

Wells Fargo Economics *Monthly Macro Manual*

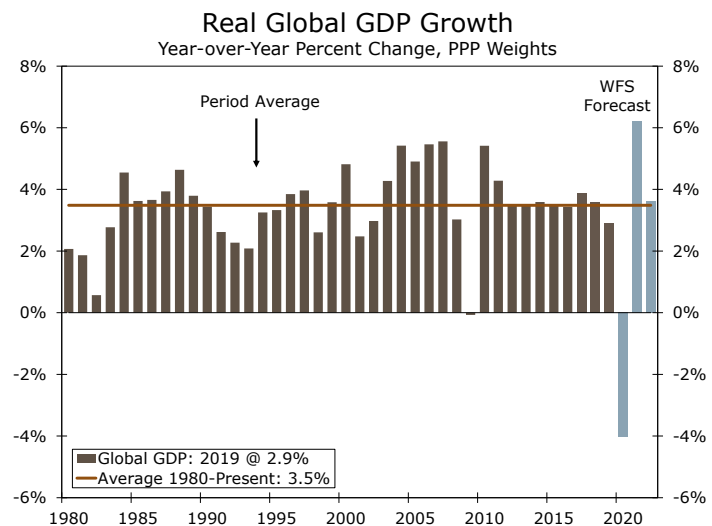
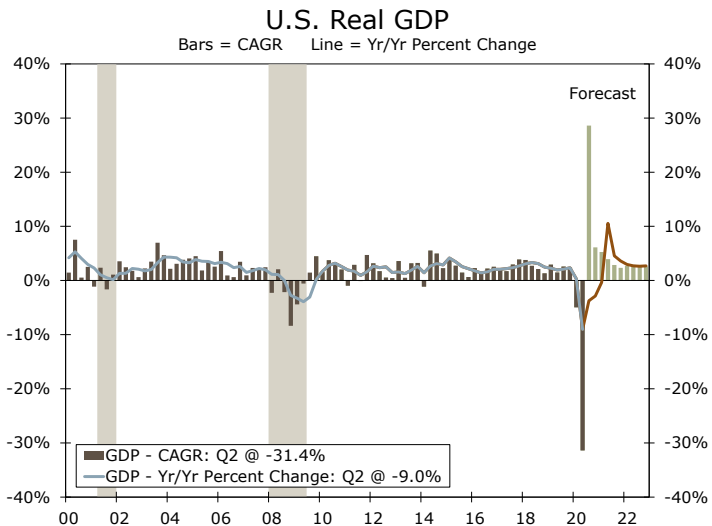
Your guide to the data and events that will shape the economic outlook and drive financial markets in the month ahead.

October 07, 2020

Key Takeaways

Developments since our September Monthly Economic Outlook

- **Our real GDP growth forecast for the United States is largely unchanged.** A modest upward revision to real GDP growth in 2020 was partially offset by a small downward revision to 2021. Data for Q3 GDP growth is reported on October 29 and appears likely to come in right around 30%. Our current forecast is 28.6%.
- **Similarly, our forecast revisions for the unemployment rate are relatively minor.** We expect it to average 7.6% in Q4-2020 (down from 7.8% in our previous forecast) and 5.9% in Q4-2021 (unchanged).
- **Our baseline forecast assumes no additional fiscal stimulus.** We will likely revisit our fiscal policy assumptions after the election on November 3 and make changes accordingly.
- **We do not expect inflation, as measured by the core PCE deflator, to run above 2% on a sustained basis for the foreseeable future. Thus, our forecast continues to project no fed funds hikes through at least the end of 2022.**
- Our year-end targets for the 10-year Treasury yield are unchanged at 0.85% for 2020 and 1.30% for 2021.
- **Our global growth forecast, like our U.S. forecast, is largely unchanged.** Most international economies saw their GDP growth forecasts changed by only a couple tenths of a percentage point either for this year and next.



Source: U.S. Department of Commerce, International Monetary Fund and Wells Fargo Securities

Monthly Macro Calendar: October 5-November 6

Monday	Tuesday	Wednesday	Thursday	Friday
5	6	7	8	9
ISM Services Index September 57.8 Reserve Bank of Australia Rate Decision October 0.25% (Cash Rate) Evans (Chicago Fed) Gives Luncheon Speech at NABE	Powell* (Fed Chair) Addresses NABE Conference in Chicago Trade Balance August -\$67.1B JOLTS Job Openings August 6,493K	Williams* (Vice Chairman) Speaks on Flexible Avg. Inflation Targeting Rosengren, Bostic & Kashkari* Speak on Racism and Economy FOMC Meeting Minutes U.S. Vice-Presidential Debate	Bostic (Atlanta Fed) Speaks on Panel to Rework America Alliance Rosengren (Richmond Fed) Speaks at Virtual Event on Econ. Recovery	
12	13	14	15	16
U.S. Columbus Day Observed [U.S. Bond Markets Closed]	Consumer Price Index (MoM) August 0.4%	PPI Final Demand (MoM) August 0.3% Quarles* (B. of Gov.) & Kaplan* (Dallas) Speak on Financial Supervision Clarida* (Board of Governors) Speaks at IIF Annual Meeting	Quarles* (Board of Governors) Speaks at IIF Annual Meeting Kashkari*(Minneapolis Fed) Speaks on U.S. Economic Outlook Second U.S. Presidential Debate	Retail Sales (MoM) August 0.6% Industrial Production (MoM) August 0.4%
19	20	21	22	23
China GDP (SA, QoQ) Q2 11.5% **released night of 10/18	Housing Starts (SAAR) August 1,470K	United Kingdom CPI (YoY) August 0.2% Canada CPI (YoY) August 0.1% Federal Reserve Beige Book Released	Existing Home Sales (SAAR) August 6.0M Japan CPI (YoY) September 0.2% Third U.S. Presidential Debate	
26	27	28	29	30
New Home Sales (SAAR) August 1,011K FOMC Blackout Period Begins	Durable Goods (MoM) August 0.5% Consumer Confidence Index September 101.8	Bank of Canada Rate Decision Previous 0.25% Central Bank of Brazil Rate Decision Previous 2.00%	U.S. GDP (Annualized, QoQ) Q2 -31.4%; Q3 28.6% (W) European Central Bank Rate Decision Previous -0.50% (Deposit Rate)	Personal Income & Spending (MoM) August -2.7%; 1.0% (Income; Spending) Eurozone GDP (QoQ) Q2 -14.7%
2	3	4	5	6
ISM Manufacturing Index September 55.4	U.S. Election Day	ISM Services Index September 57.8 Trade Balance August -\$67.1B U.S. Treasury Refunding Announcement	FOMC Rate Decision (Upper Bound) Previous 0.25% November 0.25% (W)	Nonfarm Payrolls September 661K

Note: (W) = Wells Fargo Estimate, (C) = Consensus Estimate, * = voting FOMC member in 2020, Red = Market Moving Releases

