Uncommon truths
How far from normal?

Covid-19 has not gone away, shutdowns are being selectively reintroduced and we suspect the recovery becomes more difficult from here. We maintain a diversified model asset allocation.

We have been living with Covid-19 for more than six months but the outlook remains as murky as ever. Hence, we give an update on some previously discussed metrics, as well as introduce some new measures to better understand the path of the virus and its effect on economic activity. This would normally feed through to asset allocation conclusions but for now central banks are shielding markets from the worst effects of the virus and the economic fallout.

Global stock markets are back to where they were in January (judging by MSCI World, as shown in **Figure 3a**). Economies appear to be recovering after sharp GDP declines in Q2, with increased consumer spending and industrial production in a range of countries in May, June and July. For example, US manufacturing output exhibited monthly gains of 3.8%, 7.4% and 3.4% in the months of May, June and July, respectively, while retail sales were up 18.3%, 8.4% and 1.2%. It is not just the US: the UK registered monthly gains in retail sales volumes of 12.2%, 13.9% and 3.6% in May, June and July respectively.

That suggests an impressive degree of resilience and recovery. However, it may also be indicative of a release of pent-up demand created in part by government job and income support measures that are now unwinding. An indication of the underlying macro and micro risks is given by the following: first, the 9.3m US payrolls created in May, June and July was less than half the 22.2m lost in March and April; second, the US total rig count is at an all time low (and is close to the low for oil rigs alone) and, third, though UK retail sales (value) were 4% above pre-Covid levels in July, non-internet sales were still 9% below where they were in January (ex-auto fuel). That high street weakness in the UK is corroborated by continued store and restaurant closures (M&S and Pizza Express over the last week, for example), a trend which we think is likely to continue as the government furlough scheme ends over coming months.

What about the virus? With around 23 million cases and 790,000 deaths so far (Johns Hopkins University data[1]), Covid-19 been more serious than many of us imagined when it first emerged. As shown in **Figure 1**, the trends are somewhat complicated. Africa looks to have turned the corner, as does Oceania (for the second time). There are also tentative signs that the latest North America wave has peaked. However, European cases have turned up again and those of Asia and South America continue to increase as do deaths (India and Argentina being examples). There may be a flattening of the trend at the global level but it is too soon to suggest that things are improving.

The bad news is that the virus has not gone away and that easing of lockdowns is causing higher infection rates (see many countries in Europe, for example). However, the good news is that case fatality rates appear to have fallen (calculated as deaths in a period divided by cases in that same period). World Health Organisation data suggests that in the early stages the case fatality rate was around 5% (based on March data), whereas it is now closer to 2.4% (July data).

Figure 1a – Covid-19 daily cases (7-day MA)

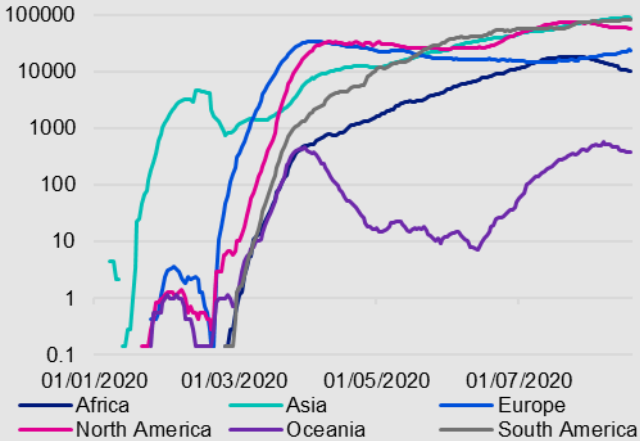
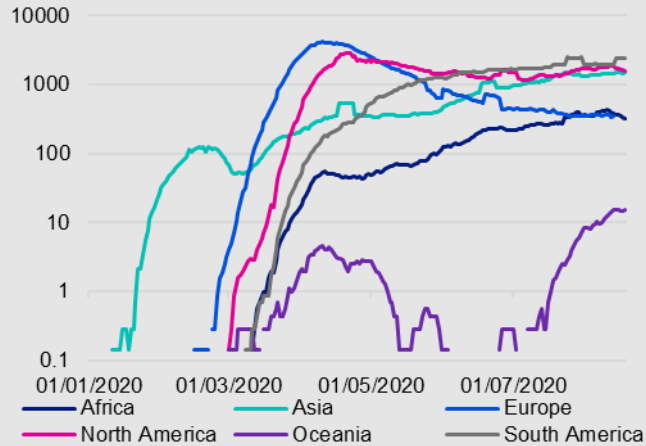


Figure 1b – Covid-19 daily deaths (7-day MA)



Based on daily data from 1 January 2020 to 18 August 2020. Scales are logarithmic. "7-day MA" is a seven-day moving average. "North America" includes Bermuda, Canada, Greenland, Mexico, Puerto Rico and the United States. All other countries in the Americas and the Caribbean are included in "South America". Note that on 12 August 2020, the UK government revised down the Covid-19 death toll by 5,377, which caused a one-off step change in the Europe death data shown above, rendering the 7-day moving average negative (because the scale is logarithmic, no value is shown for Europe on subsequent days). Source: European Centre for Disease Prevention and Control and Invesco

There are a number of potential explanations for the drop in case fatality rates: first, in the early stages, testing was often done only upon hospitalisation, suggesting there was already a risk of death, while tests are now widespread with greater likelihood of detecting mild cases; second, infections now seem more concentrated in younger generations than was the case in the early stages of the outbreak[2], which is presumably reducing death rates (though, strangely, the final frame of **Figure 2** suggests the age structure of the population is not as important as we thought); third, experience has taught us how to minimise the risk of death once admitted to hospital and, fourth, it is easier to achieve good outcomes when other life threatening conditions (respiratory illness, seasonal flu etc.) are absent, as tends to be the case during summer months.

