



The Big Picture

Eyes wide shut

Quarterly update
From Invesco's Global Market Strategy Office

For professional/qualified/accredited investors only

18 June 2020

Data as of 29 May 2020 unless stated otherwise



The Big Picture

Eyes wide shut

In the face of what we expect to be the deepest global recession in living memory (by far), equity markets are running with their eyes wide shut into what feels like a trap: they are focusing on policy support and improved economic momentum, while ignoring the earnings chasm that is opening beneath them. If equities are obsessed with good news, gold seems to be focussed on the negative, so that within our Model Asset Allocation we prefer cash, investment grade credit (IG), high yield credit (HY) and real estate. Regionally, we are focused on emerging market (EM), Japanese and UK assets.

Model asset allocation

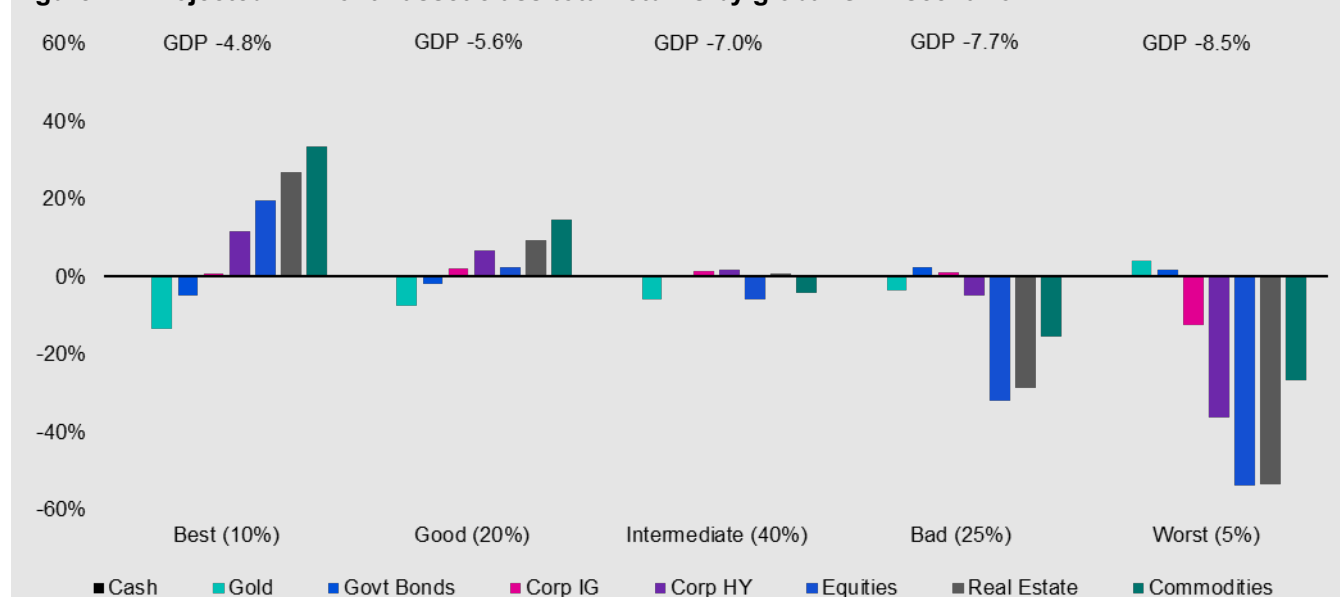
In our view:

- Equities offer poor returns and we prefer other cyclicals. We go more Underweight.
- Real estate offers attractive yields but has issues. We reduce but stay Overweight.
- Corporate high-yield (HY) is among our favourite cyclical assets. We increase to Overweight.
- Corporate investment-grade (IG) is favoured in nearly all scenarios. We stay at Maximum.
- Government debt looks better than it did relative other assets. We add but remain Underweight.
- Emerging markets (EM) is still the sovereign space with the best potential. We stay at Maximum.
- Cash returns are low but stable and de-correlated. We increase to Maximum.
- Gold has priced in a lot of the bad news. We reduce to zero.
- Commodities have rallied (especially oil). We reduce to Neutral.
- Currency hedges are not needed.

Assets that we consider good value on a long-term basis include:

- EM assets (valuations are relatively attractive; bottoming of oil could be good news)
- Agriculture (prices at multi-decade lows in real terms, relatively non-cyclical)
- Japanese real estate (REITS yield is 3.6%, dividends are growing and Japan relatively unaffected by Covid)

Figure 1 – Projected 12-month asset class total returns by global GDP scenario



Notes: based on local currency returns. Figures in parenthesis are our subjective probabilities. GDP data shows projected global GDP growth in 2020. Cash is an equally weighted mix of USD, EUR, GBP and JPY. As of 29 May 2020. There is no guarantee these views will come to pass. See Appendices for definitions, methodology and disclaimers. Source: BAML, MSCI, GSCI, FTSE, Refinitiv Datastream and Invesco

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We are focused on cash, IG, HY and real estate

Deep recession and central bank largesse make it hard to put a value on assets

We imagine five global economic scenarios from “W” to “V”

Economic scenarios are then turned into expected returns for each asset class and region

There is a negative skew to the projections, with more downside than upside for all assets (except cash) ...

...based on a comparison between valuations and our projections for earnings, dividends, defaults etc.

Summary and conclusions: Eyes wide shut

In the face of what we expect to be the deepest global recession in living memory (by far), equity markets are running with their eyes wide shut into what feels like a trap: they are focusing on policy support and improved economic momentum, while ignoring the earnings chasm that is opening beneath them. If equities are obsessed with good news, gold seems to be focused on the negative, so that within our Model Asset Allocation we prefer cash, investment grade credit (IG), high yield credit (HY) and real estate. Regionally, we are focused on emerging market (EM), Japanese and UK assets.

Measures of mobility suggest the low point in this recession occurred in early April, with gradual improvement since then. It could be the shortest recession on record. That is good news and could explain the improved financial market momentum. However, it may also be the deepest recession for some time and the full extent of the damage may need time to be fully appreciated. Central banks may be able to boost market multiples and depress spreads but they can't prevent the sharp drop in corporate earnings and dividends that we believe are inevitable, nor the jump in credit defaults. This makes it very hard to know what one should be willing to pay for an asset.

Further, there are many uncertainties about the future path of the global economy. This will depend upon many factors including: the speed of lockdown release, the behavioural reaction of populations to that release, the extent of any collateral damage, the discovery (or not) of a vaccine, the probability of second round Covid-19 outbreaks (and the likely policy and behavioural reactions). Also, let's not forget the US presidential election on 3 November 2020. For these reasons, we imagine five economic scenarios ranging from a “W” shaped multiple outbreak scenario with 2020 global GDP growth of -8.5%, followed by -0.3% in 2021, to a “V” shaped rapid recovery scenario, where GDP growth of -4.8% in 2020 is followed by +11.0% in 2021.

For each of these scenarios we have constructed a set of financial market assumptions to enable the generation of 12-month projected returns for each asset class, across all regions. This includes assumptions about central bank policy rates (and asset purchases), yield curves, credit spreads, credit default and recovery rates, equity and real estate yields and dividend growth. The scenarios are described in **Figure 27** and the assumptions are outlined in **Appendix 4**. Broadly speaking, the worse the economic scenario, the worse the assumptions in terms of defaults, spreads and yields (for assets such as HY, equities and real estate) and the lower that government yields are assumed to fall (except in the worst case scenario because it is assumed that markets finally balk at buying ever increasing amounts of government debt).

The resulting projections are summarised in **Figure 1** and are translated into market forecasts in **Figure 31** (for example, the 12-month S&P 500 targets range from 1250 to 3600). A number of features of **Figure 1** are worth exploring: first, as one might expect, defensive assets (gold and government bonds, for example) are expected to do better in weak economic scenarios, while the reverse is true for more cyclical assets such as HY, equities, real estate and commodities (note that IG is somewhere in the middle); second, the projected returns in the Intermediate (“Swoosh”) scenario are limited and often negative; third, there is a negative skew to the projections (whether looking at defensive or cyclical assets, our projections suggest more downside than upside, except for cash).

That negative skew and limited returns in the intermediate scenario are the result of a comparison between valuations (yields, spreads, multiples etc.) and the corporate damage being wrought by the lockdown (earnings and dividend cuts, defaults etc.). Markets are priced more optimistically than we would expect given the depth of the recession, perhaps due to central bank asset purchases and improving economic momentum. This leaves little scope for upside in all but the best (“V” shaped) scenario. Though central banks can control prices (spreads, yields etc.), we fear they cannot prevent the dividend cuts and defaults. Hence, their role is to persuade markets to look through the damage. Interestingly, though we find that equity markets are priced for the best of outcomes, we think gold, among defensive assets, has priced in a lot of bad news.

Optimisations shun equities and gold	We suspect there are better ways to gain cyclical and defensive exposure than using those two assets. This is borne out by our optimisation work: Figure 33 shows that equities would be Underweighted in all scenarios, with a preference for HY, real estate and commodities in the better economic scenarios (among cyclical assets). Gold would be zero-weighted in all but the very worst economic outcome, with a preference for cash in all other cases. IG would be given the maximum allocation in all but the best scenario, while government debt would be maximised in the weaker outcomes.
We prefer cash to gold at this stage	At some stage we must get off the fence and put those scenarios to use in our Model Asset Allocation. We do this by using a probability-weighted measure of our projected returns. Figures 35 and 36 show the results and Figures 2 and 3 show how we apply them. Given all the above, it should be no surprise that we now favour cash (increased to the maximum 10%) over gold (reduced to zero). Though we see upside to gold in the worst economic scenario we fear downside in all other cases, especially if there is a change of president in the US (see the discussion of the president dummy variable in Figure 23). Cash, on the other hand may give nothing (or less than nothing in some cases) but we think the returns are dependable and decorrelated.
Maximum allocated to IG and Overweight HY	We remain maximum allocated to IG , with a preference for US, UK and EM paper (we admit there is a lot of US corporate debt but the Fed is now starting a purchase programme). If we followed strictly the results of the optimisation process shown in Figure 36 , we would take HY to the maximum allowed (10%) but feel nervous about a potential spate of defaults. Hence, we take it to a slightly Overweight 6%, with a focus on the US market. Nonetheless, we view it as a better cyclical alternative than equities and a rewidening of spreads would encourage us to commit more.
We upgrade government bonds and downgrade equities but are below Neutral in both	We go in opposite directions on the two big asset categories: boosting government bonds from 20% to 25% (though still Underweight versus our Neutral 30%) and reducing equities to an even further Underweight 25% from 30% (versus a Neutral 40%). We believe that both assets offer sub-par returns versus similar alternatives but government bonds look relatively better than they did after the rally in cyclical assets, while the reverse is true for equities which have been at the forefront of that rebound. As shown in Figure 3 , EM, Japan and the UK are among our favourites in both assets, though we prefer US treasuries to JGBs.
Real estate and commodities reduced	Finally, we reduce the allocations to real estate and commodities, both of which were previously at the maximum allowed. Real estate is the cyclical asset that has rallied the least and that still offers the most attractive yields (in our opinion). However, we think its structural challenges have worsened as a result of Covid-19 and we reduce the allocation from 16% to 12% (Overweight versus a Neutral 8%), with a preference for EM and Japan. Commodities are reduced to a Neutral 2% after the strong rally in oil. From a regional perspective, we remain Overweight UK, Japanese and EM assets.

Figure 2 – Expected total returns (annualised, local currency) and Model Asset Allocation*

	Probability-Weighted 1-year Total Return	Neutral Portfolio	Policy Range		Model Asset Allocation	Position Vs Neutral
Cash & Gold	-3.0%	5%	0-10%	↑	10%	Overweight
Cash	-0.1%	2.5%	0-10%	↑	10%	Overweight
Gold	-5.9%	2.5%	0-10%	↓	0%	Underweight
Government Bonds	-0.3%	30%	10-50%	↑	25%	Underweight
Corporate IG	0.8%	10%	0-20%		20%	Overweight
Corporate HY	0.2%	5%	0-10%	↑	6%	Overweight
Equities	-10.6%	40%	20-60%	↓	25%	Underweight
Real Estate	-5.0%	8%	0-16%	↓	12%	Overweight
Commodities	-0.5%	2%	0-4%	↓	2%	Neutral

*This is a theoretical portfolio and is for illustrative purposes only. It does not represent an actual portfolio and is not a recommendation of any investment or trading strategy. Arrows show direction of change in allocations. See appendices for definitions, methodology and disclaimers. There is no guarantee that these views will come to pass. Source: Invesco Global Market Strategy Office

Model asset allocation*

Figure 3 – Model asset allocation (18/06/2020)

	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%			

*This is a theoretical portfolio and is for illustrative purposes only. It does not represent an actual portfolio and is not a recommendation of any investment or trading strategy. Cash is an equally weighted mix of USD, EUR, GBP and JPY. Currency exposure calculations exclude cash. Arrows show direction of change in allocations. See appendices for definitions, methodology and disclaimers.

Source: Invesco Global Market Strategy Office

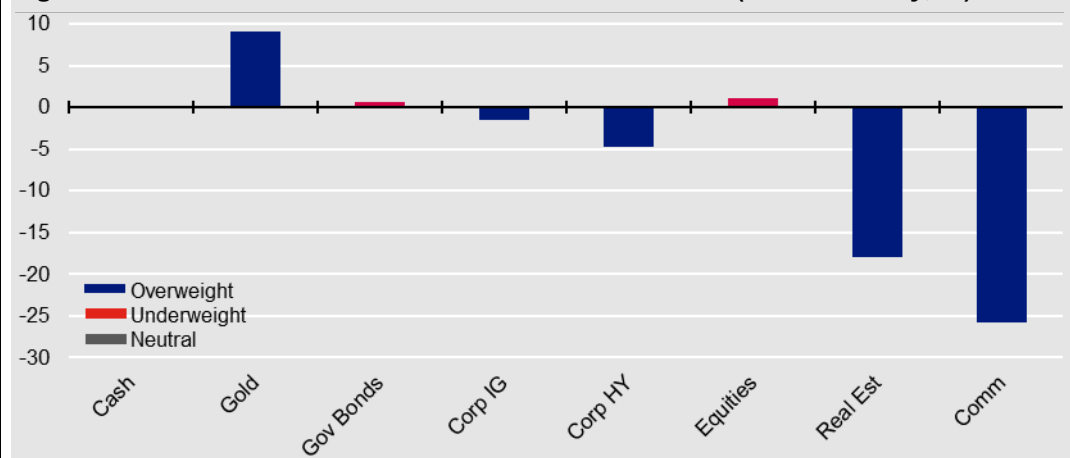
Gold and equities stood out in the recent defensive environment

Since we last wrote

Our last quarterly was published when the Covid-19 panic was at its height (see [Investing in an uncertain world](#) published on 22 March 2020). We now have a fuller understanding of the economic damage wrought by this pandemic but financial markets seem to be looking through that. **Figure 4** shows global asset class returns over the last three months (as of 29 May 2020). Full regional detail is shown in **Appendix 2**.

Figure 4 suggests that asset class returns have broadly followed a defensive pattern, with cyclical assets faring the worst. However, two assets stand out: first, gold has done much better than other “defensive” assets such as government debt and, second, equities have not behaved like other cyclical assets (though US and Japanese equities led the way, **Appendix 2** shows that no equity region has suffered big losses in the last three months). We have benefitted from Overweight exposures to cash, gold and IG but have suffered from the Overweight exposure to real estate and industrial commodities.

