

**Covid-19 Macro Note #9 – The Post Pandemic World (25 April 2020)**

Markets showed extreme levels of resilience to bad news last week for the reason investors were expecting as much. We summarise some thoughts on how various economies will open up below, in painfully slow phased approaches. We update you on the various drug developments and testing rollouts. Our main focus however, is on what the post-pandemic world may look like and what the investment implications for your portfolio are.

10yr yields this morning: US: 0.60%; UK: 0.29%; Germany: -0.47%

Equity markets as of 24 April 2020 close

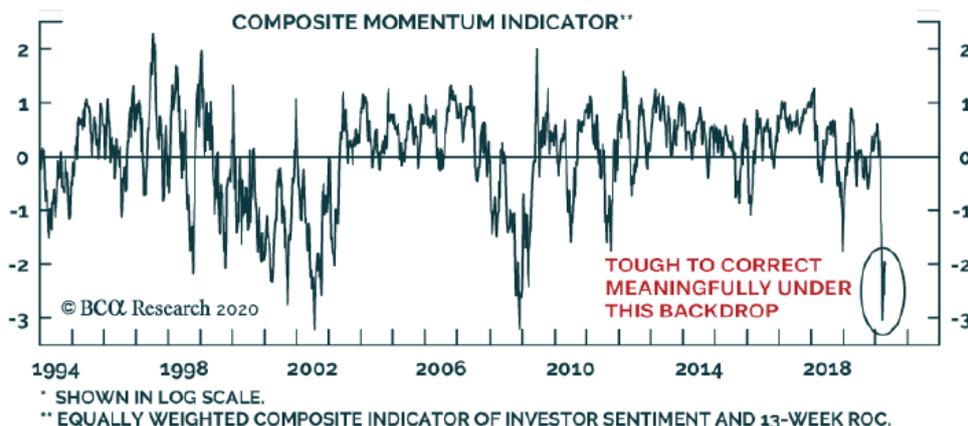
	MSCI World	S&P500	China A-Shares
WTD (20 – 24 April)	-1.3%	-1.3%	-1.1%
MTD	7.5%	9.9%	3.0%
YTD	-13.8%	-11.7%	-7.3%
From Peak	-17.4%	-15.9%	-9.7%

Credit:

	Spread	Yield (YTW)
Global High Yield Bonds	9.3	9.8
US Corp High Yield	7.8	8.4
US Corp HY ex-energy	6.8	7.4

Despite worsening news on unemployment (26M new claims since mid-March in the US), severely contractionary business survey results (US composite PMIs at 27.4 and Europe at 13.5), further downward revisions to GDP forecasts and negative corporate earnings surprises, equity markets fell by just 1% last week, implying investors were expecting as much. This conclusion is supported by the composite indicator of investor sentiment being at its historical low point (below).

**Exhibit 2: Investor sentiment at a bottom implies markets may not fall further on bad news**



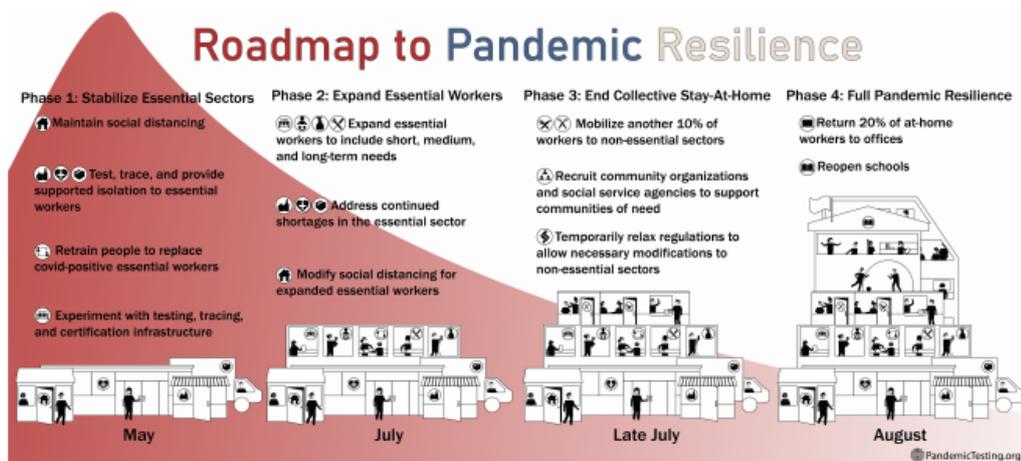
## Economy re-openings

Watching China and other countries early to open their economies, we know it will be a gradual phased re-opening the pace of which will be set by the Korean model with opening paced by the supply of PPE, PCR testing and Serology antibody testing capacity and adoption of digital tracing apps.

