Uncommon truths
Global debt review 2020

Global debt ratios were up in 2019 and were higher than during the GFC recession of 10 years ago. So long as there is economic growth and financing costs remain low, this need not be a problem…..

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 2019 data, we are able to deliver the next instalment.

Given the ongoing recession, we imagine that debt ratios will change (rise) dramatically, which may call into question the value of this exercise. However, several pre-Covid trends were of interest to us and may illuminate the future path.

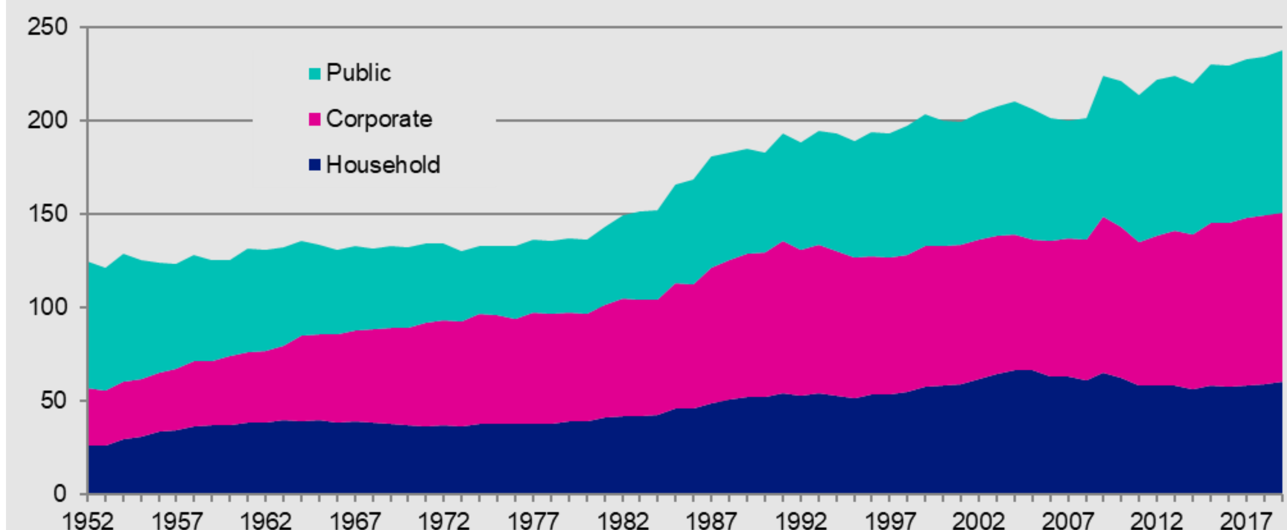
Starting at the top, the global debt ratio increased from 216.4% in 2018 to 220.9% in 2019 (based on the BIS "All-Country" non-financial sector debt-to-GDP ratio, using purchasing power parity or PPP exchange rates to convert all data to US dollars). Having fallen marginally in the previous two years, from a peak of 218% in 2016, this ratio resumed its upward path in 2019 with the biggest annual jump outside of recession since the BIS started publishing this aggregate in 2001 (when the ratio was 172.6%).

We believe that using PPP exchange rates is the best way to calculate such aggregates, since the use of market exchange rates causes too much volatility in the global series. For example, using market exchange rates, the BIS All-Country aggregate debt-to-GDP ratio fell from 243.8% in 2017 to 232.6% in 2018 and then rebounded to 243.2% in 2019. We believe that some of that variability is down to the movement of the dollar (the JP Morgan trade-weighted US dollar index appreciated by 4.1% during 2018 and declined by 0.5% in 2019).

The problem with BIS All-Country aggregates is that they only go back to 2001, so we have constructed our own version by aggregating the data for the world's 25 largest economies (as of 2019, measured by GDP). **Figure 1** shows the results and suggests that the global debt-to-GDP ratio hit a new high of 237.7% in 2019 (up from 234.0% in 2018). Unfortunately, our measure is based upon market exchange rates, so we use a smoothing process to dampen the effect of exchange rate movements (see the note to **Figure 1**).

Casual inspection of **Figure 1** suggests that debt-to-GDP has recently increased in all three sectors (households, corporates and governments). However, since 2009 (when global debt-to-GDP reached a new peak), the household debt ratio has at worst been stable, whereas those for corporates and governments have risen (the same applies on a PPP basis).

