wei Dai, Joseph Kolerich, and Douglas Longo, "Pursuing Higher Expected Returns with Duration Constraints" (October 2017).

Exhibit 1: Return Dimensions Around the World
Illustrative Index Performance (%)



Past performance is not a guarantee of future results. Actual returns may be lower. The Dimensional and Fama/French Indices represent academic concepts that may be used in portfolio construction and are not available for direct investment or for use as a benchmark. Index returns are not representative of actual portfolios and do not reflect costs and fees associated with an actual investment.

Annualized compound returns (%) in US dollars. MSCI indices are gross div. Profitability is measured as operating income before depreciation and amortization minus interest expense scaled by book. See Index Descriptions in the appendix for descriptions of Dimensional and Fama/French index data. S&P data © 2021 S&P Dow Jones Indices LLC, a division of S&P Global. All rights reserved. MSCI data © MSCI 2021, all rights reserved.

current term structure. The larger the sum of those two components (i.e., the higher the forward rate of a bond), the larger the bond's expected return. Hence, the larger the differences in expected returns among bonds of different durations—as captured, for example, by term spreads—the larger the expected future term premiums. **Exhibit 2** illustrates the relation between current term spreads and term premiums in the US from 1976 through 2020.

Dimensional uses this information in global yield curves to dynamically vary a portfolio's duration. For instance, when global yield curves are upwardly sloped and term spreads are wide (or forward rates are high), Dimensional may extend durations due to larger expected term premiums. When global yield curves are flat or inverted and term spreads are narrow (or forward rates are low), Dimensional may shorten durations due to lower expected term premiums.

Research also shows that the expected return of a credit bond is related to its yield and expected capital appreciation (forward rate). In particular, the larger the differences in expected returns among bonds of different credit quality—as reflected, for instance, in credit spreads—the larger the expected credit premium. **Exhibit 3** shows the reliable relation between credit spreads and credit premiums in the US from 1976 to 2020. Using this information from current yield curves, we can also dynamically vary the credit quality of our strategies to pursue higher expected returns.

The available global opportunity set is a further consideration within a fixed income allocation. Investing in global bonds can increase expected returns, diversify term and credit exposure, and reduce idiosyncratic risks. Considering a global opportunity set in fixed income allows us to more effectively pursue higher expected returns and manage risks.

In portfolios with higher equity allocations, taking on more term and credit exposure (by focusing on longer duration or lower credit quality bonds, respectively) can supplement the higher expected return goal of such asset allocations without materially impacting the overall volatility of the portfolio since this volatility is dominated by the equity component. In portfolios with higher fixed income allocations, the goal is to preserve capital and minimize losses in consumption power, so such allocations would benefit from fixed income investments that emphasize short duration, high credit quality, and inflation protection.[7]

For example, in the portfolios with higher fixed income allocations in the Core Plus ETF Wealth Models, inflation protection is pursued through an allocation to the Inflation-Protected Securities ETF. This ETF is a US TIPS solution targeting higher expected returns while providing protection from inflation.

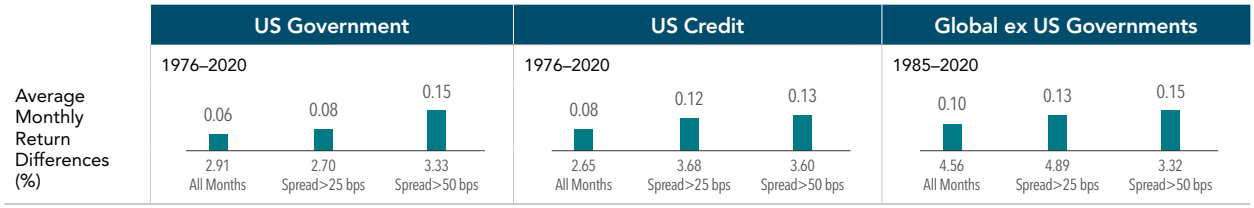
Because the Core Plus ETF Wealth Models aim to provide deeper exposure to the term and credit premiums and broader opportunities for global diversification, they split their 60/40 allocation to fixed income between the Short-Duration Fixed Income ETF and Core Fixed Income ETF and focus exclusively on the Core Fixed Income ETF in the 80/20 allocation.