Figure 4 – Global asset class total returns since 29/02/20 (local currency, %) *

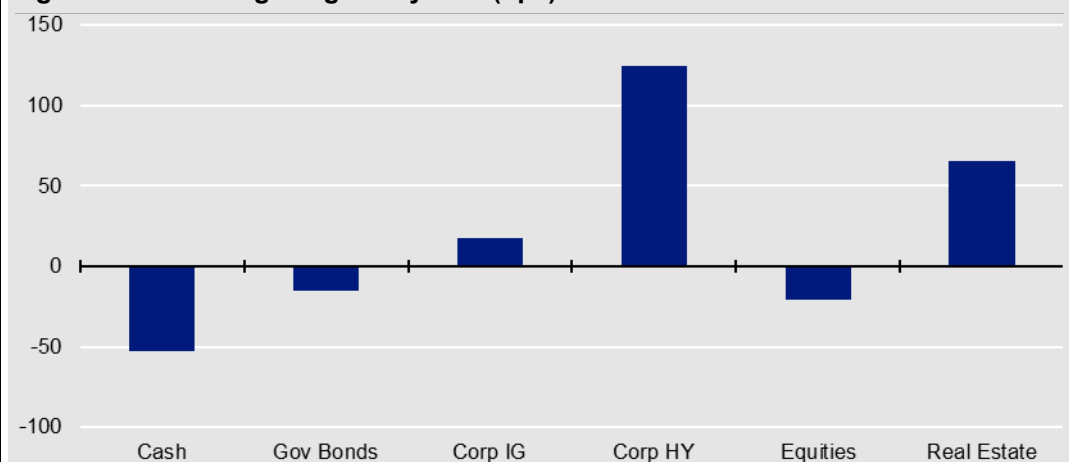


*29/02/20 to 29/05/20. Colours represent model allocations during this period. See appendices for definitions and disclaimers. Past performance is no guarantee of future results. Source: Refinitiv Datastream and Invesco

Have risky asset yields risen enough?

We must now evaluate whether anything has changed that could necessitate a change in our projections and allocations. Asset class yields have diverged, with cash and government yields falling, as might be expected during recession (see **Figure 5**). On the other hand, the yield on riskier assets have risen, except for equities. In the absence of any other changes this would push us in the direction of HY and real estate. Of course, many other things have changed, so we must reserve judgement for now.

Figure 5 – 3m change in global yields (bps)



From 29/02/20 to 29/05/20. See appendices for definitions and disclaimers. Past performance is no guarantee of future results. Source: Refinitiv Datastream and Invesco

What do Invesco's 10-year CMAs say?

Taking a step back: focusing on the next decade using Invesco's CMAs

Before worrying about the path out of the Covid-19 recession, we thought it worth stepping back and looking at the long-term prospects. Invesco Investment Solutions recently published their 10-year capital market assumptions (as of 31 March 2020) and we thought it might be interesting to put them into our asset allocation framework and run them through our optimisation process. **Figure 6** shows their projected returns for global asset classes in a range of currency bases (their framework differs from ours, so we have had to adapt some of their categories – for instance, we use their US Treasury Short category to represent cash and precious metals for gold).

Figure 6: Invesco 10-year capital market assumptions (global assets, % ann.)

	USD	EUR	GBP	CHF
Cash & Gold	1.5	-0.3	1.4	0.1
Cash - US Treasury Short	1.4	-0.8	0.7	-0.5
Gold	1.5	0.3	2.0	0.7
Government Bonds	1.4	0.2	0.8	-0.4
Corporate IG	2.8	1.7	1.4	0.1
Corporate HY - US HY	6.8	5.6	3.0	1.8
Equities	6.0	4.8	4.9	3.7
Real Estate	6.1	4.9	3.9	2.6
Commodities	3.1	1.9	4.3	3.0

Note: Estimates as of 31 March 2020 and based on the 10-year capital market assumptions published by Invesco Investment Solutions in 2020 Long-Term Capital Market Assumptions – Q2 Update. The detailed USD version of the CMAs is reproduced in Appendix 3. The above table uses the geometric expected return version for global asset classes ("gold" is based on the projections for precious metals and the "Cash & Gold" category shows the average of those two assets). These estimates reflect the views of Invesco Investment Solutions, the views of other investment teams at Invesco may differ from those presented here. There is no guarantee that these views will come to pass. Source: Invesco Investment Solutions

HY and equities dominate CMA based optimal portfolios

Not surprisingly, the further we move along the risk spectrum, the higher the projected returns; with one exception: commodities (due to conservative agriculture and precious metals forecasts). Combining those projections with measures of volatility and diversification (our 10-year historical covariance matrices) gives the results shown in **Figure 7**. Though results vary by currency base and depending on what is maximised (Sharpe Ratio or returns), there are some broad themes: HY is always given the maximum allocation and equities are largely Overweighted, while government bonds and commodities are largely Underweighted.

Figure 7: Optimised global allocations based on Invesco's 10-year CMA projected returns

	Neutral Portfolio	Policy Range	Maximise Sharpe Ratio				Maximise Return			
			USD	EUR	GBP	CHF	USD	EUR	GBP	CHF
Cash & Gold	5%	0-10%	10%	0%	10%	10%	10%	5%	0%	10%
Cash	2.5%	0-10%	10%	0%	10%	0%	10%	5%	0%	6%
Gold	2.5%	0-10%	0%	0%	0%	10%	0%	0%	0%	4%
Government Bonds	30%	10-50%	40%	10%	10%	10%	15%	10%	10%	14%
Corporate IG	10%	0-20%	20%	13%	9%	0%	20%	20%	0%	20%
Corporate HY	5%	0-10%	10%	10%	10%	10%	10%	10%	10%	10%
Equities	40%	20-70%	20%	58%	60%	54%	42%	51%	60%	30%
Real Estate	8%	0-16%	0%	9%	1%	16%	3%	4%	16%	16%
Commodities	2%	0-4%	0%	0%	0%	0%	0%	0%	4%	0%

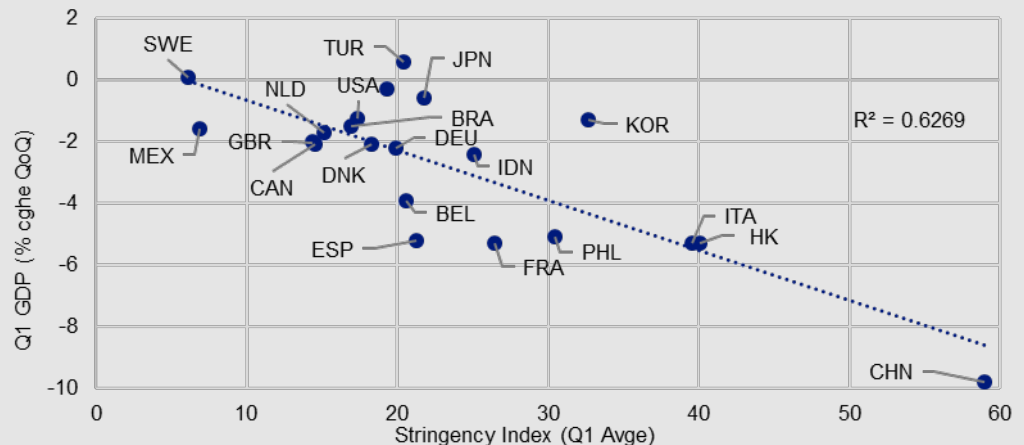
Note: optimisations are based on the 10-year projected returns published by Invesco Investment Solutions in 2020 Long-Term Capital Market Assumptions – Q2 Update, as shown in **Figure 6** above. Optimisations are performed by the Asset Allocation Research team using our historical 10-year covariance matrices (for each currency). "Gold" is based on the projections for precious metals and the "Cash & Gold" category shows the sum of allocations for those two assets). "Maximise Sharpe Ratio" optimisations are performed by maximising the Sharpe Ratio subject not violating the constraints implied by the policy ranges shown in the table. "Maximise Return" optimisations are performed by maximising return subject to the policy range constraints but also subject to the standard deviation of returns not exceeding that of the Neutral Portfolio (as shown in **Figure 3**). Though based on the projected returns provided by Invesco Investment Solutions, these optimal allocations do not represent their views, nor those of any other investment team at Invesco. See appendices for definitions, methodology and disclaimers. Source: Invesco Investment Solutions, Invesco

Equities have been the stand-out cyclical asset during the recovery

From shock and denial to upturn

Perhaps the biggest challenge we face is to understand why equities are performing so well in the face of the deepest economic recession since at least the Great Depression (the Bank of England's scenario suggests the biggest calendar year decline in UK GDP since 1706). This is especially confusing as other cyclical assets have fared less well (real estate and commodities, for example).

Figure 8 – GDP versus shutdown stringency in 2020 Q1



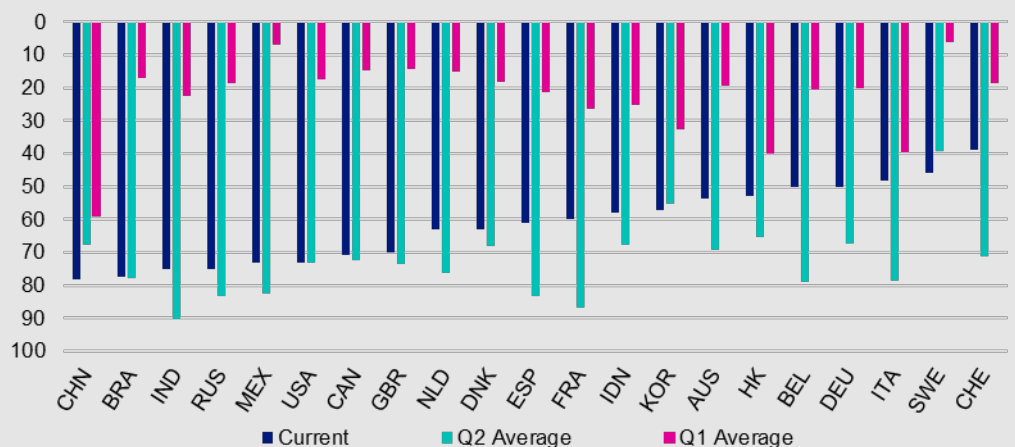
The "Blavatnik Stringency Index" is the Oxford Covid-19 Government Response Stringency Index from the Blavatnik School of Government, Oxford. It measures the stringency of government responses to Covid-19, including the extent of school, business and travel shut-downs but also includes policy measures (both monetary and fiscal) and healthcare actions (testing etc.). The index ranges from 0 to 100, with higher scores indicating a more stringent response. GDP is calculated as the seasonally adjusted quarter on quarter change during 2020 Q1 (not annualised). See appendices for country abbreviations.

Source: Blavatnik School of Government, University of Oxford, Bloomberg and Invesco

Q2 GDP data will be worse than Q1 but lockdowns are easing

We now have evidence from Q1 GDP data about the extent of the economic damage wrought by the Covid-19 lockdowns. **Figure 8** suggests a correlation between the extent of the lockdown and the loss of GDP. Not surprisingly, given the origin of the virus, the Chinese economy suffered the most during Q1. However, as most economies entered lockdown towards the end of Q1, it is likely that Q2 will look much worse. Indeed, **Figure 9** shows that average stringency indices during Q2 are so far much higher than during Q1, although in many cases the current level is lower than the Q2 average, suggesting an easing of lockdown conditions (France, Italy and Switzerland are good examples).

Figure 9 – Blavatnik Stringency Index



The "Blavatnik Stringency Index" is the Oxford Covid-19 Government Response Stringency Index from the Blavatnik School of Government, Oxford. It measures the stringency of government responses to Covid-19, including the extent of school, business and travel shut-downs but also includes policy measures (both monetary and fiscal) and healthcare actions (testing etc.). The index ranges from 0 to 100, with higher scores indicating a more stringent response. The current value is as of 16 June 2020 and the Q2 average is calculated up to that date (countries are ranked by the current index). See appendices for country abbreviations.

Source: Blavatnik School of Government, University of Oxford, Bloomberg and Invesco

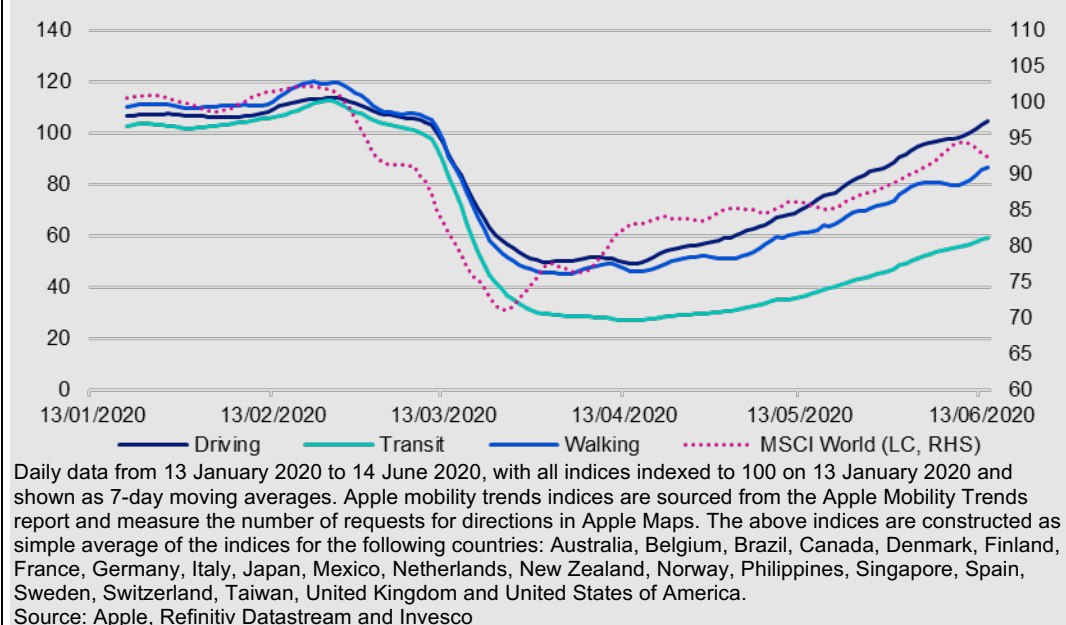
The recession is dramatic but....

Based on the evidence in **Figures 8 and 9**, we expect Q2 GDP declines to be bigger than during Q1, with France, India, Spain, Russia, Brazil and Mexico likely to be among the worst affected. France's INSEE institute estimates that each month of lockdown causes a loss of 3 percentage points of annual GDP, while the Bank of England estimates the loss to UK GDP will be 2.5 percentage points per month of lockdown (and that UK GDP will fall by 14% in 2020).

...things are improving

These are dramatic declines by any measure but there are signs the worst is behind us: first, **Figure 9** suggests that lockdowns are starting to ease; second, PMI surveys from around the world point to some improvement in May (from record lows) and, third, measures of mobility paint a picture of a return towards normality. **Figure 10** is a good example, showing Apple mobility trends data averaged across 22 countries (no data is available for China). Though every country is following its own path, the global averages suggest a bottoming of mobility in the early-to-mid-April period, with driving almost back to normal. Not surprisingly, the use of public transport (transit) remains around 40% below pre-Covid levels. Interestingly, global equity markets (MSCI World) led both on the way down and the way back up.

Figure 10 – Global Apple mobility trends and MSCI World



Mobility seemed to bottom in the first half of April

Similar evidence comes from the Google mobility dataset (see **Figure 11**). As with the Apple data set, there seemed to be a bottoming of mobility in the early-to-mid-April period, at around the same time that our global average lockdown stringency index peaked (we show the indices as 7-day moving averages and the stringency index is inverted). If anything, **Figure 11** suggests the normalisation of activity may be occurring slightly faster than lockdowns (stringency) are being eased (whether we look at workplaces, retail & recreation and transit stations or, on the opposite side, residential). Again, this may justify the improved momentum in equity markets.

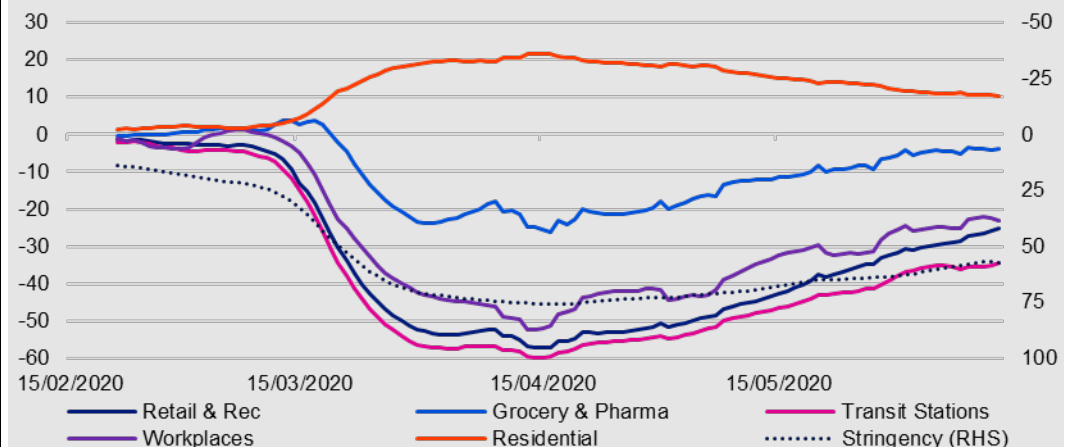
April may form the bottom of the current economic downturn...

