Business Forecast 2021
January 29, 2021
11:30 a.m. - 1:30 p.m.

11:30 a.m. - Recognition of Sponsors & 2020 Economic Forecast Contest Awards
Mervin Jebaraj
Center for Business and Economic Research
University of Arkansas

11:35 a.m. - Welcome
Matt Waller
Dean, Sam M. Walton College of Business
University of Arkansas

11:40 a.m. - Global Forecaster
Catherine Mann
Global Chief Economist
Citibank

12:00 a.m. - Domestic Forecaster
Mark Palim
Vice President and Deputy Chief Economist
Fannie Mae

12:25 a.m. - Regional Forecaster
Mervin Jebaraj

12:45 a.m. - Panel Discussion
Catherine Mann
Mark Palim
Mervin Jebaraj

Business Forecast 2021 is in association with the National Association for Business Economics (NABE).
Please use Twitter hashtag #BF2021 for this event.
Catherine Mann is the Global Chief Economist at Citibank, responsible for thought leadership, research guidance of a global team of economists, and cross-fertilization of research across macroeconomics, fixed-income, and equities. Prior to this position, Mann was Chief Economist at the OECD, where she also was Director of the Economics Department and was Finance Deputy to the G20 (2014-2017). Prior to the OECD, she held the Barbara ’54 and Richard M. Rosenberg Professor of Global Finance at the International Business School, Brandeis University, where she directed the Rosenberg Institute of Global Finance (2006-2014). She spent 20-plus years in Washington, DC. Her positions included Senior Fellow at the Peter G. Peterson Institute for International Economics; Economist, Senior Economist, and Assistant Director in the International Finance Division at the Federal Reserve Board of Governors; Senior International Economist on the President’s Council of Economic Advisers; and Adviser to the Chief Economist at the World Bank. Her written work includes more than 85 scholarly articles and seven books primarily on the topics of US external imbalances, trade, international capital flows and the dollar; and information technology and services trade in global markets. Mann received her PhD in Economics from the Massachusetts Institute of Technology and her undergraduate degree is from Harvard University.

Mark Palim is Vice President and Deputy Chief Economist at Fannie Mae, responsible for overseeing the Economic and Strategic Research Group’s forecasting functions. Prior to working at Fannie Mae, Mark was an economic consultant at PricewaterhouseCoopers and LECG. His practice focused on applying economic and financial theory to a variety of business disputes and policy questions. He worked as a consulting and testifying expert in antitrust cases and disputes in the financial services industry. In addition, Palim led a team of 75 adjudicators charged with valuing claims for the Department of Justice and the Special Master administering the Federal September 11th Victim Compensation Fund. Mark was first involved with economic forecasting and mortgage securities in 1988 when he was a portfolio manager and reported to the Chief Economist at Mercantile Safe Deposit and Trust Company. Subsequently, he continued his work on macroeconomic and policy issues as a staff economist for the National Association of Federal Credit Unions (NAFCU). Currently, Palim serves on the Board of Directors of the National Association for Business Economics (NABE). His research has been published in peer reviewed economic journals and professional handbooks. Palim has a Ph.D. in economics from George Mason University and a B.A. in international studies from the Johns Hopkins University and is a Chartered Financial Analyst charter holder (CFA).

Mervin Jebaraj is the Director of the Center for Business and Economic Research. During his time at the center, he has been instrumental in creating and executing economic studies for clients such as the Arkansas Economic Development Commission, the Northwest Arkansas Council, the Walton Family Foundation, Arvest Bank, the University of Arkansas and many others. He has contributed to economic thinking and public policy discussion that journalists, business people, and community leaders alike rely on to understand how national and regional issues impact Northwest Arkansas and Arkansas as a whole. Arkansas Business and the Northwest Arkansas Business Journal recognized Mervin in their 40 Under 40 lists and on the Arkansas 250 list. He makes presentations that share the center’s expertise directly to over 5,000 individuals annually and tens of thousands more hear and see his economic analysis and commentary through TV, radio and print media. Jebaraj serves on the Community Development Advisory Council of the Federal Reserve Bank of St. Louis, on the Board of Directors of the Association for University Business and Economic Research and on the Board of Directors of the Walton Arts Center. He is also a member of the National Association for Business Economics.
Global Economics Outlook & Strategy