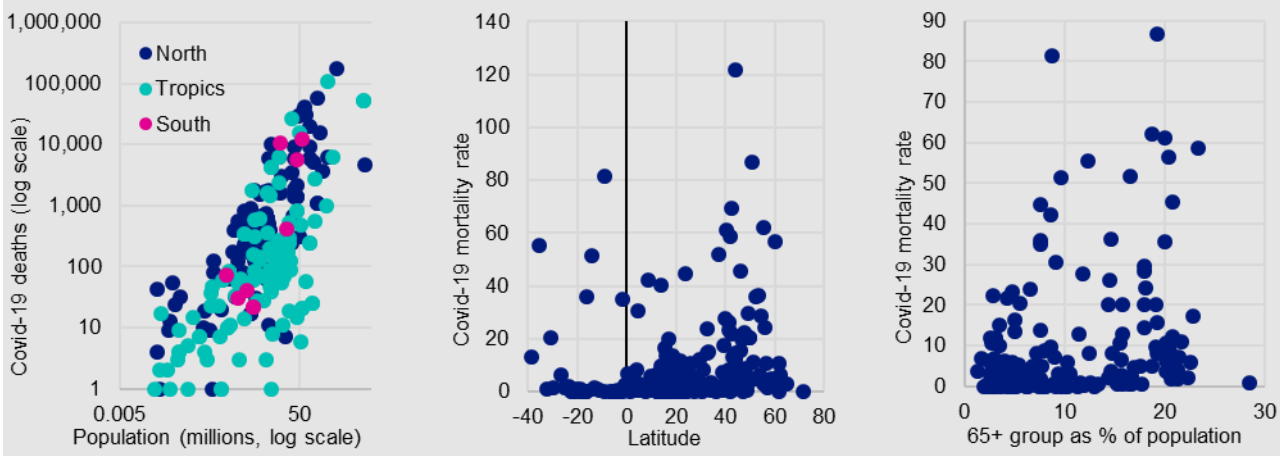
Another piece of good news is that there is evidence from some Southern Hemisphere countries that social distancing may be reducing the transmission of other viruses that can either be dangerous in their own right, stretch hospital resources or reduce the probability of recovering from Covid. For example, in Australia there were 9,131 confirmed cases of influenza in the April-July period of 2019, whereas in 2020 there were only 33 such cases in the same period (using WHO FluMart Output[3]). Of course, patients may have been dissuaded from seeking help and medical resources may have been focused elsewhere but this is nevertheless a dramatic decline.

Talking of Southern Hemisphere countries brings us back to an idea we first mentioned in early May, that of the potential seasonality of the virus (see Geography, demography and the value of life). At that time, the countries with high mortality rates (deaths per 100,000 inhabitants) were all in Northern latitudes and no country in Southern latitudes had a mortality rate above 10. However, the central frame of **Figure 2** shows that things have since evened up. Though San Marino (121.9) and Belgium (86.8) continue to have the highest mortality rates, several Southern Hemisphere countries are rapidly catching up, notably Peru (81.4), Chile (55.5) and Brazil (51.4).

This is important, because if there is seasonality of infections and deaths (either because of the nature of the virus or because our behaviour patterns change in winter), then current Northern Hemisphere cases and deaths could be a poor guide to what will happen during the coming autumn and winter months. That is doubly problematic because the world's population is concentrated in Northern latitudes, with 3.9 billion living in countries to the north of the tropics and less than 0.2 billion living to the south of them (the remaining 3.7 billion living in the tropics, using 2019 population data from the European Centre for Disease Control and Prevention[4]).

That bad news about potential seasonality is balanced by the fact that governments know this and are preparing for the coming winter season. Hence, we should not be caught out as we were earlier this year ("Won't get fooled again") but part of the official reaction to a resurgence of cases is likely to be further closures of economies (even if the actions become more precise than the blunt lockdowns of this year).

Figure 2 – Are national Covid-19 mortality rates linked to geographic location and age of population?



Note: Covid-19 mortality rate is the number of Covid-19 deaths per 100,000 of population (the latter as of 2019). Latitude is the geographic latitude of each country as provided by Google Developers. "North" is the group of countries with latitude greater than 23.5 degrees. "Tropics" is the group of countries with latitude between -23.5 and +23.5 degrees. "South" is the group of countries with latitude less than -23.5 degrees. "65+ age group as percent of population" uses United Nations projections for 2020. As of 18 August 2020.
Source: European Centre for Disease Prevention and Control, Google Developers, United Nations and Invesco

This suggests it will be difficult for economies to follow the usual post-recession recovery path and we suspect progress will be faltering until either the virus is conquered or a viable vaccine is widely available. Mobility data from Apple and Google (**Figures 3a and 3b**) suggests that some activities are back to pre-Covid levels (walking, driving, shopping at grocery and pharmacy stores) but some are not (use of public transport or transit stations, visits to workplaces and use of general retail and recreation facilities).

Across the range of countries used in those charts, use of workplaces and transit stations remains 20%-30% below the levels seen in January. Further, there appears to have been a levelling out of such activities and even a decline in recent months, as is also the case for frequentation of retail and recreation facilities. If these metrics are a good judge of economic momentum (and they did suggest economies bottomed in early April), then it appears that economies have stalled (though it is possible that some of the work related lull is due to summer vacations).

