Uncommon truths
Can the Fed save the S&P 500?

The further we get into this lockdown, the clearer is becoming the extent of the economic fallout and it is not pretty. But major equity indices suggest it will be a normal recession. Why the disconnect?

The contrast continues: on the one hand, estimates of the economic damage occasioned by the fight against Covid-19 darken by the day; on the other, equity markets are behaving as though the end of a mild recession is around the corner.

For the moment Asia appears to be getting off lightly. China's first quarter GDP was 12%-13% below what we might have expected without Covid-19 and monthly activity data suggests momentum was building as the quarter ended. Even better, South Korea's Q1 GDP was down only 1.4% on the previous quarter and was up 1.3% versus the year-ago period.

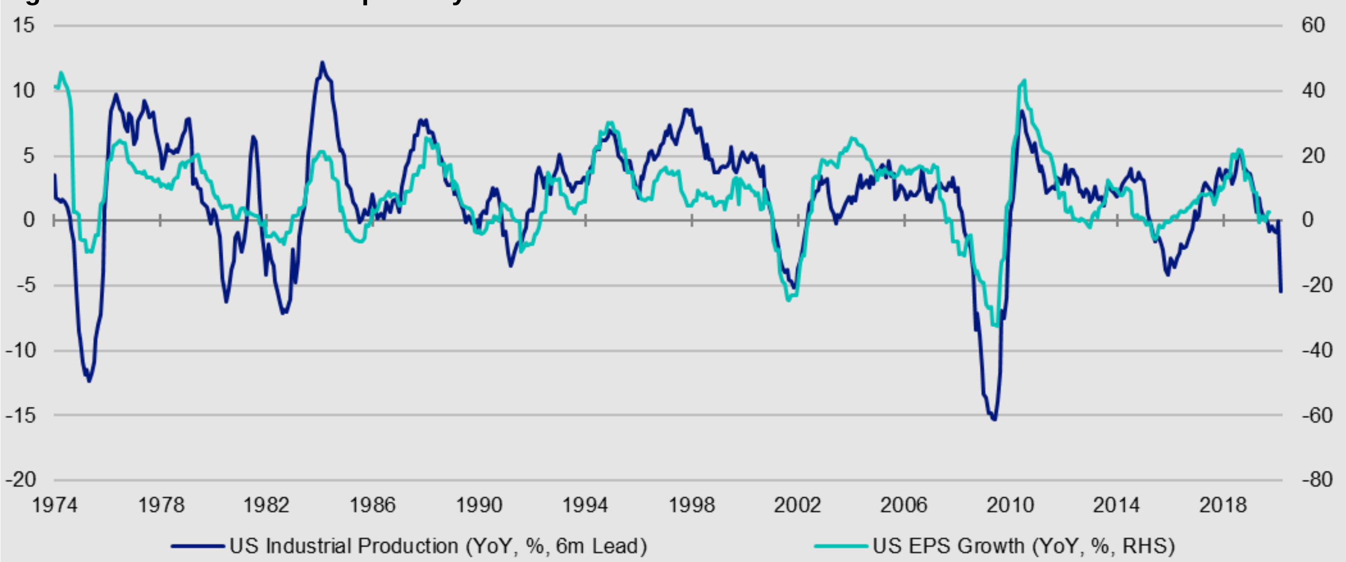
However, Europe and then the US quickly became the successive epicentres of the pandemic and the degree of lockdown appears to have been greater than in many parts of Asia. Unfortunately, the scale of the damage will only be hinted at by March data and then more fully revealed by the April numbers. As of today, we have little hard data from Europe for the month of March, though survey data has been truly awful (for example the Markit Eurozone Flash Composite PMI slumped to 13.5 in April).