Deviation, Dispersion, and Prospects

Global Economic Outlook & Strategy - Deviation, Dispersion, and Prospects

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Overview of January Projections

We have kept global growth forecast for 2021 unchanged at 5% from the Prospects and raised it by 0.1pp to 3.7% for 2022 (2020: -3.7%). We have kept our global inflation forecasts unchanged for 2021 and 2022 at 2.2% and 2.4% respectively (2020: 1.9%).

Global, AE, EM – GDP Growth (%YY), 2018-2025F

Note: At market exchange rates. Horizontal lines are respective LT averages (2000-2019) for Global, AE and EM %YY GDP growth.
Source: National Statistical Offices, IMF and Citi Research

Global – GDP Growth Forecast Revision (%YY), 2018: Jan-21

Note: At market exchange rates. Source: National Statistical Offices, IMF and Citi Research

Global, AE, EM – Inflation (%YY), 2001-2025F

Note: At market exchange rates. PCE for the US. Horizontal lines are respective LT averages (2000-2019) for Global, AE and EM %YY inflation.
Source: National Statistical Offices, IMF and Citi Research

Global – Inflation Forecast Revisions (%YY), 2018: Jan-21

Note: At market exchange rates. PCE for the US. Source: National Statistical Offices, IMF and Citi Research

Prepared for Mervin Jebaraj
Unpack Prospects Using Deviation and Dispersion

Deviation and Dispersion

the SMALLER the STANDARD DEVIATION (SD)
the LESS cross section dispersion

the LARGER the STANDARD DEVIATION (SD)
the MORE cross-section dispersion

the LARGER the STANDARD DEVIATION (SD)
the GREATER the deviation from historical experience

Source: Citi Research
The COVID Shock and Rebound: Global Assessment; Potential Turbulence?

AE, EM – Real GDP Growth (%YY) and Growth Differential (pp), 2000-2022 Q2F

%YY, Difference in pp

-12.5
-10.0
-7.5
-5.0
-2.5
-0.0
2.5
7.5
10.0
12.5


Forecasts

Last updated: 1/22/2021
Data through: 2020 Q3

Source: National Statistical Sources and Citi Research
Dispersion Headwinds from Asynchronous, Delayed Return to Pre-COVID GDP

Global – Timetable for Return to pre-COVID Level of GDP (% of Global GDP)

Dispersion of Real GDP Growth across Economies within the Aggregate (%YY, Standard Deviation), 2000-2022 Q2F

Source: National Statistical Sources and Citi Research

Source: Citi Research
Standard Deviation Headwinds: COVID Shock in Historical Perspective

Global, AE, EM – Deviation from Historical Experience for %YY Real GDP Growth (SD), 2000-2022 Q2F

Select Economies – Deviation from Historical Experience for %YY Real GDP Growth (SD), 2000-2022 Q2F

Source: National Statistical Sources and Citi Research

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Vaccine Prospects Could Provide Strong Support, Possibly in 2021

Impact on Global, AE, EM GDP Growth of Vaccine Scenarios

Citi Forecast in October + The marginal impact of vaccine news in Nov

Source: Citi Research, Global Economics View – When Will COVID-19 Vaccine Lift Economy? Note that the deviations from baseline in the referenced note differs from these calculations. These calculations incorporate the 80% Probability of Success in the initial boost to growth.
Leaders out of COVID through Services and Manufacturing