While not surprising, given the partial re-imposition of lockdowns in many countries, we believe this apparent stalling is a concern for cyclical assets that rely on economic momentum (equities, real estate, high-yield credit and commodities, say).

The harsher the lockdowns become, the greater could be the short-term economic damage and consequent cause for concern for cyclical assets (though there is evidence from the Spanish flu pandemic that the damage is caused by the pandemic itself and not the measures taken to control it[5]). We suspect that higher infection rates will be associated with tighter lockdowns, remembering of course that infections in one country can impact the economy of another (see, for example, the imposition of quarantine periods on those returning to the UK from some countries including France, Spain and the US).

One measure of the extent of lockdowns is the Blavatnik Stringency Index and this is compared with Q2 GDP outcomes in **Figure 4a**. An R-squared of 0.11 doesn't seem very impressive (especially compared to the 0.63 given when using Q1 data). However, China is a clear outlier and if it is removed the R-squared improves to 0.27 (of which, more later).

Figure 4b shows the current Blavatnik Stringency Index for a range of countries versus the Q2 average and the maximum seen so far. It gives an idea of how stringent individual countries are compared to the past few months. In most of the cases shown, lockdowns are now less stringent than on average during Q2 and therefore less so than at the point of maximum lockdown. This is good news in that it suggests economic performance in Q3 will be better than in Q2. Italy and Switzerland are perhaps the best examples and could therefore see the strongest Q3 rebound. Europe looks well placed from that perspective.

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Figure 3a – Apple Mobility Trends and MSCI World

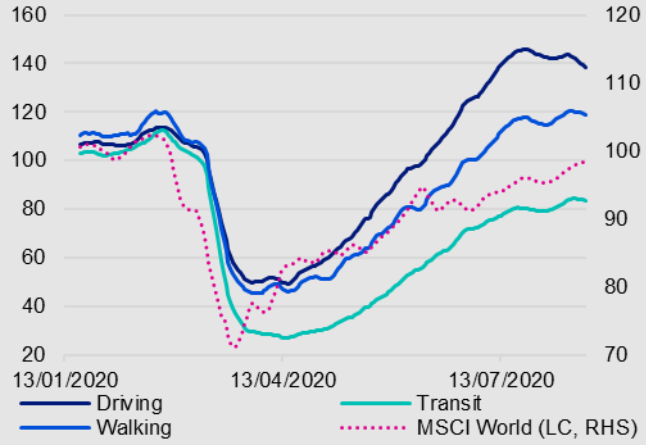
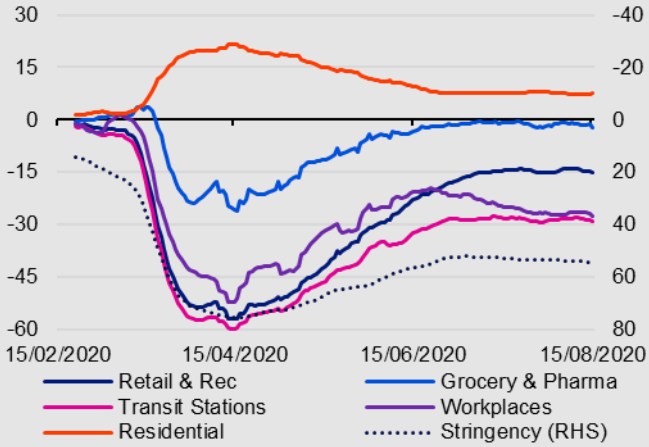


Figure 3b – Google Mobility Data and stringency



Daily data shown as 7-day moving averages (from 13 January 2020 to 17 August 2020 for Apple chart, with all indices indexed to 100 on 13 January 2020, and 15 February 2020 to 15 August 2020 for Google chart). Apple mobility trends indices are sourced from the Apple Mobility Trends report and measure the number of requests for directions in Apple Maps. 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: 19/08/20. The Google 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). "Stringency" 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. The index ranges from 0 to 100, with higher scores indicating a more stringent response. The above indices are constructed as simple averages of the indices for the following countries: Australia, Belgium, Brazil, Canada, Denmark, Finland, France, Germany, Italy, Japan, Mexico, Netherlands, New Zealand, Norway, Philippines, Singapore, Spain, Sweden, Switzerland, Taiwan, United Kingdom and United States of America (plus Hong Kong, India and South Korea for the Google chart).
Source: Apple, Google, Blavatnik School of Government, University of Oxford, Refinitiv Datastream, Invesco

That could favour European equities, say. However, the effect may be short-lived given that infections are on the rise again and that lockdowns are again being tightened (though it is yet to be reflected in the stringency indices of most countries). We also fear that another dampening force on European equities could be the recent weakening of the dollar, via the effect on overseas earnings (export revenues and translation of overseas profits).

That lockdowns are now less stringent than during Q2 is good news but economies are far from normal (as would be indicated by a Blavatnik Stringency Index of zero). Hence, we believe it would be naïve to think we are back to normal, either in terms of growth rates or absolute levels of activity. Indeed, we suspect "normality" will be elusive as long as governments are having to use non-pharmaceutical interventions (NPIs) to control the spread of the virus and that could be for at least another year. Even when we are through this, we believe there will be some kind of new "normality" (see Virtual clusters).

