

WELLS  
FARGO

SECURITIES

# 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*

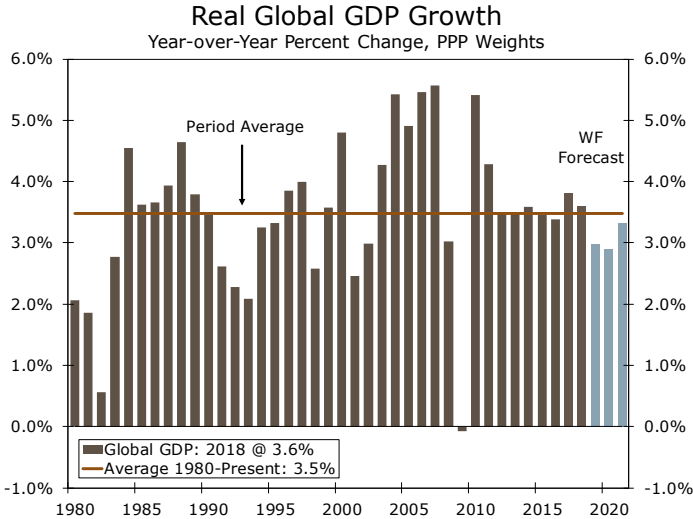
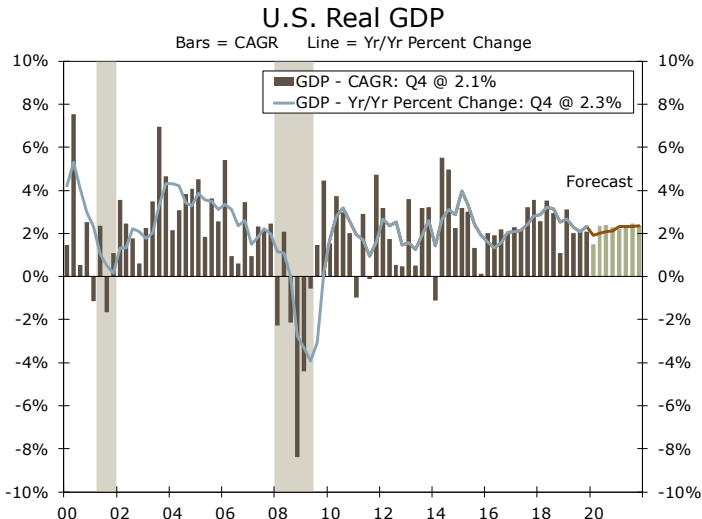
February 12, 2020

Together we'll go far



## Developments since our January Monthly Economic Outlook

- Our forecast for U.S. real GDP growth in 2020 remains mostly unchanged, down just 0.1 percentage point relative to our January forecast. U.S. economic data have broadly shown a more positive trend over the past few months, but the coronavirus outbreak in China is a significant downside risk to our forecast. For now, we expect the impact on U.S. economic growth from the coronavirus to be minimal, but we will be monitoring the situation closely and will update our forecast accordingly.
- We continue to look for the Fed to keep the fed funds rate unchanged for the foreseeable future. While the coronavirus represents a risk to the outlook, economic growth around 2% and modestly higher core inflation, which is our base case, should keep the Fed from cutting any further. We have modestly revised down our 2020 year-end forecast for the 10-year Treasury yield to 2.10%.
- Our 2020 global growth forecast has fallen by 0.1 percentage points and is now just 2.9%, which if realized would be the slowest pace since 2009. This downward revision was largely driven by lower growth expectations in China, where we expect real GDP growth to take about a one percentage point hit in Q1 before bouncing back later in the year.



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

# Monthly Macro Calendar: February 10-March 6

Monday	Tuesday	Wednesday	Thursday	Friday
<b>10</b>	<b>11</b>	<b>12</b>	<b>13</b>	<b>14</b>
<b>Bowman* (Board of Governors)</b> Speaks about Community Banks <b>Harker* (Philadelphia Fed)</b> Discusses the Economic Outlook	<b>JOLTS Job Openings</b> December 6,423K <b>Powell* (Fed Chair)</b> Semi-annual report to House Fin. Services Com m. <b>Quarles* (Board of Governors)</b> Speaks on Bank Supervision	<b>Powell* (Fed Chair)</b> Semi-annual testimony to Senate Banking Committee <b>Harker* (Philadelphia Fed)</b> Discusses the Economic Outlook <b>WFS Economics Wuhan Coronavirus Call</b> See below for details	<b>Consumer Price Index (YoY)</b> December 2.3%; January 2.5% (W) <b>Senate Banking Committee</b> Holds Hearing into Fed Nominations <b>Williams* (New York Fed)</b> Speaks at New York Bankers Association	<b>Retail Sales (MoM)</b> December 0.3%; January 0.3% (W) <b>Industrial Production (MoM)</b> December -0.3%; January -1.0% (W) <b>Eurozone GDP (YoY)</b> Q3 1.0%; Q4 1.0% (C) <b>U.S.-China Phase I Trade Deal Takes Effect</b>
<b>17</b>	<b>18</b>	<b>19</b>	<b>20</b>	<b>21</b>
<b>Japan GDP (SA, QoQ)</b> Q3 0.4%; Q4 -1.0% (C)		<b>Housing Starts</b> December 1,608K; January 1,390K (C) <b>Producer Price Index Final Demand (YoY)</b> December 1.3% <b>U.K. CPI (YoY)</b> December 1.3% <b>FOMC Meeting Minutes</b>	<b>Japan CPI (YoY)</b> December 0.8%	<b>Existing Home Sales</b> December 5.54M; January 5.46M (C) <b>Kaplan* (Dallas Fed)</b> Speaks at Housing Event at Dallas Fed <b>Brainard*, Bostic &amp; Clarida*</b> Panels at Chicago Booth Policy Forum
<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>
<b>Mester* (Cleveland Fed)</b> Speaks on Economy at NABE Conference	<b>Consumer Confidence</b> December 131.6; January 131.0 (C) <b>Clarida* (Board of Governors)</b> Speaks at NABE Conference		<b>Durable Goods Orders (MoM)</b> December 2.4%	<b>Personal Income &amp; Spending (MoM)</b> December 0.2% & 0.3% <b>Bullard (St. Louis Fed)</b> Discusses Economy & Monetary Policy <b>Eurozone CPI (YoY)</b> January 1.4%
<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
<b>ISM Manufacturing Index</b> January 50.9 <b>Reserve Bank of Australia Rate Decision</b> Previous 0.75%; March 2 0.75% (W)	<b>Evans (Chicago Fed)</b> Takes Part in Q&A at University of Illinois	<b>ISM Non-Manufacturing Index</b> January 55.5 <b>Bank of Canada Rate Decision</b> Previous 1.75%; March 1.75% (W) <b>Federal Reserve Beige Book Released</b>		<b>Nonfarm Payrolls</b> January 225K <b>Trade Balance</b> December -\$48.9B <b>Evans (Chicago Fed)</b> Panel at Shadow Open Market Committee Event

Note: (W) = Wells Fargo Estimate, (C) = Consensus Estimate, \* = voting FOMC member in 2020