Figure 1 – Global non-financial sector debt-to-GDP from 1952 to 2019 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 2007 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 2019 is the average of debt at end-2018 and at end-2019).
Source: BIS, IMF, OECD, Oxford Economics, Datastream and Invesco

Figure 2 shows even more graphically how debt has risen since 2009. Banks may have deleveraged since the Global Financial Crisis (GFC) but non-financial sectors have not (banks are not shown in the chart). That rise in debt is even more incredible when one considers that 2009 was a year of deep global recession, when debt would have been expected to rise, whereas 2019 was not. Rather than deleveraging, as had been expected after the GFC, non-financial sector debt ratios have continued the decades long uptrend that had accelerated in the late 1970s (see **Figure 1**).

Amazingly, only three of the 25 countries analysed reduced their total debt-to-GDP ratios in the last 10 years (Germany, Spain and India). At the other extreme, China and France both saw big increases in debt ratios (across all sectors). More surprising has been the rise in Swiss debt (though public sector debt has fallen slightly).

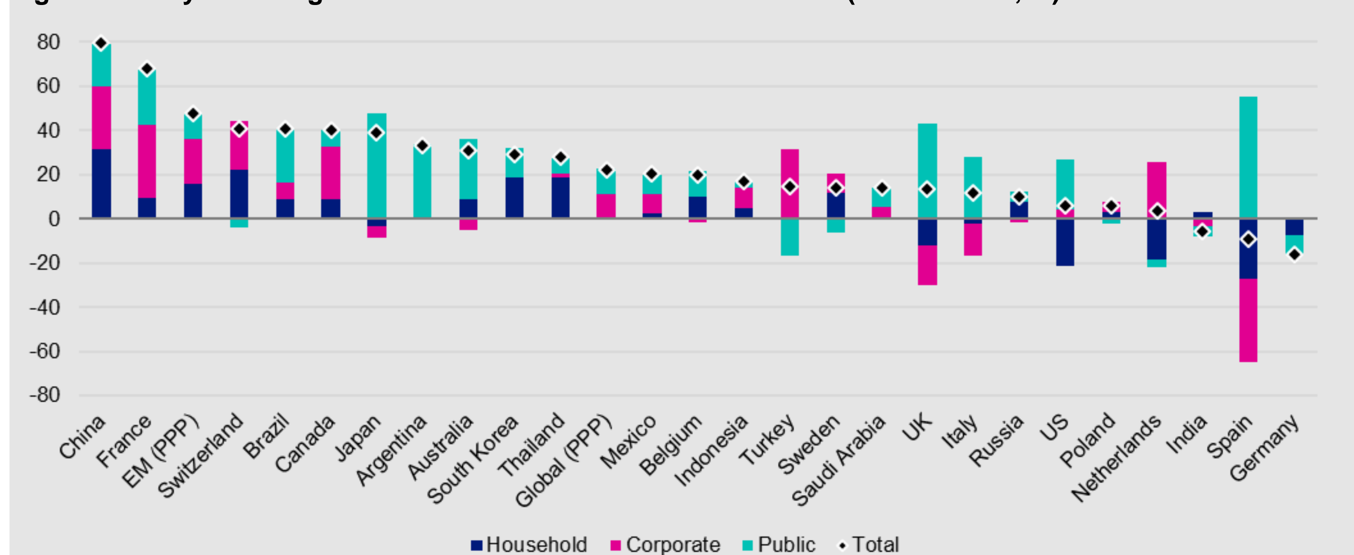
As noted previously, the 10-year rise in the global debt ratio was due in equal part to gains in corporate (+11.1 percentage points) and public (+11.9) debt ratios, with the household ratio falling 0.6 percentage points (the latter is hard to see in **Figure 2**).

The 10-year decline in household debt-to-GDP ratios is most noticeable in Spain (-27.3 percentage points), the US (-21.2), the Netherlands (-18.6) and the UK (-11.9). In all four cases, household debt had risen to a problematic level (i.e. above 80% of GDP). In 2009, the household debt-to-GDP ratios were: Netherlands 118.4% (99.8% in 2019), US 96.6% (75.4%), UK 95.7% (83.8%) and Spain 84.2% (56.9%). Apart from Spain, those ratios were still troubling in 2019, especially as it was just before the onset of the Covid-recession (**Figure 3** shows 2019 debt ratios).