China is an interesting exception to the general rule shown in **Figures 4a** and **4b**. First, GDP rebounded strongly in Q2, despite a stringency index suggesting China's lockdown was as severe as in many other countries (the UK and Spain, for example, both of which suffered big GDP declines) and despite China's lockdown being more stringent in Q2 than in Q1 (based on quarterly averages for the Stringency Index). Second, the Blavatnik Index for China is now the highest it has ever been and is higher than the Q2 average (the same applies to Australia and Hong Kong). This could suggest either that China's GDP data is misleading (yes, that old saw) or that it is about to spring a negative surprise during Q3

There is, however, one other possible explanation, which is that the Blavatnik Index is less correlated with economic activity when lockdowns are localised rather than national. The Blavatnik Index takes account of the most stringent action in a country, even if it is only localised, so as governments rely on more precise shutdowns, use of the index could overstate the GDP impact. This may be what is happening in China, since it is now relying on localised lockdowns (though national travel restrictions are still largely in place[6]). To be fair to the team at the Blavatnik School of Government, their index was designed to measure the impact of lockdown policies on healthcare outcomes and not the economy. Though we need to be cautious in future about mapping directly from such stringency indices to GDP effects, we believe that even localised actions will penalise overall economic activity, especially the more prevalent they become.

Having been the country where the outbreak became apparent, has China been among the most successful to deal with it, judged by national GDP and mortality outcomes (the health versus wealth balance)? The evidence shown in **Figure 5a** suggests this is indeed the case, with China able to achieve positive economic growth across 2020 Q1 and Q2, while limiting the mortality rate to 0.33 per 100,000 inhabitants. Among the sample of countries shown, China could be said to have had the best pandemic (if that makes sense), though the geopolitical fallout of its handling of the virus may yet impose costs (and there are continued doubts about the quality of its Covid data, though not always well founded[7]).

Other countries that have fared relatively well are South Korea, Indonesia and Japan, though all three have had recent problems, suggesting it may premature to judge.

Figure 4a – Blavatnik stringency and GDP in Q2

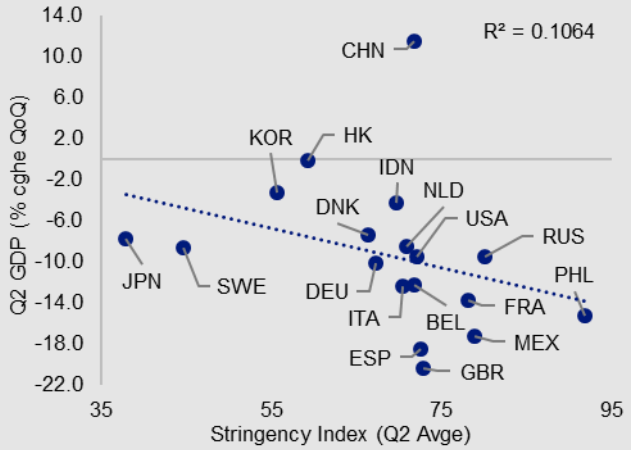
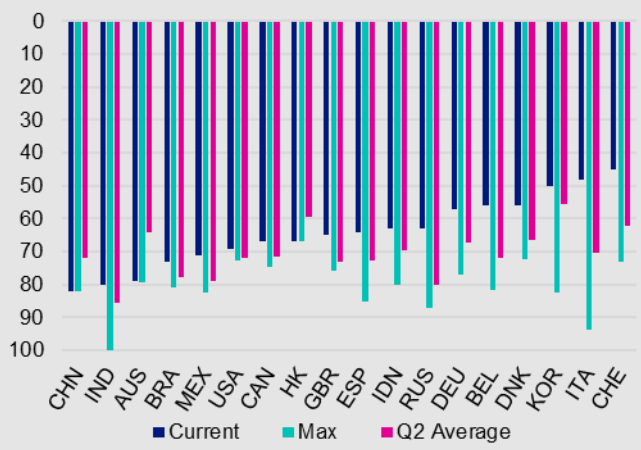


Figure 4b – Blavatnik Stringency Index



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. The index ranges from 0 to 100, with higher scores indicating a more stringent response. The current value is as of 17 August 2020. GDP is calculated as the seasonally adjusted quarter on quarter change during 2020 Q2 (not annualised). See appendices for country abbreviations.
Source: Blavatnik School of Government, University of Oxford, Bloomberg and Invesco

At the other end of the scale, Spain and the UK can be said to have had a bad pandemic, with high mortality rates (61.3 and 62.1, respectively) and cumulative GDP declines of more than 22% during 2020 Q1 and Q2. Belgium, Italy and France are not far behind, along with Mexico, which is still recoding 500-1000 daily deaths.

The best that can be said for those European countries is that having suffered outsized GDP declines, they may now enjoy big rebounds. However, that remains to be seen, especially with reported cases climbing and localised shutdowns enforced in many countries.

One final ray of hope (or mitigation) is that the rise in reported cases may simply reflect more testing. However, this could be a two-way relationship, with some countries doing more testing when cases rise.

One way to cut through the fog is to calculate the positive rate, that is the number of positive cases in a period divided by the number of tests (we use a lag of four days between tests and cases to allow for the delay in receiving test results). **Figure 5b** (with thanks to Ashley Oerth) shows the time series of positive rates for a selection of countries where the positive rate has been rising (suggesting that infections are genuinely rising, whether or not there is more testing). The 3%-12% range is the ideal range suggested by the WHO within which the level of testing is deemed to be good (above that range suggests too little testing and below suggests too much[8]).

The evidence in the chart suggests that though India and the US had rising positive rates, the trend now seems to have turned and both may be said to be getting control of the outbreaks (and both are doing a good level of testing). On the other hand, Spain and Japan have worrying trends (with good testing levels), while France and Italy look to be following in their path (though may be over testing). Indonesia is in a worrying situation, with cases genuinely rising (irrespective of testing numbers) and the testing regime seems to be inadequate to identify all cases. Mexico is not shown in the chart but is in an even worst place than Indonesia, with cases rising and a positive rate around 60%, suggesting that testing needs to be ramped up dramatically.

