RESEARCH

Picking the Right Model: Risk Tolerance and Long-Term Investment Goals

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Model portfolios streamline the process of determining an appropriate asset allocation for an investor. But which model is the right one? There are some widely accepted principles: Investors with a high risk tolerance or those seeking aggressive wealth growth may prefer stocks; those with a low risk tolerance may prefer to give up the higher expected returns of stocks in exchange for the lower volatility of bonds. Many investors fall somewhere in between.

To identify a model that fits an investor's needs and preferences, it can be helpful to go beyond generalities and quantify such tradeoffs. Investors may want to know, for example, how long it would have taken a 100% equity model to recover from a market downturn vs. a model holding 60% equities and 40% fixed income (60/40) or one with 100% fixed income. To find an asset allocation that an investor can stick with, it is also useful to know how much worse a five-year performance could be for a 60/40 allocation vs. one with 100% fixed income or 100% equity. Finally, it is helpful to evaluate how different allocations hold up to inflation and changes in standards of living.

In this study, we examine the historical performance of different wealth-focused index models to provide financial professionals with a better understanding of these tradeoffs.

To do so, we use the Dimensional Core and Core Plus Wealth Index Models (UK).[1] These index models are designed to help investors assess the performance of different asset allocations over time. The Core Wealth Index Models have a moderate focus on securities with higher expected returns. The Core Plus Wealth Index Models apply a stronger emphasis on securities with higher expected returns by taking on more deviation from the market in pursuit of reliable equity and fixed income premiums. For the construction of the Core and Core Plus Wealth Index Models as of 31 December 2021, see the appendix.[2]
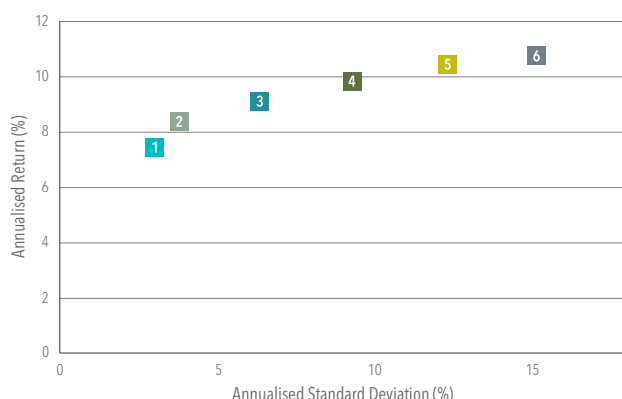
BALANCING RISK AND RETURN

Model portfolios are often offered in a range of equity/fixed income allocations. Investors' wealth goals can range from preservation of capital to aggressive wealth growth, and the split between equities and fixed income in a portfolio is one of the most effective tools for balancing the expected risk and return.

The relative historical performance of the Dimensional Core Wealth Index Models (UK)—which range from 100% fixed income to 100% equity in increments of 20%—helps to illustrate how the split between equities and fixed income can be used to find the right balance for an investor. **Exhibit 1** shows the annualised return and standard deviation of the index models over the period January 1985 to December 2021.

Not surprisingly, both realized return and volatility increase as the equity allocation increases across the models. At 20% equity and 80% fixed income, the Core 20/80 Wealth Index Model had an annualised return of 8.34% over this period, with an annualised standard deviation of 3.75%. In comparison, the Core 80/20 Wealth Index Model, composed of 80% equities and 20% fixed income, had an annualised return of 10.44%, with an annualised standard deviation of 12.33%.

Put differently, a hypothetical £1 invested in the 20/80 model in 1985 would have grown to £19.37 by the end of 2021, whereas it would have grown to £39.41 had it been invested in the 80/20 model.[3]

EXHIBIT 1: Annualised Return and Standard Deviation, *January 1985–December 2021*

	Name	Annualised Return (%)	Annualised Standard Deviation* (%)
1	Dimensional Core 0/100 Wealth Index Model (UK)	7.40	3.05
2	Dimensional Core 20/80 Wealth Index Model (UK)	8.34	3.75
3	Dimensional Core 40/60 Wealth Index Model (UK)	9.10	6.34
4	Dimensional Core 60/40 Wealth Index Model (UK)	9.83	9.29
5	Dimensional Core 80/20 Wealth Index Model (UK)	10.44	12.33
6	Dimensional Core 100/0 Wealth Index Model (UK)	10.72	15.17

Past performance, including hypothetical performance, does not predict future returns.

*Annualised number is presented as an approximation by multiplying the monthly number by the square root of the number of periods in a year. Please note that the number computed from annual data may differ materially from this estimate. In GBP. Source: Dimensional. Indices are not available for direct investment. All performance results of the hypothetical index models are based on performance of indices with model/backtested asset allocations. The performance was achieved with the benefit of hindsight and does not represent actual investment strategies. The model's performance does not reflect advisory fees or other expenses associated with the management of an actual portfolio. There are limitations inherent in model allocations. In particular, model performance may not reflect the impact that economic and market factors may have had on the advisor's decision-making if the advisor were actually managing client money. See appendix for descriptions of the Dimensional Index Models.

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1. For brevity, the Dimensional Core Wealth Index Models (UK) are also referred to in this paper as the "Core Wealth Index Models," "Core Models," or simply "Core." Similarly, the Dimensional Core Plus Wealth Index Models (UK) are also referred to as the "Core Plus Wealth Index Models," "Core Plus Models," or simply "Core Plus."

