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Uncommon truths
Nikkei at 40,000?

More than 30 years after the previous peak, we wonder if the Nikkei could set a new all-time high this year. Central banks could make it happen but without multiple expansion it may take until 2026.

With an abundant supply of liquidity, bubbles are appearing everywhere and two collided this week when Elon Musk had a love-in with Bitcoin. With the Nikkei 225 on the brink of passing 30,000, we are reminded of the mother of all bubbles that took 20 years to unwind.

Those who were around at the time will remember that Japanese equities seemed invincible in the late 1980s. The Nikkei 225 reached a closing peak of 38,916 on 29 December 1989 (see **Figure 1**). According to our calculations, that put the Japanese equity market on a cyclically-adjusted PE (CAPE) of 93 (based on Datastream indices and using a 10-year moving average of earnings). By comparison, we reckon the US CAPE reached a peak of 49 in early 2000 (during the dotcom bubble).

Amazingly, the Nikkei didn't bottom until 10 March 2009 (at 7,055), almost 20 years after the peak, taking the CAPE to around 19. In the subsequent 12 years, the index has recovered nearly three-quarters of the ground lost during that 20-year slide (the CAPE is now around 22, versus 38 in the US).

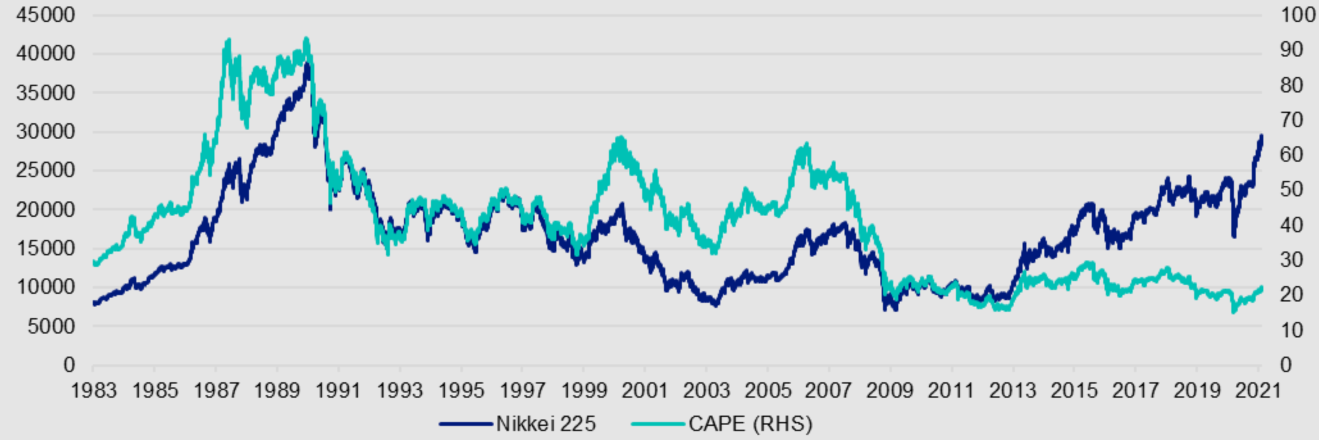
As has been the case elsewhere, we suspect that Japan's equity market recovery from that 2009 low has been aided by central bank asset purchases (and not just those of the Bank of Japan). Such asset purchases accelerated again with the onset of the Covid pandemic and have been an important factor behind the 79% gain in the Nikkei 225 since the low of 19 March 2020.

Markets have also been helped in recent months by the good news on vaccines and what that implies for economic recovery. Interestingly, Japan seems to be in no hurry to start the vaccine rollout, with the first vaccinations (for healthcare workers) only now about to be administered (see this from The Japan Times). Further, the rollout to old and vulnerable parts of the population is not expected to start until early April, whereas the UK is about to complete the inoculation of its over-70s. However, procurement arrangements suggest it will have enough doses for the total population by June and many local governments are expecting to have completed the rollout by the end of September (for those willing to be vaccinated).

