

Uncommon truths

Hot, Hot, Hot!

We are seeing extreme climatic conditions but 2027 could be even worse. The trend looks set for a 3.5-4.2°C change by 2100. This suggests we need massive mitigation and adaptation spending.

Hot, Hot, Hot (borrowed from The Merry-men) could describe the situation in the Middle East. The Brent first futures price has risen back to near \$100, bond yields are up, the dollar is strengthening and stock markets are down. However, implied volatility indices such as VIX and MOVE suggest there is little panic. We are monitoring the situation but still expect global economic resilience and stick with our preference for cyclical assets. However, that could change if the Strait of Hormuz and Red Sea remain closed into Q4.

But the title of this document refers to the extreme temperatures seen in Europe and North America (accompanied by wildfires in Canada, France and Spain, extremely low rainfall in the UK, low rivers in many parts of Europe and spikes in excess deaths in countries such as Belgium, France, Germany and Spain). Based on data from the UK Meteorological Office's Hadley Centre, I reckon the average global temperature (sea and air surface) in January-May was 1.43°C above the 1850-1900 average for the time of year. That is bad but was exceeded in 2024 (1.59), 2025 (1.52), 2016 (1.48) and 2020 (1.45).

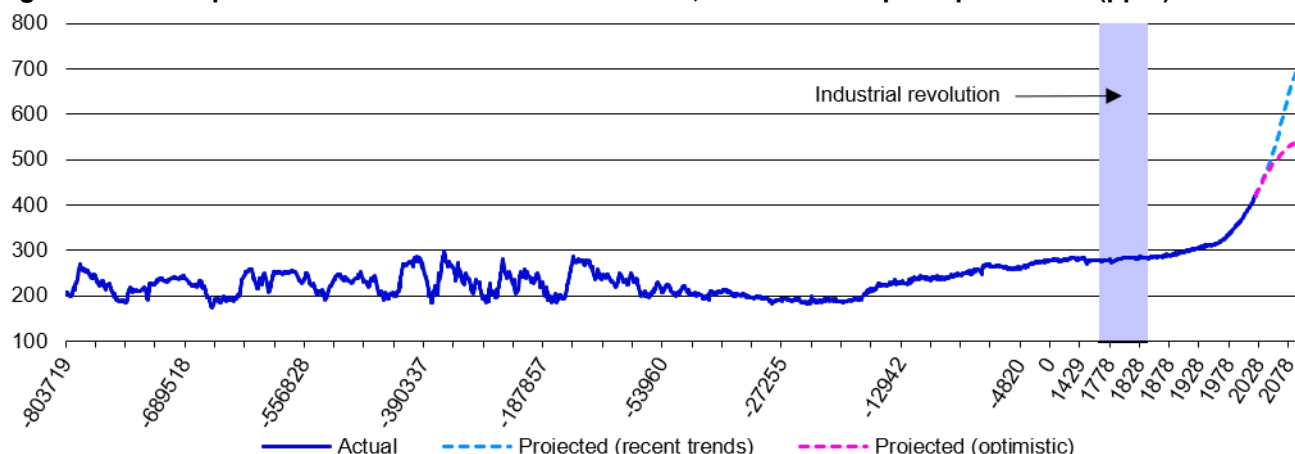
Then came June, the hottest ever in Western Europe and the second hottest globally, with the surface air

temperature 1.39°C above the 1850-1900 average, according to the EU's Copernicus Climate Change Service (June 2024 was the hottest at 1.50°C above the 1850-1900 average).

Unfortunately, it could get even hotter. Though 2026 may not turn out to be the hottest year on record, I think 2027 could be, due to building El Nino conditions. The global sea-surface temperature averaged 20.86°C in June, the hottest June on record for extra-polar (60°S-60°N) oceans, with high temperatures particularly notable in the Pacific, including some of the Nino 3.4 region used to monitor El Nino events. From July onwards, the historical peaks came in 2023, a period that preceded the 2023-24 El Nino event associated with the record temperatures of 2024.

To that building El Nino event must be added the overall warming trend (see Figure 2b). Are rising temperatures (and broader climate change) caused by human activity? Perhaps it is just coincidence, but the atmospheric concentration of CO₂ reached a new high of 429.35 parts per million (ppm) in 2025, according to the US National Oceanic and Atmospheric Administration. Figure 1 shows this to be well above the norms of the last 800,000 years. As CO₂ concentration is correlated to CO₂ emissions in the previous one hundred years, I believe that rising CO₂ emissions have contributed to rising temperatures (molecules of greenhouse gases such as CO₂ absorb energy, thus holding heat in the atmosphere).