We do, however, have some hard data from the US. Retail sales fell 9% in the month of March and manufacturing output declined 6%. Those are astounding changes but the economy wasn't in lockdown for the full month, so we would expect the numbers to worsen in April. Already, the Chicago Fed National Activity Index had fallen to -4.2 in March, close to the lows seen in 1980 and during the Global Financial Crisis (GFC). Both those episodes witnessed QOQ GDP declines of 2% (around 8% annualised) but if April is worse than March then we believe the Q2 GDP decline will be much greater than that.

That would normally be bad news for the equity market. **Figure 1** shows the relationship between US industrial production and profits (earnings per share). Not only is there a good correlation (with a six-month lag between production and profits) but there is also a geared effect passing from output to profits (via operational gearing). We would not be surprised to see a year-on-year production decline far in excess of the 15% seen during the GFC, in which case we expect to see a halving of EPS (and perhaps worse).

Just to underline the risks, there is a good correlation between the unemployment rate and mortgage delinquency rates in the US. In the fourth quarter of 2019, both unemployment (3.5%) and delinquency (3.8%) rates were at the lowest since the delinquency data started in 1980. Based on recent jobless claims data, we believe that unemployment could rise to 20% and more. Bearing in mind that: 1) unemployment peaked at 10.8% in December 1982 and delinquencies peaked at 6.1% two years later and 2) unemployment again reached 10% during the GFC, while delinquencies peaked at 10.1% in early 2010, we suspect delinquencies will rise sharply over the coming year or two. That could place strain upon the banking system, which fortunately started this crisis better capitalised than it was before the GFC.

Figure 1 – US industrial and profit cycles



Monthly data from January 1974 to March 2020. EPS is earnings per share, based on the Datastream US Market Index.
Source: OECD, Refinitiv Datastream and Invesco

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Those brave enough to forecast are suggesting a dramatic outcome for Q2. On 14 April, the UK's Office for Budget Responsibility published a fiscal analysis that assumed UK GDP would fall 35% QOQ in Q2 (not annualised), with a 2020 decline of 13% (based on a 3-month lockdown with recovery thereafter).

France's National Institute of Statistics and Economic Studies (INSEE) published an updated analysis on 9 April that suggested the lockdown is causing a 36% loss of economic activity. Though INSEE has not yet forecast the Q2 and full-year GDP impacts, it has a working assumption that each month of full lockdown causes a loss equivalent to three percentage points of annual GDP. So, three months of lockdown would cause a 9% loss of GDP during 2020, for example, assuming a return to normal activity thereafter.

As for the US, on 3 April Morgan Stanley forecast the US economy would shrink by 38% during Q2 (QOQ seasonally adjusted annualised rate) and that GDP would fall by 5.5% in 2020. Invesco's Economics team (John Greenwood, and Adam Burton) predict a base-case 35% decline in US Q2 GDP (QOQ SAAR).

Clearly the range of global GDP scenarios that we developed in early March for the Big Picture document are out of date and now hopelessly optimistic (the scenarios ranged from -3.5% to +2.0% for 2020). Within Invesco's Global Market Strategy Office, we are examining just how bad things could become and because the analysis is spearheaded by former Roubini Global Economics Head of Research, Arnab Das, the scenarios get very bad indeed! In a worst-case rolling lockdown scenario, Arnab thinks global GDP could fall by around one-third during 2020 (with another 13% decline in 2021). Even his best-case scenario gives a 5% loss of global GDP in 2020 and the intermediate scenario produces an 18% loss.

