Uncommon truths
Central banks in a pickle

We think tapering is off the agenda for 2021 and believe that central banks may purchase increasing amounts of assets. That may be good for risk assets this year but we worry where this is leading.

A fellow panellist on a recent webinar asked a simple but profound question: would the S&P 500 have produced a 19% total return in 2020 without Covid? The point being that policy makers provided enough support to allow financial markets to look through a very deep recession and gaze far into an untroubled future. Ample liquidity turns all news into good news.

ETFGI reports that global ETF and ETP flows were a record $762.87bn in 2020, a new high and up 34% on the year before (the previous record of $653.3bn was in 2017). That is a fraction of total asset flows (for example, the financial assets of the US non-financial sector increased by $7.9trn during the first three quarters of 2020, including price adjustments) but is impressive in a period of deep global recession.

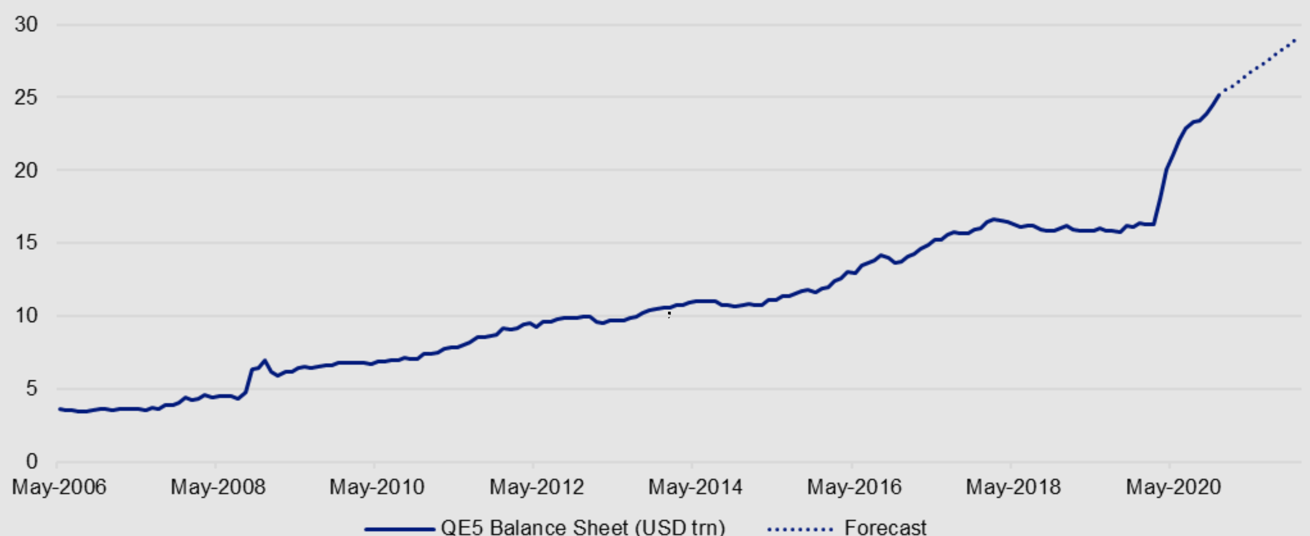
Equity ETF/ETPs accounted for 48% of those flows (fixed income products accounted for 30%). Given the huge financing requirements of governments, it might have been expected that fixed income flows would dominate. However, for that to have happened, government bond yields would have needed to rise to encourage investors to switch out of other assets. We believe central banks prevented that happening.

Further, it did not need to happen. According to IMF estimates embedded in the World Economic Outlook of October 2020, global government financing needs increased by $5.6trn in 2020 (to $7.3trn). Central banks were more than up to the task of facilitating that new debt: our estimates suggest that the QE5 collection of central banks increased their balance sheets by $8.8trn during 2020 (the QE5 is the Fed, ECB, BOE, BOJ and SNB). **Figure 1** shows the extent of that increase, though be aware that the proportionate increase in 2020 is like what happened at the time of the GFC but from a much higher base.

Of course, balance sheet expansion does not always equate to asset purchases. While the Fed's balance sheet increased by $3.2trn during 2020 and its purchases of securities amounted to $3.0trn, the ECB's balance sheet expanded by €3.3trn and total asset purchases were "only" €1.0trn. Central banks have also supported financial systems via the provision of loans and liquidity to banks and loans to the broader corporate sector. Nevertheless, central banks seemingly facilitated the low-cost financing of governments, even if they did not directly fund them.