Figure 1 – Atmospheric concentration of CO₂ from -803,719 to 2100 in parts per million (ppm)



Note: "Actual" data is from the year -803,719 (i.e. 803,719 B.C.) to 2026. Data is not available for all years, so the date axis is not to scale. Data is shown for each year from 1750, using simple interpolation to fill any gaps. Data from 1958 to 2025 is based on observations at the US National Oceanic and Atmospheric Administration's (NOAA) Mauna Loa Observatory on Hawaii. The 2026 datapoint (429.7 ppm) is based on the forecast change for 2026 produced by the UK's Meteorological Office. Data prior to 1958 is derived from ice core records, as provided by NOAA Earth System Research Laboratories. Projections assume that CO₂ concentration is determined by emissions in the previous 100 years (using an econometric relationship derived from data since 1750). Projections rely on forecasts of future CO₂ emissions by low, middle and high-income countries (the global total being an aggregation of the three): "recent trends" assumes a continuation of recent trends in declines in the CO₂ intensity of GDP and growth in GDP per capita, whereas "optimistic" assumes a more aggressive reduction in CO₂ intensity (see the detailed explanation in the appendix). In both cases, population forecasts are taken from the UN's World Population Prospects 2024. "Industrial revolution" is the period 1760-1840. Source: NOAA, Our World in Data, UK Meteorological Office, United Nations, World Bank, LSEG Datastream and Invesco Strategy & Insights

The good news is that we can do something about it. However, CO₂ emissions hit a new high in 2025 (41.0bn tonnes, according to the Energy Institute Statistical Review of World Energy). I reckon they will continue climbing, using a model that calculates CO₂ emissions as the product of population, GDP per capita and the CO₂ intensity of GDP.

Of course, the outcome depends on the assumptions. UN Medium Variant projections suggest the world's population will rise from 8.2bn in 2025 to a peak of 10.3bn in 2084. Luckily, that peak is around 1bn lower than predicted in 2015 (total population was then expected to reach 11.21bn in 2100 and to go higher). Nevertheless, if real incomes (and spending) continue to rise, that 26% gain in population will require massive technological shifts to stabilise CO₂ emissions. Figure 2a shows that we are on the right path, with a gradual decline in the CO₂ intensity of economic activity. Technological change will hopefully drive it even lower.

Unfortunately, it isn't happening fast enough. If CO₂ intensity follows recent trends, I estimate that annual CO₂ emissions will double by the time they peak in 2072 (assumptions are in the appendix). Based on my models, this, and the emissions of recent decades, will result in a further rise in the atmospheric concentration of CO₂ (see "Projected (recent trends)" in Figure 1). This leads me to conclude that by 2100 the global temperature will be 4.2°C higher than the 1850-1900 average, based on the model shown in Figure 2b (which shows the variance versus 1961-1990).

A highly optimistic scenario, that sees high-income country gross emissions fall to zero by 2060 and a doubling of the rate of decline in CO₂ intensity in low- and middle-income countries, gives the result that global CO₂ emissions fall from here and would halve by 2091. But CO₂ concentration would continue to climb because of past emissions (see "Projected (optimistic)" in Figure 1) with a peak in 2088. Nevertheless, I still predict a temperature gain of 3.5°C versus 1850-1900 by the end of the century, which shows the scale of the challenge facing us.

Even on my most optimistic scenario (accepting the simplicity of my models), the temperature change outcomes would be dramatic, as would the potential implications for weather pattern volatility, rising sea levels, health, agricultural production and migration flows. The 2100 temperature projections are roughly 0.5°C higher than what was suggested just five years ago, which shows how little progress we are making.

The world may need big investment in carbon reducing and carbon removing technology, from reforestation, through electrification of transport systems to renewable energy sources (as covered in *The 21st Century Portfolio*, November 2019, and in various editions of *Economic Transition Monitor*). That could continue to present investment opportunities in related technologies and industries. Meanwhile, large scale adaptation spending (infrastructure, food sciences etc.) may be needed as we learn to live in a changing world.