2. For additional information on the Dimensional Core and Core Plus Wealth Index Models (UK), see Dimensional's *Matrix Book 2022*. For additional information on asset allocation, see Kaitlin Simpson Hendrix, "Dimensional's Approach to Asset Allocation," *Insights* (blog), Dimensional Fund Advisors, December 2021.
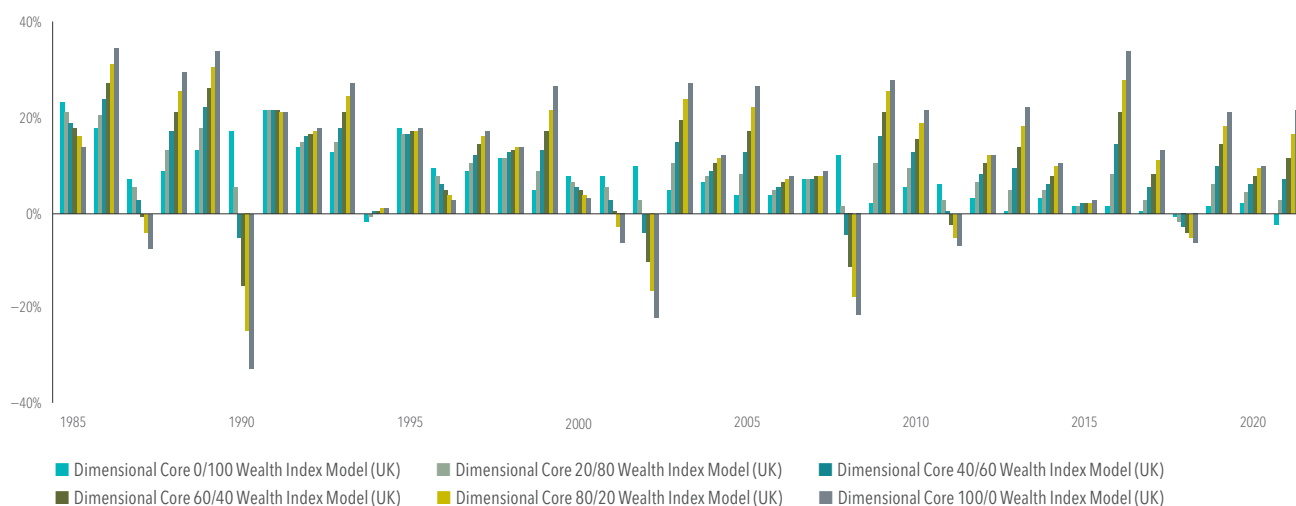
3. See appendix for additional methodology information.

Panel A of **Exhibit 2** shows calendar-year returns for the six models from 1985 to 2021. While the models with larger allocations to equities delivered better performance in many years with strong stock market returns, they also underperformed more when equity returns were negative, leading to more year-over-year volatility in model performance. For instance, in 2008, a disappointing year for equity markets, the return to the all-equity Core 100/0 Wealth Index Model was −20.88%. Performance then swung strongly positive in 2009 with a return of 27.77%. By comparison, the all-fixed-income Core 0/100 Wealth Index Model returned approximately 12.16% in 2008 and 2.08% in 2009.

We see a similar pattern in **Panel B** of **Exhibit 2**, which presents the average, best, and worst annualised rolling one-year, three-year, and five-year returns to each model. Across all time horizons, as the model weight in equity increases, the average performance increases. For example, the average annualised rolling five-year return to the 100% equity model was 9.86%, exceeding the average of 9.24% for the 60/40 model, which in turn exceeded the 7.40% for the all-fixed-income model.

On the flip side, the all-equity model experienced the most severe worst return across all time horizons.

EXHIBIT 2: Calendar-Year Returns and Best and Worst Returns, *January 1985–December 2021*

PANEL A: Calendar-Year Returns

■ Dimensional Core 0/100 Wealth Index Model (UK) ■ Dimensional Core 20/80 Wealth Index Model (UK) ■ Dimensional Core 40/60 Wealth Index Model (UK)
■ Dimensional Core 60/40 Wealth Index Model (UK) ■ Dimensional Core 80/20 Wealth Index Model (UK) ■ Dimensional Core 100/0 Wealth Index Model (UK)

Past performance, including hypothetical performance, does not predict future returns.