IV. THE DIMENSIONAL DIFFERENCE

At Dimensional, our investment approach is based on a belief in markets. We believe that in public capital markets, competition among many market participants all around the globe makes prices quickly reflect new information and expectations. As a result, the global market portfolio provides a continuously updated, instantaneous snapshot of global diversification across securities, sectors, and countries and represents a sensible starting point for an asset allocation. We then deviate from the market portfolio in order to pursue higher expected returns while managing risks and controlling costs.

Valuation theory provides a robust framework about the drivers of expected stock returns. It tells us that a stock's current market price reflects information about future cash flows discounted by the expected stock return. Numerous studies using data that cover over 40 countries and span close to a century show that price variables, such as market capitalization and relative price, combined with cash flow variables like profitability and investment contain reliable information about the cross-section of expected stock returns. We use this information to structure equity portfolios that systematically target the well-known long-term drivers of expected returns, while also incorporating into the daily implementation process information about short-term drivers of expected returns, such as investment, momentum, and securities lending as well as information about intraday costs. The equity portfolios in the Wealth Models aim to maintain a consistent focus on the size, value, and profitability premiums, as there is no compelling evidence that timing the equity premiums is profitable for investors.[8] In summary, our approach to equities is based on rigorous theoretical and empirical research.

Exhibit 2: Term Spreads and Future Term Premiums
Intermediate minus Short Duration

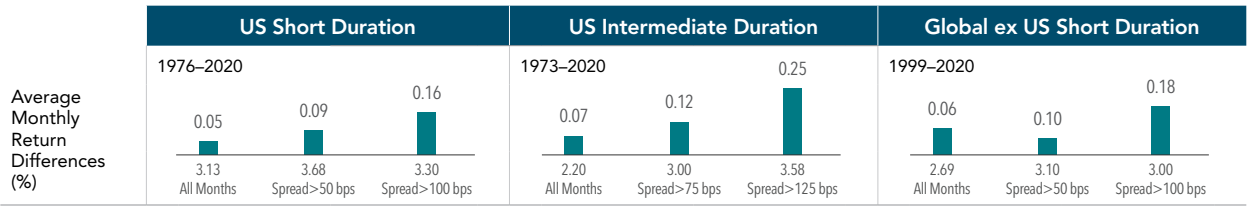


Past performance is no guarantee of future returns. Asset class filters were applied to data retroactively and with the benefit of hindsight. Actual returns may vary.

Source for return differences between US short and intermediate bonds: Dimensional calculation based on Bloomberg Barclays US Government 1–3 Year and Intermediate Indexes. Returns in USD. Source for return differences between Global Ex-US short and intermediate bonds: Dimensional calculation based on FTSE World Government Bond Index 1–3 Years and 1–10 Years Indexes of Australia, Canada, France, Germany, Japan, the Netherlands, Great Britain, and Switzerland. Average returns and average t-stats are calculated by taking averages across eligible countries. Returns are hedged to USD. Average monthly return difference for "Spread > 25" and "Spread > 50" represents the average returns difference between bonds with an intermediate or long duration and those with a shorter duration for the months when the term spread is greater than 25 basis points and 50 basis points, respectively. Indices are not available for direct investment; therefore, their performance does not reflect the expenses associated with the management of an actual portfolio. For illustrative purposes only.