Unless stated otherwise, all data as of 24 July 2026.

Figure 2a – kg of CO₂ per 2021 PPP \$ of GDP

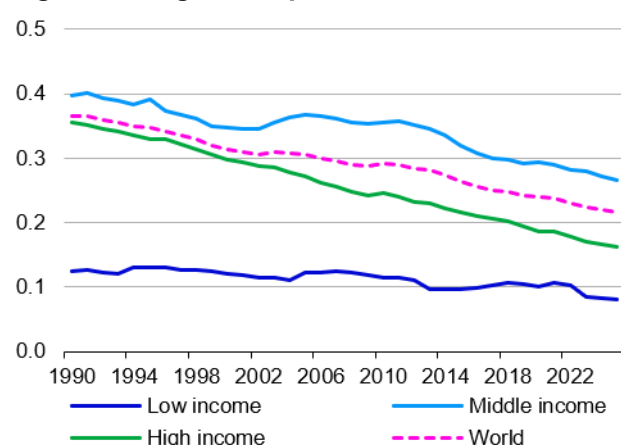
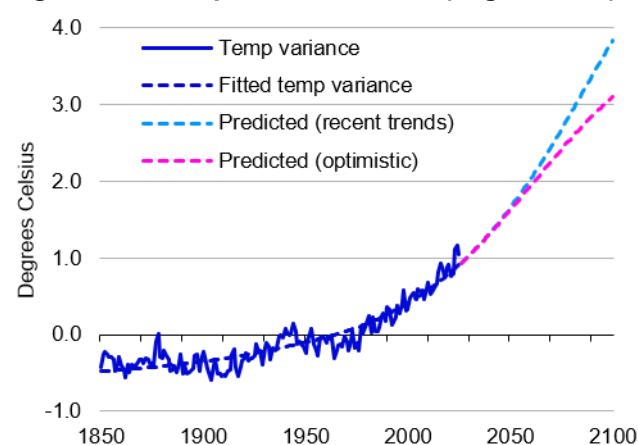


Figure 2b – Temperature variance (deg. Celsius)



Notes: Figure 2a shows the CO₂ intensity of GDP annually from 1990 to 2025 for low, middle and high-income countries (as currently defined by the World Bank). Figure 2b shows annual data from 1850 to 2100. It shows the historical global temperature variance ("Temp variance"), which is the global average land-sea temperature anomaly relative to the 1961-1990 average temperature in degrees Celsius, median estimate, as provided by UK Met Office Hadley Centre. "Fitted temp variance" is the result of a regression analysis that fits historical temperature variance to atmospheric CO₂ concentration (using the natural logarithm of the 100-year moving average of concentration, on the assumption that temperature at any moment is determined by CO₂ concentration during the previous 100 years). "Predicted (recent trends)" applies that fitted relationship to our forecast of CO₂ concentrations, assuming that recent trends in CO₂ intensity and GDP per capita continue, though with some convergence between World Bank income groups after 2050 (see appendix for details). "Predicted (optimistic)" assumes a doubling of the rate of decline in CO₂ intensity (with the added assumption that high-income CO₂ emissions trend to zero in 2060). Source: NOAA, Our World in Data, UK Meteorological Office, United Nations, World Bank, LSEG Datastream and Invesco Strategy & Insights

Figure 3 – Asset class total returns (%)