PANEL B: Average, Best, and Worst Annualised Rolling Returns

	1 Year			3 Year			5 Year		
	Average Return	Best Return (Start Date)	Worst Return (Start Date)	Average Return	Best Return (Start Date)	Worst Return (Start Date)	Average Return	Best Return (Start Date)	Worst Return (Start Date)
Dimensional Core 0/100 Wealth Index Model (UK)	7.53%	28.56% Apr-85	−2.16% Sep-17	7.35%	19.26% May-90	−0.30% Jul-16	7.40%	16.44% Sep-88	0.04% Nov-16
Dimensional Core 20/80 Wealth Index Model (UK)	8.44%	27.58% Sep-85	−1.87% Feb-94	8.12%	18.79% Oct-90	0.64% Apr-17	8.12%	15.59% Sep-88	2.09% Apr-15
Dimensional Core 40/60 Wealth Index Model (UK)	9.30%	32.93% Sep-85	−9.39% Nov-07	8.75%	20.03% Oct-90	0.03% Mar-06	8.70%	16.83% Jan-85	3.07% Apr-15
Dimensional Core 60/40 Wealth Index Model (UK)	10.25%	43.30% Sep-92	−16.70% Oct-89	9.36%	21.30% Oct-90	−3.28% Mar-06	9.24%	18.10% Jan-85	3.01% Apr-98
Dimensional Core 80/20 Wealth Index Model (UK)	11.22%	54.93% Sep-92	−25.80% Oct-89	9.89%	22.47% Feb-91	−6.70% Apr-00	9.70%	19.23% Jan-85	1.09% Apr-98
Dimensional Core 100/0 Wealth Index Model (UK)	11.93%	66.83% Sep-92	−33.86% Oct-89	10.12%	26.40% Apr-03	−10.69% Apr-00	9.86%	20.04% Aug-92	−1.32% Sep-87

Past performance, including hypothetical performance, does not predict future returns.

Other aspects of risk worth considering are potential drawdowns and the length of time it may take to recover lost value. Consider, for instance, an investor's experience during a challenging market environment. **Exhibit 3** shows the drawdown for each of the models over the global financial crisis from November 2007 through February 2010. We present the duration of the peak-to-trough drop and the length of time it takes to recover the value from each maximum drawdown over the period. As the equity allocation increases across the models, the drawdown was larger and time to recovery lengthened. An investor in the Dimensional Core 100/0 Wealth Index Model (UK) would have seen a loss of around 35% of the value of their investment over the 16-month period ending February 2009, and it would have taken 12 months to get back to the previous peak. In contrast, an investor in the Dimensional Core 40/60 Wealth Index Model (UK) would have experienced a loss of around 11% during the model's largest downturn ending February 2009, and it would have taken only five months to recover.

Making sure that the asset allocation is consistent with investors' risk tolerance can help them stick to their investment plan during challenging times.

These results suggest that an all-equity or equity-heavy model portfolio may be appropriate for investors with a focus on growth of wealth and a high risk tolerance. For investors whose investment goal is primarily the preservation of capital or those with a low risk tolerance, a model invested predominantly in fixed income securities may be the appropriate allocation. For investors with a moderate risk tolerance or those who seek total returns consisting of both capital appreciation and current income, a blended asset allocation, such as 60% equity and 40% fixed income, may be fitting.

EMPHASIS ON HIGHER EXPECTED RETURNS

The degree of emphasis on securities with higher expected returns is another lever that can be used to balance expected risk and return. For instance, compared to the Core Wealth Index Models, the Core Plus Wealth Index Models place greater emphasis on reliable equity and fixed income premiums by (i) overweighting stocks with lower market capitalisations, lower relative prices, and higher profitability, and (ii) focusing on longer duration and lower-credit-quality bonds.[4]

While we expect such securities to outperform every day, realized returns are volatile and premiums can vary over time. The relative performance of an investment approach that pursues premiums systematically depends on the degree of emphasis the approach places on the premiums and the realization of those premiums.

For example, over the long term, from January 1985 through December 2021, the Core Plus 60/40 Wealth Index Model outperformed its Core counterpart by 40 basis points (bps) annualised. For a hypothetical £1 million invested in a 60/40 allocation in 1985, this is a 15% difference in ending wealth as of year-end 2021.[5]

Yet year-by-year performance varied. Over the one-year period ending 30 June 2020, the Core Plus 60/40 Wealth Index Model underperformed the Core 60/40 Wealth Index Model by 263 bps, driven primarily by a negative value premium. Over the following year ending 30 June 2021, when the value premium was strongly positive, the Core Plus 60/40 Wealth Index Model outperformed by 335 basis points.