Looking beyond government bond markets, we think central banks impacted financial markets in a number of ways during 2020: first, some of them purchase other assets, with the BOJ and SNB perhaps the most adventurous; second, those selling bonds to central banks have to do something with the proceeds and some of it probably "leaked" into other assets and, finally, by enabling governments to protect household and corporate cash-flows, they cushioned profits and savings flows.

Figure 1 – Aggregate balance of QE5 central banks (USD trillion)



Note: monthly data from May 2006 to December 2020 (forecast is from January 2021 to December 2021). The QE5 is the collection of five central banks that have extensively used quantitative easing since the global financial crisis (US Federal Reserve, Bank of England, European Central Bank, Bank of Japan and Swiss National Bank). Forecast assumes the following balance sheet expansion per month during 2021: Fed $120bn, ECB $150bn (€130bn), BOJ $30bn, BOE $20bn (£15bn), SNB $10bn. Source: Bank of England, Refinitiv Datastream and Invesco

Hence, in our opinion, central banks did something extraordinary during a global pandemic and global recession. They not only put a floor under risk assets, they appear to have also removed the ceiling, thus creating bubbles in numerous places (Bitcoin and some US stocks, say), while enabling a chatroom full of retail vigilantes to take on hedge funds. Outside of financial markets, house prices are rising strongly in a number of countries (the US Case-Shiller 20 Index was up 9.1% y-o-y in January, while in the UK the Nationwide House Prices Index was up 7.3% and the Netherlands House Price Index was up 8.3%).

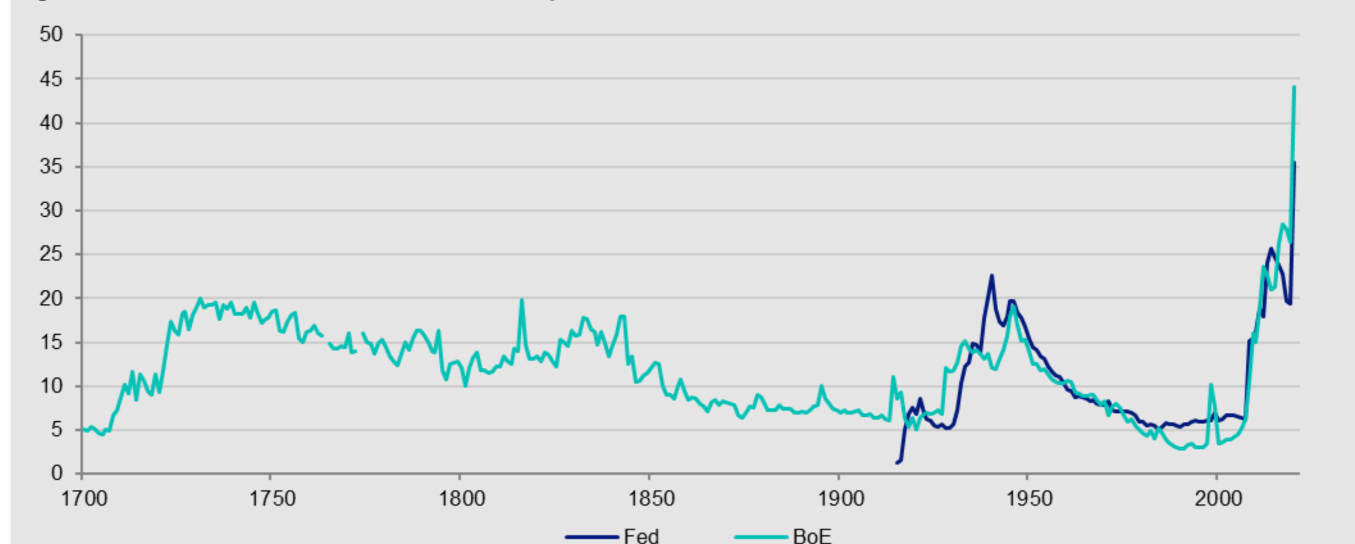
The question is what comes next? With the pandemic still going strong in many parts of the world, economic performance is not what was hoped for a few months ago. For example, in the US, despite an inventory boosted 4.0% annualised GDP gain in Q4, retail sales fell for the third month in a row in December, payrolls fell in December and initial jobless claims have been running at 800-900k per week so far this year (a level never seen before the pandemic, not even during the GFC). Meanwhile, in Europe, French GDP declined 1.3% in 2020 Q4 and only a small gain was registered in Germany (0.1%). Further GDP declines are expected and we think it possible that global GDP could contract during the current quarter.