Apart from caution in the vaccine approval process, perhaps Japan feels less urgency than many other developed countries because it has been able to better control any outbreaks. For example, Japan has recorded less than 7,000 Covid deaths in total. Further, according to data from Johns Hopkins University, its Covid mortality rate has so far been 5 per 100,000 people, versus 173 in the UK and 144 in the US. Even better, that has not been achieved by sacrificing economic growth: Japan's year-on-year GDP growth is set to have been around -1.9% in 2020 Q4 (if consensus estimates prove to be correct when data is published on 15 February), compared to -7.8% and -2.4% in the UK and the US, respectively (UK and US data has already reported).

Based on the above, it may be believed that Japan has little to gain from vaccine rollout compared to other countries. However, it should help with the eventual opening of the country to the outside world, though whether the Tokyo Olympics can go ahead as planned in July/August is to be seen.

Figure 1 – Nikkei 225 index and Japan equity CAPE



Based on daily data from 3 January 1983 to 11 February 2021. CAPE = cyclically-adjusted price/earnings ratio and is calculated by comparing price to a 10-year moving average of earnings (constructed using the Datastream Japan Market index). Past performance is no guarantee of future results. Source: Refinitiv Datastream and Invesco

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From a stock market perspective, perhaps the most important question is how long it will take the Nikkei 225 to set a new all-time high? That would require a 32% gain from current levels. That sounds a lot but given the 79% jump since the pandemic low it could happen very quickly.

As suggested by the CAPE ratio in **Figure 1**, Japanese equity valuations do not appear stretched. Further, a dividend yield of around 2% compares favourably to a 10-year JGB yield of 0.06% and a US dividend yield of 1.4%. Though Japanese earnings per share (EPS) have suffered during the recent recession (see **Figure 2**), dividends have held up reasonably well compared to many other countries (we have often pointed to the relatively low payout ratio in Japan).

The Japanese economy did slow towards the end of 2020 because of lockdown measures, with industrial production falling in both November and December. Such weakness may have continued into the early part of 2021 but the current wave of the pandemic appears to be coming under control (judging by the decline in daily cases), in which case growth may resume in the months ahead. Even if production shows no growth between December 2020 and May 2021, the year-on-year growth in May will be around 18%, a rate only exceeded just after the Global Financial Crisis.

The focus on industrial production is explained by the close relationship with EPS, as shown in **Figure 2**. We find that in most countries there is a 6-9-month lag between what happens to industrial production and EPS. Hence, we would not be surprised to see some impressive y-o-y EPS growth in Japan at the end of this year, which may be enough to spur the Nikkei on to that new all-time high. However, that EPS growth will mainly signal the rebound from the short, sharp Covid-related shock and so may already be in the price.

It is exactly because of these short-term swings in EPS that we prefer to use a cyclically-adjusted approach to measuring price-earnings ratios. The effect of the ongoing EPS rollercoaster on the 10-year moving average of earnings will be dampened and this allows us to think more clearly about what may be needed to push the Nikkei to that all-time high.

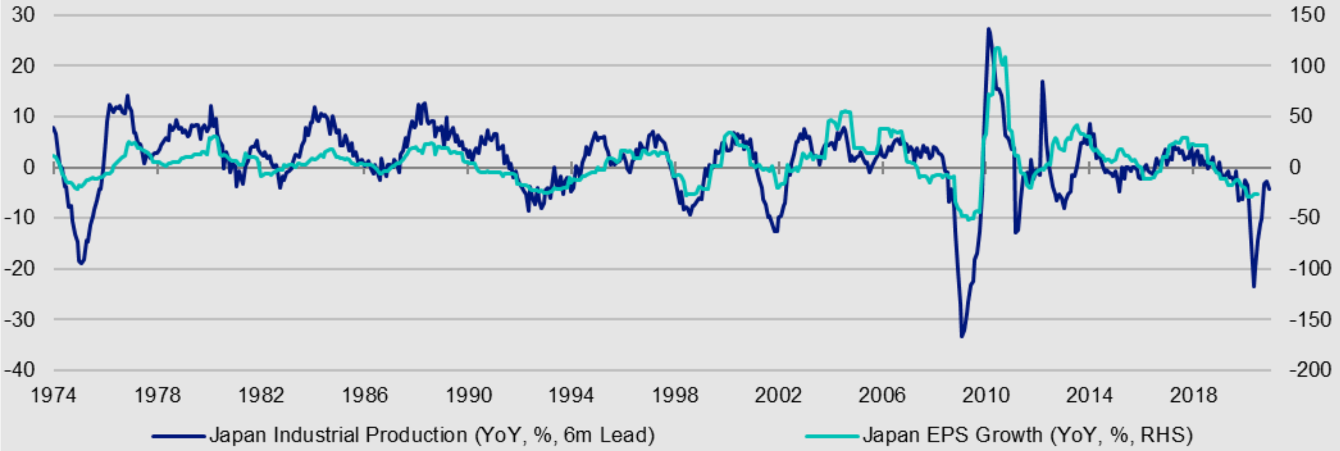
If we imagine that Japan's EPS will rebound to pre-pandemic levels by the end of 2021 and that thereafter the rate of growth in EPS matches that of its 10-year moving average measured over the 20 years from end-2000 to end-2020 (6.3% annualised), then without any multiple expansion (i.e. the CAPE remains at current levels) it will take until 2026 before the Nikkei sets a new all-time high. That is still a long time to wait.

