Uncommon truths
Global debt review 2023

Global debt ratios declined again in 2022 on the back of the rebound in nominal GDP (a benefit of inflation) and declines in public sector debt. The effect of higher interest rates is yet to be fully seen in debt service ratios and we fear corporate debt could become a problem in some countries.

The man from Mars may question whether planet Earth has a debt problem (if so, to whom is it owed?). However, the global financial crisis (GFC) showed that, even if net debt is zero, it is difficult to unwind that debt when there are so many interlinkages. We therefore assume that more debt brings more risk. Hence, our annual review of global debt. Now that the Bank for International Settlements (BIS) has published its 2022 data, we are able to deliver the next instalment.

After a record jump in global debt to GDP ratios in 2020, further relief came in 2022. Nearly three-quarters of the 2020 gain has now been reversed when PPP (purchasing power parity) exchange rates are used (nearly all has been reversed when using market exchange rates). The sharp jump in debt to GDP in 2020 was the result of a combination of rising debt (especially in the public sector) and falling GDP (both of which were due to the effects of the Covid pandemic). Though, the decline in the debt ratio in 2021 was entirely due to the jump in GDP, as debt continued to rise, that of 2022 was due to a mix of falling public sector debt and rising nominal GDP.

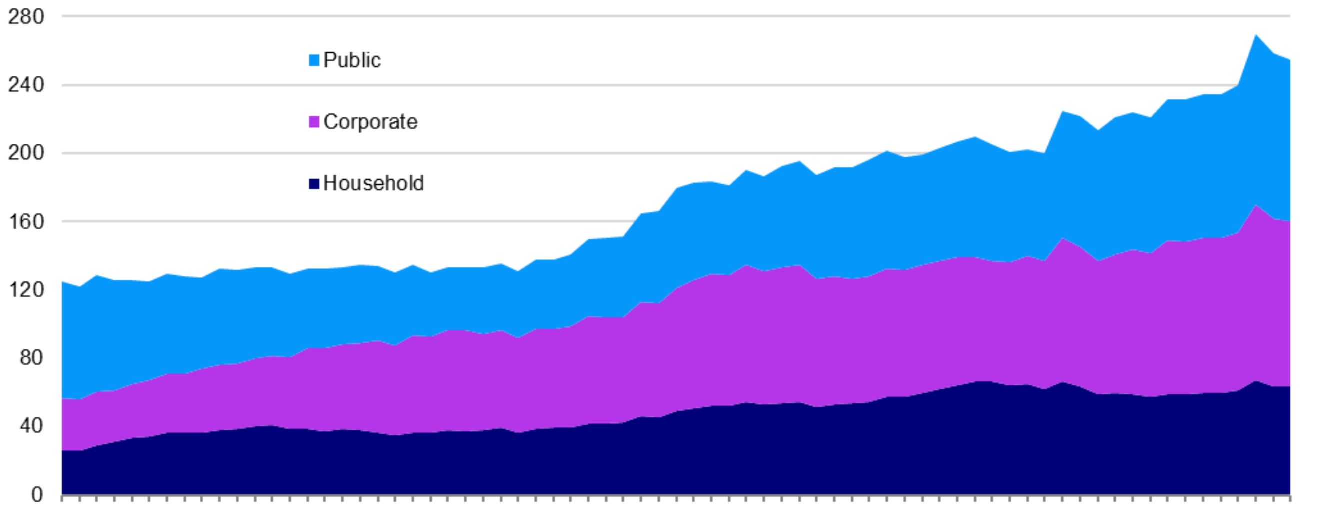
The global debt to GDP ratio fell to 236.4% in 2022 from 247.1% in 2021 (and 257.9% in 2020), based on the BIS "All-Country" non-financial sector debt to GDP ratio, using PPP exchange rates to convert to US dollars. That debt to GDP ratio was 228.4% in 2019.

We believe that using PPP exchange rates to calculate such aggregates avoids the volatility that comes with market exchange rates. For example, using market exchange rates, the BIS All-Country aggregate debt-to-GDP ratio rose from 247.0% in 2019 to 291.0% in 2020 and has since fallen back to 247.9%.