It is sad how little progress has been made in most Western economies on these measures such that early May exits are turning to late May with gradual phasing as per the Harvard Safra Center report Roadmap to Pandemic Resilience below. This report is the best written plan we have found for what needs doing under the heading of massive scale testing, tracing and supported isolation (TTSI). That paper describes the Korean model as laid out in our missive #6.

What is revealing in this report is how little the US has done along these lines on any dimension. There are two thresholds for testing. One is PCR testing of those who are symptomatic so that they can be isolated. Experts set this threshold at 5 - 6x the number of cases per day which is where the 200,000/day testing threshold comes from for the US. The second threshold is for testing a much larger portion of the population such that we catch a large percentage of those who are asymptomatic, but infected. Harvard sets this threshold testing rate at a 2M PCR tests/day for phase I opening below and 20M for phase IV opening. This compares to the roughly 100,000 per day being done today in private and public labs in the US. Interestingly, we note that the Foundation for Innovative New Diagnostics (FIND) posts 468 commercially available sources of diagnostic tests (PCR and other). So there is a lot of activity, but it is not clear that there is any centralized coordination to bring tests to patients as quickly as possible.

### Exhibit 3: Harvard Safra Research on 4-phases to US Economic Re-opening



We summarise below the expected (announced in some cases) dates for when various parts of the economy in the key countries are likely to officially open back up. We expect many people will still work from home and not participate in these parts of the economy at their normal levels despite them opening up.

#### Exhibit 4: Containment Exit Forecasts

Part of Economy open/closed	China (ex Hubei)	Developed Asia (Japan Proxy)	Europe (Italy, Germany, France)	UK	US (larger states)	India
Schools & Universities	Open	Sep/Oct	Sep/Oct	Sep/Oct	Sep/Oct	Sep/Oct
Bars & Restaurants	Open	Restrictions remain to July	Mid May	Late May	Late May	Mid June
Services businesses (non-food, bar, rest retail) closed or WFH	Open	Restrictions remain to July	Early May	Mid May	Mid May	Early June
Manufacturing	Open	Restrictions remain to July	Early May	Mid May	Mid May	Early June
Mass Events (sports, music, cinemas)	June	June	June/July	June/July	June/July	June/July
International Travel	Restrictions remain to July	Restrictions remain to July	Regional travel by mid summer	Regional travel by mid summer	Regional travel by mid summer	Restrictions to end of summer

Note: Heat map colour coding: green is open or soon to open by end May, yellow in summer, red in fall or later

#### Antivirals Development Update

The news is not pleasant here. In a paper published in mid-April in the Journal of the American Medical Association, the authors concluded that “currently, there is no evidence from randomized clinical trials that any potential therapy improves outcomes in patients with either suspected or confirmed COVID-19, and there are no clinical trial data supporting any prophylactic therapy” The paper analysed the 291 clinical trials underway at the time, including those not yet recruiting, recruiting, active, or completed. Their conclusion may change as the results of clinical trials underway become known but is a reminder that many press reports floating around in March 2020 had overstated the potential for certain drugs.

Hydroxychloroquine (HCQ) and azithromycin (a “Z-pack”) have failed with an NIH panel on 19 April recommending against their use and of lopinavir/ritonavir or other HIV protease inhibitors and against interferon. This says that three of the four areas of focus of the WHO “Solidarity” trial are non-starters for Covid-19 treatment, leaving just Remdesivir.