**WFS Economics Effects of Wuhan Coronavirus Conference Call: February 12, 2020, at 11:00am ET. Register [Here](#).**

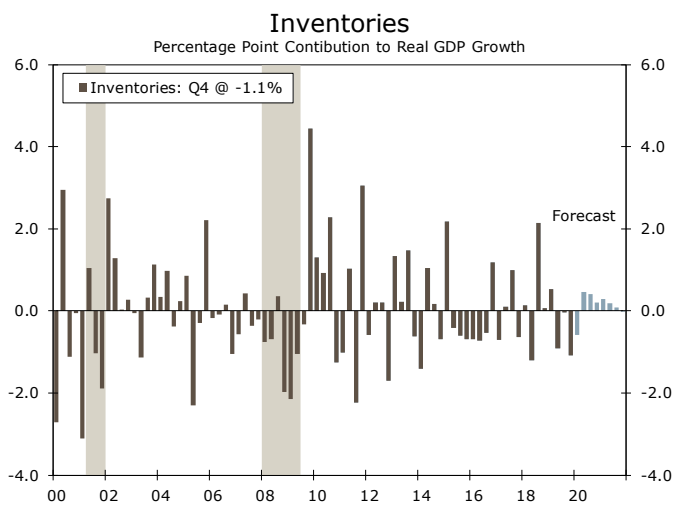
Source: Bloomberg LP and Wells Fargo Securities

Real GDP growth forecast for Q1-2020: 1.5% (seasonally adjusted annualized rate)

- **Change since last *Monthly Economic Outlook*: +0.3 percentage points**
- **We expect U.S. economic growth to bottom out in Q1, with inventories providing another sizeable drag.** Boeing's 737 MAX production halt alone is expected to shave half a percentage point from headline growth. Compounding the inventory drag from Boeing will be manufacturers' increased reliance on inventories due to supply chain disruptions stemming from the coronavirus. **The outbreak is a new risk to the outlook, though the realized impact to the U.S. remains minimal at this point.** Imports should pick up in Q1, after contracting at the fastest pace since the recession in Q4, though uncertainty regarding imports from China will limit the extent of a rebound. Net exports are likely to be a modest drag in Q1. The consumer should remain resilient, however, with **consumer spending expected to be a key engine of growth amid solid fundamentals.**

Real GDP growth forecast for full-year 2020: 2.0% (year-over-year percent change)

- **Change since last *Monthly Economic Outlook*: -0.1 percentage points**
- **Domestic demand should continue to grow at a solid rate.** We expect consumer spending to grow at about a 2% pace, and look for equipment spending to gradually climb out of its present slump on its way to a 3-4% pace of growth. Residential construction is also expected to be a bright spot amid low mortgage rates.



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

## Key Themes and Upside/Downside Scenarios

- **Upside scenario:** The Wuhan coronavirus outbreak begins to subside and trade uncertainty across the globe continues to dissipate. The global economy finds firmer footing and investment spending accelerates. Inflation returns to the Fed's 2% target and periodically exceeds it for brief periods of time.
- **Downside scenario:** The Wuhan coronavirus outbreak turns into a pandemic and/or there is a renewed escalation in the trade war, which weighs on economic growth domestically and abroad. Uncertainty continues to have both direct and indirect negative effects, and U.S. growth falls dangerously close to stall speed.

## Inflation Forecast

- We have revised our headline inflation forecast lower based on our expectation for lower oil prices this year. Our core inflation forecast remains unchanged. **We still expect core PCE inflation to rise slightly in the coming months, but to remain just shy of 2%.**

## Labor Market Forecast

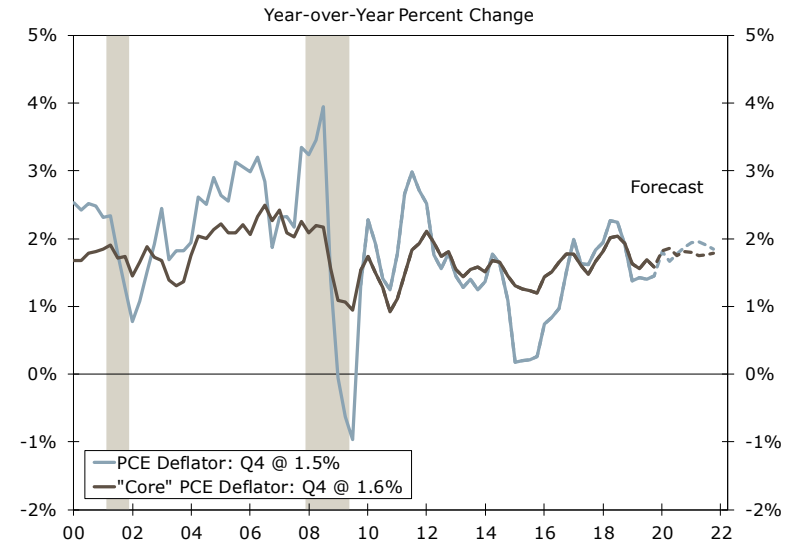
- We expect the pace of hiring to slow, though Census hiring in the coming months will create some volatility in the monthly data.** Nonfarm payroll growth averaged 175K in 2019, and we expect it to slow to an average of 135K in 2020. By our [estimates](#) it currently takes 130K new jobs a month to keep the unemployment rate steady.

## Fed Funds Outlook

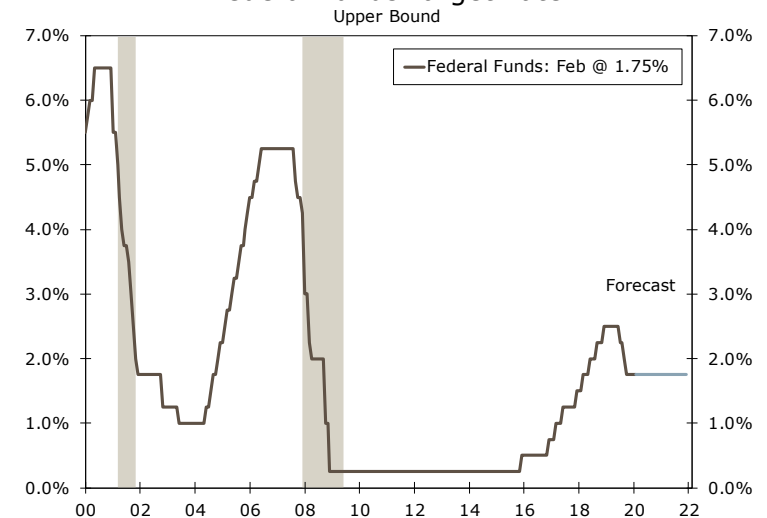
### Fed Funds Forecast for 2020 & 2021: **No Change**

- We believe the fed funds rate will remain unchanged through 2021, as **growth, inflation and financial conditions will be healthy enough to prevent more easing, but not hot enough to warrant rate hikes.**
- The bar to hike rates remains higher than the bar to cut rates, in our view.
- The Wuhan coronavirus is a significant downside risk to the outlook, and should the outbreak worsen, it could cause the Fed to ease policy. This is not our base case scenario, but given the virus-related uncertainty we think the market is right to view the risks as skewed towards cuts rather than hikes.

