



Vantage Point

PANDEMIC
Q2.2020

Introduction

WELCOME TO THE LATEST EDITION OF VANTAGE POINT

Since our last publication, the world has seen the emergence of a novel coronavirus that has infected large numbers of people in China and the rest of the world. Of course, this is first and foremost a human tragedy and, at the time of writing, it's very difficult to judge how widely the disease will spread. That said, it is having and will continue to have a large economic impact and much of this edition is devoted to trying to work out what that might be. As regular readers will know, we don't deal in point forecasts – and a shock like the emergence of the coronavirus highlights the strength of the scenario-based, probabilistic approach we take. By mapping plausible scenarios, probability-weighting them and generating summary fan charts for key asset prices, we can draw broad investment conclusions that we think take account of the full distribution of likely outcomes.

The coronavirus appears to be more infectious but less deadly than some other diseases, such as SARS or MERS. That means the main economic impact is likely to be felt through the measures taken to contain it – for instance, travel restrictions, reduced working time and, in extremis, quarantine. A number of countries have already gone into effective lockdown, including the US and much of Europe and this will have a dramatic impact on GDP in the first half of the year and possibly beyond. Already, a global recession in 2020 looks more likely than not.

In economic terms it is both a supply shock and a demand shock. It cuts supply because working hours fall and supply chains are disrupted; and it hits demand because people can't go out shopping, buy services face-to-face, or go on holiday. Markets have reacted with shock – as of March 23 the S&P 500 is down 34% from peak – already the 5th largest post-war recessionary drop, in a fraction of the time

it took the others to get there. Central banks fear the demand shock more and the Fed has led the way with rate cuts and a relaunch of QE. Financial market stresses have appeared and central banks have coordinated to supply the overwhelming demand for cash and dollars. Longer term, the situation could get more complicated should the substantial hit to global supply push up global costs and prices, especially if that impact endures because the spread of the disease causes de-globalization to accelerate.

Our scenarios explore these and other issues in depth. There are a couple of 'upside' V-shaped scenarios, but there are also two downside 'U' and 'L'-shaped ones. In each case we go through the economic mechanisms in some detail and end up with some very distinctive economic and market outcomes. In the end though, this is a hugely uncertain situation and I encourage readers to use the scenarios to test their own assumptions, whether that's 'time to buy' or 'it's Armageddon out there', or anything in between. Our own broad investment conclusion, based on the return and risk expectations embodied in our fan charts, is that a more risk-averse stance may be prudent until we have more clarity. The potential for a strong bounce back exists no doubt but, it's not clear from our analysis that the expected gain in the best scenario outweighs the expected losses in the worst.

As ever, we hope you enjoy reading the document and look forward to your feedback.



SHAMIK DHAR
CHIEF ECONOMIST



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Executive Summary

WHAT WE THINK – ECONOMIC SCENARIOS

35%

V-shaped recovery; coronavirus spreads but economic impact contained

Disease peaks during the summer. Central bank liquidity provision is large enough to prevent severe dislocation in financial markets and the Fed in particular supplies enough dollars to overcome the dollar shortage and satisfy the global demand for cash. Large fall in Chinese GDP in China in H1 (-10% or so), followed by a strong recovery during H2 2020 as inventories are rebuilt and services production/consumption resumes. The impact on Europe and the US lasts longer, with similarly large hit to GDP, but global growth picks up gradually during H2 2020. Output recovers everywhere so that, by the first half of 2021, it is more or less where it would have been had the disease never emerged, so there is no permanent loss to output (hence the V-shape recovery). Global monetary and fiscal policy remains loose. Other central banks may revert to unorthodox policy measures and closer coordination with fiscal authorities. Global inflation remains subdued and interest rates remain low. Risk assets bounce back in Q2, ahead of the economic recovery as investors learn that the long-term macro consequences of the disease will be limited.

35%

U-shaped recovery; financial market shake-out

Coronavirus spread more persistent and widespread than V-shaped recovery but not as severe as the L-shaped recovery. Nevertheless, this is the trigger for widespread risk-off sentiment in the face of heightened uncertainty. Risk premia rise sharply, equity and credit prices fall – particularly in highly leveraged corporates. Sell-off exacerbated by a huge tightening of financial conditions as credit vulnerabilities are exposed in the US. Non-China EMs suffer from China exposure and a withdrawal of liquidity and are limited in their policy tool-kit to stem the outflows. A further dramatic flight to safety ultimately brings government bond yields to previously unthinkable lows and even further into negative territory for certain regions. But preceding that, huge demand for cash causes some yields to rise temporarily leading to severe market dislocation as liquidity squeeze and dollar shortage worsens. Unlike the L-shaped recovery, this is primarily a hit to global aggregate demand (rather than supply). Spill-over effects, such as in energy prices, surface making the situation worse. Global policy makers unable to put a floor on deteriorating sentiment in the short-term. Sell-off triggers a slowdown not unlike that seen after the tech bust of 2000-1 followed by a U-shaped recovery.

20%

L-shaped recovery; globalization flatlines

As contagion spreads outside China, developed countries are overwhelmed by the epidemic and economic activity in affected regions falls to a trickle. With hits to demand and supply, the impact on Chinese GDP is massive--close to 18%--over the course of 2020, mostly in the first half of the year. Europe and the US see similar-sized GDP losses during the rest of 2020. Ultimately, this adds pressure on firms to diversify supply chains over the longer term, accelerating underlying de-globalization trends. The impact on global GDP is large, mostly felt through the supply side. Global costs rise as businesses struggle to find alternatives to Chinese production. US, EU and China respond with protectionist moves, especially if China attempts to devalue the Yuan, further exacerbating the supply shock. Central banks can accommodate to some degree, but there is only so much monetary policy can do in the face of a negative supply shock. Fiscal policy is loosened globally, but insufficiently to offset global retrenchment and many businesses go bust. Asset prices fall despite loose monetary policy stance, since policy is still tighter than previously expected and confidence is hit hard by duration and spread of disease. In the longer term, the liberal international trading/investment order is truly dead and a new narrative takes hold: the virus has accelerated an underlying trend in which re-shoring and nationalism means higher costs and lower growth for years (whether true or not). Risk markets sell off big time, equities enter a prolonged bear market, and global yields dive further into negative territory.

10%

US-led inflation returns

PROBABILITY*

SCENARIO

Growth fears are overdone in the US as the coronavirus is contained. The economy remains resilient, resumes its upward trajectory prior to the coronavirus, and activity rebounds sharply in 2H as rest of world weakness lingers. Ultimately, the US economy is more resource constrained than anticipated. Inflation rises more than expected and breaches the Fed's 2% target in early 2021. Inflation expectations quickly and sharply adjust higher, forcing the Fed to tighten as China/others are weakening. Higher rates and dollar prompt capital flight from risky assets, particularly in emerging markets. Financial instability and dollar shortage ensues yet the main transmission mechanism is international financial markets. Replay of 2015-2016 but bigger.

CAPITAL MARKET PRICING – WHAT THE MARKETS THINK

Rates



- Markets are pricing in the Fed Funds to remain on hold, with rates effectively at zero, until 2022.
- In our V-shaped recovery, we see rates remaining on hold until the end of 2020. In the two downside scenarios (U-and-L-shaped recovery), we see rates remaining on hold for longer, with negative rates in the US a possibility in the L-shaped scenario. On balance, our interest rate fan chart is more optimistic than the market given the near split probabilities between the two upside (45%) and downside scenarios (55%).

Fixed Income



- Yields descended sharply to all-time lows on a heightened flight to safety from the coronavirus fallout and expected impact on growth. The fall in inflation expectations on the back of the oil price shock has also contributed to lower yields.
- There have been signs of distress in parts of the Treasuries market, with off-the-run US Treasuries particularly hard to trade. The Fed and other central banks have coordinated to supply dollar liquidity but markets continue to expect more.
- Like rates, market pricing of yields is closer to the expected outcomes reflected in our two downside scenarios.
- Our V-shaped recovery scenario sees a pick-up in yields in the 2H but risks are heavily skewed to the downside as seen in the fan chart.
- Our probability-weighted or mean forecast suggests rates will stabilize but remain below pre-coronavirus levels with a slight drift upward through 2021.

Equities



- Similar to pricing in fixed income markets, equities are pricing in outcomes more in-line with the downside scenarios.
- Prior to the S&P 500's peak on February 19, valuations had quietly crept to the highest level post-financial crisis at 19X 12-month forward earnings. In this richly-priced environment, the market quickly became fearful that the hit to the global economy would not be a V-shaped recovery – but a U-shaped one with a more prolonged period of lackluster growth before an eventual bounce higher.
- This is yet to be fully reflected in earnings estimates.
- Despite our more optimistic V-shaped recovery, the mean forecast for the S&P 500 across scenarios and probability distributions suggest that risks remain skewed to the downside.

SUMMARY

Recent market dislocation reversed the longstanding negative correlation between bonds and equities, as treasury yields rose even as stock markets were falling sharply. This reflected huge demand for cash, selling to meet margin calls and a temporary dollar shortage. With decisive Fed intervention, markets are likely to return to situation we've been in ever since the Global Financial Crisis – with bonds and equities negatively correlated, acting as a natural hedge within portfolios.

Oil and commodities

- The price war between Saudi Arabia and Russia has driven oil prices down to below \$25. This is likely to continue for some time as this is ultimately a battle for long-term control of the oil market – and oil futures reflect that. Both sides would like to see US shale production shrink further.
- The world supply curve of oil is flatter than used to be – thanks to shale technology – so prices are unlikely to rise sharply even if world production were to be cut back again later this year. Again, futures markets appear to be discounting that, with curves often in backwardation.
- Other key commodity prices have fallen as markets price in a large and persistent fall in Chinese demand. Copper and Iron ore prices will be key indicators of recovery.

INVESTMENT CONCLUSIONS

Equities

- We expect uncertainty surrounding the duration and magnitude of the coronavirus to continue to generate volatility in global equity markets until the spread of the virus slows.
- With the hit to earnings well underway, proper modeling remains ephemeral. We suggest sitting tight until some evidence of earnings stability is established. We urge investors to remain cautious before looking to take advantage of lower prices as we believe further negative news is likely and do not expect an imminent and decisive recovery in prices.
- International and EM equity markets are increasingly fragile due to shocks from the virus and oil prices, and selective exposure is suggested. Although we continue to view them as attractive long-term investments, price fragility remains high until some degree of positive news is received.