Data as at 24 Jul 2026			Total Return (USD, %)					Total Return (Local Currency, %)				
	Index	Current Level/Ry	1w	1m	QTD	YTD	12m	1w	1m	QTD	YTD	12m
Equities												
World	MSCI	1105	-0.3	0.2	-1.3	10.1	19.4	-0.1	0.1	-1.3	11.0	21.1
Emerging Markets	MSCI	1628	0.5	-5.6	-5.3	17.5	31.4	0.4	-6.0	-5.7	19.8	36.5
China	MSCI	73	0.9	3.2	4.9	-10.7	-8.0	0.9	3.1	4.9	-10.6	-8.8
US	MSCI	7068	-0.6	0.8	-1.1	8.9	17.5	-0.6	0.8	-1.1	8.9	17.5
Europe	MSCI	2792	0.0	1.8	-0.2	8.1	16.7	0.7	1.3	0.2	11.0	19.9
Europe ex-UK	MSCI	3430	-0.2	1.1	-1.1	7.7	15.8	0.5	0.9	-0.5	11.2	19.3
UK	MSCI	1702	0.5	4.4	3.0	9.4	20.0	1.4	3.0	2.6	10.4	21.9
Japan	MSCI	5425	1.7	-1.3	-1.5	14.3	24.3	2.5	-0.1	-0.7	19.4	38.6
Government Bonds												
World	BofA-ML	3.99	-0.9	-1.4	-1.4	-2.6	-2.4	-0.5	-1.4	-1.3	-1.1	0.3
Emerging Markets	JP Morgan	6.28	-0.5	0.2	-0.8	0.7	6.2	-0.5	-0.3	-0.6	1.8	5.7
China	BofA-ML	1.50	0.2	0.8	0.4	5.3	7.2	0.2	0.4	0.2	2.1	1.5
US (10y)	Datastream	4.68	-1.0	-1.8	-1.6	-1.5	2.5	-1.0	-1.8	-1.6	-1.5	2.5
Europe	BofA-ML	3.40	-0.8	-1.4	-2.2	-3.6	-3.4	-0.3	-1.7	-1.8	-0.5	-0.1
Europe ex-UK (EMU, 10y)	Datastream	3.15	-0.9	-1.6	-2.5	-3.5	-3.9	-0.4	-2.0	-2.1	-0.4	-0.6
UK (10y)	Datastream	5.11	-1.4	-0.9	-1.3	-1.8	0.8	-0.5	-2.2	-1.8	-0.9	2.4
Japan (10y)	Datastream	2.77	-1.5	-2.0	-1.5	-8.4	-16.8	-0.7	-0.8	-0.8	-4.3	-7.2
IG Corporate Bonds												
Global	BofA-ML	4.96	-0.9	-1.3	-1.4	-1.1	1.5	-0.7	-1.5	-1.3	-0.2	2.6
Emerging Markets	JP Morgan	6.70	-0.4	-0.4	-0.4	1.8	5.7	-0.4	-0.4	-0.4	1.8	5.7
China	BofA-ML	2.07	0.2	0.7	0.3	5.1	8.1	0.1	0.3	0.2	1.9	2.4
US	BofA-ML	5.47	-0.9	-1.7	-1.5	-0.5	3.2	-0.9	-1.7	-1.5	-0.5	3.2
Europe	BofA-ML	3.81	-0.8	-0.7	-1.5	-2.8	-2.3	-0.3	-1.0	-1.1	0.3	1.1
UK	BofA-ML	5.85	-1.3	-0.4	-1.0	-1.4	1.7	-0.5	-1.7	-1.4	-0.5	3.3
Japan	BofA-ML	2.46	-1.2	-1.5	-1.1	-5.0	-11.6	-0.4	-0.3	-0.4	-0.7	-1.4
HY Corporate Bonds												
Global	BofA-ML	7.31	-0.6	-0.2	-0.5	1.2	4.2	-0.5	-0.3	-0.4	1.9	5.0
US	BofA-ML	7.59	-0.6	-0.3	-0.4	1.5	4.8	-0.6	-0.3	-0.4	1.5	4.8
Europe	BofA-ML	5.90	-0.8	0.1	-0.8	-1.6	-0.4	-0.2	-0.2	-0.4	1.5	3.0
Cash (Overnight rates)												
US		3.66	0.1	0.3	0.0	1.9	4.0	0.1	0.3	0.0	1.9	4.0
Euro Area		2.18	0.5	-1.2	0.2	-1.7	-0.8	0.0	0.2	0.0	1.0	2.0
UK		3.73	1.2	-0.2	0.7	1.0	1.6	0.1	0.3	0.0	1.9	3.9
Japan		0.98	0.3	-0.7	0.7	-2.5	-9.6	0.0	0.1	0.0	0.4	0.6
Real Estate (REITs)												
Global	FTSE	1888	0.7	4.0	3.8	13.5	16.2	1.2	3.7	4.3	17.2	20.2
Emerging Markets	FTSE	1274	-2.1	0.5	0.4	-0.1	1.2	-1.6	0.1	0.9	3.1	4.7
US	FTSE	3823	1.7	5.3	5.5	24.0	25.4	1.7	5.3	5.5	24.0	25.4
Europe ex-UK	FTSE	2555	-1.2	1.1	-0.4	-2.1	-3.3	-0.7	0.8	0.0	1.0	0.0
UK	FTSE	883	1.6	7.4	6.4	13.0	15.4	2.5	6.0	6.0	14.0	17.2
Japan	FTSE	2344	-0.8	3.6	0.8	-8.5	5.2	0.0	4.8	1.6	-4.4	17.3
Commodities												
All	GSCI	5583	4.1	15.6	14.9	42.6	46.1	-	-	-	-	-
Energy	GSCI	1156	6.3	27.0	26.2	91.4	79.0	-	-	-	-	-
Industrial Metals	GSCI	2337	1.0	3.4	2.6	9.7	30.6	-	-	-	-	-
Precious Metals	GSCI	4555	1.7	1.8	0.8	-7.6	22.0	-	-	-	-	-
Agricultural Goods	GSCI	518	1.9	11.8	10.4	9.7	8.0	-	-	-	-	-
Currencies (vs USD)*												
EUR		1.14	-0.6	0.1	-0.5	-3.2	-3.3	-	-	-	-	-
JPY		163.85	-0.9	-1.3	-0.8	-4.4	-10.3	-	-	-	-	-
GBP		1.33	-0.9	1.4	0.4	-0.9	-1.6	-	-	-	-	-
CHF		1.22	-1.3	-0.7	-1.2	-3.1	-2.8	-	-	-	-	-
CNY		6.77	0.1	0.6	0.2	3.3	5.6	-	-	-	-	-