## PCE Deflator & "Core" PCE Deflator



## Federal Funds Target Rate



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

## Wells Fargo U.S. Interest Rate Forecast

	Actual								Forecast							
	2018				2019				2020				2021			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
Quarter End Interest Rates																
Federal Funds Target Rate	1.75	2.00	2.25	2.50	2.50	2.50	2.00	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75
3 Month LIBOR	2.31	2.34	2.40	2.81	2.60	2.32	2.09	1.91	1.80	1.80	1.80	1.80	1.85	1.85	1.85	1.90
Prime Rate	4.75	5.00	5.25	5.50	5.50	5.50	5.00	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75
Conventional Mortgage Rate	4.44	4.57	4.63	4.64	4.28	3.80	3.61	3.72	3.60	3.70	3.80	3.80	3.90	3.95	4.00	4.05
3 Month Bill	1.73	1.93	2.19	2.45	2.40	2.12	1.88	1.55	1.60	1.60	1.60	1.60	1.65	1.65	1.65	1.70
6 Month Bill	1.93	2.11	2.36	2.56	2.44	2.09	1.83	1.60	1.60	1.60	1.60	1.65	1.65	1.65	1.70	1.75
1 Year Bill	2.09	2.33	2.59	2.63	2.40	1.92	1.75	1.59	1.60	1.65	1.70	1.70	1.75	1.75	1.80	1.85
2 Year Note	2.27	2.52	2.81	2.48	2.27	1.75	1.63	1.58	1.55	1.65	1.75	1.75	1.80	1.85	1.90	1.95
5 Year Note	2.56	2.73	2.94	2.51	2.23	1.76	1.55	1.69	1.65	1.75	1.85	1.90	1.95	2.00	2.05	2.10
10 Year Note	2.74	2.85	3.05	2.69	2.41	2.00	1.68	1.92	1.80	1.95	2.05	2.10	2.20	2.25	2.30	2.35
30 Year Bond	2.97	2.98	3.19	3.02	2.81	2.52	2.12	2.39	2.30	2.45	2.55	2.60	2.70	2.75	2.80	2.85

Forecast as of: February 12, 2020

Source: Federal Reserve Board and Wells Fargo Securities

## What Are We Watching in the Month Ahead?

- Markets priced for nearly two rate cuts from the Fed in 2020
  - Markets are priced for nearly 50 bps of easing from the Fed over the next twelve months, while our forecast is for the fed funds rate to remain unchanged for the foreseeable future. **This divergence explains much of our expectation for higher rates over the next few quarters.**
- Coronavirus keeping investors worried about the global growth backdrop
  - The emergence of the coronavirus in China has put downward pressure on yields amid fears that an already fragile global economy could be strained even more. **While we have downwardly revised our global GDP forecast for 2020, there are clearly additional downside risks should the virus turn into a global pandemic.**
- Inflation remains the missing ingredient
  - Core PCE inflation has been below 2.0% every month since September 2018, and was just 1.6% in December. Furthermore, wage growth has slowed of late, despite continued labor market tightening.
  - With global growth under pressure and foreign monetary policy unlikely to tighten anytime soon, inflation that remains stuck below 2% is yet another factor keeping Treasury yields from climbing very much in our forecast.**

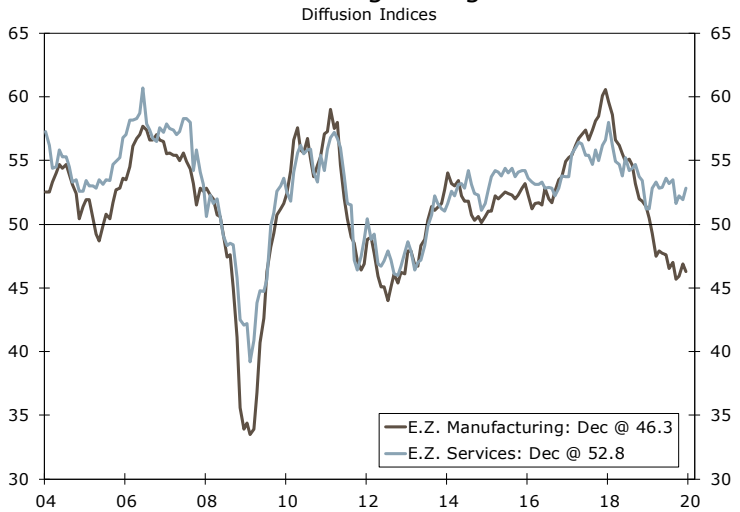
## Coronavirus Looms Large for Euro Factories

- **In Europe, there are signs that a stabilization in the manufacturing sector has taken hold.** The Eurozone manufacturing PMI has stabilized around a level 46-47 over the past few months, and hard data suggest that the pace of contraction has eased.
- **But the coronavirus outbreak in China creates an additional source of downside risk for Eurozone manufacturing.** A sharp slowdown in the Chinese factory sector, would have bigger implications for the Eurozone than the United States, in our view, and could be the catalyst for another leg down in the Eurozone economy.

## Japanese Economic Data Noisy

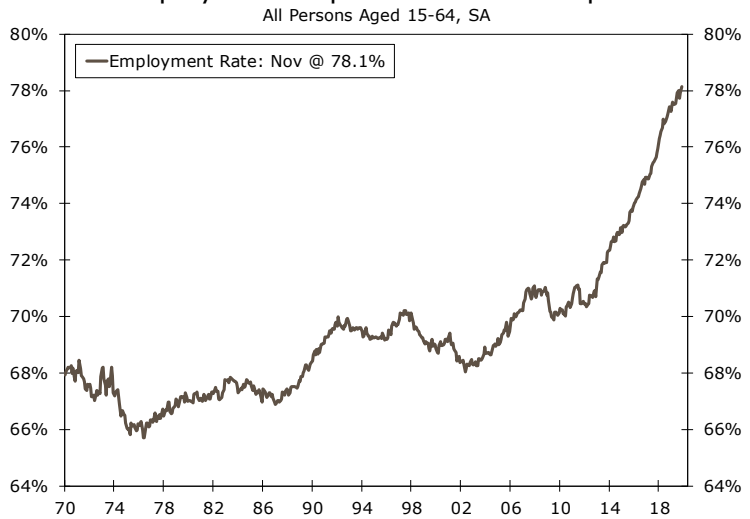
- Real GDP growth for Q4-2019 is set to be reported for Japan next week, and it will likely show an outright decline in GDP for the quarter. Economic data have been noisy in Japan, as an increase in the value-added tax on October 1, coupled with a typhoon shortly thereafter, have led to distortions in the data.
- **Through the noise, Japan's economy remains fairly stable, with the underlying pace of growth likely just a bit below 1%.** Inflation also remains a bit below 1% despite the significant tightening in the Japanese labor market over the past few years.