Of course, there are three critical assumptions that underpin that estimate: first, that EPS will rebound to pre-Covid levels by the end of 2021; second, that subsequent annualised growth matches that of the last 20 years and, finally, that the CAPE remains at the current level. If we want to be more optimistic about the attainment of that new high, perhaps the most likely route is through multiple expansion – the CAPE would only need to rise from the current 22 to 29-30 to do the trick during 2021, even without any rebound in earnings. That doesn't need the CAPE to go back to record levels or even to match the current US ratio, it simply needs a return to where it was in mid-2015.

That doesn't seem too much to ask in these bubbly times. For some time now, we have been Overweight Japanese equities in our Model Asset Allocation and we see no reason to change (see **Figure 6**). Markets like to have a target and nothing could be more symbolic than the Nikkei crossing 40,000.

Unless stated otherwise, all data as of 11 February 2021

Figure 2 – Japan industrial production and earnings per share growth



Based on monthly data from January 1974 to January 2021. EPS growth is based on the Datasream Japan Market index.
Source: Refinitiv Datastream and Invesco

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Figure 3 – Asset class total returns

Data as at 11/02/2021		Current	Total Return (USD, %)					Total Return (Local Currency, %)				
	Index	Level/RY	1w	1m	QTD	YTD	12m	1w	1m	QTD	YTD	12m
Equities												
World	MSCI	680	2.0	3.3	5.3	5.3	20.3	1.6	3.2	5.5	5.5	17.4
Emerging Markets	MSCI	1428	2.9	5.9	10.7	10.7	33.2	2.4	5.5	11.0	11.0	32.8
China	MSCI	127	4.5	14.5	18.1	18.1	52.1	4.4	14.4	17.9	17.9	50.6
US	MSCI	3841	1.4	3.5	4.9	4.9	21.9	1.4	3.5	4.9	4.9	21.9
Europe	MSCI	1880	1.7	0.4	2.3	2.3	8.2	0.4	0.0	2.6	2.6	-1.6
Europe ex-UK	MSCI	2371	1.8	1.1	2.3	2.3	12.8	0.4	1.2	3.1	3.1	1.6
UK	MSCI	1052	1.5	-1.7	2.1	2.1	-5.7	0.3	-4.1	1.0	1.0	-11.7
Japan	MSCI	4074	4.4	3.8	5.7	5.7	22.2	3.7	4.2	7.2	7.2	16.5
Government Bonds												
World	BofA-ML	0.31	0.6	-0.4	-1.7	-1.7	6.9	-0.1	-0.4	-1.2	-1.2	1.8
Emerging Markets	BBloom	4.00	0.3	0.3	-1.5	-1.5	2.9	0.3	0.3	-1.5	-1.5	2.9
China	BofA-ML	3.17	0.3	0.4	1.7	1.7	8.9	-0.1	-0.1	0.1	0.1	0.5
