

Special Topic: The Perfect Storm for Rising Rates

As 2020 goes into the history books, global economies still face an unprecedented challenge from the Covid pandemic. 2021 should provide a much more benign environment for risk assets, but may also bring about much higher interest rates. Advocate model indicates that 10-year Treasury yield may rise by more than 160bps in each of the next two years, an outcome that is almost 10 times greater than implied by the current forward market.

2020 Was a Bad, Bad Year

If you're going through hell, keep going.

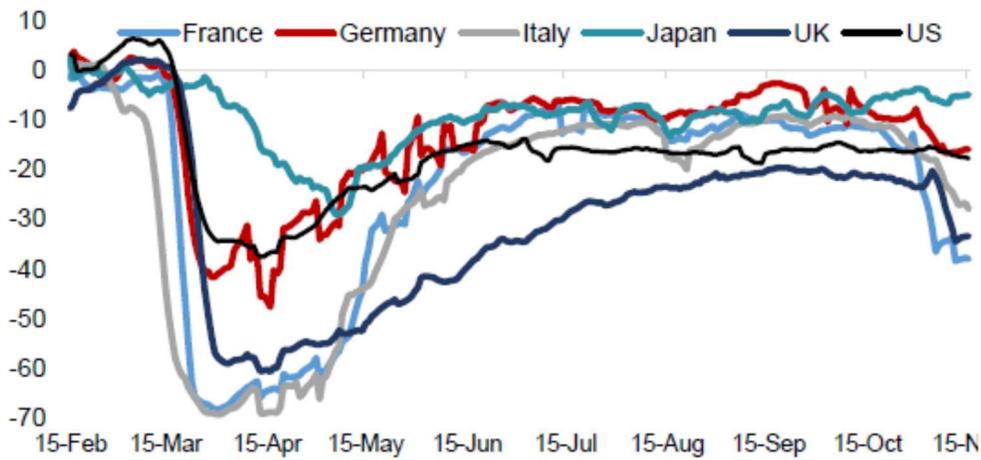
-Winston Churchill

Global economies are undeniably going through one of the roughest periods in recent history, having to contend with:

1. Covid Waves 3 and 4 driving another global economic slowdown
2. Economic restructuring due to stay-at-home workforce and retail/food service closures
3. Disinflation concerns greater than inflationary

By Deutsche Bank's estimates, 2020 produced some of the sharpest declines in economic activity in many years. For some countries, the drop in GDP was the largest in several hundred years (U.K. since 1710) or at least since World War II (Japan since 1945, U.S. since 1946). Google mobility data (chart below) can be used to proxy real-time economic activity in various countries. It shows the onset of another wave of pandemic slowdown in late 2020.

FIGURE 1. ACTIVITY AS REPRESENTED BY AVERAGE OF 3 GOOGLE MOBILITY INDICATORS (RETAIL & RECREATION, GROCERY & PHARMACY, WORKPLACES)



Sources: Credit Suisse, Google Mobility Data

CBO estimates¹ the outright impact of the pandemic on U.S. economic activity to be about -10% in 2020. Although vaccine distribution has begun, economic activity in 2021 may still face some lingering drag from the pandemic. We assume the 2021 economic drag from the pandemic would be only a quarter the size of the 2020 drag, i.e. -2.5%.

2021 – The Great Post-Pandemic Recovery

The future's so bright, I gotta wear shades

- Timbuk 3

2021 heralds the start of the post-pandemic recovery. A number of factors are coming together to drive both an excellent environment for economic recovery as well as the perfect storm for higher rates:

1. The Covid vaccines are coming in 2021!
2. Huge amount of fiscal stimulus in the pipeline and the supercharged post-Covid economic rebound
3. Pent-up spending power in household savings and housing appreciation in 2020
4. Massive increase in government debt to finance fiscal stimulus programs
5. Huge monetary stimulus in the pipeline
6. Willingness of the Fed and other major central banks to be behind the curve on the recovery, i.e. hike much slower than historical norms even if inflation is at or above its long-term 2% target
7. Cessation and gradual runoff (tapering) of QE

Methodology

This paper will address each of the above factors and quantify their ultimate impact on interest rates in 2021 and 2022. We included the following factors in our quantification of potential rate rise:

- Fiscal stimulus impact on economy
- Government fiscal deficits
- Impact of monetary policy on interest rates (downward only)
- Impact of central bank willingness to tolerate greater-than-2% inflation for the time being
- QE and subsequent tapering
- Pent-up consumption

¹ “The Effects of Pandemic-Related Legislation on Output”, Congressional Budget Office, September 2020.

We did not include the following in our analysis:

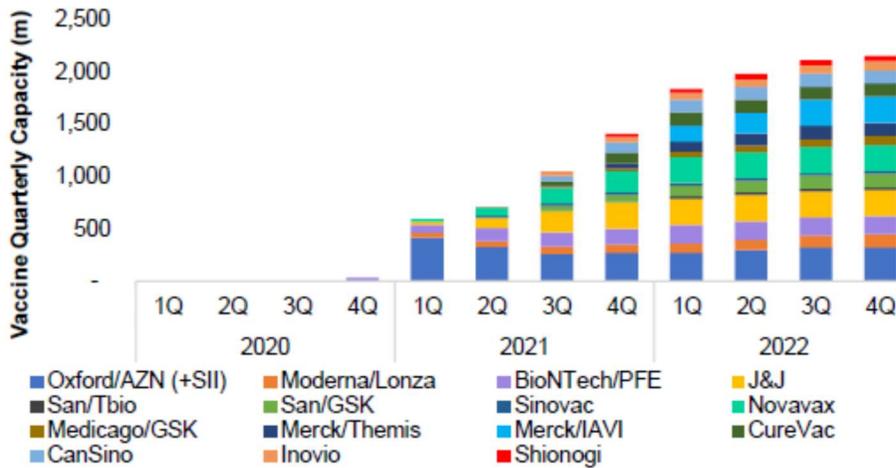
- Stimulative effect of monetary policy in 2020 – There is considerable uncertainty as to the relationship between the length / size of monetary easing and the strength of the subsequent recovery. Given the one-off nature of the pandemic, that uncertainty would be greater still. We therefore elected not to include this effect, which means our rate rise analysis would err on the conservative side.
- Additional fiscal stimulus from the Biden Administration. In light of the Democrats winning both Georgia Senate seats, it is almost a certainty that additional fiscal stimulus programs will be forthcoming in 2021. Rather than make assumptions of the size of a Biden stimulus package, we opt to not include it in our analysis but instead will quantify the rate impact of each additional \$100Bn of fiscal stimulus.

I. The Covid Vaccines are Coming in 2021!

While we are far from Covid experts, it is impossible to construct a macroeconomic narrative of 2021 without taking Covid vaccines into consideration. The U.K. began the first vaccinations of Pfizer’s fully phase-3 tested vaccine on December 8th and the U.S. started on December 14th after the FDA granted Emergency Use Authorization (EUA) to Pfizer (and Moderna one week later). While initial distribution of any regulator-approved vaccine will be limited largely to health-care workers and the most vulnerable populace, broad distribution of vaccines will ramp up in Q1-2021. Credit Suisse estimates that global vaccination capacity will exceed 1 billion by the third quarter of 2021 and reach 2 billion by the first quarter of 2022.

Global approval of the Astrazeneca/Oxford (“AO”) vaccine will likely be needed to bring about a significant economic recovery in emerging markets. The unit price of the AO vaccine is considerably lower than competitors and emerging countries may not have sufficient cooling infrastructure necessary to support and store Pfizer & Moderna vaccines. The well-publicized AO vaccine problems in phase 3 trials could well have set back EM recovery by another quarter versus advanced economies. Credit Suisse’s analysis shows that the majority of Q1-2021 supply of vaccines was to have been supplied by AO. This may no longer be the case.