The BIS All-Country aggregates only go back to 2002, so we have constructed our own aggregate across the world's 25 largest economies (as of 2019, measured by GDP). They accounted for around 84% of World GDP in 2022, according to IMF data. **Figure 1** shows the results and suggests that, after reaching a new high of 269.5% in 2020, the global debt to GDP ratio fell back to 254.7% in 2022 (it was 239.6% in 2019). Our measure is based upon actual exchange rates, so we use a smoothing process to dampen the effect of exchange rate swings (see the note to **Figure 1**).

On that basis, global debt to GDP declined in all three sectors (household, corporate and public), though debt increased in all categories (which is slightly different to the outcome for BIS all-reporting countries aggregate mentioned above, where public sector debt fell).

Figure 1 – Global non-financial sector debt to GDP from 1952 to 2022 using market exchange rates (%)



Note: Based on annual data for the 25 largest economies in the world (as of 2019). Data was not available for all 25 countries over the full period considered. Starting with only the US in 1952, the data set was based on a successively larger number of countries until in 2008 all 25 were included in all categories. The data for all countries is converted into US dollars using market exchange rates. Unfortunately, debt is a stock measured at the end of each calendar year, whereas GDP is a flow measured during the year so that when the dollar trends in one direction it can distort the comparison between debt and GDP. To minimise this problem, we use a smoothed measure of debt which takes the average over two years (for example, debt for 2022 is the average of debt at end-2021 and at end-2022).
Source: BIS, IMF, OECD, Oxford Economics, Refinitiv Datastream and Invesco Global Market Strategy Office

Invesco

Figure 2 shows the detail of last year's fall in debt by country and sector (in terms of changes to debt-to-GDP ratios). The global debt ratio declined by around 10 percentage points, with the majority of the decline accounted for by public sector debt (as already mentioned). Total debt ratios declined in 22 of the 25 countries that we follow, with the biggest reductions in the UK, Spain and Belgium. Among those three, the public sector was the only one to see a decline in the local currency amount of debt, with rising GDP doing the rest of the work in bringing down the debt-to-GDP ratios. At the other end of the spectrum, China, South Korea and Argentina were the only countries to see a rise in total debt ratios, with the local currency value of debt rising in all sectors in those three countries (though rising GDP enabled declines in some sector debt-GDP ratios).

Looking to longer term trends, total debt ratios have risen substantially in the last 10 years. The global debt to GDP ratio increased by 20.0 percentage points in the 10 years to 2022 (using PPP exchange rates) or 29.1 percentage points (using market exchange rates), with most of that rise coming before 2019. The 10-year change is largely due to the rise in corporate and public sector debt.

Around one-third of the 25 countries experienced a decline in their total debt to GDP ratio over the last 10 years, the Netherlands being the most notable with a decline of 73.3 percentage points to 280.7%. The decline in the Dutch debt to GDP ratio was fairly evenly spread across the household, corporate and public sectors.