Notes: **Past performance is no guarantee of future results.** *The currency section is organised so that in all cases the numbers show the movement in the mentioned currency versus USD (+ve indicates appreciation, -ve indicates depreciation). Please see appendix for definitions, methodology and disclaimers.

Source: LSEG Datastream and Invesco Strategy & Insights

Figure 4 – Global equity sector total returns relative to market (%)

Data as of 24 Jul 2026	Global				
	1w	1m	QTD	YTD	12m
Energy	2.9	8.3	10.1	13.1	11.3
Basic Materials	2.6	0.1	1.6	-1.5	8.8
Basic Resources	4.1	0.4	2.1	-3.8	18.7
Chemicals	-0.6	-0.5	0.6	3.9	-7.5
Industrials	1.4	0.4	0.3	1.2	-2.9
Construction & Materials	0.0	-5.6	-4.7	-4.2	-8.5
Industrial Goods & Services	1.6	1.4	1.1	2.0	-2.0
Consumer Discretionary	-3.9	-2.6	-2.3	-15.6	-18.5
Automobiles & Parts	-8.8	-7.5	-11.3	-25.3	-15.2
Media	-0.7	-0.3	1.4	-23.8	-36.5
Retailers	-3.4	-1.8	0.0	-8.7	-12.6
Travel & Leisure	-0.9	-1.9	-0.9	-11.0	-18.3
Consumer Products & Services	-3.0	-0.5	0.3	-18.3	-24.0
Consumer Staples	-0.9	1.7	3.0	-2.6	-9.9
Food, Beverage & Tobacco	-0.9	1.7	2.8	-0.1	-7.4
Personal Care, Drug & Grocery Stores	-1.0	1.7	3.2	-6.9	-14.3
Healthcare	0.7	4.4	2.4	-5.6	-2.7
Financials	1.0	4.4	5.6	0.6	0.9
Banks	1.6	4.7	6.0	4.9	10.1
Financial Services	-0.3	3.1	4.4	-6.1	-11.0
Insurance	1.4	6.0	6.5	0.6	-1.5
Real Estate	0.4	2.7	4.5	-2.2	-8.5
Technology	-0.6	-3.5	-4.9	6.6	11.6
Telecommunications	-0.8	-9.4	-6.4	6.7	5.1
Utilities	1.4	2.2	3.2	-0.6	-3.7

Notes: **Past performance is no guarantee of future results.** Returns shown are for Datastream sector indices versus the total market index. Source: LSEG Datastream and Invesco Strategy & Insights

Figure 5a – US factor index total returns (%)