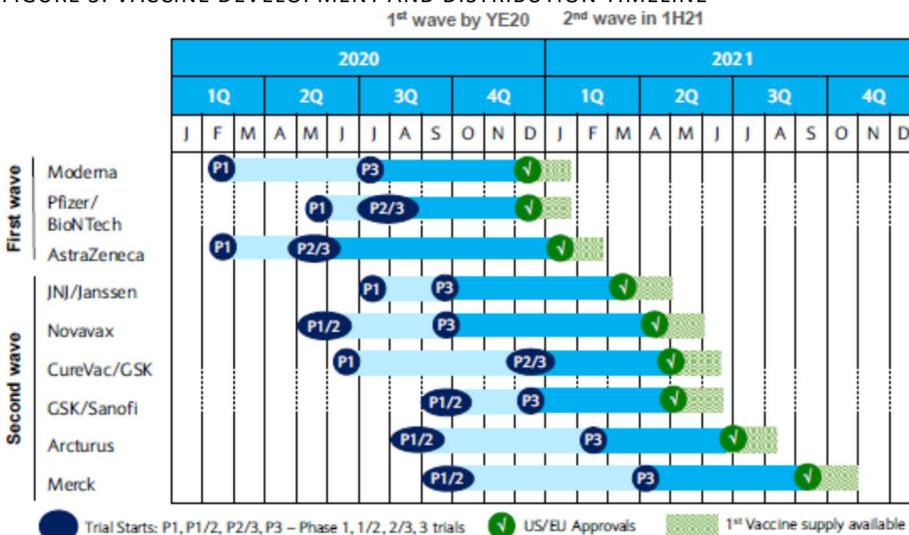
FIGURE 2. CREDIT SUISSE ESTIMATE OF GLOBAL VACCINATION CAPACITY (PERSONS)



Sources: Credit Suisse European Pharma Equity Research estimates, company data

Barclays believes that “most developed market economies could reach population immunity by the end of Q2 or Q3” in 2021. If that estimate is correct, there could be the beginnings of a major rebound in economic activity in Q1/Q2 as the vaccines work their way through the population.

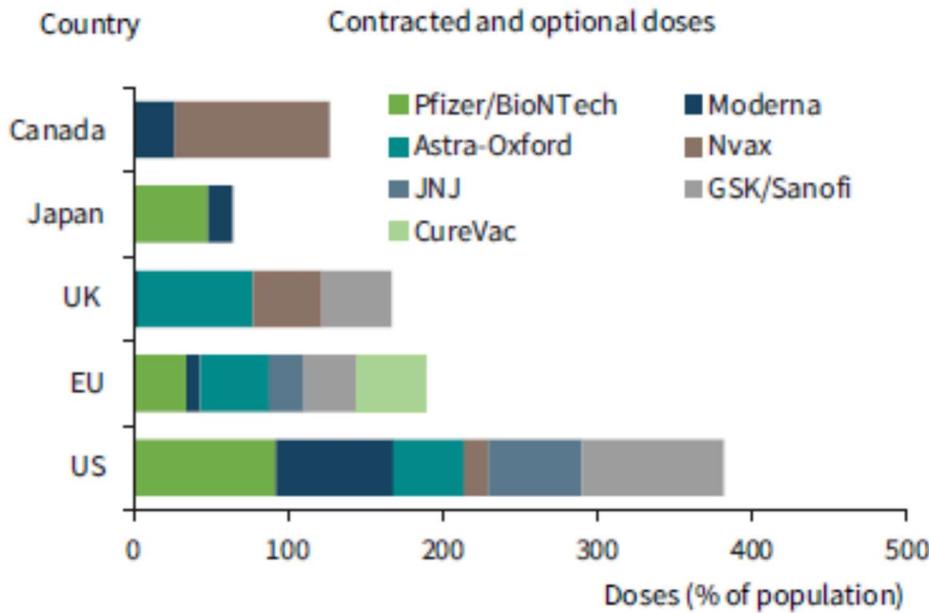
FIGURE 3. VACCINE DEVELOPMENT AND DISTRIBUTION TIMELINE



Source: Barclays

The U.S. is likely to rebound quickly in 2021 due to the combination of its “Warp Speed” vaccine order-and-acquisition program and the front-loaded fiscal and monetary stimuli. Approximately 80% of the U.S. population is covered (assuming two doses per person) with its pre-order options from just the two vaccine front-runners (Pfizer/BioNTech and Moderna), while U.K. and EU have a lot more riding on the AstraZeneca / Oxford’s vaccine as well as others not as far along the development path.

FIGURE 4. TOTAL CONTRACTED AND OPTIONAL COVID VACCINE DOSES AS PERCENT OF TOTAL POPULATION



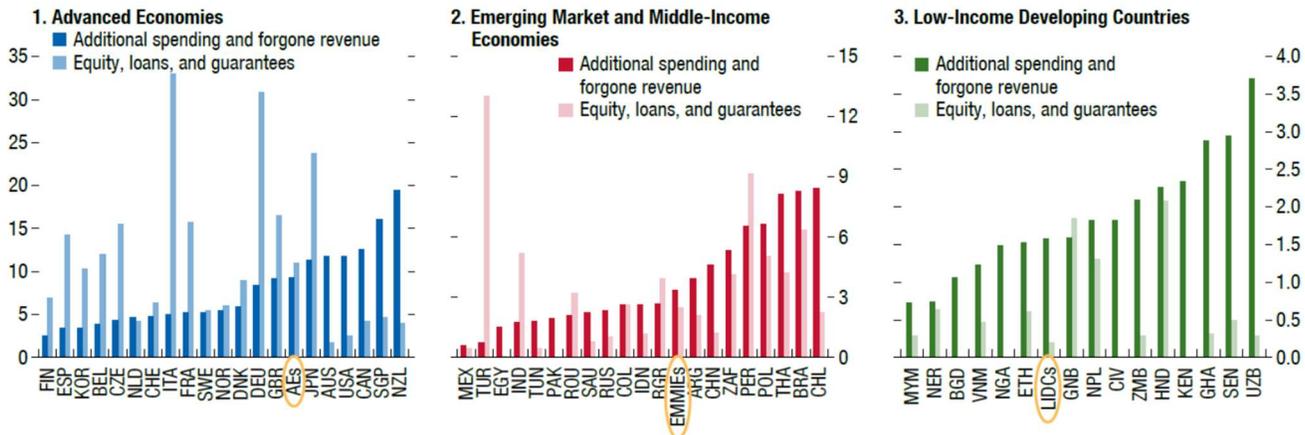
Source: Barclays

A successful immunization program requires both a ready supply of vaccines along with an effective distribution mechanism. Thus far, many developed countries have seen delays in the initial distribution of the vaccines. Significant immunization delays could clearly push back the onset of the subsequent economic recovery and worsen economic drag beyond the -2.5% Advocate estimate for 2021.

2. Fiscal Stimulus in Pipeline and Gauging the Resultant Post-Covid Economic Rebound – The Rich Can Afford More Stimulus

Governments around the world poured enormous fiscal stimuli into their economies to mitigate the impact of the pandemic, but the size of stimuli was not uniform. Advanced economies received the greatest largesse, averaging 9% GDP in fiscal stimulus and another 10% in equity, loans and guarantees (ELGs). By contrast, emerging economies only got an average of 3% GDP in fiscal stimulus and 2% in ELGs. The poorest of the emerging countries were only able to muster 1.5% fiscal stimulus and another 2% in ELGs.