US (10y)	Datastream	1.14	0.0	0.0	-2.0	-2.0	7.0	0.0	0.0	-2.0	-2.0	7.0
Europe	Bofa-ML	-0.16	1.4	-0.6	-1.6	-1.6	13.2	0.1	-0.5	-0.8	-0.8	1.8
Europe ex-UK (EMU, 10y)	Datastream	-0.49	1.3	-0.5	-1.7	-1.7	12.1	0.0	-0.3	-0.9	-0.9	0.9
UK (10y)	Datastream	0.49	0.9	1.0	-1.3	-1.3	8.5	-0.3	-1.5	-2.4	-2.4	1.6
Japan (10y)	Datastream	0.08	0.5	-0.8	-1.8	-1.8	4.0	-0.2	-0.4	-0.4	-0.4	-0.9
IG Corporate Bonds												
Global	BofA-ML	1.50	0.6	0.2	-1.0	-1.0	8.0	0.1	0.1	-0.9	-0.9	4.6
Emerging Markets	BBloom	3.51	0.2	1.1	0.2	0.2	9.3	0.2	1.1	0.2	0.2	9.3
China	BofA-ML	4.10	0.3	0.5	1.9	1.9	10.2	-0.1	-0.1	0.3	0.3	1.7
US	BofA-ML	1.94	0.2	0.3	-1.3	-1.3	5.9	0.2	0.3	-1.3	-1.3	5.9
Europe	BofA-ML	0.34	1.4	-0.2	-0.9	-0.9	12.9	0.1	-0.1	0.0	0.0	1.6
UK	BofA-ML	1.62	1.3	1.6	-0.5	-0.5	11.0	0.1	-0.8	-1.6	-1.6	3.9
Japan	BofA-ML	0.42	0.6	-0.4	-1.5	-1.5	4.9	-0.1	0.0	0.0	0.0	-0.1
HY Corporate Bonds												
Global	BofA-ML	4.63	0.6	1.1	1.0	1.0	8.4	0.4	1.1	1.2	1.2	6.3
US	BofA-ML	4.72	0.5	1.3	1.4	1.4	6.6	0.5	1.3	1.4	1.4	6.6
Europe	BofA-ML	2.98	1.5	0.6	0.5	0.5	14.8	0.3	0.7	1.4	1.4	3.3
Cash (Overnight LIBOR)												
US		0.08	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.2
Euro Area		-0.59	1.4	-0.2	-0.8	-0.8	10.5	0.0	-0.1	-0.1	-0.1	-0.6
UK		0.04	1.1	2.2	1.0	1.0	6.8	0.0	0.0	0.0	0.0	0.1
Japan		-0.08	0.8	-0.5	-1.4	-1.4	4.7	0.0	0.0	0.0	0.0	-0.1
Real Estate (REITs)												
Global	FTSE	1828	2.5	5.6	3.0	3.0	-8.0	1.2	5.8	3.9	3.9	-17.2
Emerging Markets	FTSE	1970	2.8	0.1	0.0	0.0	-11.8	1.5	0.3	0.9	0.9	-20.6
US	FTSE	2978	3.1	10.3	6.1	6.1	-7.7	3.1	10.3	6.1	6.1	-7.7
Europe ex-UK	FTSE	3569	-0.2	-1.4	-4.9	-4.9	-5.4	-1.5	-1.3	-4.1	-4.1	-14.8
UK	FTSE	1347	1.7	3.1	0.1	0.1	-10.4	0.5	0.6	-1.0	-1.0	-16.1
Japan	FTSE	2785	4.3	7.6	6.4	6.4	-7.3	3.6	8.1	8.0	8.0	-11.7
Commodities												
All	GSCI	2206	2.5	7.4	11.6	11.6	-3.1	-	-	-	-	-
Energy	GSCI	317	3.2	10.4	18.6	18.6	-22.8	-	-	-	-	-
Industrial Metals	GSCI	1481	5.2	4.6	5.9	5.9	29.1	-	-	-	-	-
Precious Metals	GSCI	2130	2.1	-0.6	-3.2	-3.2	16.3	-	-	-	-	-
Agricultural Goods	GSCI	422	-0.4	4.2	5.5	5.5	24.0	-	-	-	-	-
Currencies (vs USD)*												
EUR		1.21	1.4	-0.2	-0.7	-0.7	11.1	-	-	-	-	-
JPY		104.75	0.8	-0.5	-1.4	-1.4	4.8	-	-	-	-	-
GBP		1.38	1.2	2.5	1.1	1.1	6.8	-	-	-	-	-
CHF		1.12	1.6	0.0	-0.5	-0.5	9.6	-	-	-	-	-
CNY		6.46	0.2	0.4	1.1	1.1	7.9	-	-	-	-	-