At the other extreme, household debt ratios have risen the most in China (+31.7 percentage points to 55.2%), Switzerland (+22.3 ppts to 132%), Thailand (+18.7 ppts to 69.2%) and Sweden (+11.8 ppts to 88.5%). While the 2019 household debt ratios were unremarkable in China and Thailand, the same could not be said for Sweden and especially for Switzerland. Extremely low interest rates may have encouraged Swiss households to take on more debt (we will examine debt service ratios at the end of this document).

We have often expressed concern at the rise in US corporate debt (non-financial sector) but **Figures 2** and **3** show that the US is neither the country with the highest corporate debt ratio, nor with the biggest gain in that ratio over the last 10 years. Not surprisingly, China features among the countries with the largest 10-year gain in the corporate debt ratio (+28 ppts to 149.3% of GDP) but it ranks behind France (+33.3 ppts to 153.2%) and Turkey (+30.7 ppts to 66.0%). Other countries with notable gains in corporate debt ratios are the Netherlands (+25.6 ppts to 158.3%), Canada (+23.4 ppts to 114.0%) and Switzerland (+22.0 ppts to 122.3%). We consider that all these countries, with the exception of Turkey, have levels of corporate debt that could become problematic under certain circumstances (recession and/or a rise in financing costs).

Figure 2 – 10-year change in non-financial sector debt/GDP ratios (2009 to 2019, %)



Note: Based on year-end local currency non-financial sector debt-to-GDP ratios. "EM" = emerging markets. "Global (PPP)" and "EM (PPP)" use BIS "All reporting countries" and BIS "Emerging markets" data, respectively, using PPP exchange rates (they are based on a larger sample of countries than is shown in the chart). The 10-year change is calculated as the end-2019 debt to GDP ratios minus those of 2009. The countries shown are the 25 largest in the world by GDP, as of 2019. Source: BIS and Invesco

As with household debt, Spain is the country that has seen the largest decline in its corporate debt ratio over the last 10 years (-37.2 ppts to 93.1%). Other notable declines were in the UK (-17.8 ppts to 80.1%) and Italy (-14.6 ppts to 67.9%). Though an improvement, those 2019 debt ratios could hardly be described as comfortable, in our opinion.

Though **Figure 2** shows that public sector debt has fallen since 2009 in some cases (notably Turkey, Sweden and Germany), it has risen in most other countries. Governments have not used the intervening 10 years of global growth to reduce public debt ratios from GFC levels.

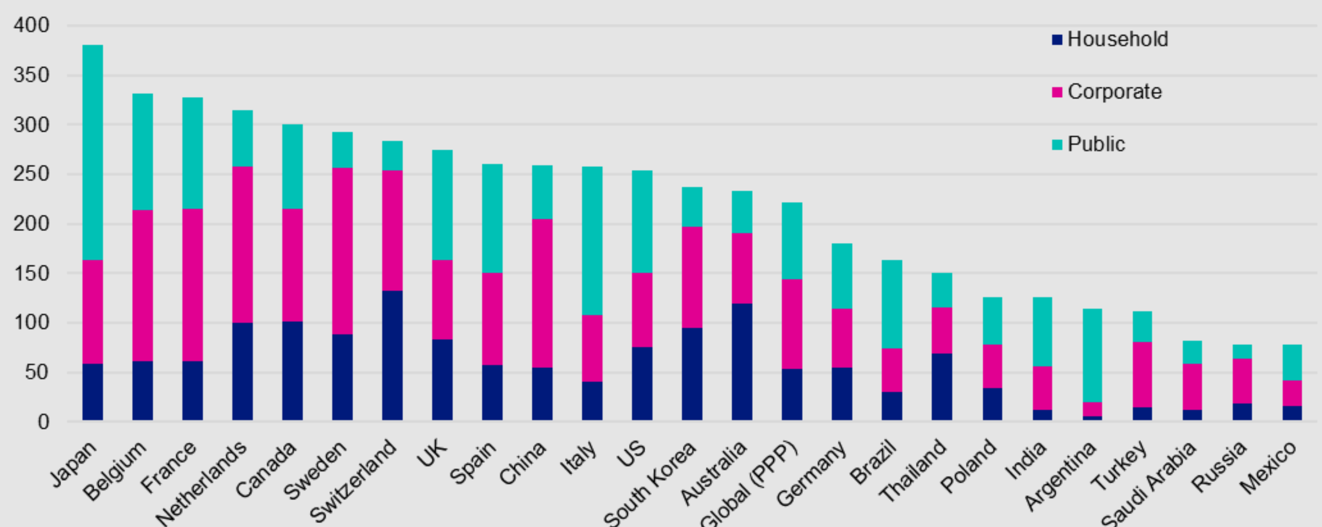
Indeed, in the three countries that have seen the largest 10-year gain in gross public sector debt (Spain +55.4 ppts to 110.7%, Japan +47.8 ppts to 217.9% and UK +43.2 ppts to 110.9%), it was partially the counterpart to falling private sector debt. Whether this was the result of crowding out of the private sector or a policy aim to replace a retreating private sector is not clear but those 2019 debt ratios were not good starting points from which to enter the Covid-recession.