Equity markets rallied this time last week on the back of leaked trial results from Gilead’s Remdesivir. The leaked results suggested that out of a group of 125 pre-screened patients 123 recovered and the antiviral was found to noticeably expediate recovery times. While the results were very encouraging the key issues with the trial were that patients were pre-screened and that there was no control group. This was shortly followed by news the drug had performed exceptionally well in monkey testing trials, this time with a control group. This Thursday however we had yet more leaked results on Remdesivir, on this occasion the trial in question was on late stage patients in China, with a control group. The drug was found to offer no clinical benefit relative to the control group and the trial was terminated early due to a lack of patients. While this is undoubtedly a setback, Gilead have been quick to point out that the drug is likely to be far more effective in treating earlier stage patients and that the lack of patients and early termination of the trial cloud its efficacy. Gilead is expected to publish its earlier stage patient trial data in mid-May and it remains to be seen whether Remdesivir will prove to be an effective weapon against the virus.

#### Vaccines Development Update

RNA vaccines, recombinant protein vaccines and cell culture-based vaccines are all options being examined for COVID-19 vaccines. RNA vaccines are the newest and potentially the most likely to be effective. They aim to leverage the body’s ability to generate the immunogenic (i.e., antibody-provoking) protein. No vaccines have ever been approved using this technology. Cell culture-based vaccines are the incumbent technology in which the immunogenic protein is generated outside the body in vitro, and injected into the body.

Last Thursday Bill Gates published his views on the pandemic and the cures based on the work of his foundation. He is focused on the RNA vaccine:

*“A big challenge for vaccine trials is that the time required for the trials depends on finding trial locations where the rate of infection is fairly high. While you are setting up the trial site and getting regulatory approval, the infection rate in that location could go down. And trials have to involve a surprisingly large number of people. For example, suppose the expected rate of infection is 1 percent per year and you want to run a trial where you would expect 50 people to be infected without the vaccine. To get a result in six months, the trial would need 10,000 people in it.*

*The goal is to pick the one or two best vaccine constructs and vaccinate the entire world—that’s 7 billion doses if it is a single-dose vaccine, and 14 billion if it is a two-dose vaccine. I am often asked when large-scale vaccination will start. Like America’s top public health officials, I say that it is likely to be 18 months, even though it could be as short as nine months or closer to two years.”*

These five are among the most promising vaccines in development today:

- The first vaccine to start human trials is an RNA vaccine from **Moderna**, which started a phase 1 clinical safety evaluation in March.
- **J&J** announced a very ambitious timetable for a COVID-19 vaccine that uses the same technology platform as their Ebola vaccine aiming for production by Spring 2021.
- **Sanofi and GlaxoSmithKline** have accelerated development of a vaccine based on the delivery of SARS-CoV-2 spike proteins into humans, a process designed to engender an antibody response. Unlike RNA/DNA vaccine development, applying the Flu-Blok approach to COVID-19 relies on more proven vaccine technology and aims for FDA approval in the latter half of 2021.
- China’s **CanSino Bio** has become the first developer to move their vaccine to phase 2 trials (10<sup>th</sup> April).
- Researchers at Oxford University Jenner Institute are very confident on developing up to a 1 million doses of a fully functioning vaccine called **ChAdOx1** by September of this year. They say the initial doses could be used to treat front line workers. Phase 1 clinical trials have begun, and they are already enrolling up to 2,000 volunteers for phase 2 trials. The same vaccine technology has been used on other diseases, including the related coronavirus MERS, as well as Ebola.

Vaccine development has a far higher success rate for treating infectious diseases compared to antiviral medications. While just 90 antivirals have been approved for use against infectious disease since 1960 out of thousands proposed, vaccines have nearly a 35% success rate in clinical trials.