It is therefore important to consider the tradeoff between targeting higher expected returns and the risk of underperforming when the targeted premiums do not materialize. Investors with lower risk tolerance may prefer a Core-like investment approach with a moderate amount of deviation from the market in the pursuit of higher expected returns. For investors with higher risk tolerance, a Core-Plus-like investment approach with greater deviations from the market in the pursuit of higher expected returns may be a better fit.
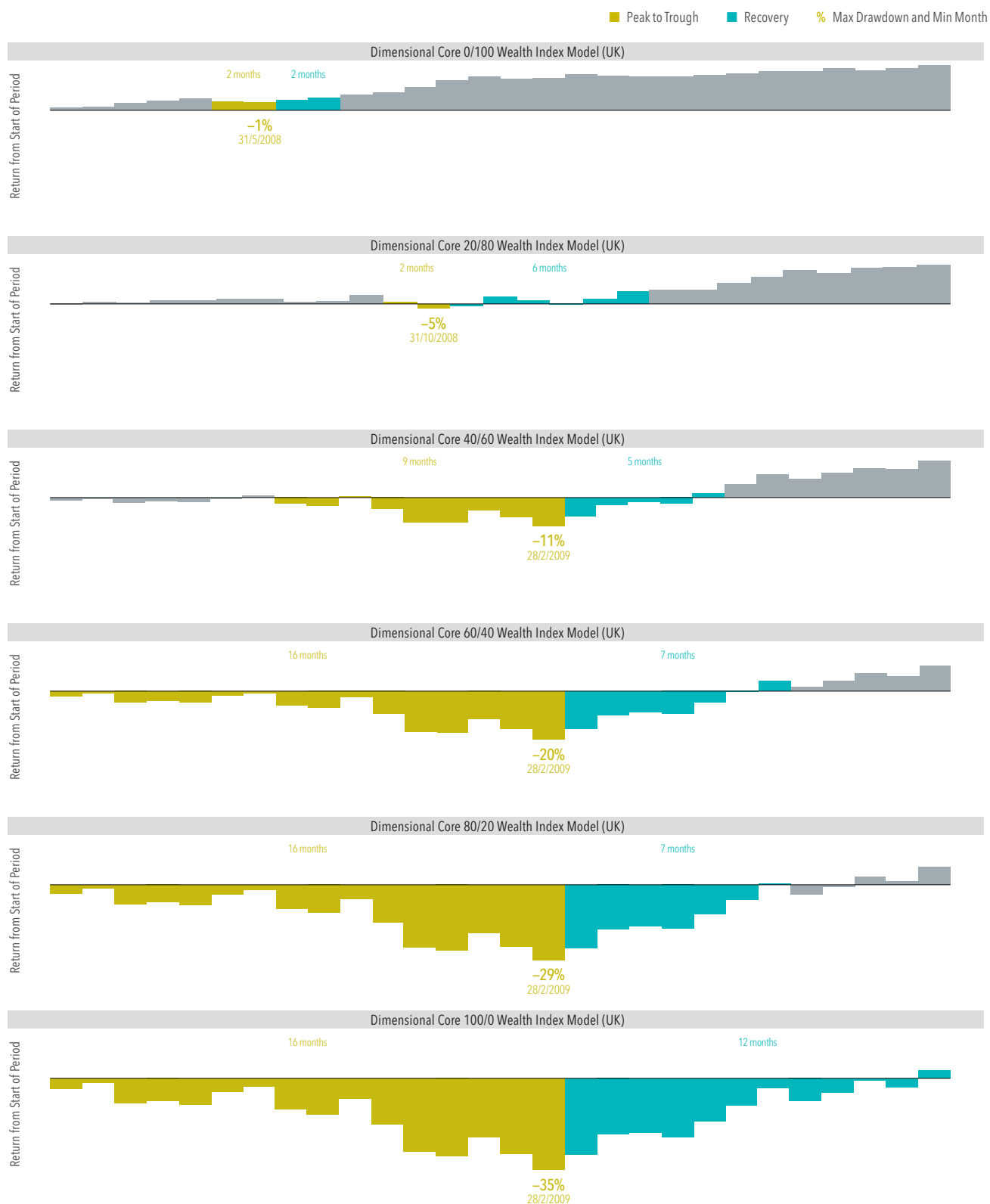
INFLATION AND STANDARD OF LIVING RISK

When making asset allocation decisions, investors also face inflation risk and standard-of-living risk. Positive nominal returns over a given period can still result in a reduction in purchasing power if those returns do not outpace inflation. Even realized returns that beat inflation can feel like a loss if they do not keep up with the change in societal standard of living, which has been positive annually on average since the 1960s in the UK, as measured by household final consumption expenditure per capita. Changes in the standard of living reflect changes in consumer preferences for the quantity, quality, and diversity of goods and services consumed over time.

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4. Profitability is measured as operating income before depreciation and amortisation minus interest expense scaled by book.
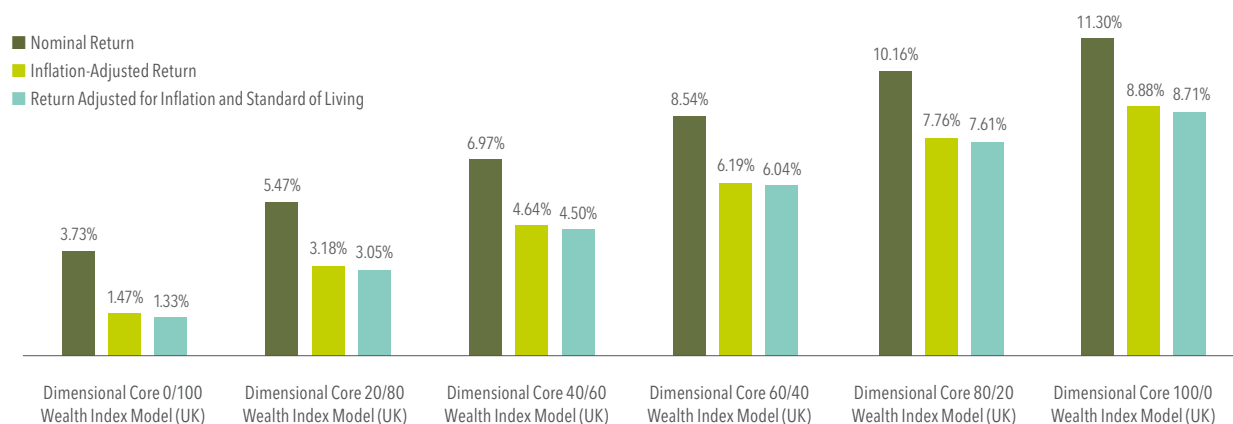
5. £1 invested in the Dimensional Core Plus 60/40 Wealth Index Model (UK) in 1985 would have grown to £36.83 by the end of 2021, whereas it would have grown to £32.06 had it been invested in the Dimensional Core 60/40 Wealth Index Model (UK). See appendix for additional methodology information.