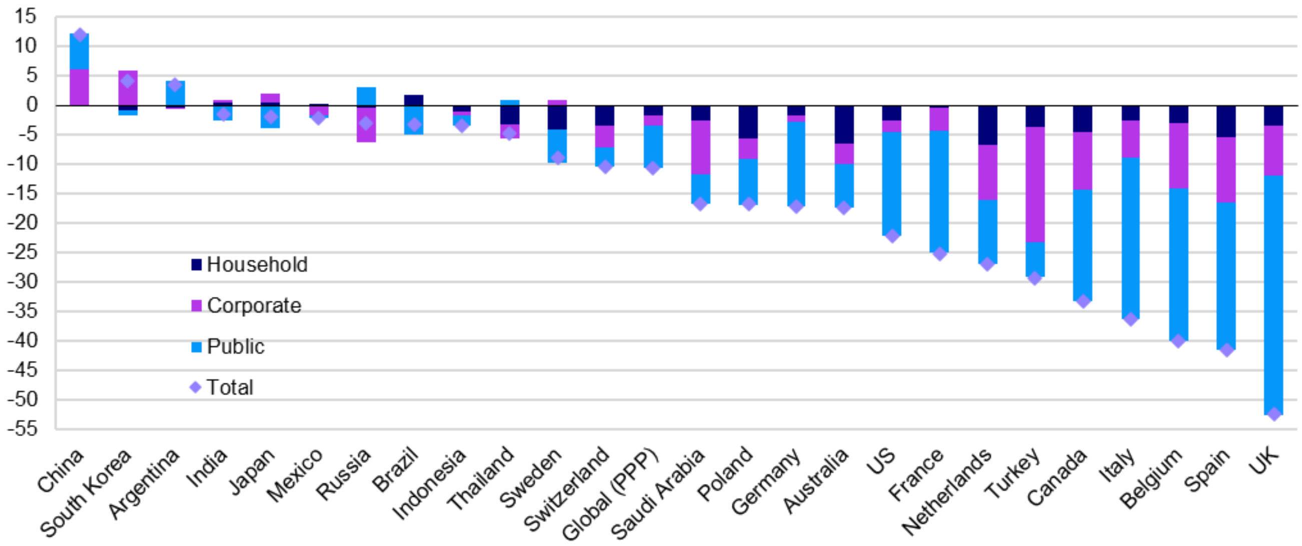
China is once again the country with the largest rise in the debt to GDP ratio over the last 10 years, with a 105-percentage point increase (from 191.1% to 297.2%), with big contributions from all three sectors but especially the public sector. Next in line are South Korea (+ 61.9 ppts over 10 years), Japan (+58.2 ppts) and Thailand (+53.5 ppts). The latter is the country with the largest three-year increase (+38.7 ppts), with the public sector accounting for half of that.

So where does this leave accumulated debt across countries? **Figure 3** shows debt to GDP ratios for the 25 countries that we follow. As has been the case for some time, the countries with the biggest debt burdens are to be found in the developed world, with Japan once again leading the way, though its debt to GDP ratio edged down from 416.1% in 2021 to 414.1% in 2022, according to BIS data. The next two countries (France and Canada) are the same as last year. The first change in ranking occurs at #4, with Sweden moving up from #5 and replacing Belgium, which falls to #7.

At the other end of the spectrum, the two countries with the lowest debt ratios (Indonesia and Mexico) are unchanged from last year.

Other countries on the move in 2022 in **Figure 3** include: Switzerland (from 6th to 5th), China (10th to 6th), Netherlands (7th to 8th), South Korea (13th to 9th), US (12th to 10th), Spain (9th to 11th), UK (8th to 12th), Italy (11th to 13th), Thailand (15th to 14th), Australia (14th to 15th), Russia (21st to 19th), Argentina (23rd to 21st), Turkey (19th to 22nd), Saudi Arabia (22nd to 23rd).

Figure 2 – Change in non-financial sector debt/GDP ratios during 2022 (%)



Note: Based on year-end local currency non-financial sector debt-to-GDP ratios. "Global (PPP)" uses BIS "All reporting countries" data, using PPP exchange rates (it is based on a larger sample of countries than is shown in the chart). The change is calculated as the end-2022 debt to GDP ratios minus those of end-2021. The countries shown are the 25 largest in the world by GDP, as of 2019.
Source: BIS, Refinitiv Datastream, and Invesco Global Market Strategy Office

So, after a sharp rise in debt ratios in 2020, there were declines in 2021 and 2022, due partly to rising GDP and partly to a decline in public sector debt. If economies continued to expand, we would normally expect a further decline in debt ratios as public sector expenditure declines and public and private revenues increase. However, many economies are slowing and we fear that recession is possible in some countries.

Of course, debt only becomes a problem when debt service ratios increase. The rise in debt to GDP ratios over the last 10 years was easily absorbed because bond yields fell to historical lows in the developed world. However, the sharp rise in bond yields during 2022 may change the picture. Governments have the luxury of being able to use the tax system to increase income if debt service ratios increase. The private sector has no such ability (raising prices may damage sales), so it is perhaps more important to focus on the affordability of private sector debt.