7. Matthew Wicker and Kaitlin Simpson Hendrix, "Making Fixed Income More Flexible When Targeting Your Goals" (Dimensional Fund Advisors, February 2023).
8. For example, see: Wei Dai, "Premium Timing with Valuation Ratios" (white paper, Dimensional Fund Advisors, September 2016) and Jim Davis, "Mean Reversion in the Dimensions of Expected Stock Returns" (white paper, Dimensional Fund Advisors, November 2014). See also: "The Randomness of Global Equity Returns" (Dimensional Fund Advisors, June 2019) and "Why Should You Diversify?" (Dimensional Fund Advisors, December 2018).

Exhibit 3: Credit Spreads and Future Credit Premiums
Credit minus Government



Past performance is no guarantee of future returns. Asset class filters were applied to data retroactively and with the benefit of hindsight. Actual returns may vary.

Monthly data in US dollars. Bloomberg Barclays US Indices for US bond returns. Bloomberg Barclays Global Aggregate 1-3 Year Upper Tier (AAA+AA) Government and Global Aggregate Corporate 1-3 Year indices for Global ex US Short Term Credit returns. Bloomberg Barclays data provided by Bloomberg Finance LP. For each month, credit spread is measured as the yield difference between investment grade credit and government bonds, as represented by the Bloomberg Barclays indices as of the beginning of the month. Average monthly return difference for "Spread > 50" and "Spread > 100" represents the average returns difference between investment grade credit and government bonds for the months when the credit spread is greater than 50 basis points and 100 basis points, respectively. Average monthly return difference for "Spread > 75" and "Spread > 125" represents the average returns difference between investment grade credit and government bonds for the months when the credit spread is greater than 75 basis points and 125 basis points, respectively. Indices are not available for direct investment; therefore, their performance does not reflect the expenses associated with the management of an actual portfolio. For illustrative purposes only.

The same applies to our approach to asset allocation within fixed income. The analytical framework for the expected return of a bond shows that forward rates (the yield and expected capital appreciation components of a bond's expected return) can provide information about differences in expected bond returns. Decades of rigorous empirical research spanning from Fama in the 1970s[9] to Lee et al. (2020)[10] show that differences in forward rates across bonds of different duration, credit quality, and currency of issuance do contain reliable information about differences in their average subsequent returns. Based on that research, our fixed income portfolios target higher expected returns by using information in current forward rates to dynamically vary their allocations to different durations, credit qualities, and yield curves within the allowed ranges of their guidelines. Just like in our equity model allocations, we seek to outperform the market without trying to outguess it in our fixed income model allocations. Ample research shows that, like changes in stock prices, changes in interest rates are largely unpredictable.[11] Hence, our fixed income allocations do not try to forecast interest rate changes but instead focus on reliable drivers of expected bond returns that are observable today.

Overall, the investment solutions in our models seek to add value by using up-to-date information embedded in the latest market prices to identify reliable differences in expected returns across securities and are supported by rigorous theoretical and empirical research. Thus, unlike some competitors, we avoid both the rigidities of indexing as well as the unreliability of forecasting.

Across both equities and fixed income, we have an integrated emphasis on reliable drivers of higher expected returns in order to incorporate useful information about interactions among premiums. In contrast, other models either do not target sources of higher expected returns or may target them separately.

Another way our models differ from competitors' models is that Dimensional does not employ traditional optimization techniques in developing asset allocations but instead designs models using a thoughtful framework designed to help investors meet their goals. An approach to asset allocation that uses ex post investment outcomes as ex ante return assumptions in a complex, opaque model may result in poorly understood or misleading conclusions for investors. For more on this, see Lee (2013) and Davis (2008).[12]