Fixed Income

- Emergency actions by the Federal Reserve should help stabilize liquidity in the Treasury market and allow yields to find firmer footing. Expect a steepening of the yield curve as a result of policy movement and for the correlation between stocks/bonds to return to a low or negative level.
- Even in the case of a V-shaped recovery beginning in the 2H, volatility is likely to remain elevated and high-quality fixed income offers a much-needed buffer.
- There is concern over the liquidity and resilience of high yield and leveraged loans and we view them as vulnerable asset classes in this environment. As such, we suggest reduced exposure to liquid instruments in these areas to minimize daily price swings that can induce further fear.

US Dollar

- We expect the USD to appreciate as uncertainty regarding the depth and length of the shock, and the associated financial market volatility, drives flows into US safe assets.
- The increase in demand for US Dollar cash from international investors, as seen by the widening in the USD cross currency basis, also provides support to the currency.
- As US rates converge closer to rate levels in the rest of the world, the appreciation may be somewhat limited. However we do not believe the narrowing of interest rate differentials to be sufficient to drive broad USD weakness.

Alternative

- Risk mitigation via liquid alternative strategies such as absolute return, market neutral and other hedging approaches can provide investors with enhanced bear market protection in these extreme environments.
- Investors holding private or locked-up alternative investments are shielded from daily market swings and panic selling by the sheer nature of illiquid investments.

SECTION 1

Economics



Economic Scenarios

35%
(Probability)

Scenario #1: V-shaped recovery; coronavirus spreads but economic impact contained

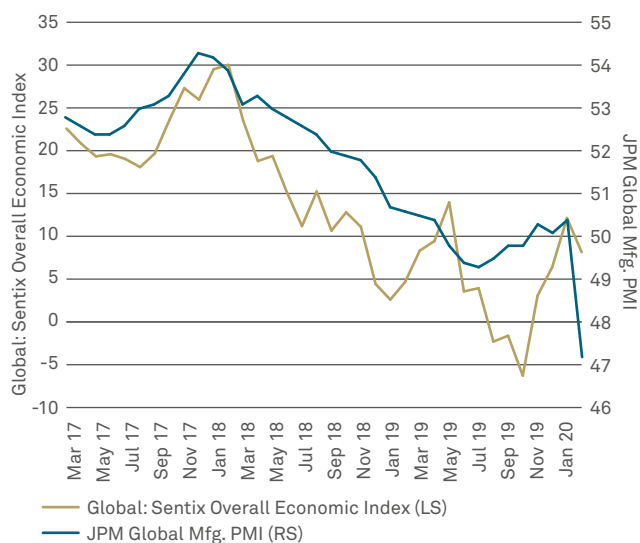
In our central scenario, the macro consequences of Covid-19 are contained. To be clear, the 'V' is both larger and longer-lasting than overly-complacent markets were expecting during the first half of February. Growth is hit hard in China for 1-2 quarters, with output falling by 10% or more in the 1H, but is followed by a strong recovery during the second half of the year as inventories are rebuilt and services production/consumption resumes. The impact on Europe and the US lags that of China/Asia, and is similarly large in Q2 and Q3, but we are past the worst by high summer as the global rate of new infections falls and the effects of looser fiscal and monetary policy start to kick in. Global growth picks up gradually during H2 2020. Output recovers everywhere so that, by early 2021, it is more or less where it would have been had the disease never emerged, so there is no permanent loss to output (hence the V-shape recovery).

Global monetary and fiscal policy remains loose led by the Fed. As ex-US advanced economies are constrained by the effective zero lower bound, there is less room to cut rates. As a result, central banks may revert to unorthodox policy measures and closer coordination with fiscal authorities (in the form of targeted easing, supporting small and medium sized businesses, possibly even money-financed fiscal expansion). Additionally, fiscal stimulus packages that aim to boost consumption (via tax cuts, aid to state or local authorities) are implemented.

In this scenario, global inflation remains subdued and interest rates remain low. Markets start to move upwards well before the economic data starts to improve. Risk assets bounce back in Q2 as investors learn that the long-term macro consequences of the disease will be limited.

Global Economic Sentiment and Manufacturing PMI

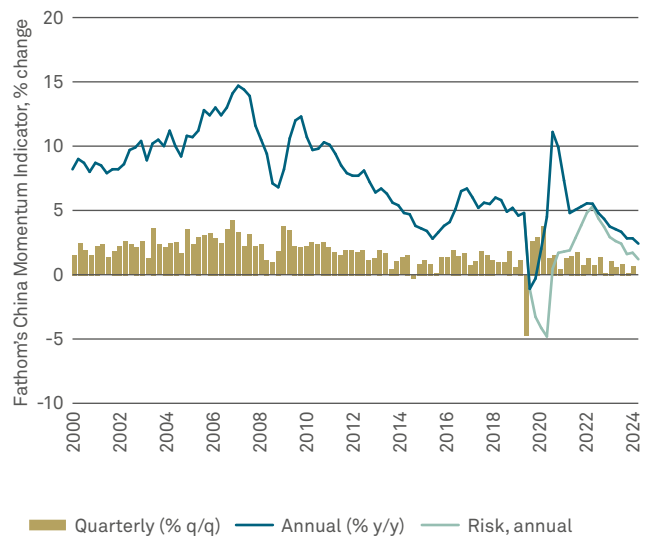
ONCE UNCERTAINTY SUBSIDES, WE COULD SEE A RECOVERY FROM THE SHARP CONTRACTION FROM CORONAVIRUS BY END OF 2020.



Monthly data as of February 2020. Source: BNY Mellon using data from Bloomberg.

China GDP

THE GROWTH IMPACT TO CHINA WILL BE QUITE SIGNIFICANT OVER THE NEXT SEVERAL QUARTERS, YET A RECOVERY IS LIKELY ONCE INVENTORIES ARE REBUILT AND PRODUCTION/SERVICES RESUME DURING THE 2H.



Quarterly data as of Q4 2019. Forecasts from 2020 onwards. Source: Fathom Consulting.

Charts are provided for illustrative purposes and are not indicative of the past or future performance of any BNY Mellon product.

35%
(Probability)

Scenario #2: U-shaped recovery; financial market shake-out

In this scenario, the coronavirus spread is more persistent and global than scenario #1 but not as severe as scenario #3. Nevertheless, this is the trigger for widespread risk-off sentiment in the face of heightened uncertainty. Risk premia rise sharply, equity and credit prices fall – particularly in highly leveraged corporates and economies (peripheral Eurozone). In other words, the sell off we've seen to date turns into a prolonged bear market, while the 'search for yield' turns into a pronounced 'flight to safety'. This brings Treasury yields to previously unthinkable lows, with a non-zero probability for Treasuries to dip into negative territory. An even larger share of global bonds start to yield negative and the dollar rises sharply from its safe-haven status.

The situation is worsened by periods of severe financial market dislocation. The uncertainty of the economic outcome causes the market to panic from time to time, causing flight into cash, even out of traditional safe-haven instruments such as Treasuries and gold. Selling to meet margin calls exacerbates this pressure and key yields rise even as equity markets sell off. A key underlying issue is the global shortage of dollars which generates stress in FX (basis swaps), sovereign fixed income and dollar funding markets more generally. Coordinated central bank action is insufficient to meet this demand, which continues to intensify.

Global financial crisis ensues but China is at risk too, where tighter financial conditions, falling capital productivity and lower property prices could initiate a collapse of shadow banking and a large rise in bad loans. A liquidity squeeze on Chinese banks

morphs into solvency crisis and a need for widespread recapitalization, mitigating any recovery even if the disease is brought under control. China loosens policy, both fiscal and monetary, but reinforces capital controls in an attempt to put a floor under the Yuan.

Fed runs out of firepower and global dollar shortage intensifies. Growth and inflation fall and despite their best efforts, global policy makers are unable to put a floor on deteriorating sentiment. The oil price does not act as a stabilizer – since widespread fear means beneficiaries in oil-importing countries don't raise their spending sufficiently to offset investment cutbacks by producers, notably in the US. Falling oil prices also exacerbate the financial crisis: there are widespread bankruptcies in the US energy sector which causes US high yield credit spreads to spike significantly and threatens the financial viability of investors overly exposed to those assets.

Unlike scenario #3, this is primarily a hit to global aggregate demand (rather than supply). Global sell-off, tighter financial conditions, and a higher dollar drive growth and inflation lower. A slowdown ensues not unlike that seen after the tech bust of 2000-1 followed by a U-shaped recovery. The world economy eventually gets back to previous levels of output, but much more slowly than in scenario #1. That said, it's possible that the hit to demand is so severe and investment falls so sharply that there is permanent scarring.

US Stock Prices and Consumer Spending

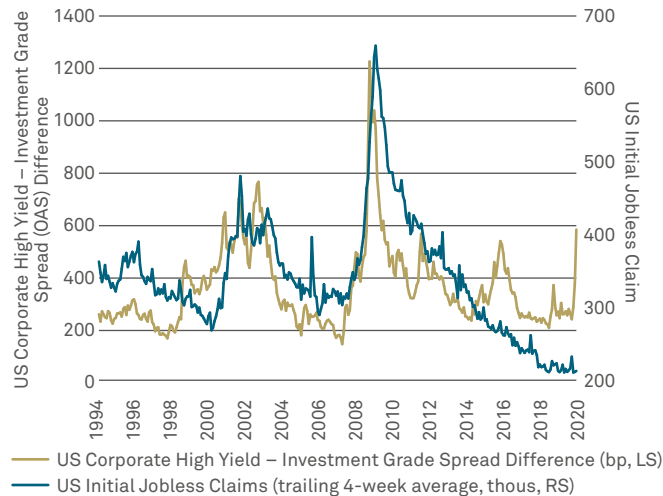
A KEY CHANNEL IN WHICH A STOCK MARKET CORRECTION SPILLS OVER INTO THE REAL ECONOMY IS VIA LOWER CONSUMER SPENDING, EXACERBATING THE DOWNTURN.



Adjusted retail sales less food and autos. Monthly data as of February 2020.
Source: BNY Mellon using data from Bloomberg.

US Corporate Credit Risk Sentiment vs. Initial Jobless Claims

TIGHTER FINANCIAL CONDITIONS EXACERBATE RISK-OFF SENTIMENT, EXPOSES CORPORATE CREDIT VULNERABILITIES, AND ULTIMATELY SPILLS OVER INTO THE REAL ECONOMY.



OAS: option adjusted spread. Monthly data as of March 12, 2020. Source: BNY Mellon using data from Bloomberg.

Charts are provided for illustrative purposes and are not indicative of the past or future performance of any BNY Mellon product.