EXHIBIT 3: Drawdown and Recovery during the Global Financial Crisis, *November 2007–February 2010*

■ Peak to Trough   ■ Recovery   **%** Max Drawdown and Min Month

Dimensional Core 0/100 Wealth Index Model (UK)

Return from Start of Period

2 months   2 months

−1%
31/5/2008

Dimensional Core 20/80 Wealth Index Model (UK)

Return from Start of Period

2 months   6 months

−5%
31/10/2008

Dimensional Core 40/60 Wealth Index Model (UK)

Return from Start of Period

9 months   5 months

−11%
28/2/2009

Dimensional Core 60/40 Wealth Index Model (UK)

Return from Start of Period

16 months   7 months

−20%
28/2/2009

Dimensional Core 80/20 Wealth Index Model (UK)

Return from Start of Period

16 months   7 months

−29%
28/2/2009

Dimensional Core 100/0 Wealth Index Model (UK)

Return from Start of Period

16 months   12 months

−35%
28/2/2009

In GBP. Source: Dimensional. Indices are not available for direct investment. All performance results of the hypothetical index models are based on performance of indices with model/backtested asset allocations. The performance was achieved with the benefit of hindsight and does not represent actual investment strategies. The models' performance does not reflect advisory fees or other expenses associated with the management of an actual portfolio. There are limitations inherent in model allocations. In particular, model performance may not reflect the impact that economic and market factors may have had on the advisor's decision-making if the advisor were actually managing client money. See appendix for descriptions of the Dimensional Index Models. Indices are not available for direct investment.

EXHIBIT 4: Average Annual Returns Adjusted for UK Inflation and Standard of Living, *2002–2021*

Past performance, including hypothetical performance, does not predict future returns.

In GBP. Source: Dimensional, Office for National Statistics. Inflation proxied by the UK Consumer Price Index. Change in UK standard of living computed using the annual change in household final consumption expenditure per capita at current prices. All performance results of the hypothetical models are based on performance of indices with model/backtested asset allocations. The performance was achieved with the benefit of hindsight and does not represent actual investment strategies. The models' performance does not reflect advisory fees or other expenses associated with the management of an actual portfolio. There are limitations inherent in model allocations. In particular, model performance may not reflect the impact that economic and market factors may have had on the advisor's decision-making if the advisor were actually managing client money.

See appendix for descriptions of the Dimensional Index Models. All rights reserved. Indices are not available for direct investment.

Exhibit 4 shows nominal returns, inflation-adjusted returns, and returns adjusted for both inflation and changes in the standard of living in the UK for the Dimensional Core Wealth Index Models (UK) over the 20-year period from 2002 through 2021. Inflation is proxied by the UK Consumer Price Index and standard-of-living adjustments are computed using the annual change in household final consumption expenditure per capita.

Both inflation and standard-of-living adjustments meaningfully chip away at an investor's return.

The reduction in purchasing power due to inflation is greater for the equity-heavy models than for the fixed-income-heavy models, although the difference in magnitudes is small. Over the 20-year period ending 31 December 2021, the average annual return of the all-fixed-income model falls from 3.73% to 1.47% after adjusting for inflation, a reduction of 2.26 percentage points. By comparison, the all-equity model falls by 2.42 percentage points, from 11.30% to 8.88%, when adjusted for inflation over the same period.

The impact of the standard-of-living adjustment also eats away at an investor's return. For the all-fixed-income model, the average annual nominal return falls to an inflation- and standard-of-living adjusted 1.33%. The average annual nominal return of the all-equity model falls to an adjusted return of 8.71%.

As shown by Dai and Medhat (2021), equities have outpaced inflation over the long term.[6] This study further contributes to the literature by showing that equities have also outpaced the growth in standard of living over time. It is important for investors to evaluate asset allocation decisions with inflation and standard-of-living risk in mind and to set expectations for long-term financial goals.

PUTTING IT ALL TOGETHER

Picking a model portfolio with the appropriate equity/fixed income split and degree of emphasis on securities with higher expected returns may help investors stay the course during periods of high market volatility and better position them to achieve their long-term investment goals. This study helps quantify the risk-return tradeoffs across different wealth models, examining multiple types of risk: volatility of returns, inflation risk, and standard-of-living risk. A better understanding of the risk-return tradeoffs of different model portfolios can empower a financial advisor to better align clients' portfolios with their risk tolerance and long-term investment goals and, as a result, provide a better investment experience.

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6.   For more on this, see: Wei Dai and Mamdouh Medhat, "US Inflation and Global Asset Returns." Available at SSRN: 3882899.