Bearing in mind the obvious caveat that **Figures 10 and 11** are based on averages across countries and therefore miss a lot of country specific detail, they do offer hope that the worst of the economic damage is behind us, with the late-March/early-April period forming the global nadir (confirming what PMIs have been telling us). On a quarterly GDP basis, this suggests that Q2 will be the bottom, with the extent of the decline during Q2 limited by the nascent recovery.

...but the recovery does not look V-shaped

Unfortunately, one final detail from those charts is that the recovery is not as steep as the decline. For now, this does not look like a V-shaped recovery, rather an elongated tick-mark (or Nike Swoosh). Whether it remains that way depends upon a range of factors that we shall consider in the following section.

Figure 11 – Global Google mobility trends and Blavatnik Stringency



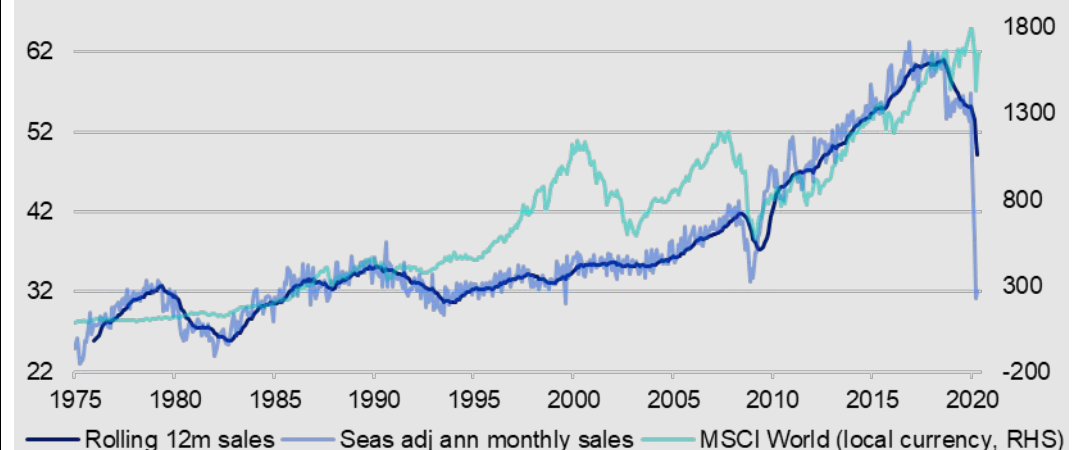
Daily data from 15 February 2020 to 12 June 2020, shown as 7-day moving averages. Google mobility trends indices show percentage deviation from the baseline and are sourced from Google LLC "Google COVID-19 Community Mobility Reports". <https://www.google.com/covid19/mobility/> Accessed: 04/06/20. These datasets show how visits and length of stay at different places change compared to a baseline (the median value, for the corresponding day of the week, during the 5-week period Jan 3–Feb 6, 2020). The "Blavatnik Stringency Index" is the Oxford Covid-19 Government Response Stringency Index from the Blavatnik School of Government, Oxford. It measures the stringency of government responses to Covid-19, including the extent of school, business and travel shut-downs but also includes policy measures (both monetary and fiscal) and healthcare actions (testing etc.). The index ranges from 0 to 100, with higher scores indicating a more stringent response. The above indices are constructed as a simple average of the indices for the following countries: Australia, Belgium, Brazil, Canada, Denmark, Finland, France, Germany, Hong Kong, India, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Philippines, Singapore, South Korea, Spain, Sweden, Switzerland, Taiwan, United Kingdom and United States of America.

Source: Google, Blavatnik School of Government, University of Oxford and Invesco

The global economy was already slowing pre-Covid but equities hadn't noticed

In looking ahead to the coming quarters and years, we shouldn't forget that the global economy was already decelerating before Covid-19 struck. **Figure 12** shows that global auto sales peaked in mid-2018 and that the Covid-inspired collapse simply accentuated an existing downtrend (note that global equities had ignored that trend).

Figure 12 – World passenger car sales (million) and global equities



Note: Monthly data from January 1975 to April 2020 (MSCI World as of 29 May 2020). Based on an aggregation of country sales data from Australia, Austria, Belgium, Brazil, Bulgaria, China, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hong Kong, Hungary, Iceland, India, Indonesia, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Malaysia, Mexico, Netherlands, New Zealand, Norway, Panama, Philippines, Poland, Portugal, Romania, Singapore, Slovakia, Slovenia, South Africa, South Korea, Spain, Sri Lanka, Sweden, Switzerland, Taiwan, Thailand, Turkey, UK, US, Vietnam. Data exists for all countries since January 2011, prior to which partial global totals are adjusted to compensate for countries that are missing (and to avoid discontinuities in the data). The last month for which data exists for all countries is May 2019. The global total for subsequent months is calculated by assuming that year-on-year growth in the global total is the same as that for those countries for which data exists "Seas adj" indicates the series is seasonally adjusted to smooth the data. Past performance is no guarantee of future results. Source: National data sources, OECD, European Automobile Manufacturers' Association, Refinitiv Datastream, MSCI, Invesco

Figure 13 – QE5 balance sheet growth and asset returns



Note: QE5 BS is the aggregate balance sheet of Fed, ECB, BOE, BOJ and SNB in USD, rebased to 100 in May 2006. Forecast considers asset purchase plans of the central banks but ignores other sources of growth. The Fed has announced unlimited purchases, which we assume occur as follows: \$120bn per month during the rest of 2020, \$60bn per month during 2021 H1 and \$30bn per month during 2021 H2. The ECB has announced plans to purchase €1.1 trillion of assets in 2020 and to continue purchases during 2020 H1: we assume \$130bn per month until June 2021, with a halving of that rate thereafter. The BOJ has announced a doubling of the rate of ETF purchases: we assume \$45bn asset purchases per month in 2020 and \$30bn per month in 2021. The BOE has announced £200bn of purchases (we assume they occur smoothly during 2020, with a halving of the rate in 2021). The SNB has announced no plan but we assume \$10bn per month in 2020, with a halving of those rates in 2021. The multi-asset benchmark is a fixed weighted index based on the Neutral asset allocation of Invesco's Asset Allocation Research team. From May 2007 to December 2021. As of 12 June 2020. Past performance is no guarantee of future results. Source: BOE, Refinitiv Datastream and Invesco

Central banks to the rescue....once more

The final ingredient in projecting returns is the policy backdrop. We show fiscal policy settings in **Figure 25** but central bank actions may be more important when it comes to immediate financial market impact. We consider that policy rates are about as low as they will go in many developed countries (or that further cuts will have limited material effect on economies or markets). However, asset purchase plans have been reignited and have recently been increasing in size, scope and duration. We suspect such quantitative easing policies will better define the stance of central banks under our various economic scenarios, with programme sizes increasing (decreasing) the worse (better) the economic outcome.

Figure 13 shows the year-on-year (y/y) growth of the aggregate balance sheet of the Fed, ECB, BOE, SNB and BOJ (the QE5). If our understanding of central bank intentions is correct, the y/y growth in this aggregate balance sheet will reach 45% in early 2021. This is extraordinary but does not quite match the 61% seen in October 2008 (though plans may change).

Asset purchases tend to support asset prices..

Interestingly, for much of the period since 2010, asset market performance seems to have been correlated with the growth of the QE5 balance sheet, though often with a lag. This makes sense, given that the balance sheet expansion has largely been in the form of asset purchases. However, in 2008/9, the path of asset markets and central bank balance sheets diverged (central banks were buying assets in reaction to market weakness), though eventually in March 2009 the Fed managed to persuade markets that it was doing enough. So far during this crisis, asset market losses have been relatively contained considering the extent of the economic slump (according to our multi-asset benchmark), perhaps because of the rapid central bank reaction witnessed in **Figure 13**.

...but are central banks allowing equity markets to stay in shock & denial?

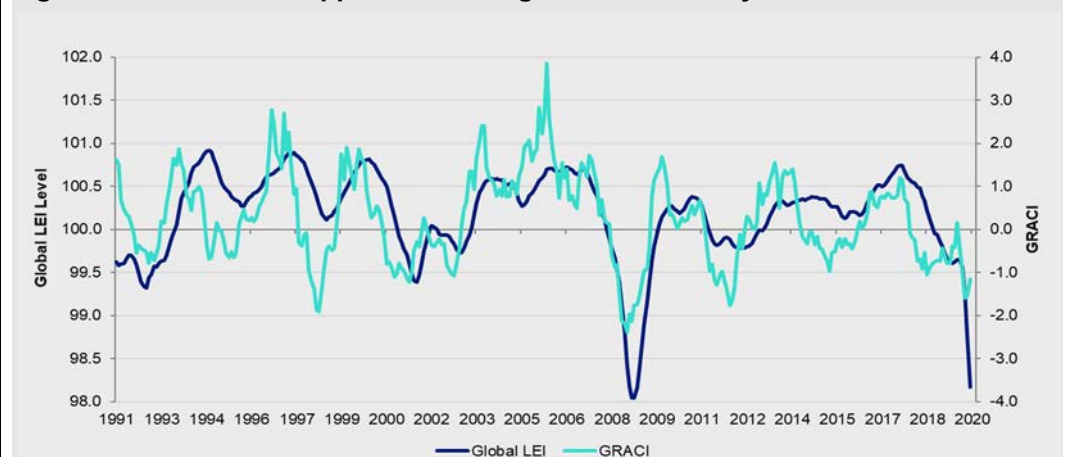
Looking forward, an optimistic view would be that if markets remained where they were at the end of May, the y/y gain in our multi-asset benchmark would peak at around +7% in March 2021, suggesting potential upside (given the magnitude of the balance sheet expansion). The pessimistic view is that markets may still be in the first stage of grief (shock and denial) and need to pass through pain & guilt, anger & bargaining and depression before getting to the upturn! Central banks (in their role as counsellors) may have temporarily short circuited the grief but it is usually better for all concerned if the full process is allowed to take its course.

Invesco's IIS team consider that markets have moved to a recovery regime

From economics to financial markets

A neat bridge from the economy to markets is provided by the Global Risk Appetite Cycle Indicator (GRACI) provided by Invesco's Investment Solutions (IIS) team, as shown in **Figure 14**. This is a summary measure of the performance of riskier versus safer asset classes and suggests a bottoming of sentiment and may indicate the worst of the recession is behind us. Interestingly, this measure did not reach the lows seen in recent decades (LTCM/Russia crisis, global financial (GFC) and Eurozone crises), perhaps due to the extensive policy support offered by governments and central banks. The IIS team now consider that markets have moved to a recovery regime.

Figure 14 – Global risk appetite and the global business cycle

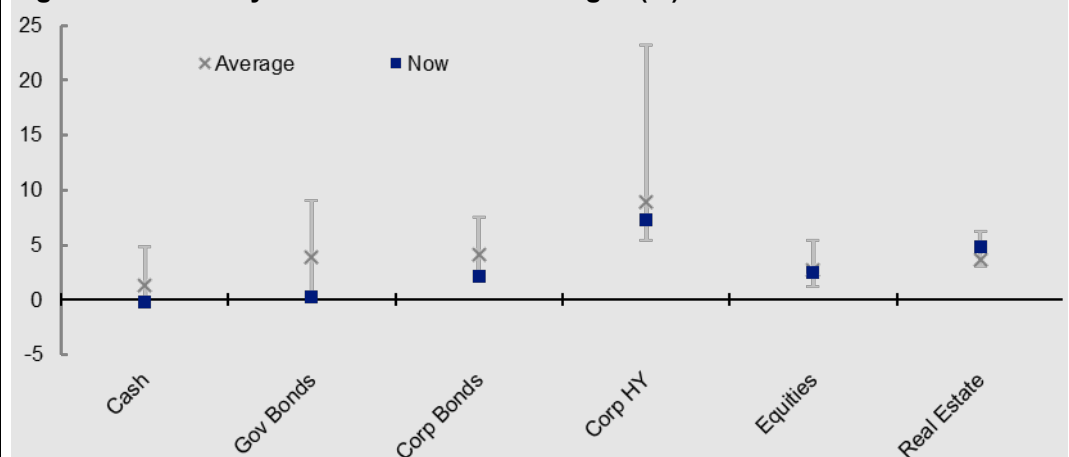


Note: monthly data from January 1992 to May 2020 (as of 29 May 2020). Both Global LEI (Leading Economic Indicator) and GRACI (Global Risk Appetite Cycle Indicator) are provided by Invesco Investment Solutions (IIS). Global LEI is a weighted average of leading indicators for 23 countries (both developed and emerging). GRACI is a measure of relative risk-adjusted performance between riskier and safer asset classes (it measures how much investors have been rewarded, on average, for taking an incremental unit of risk in global financial markets on a trailing medium-term basis). A rising index signals improving market sentiment and vice-versa. Past performance does not guarantee future results.
Source: Federal Reserve, BEA, Moody's, Invesco Investment Solutions

The highest yields are available on HY, equities, real estate and EM assets

An important factor in our asset return projections is current valuations. **Figure 15** shows that yields on many fixed income assets are at historical lows, with that on HY still below normal. **Appendix 1** shows the full regional detail and makes even clearer the comparison across asset classes and regions: HY, equities and real estate offer the best yields, especially in emerging markets. Such valuation measures may not tell us what happens tomorrow but we think they help shape longer-term returns.

Figure 15 – Global yields within historical ranges (%)



Start dates are cash 1/1/01; govt bonds 31/12/85; corp bonds 31/12/96; corp HY 31/12/97; equities 1/1/73; real estate (REITs) 18/2/05. See appendices for definitions, methodology and disclaimers. As of 29 May 2020.
Source: Refinitiv Datastream and Invesco

US treasury yields have never been so low

Figure 16 shows that US treasury yields have never been so low, not during the Great Depression nor during WW2 when the Fed was setting bond yields. This is not a good starting point, especially as returns over the medium term are highly correlated to yield (and if held to maturity they are in line with the yield to maturity at the time of purchase).

Figure 16 – US 10-year yields since 1790 (%)

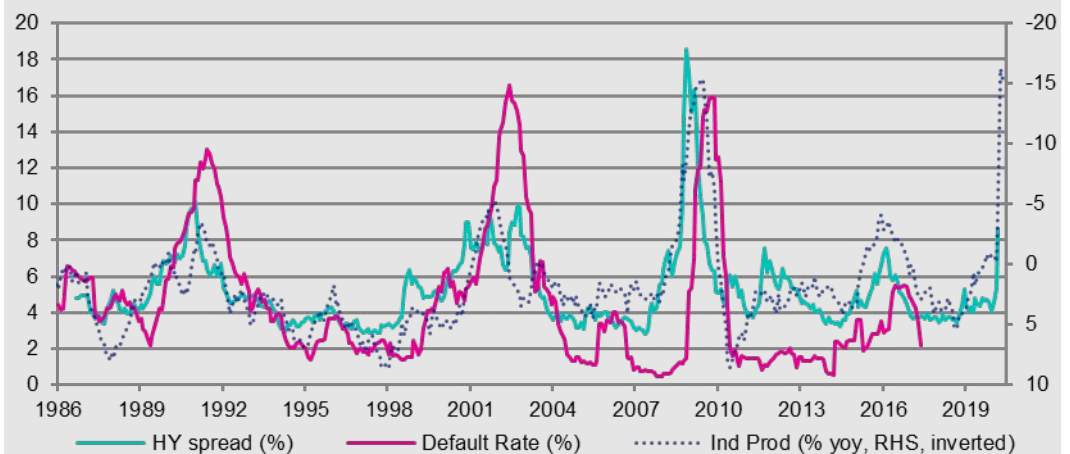


Data is monthly, from December 1790 to May 2020 (as of 29 May 2020). Past performance is no guarantee of future results. Source: Global Financial Data, Refinitiv Datastream and Invesco

HY spreads moved to mild recession territory but have since narrowed

The yield on US HY credit moved higher during the generalised sell-off in risky assets during March 2020, causing the spread versus treasury yields to rise to a level rarely seen outside of the GFC (see **Figure 17**). We have noted before that future returns on US HY are often at their highest when spreads are at their widest (when nobody else is interested). However, **Figure 17** suggests the recent widening of HY spreads was short lived and limited in magnitude (given the depth of the ongoing recession when both spreads and defaults would normally be expected to rise sharply).