Source: Bloomberg LP and Wells Fargo Securities

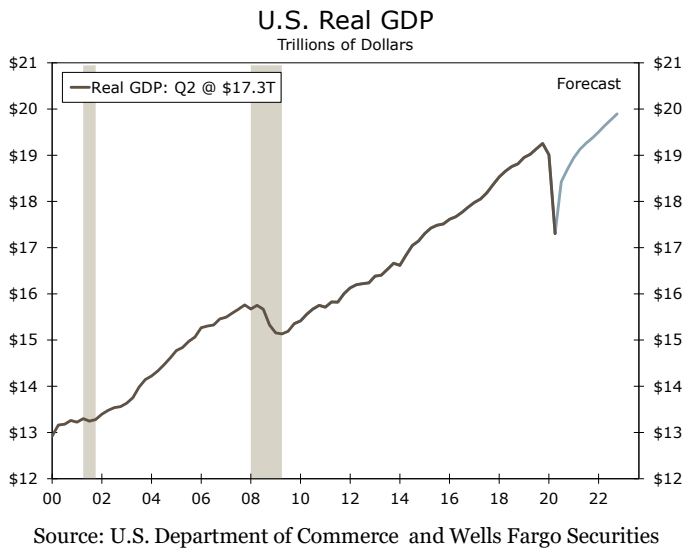
U.S. Growth Outlook

Real GDP growth forecast for Q3-2020: **28.6%** (seasonally adjusted annualized rate)

- Change since last forecast: **+3.2 percentage points**
- We still look for consumer spending and residential investment to lead the sizeable Q3 rebound in GDP. **Equipment spending is also shaping up to see a big bounce back** as leading indicators continue to beat expectations. **This component drove nearly all of our upward revision to Q3 GDP growth.**

Real GDP growth forecast for full-year 2020: **-3.8%** (year-over-year percent change)

- Change since last forecast: **+0.4 percentage points**
- **We have modestly upgraded our full-year 2020 forecast, but our thematic outlook remains unchanged.** Consumer spending on durables and a solid housing market should continue to provide lift throughout the end of the year, as will a bounce back in equipment spending. Uncertainty over the virus trajectory in the fall and winter months, however, remains a serious downside risk, as does less stimulative fiscal policy.
- Further out, we continue to expect above-trend growth to chip away at the slack in the economy, but **an output gap is still likely to persist through 2022 as the economy remains smaller than it would have been in the absence of the pandemic.**



Key Themes and Upside/Downside Scenarios

- *Upside scenario:* COVID-19 outbreaks remain broadly in check and medical advancements occur faster than expected. The U.S. economy accelerates amid a waning pandemic and a highly stimulative economic policy backdrop.
- *Downside scenario:* A “second wave” hits much of the northern hemisphere in the fall and winter months, halting the economic rebound. Monetary and fiscal policy responses are not as forthcoming/effective the second time around, medical advancements are disappointingly slow, and a double-dip recession takes hold.

Inflation Forecast

- **We did not make any major changes to our inflation forecast.** We still look for the year-over-year rate of PCE inflation to remain below 2% for quite some time.

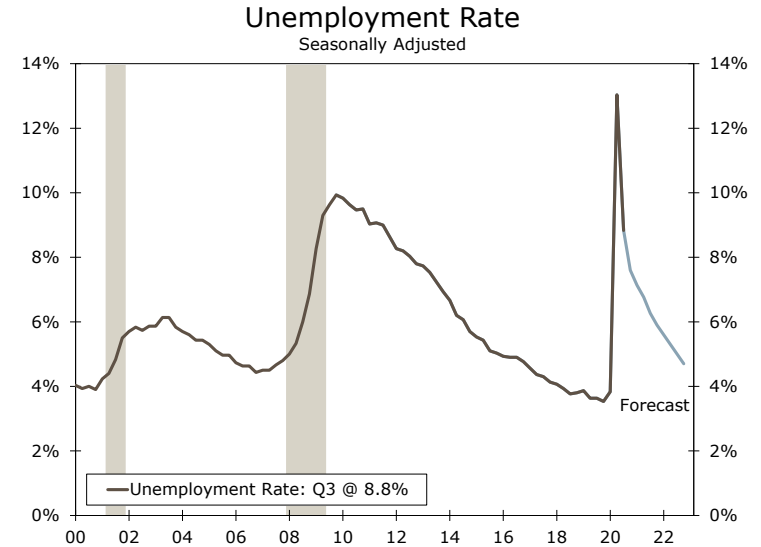
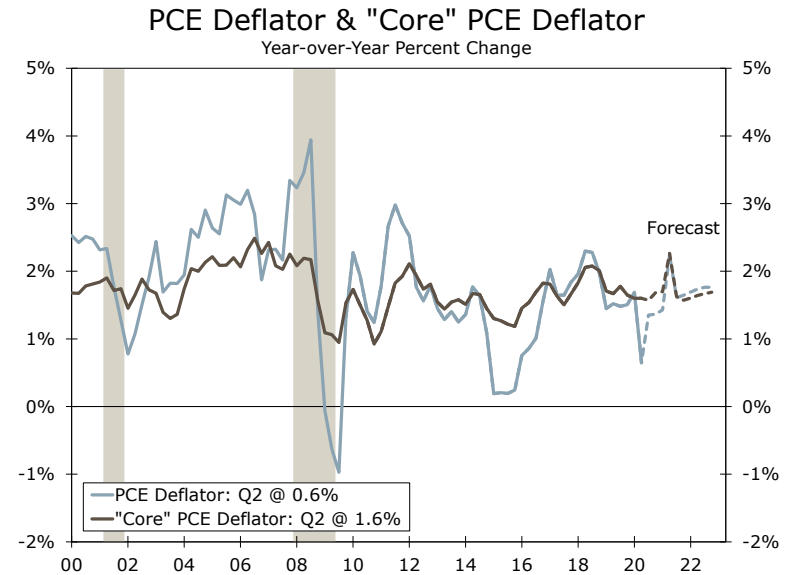
Labor Market Forecast

- **We did not make any major changes to our labor market forecast.** We still look for a gradual recovery in the labor market and forecast the unemployment rate to be below 6% at the end of 2021 and under 5% by the end of 2022.
- Employers added another 661K jobs in September, which was less than half the number of jobs added in August. The unemployment rate slid to 7.9% in September, but not for the right reasons—twice as many people left the labor force as became employed.
- **A wave of high-profile, mass layoff announcements in recent weeks suggests the speed of the recovery in job growth is likely to downshift in the months ahead, absent additional fiscal stimulus.**

Fed Funds Outlook

Fed Funds Forecast for 2020-2022: **No Change**

- We continue to expect the FOMC to keep the federal funds rate unchanged through the end of 2022.
- **In light of the Fed's new policy strategy (average inflation target regime), our baseline forecast for subdued inflation leads us to believe the FOMC will not raise rates until *at least 2023*, and possibly longer, unless inflation materially surprises to the upside.**



Source: U.S. Department of Commerce, U.S. Department of Labor and Wells Fargo Securities

Wells Fargo Securities U.S. Interest Rate Forecast

	Actual								Forecast							
	2019				2020				2021				2022			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Quarter End Interest Rates																
Federal Funds Target Rate	2.50	2.50	2.00	1.75	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
SOFR ¹	2.43	2.43	2.28	1.67	1.23	0.05	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
3 Month LIBOR	2.60	2.32	2.09	1.91	1.45	0.30	0.23	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Prime Rate	5.50	5.50	5.00	4.75	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25
Conventional Mortgage Rate	4.28	3.80	3.61	3.72	3.45	3.16	2.89	2.80	2.80	2.85	2.90	3.00	3.05	3.10	3.15	3.20
3 Month Bill	2.40	2.12	1.88	1.55	0.11	0.16	0.10	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
6 Month Bill	2.44	2.09	1.83	1.60	0.15	0.18	0.11	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15
1 Year Bill	2.40	1.92	1.75	1.59	0.17	0.16	0.12	0.15	0.15	0.15	0.20	0.20	0.20	0.20	0.25	0.25
2 Year Note	2.27	1.75	1.63	1.58	0.23	0.16	0.13	0.15	0.20	0.20	0.20	0.25	0.25	0.30	0.35	0.45
5 Year Note	2.23	1.76	1.55	1.69	0.37	0.29	0.28	0.30	0.35	0.40	0.50	0.60	0.65	0.70	0.80	0.90
10 Year Note	2.41	2.00	1.68	1.92	0.70	0.66	0.69	0.85	1.00	1.10	1.20	1.30	1.35	1.40	1.45	1.50
30 Year Bond	2.81	2.52	2.12	2.39	1.35	1.41	1.46	1.60	1.75	1.90	2.05	2.15	2.20	2.20	2.25	2.30

Forecast as of: October 07, 2020

¹ Quarterly Average of Daily Close

Source: Federal Reserve Board and Wells Fargo Securities

What Are We Watching in the Month Ahead?