Eurozone Purchasing Managers' Indices



Source: Bloomberg LP, OECD and Wells Fargo Securities

Employment-Population Ratio in Japan



## Wells Fargo Central Bank Policy Forecasts

Central Bank	Current Policy Rate	Last Major Policy Change	WF Next Forecasted Policy Change
United States (FOMC)	1.75%	October 2019 25 bps cut	No change through Q4-2021
Eurozone (ECB)	-0.50% (Deposit Rate)	September 2019 10 bps cut, restart of asset purchases in November of 20 billion euros per month with an open-ended timeframe	No change through Q2-2021
United Kingdom (BoE)	0.75%	August 2018 25 bps hike	No change through Q2-2021
Japan (BoJ)	-0.10%	July 2018 QQE and a greater degree of variation in 10-year govt. bond yield target	No change through Q2-2021
Canada (BoC)	1.75%	October 2018 25 bps hike	No change through Q2-2021

Forecast as of: February 12, 2020

Source: Bloomberg LP and Wells Fargo Securities

## What Are We Watching in the Month Ahead?

## European Central Bank

- Economic growth and core inflation appear to have stabilized in the Eurozone, reassuring policymakers that a recession is not imminent, though the coronavirus looms as a possible risk. Furthermore, policymakers appear increasingly concerned about the costs of an extended period of negative policy rates. As a result, **we expect monetary policy in Europe to be on hold for the foreseeable future.**

## Bank of Japan

- **We do not expect the BoJ to make any material changes to monetary policy for the foreseeable future.**

## Bank of England

- **We expect the BoE to keep interest rates on hold through the end of 2020, but we acknowledge that the balance of risks is skewed towards a rate cut at one of the next few meetings.**

## Bank of Canada

- **We look for the BoC to keep rates on hold for the foreseeable future.** Economic growth in Canada appears listless at around 1.5%, but core inflation continues to track close to the 2% target.



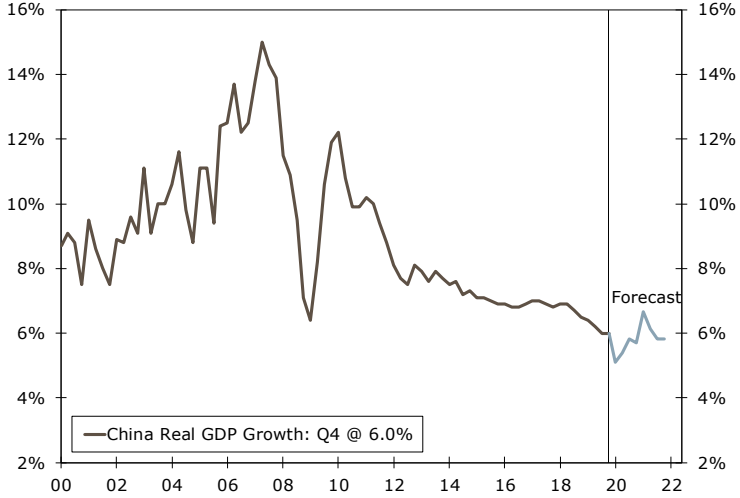
## Chinese Growth to Take a Near-Term Hit

- The coronavirus outbreak in China has continued to intensify, raising questions about the near-term outlook for Chinese growth. **Because of the timing of the Lunar New Year, hard economic data on the China's economy will not be available until March.**
- Quantifying the impact from the virus is difficult, both because there is no solid historical parallel nor do we know just how much the virus will eventually spread. In the meantime, **Chinese authorities have taken financial measures to support the economy, such as lowering interbank interest rates and adding liquidity to money markets.**

## Asia Most Exposed to a China Slowdown

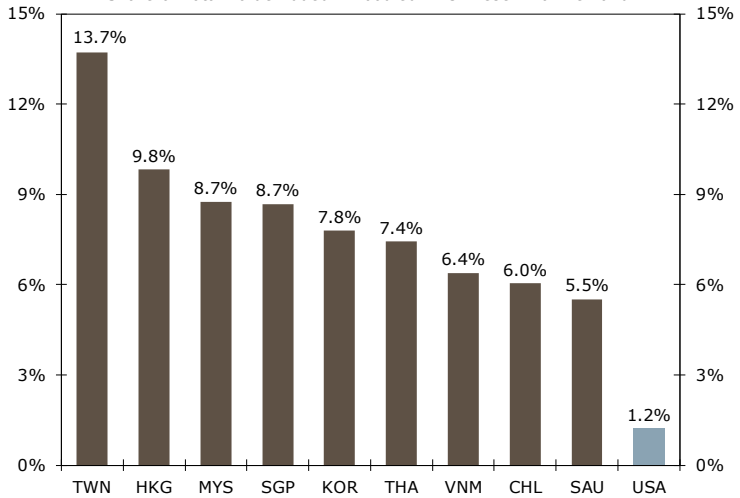
- Nonetheless, we expect a significant hit to China's Q1 GDP, with that lost output mostly, but not fully, recovered in subsequent quarters. **We now forecast Chinese GDP growth of 5.5% for 2020 (compared to 5.9% in mid-January), and a recovery in growth to 6.1% in 2021 (compared to 5.9% in mid-January). We view the risks to this forecast as roughly balanced.**
- The countries with the most economic exposure to China are not surprising and include Taiwan, Hong Kong, Malaysia, Singapore and South Korea. **The U.S. has relatively little direct economic exposure.**

China Real GDP Growth  
Year-over-Year Percent Change



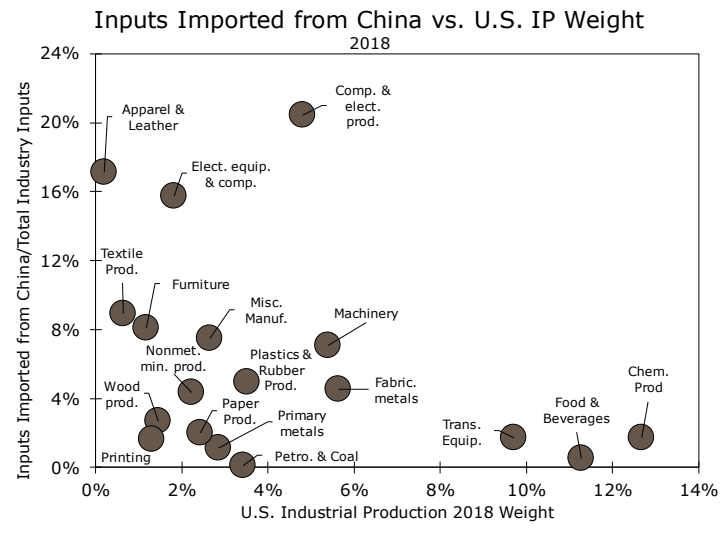
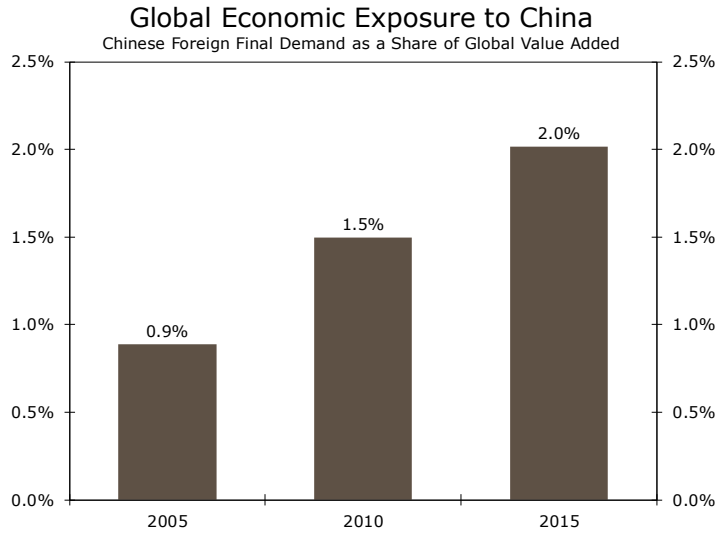
Source: Bloomberg LP, OECD and Wells Fargo Securities