Other countries with large 10-year gains in gross public sector debt ratios were: Argentina (+33.5% ppts to 94.4%), Italy (+28.3 ppts to 149.0%), Australia (+27.1 ppts to 41.9%) and the US (+22.6 ppts to 103.9%). Again, except for Australia, those 2019 debt ratios were uncomfortably high just ahead of what will likely be the deepest post-WW2 recession, in our opinion. Notably, the fiscal profligacy in the US during this presidency has seen the public debt to GDP ratio rise from 98.5% in 2017 to 103.9% in 2019, in a period when there has been decent GDP growth (2.4% in 2017, 2.9% in 2018 and 2.3% in 2019, according to Bloomberg data).

Figure 3 shows the net result, with countries ranked by total non-financial sector debt-to-GDP ratios in 2019. The general pattern remains the same as in recent years, with developed world countries more indebted than emerging market counterparts (in general). This may be due to better management or stronger economic growth in emerging countries but is probably also related to the fact that developed countries have simply taken advantage of their greater ability to take on debt, without pushing up financing costs. Germany is the obvious exception, being the developed country with a debt ratio most in line with those of the emerging world (and it has declined in the last 10 years). We believe this leaves Germany with more flexibility in the event of unforeseen events (such as a global pandemic).

Notable changes in the rankings during 2019 were the elevation of Belgium to #2 (from #3) and France to #3 (#4), while the Netherlands has moved in the opposite direction to #4 (#2). At the other end of the spectrum, Saudi Arabia and Mexico switched places during 2019 and it will be interesting to see how they fare during 2020, especially given the collapse in the oil price. In general, we expect a substantial rise in debt ratios during 2020 due to the ongoing recession. This applies particularly to public sector debt, with many governments trying to protect private sector cash-flows.

Figure 3 – Non-financial sector debt/GDP in 2019 (%)



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 are the 25 largest in the world by GDP, as of 2019.
Source: BIS and Invesco

Talking of cash flows, while noting that debt ratios are reaching record levels, it is hard to detect any real sign of distress in debt markets. This may be because central bank asset purchases are depressing developed world government yields and corporate spreads. However, it may also be due to unprecedently low financing costs, which are keeping debt service ratios in check.

Luckily, the BIS also publishes debt service ratios for some countries, though only for private sector debt (the debt service ratio is defined as the ratio of interest costs plus amortisations to income). **Figure 4** shows those debt service ratios for a selection of countries. Interestingly, the Netherlands (core Eurozone country) has the highest private sector debt service ratio (among countries shown), whereas Italy has the lowest. This again confirms that Italy's debt problem is a public sector issue.

Spain and Italy have seen a decline in such debt service costs since the GFC, partly because private sector debt ratios have fallen but also (presumably) because the ECB has driven interest rates and bond yields lower. The same was also true in the UK and the US but their debt service ratios appear to have flattened since around 2015.

Finally, despite the decline in interest rates, some countries have seen a gradual increase in their private sector debt service ratios, namely Canada, China, France and Switzerland. This is no doubt due to the rise in private sector debt ratios (as per **Figure 2**).

Conclusions

Global debt ratios increased in 2019 and were higher than during the GFC. Deleveraging has not happened, despite 10 years of global growth. This could be problematic, given that we have since entered what we think will be the deepest post-WW2 recession.