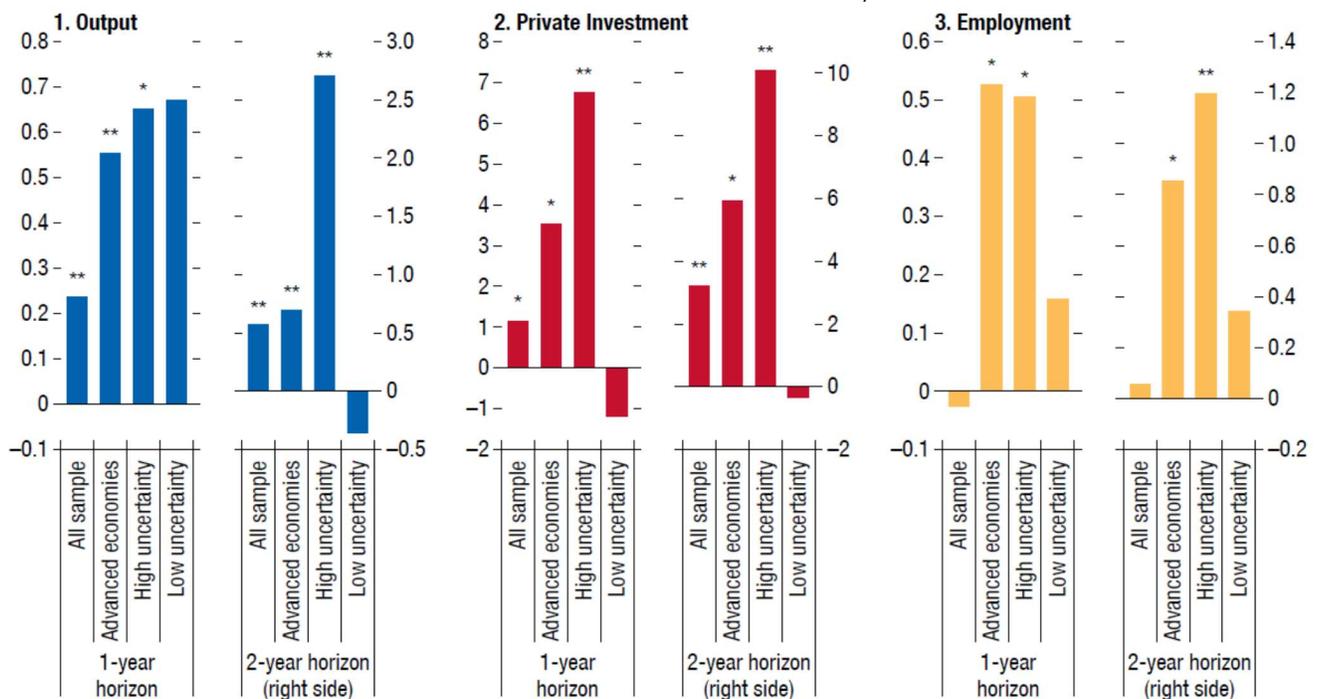
Figure 5. GLOBAL FISCAL PROGRAM SIZES (% OF PURCHASING POWER PARITY-ADJUSTED GDP IN USD), ANNOUNCED MEASURES AS OF 11 SEP 2020



Sources: IMF Fiscal Monitor Database of Country Fiscal Measures in Response to the Covid-19 Pandemic, IMF Staff Estimates

How does fiscal stimulus relate to the size of an economic rebound? IMF analysis² concludes that for advanced economies, a 1% increase in public investment results in a 0.55% increase in GDP over a 1-year horizon.

FIGURE 6. FISCAL MULTIPLIER OF PUBLIC INVESTMENT IN ADVANCED AND EMERGING MARKET ECONOMIES (PERCENT CHANGE OF AN UNEXPECTED INCREASE OF PUBLIC INVESTMENT BY 1% OF GDP)



* or ** represents statistically significant coefficient at one or two standard deviation confidence intervals. Sources: IMF Staff Estimates.

² "Fiscal Monitor – Policies for the Recovery", International Monetary Fund, Oct 2020.

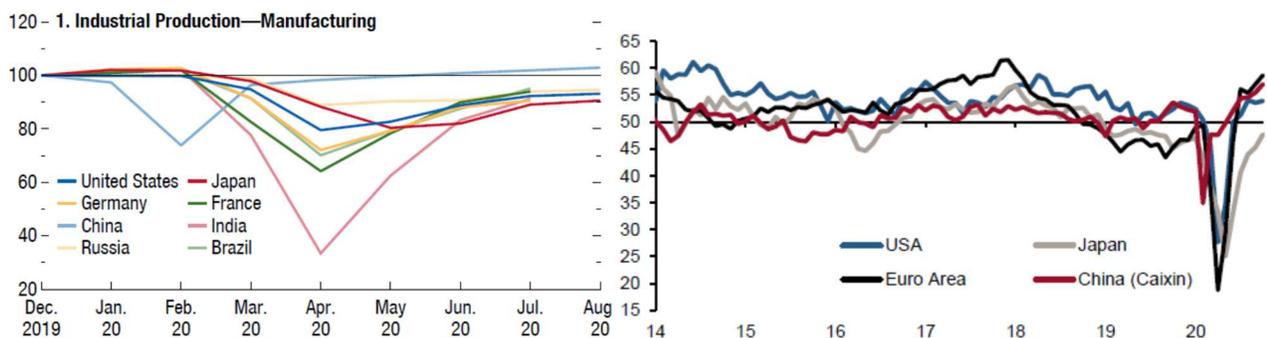
Advocate's analysis haircuts the IMF's fiscal spending-to-GDP ratio from 0.55% to 0.45% when applied to the U.S. fiscal stimuli. This reduction accounts for some of the aid going to state / local governments or to replace lost income due to very high unemployment and economic restructuring (such as the shutdown of retail and dining sectors), and therefore not generating new economic growth. Applying this 0.45% ratio to the first fiscal package produces an 4.7% GDP boost in 2020 and is in agreement with the CBO analysis³.

How does GDP growth relate to interest rates? The linkage between growth and interest rates is one of the central tenets of central bank policy. Recent research has found⁴ that 1) nominal GDP growth is highly and positively correlated with short and long-term rates in the U.S., U.K., Germany and Japan, and 2) nominal GDP growth causes long-term rates in all countries examined. Long-term regression reflects a 50% ratio between GDP growth and Treasury yield since 1960. More recent history suggests that ratio may have declined by half (27% ratio using since-2000 data).

2b. The Post-Covid Economic Rebound (Has Already Begun)

Even before the availability of Covid vaccines, the world has begun to rebound from the Q2-2020 shutdown. Whether it is manufacturing, retail sales, or trade, some countries are now at or above end-of-2019 levels. Some of those gains may be blunted by the Covid wave in the last two months of 2020.

FIGURE 7. INDUSTRIAL PRODUCTION – MANUFACTURING (LEFT) AND NEW ORDERS (RIGHT)



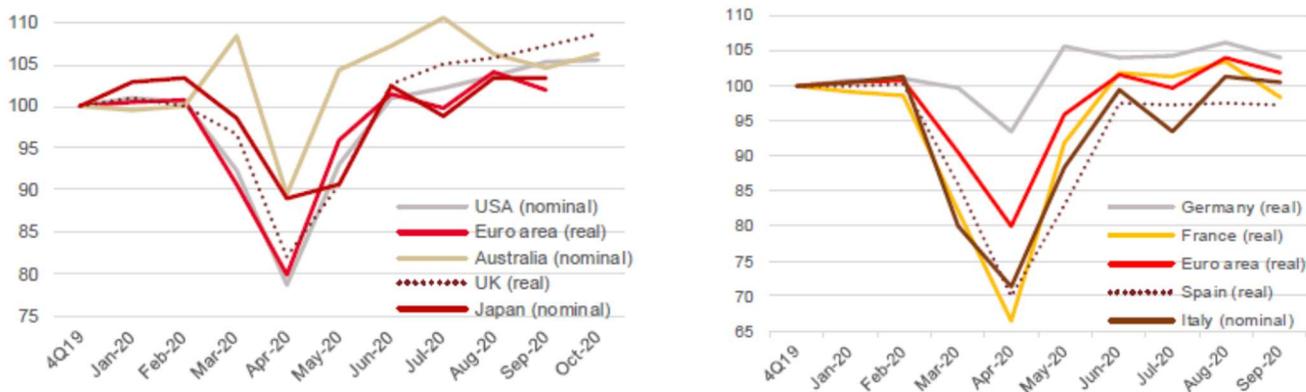
Sources: Haver Analytics and IMF Staff Calculations

Retail sales activity has rebounded strongly in many countries after the first-wave shutdown. Many countries have seen retail activity rebound to above end-of-2019 levels.

³ CBO Effects of the Pandemic-Related Legislation on Output report, page 5

⁴ "Reconsidering Monetary Policy: An Empirical Examination of the Relationship Between Interest Rates and Nominal GDP Growth in the U.S., U.K., Germany and Japan", Lee and Werner, Ecological Economics 146 (2018) 26-34.