Figure 17 – US high-yield spread, defaults and the economy

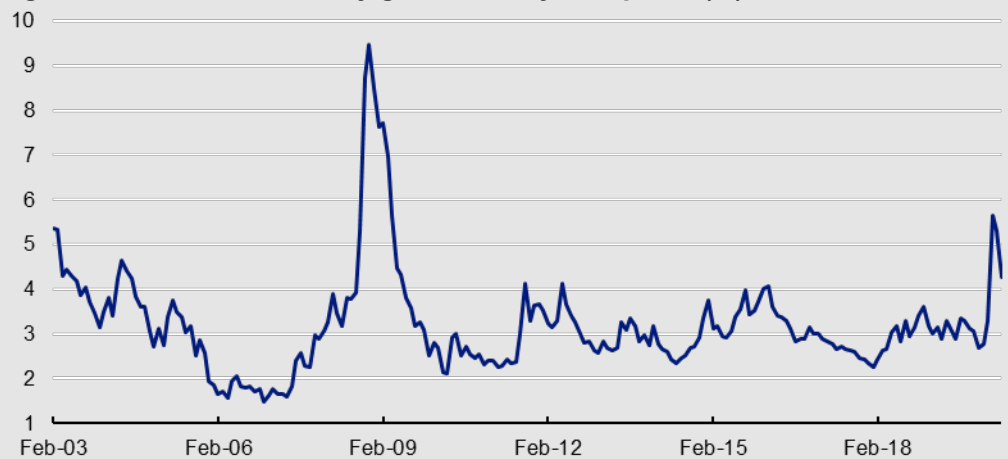


Note: Monthly data from January 1986 to May 2020 (as of 29 May 2020). "HY spread" is the difference between the yield on the BAML US High-Yield Corporate Index and that on the 10-year US treasury. "Ind Prod" shows the year-on-year percentage change in US industrial production. "Default rate" is the high-yield default rate as estimated by BAML (the series ends in May 2017). Past performance is no guarantee of future results. Source: BAML, Global Financial Data, Refinitiv Datastream and Invesco

EM spreads remain generous but are not at deep recession levels

The same applies to EM government debt spreads, though they remain wider than normal. As shown in **Figure 18**, the spread on USD denominated EM debt versus US treasury yields has narrowed in recent months but is still wider than at any point since 2004, apart from during the GFC. **Appendix 1** suggests that EM corporate bonds offer a similarly generous spread versus those of the developed world. Most EM assets seem to offer wider spreads than is usual versus developed markets.

Figure 18 – EM hard currency government yield spread (%)

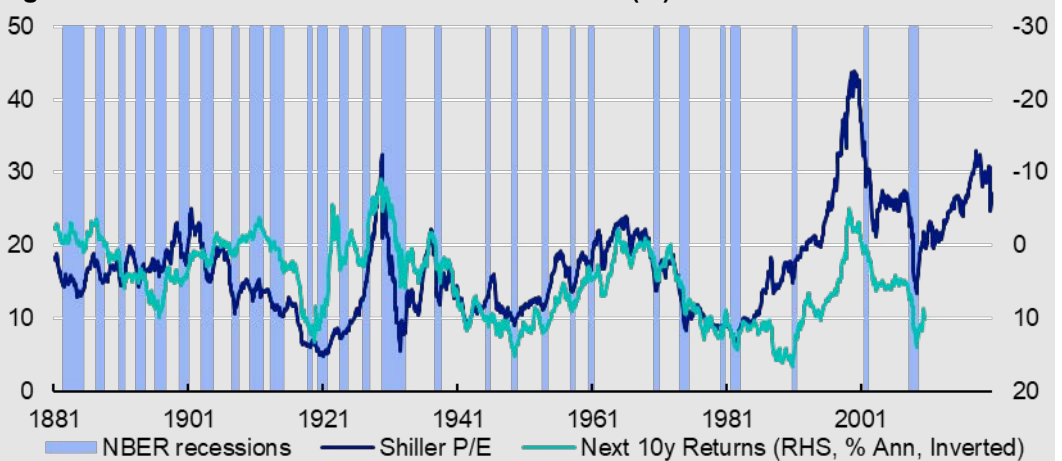


Note: Monthly data from February 2003 to May 2020 (as of 29 May 2020). Yield spread is the yield-to-worst on the Bloomberg Barclays EM USD Aggregate 7-10 Year Index minus the yield on 10-year US treasury notes. Past performance is no guarantee of future returns. Source: Barclays Bloomberg, Refinitiv Datastream and Invesco.

US equities never priced in recession and have since moved upward

The equity market rebound noted earlier has been particularly strong in the US. Trying to judge where this leaves valuations when corporate earnings and dividends are collapsing is not easy. Simple price-earnings ratios are even more useless than normal at this moment, in our opinion. We have always preferred some form of cyclically adjusted PE (CAPE), where a 10-year moving average of earnings is used to give a more stable denominator. **Figure 19** shows that the Shiller PE for the US market fell quite sharply, from a recent peak of 32 to around 23 in mid-March. However, the recent rebound in prices has lifted the Shiller PE back to 27 (at end-May), compared to a long-term average of 17. From such starting points, US equities have usually generated moderate returns over the next 10 years (although in recent decades, those returns have at least been positive).

Figure 19 – S&P 500 Shiller PE and future returns (%)

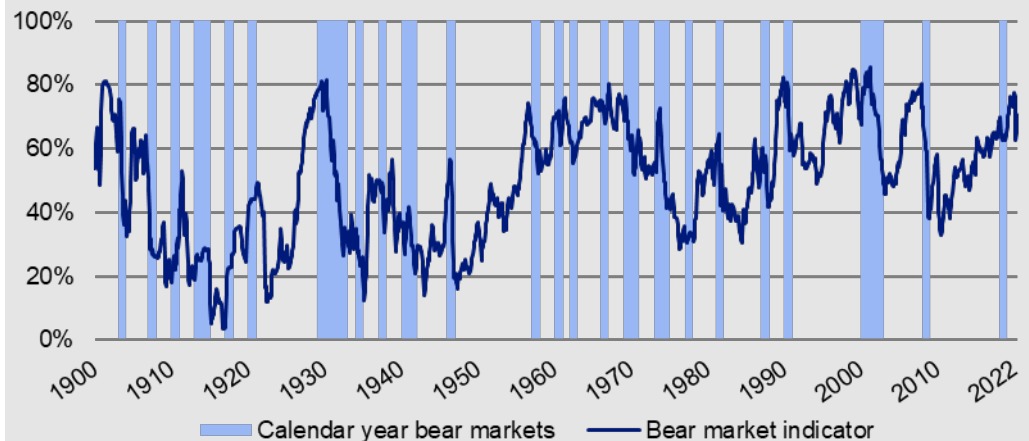


Monthly data from January 1881 to May 2020 (as of 29 May 2020). NBER recessions are periods of US economic recession as defined by the US National Bureau of Economic Research. Past performance is no guide to future returns. See appendices for definitions and disclaimers. Source: Federal Reserve Bank of St. Louis, NBER, Robert Shiller and Invesco

Our US Equity Bear Market Indicator is uncomfortably high given the state of the economy

Other facets of the US equity market give a mixed picture: yield gaps are acceptable (slightly better than over the long term) because treasury yields are so low; the slope of the yield curve is no longer inverted but is less steep than usual and profit momentum is negative and likely to become more so, in our opinion. These, along with the Shiller PE, are the components of our US Equity Bear Market Indicator (see **Figure 20**). At 71% this is uncomfortably close to what we consider the danger zone (75%-80%). At this stage of the economic cycle we would normally expect this indicator to be much lower.

Figure 20 – US equity bear market indicator is 71%

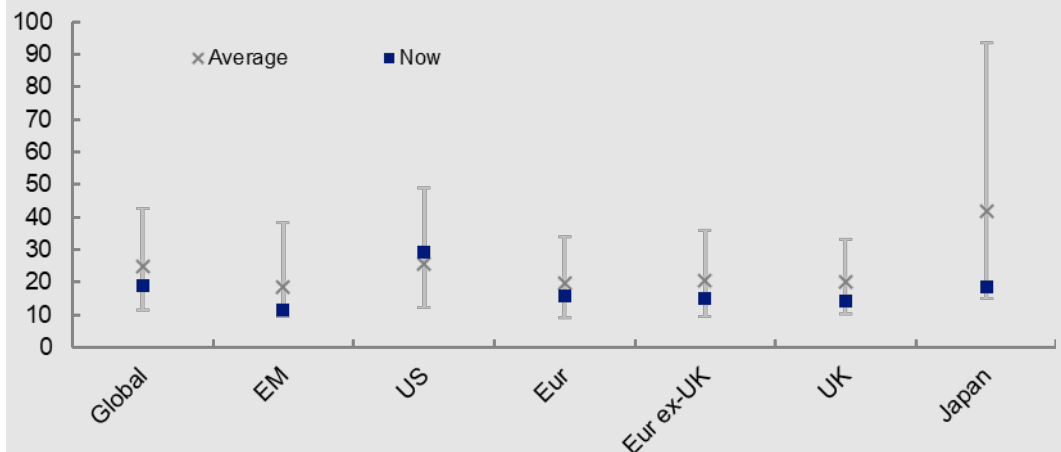


Notes: The bear market indicator is the average of the US yield curve (10y yield minus Fed rates), earnings yield gap (inverse of the Shiller PE minus 10-year yield), Shiller PE and EPS momentum (3m/3m). Each is expressed with reference to the cumulative distribution of its own history since 1881 (since 1914 for yield curve), assuming a normal distribution. A higher reading suggests more risk of an equity bear market (maximum = 100%). Monthly from 31 January 1900 to 29 May 2020. See appendices for definitions and disclaimers. Source: Global Financial Data, Robert Shiller, Refinitiv Datastream and Invesco.

Non-US equity markets are cheaper and EM could be at a turning point

Though all equity markets are likely to suffer from falling earnings, most are not as expensive as the US market, as shown by our own CAPE ratios in **Figure 21** or the dividend yields shown in **Appendix 1**. Indeed, by the CAPE metric, some markets are as cheap as they have been over recent decades, notably EM, Japan and the UK. As we recently wrote, if the oil price has bottomed, it could spell the turning point for EM earnings per share (EPS) and EM equity markets (see [Are the stars aligning for EM equities?](#)).

Figure 21 – Historical ranges for equity CAPEs

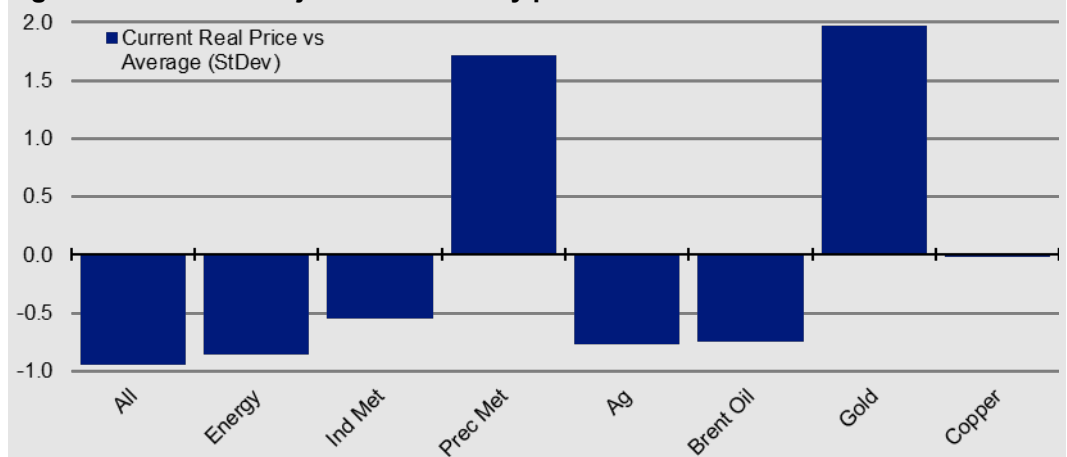


Note: CAPE = Cyclically Adjusted Price/Earnings and uses a 10-year moving average of earnings. From 1983 (except for EM from 2005). As of 29 May 2020. Source: Refinitive Datastream and Invesco

Some real estate yields have scaled GFC highs but fundamentals may have changed

Judging by the yields on REITS (see **Appendix 1**), real estate assets have been singled out for punishment during this crisis, with less of a rebound than equities (yields are above historical norms in all regions and recently exceeded GFC levels in Japan and EM). There is clearly a risk that some categories of real estate will suffer from rental holidays in the short term (whether voluntary or imposed) and that some will suffer a decline in demand over the medium to long term (high streets have suffered another blow during this crisis and demand for office space could be less than expected if the shift to working from home proves other than temporary). However, low financing costs (interest rates) could help and some categories of real estate could be more in demand than ever (warehousing for home delivery services, for example). We have thus revised down our growth projections and revised up the yields that are applied to dividends.

Figure 22 – Inflation adjusted commodity prices versus historical norms



Note: inflation adjustment is done using US consumer prices. Abbreviations: "Ind Met" is industrial metals, "Prec Met" is precious metals and "Ag" is agriculture. Historical ranges start on: All and Ag 31/12/69; Energy 31/12/82; Ind Met 3/1/77; Prec Met 2/1/73; Brent 1/6/87; gold 1/1/74; copper 1/1/74. As of 29 May 2020. See appendices for definitions, methodology and disclaimers. Source: GSCI, Refinitiv Datastream and Invesco

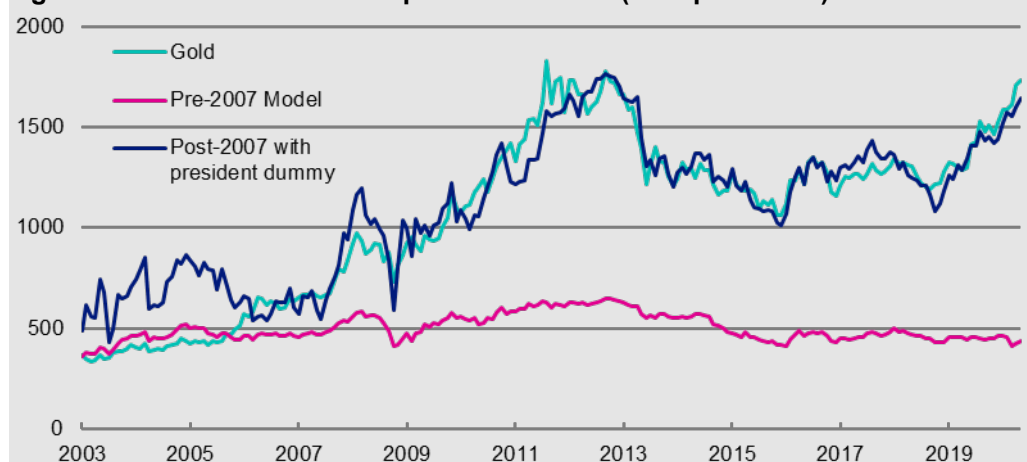
Most commodities appear cheap, especially agriculture

We complete our tour of asset classes with commodities. **Figure 22** suggests the commodity asset class is cheaper than usual but with a big contrast between precious metals and other commodity groups. That divergence may be justified by the current state of the global economy when it comes to energy and industrial metals but we would not expect agriculture to be so cyclical (and it is virtually as cheap as at any point since the mid-1970s). When it comes to cyclical commodities, the future price path will depend on the economic recovery path, in our opinion.

Oil may have bottomed but history suggests limited upside

The oil market suffered the double negative of a deep economic recession (which reduced demand) and a breakdown in the agreement between OPEC and Russia (which boosted supply). The collapse in price (temporarily into negative terrain for WTI) seems to have reduced supply: OPEC and Russia are again limiting output, while the US rig count has fallen to post-GFC lows. Lower prices could also slow the decline in the oil-intensity of global activity. We had warned for some time that oil could bottom at \$20 (as it usually does, in today's prices) and suspect the recent dip in prices could mark the end of the bear market that started in 2011 (see [Is oil cheap at \\$20](#)). However, the history of the last 150 years suggests that after bottoming, the price tends to languish in the \$20-\$40 range for some time (in today's prices).