China is the ultimate example of how the effect of rising debt over the last 10 years didn't turn into a financing problem. BIS private non-financial sector data shows that China's debt service ratio (interest payments plus amortisations divided by income) increased by only 3.9 percentage points (from 16.7% at end-2012 to 19.6% at end-2022), despite a 62.1 percentage point increase in the private sector debt to GDP ratio (to 219.5%).

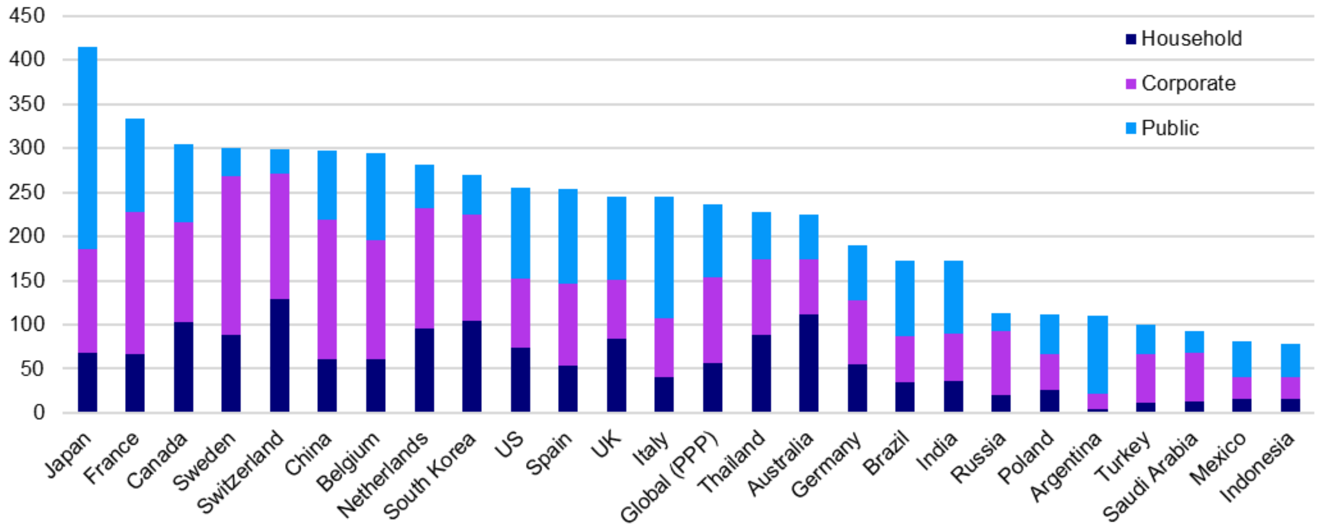
However, interest rates and bond yields rose sharply during 2022, which will have started to have an effect on debt service ratios. Of course, the rise in interest rates will take time to boost funding costs as some of the debt will be on a fixed-rate multi-year basis. Nevertheless, there were noticeable gains in private sector debt service ratios in Brazil (+5.4 percentage points to 26.3%), Australia (+2.6 to 20.1%) and South Korea (+2.3 to 23.1%). The rise in Australia's debt service ratio came despite a substantial fall in the private sector debt to GDP ratio.

Among the 25 largest economies that we follow, the only one to enjoy a sizeable decline in the private sector debt service ratio was Turkey (-5.7 percentage points to 14.0%). This reflects a 23.4 percentage point decline in the private sector debt to GDP ratio to 66.2% but may also be due to a decline in government bond yields in the latter part of 2022, which may have reduced private sector funding costs (the decline in the service ratio occurred in 2022 Q4).