Economic Exposure to China by Country  
Share of Total Value Added Embodied in Chinese Final Demand



## Potential Implications of the Wuhan Coronavirus: A Look at Our Research

- The economic impact of the coronavirus remains uncertain**, both because there is no solid historical parallel nor do we know just how much the virus will eventually spread. **Our assumption is that the virus does not become a full-blown pandemic, and that the short-term economic impact is noticeable but manageable.** Below is a sample of our research on the topic.
- China Impact:** The direct hit to China’s economy from the coronavirus is likely to be the most severe. The outbreak began during the all-important Lunar New Year and travel bans likely weighed on the services sector. Factory closures will also weigh on output. As such, **we have downwardly revised our 2020 China GDP forecast to 5.5%, from 5.9% previously.**
- Global Impact:** While the coronavirus originated in China, its impact is unlikely to be contained. Economies that have a high share of their total value added derived from final demand in China have high economic exposure to the macroeconomic effects of the virus. We find **smaller, externally oriented economies in Asia are the most likely to bear economic brunt of the current outbreak.**
- U.S. Consumer Impact:** We could see a meaningful hit to U.S. consumer confidence from the virus, which may temporarily weigh on discretionary spending. But, we find, non-discretionary spending is remarkably resilient even in the midst of uncertainty. **Any retrenchment in spending would likely be short-lived unless the current outbreak got meaningfully worse.**
- U.S. Production Impact:** U.S. output could also be hit if producers are unable to get inputs from China due to the virus. But, few industries bear both high input exposure to China and command a large fraction of U.S. production. **Low exposure and high levels of manufacturing inventories suggest spillovers to U.S. production could be limited at least for a time.**
- Please join us February 12, at 11:00am ET, as we discuss the effects of coronavirus on our outlook.**