Figure 23 – Gold versus model predicted values (USD per ounce)



Monthly data from January 2003 to May 2020 (as of 29 May 2020). Gold is modelled as a function of real 10-year US Treasury yield, 10-year US inflation breakeven and trade-weighted USD. "Pre-2007 Model" is based on data from 31 January 1997 to 31 December 2006. "Post-2007 Model" is based on data from 31 January 2007 to 30 April 2020. "President dummy" is a dummy variable that was set at zero prior to November 2016 (when President Trump was elected) and one thereafter. There is no guarantee that these views will come to pass. Source: Refinitiv Datastream and Invesco

Gold appears expensive but could get more so

As for gold, we recently noted that it is extremely expensive in real terms judged by its own history, whether compared to US consumer prices or the price of a barrel of oil (see [Could gold reach \\$7000?](#)). However, many fear the extreme policy environment, with large fiscal deficits and ballooning central bank balance sheets, could eventually lead to a debasement of currencies, the collapse of financial systems and a return to some form of gold standard. Indeed, the question about gold reaching \$7000 is based on a calculation of which price would be necessary to enable official stocks of gold to fully back currency in circulation. Whether looking at just the US or the world economy, the answer turns out to be just above \$7000. That sounds bullish for holders of gold but enthusiasm should be tempered by the possibility that such an outcome could be accompanied by restrictions on private holdings of gold (in our opinion).

Our gold fair values range from \$1500 to \$1800, depending on economic scenario

Coming back to a market based approach, **Figure 23** shows our model for gold, with the price based on real treasury yields, inflation break-evens and the trade-weighted dollar (all coefficients have been negative since the GFC, with gold tending to rise when real yields, inflation expectations or the dollar fall). We have recently updated the model to allow for the distortion that seemed to occur at the time of the 2016 US presidential election (since November 2016, the actual price moved to a significant premium to our model). The introduction of a dummy variable that is switched on in November 2016 solves that problem and gives the best fit (it suggests the current presidency has added \$230 to the price of gold). The model currently suggests a fair value of \$1640 and the fair values by our scenarios range from \$1800 in the worst case economic scenario (where we assume there will be concern about the future implications of extremely expansive fiscal and monetary policies) to \$1500 in the best case, while ignoring the risk of a change in presidency (see **Figure 31** and the later discussion about the election).

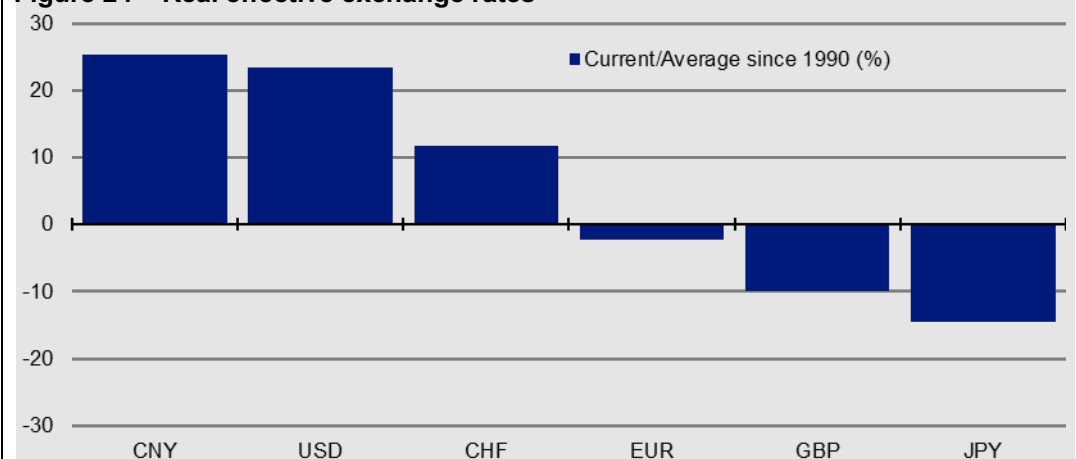
JPY remains the cheapest “safe haven” currency in our opinion

Moving from gold to official currencies, we appear to have moved from a period when so-called “safe haven” currencies were in high demand to a phase where they are less so. We believe the Japanese yen is the best example of a “safe-haven” currency (due to the amassing of a large pool of net overseas assets) and **Figure 24** suggests it remains unusually cheap versus other currencies (though less so than over recent years). Many also consider the US dollar to fulfil the same role (though the US is a large net overseas debtor, it does own the world’s reserve currency) but **Figure 24** suggests it is more expensive than usual (along with the Chinese yuan).

Sterling seems to perform the role of a “risk-on” currency

At the time of the last Big Picture document, sterling was in the process of falling to a multi-decade low of 1.15 versus the US dollar, at which point we considered it (and UK assets) to be good value. It has since recovered (to 1.23 at end-May and a high of 1.28 in early June) and we consider it to be now more in line with fundamentals (we think the UK economy will suffer more than most from the Covid-19 lockdown and Brexit is still to be fully enacted). The pound seems to perform the opposite role to the Japanese yen, rising in “risk-on” phases of the market and falling when anxiety rises.

Figure 24 – Real effective exchange rates*



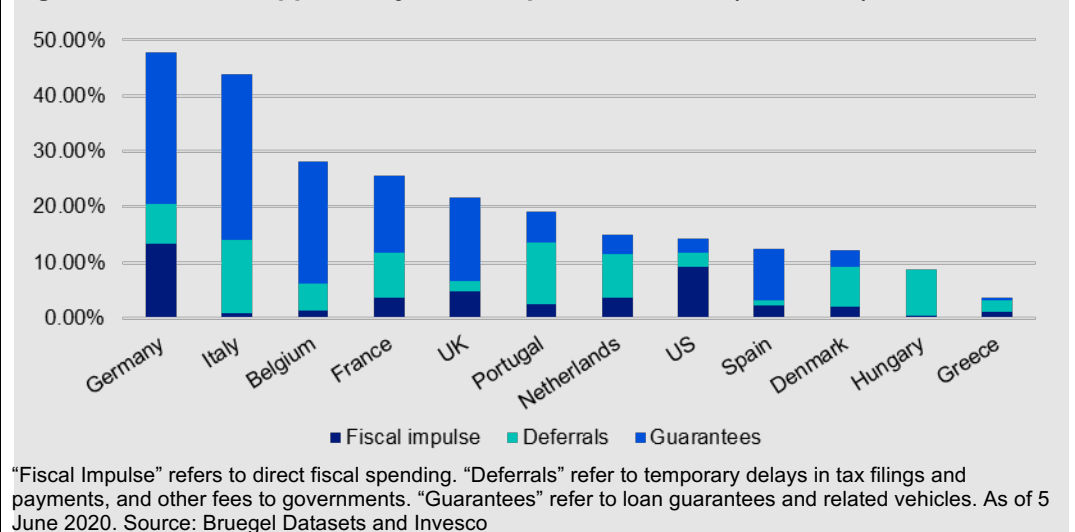
*Currency indices measured against a trade-weighted basket of currencies and adjusted for inflation differentials. As of 29 May 2020. Source: OECD, Refinitiv Datastream and Invesco

This could be a short sharp shock

Scenarios for the global economy

We are assuming that the ongoing recession brought a sudden halt to a global economic cycle that was gradually running out of steam. According to NBER recession periods, the typical US recession since WW2 has lasted 11 months (17 months if we go back to 1870). Given the nature of the current recession (exogenous shock) and the massive policy support on offer (see **Figure 25**, for example), we suspect it could be shorter (if deeper) than average. Indeed, it may turn out to be shorter than the previous post-WW2 record (six months, in 1980), even if it produces two quarters of negative GDP growth.

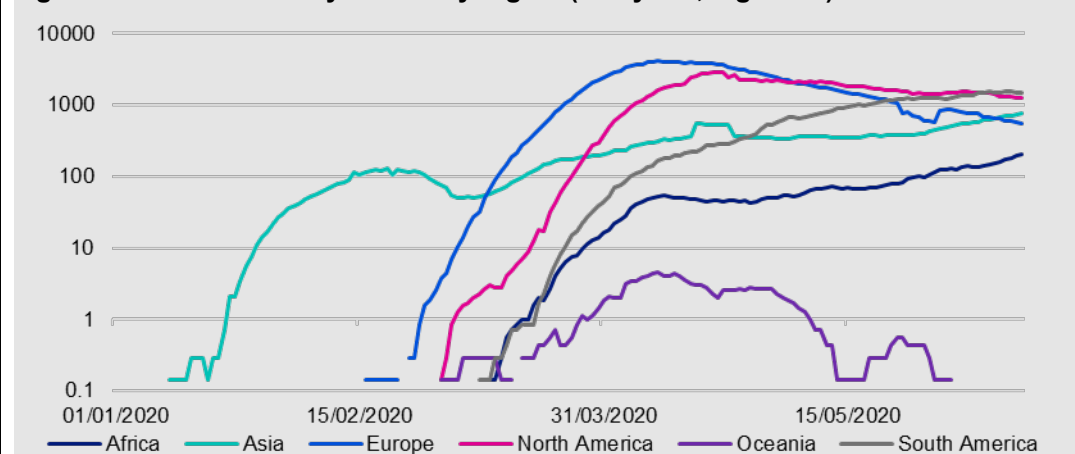
Figure 25 – Fiscal Support, Major Developed Economies (% of GDP)



But uncertainty remains, hence the use of scenarios

Nevertheless, there are many uncertainties about the shape of the recovery path, not the least of which is the path of the pandemic. The number of reported cases continues to rise globally but it is not clear to what extent that is due to more extensive testing rather than more infections. The number of deaths was on a downward path but has flattened in recent weeks. As shown in **Figure 26**, the trajectory varies by region. The daily rate of deaths seems to be on a downward path in Europe, North America and Oceania. However, the trends are not so good in Africa and South America, with Asia also trending upward (Asia includes the Middle East). With the Covid-19 virus so active, it is difficult to be confident that economies can reopen rapidly or that they will not be forced into further lockdowns if further waves of infections and deaths occur. The one source of certainty could be a viable vaccine but for the moment we do not have that. Hence, we believe it is necessary to consider a range of economic scenarios.

Figure 26 – Covid-19 daily deaths by region (7-day MA, log scale)

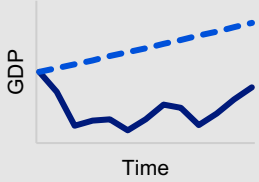
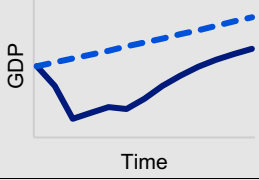
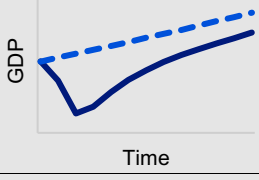
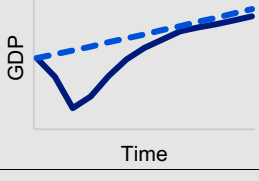
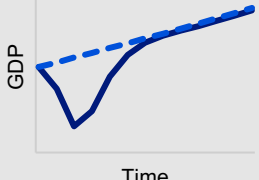


Based on daily data from 1 January 2020 to 16 June 2020. "7-day MA" is a seven-day moving average. Source: European Centre for Disease Prevention and Control, Invesco

Five scenarios with more alphabet soup!

Given the number of variables involved (path of the virus, possible second waves, vaccine, stringency of lockdowns, adherence to lockdowns, collateral damage, policy support etc.) it is possible to imagine an infinite number of scenarios. However, we have limited ourselves to just five:

Figure 27: Possible global economic and market scenarios

	Worst case (W-shaped, 5%): Multiple waves of infection requiring repeated strong lockdowns. Central banks (CB's) ease with big QE; yield curve flattening limited by concerns about government debt; credit, equity and REIT markets return to Global Financial Crisis (GFC) conditions.
	Bad case (L-shaped, 25%): A second wave in late 2020 requires partial re-imposition of lockdowns. CB's ease: yield curves flatten; credit spreads widen to recent peaks (defaults rise); equity and REIT yields rise to recent peaks and dividends fall sharply.
	Intermediate (Swoosh, 40%): Gradual easing of lockdowns and gradual return to normal behaviour. CB's ease a little more; yield curves steepen; credit spreads/equity yields stable (REIT yields fall); HY defaults and dividend declines as per normal recessions.
	Good (U-shaped, 20%): Rapid easing of lockdowns but delayed return to normal behaviour. CB's unchanged; yield curves, credit spreads and equity yields normalise (REIT yields move toward normal); HY defaults and dividend declines are limited.
	Best case (V-shaped, 10%): Rapid easing of lockdowns and speedy return to normal behaviour. CB's tighten (QE tapered); yield curves steeper than normal; credit spreads fall to recent year lows (defaults normalise); equity and REIT dividends rise and yields fall (equities to extreme lows, REITs to normal levels).
Note: Percentages in parenthesis are our assigned probabilities. Charts are shown for illustrative purposes only and are not intended as investment advice. Source: Invesco Global Market Strategy Office	

National economic growth linked to imagined stringency paths

Invesco's Global Market Strategy Office has developed a range of economic paths for major economies consistent with the scenarios outlined in **Figure 27**. We have done this by forecasting national stringency indices on a monthly basis and using those to project the path of GDP components. Allowing for the structure of each economy then allows us to forecast quarterly and annual national GDP growth, which we aggregate to give the global forecasts shown in **Figure 28**.

"Intermediate" 7% drop in global GDP in 2020

Importantly, there is an element of rebound in all of those scenarios, with Q2 being the low point for 2020 in all countries (except the UK) and in all scenarios. However, the scenarios vary thereafter, with the worst and bad cases envisaging economic relapse over the winter of 2020/21.

Figure 28: Summary of implied global GDP growth rates by scenario (%)

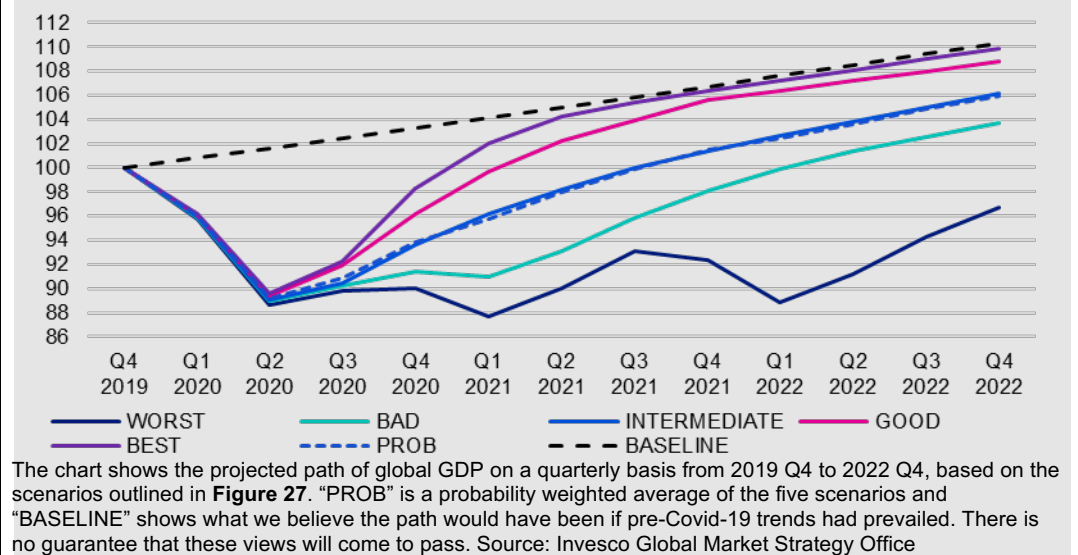
	Worst	Bad	Intermediate	Good	Best
2020	-8.5%	-7.7%	-7.0%	-5.6%	-4.8%
2021	-0.3%	3.2%	7.3%	10.1%	11.1%
2022	2.1%	7.8%	5.5%	4.6%	3.8%

Source: Invesco Global Market Strategy Office

Projected returns by scenario

The five scenarios presented earlier produce the global economic paths shown in **Figure 29**. All are consistent with deep recession in the first half of 2020 and then recovery. The scenarios differ in the steepness of the recovery and whether there is a relapse.