- What will it take to get higher Treasury yields?
 - U.S. equity markets have recouped much of their losses, **but at roughly 77 bps, the 10-year Treasury yield is only up slightly since the end of March.** What will it take to see higher yields?
 - **First, markets need to price in some rate hikes eventually.**
 - The OIS market implies no fed funds hikes for most of the 2020s. If markets are convinced the fed funds rate will be near zero for most of the decade, to some extent this caps yields even at the back end of the curve.
 - **Second, markets need to believe that higher inflation is on the way.**
 - While inflation expectations as measured by 10-year breakevens have recovered most of their decline since February, they remain stuck around 1.7% and have actually declined slightly since the Fed announced its move to average inflation targeting.
 - **Third, markets need less uncertainty related to the U.S. election and the fall/winter COVID situation.**
 - Yes, the economic data have been strong, but fears remain that this progress will be reversed if an acceleration in cases/deaths occurs as the weather turns. The presidential election adds additional uncertainty for investors.

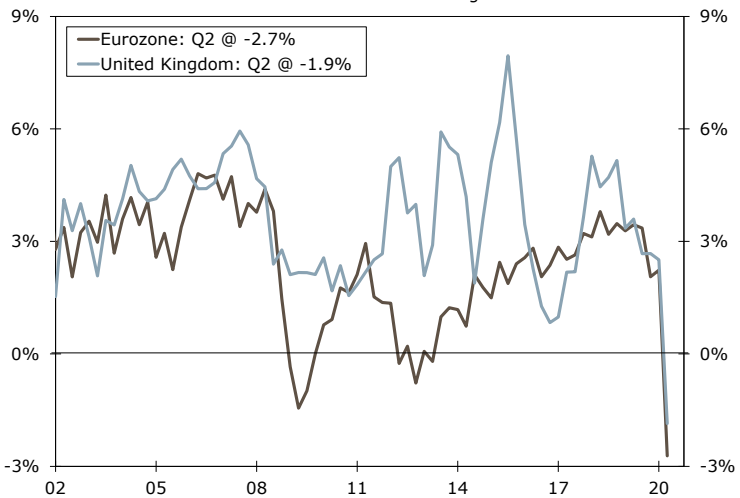
Eurozone, U.K. Household Incomes Hurting

- For the Eurozone as a whole, household disposable income fell 3.3% quarter-over-quarter, a record decline. **Compared to Q2-2019 and adjusting for inflation, Eurozone real household disposable income fell 3.4% year-over-year.**
- In the U.K., Q2 household disposable income also showed a record decline**, falling 3.0% quarter-over-quarter. Adjusting for inflation, real household disposable income was down 2% compared to Q2-2019. In both the U.K. and the Eurozone, however, consumption fell far more, leading to sharp spikes in household savings rates.

North American Household Incomes Firmer

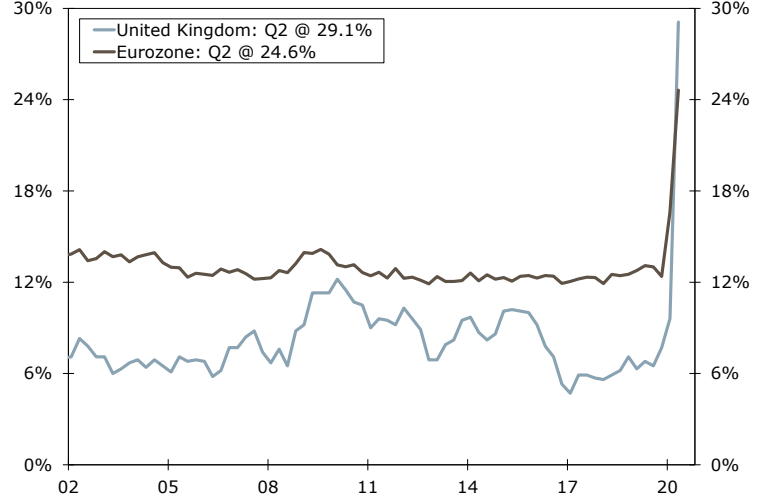
- Those European figures are in sharp contrast to their North American equivalents. **Amid sizable fiscal stimulus, U.S. Q2 household disposable income actually rose 9.6% quarter-over-quarter while Canada's Q2 household disposable income rose 10.8% quarter-over-quarter.**
- The less robust household income position does create some risk that the consumer recovery, and thus overall GDP growth, in the Eurozone and the United Kingdom might be slower than hoped, possibly restraining the euro and the pound for the time being.

Household Disposable Income
Year-over-Year Percent Change



Source: Bloomberg LP, Datastream and Wells Fargo Securities

Household Savings Rate
Percent of Disposable Income



Wells Fargo Central Bank Policy Forecasts

Central Bank	Current Policy Rate	Last Major Policy Change	WF Next Forecasted Policy Change
United States (FOMC)	0.25%	August 2020 <i>Announced it will adopt a flexible form of "average inflation targeting" such that it will aim to "achieve inflation that averages 2% over time"</i>	No change through Q1-2022
Eurozone (ECB)	-0.50% (Deposit Rate)	June 2020 <i>Expanded its Pandemic Emergency Purchase Program (PEPP) purchases by €600B, extended the horizon for PEPP purchases to June 2021 and provided some guidance on PEPP reinvestments</i>	No change through Q1-2022
United Kingdom (BoE)	0.10%	June 2020 <i>Announced a £100B increase in its asset purchase target to £745B</i>	Raise its asset purchase target by a further £100B in Q4-2020
Japan (BoJ)	-0.10%	April 2020 <i>Raised its purchase target for corporate bonds and commercial paper to ¥20T</i>	No change through Q1-2022
Canada (BoC)	0.25%	April 2020 <i>Announced two new asset purchases programs, a provincial bond purchase program of C\$50B and corporate bond purchase program of C\$10B</i>	No change through Q1-2022

Forecast as of: October 07, 2020

Source: Bloomberg LP and Wells Fargo Securities

What Are We Watching in the Month Ahead?

European Central Bank

- **We do not anticipate any further easing from the ECB**, though we see the risks as skewed towards some type of more accommodative policy.

Bank of Japan

- **We do not anticipate any further easing from the BoJ**, though we see the risks as skewed towards some type of more accommodative policy.