### **Polymerase Chain Reaction (PCR) Testing Update**

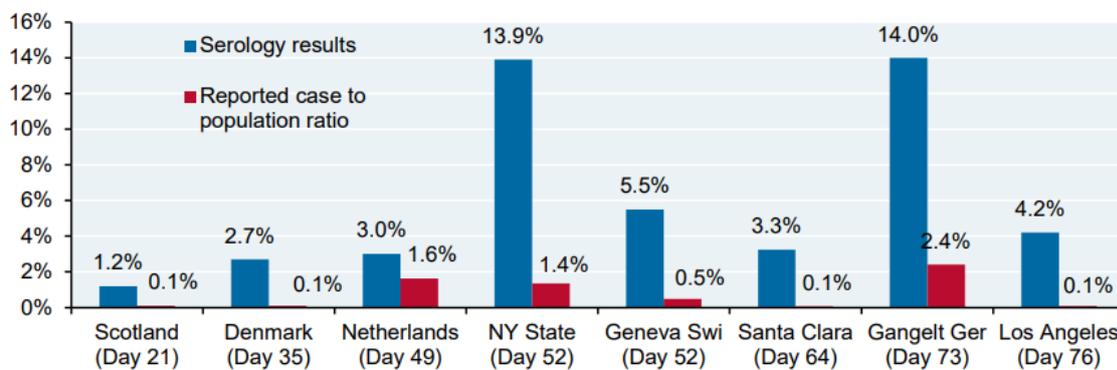
This is a test for whether you are currently or recently infected and involves taking a nasal swab and processing it in a Polymerase Chain Reaction (PCR) machine to identify presence of the virus. These are critical for front-line health care workers and for early identification of cases and isolation of the individuals. Presence of the virus can be detected before symptom appear. Today tests are taken out of the home and sent to labs for processing. There are severe limitations on the quantity of PCR tests everywhere in the world as described above, where Harvard is calling for 20M tests/day as a precursor to phase IV economic opening. The Gates foundation invested in research showing that having patients do the swab themselves, at the tip of the nose, is as accurate as having a doctor push the swab further down to the back of your throat. Swabs have been in short supply, so Gates Foundation grantees are also working to design swabs that are cheap and able to be manufactured at large scale but work as well as ones that are in short supply. This self-swab approach is faster, protects health care workers from the risk of exposure, and should let regulators approve swabbing in virtually any location instead of only at a medical center. The PCR test is quite sensitive—it will generally show whether you have the virus even before you have symptoms or are infecting other people.

Bill Gates was silent on how far out in time home PCR testing is. We will report on this when we have an estimate. This could be a serious break-through to foster earlier leaps to phase III or IV economic opening.

### Serology Antibody Testing Update

These are the blood tests which tell you whether you have the antibodies from having been infected, whether you were symptomatic or not. Serological tests are not a “back-to-work” mechanism for the whole population unless there are high levels of infection first. In recent weeks, governments have begun to utilise sample population serology tests to get a sense of the true magnitude of the population that may be immune to the virus to help decide when to open up parts of their economies. This week we began to see the first results of these sample tests published. Infection/immunity levels ranged from 1% in Scotland to over 21% in New York City. Areas which are more densely populated clearly seem to exhibit higher rates of infection/immunity. Infection levels were between 10-25x higher than official case records.

**Exhibit 5: Serology test results vs reported cases as a % of population**



Source: JPMAM, JHU. 2020. See page 7 for serology data sources.

This demonstrates the true proportion of asymptomatic or mild carriers of the disease. Epidemiologists have been quick to point out that these sample tests may understate the true levels of infection/immunity as antibodies can take up to 5 weeks to develop in some subjects. These results have a number of important consequences, firstly they show that the true mortality rate is far lower with the denominator in that equation understated by a magnitude of 10-25x. Theoretically, higher levels of immunity mean that restrictions can be less severe. However, widespread serological testing has a limited ability to send the bulk of the population back to work as the percentage of the population that is immune needs to be at 60% or so, levels well above even these higher measurements. But antibody testing adds to the mix of things that work toward the Korean model.

On Friday, the World Health Organization announced that “there is currently no evidence that people who have recovered from Covid-19 and have antibodies are protected from a second infection.” However, they were quick to clarify in a subsequent tweet that “we expect that most people who are infected with Covid-19 will develop an antibody response that will provide some level of protection.” Concerns are being raised about certification of individuals to go back to normal social interaction on the basis of relatively unreliable antibody tests. Companies including Roche and Abbott Labs are working to improve test reliability.

## Post Pandemic World

There are three key questions to think about in the post pandemic world which we attempt to answer below.

### Q1. What are the likely long-term secular effects of the massive debt-fuelled fiscal and monetary stimulus programmes?