Figure 29: Global GDP paths by scenario (2019 Q4 = 100)



From economic scenarios to projected returns

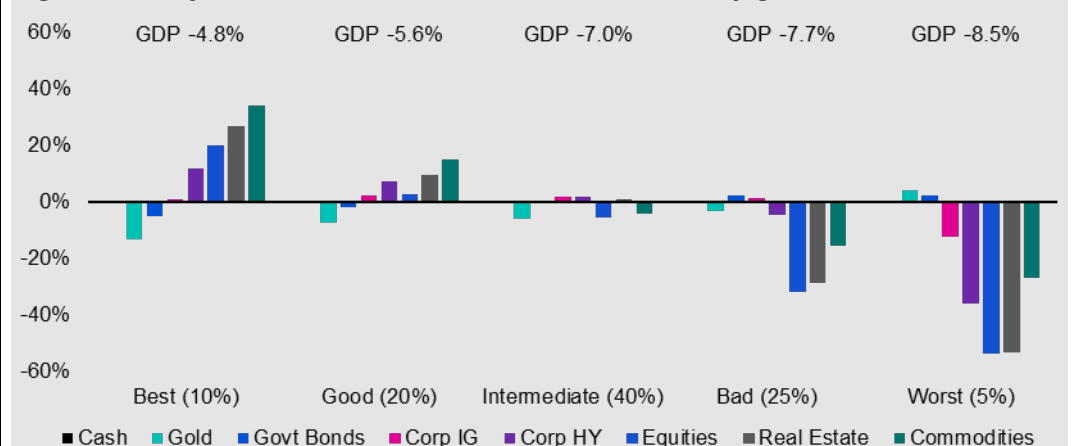
Bearing in mind current market levels, we have translated those economic scenarios into projected 12-month returns (see **Figure 30**). **Appendix 4** shows the detailed assumptions behind the projections (including 12-month growth rates), while **Figure 27** gives a summary of the concepts involved. **Figure 31** shows how those projections translate into common market benchmark levels.

The overall shape of the projections is of little surprise, with risky-assets expected to perform better in the more optimistic economic scenarios, the reverse being true for defensive assets such as gold and government debt (cash returns are negative in most cases but too small to distinguish from zero).

Current elevated prices cause a negative skew in the projections

However, there is a skew to the projections with cyclical assets expected to lose more in the weak scenarios than they gain in the strong scenarios. This is due to current valuations, which we think offer little in the way of a safety cushion (especially equities).

Figure 30: Projected 12-month asset class total returns by global GDP scenario



Gold has priced in the bad news; equities have run with the good news

This is also why the intermediate scenario projections are so modest, with IG, HY and real estate the only assets expected to provide (small) positive returns. Two assets do not fit the standard pattern: first, gold is expected to produce mild negative returns in all but the worst case scenario (because it is already so expensive) and, second, equities are projected to underperform real estate and commodities in all scenarios (and to underperform IG and HY in all but the best case scenario). Ironically, gold would appear to have priced-in a lot of bad news, while equities have focused on the good news.

Central banks assumed to have an easing bias, except in the better scenarios

The 12-month projected global returns shown in **Figure 30** are based on an aggregation of regional estimates and some of that regional detail can be seen in **Figure 31**. All central banks are expected to loosen further in the intermediate scenario, with more easing as the scenarios worsen (the Fed is not expected to introduce negative rates in any case). Not until the good ("U-shaped") scenario do we assume that central banks stick with current policy settings. We have built in a degree of tightening in the best scenario to differentiate from the other cases but believe it to be unlikely in the 12-month forecast horizon.

Worst case yield curve inversion limited by fears about fiscal deficits; gold would benefit in that scenario

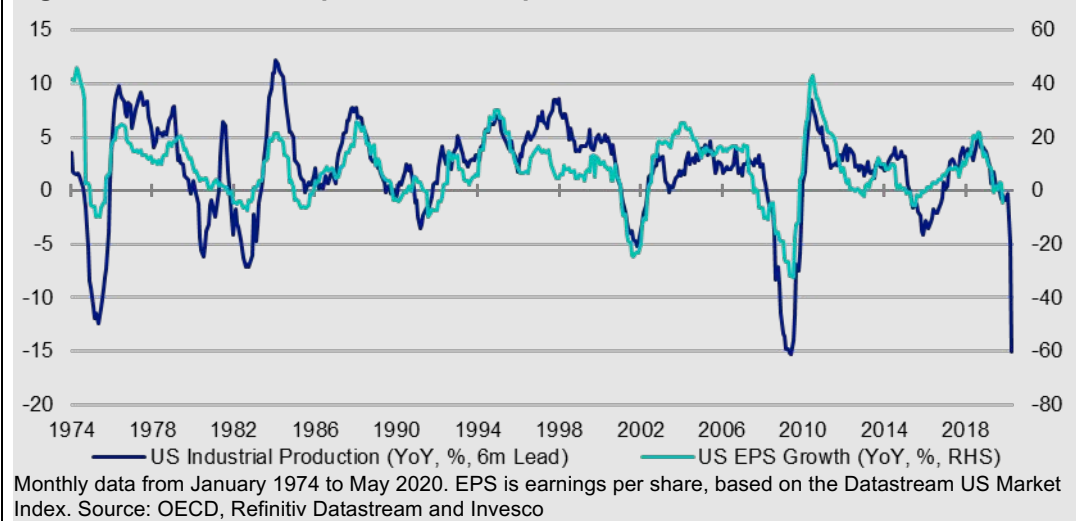
Yield curves are expected to be steeper in the better scenarios but we assume a limit to how far long bond yields can fall in the worst-case scenario due to concerns about the size of fiscal deficits (and the current exceptionally low level of yields). We assume the US dollar plays the role of a so called "safe-haven" but not as much as the Japanese yen and the Swiss franc (all are expected to strengthen versus other currencies in the weaker economic scenarios and vice-versa). The same can be said for gold, for which the price forecasts are based on our views about US treasury yields and the US dollar (except that in the worst case scenario we assume gold exceeds our model fair value due to concerns about government debt and central bank balance sheets).

Figure 31 – 12-month market forecasts by scenario

	Current (29/05/20)	Best	Good	Inter- mediate	Bad	Worst
Central Bank Rates						
US	0.25	0.50	0.25	0.15	0.05	0.00
Eurozone	-0.50	-0.40	-0.50	-0.60	-0.75	-0.80
China	4.35	4.50	4.35	4.00	3.50	3.00
Japan	-0.10	-0.10	-0.10	-0.20	-0.30	-0.40
UK	0.10	0.25	0.10	0.00	-0.10	-0.25
10y Bond Yields						
US	0.63	1.90	1.20	0.80	0.40	0.30
Eurozone	-0.45	0.50	0.10	-0.30	-0.80	-0.90
China	2.71	4.00	3.50	3.00	2.50	2.00
Japan	0.01	0.30	0.10	0.00	-0.35	-0.45
UK	0.13	1.00	0.40	0.20	-0.20	-0.35
Exchange Rates/US\$						
EUR/USD	1.11	1.25	1.20	1.15	1.10	1.05
USD/CNY	7.14	7.00	7.10	7.20	7.30	7.40
USD/JPY	107.79	115.00	114.00	112.00	105.00	100.00
GBP/USD	1.23	1.35	1.33	1.30	1.23	1.20
USD/CHF	0.96	1.02	1.00	0.98	0.94	0.92
Equity Indices						
S&P 500	3044	3600	3100	2750	1925	1250
Euro Stoxx 50	3050	3500	2950	2750	1700	1100
FTSE A50	13266	17000	14600	13250	11500	6400
Nikkei 225	21878	29000	25000	21000	16250	11000
FTSE 100	6077	7000	6000	5500	4100	3000
Commodities (US\$)						
Brent/barrel	34	50	40	30	25	20
Gold/ounce	1732	1500	1600	1630	1670	1800
Copper/tonne	5352	7000	6500	6000	4800	3500

Notes: There is no guarantee that these views will come to pass. See Appendices for definitions, methodology and disclaimers. Source: Refinitiv Datastream and Invesco Global Market Strategy Office

Figure 32: US industrial production and profits



Are equity markets priced for the big decline in earnings that we expect?

The reverse is true for cyclical assets such as industrial commodities, equities and real estate. **Figure 31** shows that we expect oil and copper prices to strengthen with the economic scenario (with both currently priced in the middle of our predicted range). Though we also expect equities to perform better in the stronger economic scenarios, our projections are skewed to the downside. This is partly because valuations are stretched in some areas (notably the US) but also because we expect dividends to fall in all scenarios except the best (based on the evidence in **Figure 32**, we expect sharp declines in earnings and dividends, in all markets). Real estate faces some of the same issues but we find that valuations are not so stretched.

Optimisations suggest we should be Underweight equities in all scenarios

Figure 33 shows the projected returns for global assets and the result of putting those returns through an optimisation process that maximises returns subject to volatility being no higher than that of the Neutral Portfolio. Though the optimised allocations hold few surprises, with cyclical assets more favoured in the better economic scenarios, there are few easy wins this time: the only constants are that equities are Underweighted in all scenarios, while the combination of cash and gold is maximum allocated in all cases (in March, IG was maximum allocated in all scenarios).

Cash plus gold always maximised but it is one or the other, not both

Unfortunately, though the combination of cash and gold is always maximum allocated, the mix is binary: in most cases, cash is maximum allocated (with gold at zero), the one exception being the worst-case scenario, where the reverse is true.

Figure 33 – Projected 12m local currency total returns and optimised allocations for global assets (%)

	Neutral	Policy Range	Projected Returns					Optimised Allocations				
			Best	Good	Inter	Bad	Worst	Best	Good	Inter	Bad	Worst
Cash & Gold	5	0-10	-6.7	-3.8	-3.0	-1.9	1.9	10	10	10	10	10
Cash	2.5	0-10	0.0	-0.1	-0.1	-0.2	-0.2	10	10	10	10	0
Gold	2.5	0-10	-13.4	-7.6	-5.9	-3.6	4.0	0	0	0	0	10
Gov Bonds	30	10-50	-5.0	-2.0	-0.2	2.3	1.9	30	16	24	50	50
Corp IG	10	0-20	0.9	2.1	1.6	1.0	-12.5	0	20	20	20	20
Corp HY	5	0-10	11.7	6.9	1.6	-4.9	-36.1	10	10	10	0	0
Equities	40	20-70	19.6	2.4	-5.8	-32.1	-53.6	30	24	20	20	20
Real Estate	8	0-16	26.8	9.4	0.7	-28.8	-53.5	16	16	16	0	0
CTY	2	0-4	33.6	14.8	-4.2	-15.5	-26.8	4	4	0	0	0

Notes: "Inter" = intermediate, "CTY" = commodities. Based on local currency returns (for both the one-year projected returns and five-year historical covariance matrix). "Neutral" shows our neutral asset allocation. Cash is an equally weighted mix of USD, EUR, GBP and JPY. Optimised allocations are derived by maximising returns while not exceeding the volatility of the Neutral Portfolio. As of 29 May 2020. There is no guarantee that these views will come to pass. See appendices for definitions, methodology and disclaimers. Source: Invesco Global Market Strategy Office

A change of US president still seems probable

A word about the US election

A symbol of life going on as normal will be the US presidential election on 3 November. We have felt for some time that there would be a change of president (see [10 surprises for 2020](#)) and now feel even more confident in that view, based on analyses of opinion polls (by FiveThirtyEight, for example), betting odds (see Oddschecker, for example) and the fact that it is difficult for an incumbent president to be re-elected in a recession year.

Gold could be a victim

We have already identified one asset class that could be impacted by the election outcome – gold. The behaviour of the yellow metal seemed to change at the time of the 2016 election, moving to a premium to what our model suggested it should be. If our interpretation is correct, a change of president could now depress the price of gold.

Democrats are bad for stocks. Really?

Discussions with investors suggest a fear that a Democrat president would be bad for the stock market but we think this is something of a myth. Admittedly, stocks have done quite well during the current presidency, with an annualised gain in the S&P 500 of 9.1% (from 20 January 2017 to 29 May 2020). Though this is around twice the annualised gain since 1853 (see **Figure 34**), it is lower than during the presidencies of Ronald Reagan (10.2%), George H. Bush (10.9%), Bill Clinton (15.2%) and Barrack Obama (13.9%). In fact, **Figure 34** reveals that stocks have done marginally better under Democrat presidents than under Republicans.

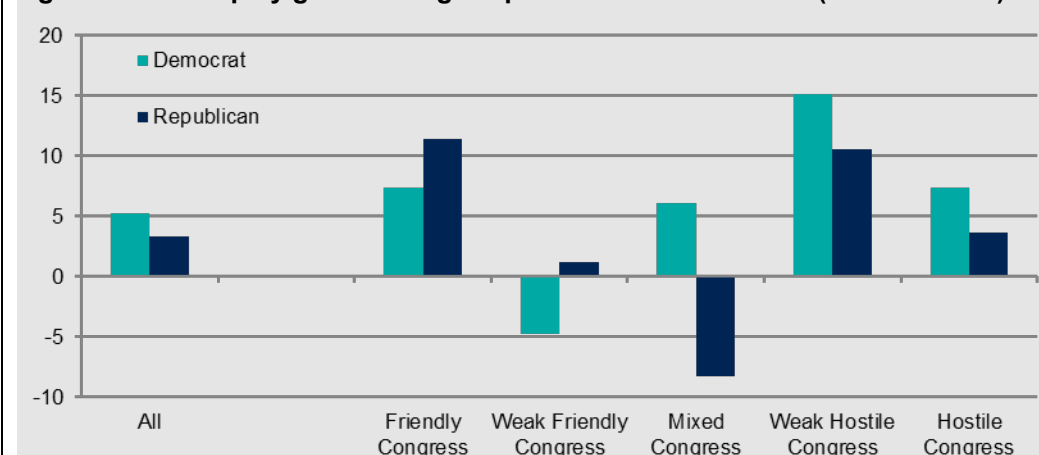
We fear for US equities but not because of Joe Biden

Hence, we are more sanguine than many when it comes to a change of president, especially considering the potential for a return to a more conventional way of interacting with the world and perhaps a reduction of risk premia (and the gold price). This is not to say there would not be challenges under a Biden presidency, with profits (minimum wage/corporate tax) and share buybacks (capital gains tax) under threat. However, in the context of a stock market that is so expensive, these are perhaps the least of our worries and a reduction of share buyback activity may be one route to improving US productivity (by encouraging businesses to focus on real, rather than financial, engineering).

Plenty of sectors could benefit

Offsetting those threats may be a more relaxed attitude to fiscal deficits and a potential boost to healthcare providers, consumer stocks (higher minimum wage), aerospace & defence (defence spending) and housebuilders and construction (infrastructure spending). On the negative side, proposals to cap drug prices could harm pharmaceutical stocks.

Figure 34 – US equity gains during US presidencies since 1853 (% annualised) *



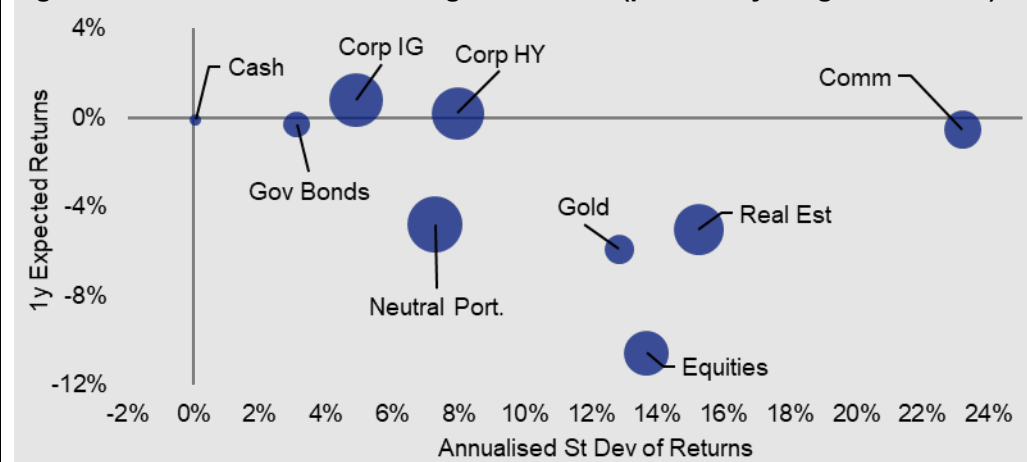
*Based on the S&P 500 index since 1957 and comparable indices as derived by Robert Shiller prior to that (see details in Appendix). The analysis starts at the beginning of the presidency of Franklin Pierce on 04 March 1853 and ends on 29 May 2020. "Friendly Congress" is when both houses are of the same party as the president; "Weak Friendly Congress" is when both houses support the President for most of his full term; "Mixed Congress" is when both parties have an equal stake in Congress; "Weak Hostile Congress" is when both houses are predominantly against the president and "Hostile Congress" is when both houses are against the president throughout his term. Past performance is no guarantee of future results. Source: 270twin, Robert Shiller, Global Financial Data, Bloomberg, Refinitiv Datastream, Wikipedia and Invesco.