Conclusions

Though trends vary across regions, Covid-19 is still with us and the number of cases seems to be rising again in countries that have relaxed lockdowns. There is evidence that it is not simply a case of more testing leading to more cases being identified.

Despite signs of a rebound in most economies since the Q2 lows, we worry that efforts to contain the virus will lead to a faltering recovery, which could threaten cyclical assets (we think the worst is over but believe we are far from normal). The upcoming Northern Hemisphere winter season could be challenging, though governments are now better prepared. We therefore maintain a diversified model asset allocation.

China is among countries that could be said to have had a good pandemic (when comparing mortality rates to GDP growth), while many European countries (Belgium, France, Italy, Spain and UK) have suffered more than most, along with Mexico. We are doubtful that this offers Europe the hope of a strong rebound.

Unless stated otherwise, all data as of 21 August 2020

Figure 5a – Health versus wealth in 2020

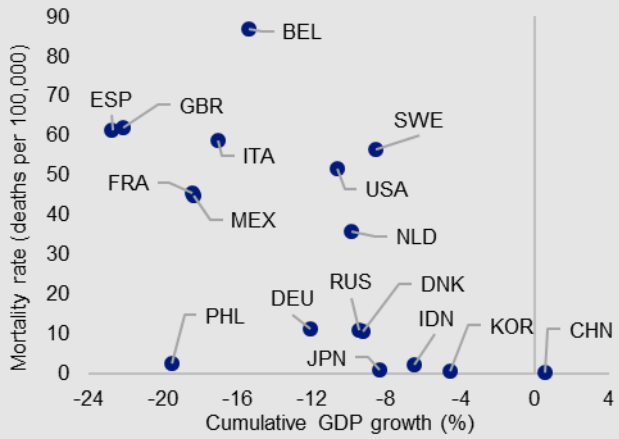


Figure 5b – Positive rates (positive results/tests)

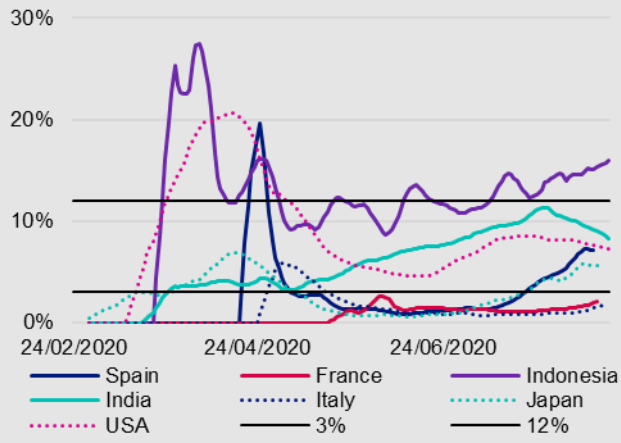


Figure 5a compares Covid-19 mortality rates (cumulative Covid-19 deaths to 18 August 2020 per 100,000 of population, based on data from the European Centre for Disease Prevention and Control) to cumulative GDP growth during the first half of 2020 (based on seasonally adjusted quarterly growth rates, not annualised). See appendices for country abbreviations. Figure 5b shows positive rates, which is the number of positive test results divided by the number of tests undertaken (based on 7-day moving averages of data and with a lag of four days between tests and cases, based on data from Our World in Data). The WHO suggested range for the positive rate is 3%-12%.
Source: European Centre for Disease Prevention and Control, Our World in Data, Bloomberg and Invesco

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Figure 6 – Asset class total returns