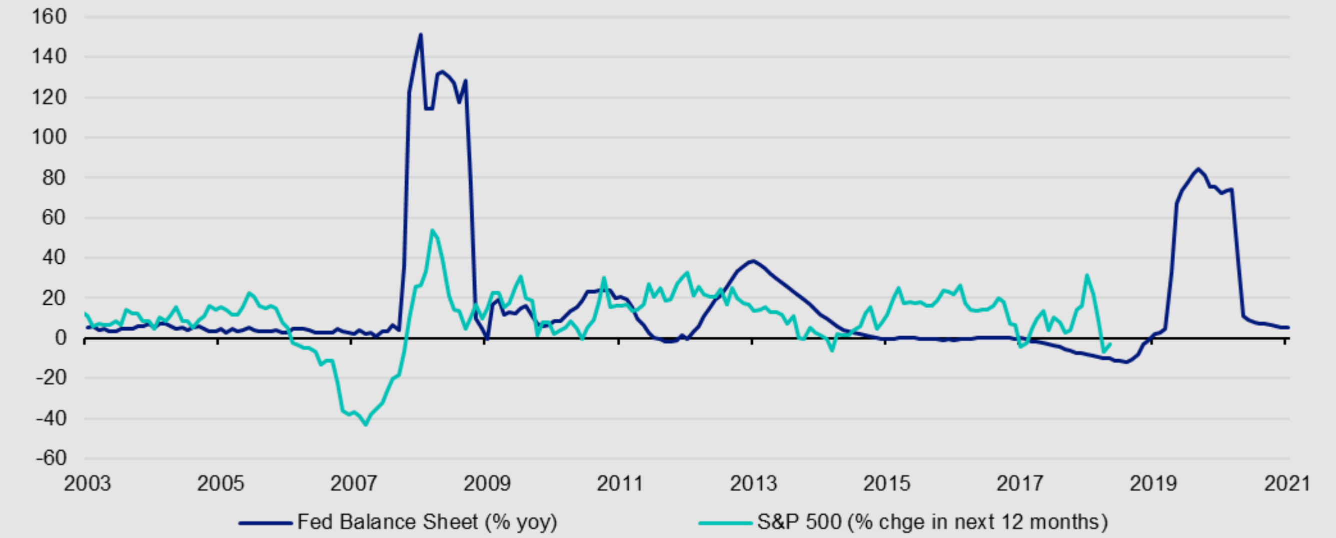
Given all the above, how is it possible that stock markets are doing so well (as of 23 April, the S&P 500 was down 14% from its recent peak, a peak that we thought was excessive)? Maybe we are wrong about the economic outlook but if so, we are in good company. Or perhaps we are wrong about how this economic downturn translates into corporate incomes and balance sheets (maybe due to policy actions).

Alternatively, perhaps it is because of the large (and for now unlimited) asset purchases launched by the Fed. Though the Fed cannot yet buy equities, its asset purchases are stretching further along the risk spectrum and money received from the Fed in exchange for assets could be recycled into equities. **Figure 2** compares the year-on-year growth in the Fed's balance sheet with S&P 500 total returns over the next 12 months. The correlation is not obvious but the experience of the GFC could lead us to believe the Fed's ongoing balance sheet expansion could propel US stocks higher. However, we have not yet seen the GFC losses that gave the springboard for that rebound.

We remain fearful that equity markets are not reflecting the depth of this recession and are Underweight in our Model Asset Allocation (see **Figure 6**).

Unless stated otherwise, all data as of 24 April 2020.

Figure 2 – The Fed's balance sheet and stock market returns



Monthly data from December 2002 to December 2021 (as of 22 April 2020). S&P 500 returns are based on the total return index as calculated by Refinitiv Datastream. The Fed's balance sheet is based on actual data, with April 2020 as of 22 April. Forecasts thereafter are based on the fact the Fed has announced unlimited purchases, which we assume occur as follows: $120bn per month for the rest of 2020 Q2, $60bn per month during 2020 H2 and $30bn per month during 2021. Past performance is no guide to future returns. See appendices for definitions and disclaimers. Source: Refinitiv Datastream and Invesco

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Figure 3 – Asset class total returns