A probability weighted approach

Model Asset Allocation: Eyes wide shut

Diversification remains critical in these uncertain times. Rather than making point projections, we are using a probability weighted version of the five scenarios described earlier (see **Figure 33**).

Figure 35 – Return versus risk for global assets (probability weighted returns)



Based on annualised local currency returns, using the probability weighted average projected return (averaged across five scenarios described in earlier sections) and a historical covariance matrix. Size of bubbles is in proportion to average historical pairwise correlation with other assets. Cash is an equally weighted mix of USD, EUR, GBP and JPY. Neutral portfolio weights shown in **Figure 36**. As of 29 May 2020. There is no guarantee that these views will come to pass. See Appendices for definitions, methodology and disclaimers.

Source: BAML, MSCI, GSCI, FTSE, Refinitiv Datastream and Invesco Global Market Strategy Office

Balancing risk and reward, with returns skewed to the negative side

Figure 35 shows our 12-month probability weighted global asset class projections and historical volatilities (based on five years of data), with cross asset correlations indicated by the size of the bubbles. The fact that projected returns for many assets are negative reflects the skew in our projections based upon our belief that several assets are expensive given the underlying economic environment. This framework allows a balancing of risk and reward (we optimise for global asset class weights and then manually allocate across the regions within each asset class). The optimiser is useful but judgement is the final ingredient.

The optimised allocations are shown in **Figure 36**. We normally focus on the “Max Return” outcome but given the unusual constellation of returns shown in **Figure 35** (and the implicit strange efficient frontier), we are now also paying attention to the “Sharpe Ratio” outcome, which no longer gives the most conservative outcome.

Figure 36 – Optimised allocations for global assets (using local currency returns)

	Neutral Portfolio	Policy Range	Optimisation results		Model Asset Allocation*	
			Sharpe Ratio	Max Return		
Cash & Gold	5%	0-10%	10%	10%	↑	10%
Cash	2.5%	0-10%	10%	10%	↑	10%
Gold	2.5%	0-10%	0%	0%	↓	0%
Government Bonds	30%	10-50%	20%	40%	↑	25%
Corporate IG	10%	0-20%	20%	20%		20%
Corporate HY	5%	0-10%	10%	10%	↑	6%
Equities	40%	20-60%	20%	20%	↓	25%
Real Estate	8%	0-16%	16%	0%	↓	12%
Commodities	2%	0-4%	4%	0%	↓	2%

Notes: Based on local currency returns (for both the one-year projected returns and five-year historical covariance matrix). Based on a probability weighted version of the returns generated by the four scenarios described earlier. Cash is an equally weighted mix of USD, EUR, GBP and JPY. “Sharpe Ratio” shows the results of maximising the Sharpe Ratio. “Max Return” maximises returns while not exceeding the volatility of the Neutral Portfolio. *This is a theoretical portfolio and is for illustrative purposes only. It does not represent an actual portfolio and is not a recommendation of any investment or trading strategy. As of 29 May 2020. See appendices for definitions, methodology and disclaimers. Source: Invesco Global Market Strategy Office

Cash, IG and HY are favoured over equities and gold	Several conclusions are common across the two optimisation processes: cash, IG and HY are maximised, while gold and equities are minimised. On the other hand, there is no such commonality regarding real estate and commodities, which suggests more judgement will be needed for those assets.
Cash raised to maximum	As we had already concluded that gold seems to have priced in a lot of bad news, while equities have priced in a lot of good news, it should be no surprise that our optimisation processes prefer other assets. When it comes to defensive assets, we now prefer cash to gold within our Model Asset Allocation and we are taking cash back to the maximum allowed 10% from the previous 5% (cash may offer no return but it has limited volatility and is decorrelated with other assets).
Gold reduced to zero after strong performance	Gold has performed very well this year (see precious metals in Appendix 2) and we can see how it could perform well in a scenario where central banks lose control. However, barring such an extreme outcome, we see limited upside potential from here and can imagine downside in many scenarios, especially if there is a change of president in the US. We are thus reducing the gold allocation to zero (from 5%).
IG remains at the maximum and government debt raised but still below Neutral.	Among other relatively defensive assets, we remain maximum allocated to IG credit (20%), with a continued preference for US, UK and EM paper (see the regional allocation detail in Figure 3). We consider that IG offers a good combination of risk, reward and diversification. We are boosting the allocation to government debt to 25%, though remain Underweight versus a Neutral 30%. It is not so much that we find the outlook to be compelling, rather that we think the potential for some cyclical assets is worse than it was three months ago (when such assets were very weak). We believe that among government debt markets, the return outlook is most promising in the US, UK and EM. We are now Overweight all those regions and have added to the US and UK positions. For both IG and government debt, EM is by far our preferred region due to the generous spreads on offer (and the potential for EM currencies to recover if oil has truly bottomed).
EM is our preferred region	
HY cautiously raised to Overweight, (focussed on the US)	Staying with fixed income assets for the moment but turning to the more cyclical HY credit , the optimisation results in Figure 36 suggest we adopt a maximum allocation of 10%. However, the full set of scenario results shown in Figure 33 are not so uniform. Hence, though we are boosting the HY position to an Overweight 6% (versus Neutral 5% and previous zero), we resist the temptation to go all the way to the maximum allowed 10%. Figure 30 shows that we expect better returns on HY than on equities in all but the best scenario but remain wary about the effect of defaults in all scenarios and a re-widening of spreads in the weaker economic outcomes. Hence, we are not prepared to go fully weighted for now. Within HY, we are sticking with the US market.
Equities lowered to further Underweight, with a preference for Japan...	Figure 35 shows why we are reducing the allocation to equities from 30% to 25%, which is Underweight versus a Neutral 40%. It is the asset class upon which we expect the worst returns (on a probability weighted basis) and has the biggest skew towards negative outcomes across scenarios (see Figure 30). Among regions, we prefer Japan, because we see attractive valuations and the least threat to dividends (due to a relatively low payout ratio). Though we remain Overweight Japanese equities, we reduce the position from 6% to 5% (Neutral 3%). We are also reducing the allocations to the Eurozone (to zero) and the UK (to a Neutral 3%) and remain very much Underweight US equities, which we believe to be extremely expensive (our S&P 500 targets range from 1250 in the worst case scenario to 3600 in the best case – see Figure 31). The only regional equity allocation that has been increased is EM, which is raised to a Neutral 4%. This is partly due to favourable valuations (the CAPE is the lowest of any region) and the potential for improved earnings momentum if the commodity cycle has bottomed.
...EM raised to Neutral	
Energy reduced to Neutral after strong oil rebound	Speaking of commodities , after the strong rally in oil prices over recent weeks, we are reducing the broad commodity allocation from the maximum allowed 4% to a Neutral 2%. We are reducing energy to a Neutral 1% and industrial metals to zero. Agriculture remains well below historical norms, based on our analysis of real prices and, because we suspect there will always be demand for food, we maintain the Overweight 1% allocation.

We reduce real estate but remain Overweight, with a preference for EM and Japan

Finally, **real estate**, has been one of our favoured assets over many years but **Figures 33 and 36** suggest this should no longer be the case. The optimisation results are mixed, with a zero-allocation suggested in the weakest economic outcomes and a maximum allocation suggested in the stronger scenarios. A good compromise would appear to be a Neutral 8% allocation. However, we do not want to change the balance too much between cyclical and defensive assets and, based on the evidence in **Figure 35**, we prefer real estate to equities among cyclicals. Hence, we have decided to remain Overweight in real estate but at a reduced 12% allocation, versus the previous 16%. Within real estate, we have a clear preference for EM and Japan (both of which remain at the maximum allowed allocation), while we reduce allocations to the US and UK (to a Neutral 2% and zero, respectively).

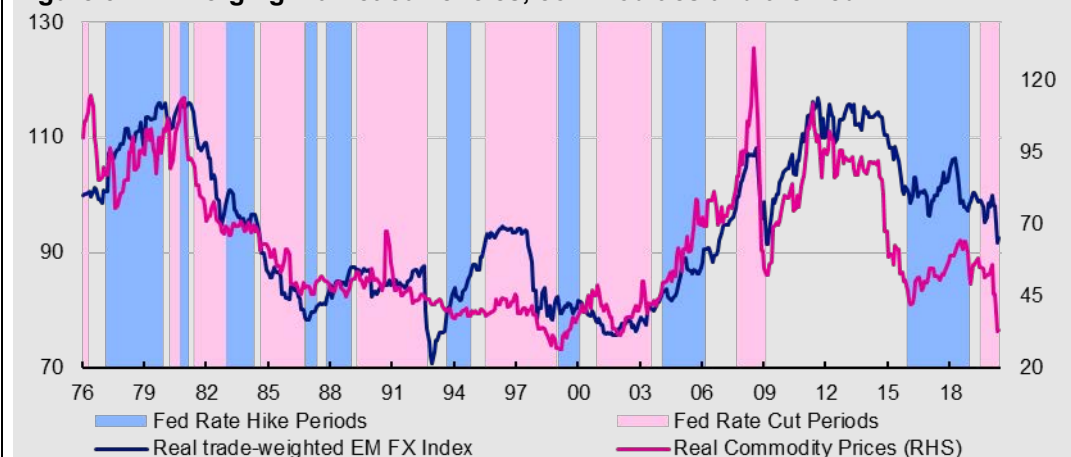
Overall, a preference for UK, Japanese and EM assets because we like them and...

Looking at the summary currency exposures shown in **Figure 3** we are now overexposed to sterling, the Japanese yen and emerging markets. This is a natural consequence of our regional asset preferences. We are very underexposed to the euro and broadly Neutral the US dollar. In terms of direction of change, the USD allocation has increased largely due to the additions to US HY and government debt, while EM currency exposure is up due to the addition to equities. Exposure to the euro is down due to the reduced Eurozone equity allocation, while that to sterling is down as a result of reduced equity and real estate allocations.

...we find their currencies attractive

The preference for sterling, yen and EM assets could also be taken as a view about their respective currencies. **Figure 24** suggested that the yen and sterling are cheap compared to historical norms but didn't say anything about EM currencies (except that the Chinese yuan appears more expensive than normal). **Figure 37** shows our index of EM currencies versus the US dollar, in real terms. The common supposition that EM currencies are driven by Fed policy finds little support in **Figure 37**; rather commodity cycles appear to be a more important driving force. Though EM currencies are in the middle of their historical range (according to our index), the relationship with commodities offers some hope if the commodity bear market that started in 2011 has bottomed. At the very least **Figure 37** offers support for the notion that EM currencies are not expensive and, at best, may offer some hope of recovery.

Figure 37 – Emerging market currencies, commodities and the Fed



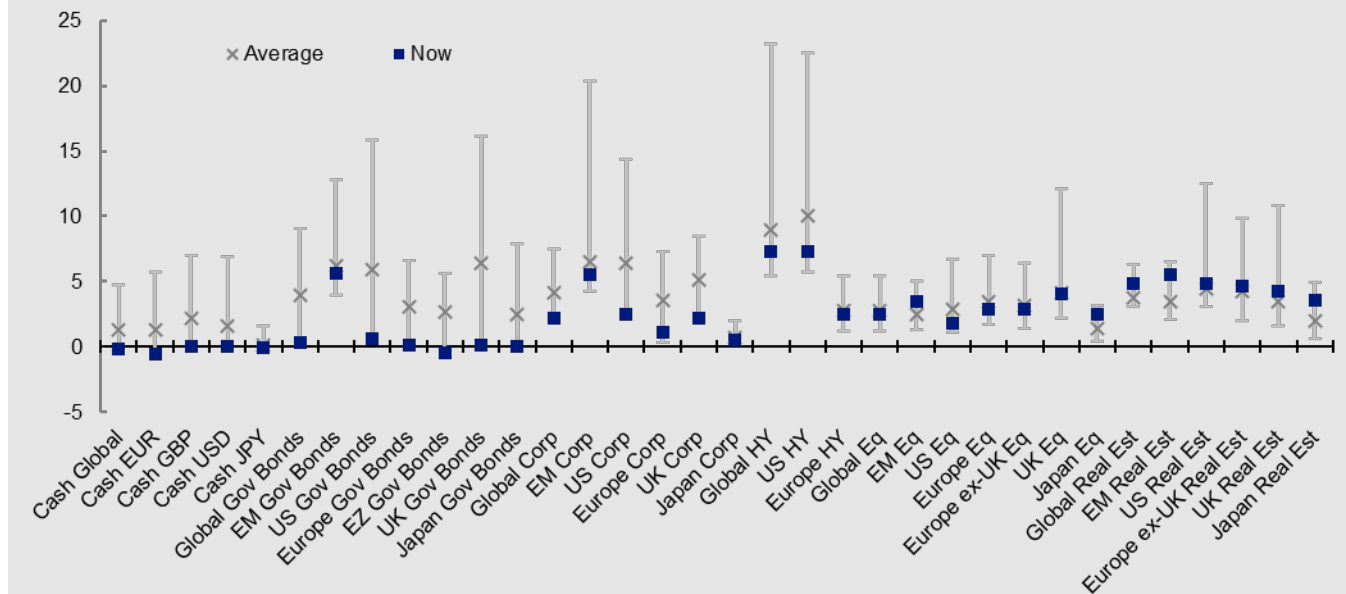
Note: monthly data from January 1976 to May 2020. Emerging market currency index is a trade weighted average of national currencies versus US dollar (trade weights are based on total trade flows for each country). There are 18 currencies in the EM basket – those of China, South Korea, Mexico, India, Russia, Singapore, Malaysia, Brazil, Thailand, Poland, Turkey, Indonesia, Czech Republic, South Africa, Hungary, Nigeria, Chile and Philippines (ordered by size of trade flows). Real adjustments use national CPI indices versus that of the US. Real commodity price index is based on the S&P GSCI Commodity Spot Price Index, adjusted by the US CPI index. All indices rebased to 100 as of January 1976. As of May 2020.

Source: IMF, OECD, Oxford Economics, S&P GSCI, Bloomberg L.P., Refinitiv Datastream and Invesco.