Data as of 24 Jul 2026	Absolute					Relative to Market				
	1w	1m	QTD	YTD	12m	1w	1m	QTD	YTD	12m
Growth	-0.9	2.4	-0.7	8.2	11.8	-0.3	1.5	0.4	-0.7	-5.2
Low volatility	0.7	3.2	2.7	9.4	6.9	1.3	2.3	3.9	0.4	-9.3
Price momentum	0.5	-3.3	-5.6	23.6	31.9	1.1	-4.0	-4.5	13.4	11.9
Quality	0.5	4.7	4.0	8.8	16.3	1.1	3.8	5.1	-0.1	-1.4
Size	-0.5	2.9	0.9	8.6	10.8	0.1	2.1	2.1	-0.3	-6.0
Value	0.5	4.6	3.9	19.2	29.8	1.1	3.8	5.0	9.4	10.1
Market	-0.6	0.8	-1.1	9.0	17.9					
Market - Equal-Weighted	0.1	1.6	0.4	12.5	16.4					

Notes: **Past performance is no guarantee of future results.** All indices are subsets of the S&P 500 index, they are rebalanced monthly, use data in US dollars and are equal-weighted. Growth includes stocks in the top third based on both their 5-year sales per share trend and their internal growth rate (the product of the 5-year average return on equity and the retention ratio); Low volatility includes stocks in the bottom quintile based on the standard deviation of their daily returns in the previous three months; Price momentum includes stocks in the top quintile based on their performance in the previous 12 months; Quality includes stocks in the top third based on both their return on invested capital and their EBIT to EV ratio (earnings before interest and taxes to enterprise value); Size includes stocks in the bottom quintile based on their market value in US dollars. Value includes stocks in the bottom quintile based on their price to book value ratios. The market represents the S&P 500 index. Source: LSEG Datastream and Invesco Strategy & Insights

Figure 5b – European factor index total returns relative to market (%)

Data as of 24 Jul 2026	Absolute					Relative to Market				
	1w	1m	QTD	YTD	12m	1w	1m	QTD	YTD	12m
Growth	0.3	2.1	1.5	11.9	15.5	-0.2	0.5	1.0	0.4	-4.2
Low volatility	-0.5	1.9	2.0	8.1	11.2	-1.0	0.3	1.4	-3.0	-7.7
Price momentum	1.3	-1.1	-1.7	13.0	28.5	0.8	-2.7	-2.2	1.4	6.6
Quality	0.6	2.9	2.3	11.3	19.8	0.2	1.3	1.8	-0.1	-0.6
Size	1.0	4.4	5.4	6.8	7.5	0.5	2.7	4.9	-4.2	-10.8
Value	0.2	4.0	4.6	11.3	22.2	-0.3	2.4	4.1	-0.1	1.4
Market	0.5	1.6	0.5	11.4	20.5					
Market - Equal-Weighted	0.2	2.2	2.2	10.2	15.5					

Notes: **Past performance is no guarantee of future results.** All indices are subsets of the STOXX 600 index, they are rebalanced monthly, use data in euros and are equal-weighted. Growth includes stocks in the top third based on both their 5-year sales per share trend and their internal growth rate (the product of the 5-year average return on equity and the retention ratio); Low volatility includes stocks in the bottom quintile based on the standard deviation of their daily returns in the previous three months; Price momentum includes stocks in the top quintile based on their performance in the previous 12 months; Quality includes stocks in the top third based on both their return on invested capital and their EBIT to EV ratio (earnings before interest and taxes to enterprise value); Size includes stocks in the bottom quintile based on their market value in euros; Value includes stocks in the bottom quintile based on their price to book value ratios. The market represents the STOXX 600 index. Source: LSEG Datastream and Invesco Strategy & Insights