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

## Wells Fargo U.S. Economic Forecast

	Actual								Forecast								Actual		Forecast	
	2018				2019				2020				2021				2018	2019	2020	2021
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q				
Real Gross Domestic Product (a)	2.6	3.5	2.9	1.1	3.1	2.0	2.1	2.1	1.5	2.4	2.4	2.3	2.2	2.3	2.4	2.4	2.9	2.3	2.0	2.3
Personal Consumption	1.7	4.0	3.5	1.4	1.1	4.6	3.1	1.8	2.5	2.0	1.9	1.9	1.8	2.1	2.2	2.2	3.0	2.6	2.4	2.0
Business Fixed Investment	8.8	7.9	2.1	4.8	4.4	-1.0	-2.3	-1.5	3.3	2.6	3.6	3.9	4.0	3.9	3.9	3.8	6.4	2.1	1.4	3.8
Equipment	6.6	3.4	2.9	7.4	-0.1	0.8	-3.8	-2.9	1.7	2.0	2.6	2.9	3.4	3.4	3.2	3.0	6.8	1.4	0.3	3.1
Intellectual Property Products	9.7	11.9	4.1	11.7	10.8	3.6	4.7	5.9	5.6	4.4	5.7	6.0	5.9	5.5	5.6	5.7	7.4	7.7	5.2	5.7
Structures	12.1	11.0	-2.1	-9.0	4.0	-11.1	-9.9	-10.1	-3.5	0.5	1.8	2.0	1.8	1.9	2.0	2.1	4.1	-4.4	-4.4	1.8
Residential Investment	-5.3	-3.7	-4.0	-4.7	-1.0	-3.0	4.6	5.8	4.5	5.0	5.0	4.5	4.0	4.0	3.5	3.5	-1.5	-1.5	4.4	4.2
Government Purchases	1.9	2.6	2.1	-0.4	2.9	4.8	1.7	2.7	0.4	0.9	0.9	0.8	0.8	0.7	0.7	0.7	1.7	2.3	1.4	0.8
Net Exports	-884.2	-850.5	-962.4	-983.0	-944.0	-980.7	-990.1	-902.0	-916.1	-925.3	-934.4	-937.3	-944.6	-950.5	-947.9	-946.5	-920.0	-954.2	-928.3	-947.4
Pct. Point Contribution to GDP	0.0	0.7	-2.1	-0.4	0.7	-0.7	-0.1	1.5	-0.3	-0.2	-0.2	-0.1	-0.1	-0.1	0.1	0.0	-0.4	-0.2	0.1	-0.1
Inventory Change	40.5	-28.0	87.2	93.0	116.0	69.4	69.4	6.5	-22.0	0.0	20.0	30.0	44.0	53.0	57.0	56.0	48.1	65.3	7.0	52.5
Pct. Point Contribution to GDP	0.1	-1.2	2.1	0.1	0.5	-0.9	0.0	-1.1	-0.6	0.5	0.4	0.2	0.3	0.2	0.1	0.0	0.1	0.1	-0.3	0.2
Nominal GDP (a)	5.0	7.1	4.8	2.9	3.9	4.7	3.8	3.6	3.3	4.2	4.4	4.3	4.3	4.3	4.2	4.1	5.4	4.1	3.9	4.3
Real Final Sales	2.4	4.8	0.8	1.0	2.6	3.0	2.1	3.2	2.7	1.9	2.0	2.1	1.9	2.2	2.4	2.4	2.8	2.2	2.4	2.1
Retail Sales (b)	4.7	5.7	5.5	3.5	2.8	3.4	4.0	4.1	4.8	3.7	3.5	3.7	3.7	3.8	3.6	3.7	4.8	3.6	3.9	3.7
Inflation Indicators (b)																				
PCE Deflator	1.9	2.3	2.2	1.9	1.4	1.4	1.4	1.5	1.8	1.7	1.8	1.9	1.9	2.0	1.9	1.8	2.1	1.4	1.8	1.9
"Core" PCE Deflator	1.8	2.0	2.0	1.9	1.6	1.6	1.7	1.6	1.8	1.9	1.7	1.8	1.8	1.7	1.8	1.8	2.0	1.6	1.8	1.8
Consumer Price Index	2.2	2.7	2.6	2.2	1.6	1.8	1.8	2.0	2.3	2.0	2.1	2.0	2.1	2.2	2.2	2.1	2.4	1.8	2.1	2.1
"Core" Consumer Price Index	1.9	2.2	2.2	2.2	2.1	2.1	2.3	2.3	2.2	2.2	2.0	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.1	2.0
Producer Price Index (Final Demand)	2.8	3.0	3.1	2.8	1.9	2.0	1.6	1.1	1.6	1.4	1.9	2.1	2.3	2.2	2.2	2.2	2.9	1.7	1.7	2.2
Employment Cost Index	2.7	2.8	2.8	2.9	2.8	2.7	2.8	2.7	2.7	2.9	2.9	3.0	3.0	3.1	3.1	3.1	2.8	2.7	2.9	3.1
Real Disposable Income (b)	3.9	3.9	4.1	3.9	3.3	3.0	2.9	2.6	2.3	3.3	2.6	2.4	2.1	1.5	2.0	2.2	4.0	3.0	2.7	1.9
Nominal Personal Income (b)	5.6	5.8	5.9	4.9	4.6	4.7	4.4	4.3	4.1	4.9	4.5	4.3	4.1	3.5	3.9	4.1	5.6	4.5	4.4	3.9
Industrial Production (a)	2.3	4.6	5.2	3.9	-1.9	-2.3	1.2	-0.5	-5.7	1.1	2.0	2.5	1.3	1.8	1.9	1.3	3.9	0.8	-0.9	1.8
Capacity Utilization	77.9	78.5	79.1	79.4	78.6	77.8	77.6	77.1	75.9	76.1	76.4	76.9	77.1	77.5	77.8	78.1	78.7	77.8	76.3	77.6
Corporate Profits Before Taxes (b)	2.9	2.4	4.2	4.2	-2.2	1.3	-1.2	-2.0	1.0	3.0	2.8	2.5	3.5	0.5	1.5	3.5	3.4	-1.0	2.3	2.2
Corporate Profits After Taxes	10.3	8.3	11.3	10.1	-2.9	1.3	-0.3	-1.6	1.8	3.9	2.8	2.5	3.5	0.5	1.5	3.5	10.0	-0.9	2.8	2.3
Federal Budget Balance (c)	-375	-7	-172	-319	-372	-56	-237	-357	-415	-48	-230	-325	-442	-58	-249	-347	-779	-984	-1050	-1075
Trade Weighted Dollar Index (d)	103.1	107.3	107.6	110.1	109.8	109.7	111.0	109.9	110.8	110.0	109.0	107.8	106.8	106.0	105.5	105.0	106.4	110.1	109.4	105.8
Nonfarm Payroll Change (e)	234	211	153	172	139	159	203	198	198	417	-95	20	130	125	125	120	193	175	135	125
Unemployment Rate	4.1	3.9	3.8	3.8	3.9	3.6	3.6	3.5	3.6	3.5	3.6	3.6	3.6	3.6	3.6	3.6	3.9	3.7	3.6	3.6
Housing Starts (f)	1.32	1.26	1.23	1.19	1.21	1.26	1.28	1.44	1.35	1.35	1.35	1.35	1.36	1.36	1.36	1.36	1.25	1.29	1.35	1.36
Light Vehicle Sales (g)	17.1	17.3	17.0	17.4	16.8	17.0	17.0	16.7	16.6	16.4	16.4	16.4	16.4	16.4	16.4	16.4	17.2	16.9	16.5	16.4
Crude Oil - Brent - Front Contract (h)	66.9	74.6	75.8	68.6	63.8	67.6	61.5	61.7	58.0	57.0	60.0	61.0	61.0	61.0	61.0	61.0	71.5	63.6	59.0	61.0
Quarter-End Interest Rates (i)																				
Federal Funds Target Rate	1.75	2.00	2.25	2.50	2.50	2.50	2.00	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.75	1.96	2.25	1.75	1.75
3 Month LIBOR	2.31	2.34	2.40	2.81	2.60	2.32	2.09	1.91	1.80	1.80	1.80	1.80	1.85	1.85	1.85	1.90	2.31	2.33	1.80	1.86
Prime Rate	4.75	5.00	5.25	5.50	5.50	5.50	5.00	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.75	4.96	5.25	4.75	4.75
Conventional Mortgage Rate	4.44	4.57	4.63	4.64	4.28	3.80	3.61	3.72	3.60	3.70	3.80	3.80	3.90	3.95	4.00	4.05	4.54	3.94	3.73	3.98
3 Month Bill	1.73	1.93	2.19	2.45	2.40	2.12	1.88	1.55	1.60	1.60	1.60	1.60	1.65	1.65	1.65	1.70	1.97	2.11	1.60	1.66
6 Month Bill	1.93	2.11	2.36	2.56	2.44	2.09	1.83	1.60	1.60	1.60	1.60	1.65	1.65	1.65	1.70	1.75	2.14	2.11	1.61	1.69
1 Year Bill	2.09	2.33	2.59	2.63	2.40	1.92	1.75	1.59	1.60	1.65	1.70	1.70	1.75	1.75	1.80	1.85	2.33	2.05	1.66	1.79
2 Year Note	2.27	2.52	2.81	2.48	2.27	1.75	1.63	1.58	1.55	1.65	1.75	1.75	1.80	1.85	1.90	1.95	2.53	1.97	1.68	1.88
5 Year Note	2.56	2.73	2.94	2.51	2.23	1.76	1.55	1.69	1.65	1.75	1.85	1.90	1.95	2.00	2.05	2.10	2.75	1.95	1.79	2.03
10 Year Note	2.74	2.85	3.05	2.69	2.41	2.00	1.68	1.92	1.80	1.95	2.05	2.10	2.20	2.25	2.30	2.35	2.91	2.14	1.98	2.28
30 Year Bond	2.97	2.98	3.19	3.02	2.81	2.52	2.12	2.39	2.30	2.45	2.55	2.60	2.70	2.75	2.80	2.85	3.11	2.58	2.48	2.78

Forecast as of: February 12, 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 January 15, 2020