Bank of England

- **We think the BoE is done cutting its policy rate, but we look for another £100 billion increase in asset purchases in Q4-2020.**

Bank of Canada

- **We do not anticipate any further easing from the BoC.**

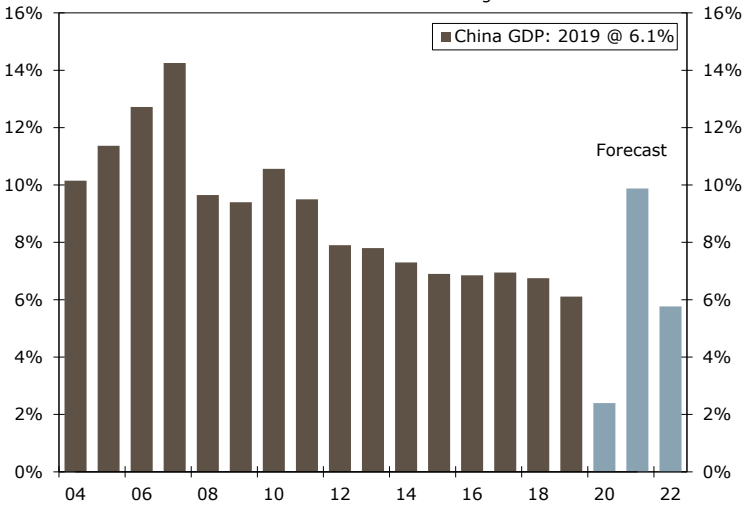
Chinese GDP Outperforming...

- On October 18, Chinese officials will release a slew of economic data, including Q3 real GDP figures. **On a year-to-date basis, it appears likely that the Chinese economy will have pulled even with 2019, meaning that real GDP through the first three quarters of 2020 was, on average, about what it was 2019.** The recovery has been led by industrial output, which was about flat through the first eight months of the year. Retail sales have lagged significantly, however, and are down 8.6% year-to-date, in contrast to the sharper retail sales recovery in other places, like the United States.

...But Chinese Retail Sales Still Lagging

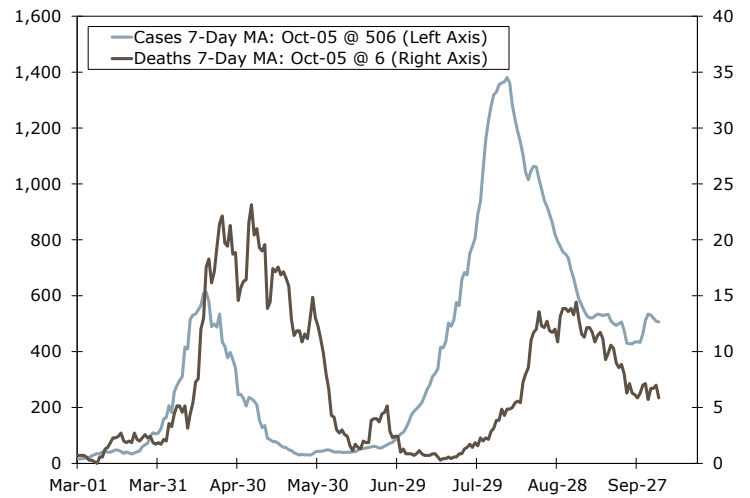
- There has been concern among some analysts and financial market participants about the validity of the COVID-19 numbers coming out of China that indicate the spread of the disease continues to remain firmly under control.** Although we understand some of that skepticism, we do think it is worth highlighting two points. **One, some of the weakness in Chinese retail sales could reflect more significant behavioral changes on the part of Chinese consumers than have occurred in the U.S. or Europe.** **Two, the spread of COVID in other parts of the Pacific Rim, such as Japan, also remains in check.**

China GDP Growth
Year-over-Year Percent Change



Source: International Monetary Fund, Bloomberg LP and Wells Fargo Securities

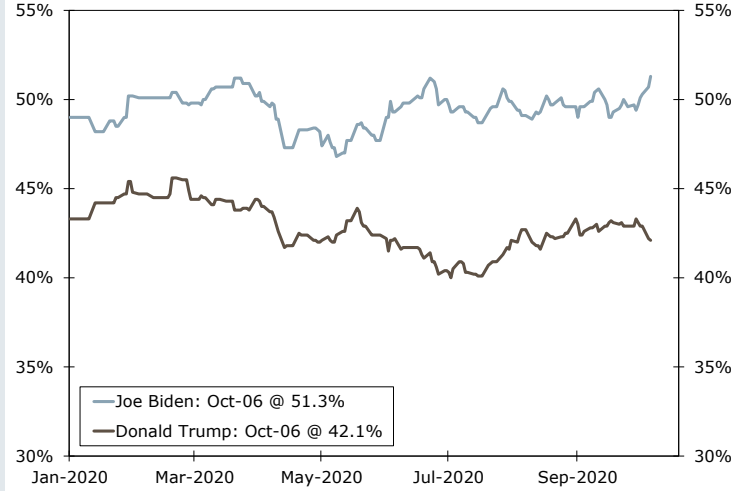
Japan COVID-19 New Cases & Deaths



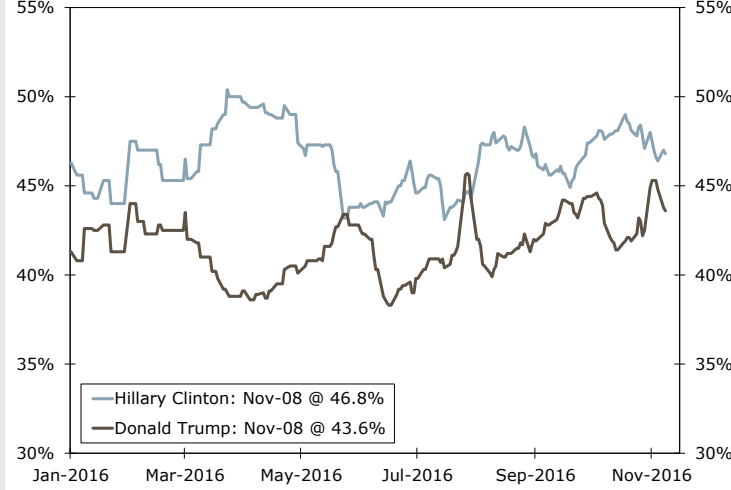
U.S. Election Day Draws Closer With Just Four Weeks Left in the Race

- At present, Joe Biden's lead in the RealClearPolitics (RCP) [national polling average](#) is +9.2, a bit wider than it has been over the past few weeks. At this point in 2016, the race was actually polling much closer, with Hillary Clinton up +4.1 on October 6.
- We continue to be struck by the relative stability of 2020 polling. As can be seen in the two charts to the right, the 2016 race was marked by considerable swings over the course of the year, oscillating between periods where Hillary Clinton polled well ahead of Donald Trump and periods where the race appeared tied or Donald Trump even had a small lead. Contrast that with 2020, where Joe Biden has led pretty much the whole year by a decent margin.
- Of course, President Trump could chip away at Joe Biden's lead in the remaining weeks of the campaign. As we have noted previously, Donald Trump closed well in 2016, cutting Hillary Clinton's national polling lead in half in the final weeks of the campaign. Exit polls also provided additional evidence that Trump won a majority of voters who decided in the final month of the race.
- Furthermore, we do not believe Donald Trump needs to pull even in the national vote to win the election. Indeed, he won the 2016 race while losing the national vote by about three percentage points, in line with the RCP polling average on Election Day. In 2016, swing states like Pennsylvania, Michigan, Wisconsin and Florida voted roughly 3-4 points to the right of the nation as a whole.
- Thus, if 2016 is any guide, Trump could be within striking distance of a win even if Biden is polling 3-4 points ahead at the national level. At the moment though, he appears well outside of that range.