**AE – Manufacturing and Services PMI (Index, 50+=Expansion) vs Gap with US (Index Points), 2015-2020 Dec**

- **Diffusion Index (50+=Expansion)**
  - AE Services
  - AE Mfg

**Source:** Markit, Macrobond and Citi Research

**Euro area – Manufacturing and Services PMI (Index, 50+=Expansion) vs Gap with Germany (Index Points), 2015-2020 Dec**

- **Diffusion Index (50+=Expansion)**
  - Euro area Services
  - Euro area Mfg

**EM – Manufacturing and Services PMI (Index, 50+=Expansion) vs Gap with China (Index Points), 2015-2020 Dec**

- **Diffusion Index (50+=Expansion)**
  - EM Services
  - EM Mfg

**Gap: AE-US (Mfg)**

**Gap: AE-US (Services)**

**Gap: EM-CN (Mfg)**

**Gap: EM-CN (Services)**

**Source:** Markit, Macrobond and Citi Research

Prepared for Mervin Jebaraj
Synchronous Trade Growth Remains Elusive in 2021 (see more [here](#))

**Global Trade Growth Headwinds**

**Trade Wars, then COVID**

**Global – Merchandise Trade (%YY, 3MMA) and Container Throughput Index (%YY, 2m lead), 2012-2020**

*Source: CPB and Citi Research*

**COVID Times:**

**Goods Trade Rebound, Services Moribund**

**Global – Merchandise Trade (%YY, 3MMA) and Container Throughput Index (%YY, 2m lead), 2012-2020**

Last updated: 1/11/2021
Data through: November 2020

Note: Trade data is until Oct-2020. Source: CPB, RWI/ISL, and Citi Research

**Global Select AE, EM – Total Tourist Arrivals (%YY), Jan – Oct 2020**

Last updated: 1/11/2021
Data through: October 2020

Note: AE data is until Sep-2020.
Source: National Statistical Sources, Haver and Citi Research
Services Contraction Continues; Weak Capex Prospects

Household Consumption Expenditure on Services
Select AE – (% YY), 2019-2020 Q3

Select AE – Investment Growth
Select AE – (% YY), 2018 Q3 – 2022 Q2 F

Note: Median, min and max values are for 2010-2019. Data for New Zealand, Norway and aggregate AE is not available for Q3-2020. Source: OECD, IMF and Research.


Source: Haver Analytics and Citi Research – US Equity Strategy
See: Monday Morning Musings - Capex Insights for 2021
What Is Next For Global Fiscal Policy? (see more here)

Note: Effect, in percentage change, of an unexpected increase of public investment by 1% of GDP. Data cover 72 advanced economies and emerging markets for which standard deviation of GDP forecasts across forecasters were available. For more details, see: Global Economics View - Prospects for 2021; What Is Next For Global Fiscal Policy? and: IMF Fiscal Monitor.
Source: IMF staff estimates, Citi Research

Global – GDP Forecast, Trend, Uncertainty Scenario

Source: Oxford Economics, Citi Research

AE – Uncertainty and Growth in Business Inv.

Note: Q4-2020 value for uncertainty is data for October only. Source: National Statistics, Citi Research
Financial Valuations are Well Ahead of the Real-Side Prospects

Potential Downgrades Dominate

Note: Data reflect index-eligible developed-market bonds with watch/outlook classifications at any of the three major agencies. Bonds may be counted in multiple categories. Source: Refinitiv, Bloomberg and Citi Research
See: US High Grade Strategy Focus: Market Dashboard – Downgrades slow to a trickle, but negative outlooks soar

US and Euro Credit Spreads, 1999-2020 Nov

Source: MSCI, Factset Consensus Data and Citi Research
See: Global Equity Quarterly: Challenging Times

Global Equities and EPS

Note: Last updated: 11/22/2020; Data through: 11/20/2020.
Source: Citi Research

Prepared for Mervin Jebaraj
Prospects for the Dollar

Figure 105. Dollar, NEER and REER Broad Basket (Index Jan-16=100), 2017-2021 Jan

Source: Macrobond, Bloomberg, Citi Research
Central Banks and the Dollar: Catalysts for Financial Turbulence?