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

	Actual								Forecast								Actual		Forecast	
	2018				2019				2020				2021				2018	2019	2020	2021
	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	0.00	0.00	-0.23	0.27	-0.51	0.15	0.01	0.11	0.15	0.07	-0.02	0.00	-0.01	-0.05	0.05
Personal Consumption	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.38	0.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02	0.03	0.00
Business Fixed Investment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-2.64	1.15	0.06	-0.12	0.01	0.01	0.01	0.00	0.01	0.00	-0.17	-0.22	-0.01
Equipment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-2.97	0.29	0.50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.19	-0.40	0.03
Intellectual Property Products	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.44	0.49	0.00	0.00	0.00	0.00	0.00	-0.01	0.00	0.00	-0.03	0.04	0.00
Structures	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.37	-2.00	-1.00	-0.70	0.00	0.00	0.00	0.00	0.00	0.00	0.02	-0.68	-0.15
Residential Investment	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27	0.25	0.50	0.50	0.25	0.00	0.00	-0.25	0.00	0.00	0.08	0.47	0.11
Government Purchases	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.91	-0.70	-0.19	-0.10	0.00	0.00	-0.10	0.00	0.00	0.00	0.12	0.13	-0.04
Net Exports	0.0	0.0	0.0	0.0	0.0	0.0	0.0	21.7	16.8	6.3	4.2	4.2	4.2	4.2	4.3	4.3	0.0	5.4	7.9	4.2
Pct. Point Contribution to GDP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.08	-0.10	-0.22	-0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	-0.02
Inventory Change	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-21.52	-17.00	-30.00	-20.00	-20.00	-15.00	-7.00	-3.00	-4.00	0.00	-5.38	-21.75	-7.25
Pct. Point Contribution to GDP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.23	0.09	-0.27	0.21	0.00	0.10	0.16	0.08	-0.02	0.00	-0.03	-0.09	0.07
Nominal GDP	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.57	-0.24	-0.60	0.24	0.07	0.11	0.15	0.08	-0.02	0.00	-0.04	-0.24	0.07
Real Final Sales	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.34	0.75	-0.23	-0.06	0.01	0.00	-0.02	-0.01	0.00	0.00	-0.02	0.07	-0.03
Retail Sales (b)	0.00	0.00	0.00	0.04	0.00	0.00	0.00	-0.01	0.56	0.68	0.73	0.87	0.65	0.66	0.73	0.77	0.01	0.00	0.71	0.70
Inflation Indicators (b)																				
PCE Deflator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05	-0.18	-0.20	-0.17	-0.11	0.02	0.04	0.01	0.00	0.00	-0.01	-0.16	0.02
"Core" PCE Deflator	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	-0.01	-0.02	-0.02	0.02	-0.01	0.00	0.00	0.00	0.00	-0.01	-0.01	0.00
Consumer Price Index	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.12	-0.16	-0.13	-0.13	-0.01	0.02	0.00	0.00	0.00	0.00	-0.14	0.00
"Core" Consumer Price Index	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.01	-0.01	-0.01	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.00
Producer Price Index (Final Demand)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04	-0.15	-0.17	-0.17	-0.13	-0.02	0.00	0.00	0.00	0.00	-0.01	-0.15	0.00
Employment Cost Index	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.06	-0.06	-0.06	-0.06	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	-0.04	0.00
Real Disposable Income (b)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.10	-0.04	-0.02	-0.05	0.04	-0.02	-0.04	-0.01	0.00	0.00	-0.03	-0.02	-0.02
Nominal Personal Income (b)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.14	-0.20	-0.20	-0.20	-0.06	0.00	0.00	0.00	0.00	0.00	-0.04	-0.16	0.00
Industrial Production (a)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06	-1.78	-0.51	0.38	0.41	0.07	0.00	0.00	0.00	0.00	0.00	-0.48	0.11
Capacity Utilization	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05	-0.51	-0.61	-0.54	-0.47	-0.82	-0.88	-1.03	-1.08	0.00	-0.01	-0.53	-0.95
Corporate Profits Before Taxes (b)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-3.50	-2.00	1.00	0.30	0.30	1.30	-1.50	-0.30	1.50	0.00	-0.88	-0.08	0.23
Corporate Profits After Taxes	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-3.46	-2.05	0.98	0.33	0.32	1.32	-1.47	-0.27	1.53	0.00	-0.87	-0.08	0.25
Federal Budget Balance (c)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.55	0.59	-0.04	5.61	5.23	8.12	6.05	11.29	0.00	0.00	0.00	25.00
Trade Weighted Dollar Index (d)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.50	1.50	1.50	1.25	1.00	1.25	1.25	1.25	0.00	0.00	1.44	1.19
Nonfarm Payroll Change (e)	6.67	-31.33	-36.00	-61.00	-34.67	7.00	10.33	13.33	18.33	11.67	10.00	10.00	15.00	15.00	15.00	10.00	-30.42	-1.00	12.50	13.75
Unemployment Rate	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03	0.00	0.00	0.00	-0.07	-0.10	-0.10	-0.10	0.00	0.00	-0.01	-0.09
Housing Starts (f)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.01	0.02	0.02	0.03	0.02	0.01	0.01	0.00	0.00	0.02	0.02	0.01
Light Vehicle Sales (g)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01	0.02	0.00
Crude Oil - Brent - Front Contract (h)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-3.00	-1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-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
3 Month LIBOR	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	0.05	0.00	0.00	0.00	0.01
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	0.00	0.00	-0.30	-0.20	-0.10	-0.10	-0.05	-0.05	-0.05	-0.05	0.00	0.00	-0.18	-0.05
3 Month Bill	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	0.05	0.00	0.00	0.00	0.01
2 Year Note	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.20	-0.15	-0.05	-0.10	-0.10	-0.05	-0.05	-0.05	0.00	0.00	-0.13	0.00
5 Year Note	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.20	-0.15	-0.05	-0.05	-0.05	-0.05	-0.05	-0.05	0.00	0.00	-0.11	-0.04
10 Year Note	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.30	-0.20	-0.10	-0.10	-0.05	-0.05	-0.05	-0.05	0.00	0.00	-0.18	-0.06
30 Year Bond	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.20	-0.10	-0.05	-0.10	-0.05	-0.05	-0.05	-0.05	0.00	0.00	-0.11	-0.05

Forecast as of: February 12, 2020  
 Notes: (a) Compound Annual Growth Rate (f) Millions of Units - Annual Data - Not Seasonally Adjusted  
 (b) Year-over-Year Percentage Change (g) Quarterly Data - Average Monthly SAAR; Annual Data - Actual Total Vehicles Sold  
 (c) Quarterly Sum - Billions USD; Annual (h) Quarterly Average of Daily Close  
 (d) Federal Reserve Advanced Foreign Eco (i) Annual Numbers Represent Averages  
 (e) Average Monthly Change

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			
	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>	<u>2018</u>	<u>2019</u>	<u>2020</u>	<u>2021</u>
Global (PPP Weights)	3.6%	3.0%	2.9%	3.3%	3.6%	3.4%	3.7%	3.3%
Advanced Economies <sup>1</sup>	2.2%	1.9%	1.7%	2.0%	2.0%	1.6%	1.7%	1.8%
United States	2.9%	2.3%	2.0%	2.3%	2.4%	1.8%	2.1%	2.1%
Eurozone	1.9%	1.2%	1.0%	1.4%	1.8%	1.2%	1.2%	1.4%
United Kingdom	1.3%	1.3%	1.2%	1.5%	2.5%	1.8%	1.8%	2.0%
Japan	0.3%	1.1%	0.4%	1.0%	1.0%	0.5%	0.8%	0.7%
Canada	2.0%	1.6%	1.5%	1.6%	2.3%	1.9%	1.9%	2.0%
Developing Economies <sup>1</sup>	4.5%	3.7%	3.8%	4.2%	4.8%	4.8%	5.1%	4.4%
China	6.7%	6.1%	5.5%	6.1%	2.1%	2.9%	3.2%	2.1%
India	7.4%	5.1%	5.9%	6.4%	3.9%	3.7%	4.9%	4.4%
Mexico	2.1%	-0.1%	0.9%	1.8%	4.9%	3.6%	3.5%	3.4%