Data as at 21/08/2020		Current	Total Return (USD, %)					Total Return (Local Currency, %)				
	Index	Level/RY	1w	1m	QTD	YTD	12m	1w	1m	QTD	YTD	12m
Equities												
World	MSCI	571	0.3	2.9	9.1	2.6	14.5	0.4	2.4	7.8	2.4	13.3
Emerging Markets	MSCI	1092	-0.1	0.7	10.4	-0.2	14.1	0.1	1.2	10.1	4.2	16.5
US	MSCI	3281	1.0	4.6	10.3	7.9	19.9	1.0	4.6	10.3	7.9	19.9
Europe	MSCI	1623	-1.2	-0.7	6.2	-7.0	4.3	-0.8	-3.1	1.2	-10.2	-2.4
Europe ex-UK	MSCI	2039	-1.1	-0.5	7.1	-2.2	8.7	-0.6	-2.9	2.2	-7.0	2.1
UK	MSCI	919	-1.7	-1.5	3.2	-20.8	-8.7	-1.4	-4.0	-2.5	-19.7	-15.3
Japan	MSCI	3315	-0.7	2.3	5.1	-2.2	11.1	-1.2	1.4	3.2	-4.7	10.5
Government Bonds												
World	BofA-ML	0.24	0.4	1.0	2.6	6.7	4.9	0.4	-0.1	0.3	4.7	2.6
Emerging Markets	BBloom	4.87	-0.1	2.0	5.9	3.2	6.1	-0.1	2.0	5.9	3.2	6.1
US (10y)	Datastream	0.63	0.7	-0.1	0.5	15.1	12.2	0.7	-0.1	0.5	15.1	12.2
Europe	Bofa-ML	-0.05	0.1	3.1	6.1	8.4	8.2	0.6	0.6	1.2	3.3	1.9
Europe ex-UK (EMU, 10y)	Datastream	-0.54	0.5	3.0	5.2	8.6	4.6	0.9	0.4	0.3	3.5	-1.5
UK (10y)	Datastream	0.17	0.0	1.8	5.4	5.1	11.9	0.3	-0.7	-0.4	6.5	3.9
Japan (10y)	Datastream	0.03	0.6	0.7	1.9	2.3	-1.8	0.1	-0.2	0.1	-0.3	-2.3
IG Corporate Bonds												
Global	BofA-ML	1.65	0.2	1.1	3.8	6.5	7.9	0.3	0.3	2.2	5.4	5.9
Emerging Markets	BBloom	4.32	0.1	2.2	4.6	5.9	11.0	0.1	2.2	4.6	5.9	11.0
US	BofA-ML	2.02	0.3	0.0	2.4	7.4	8.6	0.3	0.0	2.4	7.4	8.6
Europe	BofA-ML	0.59	0.0	3.4	7.0	5.7	5.8	0.4	0.9	2.0	0.7	-0.3
UK	BofA-ML	1.81	0.0	2.6	7.3	3.3	12.7	0.3	0.1	1.4	4.7	4.6
Japan	BofA-ML	0.51	0.5	0.8	1.9	2.3	-0.4	0.1	-0.1	0.1	-0.3	-0.9
HY Corporate Bonds												
Global	BofA-ML	5.88	0.0	2.0	5.4	0.9	5.0	0.1	1.5	4.4	0.1	3.8
US	BofA-ML	6.00	0.1	1.4	4.9	-0.1	3.4	0.1	1.4	4.9	-0.1	3.4
Europe	BofA-ML	4.14	-0.4	3.8	7.9	2.6	6.3	0.1	1.2	2.9	-2.3	0.1
Cash (Overnight LIBOR)												
US		0.08	0.0	0.0	0.0	0.3	1.0	0.0	0.0	0.0	0.3	1.0
Euro Area		-0.58	-0.4	2.3	4.9	4.8	5.8	0.0	-0.1	-0.1	-0.4	-0.6
UK		0.05	0.0	2.8	5.6	-1.1	8.4	0.0	0.0	0.0	0.2	0.4
Japan		-0.09	0.8	0.9	2.0	2.6	0.7	0.0	0.0	0.0	-0.1	-0.1
Real Estate (REITs)												
Global	FTSE	1631	-0.1	3.7	4.2	-17.8	-12.6	0.4	1.1	-0.6	-21.6	-17.7
Emerging Markets	FTSE	1959	-0.3	-1.9	4.9	-18.4	-5.5	0.1	-4.3	0.0	-22.3	-11.0
US	FTSE	2576	-0.7	4.9	2.9	-18.4	-16.1	-0.7	4.9	2.9	-18.4	-16.1
Europe ex-UK	FTSE	3291	-0.1	4.7	9.0	-10.4	0.8	0.4	2.1	3.9	-14.6	-5.1
UK	FTSE	1216	0.3	5.2	9.6	-22.4	4.6	0.6	2.6	3.6	-21.4	-3.0
Japan	FTSE	2448	2.7	5.8	5.6	-17.0	-14.3	2.2	4.9	3.7	-19.1	-14.7
Commodities												
All	GSCI	1768	0.3	2.2	7.1	-31.8	-25.4	-	-	-	-	-
Energy	GSCI	247	-0.3	1.1	7.5	-50.4	-44.7	-	-	-	-	-
Industrial Metals	GSCI	1228	1.8	2.7	9.7	0.7	3.0	-	-	-	-	-
Precious Metals	GSCI	2265	0.1	6.0	9.5	26.6	27.8	-	-	-	-	-
Agricultural Goods	GSCI	310	1.7	2.6	2.8	-10.9	-1.4	-	-	-	-	-
Currencies (vs USD)*												
EUR		1.18	-0.4	2.3	5.0	5.2	6.4	-	-	-	-	-
JPY		105.80	0.8	1.0	2.0	2.7	0.8	-	-	-	-	-
GBP		1.31	-0.3	2.5	5.8	-1.3	7.8	-	-	-	-	-
CHF		1.10	-0.3	2.4	3.9	6.2	7.8	-	-	-	-	-
CNY		6.92	0.4	0.9	2.1	0.6	2.1	-	-	-	-	-

Notes: *The currency section is organised so that in all cases the numbers show the movement in the mentioned currency versus USD (+ve indicates appreciation, -ve indicates depreciation). Past performance is no guarantee of future results. Please see appendix for definitions, methodology and disclaimers.
Source: Refinitiv Datastream and Invesco

Figure 7 – World equity sector total returns relative to market (%)

Data as at 21/08/2020	Global				
	1w	1m	QTD	YTD	12m
Energy	**-1.5**	**-2.8**	**-6.0**	**-29.9**	**-29.7**
Basic Materials	**-1.2**	**0.1**	**2.5**	**1.6**	**3.1**
Basic Resources	-1.1	0.4	3.9	3.6	7.1
Chemicals	-1.3	-0.3	0.9	-0.6	-1.7
Industrials	**-0.7**	**1.5**	**0.5**	**-3.6**	**-4.1**
Construction & Materials	-0.2	1.0	1.6	-4.4	-2.7
Industrial Goods & Services	-0.7	1.5	0.3	-3.5	-4.3
Consumer Discretionary	**1.6**	**2.3**	**3.8**	**7.9**	**5.6**
Automobiles & Parts	3.3	6.4	12.3	10.4	13.5
Media	0.0	1.0	1.9	-2.9	-4.9
Retailers	2.6	2.3	4.9	28.0	23.8
Travel & Leisure	0.6	2.2	0.2	-20.7	-23.7
Consumer Products & Services	-0.1	0.6	0.6	5.3	4.0
Consumer Staples	**-0.6**	**-0.2**	**-1.6**	**-1.4**	**-5.6**
Food, Beverage & Tobacco	-0.8	-0.8	-2.1	-5.2	-13.3
Personal Care, Drug & Grocery Stores	-0.2	0.9	-0.6	6.0	0.0
Healthcare	**0.1**	**-2.5**	**-2.9**	**9.0**	**11.2**
Financials	**-2.0**	**-2.8**	**-3.0**	**-18.9**	**-17.3**
Banks	-2.4	-3.9	-5.5	-26.4	-23.6
Financial Services	-1.4	-2.6	-1.5	-9.3	-9.1
Insurance	-2.0	-1.0	-0.1	-14.4	-14.3
Real Estate	**-0.1**	**0.5**	**-3.3**	**-12.2**	**-15.4**
Technology	**1.9**	**2.4**	**3.9**	**27.3**	**34.2**
Telecommunications	**-0.6**	**-1.1**	**-1.9**	**0.2**	**-5.2**
Utilities	**-1.2**	**-2.6**	**-2.1**	**-4.4**	**-8.7**