G4 – Central Bank Net Asset Purchases (USD Trillion, 12mma) 2008-2021E

Euro area, US – USDEUR vs ECB-Fed Net Asset Purchases Gap (USD trillion, 12m rolling), 2005-2021F

Source: National Central Banks, Haver and Citi Research

Source: National Central Banks, Haver and Citi Research
See: Global Economics Weekly - Can the USD Seek Solace in Theory and Evidence?
Inflation Projections: Downward Revisions, a Jump, then Convergence

Global, AE, EM – Inflation (%YY), 2001-2025F

Global – Inflation Forecast Revisions (%YY), 2018: Jan-2021

Note: At market exchange rates. PCE for the US. Horizontal lines are respective LT averages (2000-2019) for Global, AE and EM %YY inflation. Last updated: Jan-2021.
Source: National Statistical Offices, IMF and Citi Research

Note: At market exchange rates. PCE for the US. Last updated: Jan-2021.
Source: National Statistical Offices, IMF and Citi Research
Five Inflation Drivers: No Long-Term Reflation (see more here)

#1: Base effects ≠ long-term reflation, #2: Output gaps take many years to close, #3: Strong financial and housing inflation, #4: USD weakness has limited impact, #5: Downside risk and volatility from oil prices.

**US, EZ – Near-Term Pricing of Inflation**

Note: Pricing is based on inflation swaps using US CPI/Eurozone HICP ex tobacco as underlying. We add historic avg. tobacco inflation to get HICP. Source: Citi Research

**US, EZ – 5y5y Inflation Swap Related to CPI**

Note: 5Y moving correlation between monthly pp change in CPI inflation and 5y5y inflation swap. Source: Bloomberg, Macrobond, Citi Research
What Could Trigger a Public Debt Crisis and When? (see more [here](#))

### AE, EM – Historical Pattern of Government Debt

<table>
<thead>
<tr>
<th>Year</th>
<th>Advanced Economies</th>
<th>Emerging Markets</th>
</tr>
</thead>
<tbody>
<tr>
<td>1880</td>
<td>10</td>
<td>50</td>
</tr>
<tr>
<td>1900</td>
<td>20</td>
<td>60</td>
</tr>
<tr>
<td>1920</td>
<td>30</td>
<td>70</td>
</tr>
<tr>
<td>1940</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td>2000</td>
<td>50</td>
<td>90</td>
</tr>
</tbody>
</table>

Source: IMF, Historical Public Debt Database; IMF, World Economic Outlook database; Maddison Database Project; IMF staff calculations, Citi Research

### AE – Government Debt Held By Central Banks

<table>
<thead>
<tr>
<th>Bank</th>
<th>Share of Govt Debt Held by Central Banks (mid-2020)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BoJ</td>
<td>20%</td>
</tr>
<tr>
<td>BoE</td>
<td>15%</td>
</tr>
<tr>
<td>ECB</td>
<td>10%</td>
</tr>
<tr>
<td>RBNZ</td>
<td>5%</td>
</tr>
<tr>
<td>Fed</td>
<td>2%</td>
</tr>
<tr>
<td>BoC</td>
<td>1%</td>
</tr>
<tr>
<td>RBA</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