Forecast as of: February 12, 2020

<sup>1</sup>Aggregated Using PPP Weights

Source: International Monetary Fund and Wells Fargo Securities

## Changes to the Wells Fargo International Economic Forecast

	GDP				CPI			
	2018	2019	2020	2021	2018	2019	2020	2021
Global (PPP Weights)	-0.02%	-0.02%	-0.15%	0.03%	0.00%	0.03%	0.06%	-0.04%
Advanced Economies <sup>1</sup>	-0.07%	-0.02%	-0.03%	0.00%	0.00%	0.01%	-0.12%	-0.05%
United States	0.00%	-0.01%	0.12%	-0.07%	0.00%	0.01%	-0.07%	-0.01%
Eurozone	0.00%	-0.03%	-0.08%	0.01%	0.00%	0.01%	-0.13%	-0.02%
United Kingdom	0.00%	-0.03%	0.02%	0.00%	0.00%	-0.03%	0.03%	0.00%
Japan	0.00%	-0.05%	-0.05%	0.00%	0.00%	0.00%	-0.39%	-0.33%
Canada	0.00%	0.00%	-0.03%	-0.08%	0.00%	0.03%	0.16%	0.00%
Developing Economies <sup>1</sup>	0.01%	-0.01%	-0.24%	0.06%	0.00%	0.05%	0.19%	-0.03%
China	0.18%	0.00%	-0.41%	0.19%	0.00%	0.05%	0.20%	-0.03%
India <sup>2</sup>	0.00%	-0.03%	-0.07%	-0.20%	0.00%	0.16%	0.46%	-0.05%
Mexico	0.00%	-0.13%	-0.22%	0.03%	0.00%	0.00%	0.04%	0.00%

Forecast as of: February 12, 2020

<sup>1</sup>Aggregated Using PPP Weights

## Wells Fargo International Interest Rate Forecast

(End of Quarter Rates)

	Central Bank Key Policy Rate					
	2020				2021	
	Q1	Q2	Q3	Q4	Q1	Q2
United States	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
Eurozone <sup>1</sup>	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%	-0.50%
United Kingdom	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%
Japan	-0.10%	-0.10%	-0.10%	-0.10%	-0.10%	-0.10%
Canada	1.75%	1.75%	1.75%	1.75%	1.75%	1.75%
	2-Year Note					
	2020				2021	
	Q1	Q2	Q3	Q4	Q1	Q2
United States	1.55%	1.65%	1.75%	1.75%	1.80%	1.85%
Eurozone <sup>2</sup>	-0.60%	-0.55%	-0.50%	-0.45%	-0.35%	-0.25%
United Kingdom	0.65%	0.75%	0.80%	0.90%	0.95%	1.00%
Japan	-0.05%	-0.05%	0.00%	0.00%	0.05%	0.05%
Canada	1.65%	1.70%	1.70%	1.75%	1.80%	1.80%
	10-Year Note					
	2020				2021	
	Q1	Q2	Q3	Q4	Q1	Q2
United States	1.80%	1.95%	2.05%	2.10%	2.20%	2.25%
Eurozone <sup>2</sup>	-0.30%	-0.25%	-0.15%	-0.05%	0.10%	0.25%
United Kingdom	0.85%	1.00%	1.05%	1.05%	1.10%	1.15%
Japan	0.05%	0.05%	0.10%	0.10%	0.15%	0.15%
Canada	1.60%	1.70%	1.75%	1.80%	1.85%	1.90%

Forecast as of: February 12, 2020

<sup>1</sup> ECB Deposit Rate <sup>2</sup> 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					
	2020				2021	
	Q1	Q2	Q3	Q4	Q1	Q2
United States	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Eurozone <sup>1</sup>	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
United Kingdom	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Japan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Canada	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

	2-Year Note					
	2020				2021	
	Q1	Q2	Q3	Q4	Q1	Q2
United States	-0.20%	-0.15%	-0.05%	-0.10%	-0.10%	-0.05%
Eurozone <sup>2</sup>	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
United Kingdom	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Japan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Canada	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%

	10-Year Note					
	2020				2021	
	Q1	Q2	Q3	Q4	Q1	Q2
United States	-0.30%	-0.20%	-0.10%	-0.10%	-0.05%	-0.05%
Eurozone <sup>2</sup>	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%
United Kingdom	-0.05%	0.00%	0.00%	0.00%	0.00%	0.00%
Japan	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Canada	-0.10%	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%

Forecast as of: February 12, 2020

<sup>1</sup> ECB Deposit Rate <sup>2</sup> German Government Bond Yield

Source: International Monetary Fund and Wells Fargo Securities



## Economists & Macro Strategists

Jay H. Bryson, Acting Chief Economist	<a href="mailto:jay.bryson@wellsfargo.com">jay.bryson@wellsfargo.com</a>
Mark Vitner, Senior Economist	<a href="mailto:mark.vitner@wellsfargo.com">mark.vitner@wellsfargo.com</a>
Sam Bullard, Senior Economist	<a href="mailto:sam.bullard@wellsfargo.com">sam.bullard@wellsfargo.com</a>
Nick Bennenbroek, Macro Strategist	<a href="mailto:nicholas.bennenbroek@wellsfargo.com">nicholas.bennenbroek@wellsfargo.com</a>
Tim Quinlan, Senior Economist	<a href="mailto:tim.quinlan@wellsfargo.com">tim.quinlan@wellsfargo.com</a>
Azhar Iqbal, Econometrician	<a href="mailto:azhar.iqbal@wellsfargo.com">azhar.iqbal@wellsfargo.com</a>
Sarah House, Senior Economist	<a href="mailto:sarah.house@wellsfargo.com">sarah.house@wellsfargo.com</a>
Charlie Dougherty, Economist	<a href="mailto:charles.dougherty@wellsfargo.com">charles.dougherty@wellsfargo.com</a>
Erik Nelson, Macro Strategist	<a href="mailto:erik.f.nelson@wellsfargo.com">erik.f.nelson@wellsfargo.com</a>
Michael Pugliese, Economist	<a href="mailto:michael.d.pugliese@wellsfargo.com">michael.d.pugliese@wellsfargo.com</a>
Brendan McKenna, Macro Strategist	<a href="mailto:brendan.mckenna@wellsfargo.com">brendan.mckenna@wellsfargo.com</a>

## Economic Analysts

Shannon Seery, Economic Analyst	<a href="mailto:shannon.seery@wellsfargo.com">shannon.seery@wellsfargo.com</a>
Matthew Honnold, Economic Analyst	<a href="mailto:matthew.honnold@wellsfargo.com">matthew.honnold@wellsfargo.com</a>
Jen Licis, Economic Analyst	<a href="mailto:jennifer.licis@wellsfargo.com">jennifer.licis@wellsfargo.com</a>
Hop Mathews, Economic Analyst	<a href="mailto:hop.mathews@wellsfargo.com">hop.mathews@wellsfargo.com</a>

## Administrative Assistant

Coren Burton, Administrative Assistant	<a href="mailto:coren.burton@wellsfargo.com">coren.burton@wellsfargo.com</a>
--	--

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