Data as at 24/04/2020	Index	Current Level/RY	Total Return (USD, %) 1w	1m	QTD	YTD	12m	Total Return (Local Currency, %) 1w	1m	QTD	YTD	12m
Equities												
World	MSCI	473	-1.6	13.8	7.0	-15.8	-7.3	-1.3	13.0	7.1	-14.2	-6.2
Emerging Markets	MSCI	879	-2.4	10.0	3.8	-20.7	-16.4	-1.8	10.2	4.6	-15.3	-11.2
US	MSCI	2706	-1.2	16.4	10.1	-11.5	-1.1	-1.2	16.4	10.1	-11.5	-1.1
Europe	MSCI	1358	-1.8	8.5	1.4	-23.2	-16.6	-0.9	7.0	2.5	-19.7	-14.0
Europe ex-UK	MSCI	1662	-1.8	8.0	1.7	-21.3	-13.7	-1.0	7.6	3.0	-18.5	-11.6
UK	MSCI	840	-1.9	10.0	0.3	-28.6	-24.4	-0.6	5.1	0.8	-23.3	-20.6
Japan	MSCI	2881	-1.8	11.8	1.8	-15.2	-5.3	-1.9	7.7	1.3	-16.1	-8.9
Government Bonds												
World	BofA-ML	0.33	0.1	2.3	0.2	2.9	7.7	0.3	0.9	0.4	4.2	7.9
Emerging Markets	BBloom	9.00	-1.9	6.8	0.3	-15.2	-7.1	-1.9	6.8	0.3	-15.2	-7.1
US (10y)	Datastream	0.60	0.5	2.8	0.6	15.0	23.1	0.5	2.8	0.6	15.0	23.1
Europe	Bofa-ML	0.38	-1.0	0.3	-2.1	-4.0	0.9	-0.3	0.2	-0.6	-0.3	4.5
Europe ex-UK (EMU, 10y)	Datastream	-0.47	-0.8	1.6	-1.4	-0.9	1.1	-0.1	1.4	0.1	2.9	4.8
UK (10y)	Datastream	0.25	-1.3	6.2	0.0	-1.6	4.6	0.0	1.5	0.5	5.7	9.8
Japan (10y)	Datastream	-0.03	0.4	4.4	0.9	1.3	4.1	0.3	0.6	0.4	0.1	0.1
IG Corporate Bonds												
Global	BofA-ML	2.55	0.0	8.8	4.0	-1.8	4.8	0.3	8.3	4.3	-0.3	6.1
Emerging Markets	BBloom	6.51	-0.5	13.3	6.0	-8.3	1.4	-0.5	13.3	6.0	-8.3	1.4
US	BofA-ML	2.97	0.2	11.0	5.2	0.9	9.4	0.2	11.0	5.2	0.9	9.4
Europe	BofA-ML	1.41	-0.3	3.9	1.1	-7.2	-4.8	0.4	3.7	2.6	-3.6	-1.3
UK	BofA-ML	2.51	-1.1	12.1	4.2	-7.0	0.8	0.2	7.0	4.8	-0.1	5.8
Japan	BofA-ML	0.51	0.2	3.5	0.4	0.8	4.1	0.1	-0.2	-0.1	-0.4	0.0
HY Corporate Bonds												
Global	BofA-ML	8.53	-1.8	10.9	3.4	-11.2	-6.3	-1.7	10.8	3.6	-10.5	-5.6
US	BofA-ML	8.57	-2.3	11.4	3.0	-10.5	-5.9	-2.3	11.4	3.0	-10.5	-5.9
Europe	BofA-ML	5.93	-1.1	10.5	3.6	-13.5	-9.8	-0.4	10.3	5.2	-10.2	-6.5
Cash (Overnight LIBOR)												
US		0.00	0.0	0.0	0.0	0.3	1.7	0.0	0.0	0.0	0.3	1.7
Euro Area		0.00	-0.5	0.2	-1.9	-3.7	-3.5	0.0	0.0	0.0	-0.2	-0.5
UK		0.00	-1.1	5.2	-0.4	-6.6	-3.6	0.0	0.0	0.0	0.1	0.6
Japan		0.00	0.0	3.4	0.0	1.0	4.2	0.0	0.0	0.0	0.0	-0.1
Real Estate (REITs)												
Global	FTSE	1451	-4.2	11.2	0.6	-27.9	-21.7	-3.5	11.0	2.1	-25.2	-18.8
Emerging Markets	FTSE	1757	-4.3	9.1	-0.3	-28.8	-21.8	-3.6	9.0	1.2	-26.1	-19.0
US	FTSE	2295	-5.2	13.3	1.2	-28.2	-22.3	-5.2	13.3	1.2	-28.2	-22.3
Europe ex-UK	FTSE	2722	-2.1	2.9	-2.3	-27.4	-18.6	-1.4	2.7	-0.8	-24.6	-15.7
UK	FTSE	1083	-3.4	9.4	0.8	-31.6	-19.4	-2.1	4.5	1.3	-26.5	-15.3
Japan	FTSE	2214	-1.3	10.4	-1.1	-25.7	-13.5	-1.3	6.4	-1.6	-26.5	-16.8
Commodities												
All	GSCI	1322	-10.8	-16.5	-11.6	-49.0	-50.2	-	-	-	-	-
Energy	GSCI	151	-23.3	-29.5	-21.9	-69.6	-71.0	-	-	-	-	-
Industrial Metals	GSCI	1013	-0.9	2.7	0.8	-16.9	-19.7	-	-	-	-	-
Precious Metals	GSCI	1985	2.0	4.6	8.7	11.0	31.5	-	-	-	-	-
Agricultural Goods	GSCI	298	-1.5	-6.8	-5.5	-14.3	-8.2	-	-	-	-	-
Currencies (vs USD)*												
EUR		1.08	-0.5	0.3	-1.9	-3.5	-3.0	-	-	-	-	-
JPY		107.52	0.0	3.4	0.0	1.0	4.3	-	-	-	-	-
GBP		1.23	-1.3	4.7	-0.5	-6.9	-4.8	-	-	-	-	-
CHF		1.03	-0.6	0.9	-1.2	-0.5	4.9	-	-	-	-	-
CNY		7.08	-0.1	-0.3	0.0	-1.7	-5.1	-	-	-	-	-