9. See, for example, Eugene F. Fama, "Forward Rates as Predictors of Future Spot Rates," *Journal of Financial Economics* 3, No. 4 (October 1976).
10. Marlena Lee, Savina Rizova, and Samuel Yusun Wang, "The Cross-Section of Corporate Bond Returns," (February 2020).
11. For example, see: Eugene F. Fama (1976); Eugene F. Fama, "The Information in the Term Structure," *Journal of Financial Economics* 13, No. 4 (December 1984); Eugene F. Fama, "Term Premiums in Bond Returns," *Journal of Financial Economics* 13, No. 4 (December 1984); Eugene F. Fama and Robert R. Bliss, "The Information in Long-Maturity Forward Rates," *The American Economic Review* 77, No. 4 (September 1987); John Y. Campbell and Robert J. Shiller, "Yield Spreads and Interest Rate Movements: A Bird's Eye View," *Review of Economic Studies* 58, No. 3 (May 1991); Gregory R. Duffee, "Term Premia and Interest Rate Forecasts in Affine Models," *The Journal of Finance* 57, No. 1 (February 2002).
12. Marlena Lee, "Stress Testing Monte Carlo Assumptions" (Pension Research Council Working Paper October 2013); Jim Davis, "Efficient Frontiers Constructed with Historical Data Can Be Misleading" (October 2008).

For investors, building a broadly diversified portfolio with a consistent focus on the reliable drivers of expected returns and continuously balancing the tradeoffs among competing premiums, diversification, and costs when managing the portfolio may be a more reliable way to pursue higher expected returns than relying on capital market assumptions or opaque optimization techniques.

VI. CONCLUSION

We have highlighted what we believe to be the key issues to consider when choosing an asset allocation suitable for an individual investor's goals. Along with the broad split between equities and fixed income, it is important to consider the specific characteristics within the equity and fixed income allocations—such as a focus on reliable drivers of expected returns. Investors have different risk tolerances, sensitivities, and time horizons, all of which need to be taken into account in the asset allocation process.

Each portfolio included in the Dimensional Wealth Models is broadly diversified and aims to efficiently target a level of expected return while managing sources of risk that are not expected to add value, and minimizing implementation costs through efficient portfolio design and flexibility in execution. We believe these portfolios are effective solutions that can help many investors pursue their investment goals.

APPENDIX

Index Descriptions

Dimensional US Small Cap Index was created by Dimensional in March 2007 and is compiled by Dimensional. It represents a market capitalization-weighted index of securities of the smallest US companies whose market capitalization falls in the lowest 8% of the total market capitalization of the eligible market. The eligible market is composed of securities of US companies traded on the NYSE, NYSE MKT (formerly AMEX), and Nasdaq Global Market. Exclusions: non-US companies, REITs, UITs, and investment companies. From January 1975 to the present, the index excludes companies with the lowest profitability and highest relative price within the small cap universe. The index also excludes those companies with the highest asset growth within the small cap universe. Profitability is measured as operating income before depreciation and amortization minus interest expense scaled by book. Asset growth is defined as change in total assets from the prior fiscal year to current fiscal year. Source: CRSP and Compustat. The index monthly returns are computed as the simple average of the monthly returns of 12 subindices, each one reconstituted once a year at the end of a different month of the year. The calculation methodology for the Dimensional US Small Cap Index was amended on January 1, 2014, to include profitability as a factor in selecting securities for inclusion in the index.

Dimensional International Small Cap Index was created by Dimensional in April 2008 and is compiled by Dimensional. July 1981–December 1993: It includes non-US developed securities in the bottom 10% of market capitalization in each eligible country. All securities are market capitalization weighted. Each country is capped at 50%. Rebalanced semiannually. January 1994–present: Market capitalization-weighted index of small company securities in the eligible markets, excluding those with the lowest profitability and highest relative price within their country's small cap universe. The index also excludes those companies with the highest asset growth within their country's small cap universe. Profitability is measured as operating income before depreciation and amortization minus interest expense scaled by book. Asset growth is defined as change in total assets from the prior fiscal year to current fiscal year. The index monthly returns are computed as the simple average of the monthly returns of four subindices, each one reconstituted once a year at the end of a different quarter of the year. Prior to July 1981, the index is 50% UK and 50% Japan. The calculation methodology for the Dimensional International Small Cap Index was amended on January 1, 2014, to include profitability as a factor in selecting securities for inclusion in the index.