For the most part it is not the household sector that faces difficult debt service ratios (with perhaps the exceptions of Australia, Canada, South Korea and Sweden). More problematic is corporate debt and we suppose the biggest threat would be in countries where service ratios are the highest. As of end-2022 that list of countries would be France (non-financial corporations debt service ratio of 57.1%), Sweden (51.1%), Canada (50.4%), Netherlands (48.2%), Belgium (43.6%), South Korea (42.2%) and the US (40.4%). For the most part, those are the countries in which corporate sector debt is the most elevated (unfortunately, the BIS does not show the split between household and corporate sector debt service ratios in China, where corporate sector debt is high).

Unless stated otherwise, all data as of 07 July 2023.

Figure 3 – Non-financial sector debt/GDP in 2022 (%)



Note: "Global" uses BIS "All reporting countries" data and is calculated using PPP exchange rates (it is based on a larger sample of countries than is shown in the chart). The countries shown were the 25 largest in the world by GDP, as of 2019.
Source: BIS, Refinitiv Datastream and Invesco Global Market Strategy Office

Figure 4 – Asset class total returns (%)

Data as at 07/07/2023	Index	Current Level/RY	Total Return (USD, %) 1w	1m	QTD	YTD	12m	Total Return (Local Currency, %) 1w	1m	QTD	YTD	12m
Equities												
World	MSCI	673	-1.3	1.9	-1.3	12.8	13.4	-1.5	1.6	-1.5	12.7	12.7
Emerging Markets	MSCI	981	-0.6	-0.6	-0.6	4.5	2.0	-0.5	-0.3	-0.5	5.2	3.1
China	MSCI	59	-0.9	-2.1	-0.9	-6.2	-17.4	-1.0	-2.0	-1.0	-5.3	-16.4
US	MSCI	4180	-1.1	3.3	-1.1	15.8	14.4	-1.1	3.3	-1.1	15.8	14.4
Europe	MSCI	1875	-2.7	-0.4	-2.7	11.1	20.2	-3.2	-2.7	-3.2	7.6	12.4
Europe ex-UK	MSCI	2325	-2.7	0.0	-2.7	12.8	23.1	-3.1	-2.0	-3.1	10.3	15.0
UK	MSCI	1108	-2.8	-2.1	-2.8	5.4	11.0	-3.7	-4.8	-3.7	-1.2	3.9
Japan	MSCI	3507	0.0	0.5	0.0	13.3	17.7	-1.6	2.2	-1.6	22.1	23.2
Government Bonds												
World	BofA-ML	3.36	-0.7	-0.6	-0.7	-0.2	-3.3	-1.1	-0.9	-1.1	0.5	-4.2
Emerging Markets	BBloom	8.21	-2.0	0.1	-2.0	3.4	8.0	-2.0	0.1	-2.0	3.4	8.0
China	BofA-ML	2.49	0.6	-1.0	0.6	-1.1	-3.0	0.2	0.6	0.2	2.9	4.7
US (10y)	Datastream	4.04	-1.8	-1.7	-1.8	0.5	-4.9	-1.8	-1.7	-1.8	0.5	-4.9
Europe	Bofa-ML	3.38	-1.1	1.4	-1.1	3.2	0.3	-1.4	-0.8	-1.4	0.6	-6.8
Europe ex-UK (EMU, 10y)	Datastream	2.63	-1.6	0.9	-1.6	3.7	-1.9	-2.0	-1.3	-2.0	1.1	-8.9