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 24/04/2020	Global				
	1w	1m	QTD	YTD	12m
Energy	**2.8**	**5.3**	**-25.2**	**-25.2**	**-30.7**
Basic Materials	**1.5**	**2.4**	**-4.1**	**-4.1**	**-6.4**
Basic Resources	2.8	3.8	-4.1	-4.1	-5.0
Chemicals	0.0	0.8	-4.0	-4.0	-8.0
Industrials	**-0.4**	**-1.5**	**-6.7**	**-6.7**	**-7.3**
Construction & Materials	-1.1	-1.9	-9.7	-9.7	-9.6
Industrial Goods & Services	-0.2	-1.5	-6.3	-6.3	-7.0
Consumer Discretionary	**-0.4**	**-0.2**	**1.4**	**1.4**	**-0.3**
Automobiles & Parts	-1.6	-0.8	-8.3	-8.3	-12.2
Media	-1.2	-3.3	-5.0	-5.0	-4.9
Retailers	0.5	3.2	20.5	20.5	18.2
Travel & Leisure	-1.1	-2.9	-18.3	-18.3	-19.6
Consumer Products & Services	-0.5	-2.0	-0.7	-0.7	-1.1
Consumer Staples	**-0.5**	**0.3**	**6.2**	**6.2**	**3.1**
Food, Beverage & Tobacco	-0.9	0.2	2.8	2.8	0.1
Personal Care, Drug & Grocery Stores	0.1	0.5	12.8	12.8	13.4
Healthcare	**2.0**	**8.9**	**20.3**	**20.3**	**29.0**
Financials	**-1.7**	**-6.3**	**-15.9**	**-15.9**	**-17.0**
Banks	-1.4	-10.0	-21.4	-21.4	-24.2
Financial Services	-1.6	-0.7	-10.2	-10.2	-7.1
Insurance	-2.3	-5.4	-11.3	-11.3	-12.6
Real Estate	**-2.1**	**-0.2**	**-6.5**	**-6.5**	**-6.3**
Technology	**0.6**	**0.5**	**15.3**	**15.3**	**21.3**
Telecommunications	**0.1**	**-2.6**	**8.3**	**8.3**	**8.4**
Utilities	**-1.2**	**-0.8**	**3.7**	**3.7**	**5.4**