FIGURE 8. RETAIL SALES INDEX (Q4-2019 = 100)



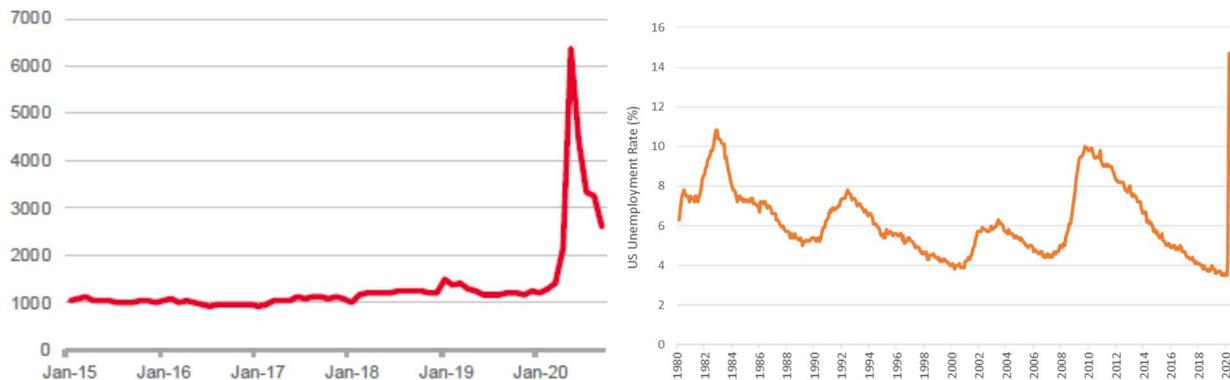
Source: SocGen

3. Pent-Up Spending Power in Household Savings and Home Appreciation

The post-pandemic recovery is expected to usher in a new wave of consumption. McKinsey notes⁵ that “as consumer confidence returns, so will spending, with ‘revenge shopping’ sweeping through sectors as pent-up demand is unleashed”. Advocate quantifies the magnitude of that pent-up consumption by looking at two household data that bode well for the post-pandemic recovery in the U.S.: 1) household savings rate and 2) robust housing market.

U.S. household savings rose sharply in 2020 as individuals seek to build cash buffers against employment disruptions. SocGen estimates that in 2020, the “excess household savings” in the U.S. rose by \$1.4Tn, or about 6.5% GDP. This can serve as a huge reserve of consumer spending power that may be unleashed once the vaccination is under way. It is already apparent in 2020 that the savings rate is starting to drop as unemployment has declined from pandemic highs.

FIGURE 9. LEFT: US PERSONAL SAVINGS GROWTH (BN USD, SAAR); RIGHT: US UNEMPLOYMENT RATE



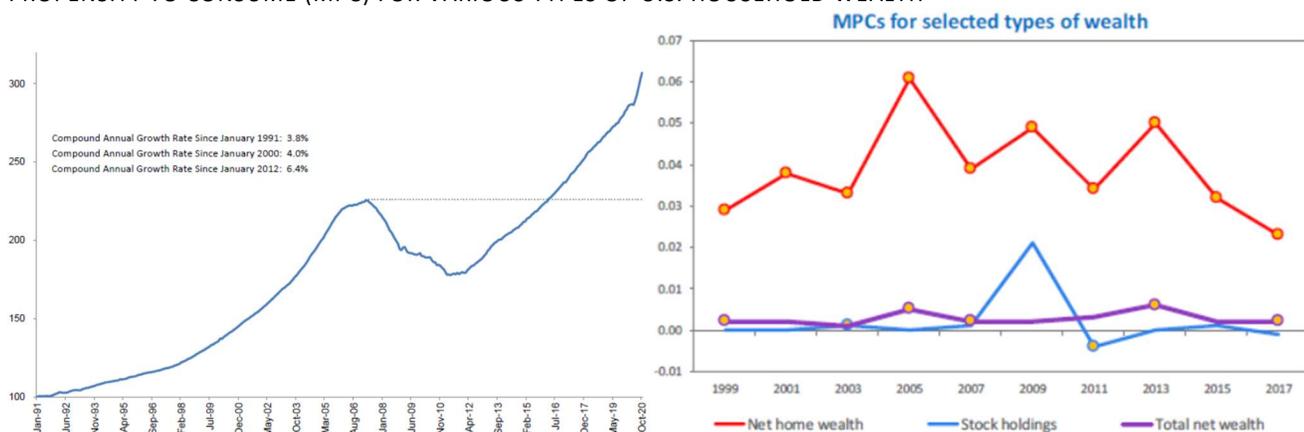
Sources: BEA, Bloomberg, SocGen, U.S. Dept of Labor

⁵ “The Next Normal Arrives: Trends that will Define 2021 – and Beyond”, January 4, 2021. McKinsey & Company

Given the huge increase in unemployment, a portion of the accumulated household savings is unlikely to be spent in the recovery as those still without jobs are likely to continue to hoard savings. The latest unemployment rate of 6.7% (Dec 2020) reflects a 71% retracement of the spike in U.S. unemployment from 3.5% in Feb 2020 to 14.7% in April 2020. 71% is used in this analysis to represent the portion of the \$1.4Tn consumer savings that may be spent in the recovery and assume consumers will spend this amount over a two-year period, more in 2021 (40%) than 2022 (31%).

U.S. housing market was very strong in 2020 as the combination of city-dwellers seeking refuge in the suburbs and record-low interest rates spurred a housing and real estate boom in the midst of the pandemic. Federal reserve data⁶ shows that homeowners’ equity in real estate rose from \$19.19Tn to \$20.44Tn from Q3-2019 to Q3-2020, resulting in a net home appreciation gain of approximately \$1.25Tn for consumers in 2020.

FIGURE 10. LEFT: PURCHASE-ONLY FHFA HOUSING PRICE INDEX (HPI), SEASONALLY ADJUSTED; RIGHT: MARGINAL PROPENSITY TO CONSUME (MPC) FOR VARIOUS TYPES OF U.S. HOUSEHOLD WEALTH



Source: FHFA, IMF Staff Analysis

IMF research⁷ concludes that the component of total net wealth that most directly relates to consumption is housing wealth and quantifies the impact of housing wealth on consumption to be between 0.02 to 0.04, i.e. a one dollar increase in housing wealth translates to \$0.02 to \$0.04 increase in consumption. During the pandemic, housing appreciation-inspired spending is likely to be delayed as consumers wait to assess their employment situation, but like household savings, this pent-up consumption is likely to be gradually released in 2021-2022. Housing appreciation may spur additional \$12Bn to \$25Bn of annual household consumption in 2021 and 2022.

⁶ “Z.1. Financial Accounts of the United States. Flow of Funds, Balance Sheets and Integrated Macroeconomic Accounts”, Board of Governors of the Federal Reserve, Third Quarter 2020.

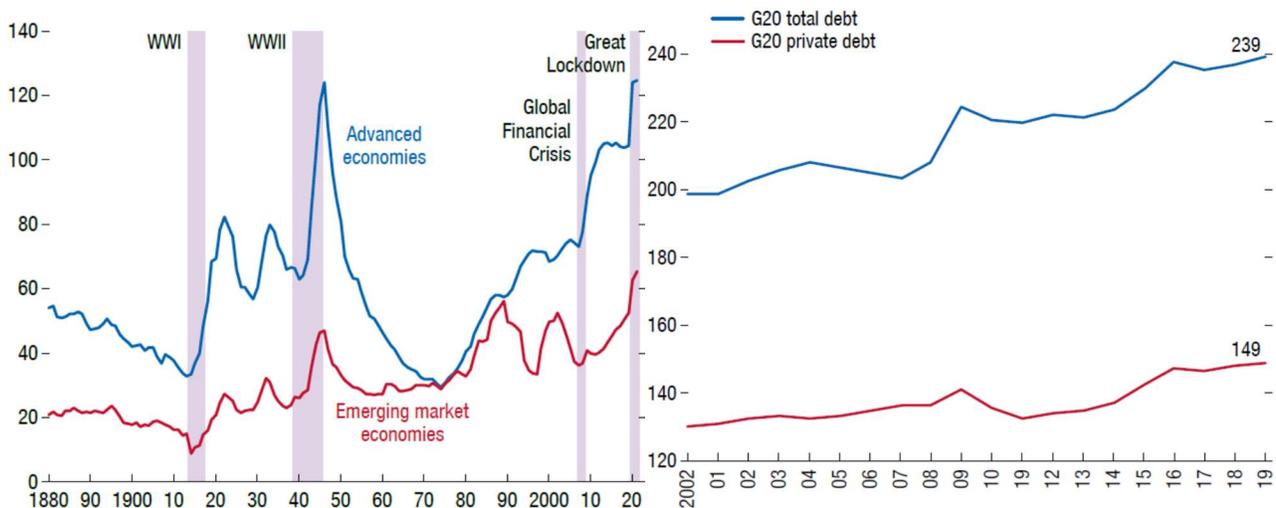
⁷ “Analyzing the Effects of Financial and Housing Wealth on Consumption using Micro Data”, Carlos Caceres, IMF Working Paper WP/19/115

The impact of each dollar of consumption results in at least the same amount of increase in GDP, all else being equal. In this paper, we will ignore the well-known positive feedback loop between consumption and GDP, i.e. we use a multiplier of 1.0 linking consumption to GDP.