2020 General Election: Trump versus Biden
Real Clear Politics Polling Average



2016 General Election: Trump versus Clinton
Real Clear Politics Polling Average



Source: RealClearPolitics and Wells Fargo Securities

Wells Fargo Securities U.S. Economic Forecast

	Actual								Forecast								Actual		Forecast	
	2019				2020				2021				2022				2019	2020	2021	2022
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
Real Gross Domestic Product (a)	2.9	1.5	2.6	2.4	-5.0	-31.4	28.6	6.1	5.3	3.9	2.9	2.3	2.7	2.9	2.6	2.6	2.2	-3.8	4.4	2.7
Personal Consumption	1.8	3.7	2.7	1.6	-6.9	-33.2	39.1	6.0	5.1	3.6	3.2	2.3	2.3	2.6	2.6	2.5	2.4	-3.8	5.2	2.6
Business Fixed Investment	4.2	0.0	1.9	-0.3	-6.7	-27.2	10.7	4.4	3.4	4.0	4.8	4.8	5.3	5.2	5.2	4.9	2.9	-5.8	2.6	5.0
Equipment	2.0	-3.8	-1.7	-1.7	-15.2	-35.9	38.7	7.5	3.5	5.5	5.8	6.9	7.1	6.4	6.1	5.8	2.1	-8.2	5.8	6.5
Intellectual Property Products	4.5	4.1	5.3	4.6	2.4	-11.4	-0.6	0.7	4.2	4.8	6.8	6.3	6.2	5.5	5.6	5.1	6.4	0.0	2.5	5.9
Structures	8.2	1.6	3.6	-5.3	-3.7	-33.6	-19.0	4.5	1.5	-1.5	-2.2	-3.4	-1.4	1.3	1.9	2.1	-0.6	-10.7	-4.8	-0.8
Residential Investment	-1.7	-2.1	4.6	5.8	19.0	-35.6	50.0	16.0	9.0	7.0	7.0	6.5	6.5	7.0	6.8	6.5	-1.7	3.8	10.1	6.7
Government Purchases	2.5	5.0	2.1	2.4	1.3	2.5	-3.1	-2.4	-1.0	-0.8	-0.4	0.2	0.2	0.5	0.5	0.8	2.3	1.2	-1.1	0.2
Net Exports	-907.4	-951.4	-950.2	-861.5	-788.0	-775.1	-928.0	-980.6	-1001.3	-987.0	-985.4	-984.8	-985.2	-989.1	-1001.0	-1013.0	-917.6	-867.9	-989.6	-997.1
Pct. Point Contribution to GDP	0.6	-0.8	0.0	1.5	1.1	0.6	-3.5	-1.1	-0.4	0.3	0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.2	0.3	-0.7	0.0
Inventories Change	101.7	49.4	44.0	-1.1	-80.9	-287.0	-118.0	-10.0	60.0	80.0	70.0	60.0	65.0	70.0	70.0	70.0	48.5	-124.0	67.5	68.8
Pct. Point Contribution to GDP	0.2	-1.0	-0.1	-0.8	-1.3	-3.5	4.0	2.4	1.5	0.4	-0.2	-0.2	0.1	0.1	0.0	0.0	0.0	-0.9	1.0	0.0
Nominal GDP (a)	4.0	4.1	4.0	3.9	-3.4	-32.8	34.3	7.8	6.9	5.6	4.7	4.1	4.5	4.7	4.5	4.4	4.0	-2.6	6.2	4.5
Real Final Sales	2.7	2.5	2.7	3.2	-3.6	-28.1	24.9	3.7	3.7	3.5	3.1	2.6	2.6	2.8	2.6	2.6	2.2	-2.9	3.5	2.7
Retail Sales (b)	2.7	3.4	3.9	4.0	1.2	-7.7	3.2	3.1	5.6	14.3	1.6	1.6	1.9	2.2	2.3	2.7	3.5	-0.1	5.5	2.3
Inflation Indicators (b)																				
PCE Deflator	1.4	1.5	1.5	1.5	1.7	0.6	1.4	1.4	1.4	2.2	1.6	1.6	1.7	1.7	1.8	1.8	1.5	1.3	1.7	1.7
"Core" PCE Deflator	1.7	1.7	1.8	1.6	1.8	1.0	1.6	1.7	1.7	2.3	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.5	1.8	1.7
Consumer Price Index	1.6	1.8	1.8	2.0	2.1	0.4	1.3	1.2	1.4	2.7	1.9	1.9	2.0	2.0	2.1	2.1	1.8	1.3	1.9	2.0
"Core" Consumer Price Index	2.1	2.1	2.3	2.3	2.2	1.3	1.7	1.9	1.8	2.7	2.0	1.8	1.9	1.9	1.9	2.0	2.2	1.8	2.1	1.9
Producer Price Index (Final Demand)	1.9	2.0	1.6	1.1	1.1	-1.0	-0.1	0.4	1.0	2.8	2.3	2.1	2.1	2.1	2.2	2.2	1.7	0.1	2.1	2.1
Employment Cost Index	2.8	2.7	2.8	2.7	2.8	2.7	2.0	1.8	1.5	1.8	2.0	2.1	1.5	1.8	2.0	2.1	2.7	2.3	1.8	1.8
Real Disposable Income (b)	3.2	2.1	1.8	1.6	1.4	11.9	5.7	4.2	2.8	-6.4	-1.3	0.7	2.0	2.3	2.7	2.7	2.2	5.8	-1.2	2.4
Nominal Personal Income (b)	4.7	4.1	3.5	3.5	3.2	10.4	6.2	4.6	3.3	-3.5	0.3	2.4	3.8	4.1	4.5	4.5	3.9	6.1	0.5	4.2
Industrial Production (a)	-1.9	-2.3	1.1	0.4	-6.8	-43.2	39.4	8.2	5.0	5.0	5.7	3.6	3.5	4.2	4.4	2.5	0.9	-7.2	5.2	4.1
Capacity Utilization	78.6	77.8	77.6	77.2	75.8	65.8	71.6	73.0	73.8	74.7	75.7	76.4	77.1	77.8	78.7	79.1	77.8	71.5	75.2	78.2
Corporate Profits Before Taxes (b)	-1.1	1.7	-0.5	1.3	-6.7	-19.3	-8.0	-4.0	8.0	22.0	10.0	3.0	4.0	5.0	3.0	4.0	0.3	-9.5	10.3	4.0
Corporate Profits After Taxes	-3.3	0.5	-0.3	1.3	-5.7	-18.8	-8.5	-3.4	7.3	22.2	10.0	2.9	3.8	5.0	2.9	4.1	-0.4	-9.1	10.1	3.9
Federal Budget Balance (c)	-372	-56	-237	-357	-387	-2001	-556	-495	-611	-270	-424	-404	-527	-142	-327	-336	-984	-3300	-1800	-1400
Trade Weighted Dollar Index (d)	109.8	109.7	111.0	109.8	112.7	110.3	106.6	107.3	105.8	105.0	104.5	104.0	103.5	103.0	102.5	102.5	110.1	109.2	104.8	102.9
Nonfarm Payroll Change (e)	139	159	203	210	-303	-4427	1304	567	450	328	283	270	257	243	227	213	178	-715	333	235
Unemployment Rate	3.9	3.6	3.6	3.5	3.8	13.0	8.8	7.6	7.1	6.8	6.3	5.9	5.6	5.3	5.0	4.7	3.7	8.3	6.5	5.2
Housing Starts (f)	1.20	1.26	1.29	1.43	1.48	1.08	1.44	1.40	1.38	1.37	1.37	1.39	1.40	1.40	1.40	1.40	1.29	1.35	1.38	1.40
Light Vehicle Sales (g)	16.9	17.0	17.0	16.8	15.0	11.3	15.4	14.3	14.5	14.8	15.3	15.3	15.5	15.7	15.7	15.8	17.0	14.0	15.0	15.7
Crude Oil - Brent - Front Contract (h)	63.8	67.6	61.5	61.7	51.0	34.7	43.8	44.0	44.0	49.0	49.0	50.0	53.0	55.0	57.0	55.0	63.6	43.4	48.0	55.0
Quarter-End Interest Rates (i)																				
Federal Funds Target Rate	2.50	2.50	2.00	1.75	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.25	0.25	0.25	0.25
Secured Overnight Financing Rate (h)	2.43	2.43	2.28	1.67	1.23	0.05	0.09	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	2.20	0.37	0.10	0.10
3 Month LIBOR	2.60	2.32	2.09	1.91	1.45	0.30	0.23	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	2.33	0.56	0.25	0.25
Prime Rate	5.50	5.50	5.00	4.75	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25	5.25	3.25	3.25	3.25
Conventional Mortgage Rate	4.28	3.80	3.61	3.72	3.45	3.16	2.89	2.80	2.80	2.85	2.90	3.00	3.05	3.10	3.15	3.20	3.94	3.08	2.89	3.13
3 Month Bill	2.40	2.12	1.88	1.55	0.11	0.16	0.10	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	2.11	0.13	0.15	0.15
6 Month Bill	2.44	2.09	1.83	1.60	0.15	0.18	0.11	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	2.11	0.15	0.15	0.15
1 Year Bill	2.40	1.92	1.75	1.59	0.17	0.16	0.12	0.15	0.15	0.15	0.20	0.20	0.20	0.20	0.25	0.25	2.05	0.15	0.18	0.23
2 Year Note	2.27	1.75	1.63	1.58	0.23	0.16	0.13	0.15	0.20	0.20	0.20	0.25	0.25	0.30	0.35	0.45	1.97	0.17	0.21	0.34
5 Year Note	2.23	1.76	1.55	1.69	0.37	0.29	0.28	0.30	0.35	0.40	0.50	0.60	0.65	0.70	0.80	0.90	1.95	0.31	0.46	0.76
10 Year Note	2.41	2.00	1.68	1.92	0.70	0.66	0.69	0.85	1.00	1.10	1.20	1.30	1.35	1.40	1.45	1.50	2.14	0.73	1.15	1.43
30 Year Bond	2.81	2.52	2.12	2.39	1.35	1.41	1.46	1.60	1.75	1.90	2.05	2.15	2.20	2.20	2.25	2.30	2.58	1.46	1.96	2.24