Dimensional Emerging Markets Small Cap Index was created by Dimensional in April 2008 and is compiled by Dimensional. January 1989–December 1993: Fama/French Emerging Markets Small Cap Index. January 1994–present: Dimensional Emerging Markets Small Cap Index composition: Market capitalization-weighted index of small company securities in the eligible markets, excluding those with the lowest profitability and highest relative price within their country's small cap universe. The index also excludes those companies with the highest asset growth within their country's small cap universe. Profitability is measured as operating income before depreciation and amortization minus

interest expense scaled by book. Asset growth is defined as change in total assets from the prior fiscal year to current fiscal year. The index monthly returns are computed as the simple average of the monthly returns of four subindices, each one reconstituted once a year at the end of a different quarter of the year. Source: Bloomberg. The calculation methodology for the Dimensional Emerging Markets Small Cap Index was amended on January 1, 2014, to include profitability as a factor in selecting securities for inclusion in the index.

The Dimensional indices have been retrospectively calculated by Dimensional Fund Advisors LP and did not exist prior to their index inception dates. Accordingly, results shown during the periods prior to each index's index inception date do not represent actual returns of the index. Other periods selected may have different results, including losses. Backtested index performance is hypothetical and is provided for informational purposes only to indicate historical performance had the index been calculated over the relevant time periods. Backtested performance results assume the reinvestment of dividends and capital gains.

Fama/French US Value Research Index: Provided by Fama/French from CRSP securities data. Includes the lower 30% in price-to-book of NYSE securities (plus NYSE Amex equivalents since July 1962 and Nasdaq equivalents since 1973). Fama/French and multifactor data provided by Fama/French.

Fama/French US Growth Research Index: Provided by Fama/French from CRSP securities data. Includes the higher 30% in price-to-book of NYSE securities (plus NYSE Amex equivalents since July 1962 and Nasdaq equivalents since 1973). Fama/French and multifactor data provided by Fama/French.

Fama/French International Value Index: January 1975–present: Fama/French International Value Index. Simulated strategy of international developed countries with securities in the lower 30% price-to-book range. Source: Ken French website. Simulated from MSCI and Bloomberg data. Fama/French and multifactor data provided by Fama/French.

Fama/French International Growth Index: January 1975–present: Fama/French International Growth Index. Simulated strategy of international developed countries with securities in the higher 30% price-to-book range. Source: Ken French website. Simulated from MSCI and Bloomberg data. Fama/French and multifactor data provided by Fama/French.

Fama/French Emerging Markets Value Index: July 1989–present: Fama/French Emerging Markets Value Index. Courtesy of Fama/French from Bloomberg and IFC securities data. Includes stocks in the upper 30% book-to-market range in each country; companies weighted by float-adjusted market cap; rebalanced annually in June. Fama/French and multifactor data provided by Fama/French.

Fama/French Emerging Markets Growth Index: July 1989–present: Fama/French Emerging Markets Growth Index. Courtesy of Fama/French from Bloomberg and IFC securities data. Includes stocks in the bottom 30% book-to-market range in each country; companies weighted by float-adjusted market cap; rebalanced annually in June. Fama/French and multifactor data provided by Fama/French.

Fama/French US High Profitability Index: July 1963–present: Fama/French US High Profitability Index. Courtesy of Fama/French from CRSP and Compustat securities data. Includes all stocks in the upper 30% operating profitability range of NYSE eligible firms; rebalanced annually in June. OP for June of year *t* is annual revenues minus cost of goods sold, interest expense, and selling, general, and administrative expenses divided by book equity for the last fiscal year end in *t–1*. Fama/French and multifactor data provided by Fama/French.

Fama/French US Low Profitability Index: July 1963–present: Fama/French US Low Profitability Index. Courtesy of Fama/French from CRSP and Compustat securities data. Includes all stocks in the lower 30% operating profitability range of NYSE eligible firms; rebalanced annually in June. OP for June of year *t* is annual revenues minus cost of goods sold, interest expense, and selling, general, and administrative expenses divided by book equity for the last fiscal year end in *t–1*. Fama/French and multifactor data provided by Fama/French.