4. Largest Jump in Government Debt in Many Years

2020 witnessed the largest single-year growth of government debt since either World War 2 (for Advanced Economies) or the Asian Currency Crisis (for Emerging Market Economies). Much of that debt went to pay for the various pandemic fiscal stimuli. Not only is the government debt rising, but private debt levels are at historical highs as well. Companies went on a debt binge starting in the second quarter of 2020 as they sought to secure as much liquidity buffer as possible while the pandemic shut down global economic activity.

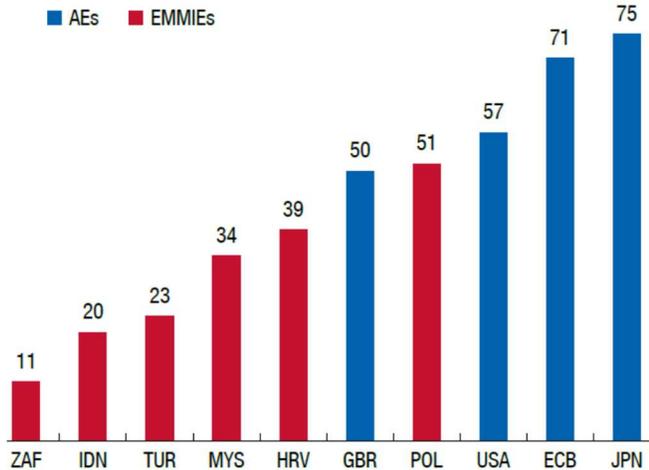
FIGURE 11. HISTORICAL AVERAGE GENERAL GOVERNMENT DEBT LEVELS OF ADVANCED AND EMERGING ECONOMIES (% GDP), HISTORICAL G-20 TOTAL AND PRIVATE DEBT (% GDP)



Sources: IMF, Historical Public Debt Database, IMF World Economic Outlook database, Maddison database Project

A significant portion of the increase in government debt in 2020 has been absorbed by the central banks' QE programs. The BOE, Fed, ECB and BOJ have purchased more than half (and as much as three-quarters) of the net supply of respective government security issuance since Feb 2020.

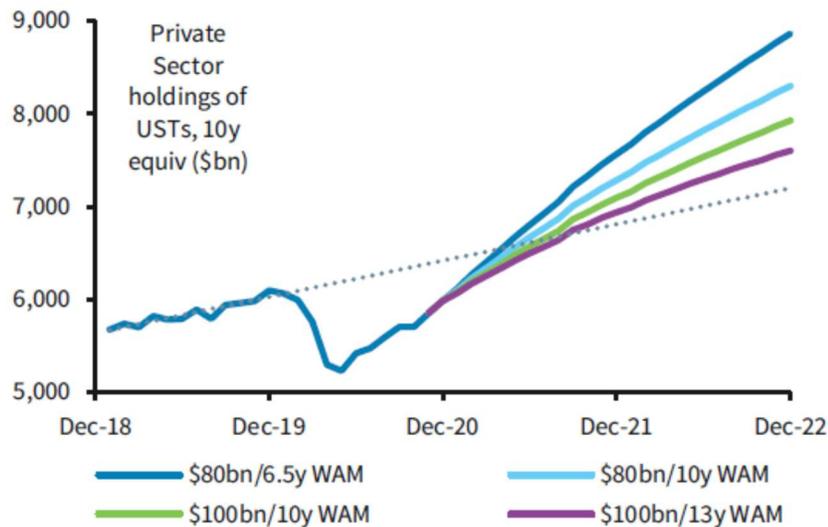
FIGURE 12. CENTRAL BANK PURCHASES OF GOVERNMENT DEBT (% OF GOVERNMENT MARKETABLE SECURITIES OR DEBT ISSUED SINCE FEB 2020)



AE: Advanced Economies, EMMIEs: Emerging Market Economies. Sources: IMF, ISDA, CME, LCH, various banks.

Public and private debt growth is likely to further outstrip QE purchases in 2021 and beyond. Using a range of reasonable estimates of future Fed QE purchases, Barclays shows that the risk-adjusted Treasuries held in price-sensitive hands is likely to continue rising in the next few years (from as low as 25% to as much as 50% between the end-of-2020 to the end-of-2022).

FIGURE 13. PROJECTED PRIVATE SECTOR HOLDINGS OF RISK-WEIGHTED TREASURIES (10YR EQUIVALENT \$BN) FOR DIFFERENT SIZES OF FED QE PROGRAM GOING FORWARD (\$BN/MONTH)



Sources: New York Fed, U.S. Treasury, Barclays

Barclays projects future U.S. budget deficits of \$2.1Tn and \$1.4Tn for 2021 and 2022 respectively, assuming a \$500Bn stimulus package rather than the \$900Bn actual package passed by Congress in December. Thus \$2.5Tn and \$1.4Tn will be used in our analysis as the net additional U.S. government debt supply projected for the next 2 years.

How does greater government bond supply or QE size relate to interest rates? Fed analysis⁸ of QE programs implemented during the Global Financial Crisis shows that a purchase of 1% of the outstanding amount of a security and its “near substitutes” (within ±2yr maturity) produces a 0.09% price appreciation.

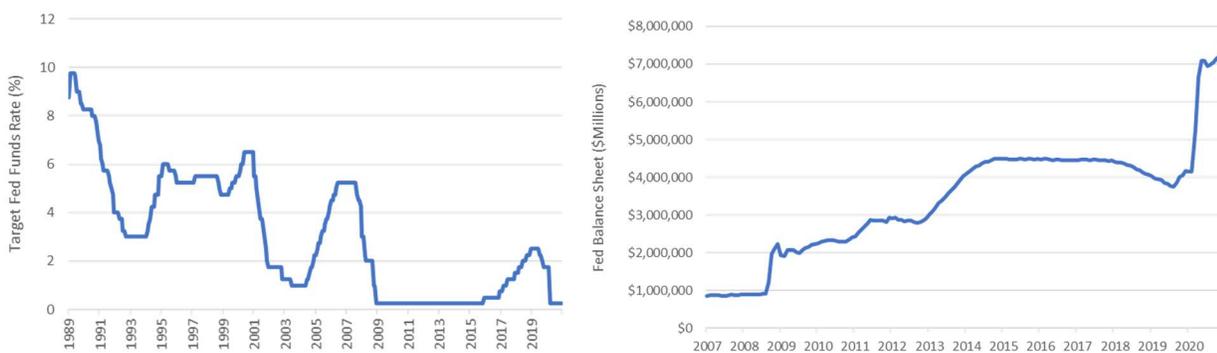
Within 2yrs of the current 10-year part of the Treasury yield curve (maturities ranging from Jan-2029 to Jan-2033), 1% equates to \$8.2Bn notional outstanding (\$8.7Bn value). This means a QE purchase of \$8.7Bn or the same amount of new Treasury supply equates to 0.9bps of 10yr Treasury yield change, in excellent agreement with a rule of thumb of \$100Bn of excess debt or QE results in 10bps higher/lower rates. We adjust this ratio by a factor of 6/10 to map Treasury supply or QE (weighted average maturity of the Treasury universe ~6yrs) into 10-year equivalent amounts. In other words, we will use a ratio of 6bps 10yr Treasury yield for every additional \$100Bn of Treasury supply or QE.

5. Monetary Stimulus

The Fed instituted a series of emergency rate cuts in response to the pandemic, and supplemented it with the largest QE program in history. This brought the target Fed Funds rate from 1.75% down to a maximum of 0.25%. The rate cut alone produced a 100bp drop in 10yr Treasury yield.

The Fed subsequently implemented very large Treasury and agency MBS purchases to first stabilize the Treasury and mortgage markets and subsequently to facilitate the transmission of its easing policy. Total Fed balance sheet rose from \$4.16Tn at the end of Feb to \$7.36Tn by the end of 2020.