Forecast as of: October 07, 2020

Notes: (a) Compound Annual Growth Rate Quarter-over-Quarter

(b) Year-over-Year Percentage Change

(c) Quarterly Sum - Billions USD; Annual Data Represents Fiscal Yr.

(d) Federal Reserve Advanced Foreign Economies Index, 2006=100 - Quarter End

(e) Average Monthly Change

(f) Millions of Units - Annual Data - Not Seasonally Adjusted

(g) Quarterly Data - Average Monthly SAAR; Annual Data - Actual Total Vehicles Sold

(h) Quarterly Average of Daily Close

(i) Annual Numbers Represent Averages

Source: U.S. Department of Commerce, U.S. Department of Labor, IHS Markit, Federal Reserve Board and Wells Fargo Securities

U.S. Economic Forecast: Change Since September 10, 2020

Changes to the Wells Fargo Securities U.S. Economic Forecast

	Actual																Forecast				Actual 2019	2020	Forecast 2021	Forecast 2022
	2019				2020				2021				2022											
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q								
Real Gross Domestic Product (a)	0.00	0.00	0.00	0.00	0.00	0.32	3.19	-1.13	-1.66	0.68	0.02	0.02	0.01	0.01	0.01	0.01	0.00	0.32	-0.13	0.05				
Personal Consumption	0.00	0.00	0.00	0.00	0.00	0.91	-0.23	0.01	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.22	0.08	0.00				
Business Fixed Investment	0.00	0.00	0.00	0.00	0.00	-1.19	5.36	-0.14	-1.33	0.01	0.00	0.01	0.01	0.01	0.01	0.01	0.00	0.29	0.18	0.01				
Equipment	0.00	0.00	0.00	0.00	0.00	0.02	14.31	-0.45	-3.00	0.00	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	1.23	0.59	0.00				
Intellectual Property Products	0.00	0.00	0.00	0.00	0.00	-3.71	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.75	-0.25	0.00				
Structures	0.00	0.00	0.00	0.00	0.00	-0.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05	-0.02	0.00				
Residential Investment	0.00	0.00	0.00	0.00	0.00	2.31	6.00	4.00	2.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.47	2.01	0.00				
Government Purchases	0.00	0.00	0.00	0.00	0.00	-0.26	-0.16	-0.77	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.12	-0.14	0.00				
Net Exports	0.0	0.0	0.0	0.0	0.0	-14.1	-14.2	-19.2	-19.5	-19.5	-19.5	-19.4	-19.29	-19.28	-19.30	-19.31	0.0	-11.90	-19.48	-19.30				
Pct. Point Contribution to GDP	0.00	0.00	0.00	0.00	0.00	-0.28	0.00	-0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06	-0.04	0.00				
Inventory Change	0.00	0.00	0.00	0.00	0.00	-0.62	82.00	40.00	-30.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	30.35	-7.50	0.00				
Pct. Point Contribution to GDP	0.00	0.00	0.00	0.00	0.00	-0.04	1.95	-0.96	-1.54	0.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.16	-0.21	0.04				
Nominal GDP	0.00	0.00	0.00	0.00	0.00	0.46	4.47	-0.45	-1.69	0.69	0.02	0.02	0.01	0.01	0.01	0.01	0.00	0.52	0.13	0.05				
Real Final Sales	0.00	0.00	0.00	0.00	0.00	0.36	0.85	-0.13	-0.07	0.02	0.02	0.01	0.01	0.01	0.01	0.01	0.00	0.17	0.09	0.01				
Retail Sales (b)	0.00	0.00	-0.02	0.00	0.00	0.04	-0.56	-0.73	-0.75	-0.86	-0.15	0.00	0.00	0.00	0.00	0.00	-0.01	-0.32	-0.41	0.00				
Inflation Indicators (b)																								
PCE Deflator	0.00	0.00	0.00	0.00	0.00	0.04	0.27	0.44	0.44	0.40	0.16	0.00	0.00	0.00	0.00	0.00	0.00	0.19	0.25	0.00				
"Core" PCE Deflator	0.00	0.00	0.00	0.00	0.00	0.05	0.30	0.47	0.47	0.43	0.17	0.00	0.00	0.00	0.00	0.00	0.00	0.21	0.27	0.00				
Consumer Price Index	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.34	0.35	0.36	0.21	0.01	0.00	0.00	0.00	0.00	0.00	0.12	0.23	0.00				
"Core" Consumer Price Index	0.00	0.00	0.00	0.00	0.00	0.00	0.16	0.41	0.42	0.42	0.26	0.01	0.00	0.00	0.00	0.00	0.00	0.14	0.28	0.00				
Producer Price Index (Final Demand)	0.00	0.00	0.00	0.00	0.00	-0.11	0.11	0.22	0.22	0.34	0.12	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.17	0.00				
Employment Cost Index	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Real Disposable Income (b)	0.00	0.00	0.00	0.00	0.00	-0.08	0.27	1.51	0.07	-0.08	-0.55	-1.22	0.24	0.31	0.30	0.07	0.00	0.43	-0.43	0.23				
Nominal Personal Income (b)	0.00	0.00	0.00	0.00	0.00	-0.03	0.65	1.96	0.51	0.29	-0.48	-1.24	0.24	0.31	0.30	0.07	0.00	0.65	-0.22	0.23				
Industrial Production (a)	0.00	0.00	0.00	0.00	-0.09	0.07	2.91	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.33	0.00				
Capacity Utilization	0.00	0.00	0.00	0.00	-0.02	0.00	0.40	0.46	0.46	0.47	0.47	0.48	0.48	0.49	0.49	0.50	0.00	0.21	0.47	0.49				
Corporate Profits Before Taxes (b)	0.00	0.00	0.00	0.00	0.00	0.79	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.03	0.00				
Corporate Profits After Taxes	0.00	0.00	0.00	0.00	0.00	1.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.03	0.00				
Federal Budget Balance (c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Trade Weighted Dollar Index (d)	0.00	0.00	0.00	0.00	0.00	0.00	0.82	2.50	2.00	2.00	2.00	2.00	1.75	1.50	1.25	1.25	0.00	0.83	2.00	1.44				
Nonfarm Payroll Change (e)	0.00	0.00	0.00	0.00	0.00	0.00	35.33	-50.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-3.67	0.00	0.00				
Unemployment Rate	0.00	0.00	0.00	0.00	0.00	0.00	-0.07	-0.17	-0.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06	-0.03	0.00				
Housing Starts (f)	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.11	0.06	0.05	0.05	0.07	0.07	0.06	0.06	0.05	0.00	0.05	0.06	0.06				
Light Vehicle Sales (g)	0.00	0.00	0.00	0.00	-0.02	-0.02	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00				
Crude Oil - Brent - Front Contract (h)	0.00	0.00	0.00	0.00	0.00	0.00	0.77	0.00	-2.00	3.00	3.00	0.00	0.00	0.00	0.00	0.00	0.00	0.19	1.00	0.00				
Quarter-End Interest Rates (i)																								
Federal Funds Target Rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Secured Overnight Financing Rate																								
3 Month LIBOR	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Prime Rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Conventional Mortgage Rate	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00				
3 Month Bill	0.00	0.00	0.00	0.00	0.00	0.00	-0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00				
2 Year Note	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00				
5 Year Note	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00				
10 Year Note	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00				
30 Year Bond	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00				