APPENDIX

Wealth Index Model Allocations as of 31 December, 2021

Dimensional Core Wealth Index Models (UK)

	0%	20%	40%	60%	80%	100%
EQUITY	**0%**	**20%**	**40%**	**60%**	**80%**	**100%**
Dimensional UK Core Equity Index	0.0	0.8	1.6	2.4	3.2	4.0
Dimensional International ex UK Core Equity Index	0.0	16.6	33.2	49.8	66.4	83.0
Dimensional Emerging Markets Core Equity Index	0.0	2.6	5.2	7.8	10.4	13.0
FIXED INCOME	**100%**	**80%**	**60%**	**40%**	**20%**	**0%**
Dimensional Global Ultra-Short Fixed Income Index (Hedged to GBP)	25.0	5.0	0.0	0.0	0.0	0.0
Dimensional Global Short-Term Government Variable Maturity Index (Hedged to GBP)	75.0	60.0	40.0	20.0	0.0	0.0
Dimensional Targeted Credit Index (Hedged to GBP)	0.0	15.0	15.0	10.0	10.0	0.0
Dimensional Global Core Plus Index (Hedged to GBP)	0.0	0.0	5.0	10.0	10.0	0.0

See "Index Descriptions" for descriptions of Dimensional index data. Indices are not available for direct investment.

Dimensional Core Plus Wealth Index Models (UK)

	0%	20%	40%	60%	80%	100%
EQUITY	**0%**	**20%**	**40%**	**60%**	**80%**	**100%**
Dimensional UK Core Equity Index	0.0	0.5	1.1	1.6	2.1	2.7
Dimensional International ex UK Core Equity Index	0.0	11.1	22.1	33.2	44.3	55.3
Dimensional Global Targeted Value Index	0.0	5.8	11.6	17.4	23.2	29.0
Dimensional Emerging Markets Core Equity Index	0.0	1.7	3.5	5.2	6.9	8.7
Dimensional Emerging Markets Targeted Value Index	0.0	0.9	1.7	2.6	3.5	4.3
FIXED INCOME	**100%**	**80%**	**60%**	**40%**	**20%**	**0%**
Dimensional Global Ultra-Short Fixed Income Index (Hedged to GBP)	5.0	0.0	0.0	0.0	0.0	0.0
Dimensional Global Short-Term Government Variable Maturity Index (Hedged to GBP)	80.0	50.0	30.0	10.0	0.0	0.0
Dimensional Targeted Credit Index (Hedged to GBP)	15.0	25.0	20.0	15.0	5.0	0.0
Dimensional Global Core Plus Index (Hedged to GBP)	0.0	5.0	10.0	15.0	15.0	0.0

See "Index Descriptions" for descriptions of Dimensional index data. Indices are not available for direct investment.

GROWTH OF WEALTH METHODOLOGY

Past performance, including hypothetical performance, is no guarantee of future results. In GBP. Growth of wealth shows the growth of a hypothetical investment of £1 in the securities in each of the Dimensional indices. Performance includes reinvestment of dividends and capital gains.

Indices are not available for direct investment; therefore, their performance does not reflect the expenses associated with the management of an actual portfolio. Index returns are not representative of actual portfolios and do not reflect costs and fees associated with an actual investment.

Index Descriptions

DIMENSIONAL CORE 0/100 WEALTH INDEX MODEL (UK): Dimensional Wealth Index Model data compiled by Dimensional. The Dimensional Core 0/100 Wealth Index Model (UK) combines the following indices: Dimensional Global Short-Term Government Variable Maturity Index (hedged to GBP) (75%) and Dimensional Global Ultra-Short Fixed Income Index (hedged to GBP) (25%). The Wealth Index Model has been retrospectively calculated by Dimensional and did not exist prior to March 2020.

DIMENSIONAL CORE 20/80 WEALTH INDEX MODEL (UK): Dimensional Wealth Index Model data compiled by Dimensional. 20% of the weight is allocated to the Dimensional Core 100/0 Wealth Index Model (UK), and 80% of the weight is allocated to the following fixed income indices: Dimensional Global Short-Term Government Variable Maturity Index (hedged to GBP) (60%), Dimensional Targeted Credit Index (hedged to GBP) (15%) and Dimensional Global Ultra-Short Fixed Income Index (hedged to GBP) (5%). The Wealth Index Model returns are calculated monthly as a weighted average of the returns of the underlying indices. The Wealth Index Model has been retrospectively calculated by Dimensional and did not exist prior to March 2020.

DIMENSIONAL CORE 40/60 WEALTH INDEX MODEL (UK): Dimensional Wealth Index Model data compiled by Dimensional. 40% of the weight is allocated to the Dimensional Core 100/0 Wealth Index Model (UK), and 60% of the weight is allocated to the following fixed income indices: Dimensional Global Short-Term Government Variable Maturity Index (hedged to GBP) (40%), Dimensional Targeted Credit Index (hedged to GBP) (15%) and Dimensional Global Core Plus Index (hedged to GBP) (5%). The Wealth Index Model returns are calculated monthly as a weighted average of the returns of the underlying indices. The Wealth Index Model has been retrospectively calculated by Dimensional and did not exist prior to March 2020.

DIMENSIONAL CORE 60/40 WEALTH INDEX MODEL (UK): Dimensional Wealth Index Model data compiled by Dimensional. 60% of the weight is allocated to the Dimensional Core 100/0 Wealth Index Model (UK), and 40% of the weight is allocated to the following fixed income indices: Dimensional Global Short-Term Government Variable Maturity Index (hedged to GBP) (20%), Dimensional Global Core Plus Index (hedged to GBP) (10%) and Dimensional Targeted Credit Index (hedged to GBP) (10%).