UK (10y)	Datastream	4.65	-1.1	0.1	-1.1	1.3	-10.7	-1.9	-2.7	-1.9	-5.0	-16.4
Japan (10y)	Datastream	0.42	1.4	-1.7	1.4	-4.2	-2.5	-0.2	0.0	-0.2	3.2	1.9
IG Corporate Bonds												
Global	BofA-ML	5.44	-0.9	0.2	-0.9	2.5	1.5	-1.0	-0.5	-1.0	1.7	-0.4
Emerging Markets	BBloom	7.90	-1.5	-0.3	-1.5	2.6	6.5	-1.5	-0.3	-1.5	2.6	6.5
China	BofA-ML	3.29	0.6	-1.1	0.6	-1.2	-4.2	0.2	0.4	0.2	2.8	3.3
US	BofA-ML	5.76	-1.3	-0.4	-1.3	1.9	0.2	-1.3	-0.4	-1.3	1.9	0.2
Europe	BofA-ML	4.51	-0.1	1.9	-0.1	4.2	6.0	-0.5	-0.4	-0.5	1.6	-1.6
UK	BofA-ML	6.76	-0.3	0.7	-0.3	4.4	-2.6	-1.1	-2.2	-1.1	-2.1	-8.9
Japan	BofA-ML	0.74	1.5	-1.7	1.5	-5.7	-4.3	-0.1	0.0	-0.1	1.6	0.1
HY Corporate Bonds												
Global	BofA-ML	8.91	-0.4	0.6	-0.4	4.8	9.0	-0.5	0.1	-0.5	4.1	7.3
US	BofA-ML	8.79	-0.6	0.1	-0.6	4.8	6.8	-0.6	0.1	-0.6	4.8	6.8
Europe	BofA-ML	7.63	0.2	1.9	0.2	6.9	16.4	-0.2	-0.3	-0.2	4.2	8.1
Cash (Overnight LIBOR)												
US		5.06	0.1	0.4	1.3	2.5	3.9	0.1	0.4	1.3	2.5	3.9
Euro Area		3.41	0.6	2.8	2.0	3.9	9.8	0.1	0.3	0.8	1.4	1.7
UK		4.93	1.1	3.6	5.3	8.4	10.2	0.1	0.4	1.2	2.1	3.2
Japan		-0.02	1.6	-1.4	-6.5	-7.7	-4.3	0.0	0.0	0.0	0.0	0.0
Real Estate (REITs)												
Global	FTSE	1536	0.0	-0.8	0.0	1.1	-4.7	-0.3	-3.0	-0.3	-1.5	-11.5
Emerging Markets	FTSE	1256	-0.5	-0.1	-0.5	-5.0	-7.2	-0.8	-2.3	-0.8	-7.4	-13.8
US	FTSE	2917	0.1	0.4	0.1	5.4	-1.8	0.1	0.4	0.1	5.4	-1.8
Europe ex-UK	FTSE	1979	1.9	-0.6	1.9	-4.9	-11.5	1.6	-2.8	1.6	-7.3	-17.8
UK	FTSE	695	-0.3	-8.1	-0.3	-3.2	-20.2	-1.2	-10.7	-1.2	-9.2	-25.3
Japan	FTSE	2065	1.1	-2.0	1.1	-2.8	-4.8	-0.5	-0.3	-0.5	4.7	-0.4
Commodities												
All	GSCI	3304	2.2	2.2	2.2	-5.5	-10.1	-	-	-	-	-
Energy	GSCI	560	3.7	3.2	3.7	-8.3	-18.3	-	-	-	-	-
Industrial Metals	GSCI	1535	0.1	-0.9	0.1	-8.4	-1.1	-	-	-	-	-
Precious Metals	GSCI	2176	0.4	-0.9	0.4	4.8	11.6	-	-	-	-	-
Agricultural Goods	GSCI	541	0.2	0.1	0.2	-3.2	1.3	-	-	-	-	-
Currencies (vs USD)*												
EUR		1.10	0.5	2.5	0.5	2.5	8.0	-	-	-	-	-
JPY		142.09	1.6	-1.4	1.6	-7.7	-4.3	-	-	-	-	-
GBP		1.28	0.9	2.9	0.9	6.6	6.9	-	-	-	-	-
CHF		1.13	0.8	2.5	0.8	4.1	9.6	-	-	-	-	-
CNY		7.22	0.4	-1.3	0.4	-4.5	-7.2	-	-	-	-	-

Notes: *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). **Past performance is no guarantee of future results.** Please see appendix for definitions, methodology and disclaimers.
Source: Refinitiv Datastream and Invesco

Figure 5 – Global equity sector total returns relative to market (%)