FIGURE 14. LEFT: FED FUNDS TARGET RATE, RIGHT: SIZE OF FEDERAL RESERVE BALANCE SHEET OF ALL ASSETS (\$ MILLIONS), 2007 – 2020



Source: Federal Reserve.

⁸ “Flow and Stock Effects of Large-Scale Treasury Purchases”, D’Amico and King, Division of Monetary Affairs, Federal Reserve Board, February 2011.

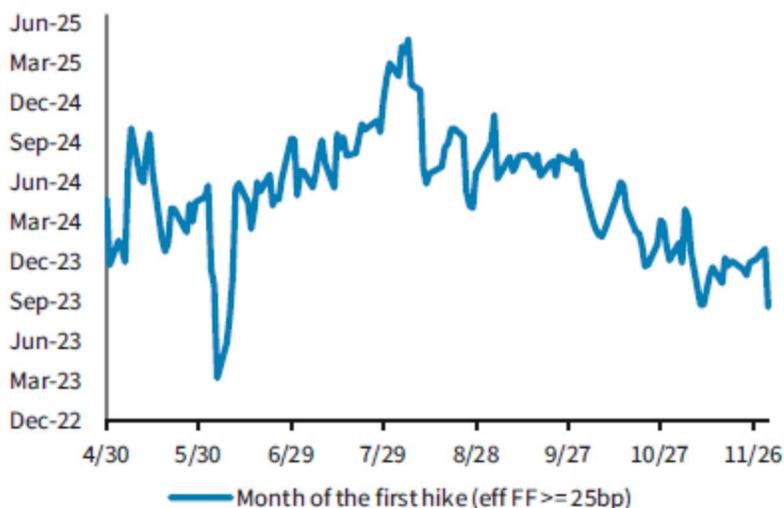
In 2020, the Fed purchased \$2.33Tn of Treasury securities on a net basis, accounting for the two-thirds of its total balance sheet growth. After an initial burst, the pace of its net Treasury purchase has stabilized at \$80Bn per month.

Due to the combination of our 2-year analysis horizon and significant uncertainty in the relationship between monetary stimulus and the size of the subsequent recovery, ***we did not include the stimulative impact of the extraordinary monetary stimulus in 2020 on the subsequent recovery*** and rather focus on the direct impact of the Fed’s rate and QE programs on lower Treasury yield. This exclusion means ***our analysis may understate the rising rate pressure as the economic recovery gets under way.***

6. Global Central Banks Want to be Slow in Hiking Rates During the Post-Covid Recovery

The Powell Fed has stated on many occasions that it is willing to err on the side of hiking slower than in the past during the post-pandemic economic rebound. The FOMC statement from the November 5th meeting reads in part: “... the Committee will aim to achieve inflation moderately above 2% for some time so that inflation averages 2% of time and longer-term inflation expectations remain well anchored at 2%.” This patient approach and willingness to tolerate near-term inflation greater than its new 2% average goal strongly suggests (based on the latest dot plot) that the Fed is on hold until 2023. The market interpretation of the timing of the first hike is currently mid-2023, 2½ years in the future.

FIGURE 15. MARKET PRICING OF THE TIMING OF THE FIRST FED RATE HIKE



Source: Barclays

It has been many decades since the market has seen a Fed that keeps rates accommodative while inflation rises, but we can reach back in history to a year that might offer an analogy – 1975.

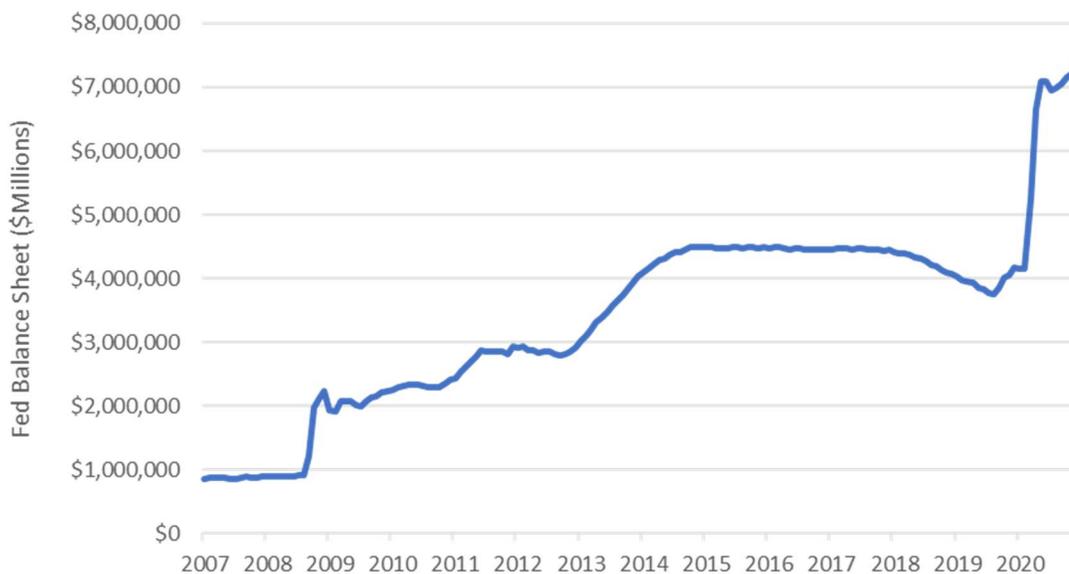
Core CPI was 9.1% in 1975 while the Burns Fed cut its target Fed Funds rate from 8% down to 4.875%, resulting in an average Fed Funds rate of 5.86% for the year. The difference between core CPI and average Fed Funds was 3.3%. Assuming the Powell Fed today can tolerate something similar (core CPI 3.3%, target FF approximately zero) for a while, we could use 1975 as a template for how wide 10-year Treasury yield may rise above the target Fed Funds. The average 10yr Treasury yield differential to Fed Funds rose from -65bps to +288bps, averaging a gap of 213bps for the year.

A 3.3% core CPI is clearly aspirational for a Fed that has struggled to get core CPI or PCE consistently up to 2% since the Global Financial Crisis. We will use a more realistic Fed inflation target of 2.5% core CPI and apply a 75% ratio (2.5% / 3.3%) to adjust the 1975 yield curve. This produces a 10-year Treasury yield of 1.6%, or 68bps above its end-of-2020 level. Considering the 10-year Treasury yield was 1.8% at the start of 2020, this is a fairly conservative assumption.

7. Taper 2.0 – The Eventual Runoff of Central Bank Quantitative Easing Programs

While major global central banks are still in the midst of their QE programs, at some point these programs must end and the size of the central banks' QE portfolios must eventually decline. For clues on the likely annual size of Fed tapering, we look to the last full year of Fed tapering. During 2018, the Fed balance sheet dropped from \$4.448Tn to \$4.075Tn, for a decrease of \$373Bn (8.4% lower).

FIGURE 16. SIZE OF FEDERAL RESERVE BALANCE SHEET OF ALL ASSETS (\$ MILLIONS), 2007 – 2020



Source: Federal Reserve.

The timing of the start of QE tapering is obviously speculative at the present time. While the Fed has stated that it would not hike rates earlier than 2023, history shows that tapering of the Fed balance sheet can begin before a rate hike happens. Assuming economic growth rebounds nicely in 2021 and

the vaccine is broadly distributed by the end of Q2-2021, it is not a stretch for QE tapering to begin in 2022.

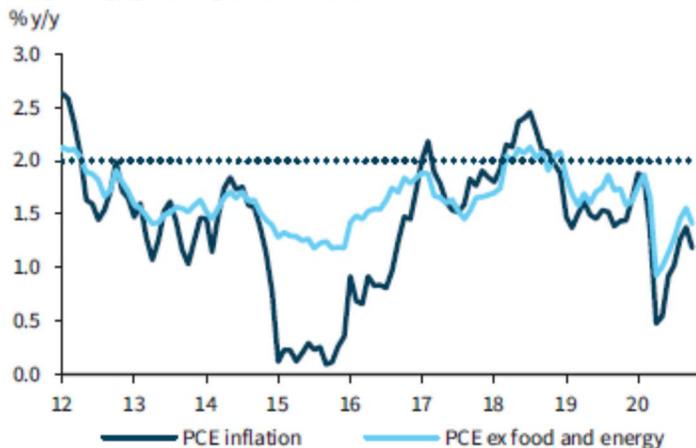
We project the Fed would maintain its \$80Bn/month Treasury QE for the entirety of 2021. Assuming a Fed taper begins in 2022, we estimate an annual taper amount of \$500Bn, approximate halfway between the \$373Bn absolute size of the last annual taper, and \$700Bn (8.4% of our projected Fed balance sheet at the end of 2021). If 2/3 of the tapering is applied to Treasury assets within the Fed's SOMA, the impact of this tapering on Treasury yield in 2022 would be 20bps (using Advocate's \$100Bn equals 6bp ratio).