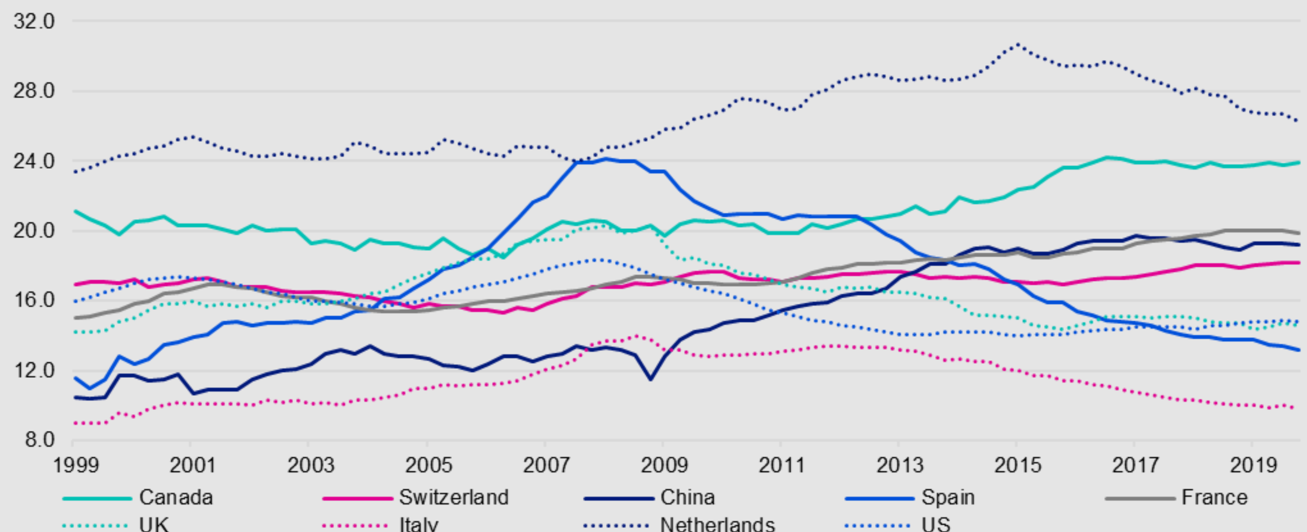
Debt is largely a developed world phenomenon, with the private sectors of countries such as Belgium, France, the Netherlands and Switzerland carrying a lot of debt (as well as China). Public sector debt problems in countries such as Japan and Italy are well known but public sector debt has been on the rise in many countries, particularly the US in recent years.

Luckily, interest rates and bond yields are at multi-century lows in many countries which helps to depress debt service ratios. Despite this, some countries are experiencing an upward trend in private sector debt service ratios, notably Canada, China, France and Switzerland.

We suspect that high debt ratios will not be a problem so long as debt service ratios remain under control. However, those high debt ratios render economic systems more fragile. That susceptibility can be revealed by economic recession and/or a rise in financing costs. We are now in deep recession but central banks have been able to control government bond yields and credit spreads. If they lose that control, we believe that debt could pose a risk to the global economy.

Unless stated otherwise, all data as of 26 June 2020.

Figure 4 – Private non-financial sector debt service ratios (%)



Note: Quarterly data from 1999 Q1 to 2019 Q4, provided by the Bank for International Settlements. Debt service ratio is defined as the ratio of interest costs plus amortisations to income. Source: BIS and Invesco