Source: Haver, National Central Banks, Citi Research

### Selected Economies – Government Debt Scenario

<table>
<thead>
<tr>
<th>Country</th>
<th>Government Debt to GDP (deviation from baseline, pp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>US</td>
<td>1.4 3.3 5.1 6.6 6.4 5.3 4.1 2.9</td>
</tr>
<tr>
<td>Germany</td>
<td>0.4 1.1 2.0 3.0 3.7 4.0 4.1 4.0</td>
</tr>
<tr>
<td>France</td>
<td>0.9 2.1 3.5 5.1 5.8 6.1 6.0 5.7</td>
</tr>
<tr>
<td>Italy</td>
<td>1.0 2.0 3.4 4.9 5.7 6.3 7.6 6.5</td>
</tr>
<tr>
<td>Spain</td>
<td>1.0 2.3 4.0 5.9 6.9 7.5 7.6 7.2</td>
</tr>
<tr>
<td>Japan</td>
<td>1.1 2.9 5.3 8.0 9.8 10.9 11.4 11.5</td>
</tr>
<tr>
<td>UK</td>
<td>0.5 1.2 2.1 3.0 3.5 3.6 3.5 3.3</td>
</tr>
<tr>
<td>China</td>
<td>0.3 0.8 1.3 2.0 2.2 2.3 2.3 2.2</td>
</tr>
<tr>
<td>India</td>
<td>0.6 0.7 0.8 1.0 0.9 0.8 0.7 0.4</td>
</tr>
<tr>
<td>South Korea</td>
<td>0.2 0.8 1.7 2.8 3.7 4.2 4.4 4.4</td>
</tr>
<tr>
<td>Brazil</td>
<td>0.7 1.2 1.6 2.0 1.7 1.7 1.6 1.4</td>
</tr>
<tr>
<td>Mexico</td>
<td>0.4 0.7 1.0 1.3 1.5 1.6 1.6 1.5</td>
</tr>
<tr>
<td>Poland</td>
<td>0.5 0.7 1.5 2.4 3.2 4.0 4.8 5.4</td>
</tr>
<tr>
<td>South Africa</td>
<td>0.2 0.5 0.9 1.3 1.5 1.6 1.6 1.5</td>
</tr>
</tbody>
</table>

Note: Red illustrates peak in deviation. Source: Oxford Economics, Citi Research

Prepared for Mervin Jebaraj
Prospects for 2021: Will Labor Markets Recover?


Shadow vs Official Unemployment Rate (%), Q3-2020

Quarterly Unempl. Rate: Shadow vs. Official (Q3 2020)

Note: Solid line is current forecast, dashed line is the October 2020 forecast vintage. Source: National Statistical Agencies and Citi Research

US: Evidence of Structural Unemployment

US: Vacancy Rate vs. Unemployment Rate

Source: National Statistical Agencies and Citi Research

See: Global Economics View - Prospects for 2021: Will Labor Markets Recover?
Prospects for 2021: NFC Debt and the Pandemic Effect

Non-financial corporate sector debt service ratio: developed economies, Q2-2020 vs. Q2-2019

Source: IIF and Citi Research
See: Global Economics View - Prospects for 2021: Non-Financial Corporate Debt and the Pandemic Effect

Consistent Leveraging in Non-Financials after QE starts

Source: Bloomberg and Citi Research

NFC debt in the US high yield market by rating

Source: Bloomberg and Citi Research

Prospects for 2021: NFC Debt and the Pandemic Effect

Prepared for Mervin Jebaraj
Global Economic Outlook: The Year Ahead
Prospects for 2021: Signs on the road to post-COVID normalization

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</tr>
</thead>
<tbody>
<tr>
<td>Citigroup Global Markets Limited</td>
<td>Pernille B. Henneberg</td>
</tr>
</tbody>
</table>

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Prepared for Mervin Jebaraj
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## Macroeconomic outlook

<table>
<thead>
<tr>
<th></th>
<th>Forecast</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2019</td>
</tr>
<tr>
<td>Real GDP annual growth (Q4-over-Q4)</td>
<td>2.3%</td>
</tr>
<tr>
<td>Unemployment rate (year-end)</td>
<td>3.5%</td>
</tr>
<tr>
<td>Core CPI (year-end, % year-over-year)</td>
<td>2.3%</td>
</tr>
<tr>
<td>10-year Treasury bond yield (annual average)</td>
<td>2.1%</td>
</tr>
</tbody>
</table>

Source: Fannie Mae Economic & Strategic Research January 2021 Forecast – Data in Forecast as of 1/11/2021
Technically, the shortest recession ever

Employment recovery path highly uncertain with potential downside risk to housing
Consumption likely to boost growth in the latter half of 2021

Home sales expected to pull back but remain elevated, while home price growth remains strong in the near-term

Quarterly change in real GDP and real personal consumption expenditures (SAAR, Bil.$2012)

New and Existing Home Sales and FHFA: Purchase Only Home Price Index
Current hospitalizations pull back from record levels
New daily cases trending downwards, potentially due to the pass-through of holiday-related infections

Source: Johns Hopkins University CSSE, COVID Tracking Project
Relief programs help keep bankruptcies low in Q3
Share of firms planning on further capital expenditures falls sharply in December
Macro policy has been supportive, and many consumers have the firepower to consume.