And In the Opposite Corner: Disinflation and Recession

Two scenarios could potentially offset the impact of the rising rate factors we outlined – 1) a low-inflation environment, which most prognosticators agree is likely even after the pandemic passes, and 2) a pandemic-driven recession as the economic damage from the multiple pandemic waves in 2020 could prove too much to overcome despite global monetary and fiscal stimuli.

Let's take a look at inflation, in particular the Fed's favorite gauge of inflation, the PCE. Since the end of the Global Financial Crisis, both core and headline PCE have fallen well short of the Fed's 2% target.

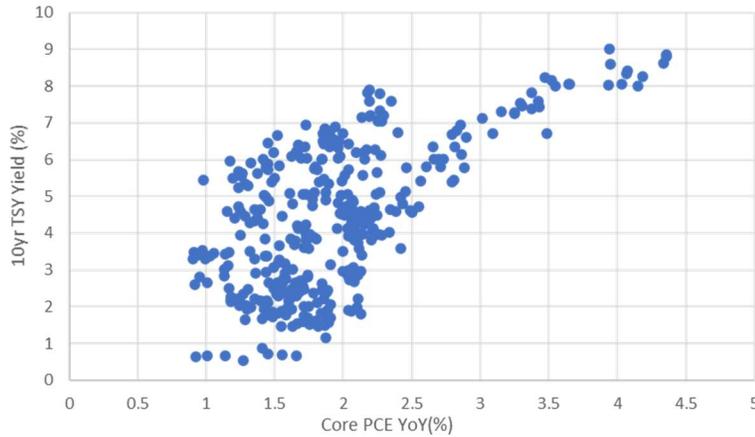
FIGURE 17. FED'S PREFERRED GAUGE OF INFLATION HAS BEEN WELL SHORT OF ITS STATED 2% TARGET, AND UNLIKELY TO GET THERE IN THE SHORT-RUN



Sources: U.S. Bureau of Economic Analysis, Haver Analytics, Barclays.

If inflation remains tame, shouldn't rates remain low as well? Data over the last 30 years offer scant support for that assertion. The chart below shows 10-year Treasury yield (y-axis) against the Year-over-Year Core PCE (Fed's favorite gauge of inflation). While there was positive correlation between rates in inflation when Core PCE was above 2.5%, that correlation broke down once Core PCE dropped below 2.5%. In fact, **10-year Treasury yield has traded in a 500 basis point range during the periods when Core PCE was below 1.5%.**

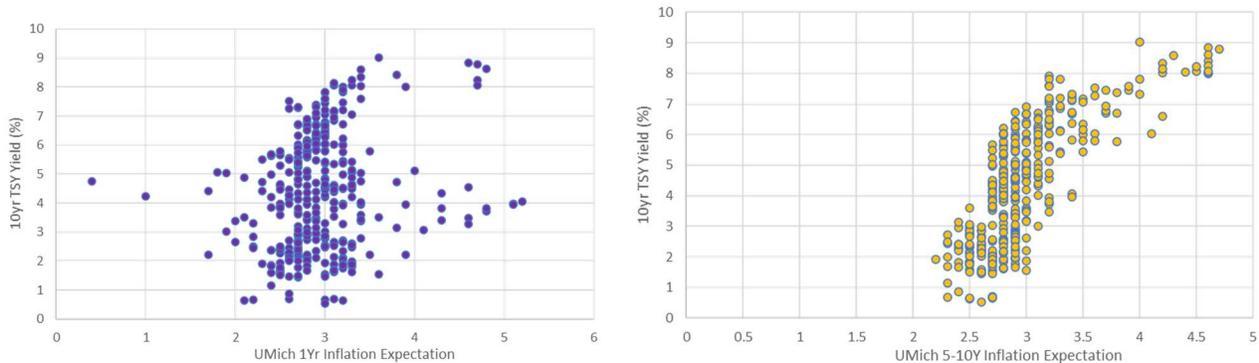
FIGURE 18. REALIZED CORE INFLATION (CORE YOY PCE, X-AXIS) VERSUS 10-YEAR TREASURY YIELD (Y-AXIS), 1990 - 2020



Sources: Bloomberg, U.S. Bureau of Economic Analysis.

Can low *expected* inflation keep rates tame? The answer is the same as realized inflation. The chart below shows that once inflation expectations (both short and long-term) dropped below 3.5%, their correlations to 10-yr Treasury yield break down completely.

FIGURE 19. LEFT: SHORT-TERM INFLATION EXPECTATION (UMICHIGAN 1-YR INFLATION SURVEY) VERSUS 10-YEAR TREASURY YIELD; RIGHT: LONG-TERM INFLATION EXPECTATION (UMICHIGAN 5-10YR SURVEY) VS 1-YEAR TREASURY YIELD, 1990 – 2020.



Sources: Bloomberg, University of Michigan

History shows that the current low realized- and expected-inflation levels are unlikely to constrain rising interest rates even up into the 4-5% area.

What about a recession? A pandemic-driven recession in 2021 can certainly spoil the rising rate party, but that is viewed as a highly unlikely outcome by most pundits given the start of vaccination and the plethora of fiscal and monetary stimuli already in place. In addition, the new Biden administration is likely to implement additional fiscal stimulus in 2021 as one of its signature programs, further lessening the threat of a recession. If in spite of all that, a recession does occur, it would delay the onset of the rate rise but may sow the seeds of an even larger rate-rise episode as additional recession-fighting fiscal stimuli would stimulate more economic growth and add to the fiscal deficit.

Analysis: Quantifying the Interest Rate Rise in 2021 and 2022

To quantify the impact of various factors on interest rates, we use the following ratios:

- 45% multiplier to fiscal stimulus size to calculate GDP impact (calibrated to match CBO estimate of fiscal stimulus program GDP impact in 2020)
- 10% multiplier to GDP to calculate 10yr Treasury yield impact (1/3 of since-2000 historical ratio, calibrated to match the 10yr Treasury yield decline of 100bps in 2020)
- \$100Bn Treasury supply equals 6bps 10yr Treasury yield (6/10 of Fed's supply-to-yield multiplier to map Treasury universe weighted-average maturity to 10-year sector)

While historical ratio of GDP-to-Treasury yield (Column BC in the following table for items 1 through 3) may have been as high as 50%, it would substantially overestimate the decline of 10yr Treasury yield in 2020. A lower sensitivity of GDP-to-Treasury yield in the current environment is most likely due to the lower elasticity of interest rates as they approach the zero-rate boundary, given that the Fed has consistently debunked using negative rates as a stimulus measure. To match the actual 10yr Treasury yield decline in 2020 requires a GDP-to-TSY multiplier of 10%. We conservatively assume this lower elasticity applies when rates and GDP are rising as well.

The components of Advocate's rate rise model are shown in the table below:

FIGURE 20. QUANTITATIVE ASPECTS OF PANDEMIC, ECONOMIC AND STIMULUS PROGRAMS

Driver	A Amount (\$Bn)	AB: Percent Impact of A in Year	B. Impact on GDP	BC: Multiplier from A or B to C	C. Impact on 10y TSY (%)	Apply to Year	Impact on 10y TSY (bps) in		
							2020	2021	2022
1. Pandemic Slowdown 2020			-10.0%	10%	-1.0%	2020	-100	0	0
1. Pandemic Slowdown 2021			-2.5%	10%	-0.3%	2021	0	-25	0
2. Fiscal Stimulus Package 1*	\$2,156	45%	4.7%	10%	0.5%	2020	47	0	0
2. Fiscal Stimulus Package 2**	\$1,476	45%	3.2%	10%	0.3%	2021	0	32	0
3. Consumption due to Personal Savings Accumulated	\$1,400	40%	2.7%	10%	0.3%	2021	0	27	0
	\$1,400	31%	2.1%	10%	0.2%	2022	0	0	21
3. Consumption due to Housing Appreciation	\$1,250	2%	0.1%	10%	0.01%	2021	0	1	0
	\$1,250	2%	0.1%	10%	0.01%	2022	0	0	1
4. Government Fiscal Deficit	\$3,250			6%	2.0%	2020	195	0	0
	\$2,500			6%	1.5%	2021	0	150	0
	\$1,400			6%	0.8%	2022	0	0	84
5. Monetary Stimulus: Impact of 150bp Rate Cut on Long Rates					-1.0%	2020	-100	0	0
5. QE TSY Purchase (2020)	\$2,329			6%	-1.4%	2020	-140	0	0
6. Impact on Long Rates if Fed Keeps Easing while Inflation Ticks Up					0.34%	2021	0	34	0
					0.34%	2022	0	0	34
7. QE (ongoing 2021)	\$960			6%	-0.6%	2021	0	-58	0
7. QE (tapering 2022)	-\$333			6%	0.2%	2022	0	0	20
						TOTAL Each Year	-98	162	160

*Excluding state and local government assistance and credit backstop to Fed emergency lending facilities.