Even worse, it is becoming apparent that vaccines are not the silver bullet once imagined when it comes to opening up the global economy: first, supply remains constrained (see problems experienced by the EU), so that rolling out vaccines across developed countries will take much of this year, while developing nations may have to wait until 2022 or later; second, it is not yet clear whether those who are vaccinated can still transmit the virus and, third, there is a risk that new variants will eventually overcome the vaccine. Ironically, as vaccines are being rolled out, countries are becoming stricter about allowing international arrivals (see recent announcements from Israel and the UK) and a return to normality now seems further away than we thought just a few months ago.

This suggests to us that governments will need to continue with the economic support provided so far during the pandemic (furlough schemes, income support, eviction protection, business loans/tax breaks, support for heavily impacted industries etc.). Hence, we think the IMF was overly optimistic when it suggested that global government financing needs would decline by $3.5trn in 2021 to $3.9trn and we suspect there will be little change versus 2020 (see President Biden's proposed $1.9trn package). On this basis, we doubt that central banks will be able to significantly taper their asset purchase and other support programmes during 2021. This view was only strengthened by Fed Chairman Powell's comments after the FOMC meeting on 27 January 2021.

This may seem like good news for financial markets and indeed it suggests central banks will remain buyers of large amounts of assets. However, to the extent that balance sheet expansion will no longer be as strong as it was last year (in percentage terms), it is possible that markets will receive less support from that direction and may even consolidate (just as when riding a bike, if you don't move forward, you fall off). If they don't buy ever increasing amounts of assets, central banks may disappoint markets.

Figure 2 – Central bank balance sheets as percent of GDP since 1700



Annual data from 1700 to 2020 (from 1915 for the Fed). BoE balance sheet data for any given year is as measured in March of the following year (except for 2020 which is as of December 2020) and is compared to the full year GDP for the given year (using our estimate of 2020 Q4 GDP for the UK). Source: Source: Bank of England, Hills, Thomas & Dimsdale, Gresham's Law, Global Financial Data, Refinitiv Datastream and Invesco

More fundamentally, there is a serious question to be asked about how central banks get off the quantitative easing treadmill. **Figure 2** shows that the BOE and the Fed are in uncharted waters when it comes to the size of their balance sheets relative to their economies. Having started the GFC with a balance sheet to GDP ratio around 5%, the BOE balance sheet ballooned to 23% of GDP in 2012/13, which at the time was a multi-century record. However, that ratio has now literally doubled again to stand at 44% (according to our estimates) and we wouldn't be surprised to see it go above 50% by the end of 2021. The Fed is not far behind at 35% and rising.

We have previously commented that reductions in those ratios have historically been multi-decade processes brought about by growth in GDP, rather than shrinkage in balance sheets. The Fed tried to buck that historical precedent by reducing its balance sheet, starting in early 2016. However, that process had already come to an end in late 2019 (i.e. before the pandemic struck) as the Fed started a new easing cycle. That accommodation accelerated markedly with the onset of the pandemic in early 2020. The effect of the pandemic, coming on top of the GFC, makes us believe that central bank balance sheet normalisation may take the best part of this century.

However, that may be an over optimistic assessment. Developed world central banks seem to have gotten themselves into an invidious position, whereby their stated main role is to boost inflation back to the arbitrary target of 2% (in most cases), which we think will be extremely difficult given the demographic headwinds. Hence, they risk throwing good money after bad in a futile attempt to hit a self-imposed target (to see the difficulty, look at average inflation rates over multi-century periods).

Even worse, over recent decades, they seem to have taken on the role of preventing financial market instability. More precisely, they do all they can to dampen downside volatility, while permitting (encouraging) upside movements. It would appear that financial markets, especially stock markets, have become too important within developed world economies to allow them to collapse, both because of the effect on corporate financing and on the economy (via wealth effects). Effectively, stock markets cannot be allowed to find their "level" during a recession for fear that would aggravate the downturn.