Global central bank liquidity injections and new government spending both amount to a little over \$8 trillion, or nearly 10% of global GDP each as shown below.

#### Monetary & Fiscal stimulus in response to the crisis<sup>1</sup>

	Central Bank Liquidity Injection		New Government Fiscal Stimulus		Rate Cuts
	US\$ Trillions	Percent of GDP	US\$ Trillions	Percent of GDP	Basis Points
US	\$4.80	22.4%	\$2.82	13.1%	-150
Eurozone	\$1.10	8.3%	\$1.76	13.2%	
Japan	\$0.20	3.9%	\$0.99	19.2%	
United Kingdom	\$0.25	9.0%	\$0.14	5.1%	-65
China	\$1.29	9.0%	\$0.54	3.8%	-100
Rest of World <sup>2</sup>	\$0.65		\$1.85		
<b>Total</b>	<b>\$8.29</b>	<b>9.6%</b>	<b>\$8.10</b>	<b>9.4%</b>	

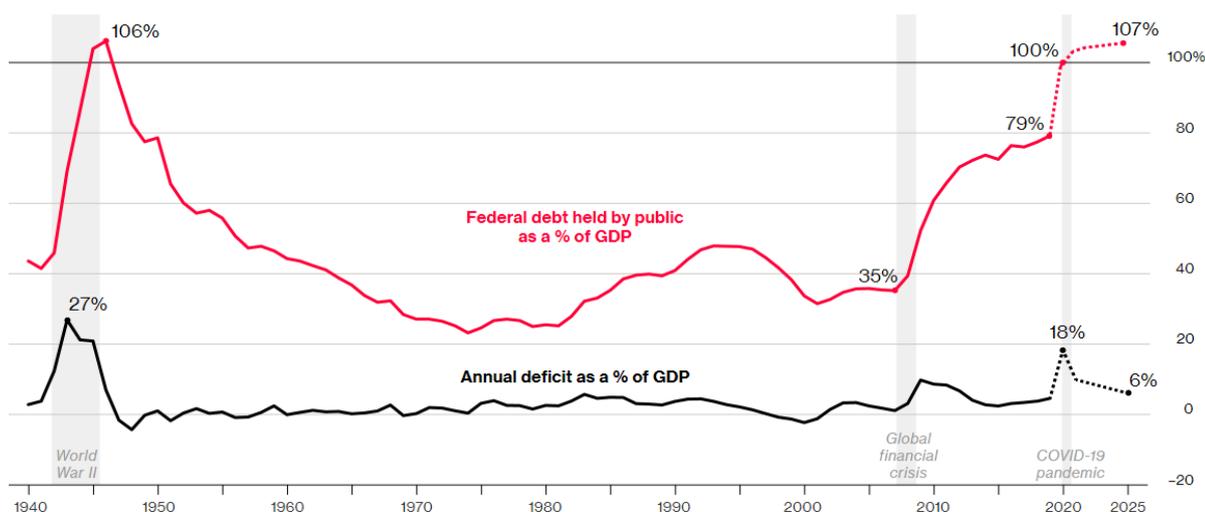
#### Notes:

1. Data as of 15 April 2020, source is Cornerstone, JPM Economic Research
2. Asian Development Bank, IMF, World Bank

Using the US as an example, The Committee for a Responsible Federal Budget estimate that the budget deficit this year will be \$3.8 trillion (18.7% of GDP) and \$2.1 trillion (9.7% of GDP) in 2021. If correct, US debt will rise to 100% of GDP this year, and reach 107% by 2023, surpassing the prior record set after World War II. These projections likely understate the future deficit and debt level as they assume no further legislation and spending is enacted to address the crisis. The projections also assume the economy experiences a recovery in 2021 and fully returns to its pre-crisis trajectory by 2025.

Past precedents suggest that the current debt burden will be dealt with through a combination of higher inflation and taxation. The last time US debt was close to current levels was in the aftermath of the second World War - Net debt-to-GDP declined from 80% in 1950 to a recent low of 23% in 1974. This steady deleveraging was driven primarily by strong real GDP growth which averaged 4.2% over the two decades from 1950 to 1970 with inflation running at 2.7%. The yield on 10-year US Treasuries averaged 3.9%, rising from 2.3% at the start of 1950 to 7.9% by 1970. With nominal growth above the cost of debt and the Eisenhower government running a relatively balanced budget, debt-to-GDP steadily declined.