Transfer payments have helped bolster the economy so far.
Debt as a share of GDP expected to surge following increase in expenditures in effort to combat the effects of the coronavirus

Source: Congressional Budget Office
Monetary policy: Where do we go from here?

Monetary policy at full-speed, and a slowing in the near-future is unlikely

Current Total Federal Reserve Assets (Tril. $)

Current Total Fed Assets: ~$7.4T

Monetary policy at full-speed, and a slowing in the near-future is unlikely
Interest rates at historic lows

Fed funds rate, treasury rates, and mortgage rates

<table>
<thead>
<tr>
<th></th>
<th>End of Year Rates</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2018</td>
</tr>
<tr>
<td>Fed Funds:</td>
<td>2.3%</td>
</tr>
<tr>
<td>10-Yr:</td>
<td>2.8%</td>
</tr>
<tr>
<td>30-Yr FRM:</td>
<td>4.6%</td>
</tr>
</tbody>
</table>

Source: Fannie Mae Economic & Strategic Research January 2021 Forecast – Data in Forecast as of 01/11/2021
Single-family starts continue climbing past pre-pandemic levels

Acceleration in pace of increase in permits suggests pace of construction may rise over the coming months

Source: Census Bureau
New home sales pull back sharply in November

While existing home sales remain elevated, large downward revisions to new home sales suggest weaker sales

New & existing home sales (SAAR, Mil. of Units)

Source: Census Bureau, National Association of REALTORS®
Inventories of existing homes falls to record low in December

Inventories of new homes increased again in December

Source: Census Bureau, National Association of REALTORS®
Home price growth continues to accelerate

FHFA Purchase-Only Home Price Index shows annual price growth of 11% in November as inventories remain low.
Multifamily Market

Effective rent change by property class

Source: RealPage, Inc.
The move away from density may have plateaued
Pickup post-COVID in New York and San Francisco in net moves to lower density

**NYC borrowers moving from high density* to low density zip codes as a % of all observations**

**San Francisco borrowers moving from high density* to low density zip codes as a % of all observations**

*High-density is defined as zip codes within the top 20th percentile of people per square mile for each CBSA.

Source: Desktop Underwriter, Fannie Mae ESR Analysis
Serious delinquencies rise sharply in Q3
FHA delinquencies remain well above VA and conventional delinquencies