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

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

Data as at 11/02/2021	Global				
	1w	1m	QTD	YTD	12m
Energy	**0.4**	**-3.4**	**-1.1**	**-1.1**	**-25.1**
Basic Materials	**1.5**	**-3.2**	**-0.3**	**-0.3**	**13.8**
Basic Resources	2.7	-3.2	0.4	0.4	20.0
Chemicals	-0.1	-3.2	-1.3	-1.3	6.8
Industrials	**0.2**	**-1.5**	**-1.8**	**-1.8**	**-1.4**
Construction & Materials	0.3	-2.3	-0.6	-0.6	-2.9
Industrial Goods & Services	0.2	-1.4	-2.0	-2.0	-1.2
Consumer Discretionary	**-0.2**	**1.5**	**0.6**	**0.6**	**12.1**
Automobiles & Parts	-1.8	0.3	6.0	6.0	46.5
Media	1.3	4.0	0.4	0.4	7.3
Retailers	-1.8	1.2	-1.3	-1.3	10.2
Travel & Leisure	0.9	0.7	-1.6	-1.6	-9.5
Consumer Products & Services	2.1	2.2	1.4	1.4	15.6
Consumer Staples	**-1.3**	**-3.4**	**-5.6**	**-5.6**	**-12.4**
Food, Beverage & Tobacco	-1.1	-2.4	-5.4	-5.4	-13.7
Personal Care, Drug & Grocery Stores	-1.6	-5.2	-5.9	-5.9	-10.0
Healthcare	**-0.5**	**-1.7**	**-0.9**	**-0.9**	**-0.1**
Financials	**0.3**	**-1.3**	**0.1**	**0.1**	**-13.3**
Banks	0.4	-1.7	0.5	0.5	-18.1
Financial Services	-0.1	-0.2	1.5	1.5	-3.8
Insurance	0.7	-1.5	-2.2	-2.2	-14.4
Real Estate	**-0.1**	**0.9**	**-2.5**	**-2.5**	**-21.1**
Technology	**0.5**	**5.6**	**5.3**	**5.3**	**28.4**
Telecommunications	**-0.5**	**-1.0**	**-2.3**	**-2.3**	**-9.8**
Utilities	**-1.9**	**-4.7**	**-5.2**	**-5.2**	**-16.3**

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

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

Data as at 11/02/2021	Absolute					Relative to Market				
	1w	1m	QTD	YTD	12m	1w	1m	QTD	YTD	12m
Growth	2.3	4.3	6.6	6.6	34.9	1.1	1.0	2.1	2.1	13.6
Low volatility	0.8	0.2	-0.6	-0.6	9.7	-0.4	-2.9	-4.9	-4.9	-7.7
Price momentum	3.4	3.4	6.9	6.9	22.3	2.1	0.2	2.4	2.4	3.0
Quality	2.6	3.0	5.4	5.4	20.2	1.4	-0.2	0.9	0.9	1.2
Size	2.9	5.5	10.5	10.5	19.2	1.6	2.3	5.8	5.8	0.3
Value	2.3	4.5	11.0	11.0	16.4	1.1	1.3	6.2	6.2	-2.0
Market	1.2	3.2	4.4	4.4	18.8					
Market - Equal-Weighted	2.0	2.6	5.4	5.4	16.7					

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 11/02/2021	Absolute					Relative to Market				
	1w	1m	QTD	YTD	12m	1w	1m	QTD	YTD	12m
Growth	1.1	2.7	3.5	3.5	20.6	0.6	1.9	0.3	0.3	22.4
Low volatility	-0.4	0.6	1.9	1.9	-1.3	-0.8	-0.2	-1.3	-1.3	0.2
Price momentum	1.7	4.3	6.0	6.0	16.5	1.3	3.4	2.7	2.7	18.3
Quality	0.8	2.9	5.0	5.0	9.0	0.4	2.1	1.8	1.8	10.6
Size	0.2	3.7	5.3	5.3	9.0	-0.2	2.8	2.1	2.1	10.6
Value	0.9	1.7	4.8	4.8	-3.1	0.5	0.9	1.6	1.6	-1.6
Market	0.4	0.8	3.2	3.2	-1.5					
Market - Equal-Weighted	0.5	1.8	3.8	3.8	3.3					

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

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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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