## Exhibit 7: US debt is expected to reach 100% of GDP this year as the deficit spikes to 18% of GDP



Sources: Committee for a Responsible Federal Budget, Congressional Budget Office, Bloomberg data

However, in the aftermath of the GFC, government debt levels remained persistently high as the developed economies did not have the same post-war advantages of young demographics and booming productivity growth rates. Deleveraging and austerity measures had the adverse effect of constraining growth, making debt/GDP reduction more difficult. As a result, the decade following the GFC was marked by low growth and low inflation in most of the developed world.

Experts are divided on the expected playbook for policymakers following the Covid-19 crisis. Clearly, the short-term impact of the Covid-19 crisis is disinflationary as lockdowns have suppressed aggregate economic demand more so than aggregate supply, putting downward pressure on prices. The c. -70% drop in oil prices since the start of the year is perhaps the starkest manifestation of this disinflationary shock.

Looking further out, the outlook for inflation will depend on whether the structural forces that have suppressed the rise in consumer prices over the past few decades intensify or abate. Some of the experts we track such as KKR warn of long-term disinflationary risks as policymakers tighten fiscal policy in order to pay off the massive debts incurred during the pandemic. Such policies would weigh on growth and inflation as households and firms restrain spending.

In the aftermath of the GFC, policymakers across developed economies embarked on various forms of deleveraging and austerity. These included the Tea Party movement in the US, the Osborne 'Austerity' budgets in the UK, the strict fiscal discipline imposed by Brussels on Italy and Greece following the European sovereign debt crisis. Such policies disproportionately impacted lower income segments of society dependent on income, while wealthier segments benefitted from massive asset price inflation (equities, bonds, property) as central banks pushed interest rates down to zero (or negative) levels. The origins of the resulting populist/protectionist movements in the US (Trump), UK (Brexit) and Europe (Lega/5-Star) can be all be directly traced to this income and wealth polarisation.

Other experts such as BCA and JPM suggest that in the aftermath of the Covid-19 crisis, policymakers will refrain from attempting to deleverage too quickly. There are already signs that Germany will not impose draconian conditions on Italy in exchange for some form of fiscal transfer / debt mutualisation. High government debt levels may increase the political pressure on central banks to keep rates low for longer, even once the labour market recovers. This could eventually lead to economic overheating and faster inflation over the two-to-three years following the pandemic. Inflation could also be supported by a pull-back of globalisation which would also contribute to cost-driven rising inflation. Global trade was already

stagnant even before the trade war flared up. The pandemic may further inflame nationalist sentiment and drive businesses to repatriate manufacturing inside national borders.

On balance, we suspect that inflation will rise more than expected over the long haul. This is not a particularly high bar to clear as expected inflation in the US is only 1.2% over the next decade based on TIPS breakevens. Market-based inflation expectations are even more subdued in most other advanced economies.

The longer-term implications of the deflationary vs inflationary scenarios are very different across asset classes, except for government bonds which are likely to provide poor returns in both scenarios given low starting yields, although returns will be even lower in the inflationary scenario. In the disinflationary scenario, expect credit and other sources of contractual income to outperform growth assets such as equities. This may very well be the case in the near term (see investment implications further below). However, in our base case of continued fiscal and monetary accommodation over a longer period, expect risk assets to outperform. Within this context, there will likely be lasting trends that reprice sectors and geographic markets very differently from the past.

## **Q2. Given the global nature of the pandemic, what does this imply for geopolitics? How will it reshape the world order?**

Deglobalisation and Regionalisation: Deglobalisation was already in motion before Covid-19 and the post-pandemic world will only see that accelerate in favour of both repatriation within national borders, but also a few tightly knit regional blocks. In the Eurozone, Germany will acknowledge that it is already de-facto fiscally integrated with Italy and other southern European nations via the ECB's Target system. Any breakup of the Euro will leave Germany holding billions of devalued Italian government bonds. So the Covid crisis may serve to accelerate a more formal institutionalisation of these fiscal links. In North America, deep existing ties and geographic proximity will incentivise the US to maintain economic links with Canada and Mexico via variants of NAFTA. A failed state on the US southern border is not in anyone's interest. The Asian region will thrive despite the US 'decoupling' economically from China as it diversifies its supply chains to other producers (including onshoring). China will increasingly build economic (and political) ties to neighbouring countries via its Belt and Road initiative. It will also increasingly assert its authority in the South China Sea.