The upshot is that central banks feel the need to ratchet up the support provided with each passing recession and to accelerate that process during deep recessions. In an attempt to prevent financial market instability, central banks push themselves further away from what most of us would previously have considered a stable policy setting. They seem to be following the maxim that the best way to avoid a hangover is to stay drunk.

That recipe for hangover management is a disaster for the human body. Can central banks continue to veer from "healthy" practices without similar consequence? Optimists may point to the case of the BOJ, whose balance sheet amounted to around 130% of Japanese GDP at the end of 2020, up from around 12% in 1996 (according to our calculations). Despite this, the yen seems to have kept its so-called "safe haven" status.

However, it is far from clear that all major central banks could do likewise without negative consequences. The obvious concern based on historical precedent is that such "banana republic" policies could provoke serious inflation, especially if central banks continue enabling fiscal profligacy.

However, the only inflation that has so far stemmed from such polices seems to be that of asset prices, which brings us on to the second problem, namely rising inequality. Central banks may be unwittingly sowing the seeds of social unrest by helping the "haves" to get even more. According to Bloomberg, the world's richest 500 people added $1.8 trillion to their combined net worth in 2020, an amount bigger than the GDP of countries such as Canada and Russia, for example. Taken too far, we suspect this will boost popularism and provoke the sort of instability that central banks are trying to avoid.

We realise that this sort of reasoning quickly leads one down the path to a bunker in New Zealand. Under the most extreme scenarios (financial meltdown and/or revolution) it is hard to think of many assets that would offer mitigation. We think such a list could include real assets such as gold and property (beware confiscation) and even cryptocurrencies (but what happens if electricity grids go down?). It would not include government bonds and probably not corporate liabilities such as stocks and credit, in our opinion.

Perhaps we are wrong and central banks really do have magic money trees that can be harvested without consequence. However, we doubt it. While enjoying the fruits of continued, and perhaps accelerating, central bank asset purchases during 2021 and thus sticking to our preference for cyclical assets (despite disrupted economic activity in the early part of the year), we do worry about where this is leading. If it seems too good to be true, it probably is. This may not be a problem for today or tomorrow but it could impact our pensions.