Figure 6 – Model asset allocation

	Neutral	Policy Range	Allocation	Position vs Neutral	Hedged	Currency
Cash Equivalents	5%	0-10%	4%			
Cash	3%		0%			
AAA CLOs	2%		4%			
Bank Loans	4%	0-8%	5%			
US	3%		4%			
Europe	1%		1%			
Bonds	40%	10-70%	31%			
Government	25%	10-40%	18%			
US	8%		5%			
Europe ex-UK (Eurozone)	7%		5%			
UK	1%		2%			
Japan	7%		2%			
Emerging Markets	2%		4%			
China**	0.2%		0%			
India**	0.1%		1%			
Corporate IG	10%	0-20%	8%			
US Dollar	5%		3%			
Euro	2%		1%			
Sterling	1%		2%			
Japanese Yen	1%		0%			
Emerging Markets	1%		2%			
China**	0.1%		0%			
Corporate HY	5%	0-10%	5%			
US Dollar	4%		4%			
Euro	1%		1%			
Equities	45%	25-65%	53%			
US	25%		25%			
Europe ex-UK	7%		9%			
UK	4%		5%			
Japan	4%		7%			
Emerging Markets	5%		7%			
China**	2%		3%			
India**	1%		1%			
Real Estate	4%	0-8%	5%			
US	1%		0%			
Europe ex-UK	1%		2%			
UK	1%		2%			
Japan	1%		1%			
Emerging Markets	1%		0%			
Commodities	2.0%	0-4%	2.3%			
Energy	1.0%		0.0%			
Industrial Metals	0.3%		1.0%			
Precious Metals	0.3%		0.3%			
Agriculture	0.3%		1.0%			
Total	100%		100%			
Currency Exposure (including effect of hedging)						
USD	51%		45%			
EUR	20%		21%			
GBP	7%		11%			
JPY	14%		10%			
EM	9%		13%			
Total	100%		100%			

Notes: *This is a theoretical portfolio and is for illustrative purposes only. It does not represent an actual portfolio and is not a recommendation of any investment or trading strategy. **China and India are included in Emerging Markets allocations. Cash is an equally weighted mix of USD, EUR, GBP and JPY. Currency exposure calculations exclude cash. Arrows show direction of change in allocations. India has been added in this edition. See the latest [The Big Picture](#) document for more details. See appendices for definitions, methodology and disclaimers. Source: Invesco Strategy & Insights

Figure 7 – Model allocations for global sectors

	Neutral	Invesco	Preferred Region
Energy	6.7%	Overweight	Europe
Basic Materials	4.3%	Neutral	Europe
Basic Resources	3.0%	Overweight ↑	Europe
Chemicals	1.3%	Underweight ↓	US
Industrials	12.8%	Neutral	US
Construction & Materials	1.8%	Overweight ↑	Europe
Industrial Goods & Services	11.0%	Neutral	US
Consumer Discretionary	12.9%	Underweight	Europe
Automobiles & Parts	2.6%	Underweight	Europe
Media	0.9%	Underweight	Europe
Retailers	5.2%	Underweight ↓	US
Travel & Leisure	1.7%	Underweight ↓	EM
Consumer Products & Services	2.5%	Neutral ↑	Europe
Consumer Staples	4.5%	Neutral	US
Food, Beverage & Tobacco	2.9%	Neutral	US
Personal Care, Drug & Grocery Stores	1.6%	Overweight	Europe
Healthcare	7.9%	Neutral	US
Financials	16.2%	Neutral ↓	US
Banks	8.3%	Neutral ↓	Japan
Financial Services	5.0%	Overweight	Japan
Insurance	2.9%	Neutral	US
Real Estate	2.5%	Overweight	Japan
Technology	24.9%	Neutral ↑	US
Telecommunications	3.8%	Underweight	US
Utilities	3.4%	Overweight ↑	US

Notes: These are theoretical allocations which are for illustrative purposes only. They do not represent an actual portfolio and are not a recommendation of any investment or trading strategy. See the latest [Strategic Sector Selector](#) for more details.

Source: LSEG Datastream and Invesco Strategy & Insights

Appendix

Methodology for Model Asset Allocation

Which asset classes?

We look for investibility, size and liquidity. We have chosen to include equities, bonds (government, corporate investment grade and corporate high yield), bank loans, REITs to represent real estate, commodities and cash (all across a range of geographies). We use cross-asset correlations to determine which decisions are the most important.

Neutral allocations and policy ranges

We use market capitalisation in USD for major benchmark indices to calculate neutral allocations. For commodities, we use industry estimates for total ETP market cap + assets under management in hedge funds + direct investments. We use an arbitrary 5% for the combination of cash and AAA CLOs. We impose diversification by using policy ranges for each asset category (the range is usually symmetric around neutral).

Currency hedging

We adopt a cautious approach when it comes to currency hedging as currency movements are notoriously difficult to accurately predict and sometimes hedging can be costly. Also, some of our asset allocation choices are based on currency forecasts. We use an amalgam of central bank rate forecasts, policy expectations and real exchange rates relative to their historical averages to predict the direction and amplitude of currency moves.

Definitions of data and benchmarks for Figure 3

Sources: we source data from LSEG Datastream unless otherwise indicated.