Figure 5 – Asset class total returns

Data as at 26/06/2020	Index	Current Level/RY	Total Return (USD, %) 1w	1m	QTD	YTD	12m	Total Return (Local Currency, %) 1w	1m	QTD	YTD	12m
Equities												
World	MSCI	516	-2.1	2.9	17.3	-7.7	1.8	-2.0	2.5	16.4	-6.7	2.7
Emerging Markets	MSCI	999	-0.1	8.2	18.5	-9.4	-2.0	-0.1	7.6	17.1	-5.2	2.5
US	MSCI	2893	-2.8	1.0	18.2	-5.1	6.3	-2.8	1.0	18.2	-5.1	6.3
Europe	MSCI	1522	-1.7	4.9	14.6	-13.1	-6.3	-1.8	3.4	12.8	-11.7	-5.1
Europe ex-UK	MSCI	1893	-1.5	6.1	17.0	-9.5	-2.4	-1.7	4.1	14.4	-9.6	-1.6
UK	MSCI	894	-2.5	1.1	7.3	-23.6	-17.6	-2.1	1.4	8.0	-17.9	-15.2
Japan	MSCI	3210	-0.6	3.6	13.4	-5.5	6.1	-0.3	3.4	12.7	-6.6	5.8
Government Bonds												
World	BofA-ML	0.26	0.3	1.1	1.5	4.2	4.7	0.4	0.5	0.7	4.5	5.4
Emerging Markets	BBloom	5.30	0.2	4.0	15.3	-2.5	1.1	0.2	4.0	15.3	-2.5	1.1
US (10y)	Datastream	0.64	0.6	0.7	0.5	14.8	17.4	0.6	0.7	0.5	14.8	17.4
Europe	Bofa-ML	0.06	0.6	3.6	3.9	1.9	2.6	0.4	1.6	1.8	2.1	4.2
Europe ex-UK (EMU, 10y)	Datastream	-0.51	0.8	2.8	2.5	3.1	0.7	0.6	0.8	0.4	3.3	2.3
UK (10y)	Datastream	0.13	0.2	0.0	1.0	-0.7	4.5	0.5	0.4	1.6	6.8	7.6
Japan (10y)	Datastream	0.01	-0.3	0.2	0.7	1.0	-1.0	0.0	-0.1	0.1	-0.2	-1.3
IG Corporate Bonds												
Global	BofA-ML	1.92	0.1	3.0	8.6	2.6	6.1	0.1	2.5	7.9	3.1	6.8
Emerging Markets	BBloom	4.88	0.3	5.1	17.3	1.5	8.4	0.3	5.1	17.3	1.5	8.4
US	BofA-ML	2.26	0.1	2.8	9.3	4.8	9.9	0.1	2.8	9.3	4.8	9.9
Europe	BofA-ML	0.90	0.1	4.0	7.4	-1.4	-1.8	0.0	2.0	5.2	-1.2	-0.2
UK	BofA-ML	2.00	0.2	2.2	7.5	-4.1	3.5	0.6	2.5	8.2	3.2	6.6
Japan	BofA-ML	0.52	-0.3	0.3	0.5	0.8	-0.3	0.0	0.0	-0.1	-0.4	-0.6
HY Corporate Bonds												
Global	BofA-ML	6.75	-0.8	3.1	11.7	-4.1	-0.1	-0.8	2.7	11.3	-3.9	0.2
US	BofA-ML	6.96	-1.3	2.1	10.0	-4.4	-0.6	-1.3	2.1	10.0	-4.4	-0.6
Europe	BofA-ML	4.72	-0.3	5.7	13.6	-5.2	-3.0	-0.4	3.7	11.3	-5.0	-1.5
Cash (Overnight LIBOR)												
US		0.08	0.0	0.0	0.0	0.3	1.3	0.0	0.0	0.0	0.3	1.3
Euro Area		-0.56	0.4	2.1	1.6	-0.2	-1.9	0.0	0.0	-0.1	-0.3	-0.5
UK		0.05	-0.2	0.0	-0.7	-6.8	-2.3	0.0	0.0	0.0	0.2	0.5
Japan		-0.09	-0.3	0.3	0.3	1.3	0.4	0.0	0.0	0.0	-0.1	-0.1
Real Estate (REITs)												
Global	FTSE	1560	-2.8	2.4	9.1	-21.9	-15.6	-3.0	0.4	6.8	-21.7	-14.3
Emerging Markets	FTSE	1903	-2.6	7.6	10.3	-21.3	-13.9	-2.8	5.5	8.0	-21.1	-12.5
US	FTSE	2450	-3.3	0.2	8.6	-22.9	-16.4	-3.3	0.2	8.6	-22.9	-16.4
Europe ex-UK	FTSE	3038	-3.3	5.2	10.1	-18.2	-6.3	-3.4	3.1	7.8	-18.1	-4.8
UK	FTSE	1112	-3.4	3.5	4.0	-29.4	-11.3	-3.0	3.9	4.7	-24.1	-8.7
Japan	FTSE	2379	-0.8	-0.1	6.7	-19.8	-12.9	-0.5	-0.4	6.0	-20.8	-13.1
Commodities												
All	GSCI	1613	-2.9	3.9	8.0	-37.8	-36.2	-	-	-	-	-
Energy	GSCI	224	-4.5	8.0	15.7	-55.0	-53.1	-	-	-	-	-
Industrial Metals	GSCI	1111	0.8	7.1	10.6	-8.9	-7.7	-	-	-	-	-
Precious Metals	GSCI	2044	1.5	3.0	11.9	14.3	23.3	-	-	-	-	-
Agricultural Goods	GSCI	290	-3.0	-2.2	-7.9	-16.6	-20.1	-	-	-	-	-
Currencies (vs USD)*												
EUR		1.12	0.4	2.2	1.7	0.1	-1.3	-	-	-	-	-
JPY		107.23	-0.3	0.3	0.3	1.3	0.5	-	-	-	-	-
GBP		1.23	-0.4	-0.3	-0.7	-7.0	-2.8	-	-	-	-	-
CHF		1.05	0.4	1.8	1.4	2.1	3.2	-	-	-	-	-
CNY		7.08	-0.1	0.8	0.1	-1.6	-2.8	-	-	-	-	-