Notes: Returns shown are for Datastream sector indices versus the total market index. Past performance is no guarantee of future results.
Source: Refinitiv Datastream and Invesco

Figure 8a – US factor index total returns (%)

Data as at 21/08/2020	US Absolute					US Relative to Market				
	1w	1m	QTD	YTD	12m	1w	1m	QTD	YTD	12m
Growth	-0.7	3.9	40.9	10.5	23.2	-1.4	-0.5	6.4	3.8	4.0
Low volatility	0.7	3.3	29.2	8.6	12.3	-0.1	-1.2	-2.4	2.0	-5.2
Price momentum	1.5	4.0	32.2	8.6	11.8	0.7	-0.4	-0.2	2.0	-5.6
Quality	-1.0	3.4	31.8	-1.8	12.2	-1.7	-1.0	-0.5	-7.7	-5.3
Size	-4.3	2.6	39.5	-18.2	-4.8	-5.0	-1.8	5.4	-23.2	-19.6
Value	-5.4	-0.3	35.7	-21.4	-8.1	-6.1	-4.6	2.5	-26.2	-22.4
Market	0.8	4.5	32.4	6.5	18.4					
Market - Equal-Weighted	-1.5	2.7	30.6	-4.2	6.3					

Notes: All indices are subsets of the S&P 500 index, they are rebalanced monthly, use data in US dollars and are equal-weighted. Growth includes stocks in the top third based on both their 5-year sales per share trend and their internal growth rate (the product of the 5-year average return on equity and the retention ratio); Low volatility includes stocks in the bottom quintile based on the standard deviation of their daily returns in the previous three months; Price momentum includes stocks in the top quintile based on their performance in the previous 12 months; Quality includes stocks in the top third based on both their return on invested capital and their EBIT to EV ratio (earnings before interest and taxes to enterprise value); Size includes stocks in the bottom quintile based on their market value in US dollars. Value includes stocks in the bottom quintile based on their price to book value ratios. The market represents the S&P 500 index. Past performance is no guarantee of future results.
Source: Refinitiv Datastream and Invesco

Figure 8b – European factor index total returns relative to market (%)

Data as at 21/08/2020	Europe Absolute					Europe Relative to Market				
	1w	1m	QTD	YTD	12m	1w	1m	QTD	YTD	12m
Growth	-0.1	1.8	31.6	6.7	21.5	0.7	4.8	13.7	19.0	21.8
Low volatility	0.2	0.0	18.2	-3.8	4.0	1.0	2.9	2.2	7.2	4.2
Price momentum	0.9	0.7	26.7	6.0	15.5	1.7	3.7	9.5	18.1	15.7
Quality	-0.3	0.9	25.5	-10.0	8.5	0.5	3.9	8.5	0.3	8.7
Size	-1.2	0.6	27.2	-14.1	3.0	-0.4	3.6	9.9	-4.3	3.2
Value	-2.6	-4.1	17.3	-27.8	-13.6	-1.8	-1.2	1.4	-19.5	-13.5
Market	-0.8	-2.9	15.7	-10.3	-0.2					
Market - Equal-Weighted	-1.0	-1.3	20.9	-10.6	1.7					

Notes: All indices are subsets of the STOXX 600 index, they are rebalanced monthly, use data in euros and are equal-weighted. Growth includes stocks in the top third based on both their 5-year sales per share trend and their internal growth rate (the product of the 5-year average return on equity and the retention ratio); Low volatility includes stocks in the bottom quintile based on the standard deviation of their daily returns in the previous three months; Price momentum includes stocks in the top quintile based on their performance in the previous 12 months; Quality includes stocks in the top third based on both their return on invested capital and their EBIT to EV ratio (earnings before interest and taxes to enterprise value); Size includes stocks in the bottom quintile based on their market value in euros; Value includes stocks in the bottom quintile based on their price to book value ratios. The market represents the STOXX 600 index. Past performance is no guarantee of future results.
Source: Refinitiv Datastream and Invesco

Figure 9 – Model asset allocation

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

Currency Exposure (including effect of hedging)			
USD	49%	↑	51%
EUR	20%	↓	4%
GBP	7%	↓	12%
JPY	15%		18%
EM	8%	↑	14%
Total	**100%**		**100%**

Notes: This is a theoretical portfolio and is for illustrative purposes only. See the latest The Big Picture document for more details. It does not represent an actual portfolio and is not a recommendation of any investment or trading strategy. Arrows indicate the direction of the most recent changes.
Source: Invesco