Unless stated otherwise, all data as of 28 January 2021

Figure 3 – Asset class total returns

Data as at 28/01/2021	Index	Current Level/RY	Total Return (USD, %) 1w	1m	QTD	YTD	12m	Total Return (Local Currency, %) 1w	1m	QTD	YTD	12m
Equities												
World	MSCI	654	-2.3	2.2	1.3	1.3	17.9	-2.0	2.3	1.7	1.7	15.4
Emerging Markets	MSCI	1351	-3.9	8.0	4.6	4.6	25.6	-3.4	8.5	5.5	5.5	26.4
China	MSCI	117	-3.1	14.5	8.5	8.5	41.1	-3.1	14.4	8.4	8.4	39.6
US	MSCI	3700	-1.8	1.4	1.0	1.0	20.5	-1.8	1.4	1.0	1.0	20.5
Europe	MSCI	1844	-2.1	0.5	0.3	0.3	7.8	-1.9	0.5	0.9	0.9	-1.2
Europe ex-UK	MSCI	2315	-1.9	-0.1	-0.1	-0.1	12.7	-1.6	0.5	0.8	0.8	2.2
UK	MSCI	1047	-2.8	2.6	1.6	1.6	-6.5	-2.7	0.5	1.2	1.2	-11.5
Japan	MSCI	3893	-2.1	2.8	1.0	1.0	18.1	-1.4	3.2	2.0	2.0	12.8
Government Bonds												
World	BofA-ML	0.27	0.0	-0.6	-1.1	-1.1	7.3	0.2	-0.5	-0.6	-0.6	2.7
Emerging Markets	BBloom	4.01	0.2	-1.5	-1.8	-1.8	3.6	0.2	-1.5	-1.8	-1.8	3.6
China	BofA-ML	3.12	-0.4	1.4	1.2	1.2	9.1	-0.2	0.5	0.2	0.2	1.9
US (10y)	Datastream	1.06	0.5	-1.1	-1.3	-1.3	8.4	0.5	-1.1	-1.3	-1.3	8.4
Europe	Bofa-ML	-0.19	0.1	-1.1	-1.3	-1.3	13.0	0.4	-0.3	-0.4	-0.4	2.6
Europe ex-UK (EMU, 10y)	Datastream	-0.57	0.2	-0.7	-1.0	-1.0	12.1	0.4	0.0	-0.1	-0.1	1.7
UK (10y)	Datastream	0.31	0.3	1.7	-0.3	-0.3	9.0	0.4	-0.3	-0.7	-0.7	3.2
Japan (10y)	Datastream	0.02	-0.7	-0.5	-1.0	-1.0	4.3	0.0	0.0	0.0	0.0	-0.3
IG Corporate Bonds												
Global	BofA-ML	1.48	0.0	-0.4	-0.9	-0.9	8.3	0.1	-0.4	-0.7	-0.7	5.3
Emerging Markets	BBloom	3.72	0.1	-0.1	-0.2	-0.2	9.5	0.1	-0.1	-0.2	-0.2	9.5
China	BofA-ML	4.05	-0.3	1.4	1.3	1.3	9.8	-0.1	0.4	0.3	0.3	2.6
US	BofA-ML	1.93	0.1	-0.6	-1.0	-1.0	6.8	0.1	-0.6	-1.0	-1.0	6.8
Europe	BofA-ML	0.34	-0.3	-0.7	-1.0	-1.0	12.2	0.0	0.1	-0.1	-0.1	1.8
UK	BofA-ML	1.52	0.2	2.1	-0.3	-0.3	10.9	0.2	0.0	-0.7	-0.7	5.0
Japan	BofA-ML	0.40	-0.7	-0.4	-1.0	-1.0	4.8	0.0	0.1	0.1	0.1	0.2
HY Corporate Bonds												
Global	BofA-ML	4.75	-0.3	0.3	0.0	0.0	7.9	-0.2	0.4	0.2	0.2	6.0
US	BofA-ML	4.87	-0.2	0.6	0.5	0.5	6.5	-0.2	0.6	0.5	0.5	6.5
Europe	BofA-ML	3.11	-0.7	-0.4	-0.7	-0.7	13.3	-0.5	0.4	0.3	0.3	2.8
Cash (Overnight LIBOR)												
US		0.08	0.0	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0	0.3
Euro Area		-0.58	-0.3	-0.8	-0.8	-0.8	9.4	0.0	-0.1	0.0	0.0	-0.6
UK		0.04	-0.1	2.0	0.3	0.3	5.4	0.0	0.0	0.0	0.0	0.1
Japan		-0.08	-0.7	-0.4	-0.9	-0.9	4.6	0.0	0.0	0.0	0.0	-0.1
Real Estate (REITs)												
Global	FTSE	1771	-0.6	0.8	-0.3	-0.3	-10.0	-0.4	1.6	0.7	0.7	-18.4
Emerging Markets	FTSE	1929	-5.7	-0.2	-2.1	-2.1	-13.5	-5.5	0.6	-1.2	-1.2	-21.5
US	FTSE	2837	0.4	1.6	1.0	1.0	-11.0	0.4	1.6	1.0	1.0	-11.0
Europe ex-UK	FTSE	3605	0.6	-2.9	-4.0	-4.0	-1.8	0.9	-2.1	-3.1	-3.1	-10.9
UK	FTSE	1337	0.9	0.4	-0.7	-0.7	-10.4	0.9	-1.6	-1.1	-1.1	-15.2
Japan	FTSE	2617	1.0	2.1	0.0	0.0	-12.2	1.7	2.6	1.0	1.0	-16.1
Commodities												
All	GSCI	2073	-0.6	6.8	4.8	4.8	-12.9	-	-	-	-	-
Energy	GSCI	287	-0.7	9.7	7.5	7.5	-34.5	-	-	-	-	-
Industrial Metals	GSCI	1410	-1.8	-0.7	0.7	0.7	22.5	-	-	-	-	-
Precious Metals	GSCI	2135	-1.3	-2.3	-2.9	-2.9	16.3	-	-	-	-	-
Agricultural Goods	GSCI	417	-0.7	9.1	4.4	4.4	20.8	-	-	-	-	-
Currencies (vs USD)*												
EUR		1.21	-0.3	-0.8	-0.8	-0.8	10.0	-	-	-	-	-
JPY		104.23	-0.7	-0.4	-0.9	-0.9	4.7	-	-	-	-	-
GBP		1.37	0.0	2.0	0.4	0.4	5.7	-	-	-	-	-
CHF		1.12	-0.4	0.0	-0.4	-0.4	9.5	-	-	-	-	-
CNY		6.45	0.2	1.4	1.2	1.2	7.6	-	-	-	-	-