The Wealth Index Model returns are calculated monthly as a weighted average of the returns of the underlying indices. The Wealth Index Model has been retrospectively calculated by Dimensional and did not exist prior to March 2020.

DIMENSIONAL CORE 80/20 WEALTH INDEX MODEL (UK): Dimensional Wealth Index Model data compiled by Dimensional. 80% of the weight is allocated to the Dimensional Core 100/0 Wealth Index Model (UK), and 20% of the weight is allocated to the following fixed income indices: Dimensional Global Core Plus Index (hedged to GBP) (10%) and Dimensional Targeted Credit Index (hedged to GBP) (10%). The Wealth Index Model returns are calculated monthly as a weighted average of the returns of the underlying indices. The Dimensional Core 80/20 Wealth Index Model has been retrospectively calculated by Dimensional and did not exist prior to March 2020.

DIMENSIONAL CORE 100/0 WEALTH INDEX MODEL (UK): Dimensional Wealth Index Model data compiled by Dimensional. The Dimensional Core 100/0 Wealth Index Model (UK) combines the following indices: Dimensional UK Core Equity Index (GBP), Dimensional International ex UK Core Equity Index (GBP) and Dimensional Emerging Markets Core Equity Index (GBP). Regional weights are rebalanced quarterly. The Wealth Index Model returns are calculated monthly as a weighted average of the returns of the underlying indices. The Wealth Index Model has been retrospectively calculated by Dimensional and did not exist prior to March 2020.

DIMENSIONAL CORE PLUS 60/40 WEALTH INDEX MODEL (UK): Dimensional Wealth Index Model data compiled by Dimensional. 60% of the weight is allocated to the Dimensional Core Plus 100/0 Wealth Index Model (UK), and 40% of the weight is allocated to the following fixed income indices: Dimensional Global Core Plus Index (hedged to GBP) (15%), Dimensional Targeted Credit Index (hedged to GBP) (15%) and Dimensional Global Short-Term Government Variable Maturity Index (hedged to GBP) (10%). The Wealth Index Model returns are calculated monthly as a weighted average of the returns of the underlying indices. The Wealth Index Model has been retrospectively calculated by Dimensional and did not exist prior to March 2020.

DIMENSIONAL UK CORE EQUITY INDEX: Compiled by Dimensional from Bloomberg, LSPD securities data. Targets all the securities in the eligible markets with an emphasis on companies with smaller capitalisation, lower relative price and higher profitability, 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 defined as operating income before depreciation and amortisation minus interest expense divided by book equity. 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 sub-indices, each one reconstituted once a year at the end of each quarter of the year. Maximum index weight of any one company is capped at 10%. Exclusion: investment companies. The index has been retrospectively calculated by Dimensional and did not exist prior to April 2008. Accordingly, the results shown during the periods prior to April 2008 do not represent actual returns of the index. The calculation methodology for the index was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. The calculation methodology for the index was amended in November 2019 to include asset growth as a factor in selecting securities for inclusion in the index.

DIMENSIONAL INTERNATIONAL EX UK CORE EQUITY INDEX: Compiled by Dimensional from Bloomberg securities data. Targets all the securities in the eligible markets with an emphasis on companies with smaller capitalisation, lower relative price and higher profitability, 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 defined as operating income before depreciation and amortisation minus interest expense divided by book equity. 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 sub-indices, each one reconstituted once a year at the end of each quarter of the year. Maximum index weight of any one company is capped at 5%. Countries currently included are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland and the US. Exclusions: investment companies. The index has been retrospectively calculated by Dimensional and did not exist prior to April 2008. Accordingly, the results shown during the periods prior to April 2008 do not represent actual returns of the index. The calculation methodology for the index was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. The calculation methodology for the index was amended in November 2019 to include asset growth as a factor in selecting securities for inclusion in the index.

DIMENSIONAL EMERGING MARKETS CORE EQUITY INDEX: Compiled by Dimensional from Bloomberg securities data. Targets all the securities in the eligible markets with an emphasis on companies with smaller capitalisation, lower relative price and higher profitability, 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 defined as operating income before depreciation and amortisation minus interest expense divided by book equity. 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 sub-indices, each one reconstituted once a year at the end of each quarter of the year. Maximum index weight of any one company is capped at 5%. Countries currently included are Brazil, Chile, China, Colombia, the Czech Republic, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Peru, the Philippines, Poland, Russia, South Africa, Taiwan, Thailand and Turkey. Exclusions: investment companies. The index has been retrospectively calculated by Dimensional and did not exist prior to April 2008. Accordingly, the results shown during the periods prior to April 2008 do not represent actual returns of the index. The calculation methodology for the index was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. The calculation methodology for the index was amended in November 2019 to include asset growth as a factor in selecting securities for inclusion in the index.

DIMENSIONAL GLOBAL TARGETED VALUE INDEX: January 1990–present: Compiled by Dimensional from Bloomberg securities data. Consists of small and mid cap companies whose relative price is in the bottom 50% of their country's small and mid cap universe, after the exclusion of utilities and companies with either negative or missing relative price data. The index excludes securities with the lowest profitability 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 defined as operating income before depreciation and amortisation minus interest expense divided by book equity. 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 sub-indices, each one reconstituted once a year at the end of each quarter of the year. Maximum index weight of any one company is capped at 5%. Countries currently included are Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the UK and the US. Exclusions: REITs and investment companies. The index has been retrospectively calculated by Dimensional and did not exist prior to April 2008. Accordingly, the results shown during the periods prior to April 2008 do not represent actual returns of the index. The calculation methodology for the index was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. The calculation methodology for the index was amended in November 2019 to include asset growth as a factor in selecting securities for inclusion in the index.