Forecast as of: October 07, 2020

Notes: (a) Compound Annual Growth Rate Quarter-over-Quarter

(b) Year-over-Year Percentage Change

(c) Quarterly Sum - Billions USD; Annual Data Represents Fiscal Yr.

(d) Federal Reserve Advanced Foreign Economies Index, 2006=100 - Quarter

(e) Average Monthly Change

(f) Millions of Units - Annual Data - Not Seasonally Adjusted

(g) Quarterly Data - Average Monthly SAAR; Annual Data - Actual Total Vehicles Sold

(h) Quarterly Average of Daily Close

(i) Annual Numbers Represent Averages

Source: U.S. Department of Commerce, U.S. Department of Labor, IHS Markit, Federal Reserve Board and Wells Fargo Securities

Wells Fargo International Economic Forecast

(Year-over-Year Percent Change)

	GDP				CPI			
	2019	2020	2021	2022	2019	2020	2021	2022
Global (PPP Weights)	2.9%	-4.0%	6.2%	3.6%	3.6%	3.2%	3.1%	3.3%
Advanced Economies ¹	1.7%	-5.7%	4.7%	2.8%	1.4%	0.9%	1.5%	1.7%
United States	2.3%	-3.8%	4.4%	2.7%	1.8%	1.3%	1.9%	2.0%
Eurozone	1.3%	-8.3%	5.2%	2.5%	1.2%	0.4%	1.1%	1.4%
United Kingdom	1.4%	-10.6%	5.5%	2.9%	1.8%	0.8%	1.3%	1.8%
Japan	0.7%	-6.0%	2.1%	2.0%	0.5%	0.1%	0.2%	0.7%
Canada	1.7%	-5.7%	5.8%	2.5%	1.9%	0.6%	1.8%	2.0%
Switzerland	0.9%	-3.7%	5.0%	1.8%	0.4%	-0.7%	0.0%	0.4%
Australia	1.8%	-3.4%	3.2%	3.0%	1.6%	0.8%	1.6%	1.8%
New Zealand	2.2%	-5.2%	5.5%	3.3%	1.6%	1.3%	1.4%	1.8%
Sweden	1.2%	-4.2%	4.0%	3.0%	1.7%	0.6%	1.2%	1.4%
Norway	1.2%	-3.8%	3.7%	2.5%	2.2%	1.4%	2.3%	2.0%
Developing Economies ¹	3.7%	-2.9%	7.3%	4.2%	5.1%	4.9%	4.2%	4.4%
China	6.1%	2.4%	9.9%	5.8%	2.9%	2.8%	2.1%	2.3%
India	4.2%	-9.0%	9.9%	5.8%	4.5%	5.5%	3.6%	3.9%
Mexico	-0.3%	-10.6%	3.4%	3.2%	3.6%	3.5%	3.8%	3.5%
Brazil	1.1%	-5.7%	3.9%	2.9%	3.7%	2.6%	3.0%	3.4%

Forecast as of: October 07, 2020

¹Aggregated Using PPP Weights

Source: International Monetary Fund and Wells Fargo Securities

Changes to the Wells Fargo International Economic Forecast

	GDP				CPI			
	2019	2020	2021	2022	2019	2020	2021	2022
Global (PPP Weights)	0.00%	0.22%	0.21%	0.02%	0.00%	0.05%	0.07%	-0.01%
Advanced Economies ¹	0.00%	0.14%	-0.07%	0.06%	0.00%	0.07%	0.15%	-0.01%
United States	0.00%	0.32%	-0.13%	0.05%	0.00%	0.12%	0.23%	0.00%
Eurozone	0.00%	-0.09%	-0.14%	0.10%	0.00%	0.05%	0.21%	0.00%
United Kingdom	0.00%	0.00%	0.00%	0.00%	0.00%	-0.35%	-0.15%	-0.05%
Japan	0.00%	0.19%	0.22%	0.00%	0.00%	0.00%	0.00%	0.00%
Canada	0.00%	0.22%	0.24%	0.00%	0.00%	0.00%	0.08%	0.00%
Switzerland	0.00%	0.74%	0.03%	0.00%	0.00%	0.00%	0.00%	0.00%
Australia	0.00%	-0.33%	-0.20%	0.00%	0.00%	0.10%	0.00%	-0.20%
New Zealand	0.00%	0.13%	-0.20%	0.00%	0.00%	0.00%	0.00%	0.00%
Sweden	0.00%	0.26%	-0.02%	0.00%	0.00%	0.20%	-0.30%	-0.30%
Norway	0.00%	0.22%	-0.06%	-0.04%	0.00%	0.10%	0.20%	0.10%
Developing Economies ¹	0.00%	0.28%	0.41%	0.00%	0.00%	0.04%	0.01%	0.00%
China	0.00%	0.00%	0.00%	0.00%	0.00%	0.01%	0.00%	0.00%
India ²	0.00%	0.26%	0.15%	0.00%	0.00%	0.18%	0.00%	0.00%
Mexico	0.00%	2.90%	4.95%	0.00%	0.00%	0.08%	0.12%	0.00%
Brazil	0.00%	0.90%	1.49%	0.00%	0.00%	0.00%	0.00%	0.00%