Serious delinquency rate (90+ Days Late)*

- Includes loans in forbearance and foreclosure as delinquent loans

Source: Mortgage Bankers Association
# Housing and mortgage market outlook

<table>
<thead>
<tr>
<th></th>
<th>2019</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Housing Starts</strong></td>
<td>1.290 million</td>
<td>1.383 million</td>
<td>1.450 million</td>
<td>1.504 million</td>
</tr>
<tr>
<td>(Percent Change Year-Over-Year)</td>
<td>3.2%</td>
<td>7.2%</td>
<td>4.9%</td>
<td>3.7%</td>
</tr>
<tr>
<td><strong>New Single-Family Home Sales</strong></td>
<td>683 thousand</td>
<td>818 thousand</td>
<td>858 thousand</td>
<td>880 thousand</td>
</tr>
<tr>
<td>(Percent Change Year-Over-Year)</td>
<td>10.7%</td>
<td>19.8%</td>
<td>4.8%</td>
<td>2.6%</td>
</tr>
<tr>
<td><strong>Total Existing Home Sales</strong></td>
<td>5.340 million</td>
<td>5.652 million</td>
<td>5.862 million</td>
<td>5.671 million</td>
</tr>
<tr>
<td>(Percent Change Year-Over-Year)</td>
<td>0.0%</td>
<td>5.8%</td>
<td>3.7%</td>
<td>-3.3%</td>
</tr>
<tr>
<td>FHFA Purchase-Only Index</td>
<td>5.4%</td>
<td>10.3%</td>
<td>4.2%</td>
<td>2.3%</td>
</tr>
<tr>
<td>(Annual Percent Change Q4/Q4)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Purchase Mortgage Originations</strong></td>
<td>$1,326 billion</td>
<td>$1,605 billion</td>
<td>$1,751 billion</td>
<td>$1,766 billion</td>
</tr>
<tr>
<td>(Percent Change Year-Over-Year)</td>
<td>7.4%</td>
<td>21.0%</td>
<td>9.1%</td>
<td>0.9%</td>
</tr>
<tr>
<td><strong>Refinance Mortgage Originations</strong></td>
<td>$1,136 billion</td>
<td>$2,806 billion</td>
<td>$2,155 billion</td>
<td>$1,447 billion</td>
</tr>
<tr>
<td>(Percent Change Year-Over-Year)</td>
<td>113.5%</td>
<td>147.0%</td>
<td>-23.2%</td>
<td>-32.9%</td>
</tr>
<tr>
<td><strong>30-Year Fixed-Rate Mortgage</strong></td>
<td>3.9%</td>
<td>3.1%</td>
<td>2.7%</td>
<td>2.9%</td>
</tr>
<tr>
<td>(Annual Average)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>10-Year Treasury (Annual Average)</strong></td>
<td>2.1%</td>
<td>0.9%</td>
<td>1.0%</td>
<td>1.2%</td>
</tr>
</tbody>
</table>

Source: Fannie Mae Economic & Strategic Research January 2021 Forecast – Data in Forecast as of 1/11/2021
The Arkansas Economy in the Time of Contagion

Mervin Jebaraj, Director
Center for Business and Economic Research
January 29, 2021

Twitter: #BF2021
@uawaltoncollege @MervinJebaraj
Arkansas Non-Farm Employment

Source: Bureau of Labor Statistics
Change in Arkansas Employment by Sector
2019-2020

Source: Bureau of Labor Statistics, CBER Calculations
Overall, how has this business been affected by the Coronavirus pandemic?

Arkansas Average

Note: No data collected between 6/27 and 8/9. No data collected between 10/12 and 11/9.

In your opinion, how much time do you think will pass before this business returns to its normal level of operations relative to one year ago?

Arkansas Average

Note: No data collected between 6/27 and 8/9. No data collected between 10/12 and 11/9.
Percent Change in Number of Small Businesses Open

Chetty, Friedman, Hendren, Stepner, and the OI Team (2020)
Percent Change in Number of Small Businesses Revenue

-12.8% Retail & Transportation
-19.7% Education & Health Services
-52.4% Leisure & Hospitality

Chetty, Friedman, Hendren, Stepner, and the OI Team (2020)
Select Counties of Arkansas - Year-over-Year Changes in Monthly Bar & Liquor Store Tax Revenue

Month - 2020 vs. 2019

- Liquor Stores
- Bars
Select Counties of Arkansas - Year-over-Year Changes in Monthly Restaurant Tax Revenue

Month - 2020 vs. 2019

- January, 5.1%
- February, -0.9%
- March, -20.0%
- April, -18.6%
- May, -15.1%
- June, -8.8%
- July, -1.8%
- August, -3.8%
- September, -3.6%
- October, 2.7%
- November, -3.5%
- November, -8.6%
Little Rock-North Little Rock-Conway MSA
Non-Farm Employment

Source: Bureau of Labor Statistics
Change in Little Rock-North Little Rock-Conway MSA Employment by Sector, 2019-2020

Source: Bureau of Labor Statistics, CBER Calculations
Percent Change in Number of Small Businesses Open

Chetty, Friedman, Hendren, Stepner, and the OI Team (2020)
Central Arkansas- Year-over-Year Changes in Monthly Bar & Liquor Store Tax Revenue