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

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

Data as at 24/04/2020	Absolute					Relative to Market				
	1w	1m	QTD	YTD	12m	1w	1m	QTD	YTD	12m
Growth	-1.2	16.2	10.9	-14.8	-3.7	0.1	0.1	0.9	-3.5	-2.6
Low volatility	-1.0	19.0	10.5	-7.2	3.5	0.3	2.5	0.5	5.1	4.7
Price momentum	-1.5	17.2	10.2	-9.5	-2.9	-0.2	1.0	0.3	2.5	-1.8
Quality	-1.7	15.1	8.7	-18.9	-13.9	-0.4	-0.8	-1.1	-8.3	-12.9
Size	-1.2	13.0	10.7	-35.1	-32.8	0.1	-2.6	0.8	-26.5	-32.0
Value	-0.6	16.0	11.5	-35.4	-30.8	0.7	0.0	1.5	-26.9	-30.0
Market	-1.3	16.1	9.9	-11.7	-1.1					
Market - Equal-Weighted	-1.6	15.3	8.9	-20.2	-13.0					

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

Data as at 24/04/2020	Absolute					Relative to Market				
	1w	1m	QTD	YTD	12m	1w	1m	QTD	YTD	12m
Growth	-0.6	15.5	6.9	-13.4	-2.9	0.5	6.3	3.7	8.2	11.5
Low volatility	0.3	11.1	6.0	-13.8	-3.6	1.4	2.2	2.8	7.8	10.7
Price momentum	1.0	15.6	7.5	-10.1	0.4	2.1	6.4	4.3	12.4	15.3
Quality	0.3	16.0	7.9	-22.6	-14.9	1.4	6.7	4.6	-3.3	-2.3
Size	-1.6	13.0	5.6	-28.6	-18.5	-0.5	4.0	2.4	-10.8	-6.4
Value	-2.3	1.9	0.0	-38.5	-36.0	-1.2	-6.3	-3.0	-23.0	-26.5
Market	-1.1	8.7	3.1	-20.0	-12.9					
Market - Equal-Weighted	-1.0	9.4	3.9	-23.2	-16.4					

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

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Figure 6 – Model asset allocation

	Neutral	Policy Range	Allocation	Position vs Neutral	Hedged	Currency
Cash	**5%**	**0-10%**	↑ **10%**			
Cash	2.5%		5%			
Gold	2.5%		↑ 5%			
Bonds	**45%**	**10-80%**	↓ **40%**			
Government	30%	10-50%	↑ 20%			
US	10%		↑ 9%			
Europe ex-UK (Eurozone)	8%		0%			
UK	2%		↑ 3%			
Japan	8%		4%			
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%	↓ 0%			
US Dollar	4%		↓ 0%			
Euro	1%		↓ 0%			
Equities	**40%**	**20-60%**	↓ **30%**			
US	24%		↑ 14%			
Europe ex-UK	6%		↓ 2%			
UK	3%		↑ 6%			
Japan	3%		↓ 6%			
Emerging Markets	4%		↓ 2%			
Real Estate	**8%**	**0-16%**	**16%**			
US	2%		↑ 5%			
Europe ex-UK	2%		2%			
UK	1%		↑ 1%			
Japan	2%		↑ 5%			
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	49%		↑ 47%			
EUR	20%		↓ 7%			
GBP	7%		↑ 16%			
JPY	15%		↑ 18%			
EM	8%		↓ 13%			
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

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Figure 7 – 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

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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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