Bigger Government: Another consequence of the Covid-19 crisis will be that 'big government' will become more prevalent. Already the State is expanding more into the private sector with various forms of direct subsidies and loan guarantees. The need for universal healthcare will become a greater political force. This will have implications for taxation and a likely rollback of some of the more controversial privatisations of the Reagan/Thatcher era, particularly in the UK (Royal Mail, Rail services, etc.). A trend towards a surveillance state may already be underway, as western democracies are forced to adopt tracking measures in place in Asian countries to contain the spread of Covid. Once the pandemic is contained, it may be difficult to roll back these measures.

## **Q3. What permanent impact does the virus have on businesses, in the way we work, and in the way we consume goods and services?**

After a decade of building up corporate debt levels (much of it used for share buybacks and dividends rather than investment and capital expenditure), companies will focus on building resilience, diversifying supply chains, reducing leverage and short-dated funding and improving liquidity. However, the crisis-driven investments in technology infrastructure and implementation, will propel the use of new technology across all aspects of life from e-commerce, remote working, online education etc.. Despite increased levels of remote working, companies, are unlikely to completely abandon centralised business centres (financial

capitals, technology hives, etc) as these are too important for innovation and communication.

There will also be greater supply chain diversification leading to more supply side redundancy, localised supply chains, higher stock inventory (less JIT manufacturing), all leading to lower cost efficiency and lower margins. A survey by KKR suggests that US manufacturing executives are likely to accept up to a 15% increase in supply costs to avoid risks of supply chain disruption from trade tariffs, epidemics, etc..

Certain well-established trends already in play prior to the crisis will find broader implementation. The combination of technological advancement and social distancing will result in increased digital delivery of a range of other essential services including healthcare, education, etc. Some industries permanently see a loss of demand (business travel) as many corporates clamp down on travel, particularly mid-level travel as companies make greater use of videoconferencing to cut their carbon print.

## Investment Implications - Covid-19 Crisis Playbook

We have updated our playbook based on the above analysis to include the following 7 strategies:

1. **Religiously rebalance** through expected volatility ahead.
2. **Expect risk of higher inflation** in the medium term. US Government bonds to underperform due to low starting yields and rising inflation. Find alternative safety net assets starting with inflation linked bonds and gold.
3. **Credit to outperform equities in near term.** We are poised for rotation on further credit spread widening.
4. **Sectoral mix shifts:**
  - Technology: Greater demand for on-line/virtual/digital services and infrastructure, whether for public health (surveillance), business resilience, education, leisure or medical diagnosis. Positive effects of WFH on carbon footprint will add further tailwind.
  - Healthcare: Countries will not be caught off-guard again. Stockpiles and redundant capacity will drive short-term burst followed by domestic healthcare companies becoming a strategically significant industry.
  - Real estate shake-up: lower commercial office space demand, higher warehousing/ logistics demand.
  - Our New World Equity Portfolio was specifically built to exploit these sectoral opportunities.
5. **Geographic mix shifts:**
  - US has more of the secular winners (Tech, Comms, Healthcare) which comprise a larger share of US market (52%) than of EM (26%) or Japan (33%).
  - The long-term economic damage and debt burden will be lower in Asia/China given their greater capacity to manage the “dance phase” of managing the virus, both from public health and stimulus perspective. China will also have a high share of secular winners (40%).
  - Currently implementing ETF basket including over-weights to Korea and Taiwan.
6. **Quality Equities Theme:**
  - Quality to out-perform, especially mega to large-cap companies with bullet-proof balance sheets.
  - Our “quality” equity managers have moved in this direction already
7. **Distressed lending and private equity:** several manager commitments are in progress alongside due diligence on two others.

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