Data as at 07/07/2023	Global				
	1w	**1m**	**QTD**	**YTD**	**12m**
Energy	**1.2**	**-1.6**	**1.2**	**-7.9**	**-4.1**
Basic Materials	**0.5**	**-1.7**	**0.5**	**-7.8**	**1.3**
Basic Resources	0.5	-1.9	0.5	-9.1	4.8
Chemicals	0.5	-1.3	0.5	-6.1	-3.2
Industrials	**-0.2**	**0.1**	**-0.2**	**-1.0**	**5.6**
Construction & Materials	-0.7	-1.0	-0.7	3.5	9.3
Industrial Goods & Services	-0.1	0.2	-0.1	-1.7	5.1
Consumer Discretionary	**0.3**	**2.6**	**0.3**	**8.7**	**3.9**
Automobiles & Parts	3.4	9.6	3.4	29.0	1.9
Media	0.0	0.1	0.0	4.7	8.0
Retailers	0.2	2.4	0.2	4.7	-3.3
Travel & Leisure	0.0	1.1	0.0	6.1	15.1
Consumer Products & Services	-1.7	-0.4	-1.7	3.6	8.8
Consumer Staples	**0.3**	**-0.9**	**0.3**	**-8.8**	**-7.0**
Food, Beverage & Tobacco	0.3	-1.4	0.3	-8.4	-6.2
Personal Care, Drug & Grocery Stores	0.3	0.0	0.3	-9.6	-8.6
Healthcare	**-1.8**	**-2.9**	**-1.8**	**-11.3**	**-9.9**
Financials	**0.3**	**-0.7**	**0.3**	**-7.5**	**-1.3**
Banks	0.4	-0.7	0.4	-8.3	-2.3
Financial Services	0.2	-0.8	0.2	-5.6	-0.6
Insurance	0.0	-0.8	0.0	-8.4	0.1
Real Estate	**1.0**	**-1.8**	**1.0**	**-9.6**	**-16.1**
Technology	**-0.3**	**1.9**	**-0.3**	**23.0**	**10.4**
Telecommunications	**0.2**	**-0.7**	**0.2**	**-5.1**	**-10.5**
Utilities	**0.1**	**-1.2**	**0.1**	**-9.2**	**-6.3**

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

Figure 6 – Model asset allocation

	Neutral	Policy Range		Allocation	Position vs Neutral	Hedged	Currency
Cash Equivalents	**5%**	**0-10%**		**10%**			
Cash	2.5%			10%			
Gold	2.5%			0%			
Bonds	**40%**	**10-70%**	↓	**46%**			
Government	25%	10-40%	↓	**20%**			
US	8%		↓	11%			
Europe ex-UK (Eurozone)	7%		↓	2%			
UK	1%		↓	1%			
Japan	7%			2%			
Emerging Markets	2%			4%			
China**	0.2%			0%			
Corporate IG	10%	0-20%	↑	**18%**			
US Dollar	5%		↑	10%		40%	JPY
Euro	2%		↑	3%			
Sterling	1%			2%			
Japanese Yen	1%			0%			
Emerging Markets	1%		↑	3%			
China**	0.1%			0%			
Corporate HY	5%	0-10%		**8%**			
US Dollar	4%			6%			
Euro	1%			2%			
Equities	**45%**	**25-65%**		**34%**			
US	25%			12%			
Europe ex-UK	7%		↑	6%			
UK	4%		↓	4%			
Japan	4%			4%			
Emerging Markets	5%			8%			
China**	2%			4%			
Real Estate	**8%**	**0-16%**	↑	**10%**			
US	2%		↑	4%			
Europe ex-UK	2%			1%			
UK	1%			2%			
Japan	2%			1%			
Emerging Markets	1%		↑	2%			
Commodities	**2%**	**0-4%**		**0%**			
Energy	1%			0%			
Industrial Metals	0.3%			0%			
Precious Metals	0.3%			0%			
Agriculture	0.3%			0%			
Total	**100%**			**100%**			

Currency Exposure (including effect of hedging)			
USD	50%	↓	42%
EUR	19%	↓	17%
GBP	7%	↓	12%
JPY	14%	↑	14%
EM	9%	↑	17%
Total	**100%**		**100%**