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 6 – World equity sector total returns relative to market (%)

Data as at 26/06/2020	Global				
	1w	1m	QTD	YTD	12m
Energy	**-2.4**	**-3.7**	**2.8**	**-25.0**	**-29.9**
Basic Materials	**1.2**	**0.4**	**6.8**	**-0.8**	**-3.3**
Basic Resources	2.5	1.0	10.0	-0.2	-1.0
Chemicals	-0.2	-0.2	3.3	-1.4	-6.3
Industrials	**-0.3**	**-1.2**	**0.2**	**-4.4**	**-5.5**
Construction & Materials	0.3	0.6	0.0	-5.8	-5.7
Industrial Goods & Services	-0.4	-1.5	0.3	-4.2	-5.5
Consumer Discretionary	**0.1**	**0.6**	**4.8**	**3.8**	**2.8**
Automobiles & Parts	0.8	2.6	7.4	-1.9	-2.2
Media	-1.3	-2.4	-1.4	-5.2	-5.1
Retailers	0.9	2.0	8.1	21.4	19.4
Travel & Leisure	-3.6	-7.2	-2.1	-20.9	-21.8
Consumer Products & Services	1.0	2.7	4.5	5.1	4.9
Consumer Staples	**-0.3**	**-0.7**	**-6.7**	**0.6**	**-2.1**
Food, Beverage & Tobacco	-1.0	-1.7	-7.1	-2.6	-6.8
Personal Care, Drug & Grocery Stores	0.7	1.0	-5.9	6.8	6.0
Healthcare	**0.1**	**-2.1**	**-1.5**	**12.7**	**16.8**
Financials	**-0.8**	**0.5**	**-5.8**	**-16.1**	**-17.0**
Banks	-1.1	1.1	-7.9	-21.5	-23.0
Financial Services	-0.9	0.1	0.6	-8.0	-6.0
Insurance	-0.1	-0.1	-8.9	-14.2	-16.6
Real Estate	**-1.2**	**-0.3**	**-5.8**	**-8.7**	**-9.6**
Technology	**1.4**	**3.1**	**8.2**	**21.7**	**31.5**
Telecommunications	**0.1**	**-1.1**	**-6.1**	**2.9**	**-0.6**
Utilities	**-0.1**	**-1.9**	**-8.6**	**-2.2**	**-3.5**

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 7a – US factor index total returns (%)

Data as at 26/06/2020	Absolute					Relative to Market				
	1w	1m	QTD	YTD	12m	1w	1m	QTD	YTD	12m
Growth	-4.1	1.8	26.4	-0.8	12.9	-1.3	1.1	8.1	5.5	7.2
Low volatility	-2.4	2.0	15.5	-3.0	4.5	0.5	1.2	-1.3	3.2	-0.8
Price momentum	-2.2	3.1	17.2	-3.7	2.6	0.7	2.3	0.2	2.4	-2.6
Quality	-3.5	0.0	17.6	-12.3	-2.9	-0.7	-0.7	0.5	-6.8	-7.8
Size	-6.0	-1.9	25.4	-26.5	-20.3	-3.2	-2.6	7.2	-21.8	-24.4
Value	-6.7	-0.6	27.8	-26.0	-18.5	-4.0	-1.3	9.3	-21.3	-22.6
Market	-2.9	0.7	17.0	-6.0	5.3					
Market - Equal-Weighted	-4.1	-0.6	17.7	-13.8	-5.0					

Notes: 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. Past performance is no guarantee of future results.
Source: Refinitiv Datastream and Invesco

Figure 7b – European factor index total returns relative to market (%)