20%
(Probability)

Scenario #3: L-shaped recovery; globalization flatlines

The containment efforts in China prove to be ineffective and the virus spreads within and outside of China, possibly in a 'second wave'. Quarantine restrictions in China are left in place for several months as contagion continues with the active labor force measuring a fraction of its size in January. As contagion spreads outside China, developed countries are overwhelmed by the epidemic and economic activity in affected regions falls sharply. Millions are infected although the mortality rate decreases. With hits to demand and supply, the impact on Chinese GDP is massive--close to 18%--over the course of 2020, much of it concentrated in the first half of the year.

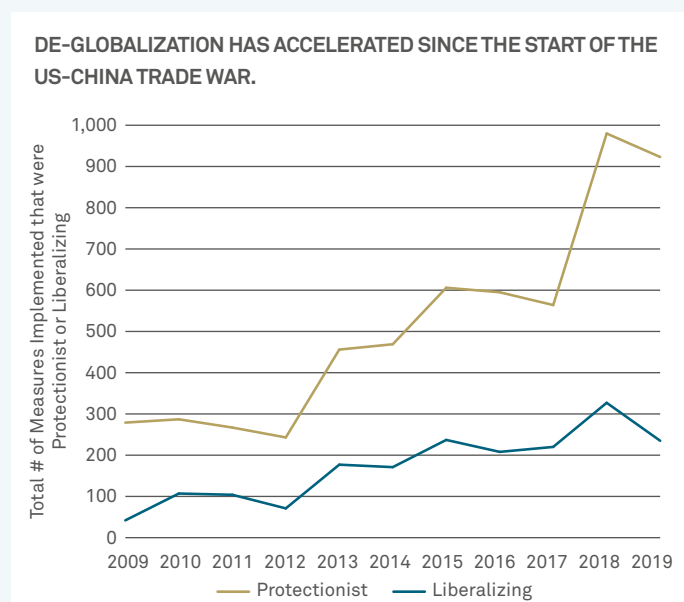
Other economies follow suit as the virus spreads worldwide. A large number of countries enter lockdown, so working hours fall, productivity is hit hard, services production declines and supply chains are disrupted. The impact on both Europe and the US is huge and lasts well beyond summer, possibly because the spread of the disease does not slow as quickly as hoped. Growth rates do not pick up sharply in H2 and some output is lost forever.

Ultimately, this is likely to add pressure on firms to diversify supply chains over the longer term and accelerates underlying de-globalization trends. The huge disruptions to supply chains

affect output in a number of countries importing parts (intermediate goods) from China and also exporting parts to China. The impact on global GDP is large, but is predominantly felt through the supply side. As a result, global costs rise during the time alternatives to Chinese production can't be found. Even when they are eventually found, they are likely to be higher cost. Rising costs hit global output and demand over a period of years.

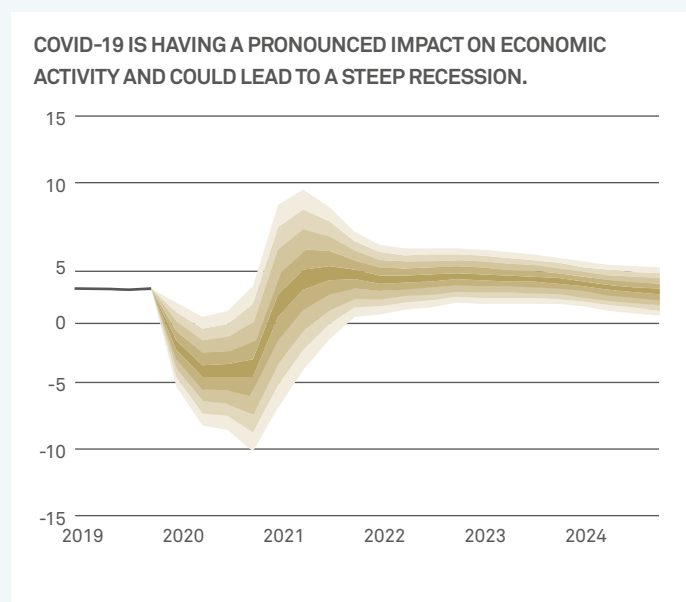
Borders remain closed for some time, and supply side shocks exacerbate de-globalization as US and EU respond to increased costs with protectionist moves, especially if China attempts to devalue the Yuan. Central banks can accommodate to some degree, but not as much as under the v-shaped scenario. Fiscal policy is loosened globally, but insufficiently to offset global shock. Asset prices fall despite the loose monetary policy stance, since policy is still tighter than previously expected and confidence is hit hard by the duration and spread of disease. In the longer term, the liberal international trading/investment order is crippled and a new narrative takes hold: the virus has accelerated an underlying trend in which re-shoring and nationalism means higher costs and lower growth for years (whether true or not). Risk markets sell off, global yields dive further into negative territory.

Trade Measures Introduced Globally



Annual data as of 2019. Source: BNY Mellon using data from Bank of England.

Global GDP – four quarter % chg.



Forecasts as of March 2020. This chart shows the range of potential global growth outcomes per Fathom consulting. Estimates begin in Q1 2020. The darker bands towards the center of the fan chart show the more likely outcomes, while the lighter bands show progressively less likely outcomes covering 90% of the forecast distribution. The width of the fan chart shows the level of uncertainty. Source: Fathom Consulting.

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10%
(Probability)

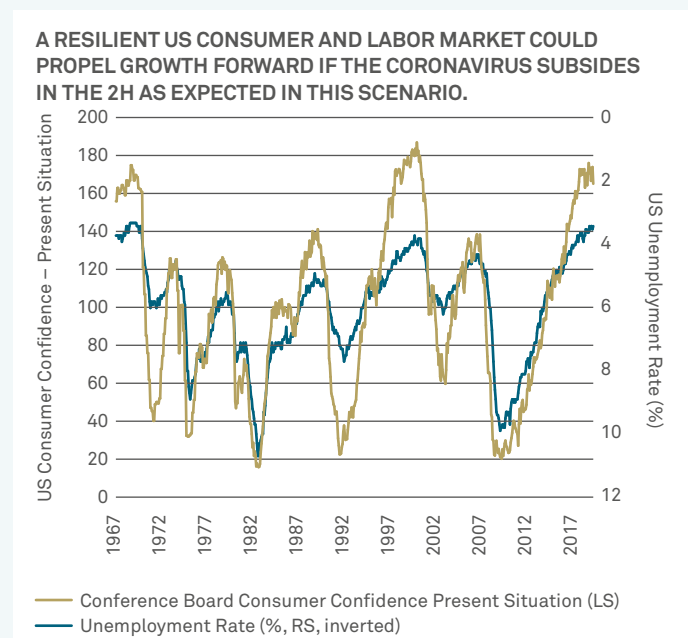
Scenario #4: US inflation returns

In this scenario, US recessionary fears are overdone and the coronavirus spread is contained, with a strong recovery starting in H2. US growth, led by a strong and healthy consumer along with increased monetary stimulus and lower trade uncertainty, remains the most resilient economy and resumes the upward trajectory seen in Q4/early Q1. Rest of world growth lags behind the US.

US growth gains momentum in late 2020/early 2021. Inflation expectations come sharply off historical lows. As the US is more resource constrained than anticipated, inflation rises and surpasses the Fed's 2% target leading the Fed to tighten policy and raise rates, even as growth in the rest of world remains slow. A large divergence emerges between monetary conditions in the US and elsewhere.

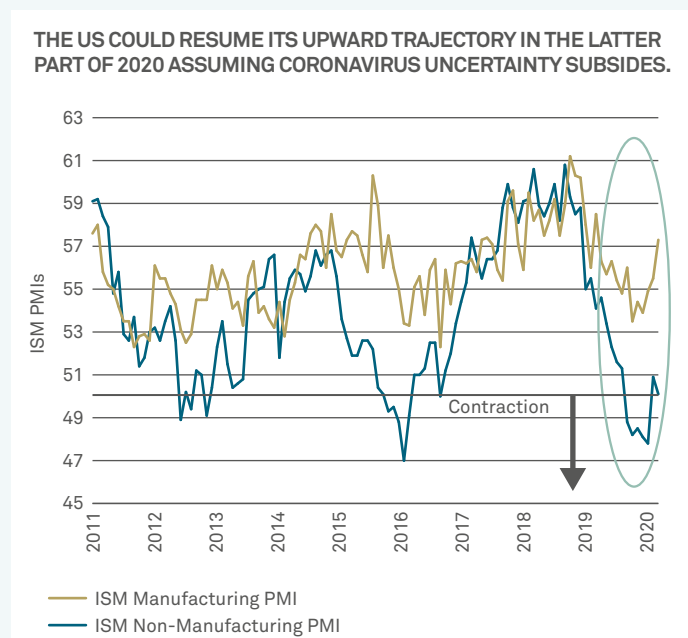
The dollar shortage reappears and capital flight from EMs picks up, particularly out of Asian EMs. The 'carry trade' reverses and dollar reserves are depleted much faster than expected; a number of dollar pegs (including the yuan) come under severe pressure. The collapse in short-term dollar financing affects investment and output in key dollar-exposed EMs, which domestic monetary policy can only ameliorate slightly. China, Asia and other EMs hit hardest, but knock-on effects to developed economies too, notably Eurozone.

US Consumer Confidence and Unemployment



Monthly data as of February 2020. Source: BNY Mellon using data from Bloomberg.

US ISM Manufacturing and Service PMIs



Monthly data as of February 2020. Source: BNY Mellon using data from Bloomberg.

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SECTION 1B

Economic Forecasts

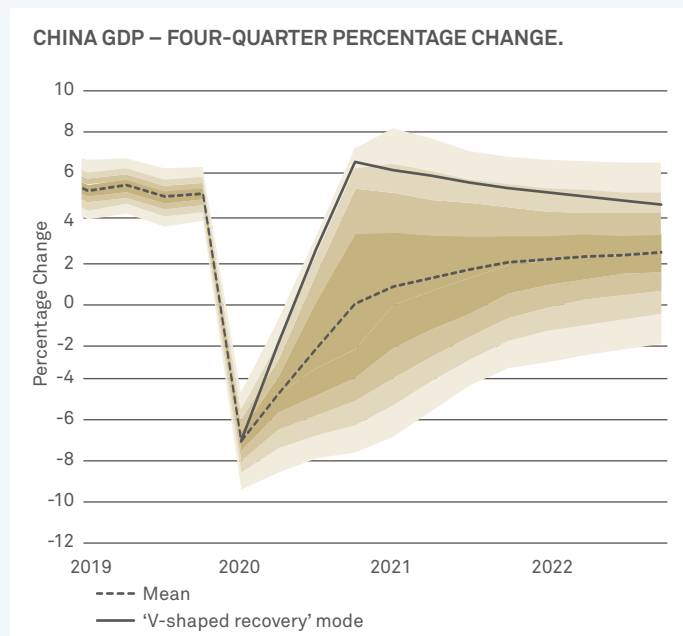
For much of January, the global economy appeared to be ‘Turning a Corner’, tracking closely what we had judged to be the single most likely, or central scenario at the time of our previous Vantage Point. Equities drifted higher in the first few weeks of this year, boosted by confirmation that the US and China had agreed a ‘Phase 1’ trade deal. Then, in late January, sentiment began to turn as it became clear that a new disease, COVID-19, was spreading rapidly through mainland China’s human population. It shifted dramatically in February as the virus began to infect a number of other countries in much the same way, and investors came to fear a pandemic, which was formally declared by the World Health Organization in early March. The emergence of COVID-19 has caused us, and many other forecasters, to reassess dramatically the outlook for the global economy and its financial markets. As a result of this, the shape of our fan charts has changed materially over the past three months, particularly in the near term, but also further out.