Notes: **China is included in Emerging Markets allocations. This is a theoretical portfolio and is for illustrative purposes only. See the latest The Big Picture document for more details. It does not represent an actual portfolio and is not a recommendation of any investment or trading strategy. Arrows indicate the direction of the most recent changes.
Source: Invesco

Figure 7 – Model allocations for global sectors

	Neutral	Invesco	Preferred Region
Energy	**7.5%**	**Underweight**	**EM**
Basic Materials	**4.5%**	**Underweight ↓**	**Europe**
Basic Resources	2.6%	Underweight ↓	Europe
Chemicals	1.9%	Neutral	Europe
Industrials	**13.0%**	**Neutral**	**Japan**
Construction & Materials	1.6%	Underweight	US
Industrial Goods & Services	11.5%	Neutral	Europe
Consumer Discretionary	**14.7%**	**Overweight**	**Europe**
Automobiles & Parts	2.7%	Neutral	Europe
Media	1.1%	Neutral	Japan
Retailers	4.7%	Overweight	Europe
Travel & Leisure	2.2%	Underweight	EM
Consumer Products & Services	4.0%	Overweight	Europe
Consumer Staples	**6.5%**	**Overweight**	**US**
Food, Beverage & Tobacco	4.3%	Overweight	US
Personal Care, Drug & Grocery Stores	2.2%	Overweight	US
Healthcare	**10.0%**	**Overweight**	**US**
Financials	**15.0%**	**Underweight**	**Japan**
Banks	7.2%	Underweight	EM
Financial Services	4.9%	Underweight	EM
Insurance	2.9%	Neutral	Europe
Real Estate	**3.0%**	**Neutral**	**EM**
Technology	**18.8%**	**Overweight**	**US**
Telecommunications	**3.5%**	**Neutral ↑**	**Europe**
Utilities	**3.6%**	**Underweight**	**Europe**

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: Refinitiv Datastream and Invesco

Appendix

Methodology for asset allocation, expected returns and optimal portfolios

Portfolio construction process

The optimal portfolios are theoretical and not real. We use optimisation processes to guide our allocations around "neutral" and within prescribed policy ranges based on our estimations of expected returns and using historical covariance information. This guides the allocation to global asset groups (equities, government bonds etc.), which is the most important level of decision. For the purposes of this document the optimal portfolios are constructed with a one-year horizon.

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), 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 gold. We impose diversification by using policy ranges for each asset category (the range is usually symmetric around neutral).

Expected/projected returns

The process for estimating expected returns is based upon yield (except commodities, of course). After analysing how yields vary with the economic cycle, and where they are situated within historical ranges, we forecast the direction and amplitude of moves over the next year. Cash returns are calculated assuming a straight-line move in short term rates towards our targets (with, of course, no capital gain or loss). Bond returns assume a straight-line progression in yields, with capital gains/losses predicated upon constant maturity (effectively supposing constant turnover to achieve that). Forecasts of corporate investment-grade and high-yield spreads are based upon our view of the economic cycle (as are forecasts of credit losses). Coupon payments are added to give total returns. Equity and REIT returns are based on dividend growth assumptions. We calculate total returns by applying those growth assumptions and adding the forecast dividend yield. No such metrics exist for commodities; therefore, we base our projections on US CPI-adjusted real prices relative to their long-term averages and views on the economic cycle. All expected returns are first calculated in local currency and then, where necessary, converted into other currency bases using our exchange rate forecasts.

Optimising the portfolio

Using a covariance matrix based on monthly local currency total returns for the last 5 years and we run an optimisation process that maximises the Sharpe Ratio. Another version maximises Return subject to volatility not exceeding that of our Neutral Portfolio. The optimiser is based on the Markowitz model.

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 4

Sources: we source data from 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). The global rate is the average of the euro, British pound, US dollar and Japanese yen rates. The series started on 1st 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 Barclays Bloomberg emerging markets sovereign US dollar 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 Barclays Bloomberg emerging markets corporate US dollar 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

Important information

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