Prior to January 1990: Constructed by market cap weighting Dimensional US Targeted Value Index and an international targeted value index.

DIMENSIONAL EMERGING MARKETS TARGETED VALUE INDEX: Compiled by Dimensional from Bloomberg securities data. Consists of small and mid cap companies in eligible markets whose relative price is in the bottom 50% of their country's respective constituents, after the exclusion of utilities and companies with either negative or missing relative price data.

The index excludes securities with the lowest profitability 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 defined as operating income before depreciation and amortisation minus interest expense divided by book equity. 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 sub-indices, each one reconstituted once a year at the end of each quarter of the year. Maximum index weight of any one company is capped at 5%. Countries currently included are Brazil, Chile, China, Colombia, the Czech Republic, Hungary, India, Indonesia, Korea, Malaysia, Mexico, Peru, the Philippines, Poland, Russia, South Africa, Taiwan, Thailand and Turkey. Exclusions: REITs and investment companies. The index has been retrospectively calculated by Dimensional and did not exist prior to April 2008. Accordingly, the results shown during the periods prior to April 2008 do not represent actual returns of the index. The calculation methodology for the index was amended in January 2014 to include profitability as a factor in selecting securities for inclusion in the index. The calculation methodology for the index was amended in November 2019 to include asset growth as a factor in selecting securities for inclusion in the index.

DIMENSIONAL GLOBAL ULTRA-SHORT FIXED INCOME INDEX (HEDGED TO GBP): February 1999–present: Compiled by Dimensional using data provided by Bloomberg. 50% of the weight is allocated to the ICE BofA SONIA 1-Month Constant Maturity Index and 50% is allocated to the Dimensional Global 1–2 Yr Government/Corporate AAA-BBB Market. Based on securities in the universe of Bloomberg Global Aggregate 1–2 Year Index. Includes government and corporate AAA-BBB bonds. Rebalanced monthly. The index has been retrospectively calculated by Dimensional and did not exist prior to January 2022. Accordingly, results shown during the periods prior to January 2022 do not represent actual returns of the index.

December 1989–January 1999: ICE BofA SONIA 1-Month Constant Maturity Index.

Prior to December 1989: 1-Month UK Treasury Bills.

DIMENSIONAL GLOBAL SHORT-TERM GOVERNMENT VARIABLE MATURITY INDEX (HEDGED TO GBP): Compiled by Dimensional using FTSE data. Includes securities in the FTSE World Government Bond 1–3 Years and 3–5 Years indices. Countries included are Australia, Austria, Belgium, Canada, France, Germany, Japan, the Netherlands, New Zealand, Norway, Spain, Sweden, Switzerland, the UK and the US as data becomes available. Countries with the steepest yield curves are overweight with respect to their market cap weight. Rebalanced monthly. The index has been retrospectively calculated by Dimensional and did not exist prior to January 2019. Accordingly, results shown during the periods prior to January 2019 do not represent actual returns of the index. Other periods selected may have different results, including losses.

DIMENSIONAL TARGETED CREDIT INDEX (HEDGED TO GBP): Compiled by Dimensional from Bloomberg securities data. Based on securities in the universe of the Bloomberg Global Aggregate Index and Global High Yield Index. Includes global investment grade corporate bonds and global BB corporates only. Eligible currencies: AUD, CAD, CHF, EUR, GBP, JPY and USD. Within the universe, the index identifies the yield curves that offer higher expected returns, the duration ranges on those yield curves offering higher expected returns, and assesses the increased expected returns associated with allocation to bonds with different credit qualities. It then overweights (with respect to their market cap weight) bonds of yield curves, duration ranges and credit qualities that offer higher expected returns. It also employs credit quality, currency and duration requirements relative to the eligible market. Rebalanced monthly. The index has been retrospectively calculated by Dimensional and did not exist prior to January 2020. Accordingly, results shown during the periods prior to January 2020 do not represent actual returns of the index. Other periods selected may have different results, including losses.

DIMENSIONAL GLOBAL CORE PLUS INDEX (HEDGED TO GBP): Compiled by Dimensional from Bloomberg securities data. Based on securities in the universe of the Bloomberg Global Aggregate Index and Global High Yield Index. Includes global government bonds, global investment grade corporate bonds and global BB corporates. Eligible currencies: AUD, CAD, CHF, EUR, GBP, JPY and USD. Within the universe, the index identifies the yield curves that offer higher expected returns, the duration ranges on those yield curves offering higher expected returns, and assesses the increased expected returns associated with allocation to bonds with different credit qualities. It then overweights (with respect to their market cap weight) bonds of yield curves, duration ranges and credit qualities that offer higher expected returns. It also employs credit quality, currency and duration requirements relative to the eligible market. Rebalanced monthly. The index has been retrospectively calculated by Dimensional and did not exist prior to January 2019. Accordingly, results shown during the periods prior to January 2019 do not represent actual returns of the index. Other periods selected may have different results, including losses.

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