Forecast as of: October 07, 2020

¹Aggregated Using PPP Weights

Source: International Monetary Fund and Wells Fargo Securities

Wells Fargo International Interest Rate Forecast

(End of Quarter Rates)

	Central Bank Key Policy Rate					
	2020	2021				2022
	Q4	Q1	Q2	Q3	Q4	Q1
United States	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%
Eurozone ¹	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%
United Kingdom	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
Japan	-0.10%	-0.10%	-0.10%	-0.10%	-0.10%	-0.10%
Canada	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%
	2-Year Note					
	2020	2021				2022
	Q4	Q1	Q2	Q3	Q4	Q1
United States	0.15%	0.20%	0.20%	0.20%	0.25%	0.25%
Eurozone ²	-0.60%	-0.60%	-0.55%	-0.50%	-0.40%	-0.35%
United Kingdom	-0.05%	0.00%	0.05%	0.10%	0.15%	0.15%
Japan	-0.10%	-0.05%	0.00%	0.05%	0.05%	0.05%
Canada	0.30%	0.35%	0.35%	0.35%	0.40%	0.40%
	10-Year Note					
	2020	2021				2022
	Q4	Q1	Q2	Q3	Q4	Q1
United States	0.85%	1.00%	1.10%	1.20%	1.30%	1.35%
Eurozone ²	-0.35%	-0.25%	-0.15%	-0.05%	0.00%	0.05%
United Kingdom	0.35%	0.45%	0.50%	0.55%	0.60%	0.65%
Japan	0.05%	0.10%	0.10%	0.15%	0.15%	0.15%
Canada	0.75%	0.90%	1.00%	1.05%	1.15%	1.20%

Forecast as of: October 07, 2020

¹ ECB Deposit Rate ² German Government Bond Yield

Source: International Monetary Fund and Wells Fargo Securities

Wells Fargo International Interest Rate Forecast

(End of Quarter Rates)

	Central Bank Key Policy Rate					2022 Q1
	2020	2021				
	Q4	Q1	Q2	Q3	Q4	
United States	0.00%	0.00%	0.00%	0.00%	0.00%	
Eurozone ¹	0.00%	0.00%	0.00%	0.00%	0.00%	
United Kingdom	0.00%	0.00%	0.00%	0.00%	0.00%	
Japan	0.00%	0.00%	0.00%	0.00%	0.00%	
Canada	0.00%	0.00%	0.00%	0.00%	0.00%	

	2-Year Note					2022 Q1
	2020	2021				
	Q4	Q1	Q2	Q3	Q4	
United States	0.00%	0.00%	0.00%	0.00%	0.00%	
Eurozone ²	0.00%	0.00%	0.00%	0.00%	0.00%	
United Kingdom	0.00%	0.00%	0.00%	0.00%	0.00%	
Japan	0.00%	0.00%	0.00%	0.00%	0.00%	
Canada	0.00%	0.00%	0.00%	0.00%	0.00%	

	10-Year Note					2022 Q1
	2020	2021				
	Q4	Q1	Q2	Q3	Q4	
United States	0.00%	0.00%	0.00%	0.00%	0.00%	
Eurozone ²	-0.10%	-0.10%	-0.10%	-0.10%	-0.10%	
United Kingdom	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%	
Japan	-0.05%	0.00%	0.00%	0.00%	0.00%	
Canada	-0.05%	0.00%	0.00%	0.00%	0.00%	

Forecast as of: October 07, 2020

¹ ECB Deposit Rate ² German Government Bond Yield

Source: International Monetary Fund and Wells Fargo Securities

Economists

Jay H. Bryson, Chief Economist	jay.bryson@wellsfargo.com
Mark Vitner, Senior Economist	mark.vitner@wellsfargo.com
Sam Bullard, Senior Economist	sam.bullard@wellsfargo.com
Nick Bennenbroek, International Economist	nicholas.bennenbroek@wellsfargo.com
Tim Quinlan, Senior Economist	tim.quinlan@wellsfargo.com
Azhar Iqbal, Econometrician	azhar.iqbal@wellsfargo.com
Sarah House, Senior Economist	sarah.house@wellsfargo.com
Charlie Dougherty, Economist	charles.dougherty@wellsfargo.com
Michael Pugliese, Economist	michael.d.pugliese@wellsfargo.com
Brendan McKenna, International Economist	brendan.mckenna@wellsfargo.com
Shannon Seery, Economist	shannon.seery@wellsfargo.com

Economic Analysts

Jen Licis, Economic Analyst	jennifer.licis@wellsfargo.com
Hop Mathews, Economic Analyst	hop.mathews@wellsfargo.com
Nicole Cervi, Economic Analyst	nicole.cervi@wellsfargo.com
Sara Cotsakis, Economic Analyst	sara.cotsakis@wellsfargo.com

Administrative Assistants

Coren Burton, Administrative Assistant	coren.burton@wellsfargo.com
--	--

Wells Fargo Securities Economics Group publications are produced by Wells Fargo Securities, LLC, a U.S. broker-dealer registered with the U.S. Securities and Exchange Commission, the Financial Industry Regulatory Authority, and the Securities Investor Protection Corp. Wells Fargo Securities, LLC, distributes these publications directly and through subsidiaries including, but not limited to, Wells Fargo & Company, Wells Fargo Bank N.A., Wells Fargo Clearing Services, LLC, Wells Fargo Securities International Limited, Wells Fargo Securities Canada, Ltd., Wells Fargo Securities Asia Limited and Wells Fargo Securities (Japan) Co. Limited. Wells Fargo Securities, LLC. is registered with the Commodities Futures Trading Commission as a futures commission merchant and is a member in good standing of the National Futures Association. Wells Fargo Bank, N.A. is registered with the Commodities Futures Trading Commission as a swap dealer and is a member in good standing of the National Futures Association. Wells Fargo Securities, LLC. and Wells Fargo Bank, N.A. are generally engaged in the trading of futures and derivative products, any of which may be discussed within this publication. Wells Fargo Securities, LLC does not compensate its research analysts based on specific investment banking transactions. Wells Fargo Securities, LLC's research analysts receive compensation that is based upon and impacted by the overall profitability and revenue of the firm which includes, but is not limited to investment banking revenue. The information and opinions herein are for general information use only. Wells Fargo Securities, LLC does not guarantee their accuracy or completeness, nor does Wells Fargo Securities, LLC assume any liability for any loss that may result from the reliance by any person upon any such information or opinions. Such information and opinions are subject to change without notice, are for general information only and are not intended as an offer or solicitation with respect to the purchase or sales of any security or as personalized investment advice. Wells Fargo Securities, LLC is a separate legal entity and distinct from affiliated banks and is a wholly owned subsidiary of Wells Fargo & Company © 2020 Wells Fargo Securities, LLC.

Important Information for Non-U.S. Recipients

For recipients in the EEA, this report is distributed by Wells Fargo Securities International Limited ("WFSIL"). WFSIL is a U.K. incorporated investment firm authorized and regulated by the Financial Conduct Authority. For the purposes of Section 21 of the UK Financial Services and Markets Act 2000 ("the Act"), the content of this report has been approved by WFSIL, an authorized person under the Act. WFSIL does not deal with retail clients as defined in the Directive 2014/65/EU ("MiFID2"). The FCA rules made under the Financial Services and Markets Act 2000 for the protection of retail clients will therefore not apply, nor will the Financial Services Compensation Scheme be available. This report is not intended for, and should not be relied upon by, retail clients.

SECURITIES: NOT FDIC-INSURED/NOT BANK-GUARANTEED/MAY LOSE VALUE