Fama/French International High Profitability Index: July 1990–present: Fama/French International High Profitability Index. Courtesy of Fama/French from Bloomberg securities data. Includes stocks in the upper 30% operating profitability range in each region; companies weighted by float-adjusted market cap; rebalanced annually in June. OP for June of

year *t* is annual revenues minus cost of goods sold, interest expense, and selling, general, and administrative expenses divided by book equity for the last fiscal year end in *t–1*. Fama/French and multifactor data provided by Fama/French.

Fama/French International Low Profitability Index: July 1990–present: Fama/French International Low Profitability Index. Courtesy of Fama/French from Bloomberg securities data. Includes stocks in the lower 30% operating profitability range in each region; companies weighted by float-adjusted market cap; rebalanced annually in June. OP for June of year *t* is annual revenues minus cost of goods sold, interest expense, and selling, general, and administrative expenses divided by book equity for the last fiscal year end in *t–1*. Fama/French and multifactor data provided by Fama/French.

Fama/French Emerging Markets High Profitability Index: July 1991–present: Fama/French Emerging Markets High Profitability Index. Courtesy of Fama/French from Bloomberg and IFC securities data. Includes stocks in the upper 30% operating profitability range in each country; companies weighted by float-adjusted market cap; rebalanced annually in June. OP for June of year *t* is annual revenues minus cost of goods sold, interest expense, and selling, general, and administrative expenses divided by book equity for the last fiscal year end in *t–1*. Fama/French and multifactor data provided by Fama/French.

Fama/French Emerging Markets Low Profitability Index: July 1991–present: Fama/French Emerging Markets Low Profitability Index. Courtesy of Fama/French from Bloomberg and IFC securities data. Includes stocks in the lower 30% operating profitability range in each country; companies weighted by float-adjusted market cap; rebalanced annually in June. OP for June of year *t* is annual revenues minus cost of goods sold, interest expense, and selling, general, and administrative expenses divided by book equity for the last fiscal year end in *t–1*. Fama/French and multifactor data provided by Fama/French.

Results shown during periods prior to each index's inception date do not represent actual returns of the respective index. Other periods selected may have different results, including losses. Backtested index performance is hypothetical and is provided for informational purposes only to indicate historical performance had the index been calculated over the relevant time periods. Backtested performance results assume the reinvestment of dividends and capital gains. Eugene Fama and Ken French are members of the Board of Directors of the general partner of, and provide consulting services to, Dimensional Fund Advisors LP.

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Risks include loss of principal and fluctuating value. Investment value will fluctuate, and shares, when redeemed, may be worth more or less than original cost.

Small and micro cap securities are subject to greater volatility than those in other asset categories.

International and emerging markets investing involves special risks, such as currency fluctuation and political instability. Investing in emerging markets may accentuate these risks.

Fixed income securities are subject to increased loss of principal during periods of rising interest rates. Fixed income investments are subject to various other risks, including changes in credit quality, liquidity, prepayments, call risk, and other factors. Municipal securities are subject to the risks of adverse economic and regulatory changes in their issuing states.

Real estate investment risks include changes in real estate values and property taxes, interest rates, cash flow of underlying real estate assets, supply and demand, and the management skill and creditworthiness of the issuer.

There is no guarantee an investment strategy will be successful. Diversification neither assures a profit nor guarantees against loss in a declining market.

The fund prospectuses contain more information about investment risks.

ETFs trade like stocks, fluctuate in market value and may trade either at a premium or discount to their net asset value. ETF shares trade at market price and are not individually redeemable with the issuing fund, other than in large share amounts called creation units. ETFs are subject to risk similar to those of stocks, including those regarding short-selling and margin account maintenance. Brokerage commissions and expenses will reduce returns.