In our V-shaped recovery scenario, to which we attach only a 35% weight, the macroeconomic consequences of COVID-19 are broadly contained, and output relative to potential follows something close to a ‘V’ shape. In the quarter when infection takes hold economic activity falls sharply as movement is restricted in

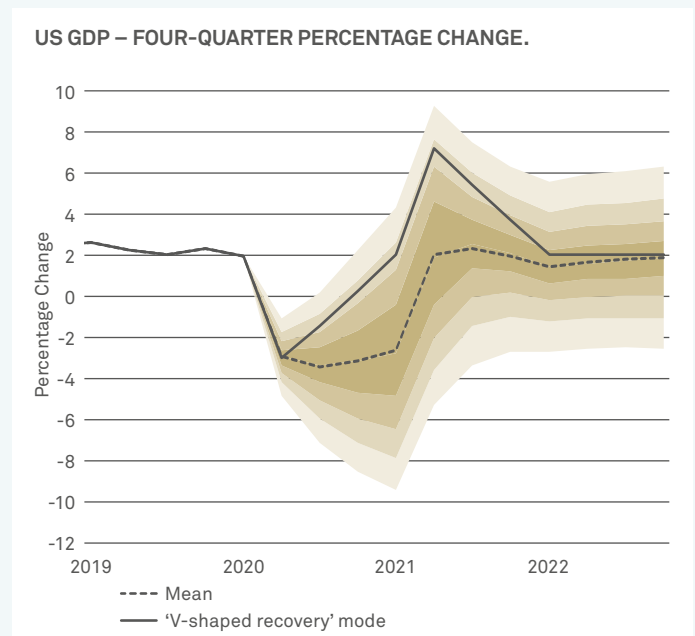
an attempt to slow the spread of the disease. Within a few months, the number of infections reaches a peak, people return to work, and inventories are replenished. Activity recovers so that, within four quarters, GDP is broadly back to where it would have been had the disease never emerged. To calibrate the initial impact, we make judgements about the proportion of those in employment who are unable to attend their place of work, the time period over which restrictions remain in place, and the fraction of the workforce who are nevertheless able to contribute to economic output from their homes.

There is considerable uncertainty about even the immediate impact of COVID-19 on the global economy. That is why our fan charts for four-quarter growth are wide, even in 2020 Q1 in the case of China, with the central 80% of the distribution lying between -8.6% and -3.8%. By the end of this year, the fan chart is wider still, reflecting the very different outcomes for economic growth in our two upside scenarios (‘Virus Contained’ and ‘Inflation Returns’), and our two downside scenarios (‘Globalization is Dead’ and ‘Financial Market Shake-out’). We see a slightly greater than even chance of a contraction in the size of China’s economy through this year. According to the official data, that has not occurred since 1976. Any estimate of economic

The two solid lines show the V-shaped upside scenario mode and mean (probability-weighted average) forecasts. The darker bands towards the center of the fan chart show the more likely outcomes, while the lighter bands show progressively less likely outcomes covering 90% of the forecast distribution. The width of the fan chart shows the level of uncertainty.



% y/y also refers to four-quarter % change. Forecasts as of March 17, 2020.
Source: BNY Mellon Global Economics and Investment Analysis (GEIA) and Fathom Consulting.



% y/y also refers to four-quarter % change. Forecasts as of March 17, 2020.
Source: BNY Mellon GEIA and Fathom Consulting.

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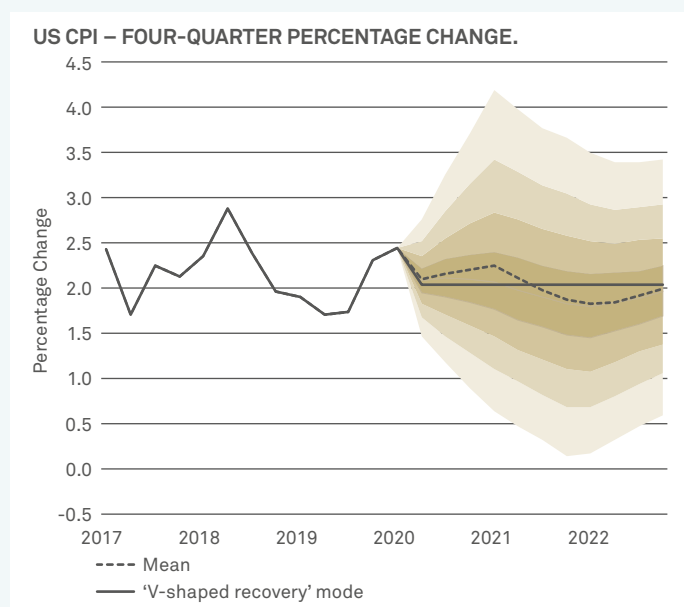
growth is, in truth, subject to measurement error. In recent years, a number of economists have become increasingly skeptical about the accuracy of China's national accounts, with some proposing their own alternative measure of the pace of economic activity, such as Fathom Consulting's China Momentum Indicator (CMI). In an effort to capture some of this uncertainty, our fan chart for Chinese GDP growth incorporates a range of possible outcomes even in the past.

Although it seems likely that COVID-19 will spread to most, if not all countries, its impact, in terms of human casualties and in terms of the economy, will depend on the response of the authorities in each case. We have taken the view that in the major economies restrictions on movement will affect a smaller proportion of the workforce than has been the case in China, and that more people will be able to work from home. This means that the hit to economic activity in the quarter where infection takes hold is smaller in these countries than it is in China. Nevertheless, fan charts for growth in the United States and in the Eurozone retain the negative skew seen in the fan chart for growth in China,

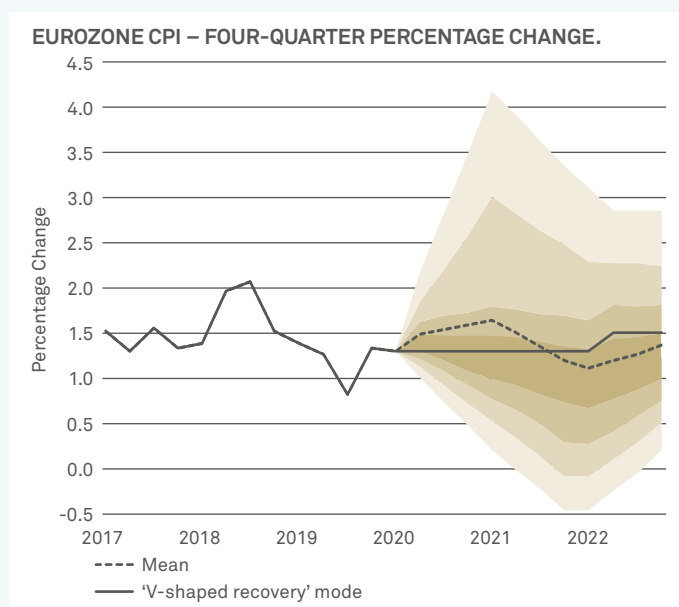
reflecting the aggregate 55% weight that we attach to our two downside scenarios. We see close to a 75% chance of a contraction in US economic activity through this year. The corresponding figure for the Eurozone is greater than 80%.

The emergence of COVID-19, and the resulting restrictions on free movement, are likely to reduce both aggregate supply and aggregate demand. In 'Virus Contained', these effects are short-lived, and our forecasts for inflation are little changed from the previous Vantage Point. But in 'Globalization is Dead', the negative supply shock endures and comes to dominate, first as significant outbreaks of the disease continue around the world into next year, interrupting global supply chains, and second as dissatisfaction with these interruptions encourages onshoring, setting in motion a sustained period of deglobalization. In this scenario, inflation rises materially above target in the major economies. Combined with our 'Inflation Returns' scenario, this imparts an upward skew to our fan charts for CPI inflation. Despite the near inevitability of recession, we see close to a one-in-four chance that Eurozone inflation exceeds 2% by the end of this year.

The two solid lines show the V-shaped upside scenario mode and mean (probability-weighted average) forecasts. The darker bands towards the center of the fan chart show the more likely outcomes, while the lighter bands show progressively less likely outcomes covering 90% of the forecast distribution. The width of the fan chart shows the level of uncertainty.



Forecasts as of March 17, 2020.
Source: BNY Mellon GEIA and Fathom Consulting.

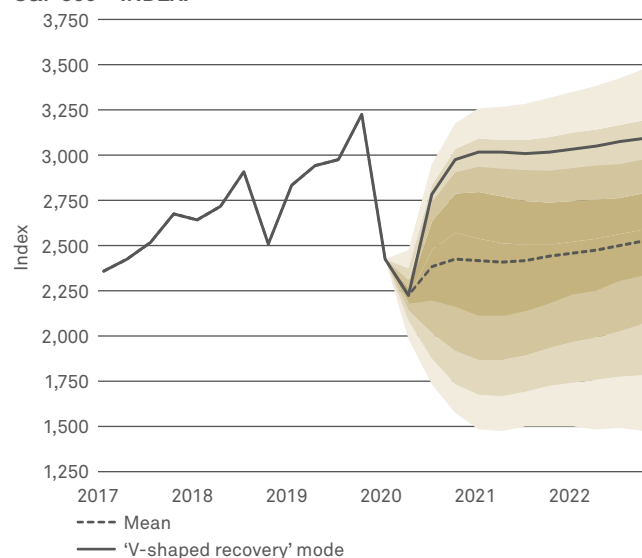


Forecasts as of March 17, 2020.
Source: BNY Mellon GEIA and Fathom Consulting.