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

Data as at 28/01/2021	Global				
	1w	1m	QTD	YTD	12m
Energy	**-0.9**	**-0.6**	**0.2**	**0.2**	**-28.6**
Basic Materials	**-1.6**	**-0.3**	**-0.3**	**-0.3**	**11.4**
Basic Resources	-3.1	-0.9	-0.8	-0.8	14.9
Chemicals	0.3	0.4	0.3	0.3	7.5
Industrials	**-0.7**	**-2.5**	**-2.5**	**-2.5**	**-3.6**
Construction & Materials	-1.4	-1.4	-1.2	-1.2	-3.4
Industrial Goods & Services	-0.6	-2.7	-2.7	-2.7	-3.6
Consumer Discretionary	**0.0**	**0.5**	**0.0**	**0.0**	**11.2**
Automobiles & Parts	-0.9	8.3	6.4	6.4	48.2
Media	1.1	-0.9	-1.4	-1.4	4.2
Retailers	0.7	0.4	0.5	0.5	13.8
Travel & Leisure	-1.4	-4.2	-4.7	-4.7	-15.7
Consumer Products & Services	-0.2	-1.5	-1.8	-1.8	11.8
Consumer Staples	**2.0**	**-2.3**	**-2.2**	**-2.2**	**-10.1**
Food, Beverage & Tobacco	2.1	-2.9	-2.6	-2.6	-12.4
Personal Care, Drug & Grocery Stores	1.9	-1.3	-1.4	-1.4	-5.9
Healthcare	**0.7**	**1.5**	**0.9**	**0.9**	**3.6**
Financials	**-1.1**	**-1.2**	**-1.2**	**-1.2**	**-15.1**
Banks	-1.3	-1.5	-1.0	-1.0	-19.4
Financial Services	-0.6	0.6	0.1	0.1	-6.9
Insurance	-1.4	-2.7	-2.8	-2.8	-15.9
Real Estate	**1.1**	**-1.4**	**-1.6**	**-1.6**	**-18.5**
Technology	**0.4**	**3.2**	**3.6**	**3.6**	**29.4**
Telecommunications	**1.2**	**-0.9**	**-0.6**	**-0.6**	**-5.5**
Utilities	**0.3**	**-1.9**	**-2.0**	**-2.0**	**-13.1**

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 5a – US factor index total returns (%)

Data as at 28/01/2021	Absolute					Relative to Market				
	1w	1m	QTD	YTD	12m	1w	1m	QTD	YTD	12m
Growth	-2.4	2.5	1.5	1.5	31.2	-0.7	1.0	0.5	0.5	11.5
Low volatility	-1.0	-1.2	-2.0	-2.0	10.6	0.7	-2.7	-2.9	-2.9	-6.1
Price momentum	-3.1	1.6	1.1	1.1	18.2	-1.4	0.1	0.2	0.2	0.4
Quality	-2.4	1.5	1.0	1.0	16.3	-0.7	0.0	0.1	0.1	-1.2
Size	-1.5	5.4	4.8	4.8	13.8	0.2	3.8	3.8	3.8	-3.4
Value	-2.3	6.1	5.0	5.0	11.8	-0.7	4.5	4.0	4.0	-5.0
Market	-1.7	1.5	0.9	0.9	17.7					
Market - Equal-Weighted	-2.3	2.0	1.0	1.0	13.7					