Appendices

Appendix 1: Global valuations vs history

Regional yields within historical ranges



Notes: As of 29 May 2020. Past performance is no guarantee of future results. See appendices for definitions, methodology and disclaimers.
Source: Bloomberg Barclays, BofAML, FTSE, JP Morgan, Refinitiv Datastream, Invesco

Appendix 2: Asset class total returns

Data as at 31/05/2020		Current	Total Return (USD, %)				Total Return (Local Currency, %)			
	Index	Level/RY	3m	YTD	12m	5y*	3m	YTD	12m	5y*
Equities										
World	MSCI	509	0.1	-8.9	6.0	5.9	0.4	-7.8	6.5	6.3
Emerging Markets	MSCI	930	-6.9	-15.9	-4.0	1.3	-4.6	-11.3	-0.2	3.7
US	MSCI	2918	3.9	-4.3	13.4	9.8	3.9	-4.3	13.4	9.8
Europe	MSCI	1477	-4.9	-15.9	-3.9	0.6	-5.0	-14.0	-4.0	1.9
Europe ex-UK	MSCI	1824	-3.0	-12.9	0.0	2.1	-4.2	-12.3	-0.7	2.2
UK	MSCI	887	-10.7	-24.3	-14.8	-3.4	-7.7	-18.9	-13.1	0.8
Japan	MSCI	3160	3.8	-6.9	7.4	3.5	3.7	-7.7	6.6	0.6
Government Bonds										
World	BofA-ML	0.29	0.8	3.6	6.1	3.5	0.6	4.2	6.1	3.0
Emerging Markets (USD)	BBloom	5.67	-7.2	-6.4	1.6	5.7	-7.2	-6.4	1.6	5.7
US (10y)	Datastream	0.63	6.3	14.5	18.4	5.2	6.3	14.5	18.4	5.2
Europe	Bofa-ML	0.18	-0.6	0.2	4.7	2.4	-1.9	1.1	4.8	2.1
Europe ex-UK (EMU, 10y)	Datastream	-0.45	-0.5	1.7	2.5	3.3	-1.7	2.7	2.7	3.0
UK (10y)	Datastream	0.13	-0.5	-0.3	6.2	1.0	2.8	6.9	8.3	5.4
Japan (10y)	Datastream	0.01	-1.4	0.7	0.0	4.2	-1.5	-0.2	-0.7	1.3
IG Corporate Bonds										
Global	BofA-ML	2.17	-1.4	0.5	6.3	3.8	-1.5	1.3	6.6	4.0
Emerging Markets (USD)	BBloom	5.53	-4.9	-2.5	7.1	7.3	-4.9	-2.5	7.1	7.3
US	BofA-ML	2.50	-0.9	2.8	9.6	4.9	-0.9	2.8	9.6	4.9
Europe	BofA-ML	1.16	-2.1	-3.4	-0.4	2.0	-3.3	-2.5	-0.2	1.7
UK	BofA-ML	2.23	-4.0	-5.2	4.6	0.7	-0.8	1.6	6.6	5.0
Japan	BofA-ML	0.52	-1.1	0.4	0.4	3.4	-1.2	-0.5	-0.4	0.5
HY Corporate Bonds										
Global	BofA-ML	7.29	-4.6	-6.0	0.3	4.0	-4.7	-5.7	0.4	4.1
US	BofA-ML	7.34	-4.2	-5.7	0.3	4.1	-4.2	-5.7	0.3	4.1
Europe	BofA-ML	5.14	-4.0	-7.6	-1.5	2.8	-5.2	-6.8	-1.3	2.5
Cash (Overnight LIBOR)										
US		0.06	0.1	0.3	1.5	1.2	0.1	0.3	1.5	1.2
Euro Area		-0.56	0.5	-1.2	-0.8	-0.2	-0.1	-0.2	-0.5	-0.4
UK		0.05	-3.7	-6.8	-1.7	-3.7	0.0	0.1	0.5	0.5
Japan		-0.10	0.2	0.7	1.5	2.8	0.0	0.0	-0.1	0.0
Real Estate (REITs)										
Global	FTSE	1534	-17.0	-23.5	-16.1	0.9	-18.0	-22.8	-16.0	0.7
Emerging Markets	FTSE	1792	-17.6	-27.0	-14.7	1.9	-18.6	-26.4	-14.5	1.6
US	FTSE	2446	-17.3	-23.2	-17.3	1.5	-17.3	-23.2	-17.3	1.5
Europe ex-UK	FTSE	2977	-15.5	-20.1	-10.1	4.7	-16.6	-19.4	-10.0	4.4
UK	FTSE	995	-17.0	-28.9	-10.3	-6.5	-14.2	-23.8	-8.6	-2.5
Japan	FTSE	2408	-13.5	-18.8	-9.8	-0.1	-13.6	-19.5	-10.5	-2.9
Commodities										
All	GSCI	1571	-25.8	-39.4	-34.3	-13.4	-	-	-	-
Energy	GSCI	211	-43.1	-57.6	-52.3	-20.5	-	-	-	-
Industrial Metals	GSCI	1044	-6.7	-14.3	-11.2	-2.6	-	-	-	-
Precious Metals	GSCI	2018	11.0	12.8	31.4	6.5	-	-	-	-
Agricultural Goods	GSCI	300	-8.9	-13.9	-15.3	-8.4	-	-	-	-
Currencies (vs USD)**										
EUR		1.11	0.7	-1.0	-0.6	0.2	-	-	-	-
JPY		107.79	0.2	0.7	0.4	2.9	-	-	-	-
GBP		1.24	-3.2	-6.7	-1.9	-4.1	-	-	-	-
CHF		1.04	0.4	0.7	4.1	-0.4	-	-	-	-
CNY		7.14	-2.0	-2.4	-3.3	-2.8	-	-	-	-

Notes: *Five-year returns are annualised. **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: Datastream and Invesco.

Appendix 3: Invesco 10-year Capital Market Assumptions (USD version)

	Asset Class	Index	Expected geometric return	Expected arithmetic return	Expected Risk	Arithmetic return to risk ratio
Fixed Income	US Treasury Short	Barclays US Treasury Short	0.4	0.4	1.5	0.28
	US Treasury Intermediate	BBG BARC US Treasury Intermediate	0.6	0.7	4.6	0.16
	US Treasury Long	BBG BARC US Treasury Long	0.7	1.4	11.6	0.12
	US TIPS	BBG BARC US TIPS	1.2	1.4	5.6	0.25
	US Bank Loans	CSFB Leverage Loan Index	6.2	6.5	8.6	0.76
	US Aggregate	BBG BARC US Aggregate	1.6	1.7	6.0	0.29
	US Inv Grd Corps	BBG BARC US Investment Grade	3.0	3.2	7.6	0.43
	US MBS	BBG BARC US MBS	1.6	1.8	6.6	0.27
	US Preferred Stocks	BOA ML Fixed Rate Pref Securities	4.4	5.2	12.6	0.41
	US High-Yield Corps	BBG BARC US High Yield	6.8	7.3	10.2	0.71
	US Intermediate Municipals	BOA ML US Municipal (3Y-15Y)	2.8	2.9	6.0	0.49
	US High-Yield Municipals	BBG BARC Municipal Bond High Yield	3.4	3.7	8.8	0.42
	Global Aggregate	BBG BARC Global Aggregate	1.7	1.9	6.8	0.28
	Global Aggregate-Ex US	BBG BARC Global Aggregate- Ex US	1.6	2.2	10.3	0.21
	Global Treasury	BBG BARC Global Treasuries	1.4	1.7	8.5	0.20
	Global Sovereign	BBG BARC Global Sovereign	2.5	2.7	6.8	0.40
	Global Corporate	BBG BARC Global Corporate	2.8	3.1	7.5	0.41
	Global Inv Grd	BBG BARC Global Corporate Inv Grd	2.8	3.1	7.7	0.41
	Eurozone Corporate	BBG BARC Euro Aggregate Credit - Corporate	2.2	3.1	13.6	0.23
	Eurozone Treasury	BBG BARC Euro Aggregate Government - Treasury	1.6	2.3	12.6	0.19
	Asian Dollar Inv Grd	BOA Merrill Lynch ACIG	2.5	2.8	8.6	0.33
	Asian Dollar High Yield	BOA Merrill Lynch ACHY	10.5	12.1	18.9	0.64
	EM Aggregate	BBG BARC EM Aggregate	5.8	6.6	13.4	0.50
	EM Aggregate Sovereign	BBG BARC EM Sovereign	7.0	7.7	12.5	0.62
	EM Aggregate Corporate	BBG BARC EM Corporate	4.9	5.9	14.6	0.41
	EM Corporate IG	BBG BARC EM USD Aggregate - Corporate -IG	3.1	3.4	8.3	0.41
Equities	World Equity	MSCI ACWI	6.0	7.3	17.0	0.43
	World Ex-US Equity	MSCI ACWI Ex-US	6.0	7.7	19.0	0.40
	US Broad	Russell 3000	6.2	7.6	17.5	0.43
	US Large Cap	S&P 500	5.9	7.2	16.7	0.43
	US Mid Cap	Russell Midcap	6.8	8.5	19.6	0.44
	US Small Cap	Russell 2000	7.9	10.2	22.8	0.45
	MSCI EAFE	MSCI EAFE	5.7	7.3	18.8	0.39
	MSCI Europe	MSCI Europe	6.1	7.7	18.8	0.41
	Eurozone	MSCI Euro X UK	5.6	7.4	19.8	0.37
	UK Large Cap	FTSE 100	7.0	8.9	20.3	0.44
	UK Small Cap	FTSE Small Cap UK	8.5	11.3	25.6	0.44
	Canada	S&P TSX	5.7	7.6	20.4	0.37
	Japan	MSCI JP	4.1	6.4	22.8	0.28
	Emerging Market	MSCI EM	7.0	9.8	25.3	0.39
	Asia Pacific Ex JP	MSCI APXJ	6.8	9.7	25.5	0.38
	Pacific Ex JP	MSCI Pacific X JP	7.1	9.9	25.2	0.39
Alternatives	US REITs	FTSE NAREIT Equity	5.3	7.0	19.3	0.36
	Global REITs	FTSE EPRA/NAREIT Developed Index	6.1	7.7	18.8	0.41
	Global Infrastructure	Dow Jones Brookfield Global Infrastructure Composite	5.7	6.7	15.1	0.45
	Hedge Funds	HFRI HF Index	6.1	6.4	8.7	0.74
	Commodities	S&P GSCI	3.1	5.7	23.9	0.24
	Agriculture	S&P GSCI Agriculture	-1.1	1.1	21.5	0.05
	Energy	S&P GSCI Energy	5.2	11.0	37.3	0.30
	Industrial Metals	S&P GSCI Industrial Metals	2.8	5.5	24.1	0.23
	Precious Metals	S&P GSCI Precious Metals	1.5	3.2	18.7	0.17

Notes: Estimates as of 31 March 2020, as published in 2020 Long-Term Capital Market Assumptions – Q2 Update. These estimates reflect the views of Invesco Investment Solutions, the views of other investment teams at Invesco may differ from those presented here. There is no guarantee that these views will come to pass. TIPS = treasury inflation protected securities, MBS = mortgage backed securities.
Source: Invesco Investment Solutions

Appendix 4: Scenario asset assumptions

Fixed income assumptions for 1-year projected returns

	US	Eurozone	UK	Japan	EM	China
Central bank rates						
Worst	0.00	-0.80	-0.25	-0.40	-	3.00
Bad	0.05	-0.75	-0.10	-0.30	-	3.50
Intermediate	0.15	-0.60	0.00	-0.20	-	4.00
Good	0.25	-0.50	0.10	-0.10	-	4.35
Best	0.50	-0.40	0.25	-0.10	-	4.50
Sovereign spreads vs rates						
Worst	40	60	10	0	-	-
Bad	40	60	10	0	-	-
Intermediate	70	100	40	20	-	-
Good	100	125	50	25	-	-
Best	150	160	100	40	-	-
Corporate IG spreads vs sovereign						
Worst	600	300	500	100	-	-
Bad	250	125	250	50	-	-
Intermediate	200	100	200	35	-	-
Good	165	50	160	10	-	-
Best	125	25	120	0	-	-
Corporate HY spreads vs sovereign						
Worst	1800	2000	-	-	-	-
Bad	875	675	-	-	-	-
Intermediate	700	500	-	-	-	-
Good	575	400	-	-	-	-
Best	400	275	-	-	-	-
HY default rates						
Worst	16%	15%	-	-	-	-
Bad	10%	10%	-	-	-	-
Intermediate	8%	8%	-	-	-	-
Good	5%	4%	-	-	-	-
Best	4%	3%	-	-	-	-
HY recovery rates						
Worst	30%	35%	-	-	-	-
Bad	35%	40%	-	-	-	-
Intermediate	40%	45%	-	-	-	-
Good	43%	50%	-	-	-	-
Best	50%	55%	-	-	-	-

Notes: See appendices for definitions, methodology and disclaimers. Source: Invesco

Equities and real estate assumptions for 1-year projected returns

	US	Europe ex-UK	UK	Japan	EM	China
Equities dividend growth						
Worst	-20%	-25%	-25%	-30%	-20%	-25%
Bad	-12%	-15%	-15%	-5%	-12%	-10%
Intermediate	-8%	-10%	-10%	-5%	-10%	0%
Good	-5%	-7%	-7%	0%	-5%	5%
Best	5%	0%	0%	7%	5%	10%
Equities dividend yield						
Worst	3.5%	6.0%	6.0%	3.5%	5.0%	3.5%
Bad	2.5%	4.4%	5.0%	3.2%	4.2%	2.4%
Intermediate	1.8%	2.9%	4.0%	2.5%	3.5%	2.3%
Good	1.7%	2.8%	3.8%	2.2%	3.0%	2.2%
Best	1.6%	2.5%	3.5%	2.0%	2.8%	2.0%
Real estate dividend growth						
Worst	-25%	-20%	-25%	-15%	-20%	-
Bad	-15%	-10%	-15%	0%	-10%	-
Intermediate	-10%	-5%	-10%	5%	-5%	-
Good	-5%	-2%	-5%	10%	-2%	-
Best	0%	2%	0%	15%	2%	-
Real estate dividend yield						
Worst	10.0%	8.0%	8.0%	5.0%	6.5%	-
Bad	6.8%	5.7%	5.7%	4.5%	6.0%	-
Intermediate	4.7%	4.4%	4.2%	3.4%	5.3%	-
Good	4.5%	4.3%	4.0%	3.2%	5.2%	-
Best	4.0%	4.0%	3.6%	2.8%	4.8%	-

Notes: See appendices for definitions, methodology and disclaimers. Source: Invesco

Appendix 5: 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.

Appendix 6: Definitions of data and benchmarks

Sources: we source data from Refinitiv 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 values in the market forecast table (figure 31) use Datastream benchmark 10-year yields for the US, Eurozone, Japan and the UK and the Thomson Reuters China benchmark 10-year yield for China. Historical and projected yields and returns (figures 5, 15, 30, 33, 35) are based on Bank of America Merrill Lynch government bond indices with historical ranges starting on 31st December 1985 for the Global, Europe ex-UK, UK and Japanese indices and 30th January 1978 for the US. The emerging markets yields and returns are based on the Barclays Bloomberg emerging markets sovereign US dollar bond index with the historical range starting on 28th February 2003. The same indices are used to construct Appendix 1.

Corporate investment grade (IG) bonds: Bank of America Merrill Lynch investment grade corporate bond indices with historical ranges starting on 31st December 1996 for the Global, 31st January 1973 for the US dollar, 1st January 1996 for the euro, 31st December 1996 for the British pound, and 6th September 2001 for the Japanese yen indices. The emerging markets yields and returns are based on the Barclays Bloomberg emerging markets corporate US dollar bond index with the historical range starting on 28th February 2003.

Corporate high yield (HY) bonds: Bank of America Merrill Lynch high yield indices with historical ranges starting on 29th August 1986 for the US dollar, and 31st December 1997 for the Global and euro indices.

Equities: We use MSCI benchmark indices to calculate projected returns and calculate long-term total returns with historical ranges starting on 31st December 1969 for the Global, US, Europe ex-UK, UK and Japanese indices, and 31st December 1987 for the emerging markets index. Equity index valuations (figures 5 and 21 and Appendix 1) are based on dividend yields and price-earnings ratios using Datastream benchmark indices with historical ranges starting on 1st January 1973 for the Global, US, Europe ex-UK and Japanese indices, on 31st December 1969 for the UK index and 2nd January 1995 for the Emerging Markets index.

Real estate: We use FTSE EPRA/NAREIT indices with historical ranges starting on 29th December 1989 for the US, Europe ex-UK, UK and Japanese indices, 18th February 2005 for the Global index, and 31st October 2008 for the Emerging Markets index.

Commodities: Goldman Sachs Commodity Index with historical ranges starting on 31st December 1969 for the All Commodities and Agriculture indices, 31st December 1982 for the Energy index, 3rd January 1977 for the Industrial Metals index, and 2nd January 1973 for the Precious Metals index. We refer to oil & gas and industrial metals as industrial commodities.

US Shiller PE and Earnings Per Share (EPS): the Shiller PE is a price to earnings ratio constructed by dividing price by the average EPS in the previous 10 years (with both numerator and denominator adjusted for inflation). It is what is commonly known as a cyclically adjusted PE ratio. It is constructed by US academic Robert Shiller. We also use the raw EPS data from his database to calculate EPS momentum on a 3m/3m basis (the percentage change in the latest three months versus the previous three months). Data is monthly from 1881 (source Robert Shiller – see [here](#)). EPS momentum data since June 1973 is derived from S&P 500 index and PE data sourced from Datastream.

US stock/equity index: we have calculated a total return index for broad US stocks based on index and dividend data from US academic Robert Shiller and Datastream. The index prior to 1926 is Robert Shiller's recalculation of data from Common Stock Indexes by Cowles & Associates (see [here](#)). From 1926 to 1957, the Shiller data is based on the S&P Composite Index and thereafter is based on the S&P 500 as we know it today.

Definitions of data and benchmarks for Appendix 2

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 JP Morgan emerging markets global composite government bond index.

Corporate investment grade (IG) bonds: Bank of America Merrill Lynch investment grade corporate bond total return indices and the Barclays Bloomberg emerging markets corporate US dollar bond total return index for emerging markets.

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

Country abbreviations (for Figures 8 and 9)

BEL	Belgium	BRA	Brazil
CAN	Canada	CHE	Switzerland
CHN	China	DEU	Germany
DNK	Denmark	ESP	Spain
FRA	France	GBR	United Kingdom
HK	Hong Kong	IND	India
ITA	Italy	IDN	Indonesia
JPN	Japan	KOR	South Korea
MEX	Mexico	PHL	Philippines
RUS	Russia	SWE	Sweden
TUR	Turkey	USA	United States of America

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