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The fed funds rate has been cut by a cumulative 150 basis points this year at two unscheduled meetings, both held in March. We see around a 1-in-4 chance that it reaches the zero lower bound or passes through it by the end of 2020. In our V-shaped recovery, ten-year US Treasury yields rebound in the second half of the year, as it becomes clear that the macroeconomic consequences of COVID-19 will be contained. But risks to this scenario are clearly to the downside, and we see close to a 1-in-4 chance that yields turn negative by the end of the year. Our fan chart for the S&P 500 is unusually broad, reflecting the heightened degree of uncertainty associated with the spread, and the macroeconomic consequences of COVID-19. The V-shaped recovery in the S&P 500 in our central case matches the V-shaped recovery in yields. Nevertheless, as with yields, risks to equity prices lie to the downside. We see around a 1-in-3 chance that the S&P 500 drops below 2000 by early next year.

S&P 500 – INDEX.

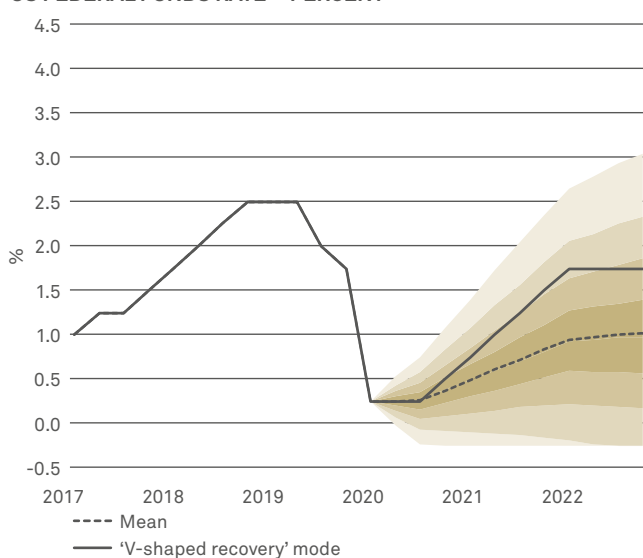


Forecasts as of March 17, 2020.

Source: BNY Mellon GEIA and Fathom Consulting.

The two solid lines show the V-shaped upside scenario mode and mean (probability-weighted average) forecasts. The darker bands towards the center of the fan chart show the more likely outcomes, while the lighter bands show progressively less likely outcomes covering 90% of the forecast distribution. The width of the fan chart shows the level of uncertainty.

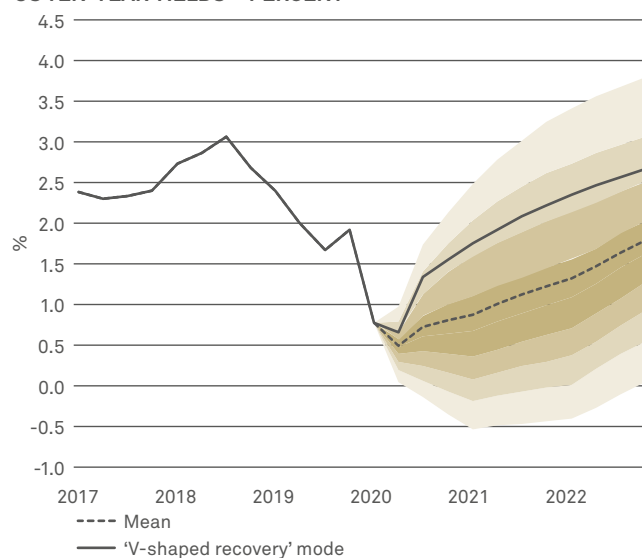
US FEDERAL FUNDS RATE – PERCENT



Forecasts as of March 17, 2020.

Source: BNY Mellon GEIA and Fathom Consulting.

US TEN-YEAR YIELDS – PERCENT



Forecasts as of March 17, 2020.

Source: BNY Mellon GEIA and Fathom Consulting.

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SECTION 2

Capital Markets



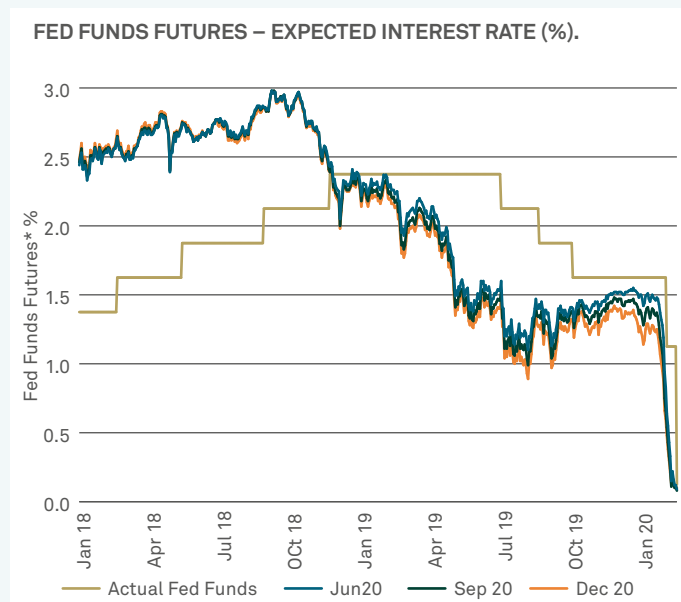
SECTION 2A

Capital Market Pricing – What is Priced In?

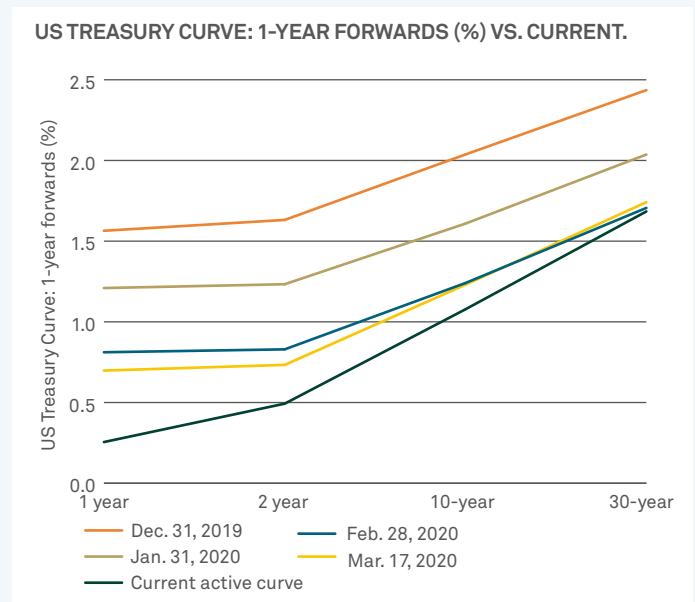
INTEREST RATES

Interest rate expectations were relatively stable for the first half of Q1 as there was increasing evidence that the global economy had bottomed and was starting to improve, particularly in the manufacturing sector. The market initially brushed off concerns stemming from the coronavirus but as cases started to grow outside China, risk-aversion escalated dramatically. After a surprise 50 bp cut on March 3 and another 100 bp on March 15, the market expects rates to remain unchanged until 2022. In our V-shaped recovery scenario (35%) where the virus spreads but economic impact is contained we expect rates to remain on hold

from current levels for 2020. However, the 55% probability attached to our downside scenarios – 1) U-shaped recovery via financial market shake-out and 2) L-shaped recovery via globalization – and accompanying impact on the distribution of potential outcomes (see fan chart) suggest that risks remain skewed to the downside and that rates may stay at zero for longer, and even become negative. Our distribution of forecasts in previous Vantage Points were generally more optimistic than what market pricing suggested; however, for the first time we acknowledge the market's concern.



*Expected Fed Funds rate at the corresponding date. Data as of March 17, 2020.
Source: BNY Mellon using data from Bloomberg.



Data as of March 17, 2020. Market estimate of US Treasury yields one-year forward at each date. Source: BNY Mellon using data from Bloomberg.

GOVERNMENT BONDS

Similar to rates, we are more constructive towards growth and inflation than what is suggested by market pricing. However, our mean, or probability weighted, forecast suggests the 10-year Treasury will remain near current levels if not slightly lower and then steadily drift higher in 2021. This is because in both our upside scenarios inflation regains upward momentum and in one of the downside scenarios, globalization flatlines, inflation increases via higher costs from supply side disruptions. However, like rates risks to our view are also skewed to the downside.

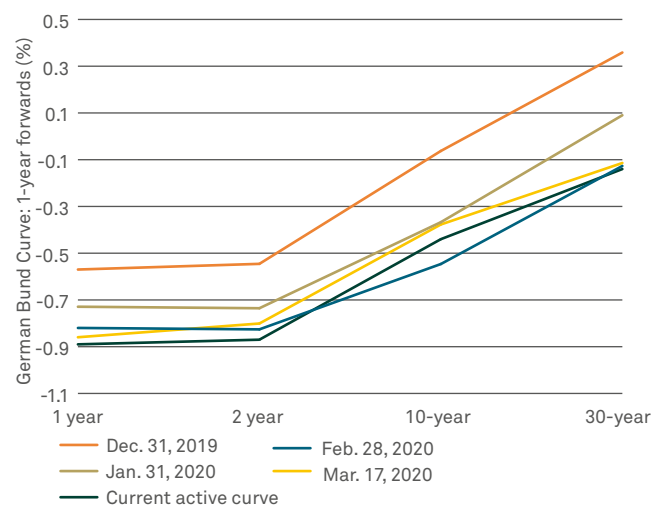
During Q1, forward curves in the US shifted markedly lower (between 70-90 bp as of 3/17) with the short end falling the furthest. From current levels and in-line with our forecasts,

markets expect modestly higher yields over the next 12-months and more so on the short-end. Forward curves in Germany fell less than in the US yet yields are expected to remain deep in negative territory but increase from current levels.

The US Treasury yield curve reinverted on the short-end in Q1 but then steepened as front end rates descended the furthest on Fed rate cuts to the zero-bound.

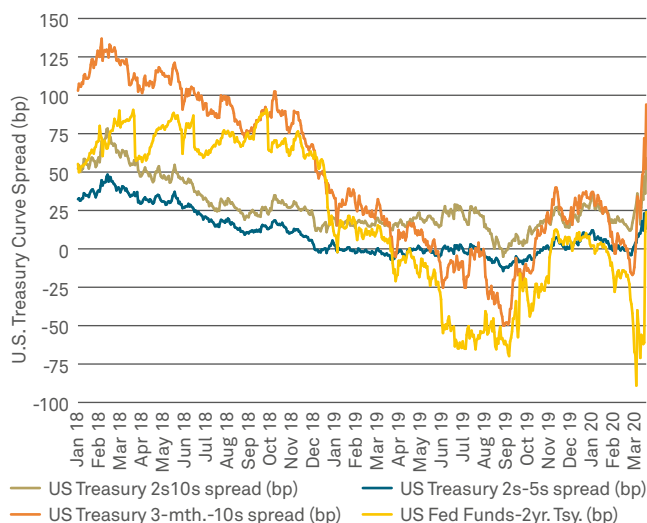
Overall, our forecasts for yields imply a market that is pricing in the worst case scenario, and while our mean forecasts implies that yields shift higher by year-end, we acknowledge the market's concern as reflected in the downside skew to our estimates.