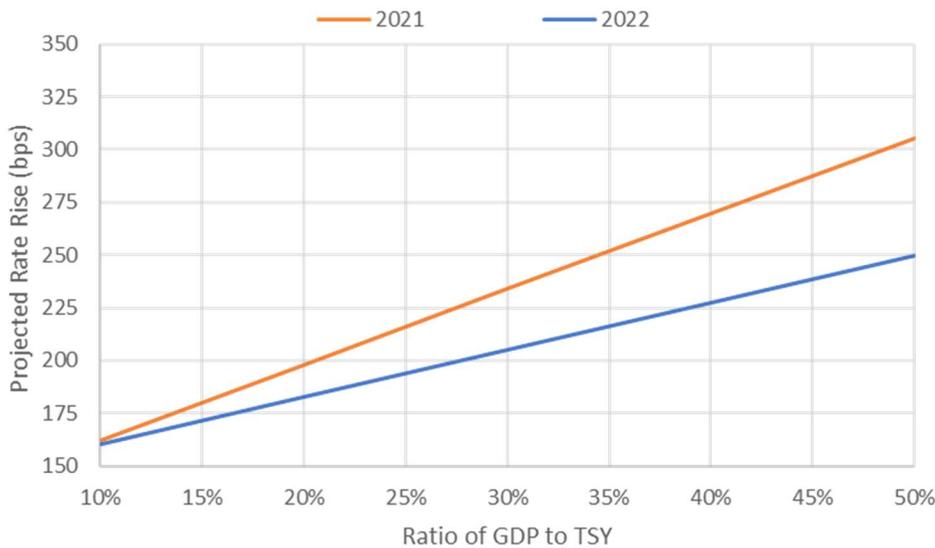
** Combinational of second fiscal package (passed in December 2020) and remainder of CARES Act.

Sources: Barclays, CBO, Congressional staff, Advocate.

Our model estimates Treasury yield would rise by 162bps and 160bps in 2021 and 2022 respectively. As the 1-year forward market on 10-year swaps is pricing in a rise of only 17bps, it is safe to say the market is not prepared for such a substantial rate rise.

We also examined the sensitivity of rate rise to a range of GDP-to-Treasury yield ratios (from 50% down to 10%). The table below shows that the rates would rise even more if Treasury yields exhibit greater sensitivity to GDP growth.

FIGURE 21. ADVOCATE PROJECTED RATE RISE IN 2021 AND 2022 FOR VARIOUS GDP-TO-TSY RATIOS (10% MEANS A 1% RISE IN GDP CORRESPONDS TO A 10BP RISE IN 10YR TREASURY YIELD)



Source: Advocate

Our analysis also does not take into account any additional fiscal stimulus to be implemented by the Biden Administration in 2021 and beyond. Any fiscal stimulus can be expected to exert two upward forces on rates due to its stimulative effect on GDP and the ancillary increase in Treasury supply in order to finance the stimulus. **Advocate estimates that every \$100Bn of fiscal stimulus could generate an additional 0.2% GDP and result in 8bps of higher rates.**

Conclusion – Sharply Rising Treasury Yield in 2021 and 2022 May Be Unavoidable

Advocate analysis shows that interest rates in the U.S. are very likely to rise sharply in 2021 and 2022:

1. Our model conservatively does not take into account the stimulative effects of the Fed's massive monetary stimuli in 2020 or any fiscal stimulus packages by the Biden Administration
2. By applying historically-calibrated multipliers (on the conservative side), Advocate's model suggests 10-year Treasury yield could rise by 162bps and 160bps in 2021 and 2022 respectively. If this is realized, 10yr Treasury yield could rebound to 2.5% (mid-2019 levels) by the end of 2021, a reasonable possibility. The forward market is only pricing in 17bps of rate rise in each of the next two years (~10% of Advocate model prediction).
3. U.S. is likely to emerge rapidly from the Covid pandemic in 2021, but the recovery could be diluted or delayed by inefficiencies in vaccine distribution.
4. Global governments have undertaken significant fiscal stimulus to counteract the economic impact of the pandemic shutdown(s). The first fiscal stimulus package in 2020 likely buffered about half of the pandemic slowdown, while the latest \$900Bn package may add as much as 2.4% to 2021 GDP.
5. Global governments have incurred sizable new debt to finance their fiscal response to the Covid pandemic. While QE offset more than half of the net Treasury supply in 2020, the excess government debt will increasingly flow to price-sensitive hands in 2021 and beyond as central bank QEs are inadequate to offset the rising tide of budget deficits. In our model, fiscal deficit alone will drive rates higher by 150bps and 84bps in 2021 and 2022, with QE only able to offset about 40% of the 2021 rise.
6. U.S. consumers saved as much as \$1.4Tn during the pandemic, much of which could be spent in the economic recovery in 2021 and 2022 as employment continues to recover. Advocate's analysis shows this delayed consumption may turbo-boost the post-Covid economic recovery by raising GDP by 2.7% in 2021 and 2.1% in 2022. Consumption from home price appreciation has a lesser effect but could add 0.1% GDP in 2021 and 2022.
7. A Fed willing to live with above-2% inflation (for a while) is bad news for longer maturity rates. 1975 provides a good template for how much the yield curve could steepen if the Fed eases (maintaining QE in our present-day case) while inflation ticks up. We haircut the 1975 yield curve slope by 25% to reflect the new normal of lower inflation. This has the potential to boost 10yr Treasury yield by 34bps in both 2021 and 2022.
8. Global central banks have implemented massive monetary stimuli, but all good things must come to an end. The end of QE and the start of tapering will likely come before the beginning of the interest rate tightening cycle. In 2022, QE tapering may move more than \$330Bn of Treasury supply away from the Fed into rate-sensitive hands, which in our model could elevate long-term rates by 20bps.
9. The Fed would have to almost quadruple the size of its Treasury QE in 2021 (from \$80Bn/month to \$300Bn/month) if it wished to offset the projected 2021 rise in rates. A

\$300Bn/month TSY QE pace would exceed the 2020 QE and is unlikely to be sustainable for any extended period, especially if the economy is recovering well.

10. Additional future fiscal packages would result in higher rates. Advocate estimates that each \$100Bn of fiscal stimulus would drive 10-year Treasury yield higher by 8 basis points.
11. While inflation should remain low in the foreseeable future, history shows this is no impediment to higher rates. An unexpected recession may delay the rate rise but any additional recession-fighting fiscal stimulus would further add to the subsequent rate rise tab.

The rising rate perfect storm in 2021-2022 results from the convergence of the impact of monetary stimulus, QE, fiscal deficit, and fiscal stimulus. Advocate model prediction of 162bp rise in 10yr Treasury yield in 2021 is almost 10-times the amount implied by the forward market and illustrates the potential market disruption if our model is proven correct. Short of an unanticipated recession or large market correction, the only remaining rising rate mitigant is the Fed. Offsetting our projected rate rise in 2021 would require the Fed to almost quadruple its current QE pace, a highly unlikely outcome unless the economic recovery is in jeopardy.

Advocate Capital Management provides risk mitigation strategies and solutions for institutional investors and corporations. We stand ready to help you with the design and implementation of customized risk mitigation strategies for rising rates, market disruptions and the end of LIBOR.

Scott Peng
Chief Investment Officer
Advocate Capital Management

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