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

Data as at 28/01/2021	Absolute					Relative to Market				
	1w	1m	QTD	YTD	12m	1w	1m	QTD	YTD	12m
Growth	-1.6	0.9	0.2	0.2	20.7	0.3	-0.4	-0.9	-0.9	21.7
Low volatility	-0.6	1.5	1.1	1.1	-0.1	1.2	0.2	0.0	0.0	0.7
Price momentum	-2.2	2.2	1.7	1.7	15.8	-0.4	0.9	0.6	0.6	16.8
Quality	-2.7	1.8	1.3	1.3	7.8	-0.9	0.5	0.1	0.1	8.7
Size	-1.6	3.1	2.4	2.4	7.8	0.3	1.8	1.2	1.2	8.7
Value	-2.1	0.5	1.0	1.0	-5.0	-0.3	-0.8	-0.1	-0.1	-4.2
Market	-1.8	1.3	1.2	1.2	-0.8					
Market - Equal-Weighted	-1.8	1.4	1.2	1.2	3.4					

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 6 – Model asset allocation

	Neutral	Policy Range		Allocation	Position vs Neutral
Cash Equivalents	**5%**	**0-10%**		**10%**	
Cash	2.5%			10%	
Gold	2.5%			0%	
Bonds	**40%**	**10-70%**	↓	**20%**	
Government	25%	10-40%		15%	
US	8%		↓	2%	
Europe ex-UK (Eurozone)	7%		↑	4%	
UK	1%		↑	2%	
Japan	7%		↓	3%	
Emerging Markets	2%			4%	
China**	0.2%			1%	
Corporate IG	10%	0-20%	↓	0%	
US Dollar	5%		↓	0%	
Euro	2%		↓	0%	
Sterling	1%		↓	0%	
Japanese Yen	1%		↓	0%	
Emerging Markets	1%		↓	0%	
China**	0.1%			0%	
Corporate HY	5%	0-10%	↓	5%	
US Dollar	4%		↓	4%	
Euro	1%		↓	1%	
Equities	**45%**	**20-60%**	↑	**50%**	
US	25%		↑	18%	
Europe ex-UK	7%		↑	12%	
UK	4%		↑	6%	
Japan	4%			6%	
Emerging Markets	5%		↑	8%	
China**	2%			3%	
Real Estate	**8%**	**0-16%**	↑	**16%**	
US	2%		↑	3%	
Europe ex-UK	2%		↑	4%	
UK	1%			3%	
Japan	2%		↓	3%	
Emerging Markets	1%		↑	3%	
Commodities	**2%**	**0-4%**	↑	**4%**	
Energy	1%		↑	2%	
Industrial Metals	0.3%		↑	1%	
Precious Metals	0.3%			0%	
Agriculture	0.3%		↑	1%	
Total	**100%**			**100%**	

Currency Exposure (including effect of hedging)				
USD	48%		↓	36%
EUR	20%		↑	23%
GBP	7%		↑	12%
JPY	15%		↓	13%
EM	9%		↑	15%
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 7 – Model allocation for global sectors

	Neutral	Invesco		Preferred Region
Energy	**5.8%**	**Neutral**		**US**
Basic Materials	**4.3%**	**Underweight**	↓	**Europe**
Basic Resources	2.4%	Underweight		Europe
Chemicals	1.9%	Neutral	↓	US
Industrials	**12.8%**	**Neutral**	↓	**US**
Construction & Materials	1.6%	Neutral		Europe
Industrial Goods & Services	11.3%	Neutral	↓	US
Consumer Discretionary	**16.5%**	**Overweight**	↑	**Japan**
Automobiles & Parts	2.7%	Underweight		Japan
Media	1.4%	Overweight	↑	US
Retailers	6.1%	Underweight	↓	EM
Travel & Leisure	2.1%	Overweight	↑	US
Consumer Products & Services	4.2%	Overweight	↑	Japan
Consumer Staples	**6.6%**	**Overweight**		**Europe**
Food, Beverage & Tobacco	4.3%	Overweight		Europe
Personal Care, Drug & Grocery Stores	2.3%	Underweight		Europe
Healthcare	**10.3%**	**Underweight**	↓	**Europe**
Financials	**13.7%**	**Neutral**		**EM**
Banks	6.3%	Neutral		EM
Financial Services	4.1%	Overweight		US
Insurance	3.2%	Neutral	↑	Europe
Real Estate	**3.4%**	**Overweight**		**EM**
Technology	**19.0%**	**Overweight**		**US**
Telecommunications	**4.2%**	**Neutral**		**Europe**
Utilities	**3.4%**	**Neutral**		**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 3

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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