Month - 2020 vs. 2019

<table>
<thead>
<tr>
<th>Month</th>
<th>YoY Change in Tax Revenue</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>-6%</td>
</tr>
<tr>
<td>February</td>
<td>-21%</td>
</tr>
<tr>
<td>March</td>
<td>-25%</td>
</tr>
<tr>
<td>April</td>
<td>-48%</td>
</tr>
<tr>
<td>May</td>
<td>-52%</td>
</tr>
<tr>
<td>June</td>
<td>-41%</td>
</tr>
<tr>
<td>July</td>
<td>-34%</td>
</tr>
<tr>
<td>August</td>
<td>-30%</td>
</tr>
<tr>
<td>September</td>
<td>17%</td>
</tr>
<tr>
<td>October</td>
<td>22%</td>
</tr>
<tr>
<td>November</td>
<td>52%</td>
</tr>
<tr>
<td>April</td>
<td>40%</td>
</tr>
<tr>
<td>May</td>
<td>28%</td>
</tr>
<tr>
<td>June</td>
<td>37%</td>
</tr>
<tr>
<td>July</td>
<td>24%</td>
</tr>
<tr>
<td>August</td>
<td>15%</td>
</tr>
<tr>
<td>September</td>
<td>37%</td>
</tr>
<tr>
<td>October</td>
<td>33%</td>
</tr>
<tr>
<td>November</td>
<td>12%</td>
</tr>
</tbody>
</table>
Central Arkansas- Year-over-Year Changes in Monthly Restaurant Tax Revenue

Month - 2020 vs. 2019

- Full-Service Restaurants
- Limited-Service Restaurants
Fayetteville-Springdale-Rogers MSA
Non-Farm Employment

Source: Bureau of Labor Statistics
Change in Northwest Arkansas MSA Employment by Sector, 2019-2020

Professional and Business Services
Mining, Logging and Construction
Trade, Transportation and Utilities
Financial Activities
Government
Non-Farm
Other Services
Manufacturing
Education and Health Services
Information
Leisure and Hospitality

Source: Bureau of Labor Statistics, CBER Calculations
Percent Change in Number of Small Businesses Open

Chetty, Friedman, Hendren, Stepner, and the OI Team (2020)
Northwest Arkansas - Year-over-Year Changes in Monthly Bar & Liquor Store Tax Revenue

- January, 5%
- February, 17%
- March, 17%
- April, 30%
- May, 47%
- June, 26%
- July, 11%
- August, 62%
- September, 34%
- October, 58%
- November, 25%

- January, 33%
- February, -41%
- March, -17%
- April, -72%
- May, -63%
- June, -49%
- July, -35%
- August, -30%
- September, -37%
- October, -31%
- November, -70%

Month - 2020 vs. 2019

- Liquor Stores
- Bars
Northwest Arkansas - Year-over-Year Changes in Monthly Restaurant Tax Revenue

Month - 2020 vs. 2019

-40.0% -35.0% -30.0% -25.0% -20.0% -15.0% -10.0% -5.0% 0.0% 5.0% 10.0% 15.0%

January, 4.7%
February, -0.7%
March, -20.6%
April, -33.3%
May, 4.8%
June, -11.0%
July, -3.1%
August, -7.7%
September, -1.8%
October, -2.3%
November, -11.0%

January, 3.1%
February, -6.7%
March, -20.5%
April, -25.6%
May, -22.8%
June, -19.2%
July, -1.9%
August, -7.7%
September, -1.8%
October, -2.3%
November, 10.4%
Percentage Change in Workplaces - Benton County

Arkansas School Closures / Economic Impact / Phase 1 Reopening

Percentage Change in Workplaces - Washington County

Arkansas School Closures / Economic Impact / Phase 1 Reopening

Dec 1, 19  Feb 1, 20  Apr 1, 20  Jun 1, 20  Aug 1, 20  Oct 1, 20  Dec 1, 20  Feb 1, 21

Workplaces Percent Change From Baseline

-60  -40  -20  0  20  40  60
Four Metro Areas of Arkansas - Year-over-Year Changes in Monthly Tax Revenue from Full-Service Restaurants

Month - 2020 vs. 2019

- Fort Smith
- Hot Springs
- Jonesboro
- Pine Bluff
Unemployment Rate, Seasonally Adjusted

Source: Bureau of Labor Statistics