GERMAN BUND SOVEREIGN CURVE: 1-YEAR FORWARDS (%) VS. CURRENT.



Data as of March 17, 2020. Market estimate of German bund yields one-year forward at each date. Source: BNY Mellon using data from Bloomberg.

US TREASURY YIELD CURVE SPREAD (BP).

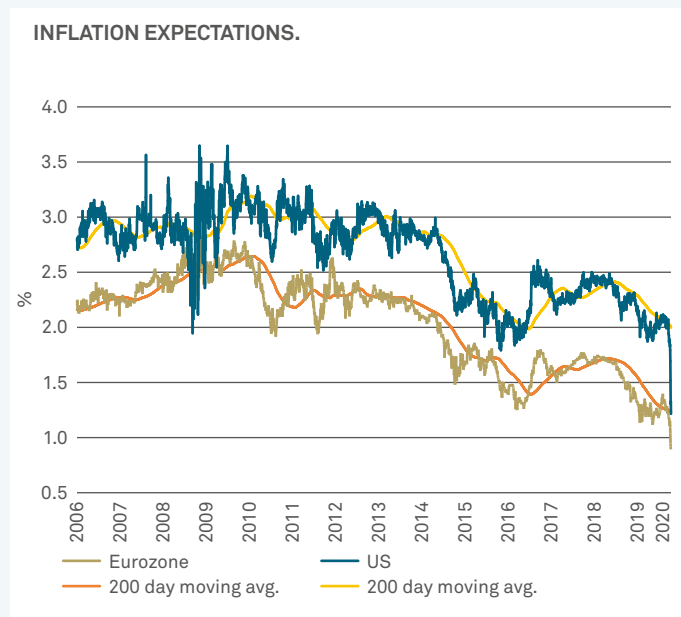


Data as of March 17, 2020. Source: BNY Mellon using data from Bloomberg.

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INFLATION

After rising in Q4 from promising signs of a global economic rebound, inflation expectations declined in Q1. Downward momentum accelerated as risk-off sentiment spiked from coronavirus concerns and inflation expectations dropped to all-time lows in both the US and Eurozone. The 5y5y inflation swap fell 65 bp to 1.41% (March 16) in the US and by 49 bp to 0.83% in the Eurozone. The market's view of inflation is more consistent with our downside scenarios as our probability weighted mean sees inflation improving by year-end. This is because in both our upside scenarios inflation regains upward momentum and in one of the downside scenarios, globalization flatlines, inflationary pressure rises thanks to higher costs from supply side disruptions. Along with our estimates for rates and yields, risks to our outlook are tilted to the downside and by more so than our last report.



5y5y inflation swap, 5-year expected inflation 5 years from now. Data as of March 17, 2020. Source: BNY Mellon using data from Bloomberg.

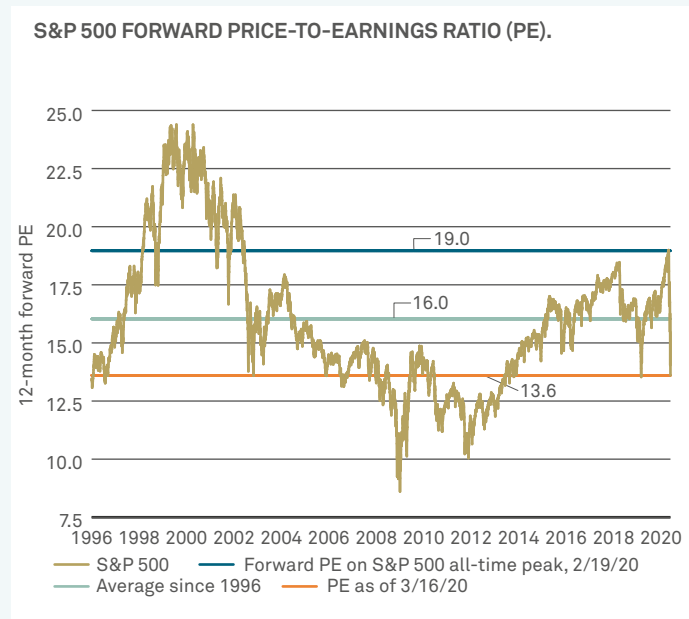
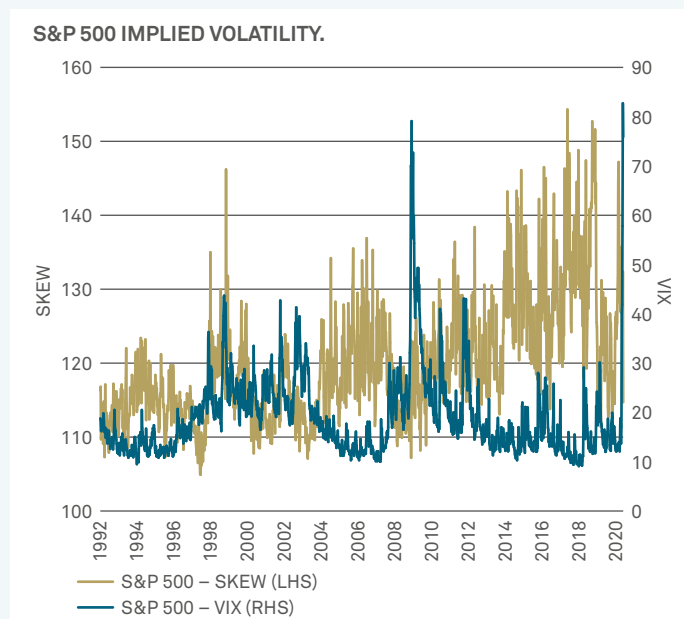
EQUITIES

2019 earnings growth for the S&P 500 was flat and coming into 2020 markets were pricing in an improved earnings outlook stemming from signs of an economic rebound and less trade uncertainty. 2020 earnings growth estimates held steady through February in Q1 between 7%-9% but are expected to weaken significantly from the coronavirus. As of March 23 2020 estimates per FactSet are 2.7% and are expected to continue moving lower. Prior to the S&P 500 peak on February 19, the S&P 500 forward PE had reached the highest post-crisis at 19.0, implying that the market had yet to price in any coronavirus-related damage thus was particularly vulnerable to any shift in sentiment.

In our last Vantage Point we had become more optimistic but “when compared to our forecasts we still believe current measures of volatility suggest a market that has become overly

complacent and susceptible to an exogenous shock.” As such, the spread of coronavirus and measures to limit the contagion have highlighted this vulnerability. We had also mentioned that “global equity returns were largely driven by multiple expansion in 2019 and will likely need higher earnings in 2020 for the rally to continue.” With lower earnings expected and limited upside potential until H2, as reflected in the V-shaped recovery, markets have sold off.

The subsequent surge in volatility and market correction reflects markets pricing in outcomes from our two downside scenarios – globalization flatlines and financial market shake-out. While our two upside scenarios total 45% probability, the greater relative severity of our downside scenarios and higher relative probability (55%) shifts the risks to equity prices to the downside as reflected in our fan chart.



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SECTION 2B

Market Sentiment

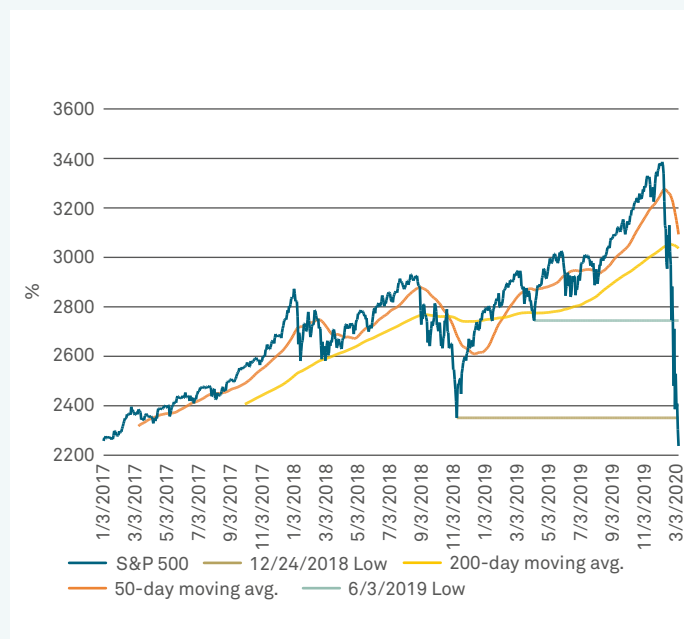
The global spread of the coronavirus and ensuing disruption to supply chains has quickly shifted the economic and market outlook for 2020. The situation is evolving rapidly and markets are pricing in a larger and more widespread hit to global growth. Economists are slashing growth expectations for 2020 almost on a daily basis as new information becomes available. Fear of a large shock to growth and earnings is causing wild swings in the equity markets and a headlong rush to safety in the bond market, pushing yields to all-time lows. The heightened market volatility is being driven by an absence of clarity and the uncertainty about the range of scenarios of how the situation could evolve. In a vacuum, investors are beginning to price in downside scenarios given the lack of information, rapid contagion, some panic by governments and corporations, supply chain disruptions and contraction of consumption.

Both the bond and equity markets are pricing in a looming recession. Credit market spreads have begun to widen in the

most vulnerable industries including energy, leisure, airline and hospitality.