Cash: returns are based on a proprietary index calculated using the Intercontinental Exchange Benchmark Administration overnight LIBOR (London Interbank Offer Rate). From 1st January 2022, we use the euro short term rate, the UK Sterling Overnight Index Average (SONIA), the US Secured Overnight Financing Rate (SOFR) and the uncollateralised overnight rate for the Japanese yen. The global rate is the average of the euro, British pound, US dollar and Japanese yen rates. The series started on 1 January 2001 with a value of 100.

Gold: London bullion market spot price in USD/troy ounce.

Government bonds: Current levels, yields and total returns use Datastream benchmark 10-year yields for the US, Eurozone, Japan and the UK, and the ICE BofA government bond total return index for the World and Europe. The emerging markets yields and returns are based on the JP Morgan Global Emerging Markets Government Bond Index.

Corporate investment grade (IG) bonds: ICE BofA investment grade corporate bond total return indices, except for in emerging markets where we use the JP Morgan Corporate Emerging Market Broad Bond Index.

Corporate high yield (HY) bonds: ICE BofA high yield total return indices

Equities: We use MSCI benchmark gross total return indices for all regions.

Commodities: Goldman Sachs Commodity total return indices

Real estate: FTSE EPRA/NAREIT total return indices

Currencies: Global Trade Information Services spot rates

Climate change scenarios (Figures 1 and 2)

In all cases, global CO₂ emissions are calculated as the sum of emissions from low-, middle- and high-income countries (as currently defined by the World Bank). Emissions for each group are calculated as the product of population, GDP per capita and the CO₂ intensity of GDP (kg of CO₂ per 2021 PPP US dollar of GDP). Population estimates are provided by the UN's World Population Prospects 2024. World Bank data is used for emissions in the 1960 to 1989 period. Estimates for the period 1990 to 2025 are calculated using actual data for population, GDP per capita and CO₂ intensity (though because CO₂ intensity is only available to 2024, recent trends are used to estimate the 2025 levels).

Two scenarios are imagined for future emissions (starting in 2026):

- “Recent trends” assumes that for high-income countries, CO₂ intensity continues to decline at the same annual rate as in the 10 years to 2024 and that GDP per capita continues to grow at the same rate as in the 10 years to 2024. For middle-income countries, it is assumed that CO₂ intensity declines at the same rate as in the 10 years to 2024 until 2050, after which time it is assumed that the decline accelerates such that CO₂ intensity matches that of high-income countries by 2100. Middle-income GDP per capita is assumed to grow at the same rate as in the 10 years (to 2024) until 2050 and thereafter to grow more rapidly such that convergence with high-income GDP per capita occurs in 2100. Low-income countries are assumed to start industrialising, so it is assumed that CO₂ intensity increases until it matches that of middle-income countries in 2050 and that it thereafter declines at the rate seen in middle-income countries in the 10 years to 2024. Low-income GDP per capita is assumed to grow at the same rate as in the 10 years to 2024 until 2050 and thereafter to grow at the rate seen in middle-income countries in the 10 years to 2024.
- “Optimistic” assumes for high-income countries that CO₂ intensity reaches zero in 2060 (at which point gross emissions will be zero) and that in the meantime there is a linear convergence to zero. High-income GDP per capita is assumed to grow at the same rate as in the 10 years to 2024, as with the “recent trends” scenario. Middle-income CO₂ intensity is assumed to decline at twice the rate seen in the 10 years to 2024 until 2050, after which it is assumed to linearly converge to zero by 2100. Middle-income GDP per capita is assumed to grow at the same rate as in the 10 years to 2024, until 2060 after which point it is assumed to accelerate, allowing linear convergence on high-income GDP by 2100 (the “recent trends” scenario assumed that convergence started in 2050). Low-income CO₂ intensity is assumed to increase (due to industrialisation), converging on (the now more rapidly declining) middle-income CO₂ intensity by 2050 and thereafter falling at twice the rate seen in middle-income countries in the 10 years (to 2024). Low-income GDP per capita is assumed to increase at the same rate as in the 10 years (to 2024) until 2050 and to then grow at the same rate as in middle-income countries in the 10 years (to 2024).

Investment risks

The value of investments and any income will fluctuate (this may partly be the result of exchange rate fluctuations) and investors may not get back the full amount invested.

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