Data as at 26/06/2020	Absolute					Relative to Market				
	1w	1m	QTD	YTD	12m	1w	1m	QTD	YTD	12m
Growth	-1.9	1.3	21.5	-1.4	12.6	0.0	-1.6	7.4	12.4	17.0
Low volatility	-0.9	2.2	14.3	-7.0	1.7	1.0	-0.7	1.0	6.0	5.6
Price momentum	-0.3	2.1	18.0	-1.3	9.3	1.6	-0.8	4.4	12.6	13.5
Quality	-1.9	1.5	18.6	-14.9	-0.7	0.0	-1.4	4.9	-3.0	3.1
Size	-4.4	1.2	20.6	-18.5	-3.0	-2.6	-1.7	6.6	-7.1	0.7
Value	-4.0	4.0	14.8	-29.3	-20.8	-2.2	1.1	1.5	-19.4	-17.7
Market	-1.9	2.9	13.1	-12.3	-3.7					
Market - Equal-Weighted	-2.2	1.8	15.6	-14.6	-4.3					

Notes: 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. Past performance is no guarantee of future results.
Source: Refinitiv Datastream and Invesco

Figure 8 – Model asset allocation

	Neutral	Policy Range		Allocation	Position vs Neutral	Hedged	Currency
Cash	**5%**	**0-10%**	↑	**10%**			
Cash	2.5%		↑	10%			
Gold	2.5%		↓	0%			
Bonds	**45%**	**10-80%**	↑	**51%**			
Government	30%	10-50%	↑	25%			
US	10%		↑	12%			
Europe ex-UK (Eurozone)	8%			0%			
UK	2%		↑	4%			
Japan	8%		↑	5%			
Emerging Markets	2%			4%			
Corporate IG	10%	0-20%		20%			
US Dollar	5%			10%			
Euro	2%			2%			
Sterling	1%			4%			
Japanese Yen	1%			1%			
Emerging Markets	1%			3%			
Corporate HY	5%	0-10%	↑	6%			
US Dollar	4%		↑	6%			
Euro	1%			0%			
Equities	**40%**	**20-60%**	↓	**25%**			
US	24%			14%			
Europe ex-UK	6%		↓	0%			
UK	3%		↓	3%			
Japan	3%		↓	5%			
Emerging Markets	4%		↑	4%			
Real Estate	**8%**	**0-16%**	↓	**12%**			
US	2%		↓	2%			
Europe ex-UK	2%			2%			
UK	1%		↓	0%			
Japan	2%			5%			
Emerging Markets	1%			3%			
Commodities	**2%**	**0-4%**	↓	**2%**			
Energy	1%		↓	1%			
Industrial Metals	0.3%		↓	0%			
Precious Metals	0.3%			0%			
Agriculture	0.3%			1%			
Total	**100%**			**100%**			
Currency Exposure (including effect of hedging)							
USD	49%		↑	51%			
EUR	20%		↓	4%			
GBP	7%		↓	12%			
JPY	15%			18%			
EM	8%		↑	14%			
Total	**100%**			**100%**			

Notes: 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 9 – Model allocations for Global sectors

	Neutral	Invesco	
Energy	**4.1%**	**Overweight**	↑
Basic Materials	**4.0%**	**Neutral**	↑
Basic Resources	2.1%	Underweight	↓
Chemicals	1.9%	Overweight	↑
Industrials	**12.4%**	**Underweight**	
Construction & Materials	1.5%	Underweight	↓
Industrial Goods & Services	10.9%	Underweight	
Consumer Discretionary	**13.7%**	**Underweight**	↓
Automobiles & Parts	2.0%	Neutral	
Media	1.3%	Underweight	↓
Retailers	4.9%	Neutral	↑
Travel & Leisure	1.9%	Underweight	↓
Consumer Products & Services	3.7%	Underweight	↓
Consumer Staples	**8.0%**	**Overweight**	
Food, Beverage & Tobacco	5.1%	Overweight	
Personal Care, Drug & Grocery Stores	2.9%	Overweight	
Healthcare	**11.2%**	**Neutral**	↓
Financials	**15.6%**	**Neutral**	↑
Banks	7.3%	Overweight	↑
Financial Services	4.4%	Neutral	↑
Insurance	3.9%	Underweight	
Real Estate	**4.2%**	**Overweight**	
Technology	**17.6%**	**Overweight**	↑
Telecommunications	**5.2%**	**Neutral**	↑
Utilities	**4.0%**	**Underweight**	

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 5

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 Bank of America Merrill Lynch 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: Bank of America Merrill Lynch 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: Bank of America Merrill Lynch 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

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