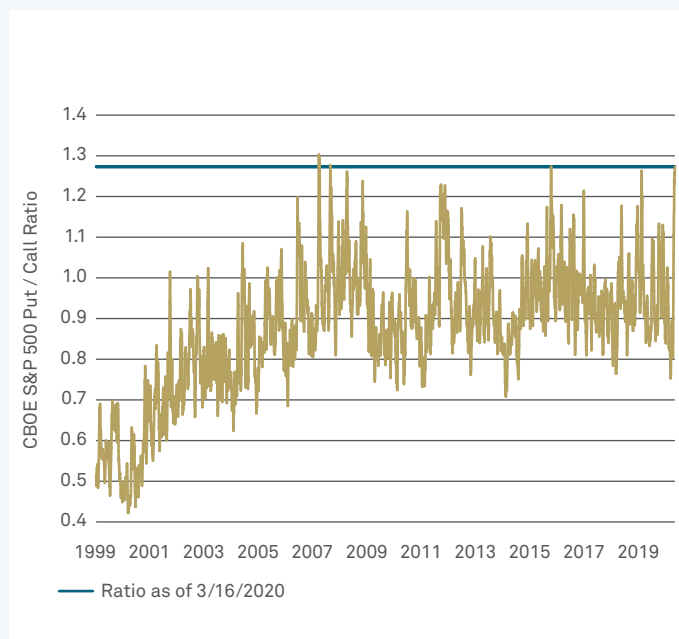
At best, with rolling quarantines across the developed economies, we expect economic repercussions to persist for the first half of the year and spill into the third quarter. Investors are faced with the question of whether the 34% (as of 3/23) equity sell-off from the high is sufficient to price-in the hit to the economy and to earnings if there is a bounce back in the second half of the year. As of this writing, 2020 earnings estimates still sit at 2.7% growth as of 3/23 per FactSet, a number which is likely stale and likely to move towards another flat year of earnings growth at best with a rising probability that growth could be less than -10%. Nevertheless, if there is a rebound in growth and earnings in the second half into 2021 there will be a moment to edge back in. That price level will be dependent on greater clarity around the trajectory of the economic impact, hence we expect further chop, and further downside, from here.

The S&P 500 Breached the Technical Test of the December 2018 Low



Daily data as of March 23, 2020. Source: BNY Mellon using data from Bloomberg.

Heightened Risk Aversion Drove the S&P 500 Put/Call Ratio to All-time Highs



CBOE: Chicago Board Options Exchange. Daily data as of March 16, 2020. Ratio show as trailing 10-day average.

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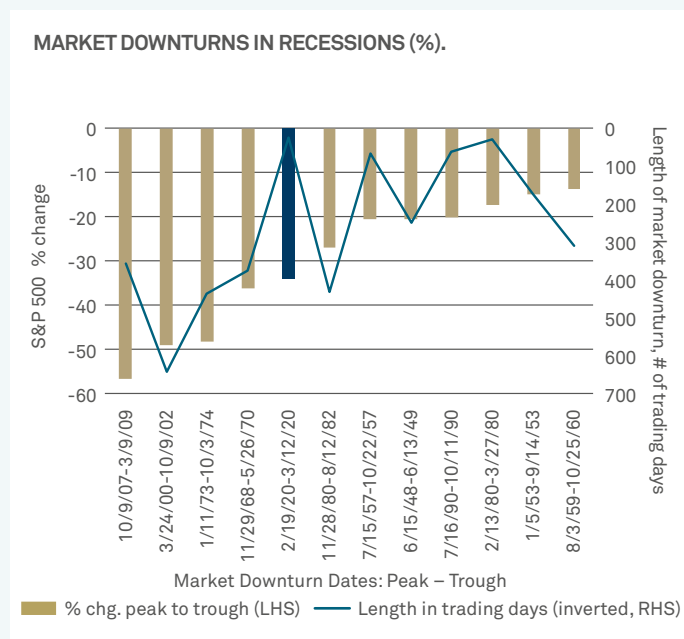
Concerns have begun to surface that risks about rising defaults in the high yield market may spill over to the broader credit markets. There is risk of a wave of ‘fallen angel’ downgrades, as the share of BBB-rated bonds (\$2.8 Trillion market size) in the investment grade market has risen notably in the past number of years. Some investors may be forced to sell ‘fallen angels’, for example if their mandate prevents them from holding high-yield bonds (\$1.2 trillion market size). And this selling pressure could test the ability of dealers to absorb them, potentially causing market dysfunction and disorderly price moves. Ultimately all this would lead to an abrupt contraction in the supply of credit and constrain funding for otherwise creditworthy firms.

Sings of dislocation were also visible in the ultra-liquid Treasury market, as a need for cash created imbalances during the rapid downdraft, and in US dollar funding markets. To ease such stress the Fed announced a new round of QE, with purchases

of at least \$500 billion in Treasury securities and \$200 billion in mortgage-backed securities, as well as a number of emergency liquidity measures, including a dramatic increase in the size of the Fed’s repo auctions and, in coordination with other major central banks, the opening up of foreign exchange swap lines in greater size and at a lower rate.

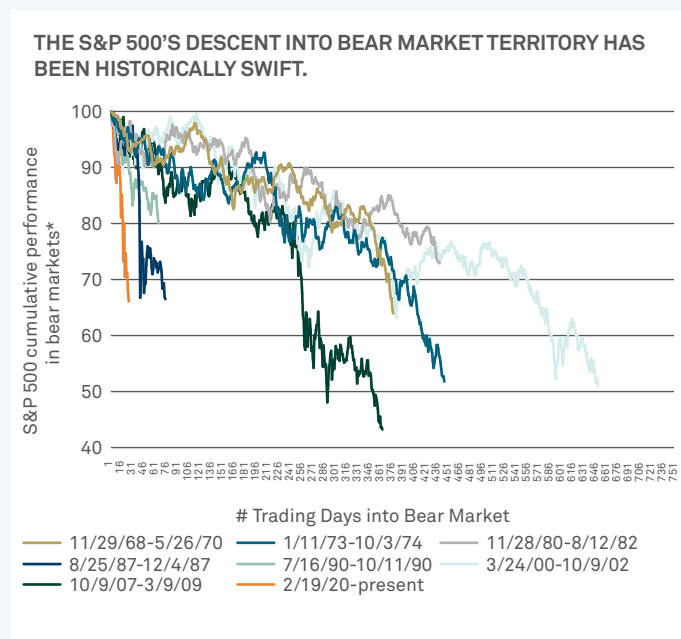
Led by the Fed, global central banks will likely continue to ease to buffer the damage and support sentiment. Despite their best efforts, uncertainty should remain elevated until it is clear coronavirus cases outside China have peaked. In addition, investors are unclear about the actual impact lower policy rates can have on output over the near-term. More important will be the central banks to maintain the flow of liquidity into the real economy and provide support for the credit markets. Key markets remain fragile and we may see further dislocations unless central banks step in.

S&P 500 Market Downturns in Post-World War II Recessions*



*Sorted from left to right by highest to lowest downturn in percentage terms. Data as of March 23, 2020 close. Source: BNY Mellon using data from Bloomberg.

S&P 500 Performance through 20%+ Bear Markets Since 1970*



Recessionary dates used by NBER (National Bureau of Economic Research). # of trading days calculated assuming 252 trading days per year. Data as of March 23, 2020 close.

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We wrote last quarter that investors needed to see economic fundamentals inflect upward to sustain the rally. Clearly, fundamentals have taken a negative turn and investors must decide whether this is a V-shaped recovery after a deep hit in the first half or a less-sunny one, such as in our two downside scenarios. Separate from the probability analysis and growth trajectories, investors are now faced with the additional factor that a prolonged market sell-off that lasts several weeks or months could ultimately hit the consumer with a negative wealth effect. The consumer has been a major pillar of the

US and global economy and the longer the market volatility goes on, the more likely that the sell-off itself negatively pressures US economic fundamentals.

Despite market fears, global central bank support and liquidity, along with likely fiscal stimulus should support economies as they begin to recover from the economic shock. Particularly in the US, even if the economy shows signs of recovery in the second half, the Fed is unlikely to raise rates until after the election, earliest, providing ample support on the upswing.

Implied S&P 500 % change from 2/19 peak based on 2020 earnings growth and PE ranges

		2020 EARNINGS GROWTH (%)				
		0%	-5%	-10%	-15%	-20%
S&P 500 12-mth. fwd PE	11	-47.0	-49.7	-52.3	-55.0	-57.6
	12	-42.2	-45.1	-48.0	-50.9	-53.8
	13	-37.4	-40.5	-43.7	-46.8	-49.9
	14	-32.6	-36.0	-39.3	-42.7	-46.1
	15	-27.8	-31.4	-35.0	-38.6	-42.2
	16	-23.0	-26.8	-30.7	-34.5	-38.4
	17	-18.2	-22.2	-26.3	-30.4	-34.5

Implied S&P 500 year-end price level based on 2020 earnings growth and PE ranges

		2020 EARNINGS GROWTH (%)				
		0%	-5%	-10%	-15%	-20%
S&P 500 12-mth. fwd PE	11	1,793.2	1,703.6	1,613.9	1,524.2	1,434.6
	12	1,956.2	1,858.4	1,760.6	1,662.8	1,565.0
	13	2,119.3	2,013.3	1,907.3	1,801.4	1,695.4
	14	2,282.3	2,168.2	2,054.1	1,939.9	1,825.8
	15	2,445.3	2,323.0	2,200.8	2,078.5	1,956.2
	16	2,608.3	2,477.9	2,347.5	2,217.1	2,086.7
	17	2,771.3	2,632.8	2,494.2	2,355.6	2,217.1

Data as of March 17, 2020. 2020 earnings growth and forward PE (price/earnings) are used for hypothetical purposes. Source: BNY Mellon using data from FactSet and Bloomberg.

SECTION 3

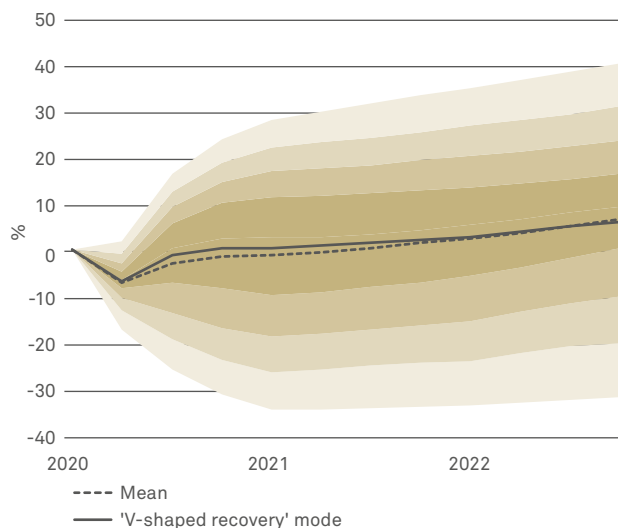
Investment Conclusions



Portfolio Perspective

In the last edition of Vantage Point, we introduced a fan chart to illustrate the impact our scenarios could have on a portfolio including both US equities and fixed income. It compares the forecasted performance of a portfolio holding 80% US equities/20% US fixed income (“risk bull”) with one holding 80% US fixed income/20% US equities (“risk bear”). The relative outperformance of the risk bull portfolio is shown here. Given the current levels of uncertainty and increased severity of our downside scenarios, the forecasted benefit of being risk-on is minimal at best. Said another way, the amount of upside an investor may sacrifice by being risk-off is also minimal. As such, during the lifespan of the virus, we recommend reducing risk exposures until we have more certainty surrounding the depth and breadth of its effect, the situation is likely to get worse before it gets better in all of our scenarios. We believe in providing investment advice that values the avoidance of extreme losses over the attempt to capture speculative gains, and that approach is reflected in our specific asset class views below.