Figure 10 – Model allocations for Global sectors

	Neutral	Invesco
Energy	**4.2%**	**Neutral** ↓
Basic Materials	**4.2%**	**Neutral**
Basic Resources	2.3%	Underweight
Chemicals	2.0%	Overweight
Industrials	**12.4%**	**Underweight**
Construction & Materials	1.5%	Underweight
Industrial Goods & Services	10.9%	Underweight
Consumer Discretionary	**14.5%**	**Underweight**
Automobiles & Parts	2.1%	Underweight ↓
Media	1.3%	Underweight
Retailers	5.4%	Neutral
Travel & Leisure	1.9%	Underweight
Consumer Products & Services	3.9%	Neutral ↑
Consumer Staples	**7.4%**	**Overweight**
Food, Beverage & Tobacco	4.7%	Overweight
Personal Care, Drug & Grocery Stores	2.7%	Overweight
Healthcare	**11.0%**	**Neutral**
Financials	**14.7%**	**Neutral**
Banks	6.7%	Overweight
Financial Services	4.4%	Neutral
Insurance	3.6%	Underweight
Real Estate	**3.9%**	**Overweight**
Technology	**19.2%**	**Overweight**
Telecommunications	**4.9%**	**Neutral**
Utilities	**3.6%**	**Neutral** ↑

Notes: These are theoretical allocations which are for illustrative purposes only. They do not represent an actual portfolio and are not a recommendation of any investment or trading strategy. See the latest Strategic Sector Selector for more details.
Source: Refinitiv Datastream and Invesco

Appendix

Methodology for asset allocation, expected returns and optimal portfolios

Portfolio construction process

The optimal portfolios are theoretical and not real. We use optimisation processes to guide our allocations around "neutral" and within prescribed policy ranges based on our estimations of expected returns and using historical covariance information. This guides the allocation to global asset groups (equities, government bonds etc.), which is the most important level of decision. For the purposes of this document the optimal portfolios are constructed with a one-year horizon.

Which asset classes?

We look for investibility, size and liquidity. We have chosen to include: equities, bonds (government, corporate investment grade and corporate high-yield), REITs to represent real estate, commodities and cash (all across a range of geographies). We use cross-asset correlations to determine which decisions are the most important.

Neutral allocations and policy ranges

We use market capitalisation in USD for major benchmark indices to calculate neutral allocations. For commodities, we use industry estimates for total ETP market cap + assets under management in hedge funds + direct investments. We use an arbitrary 5% for the combination of cash and gold. We impose diversification by using policy ranges for each asset category (the range is usually symmetric around neutral).

Expected/projected returns

The process for estimating expected returns is based upon yield (except commodities, of course). After analysing how yields vary with the economic cycle, and where they are situated within historical ranges, we forecast the direction and amplitude of moves over the next year. Cash returns are calculated assuming a straight-line move in short term rates towards our targets (with, of course, no capital gain or loss). Bond returns assume a straight-line progression in yields, with capital gains/losses predicated upon constant maturity (effectively supposing constant turnover to achieve that). Forecasts of corporate investment-grade and high-yield spreads are based upon our view of the economic cycle (as are forecasts of credit losses). Coupon payments are added to give total returns. Equity and REIT returns are based on dividend growth assumptions. We calculate total returns by applying those growth assumptions and adding the forecast dividend yield. No such metrics exist for commodities; therefore, we base our projections on US CPI-adjusted real prices relative to their long-term averages and views on the economic cycle. All expected returns are first calculated in local currency and then, where necessary, converted into other currency bases using our exchange rate forecasts.

Optimising the portfolio

Using a covariance matrix based on monthly local currency total returns for the last 5 years and we run an optimisation process that maximises the Sharpe Ratio. Another version maximises Return subject to volatility not exceeding that of our Neutral Portfolio. The optimiser is based on the Markowitz model.

Currency hedging

We adopt a cautious approach when it comes to currency hedging as currency movements are notoriously difficult to accurately predict and sometimes hedging can be costly. Also, some of our asset allocation choices are based on currency forecasts. We use an amalgam of central bank rate forecasts, policy expectations and real exchange rates relative to their historical averages to predict the direction and amplitude of currency moves.

Definitions of data and benchmarks for Figure 6

Sources: we source data from Datastream unless otherwise indicated.

Cash: returns are based on a proprietary index calculated using the Intercontinental Exchange Benchmark Administration overnight LIBOR (London Interbank Offer Rate). The global rate is the average of the euro, British pound, US dollar and Japanese yen rates. The series started on 1st January 2001 with a value of 100.

Gold: London bullion market spot price in USD/troy ounce.

Government bonds: Current levels, yields and total returns use Datastream benchmark 10-year yields for the US, Eurozone, Japan and the UK, and the Bank of America Merrill Lynch government bond total return index for the World and Europe. The emerging markets yields and returns are based on the Barclays Bloomberg emerging markets sovereign US dollar bond index.

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

Corporate high yield (HY) bonds: Bank of America Merrill Lynch high yield total return indices

Equities: We use MSCI benchmark gross total return indices for all regions.

Commodities: Goldman Sachs Commodity total return indices

Real estate: FTSE EPRA/NAREIT total return indices

Currencies: Global Trade Information Services spot rates

Country abbreviations

BRA	Brazil
CAN	Canada
CHN	China
ESP	Spain
FRA	France
GBR	United Kingdom
GER	Germany
HK	Hong Kong
IND	India
INDO	Indonesia
ITA	Italy
JPN	Japan
KOR	South Korea
MEX	Mexico
PHL	Philippines
RUS	Russia
SWE	Sweden
SWI	Switzerland
USA	United States of America

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