80:20 PORTFOLIO OUTPERFORMANCE.



Forecasts as of March 17, 2020. Source: BNY Mellon GEIA and Fathom Consulting.

EQUITIES

US Equities: Although in our V-shaped recovery scenario, equities see a recovery in the second half, the hit to earnings is well underway and will require more concrete data in order to model the forward looking expectations. There is some temptation for investors to view the unprecedented quick and sharp decline in US markets as a buying opportunity, but after weighing the downside risks and uncertainty that remain, we believe further negative news is likely and do not expect an imminent recovery in prices. Markets may continue to experience swings, and will need positive news to move decisively upward. We suggest reducing exposure to index-tracking instruments to limit the degree of sentiment shocks felt in the portfolio, and maintaining a neutral to slightly underweight stance on equities overall until some evidence of earnings stability is established. We expect US GDP to be hit less hard than other nations, but the likelihood of recession has risen and markets will need to discount the deeper and longer affect the virus will have on global supply and demand.

European Equities: The European economy was in a much more fragile place than the US to start the year, and will likely be affected more dramatically as a result. This increases the probability of Europe falling into a recession, even with a V-shaped global recovery in the 2H. Despite our constructive stance on European equities coming into the year, recent events have, at best, delayed the valuation recovery we expected. We caution investors to wait for virus spread to peak before deploying fresh capital into the region. At a time like this, it is critically important for investors to maintain a quality bias and a strategic viewpoint; we still believe European equities are attractive for the long-term, and high quality companies with strong balance sheets can weather the storm. In the meantime, however, we suggest avoiding passive exposure overall, and avoiding exposure to European Financials.

Emerging Markets (EM) Equities: We believe that the external environment for EM equities has become more complicated by the intensifying coronavirus shock, oil price volatility, and global recession concerns acting as headwinds, and questions over whether the easy global fiscal and monetary stances can be supportive enough for EM earnings. In this environment we believe that a selective approach is key for positive return

opportunities. We are more constructive on countries such as Brazil and Mexico, which have room for further monetary easing, and resilient earnings growth. We think that positive news of virus containment out of China and the rest of Asia may produce selective buying opportunities over the coming months across Emerging Markets as long as our two downside scenarios do not materialize.

FX

US Dollar and Foreign Exchange (FX): FX volatility has surged due to coronavirus and global recession worries along with the oil price war between Saudi Arabia and Russia. However, we do expect volatility to subside over time as global monetary and fiscal policy fuel confidence in markets. In the meantime, the USD's trajectory will be driven by flows into safe US dollar assets and demand for USD cash from international investors. We do not see relative global monetary policy and the convergence of US rates closer to rate levels in the rest of the world as sufficient to drive broad USD weakness. In EM FX, oil price volatility may continue to put pressure on risky EM currencies such as the Colombian and Mexican Pesos as well as the Russian Ruble.

ALTERNATIVES

Alternatives: Risk mitigation via liquid alternative strategies such as absolute return, market neutral and other hedging approaches can provide investors with enhanced bear market protection in these extreme environments. Investors holding private or locked-up alternative investments are shielded from daily market swings and panic selling by the sheer nature of illiquid investments. Although illiquidity can feel limiting at times, it prevents investors from over- or under-reacting to short-term movements and reinforces a long-term approach to investing.

FIXED INCOME

Sovereign Debt: Global Central Banks, led by the Federal Reserve, acted in emergency fashion by cutting policy rates and injecting a flood of liquidity into markets. These actions came on the heels of sovereign debt yields falling even lower than investors thought possible. Liquidity in the Treasury market became stressed and triggered the Fed to launch a new round of Quantitative Easing to support more stable market functioning in Treasuries, MBS, Municipals and corporate debt. We expect these actions to cause a steepening in the yield curve and for the stock/bond correlation to return to a low or negative level. As such, with the expectation of further volatility in risk markets, sovereign debt offers a much needed buffer against sharp swings in risk assets.

Global Investment Grade Credit (IG): As companies gain more clarity on the effects coronavirus will have on earnings in Q1 and Q2, IG credit may face further spread widening in sectors more exposed to the reduction in economic activity (Energy, Technology, Industrials, Consumer), but falling policy rates and market support from the Fed in the US should provide support and keep credit spreads contained. However, there is a chance that some vulnerability in BBB corporates surfaces as earnings take a hit, albeit temporarily. We view US corporate bonds as more attractive than international corporates as the US economy came into this crisis on stronger footing and we expect it to be more resilient through volatility. Effective diversification away from equity beta is critical through environments like this, and IG credit is a necessary tool that can provide not only price protection, but additional yield with less downside risk than stocks.

High Yield (HY) and Leveraged Loans: Mounting fear in risk markets has caused credit spreads in HY and Leveraged Loans to widen to levels seen in Q4 2018. In our Financial Market Shakeout (U-Shaped) scenario, this asset class is at the center of the storm and we would expect it to suffer sharp losses (and a sharper rise in credit spreads) as global markets digest the impact of the virus. Furthermore, the sharp drop in oil prices adds another layer of pressure and uncertainty to the asset class. Given these forces coupled with the correlation to equities, we view it as prudent to reduce risk exposure to this to this asset class until volatility subsides and most of the bad news has been reported.

EM Hard Currency Debt: A stronger USD makes us favor EM hard currency debt relative to local currency debt. Within hard currency debt, we favor sovereign debt over corporates. Given oil price volatility, we suggest a cautious stance in pockets of EM credit that have high exposure to oil.

EM Local Currency Debt: Given the continued uncertain macro environment due to coronavirus and oil prices, we believe hedging local currency risk is a prudent strategy to dampen volatility. We view that for EM local currency debt selective risk taking is advised in the current environment. Continuation of easing inflation in emerging markets where there is still room for further rate cuts along with steep curves make their local debt attractive (such as Brazil, Egypt, and Mexico).

All investments involve risk, including the possible loss of principal. No investment strategy or risk management technique can guarantee returns or eliminate risk in any market environment.

Important Disclosures:

RISKS

Equities are subject to market, market sector, market liquidity, issuer, and investment style risks, to varying degrees.

Bonds are subject to interest-rate, credit, liquidity, call and market risks, to varying degrees. Generally, all other factors being equal, bond prices are inversely related to interest-rate changes and rate increases can cause price declines. **Commodities** contain heightened risk, including market, political, regulatory, and natural conditions, and may not be suitable for all investors. **High yield bonds** involve increased credit and liquidity risk than higher-rated bonds and are considered speculative in terms of the issuer's ability to pay interest and repay principal on a timely basis. Investing in **foreign denominated and/or domiciled securities** involves special risks, including changes in currency exchange rates, political, economic, and social instability, limited company information, differing auditing and legal standards, and less market liquidity. These risks generally are greater with emerging market countries.

Small and midsize company stocks tend to be more volatile and less liquid than larger company stocks as these companies are less established and have more volatile earnings histories. **Currencies** can decline in value relative to a local currency, or, in the case of hedged positions, the local currency will decline relative to the currency being hedged. These risks may increase volatility.

Alternative strategies may involve a high degree of risk and prospective investors are advised that these strategies are suitable only for persons of adequate financial means who have no need for liquidity with respect to their investment and who can bear the economic risk, including the possible complete loss, of their investment. The strategies may not be subject to the same regulatory requirements as registered investment vehicles. The strategies may be leveraged and may engage in speculative investment practices that may increase the risk of investment loss. Investors should consult their investment professional prior to making an investment decision.

INDEX DEFINITIONS

US Consumer Prices (CPI) Index measure of prices paid by consumers for a market basket of consumer goods and services.

The yearly (or monthly) growth rate represents the inflation rate. The **10Y US Treasuries Average Yield** of a range of Treasury securities all adjusted to the equivalent of a ten-year maturity. The **CBOE VIX Index (VIX)** is an indicator of the implied volatility of S&P 500 Index as calculated by the Chicago Board Options Exchange (CBOE). The **Majors Dollar Index (USD)** measures the value of the US dollar relative to a basket of currencies of the most significant trading partners of the US including the euro, Japanese yen, Canadian dollar, British pound, Swedish krona, and Swiss franc. The **MSCI EM Index (Emerging Markets Equities)** tracks the total return performance of emerging market equities. The **S&P 500 Composite Index (S&P 500)** is designed to track the performance of the largest 500 US companies. **Europe STOXX 600** Index represents the performance of 600 large, mid and small capitalization companies across 18 countries in the European Union. **Bloomberg Barclays US Corporate High Yield:** covers the universe of fixed-rate, non-investment grade corporate debt in the US. **Bloomberg Barclays US Corporate Investment Grade:** designed to measure the performance of the investment grade corporate sector in the US **1-mth. 1-year forward swap:** the avg. interest rate for 1-mth. in 1-year forward. **GDP:** gross domestic product is the total monetary or market value of all the finished goods and services produced within a country's borders over a given time period. **Fed funds Rate:** the target interest rate for overnight lending and borrowing between banks. **Purchasing Managers Index (PMI):** An economic indicator derived from monthly surveys of private sector companies. A level above 50 indicates expansion compared to the prior month and below 50 contraction.

STATISTICAL TERMS

Skewness in statistics represents an imbalance and an asymmetry from the mean of a data distribution. In a normal data distribution with a symmetrical bell curve, the mean and median are the same. **Probability-weighted mean** is similar to an ordinary arithmetic mean, except that instead of each of the data points contributing equally to the final average, data points are weighted by the statistical probability for a particular scenario outcome. **Duration** is a measure of a bond's interest-rate sensitivity, expressed in years. The higher the number, the greater the potential for volatility as interest rates change. **Z-score:** number of standard deviations from the mean a data point is.

BNY Mellon Global Economics and Investment Analysis team



Shamik Dhar
Chief Economist



Alicia Levine, PhD
Chief Strategist



Liz Young, CFA
Director of Market Strategy



Lale Akoner
Market Strategist



Bryan Besecker, CFA, CAIA
Market Strategist



Sebastian Vismara
Financial Economist

im.bnymellon.com

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