# REAL

**REGIONAL ECONOMIC ANALYSIS OF LOUISIANA**

# REPORT

CENTER FOR
**ECONOMIC**
**RESEARCH**

COLLEGE OF BUSINESS

FALL 2022

# Dean's Message

The Center for Economic Research, along with business economics undergraduates at Louisiana Tech, have worked diligently to produce the Fall 2022 issue of the Regional Economic Analysis of Louisiana (REAL) Report. This publication is the 10th in this series designed to provide insight into recent economic developments in Louisiana.

This issue focuses on the housing market, employment recovery across the state, factors affecting health insurance costs, forecasts of natural gas pricing, and the potential economic impact of passenger transit from Baton Rouge to New Orleans. As always, the report also includes economic forecasts for Louisiana.

The REAL Report is produced by the Center for Economic Research, in collaboration with faculty and students in Louisiana Tech University's College of Business, for the state of Louisiana and our region of the South. Providing an invaluable learning experience, this report is compiled by undergraduate economics majors in partial fulfillment of their Regional Economic Analysis class.

This report, along with previous issues, can be found online at **Business.LATech.edu/RealReport**. For more information on the report, the Center for Economic Research, or the Regional Economic Analysis class (ECON 425), contact Dr. Patrick Scott at PScott@LATech.edu. Inquiries about specific sections of the report should be referred to the author of each section, while media inquiries should be directed to Waldroup@LATech.edu.

I hope this report is beneficial to your efforts.

Sincerely,

CHRISTOPHER L. MARTIN, PH.D.
Dean and Chase Endowed Professor
College of Business
Louisiana Tech University

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# Meet the Team

**Georgia Carroway** is a fourth-year business economics major with a minor in political science at Louisiana Tech University from Benton, LA. Georgia is involved in the Pre-law Society, the Louisiana Tech Mock Trial Team, and is a member of Sigma Kappa Sorority. Georgia plans to graduate Spring 2023 and attend law school.

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**Lauren Lasiter** is a fourth-year business economics major at Louisiana Tech University from Bossier City, LA. She is involved in Kappa Delta Sorority and is treasury intern at Origin Bank. She plans to graduate in May of 2023 and pursue a master's in economics.

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**Liam Moppert** is a fourth-year business economics major with a minor in aerospace studies from Baton Rouge, LA. He is involved with the Air Force ROTC program and is a Combat Systems Officer Select. He plans to graduate in Winter of 2023 and begin work in the Air Force.

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**Dr. Patrick Scott** is an associate professor of economics and director of the Center for Economic Research. He teaches macroeconomics, monetary theory, and research methods at Louisiana Tech University. His research interests include optimal monetary policy models, dynamic general equilibrium models, time series forecasting, and Bayesian econometrics.

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# Louisiana Economic Indicator Forecasts

## BY C. PATRICK SCOTT, PH.D.

Forecasts are provided using a Bayesian model averaging approach from many statistical models. This method is utilized to capture the relative uncertainty that any one individual model is not properly specified and thus accounting for that uncertainty in our analysis.

## Non-Farm Employment

Total non-farm employment continues its slow march to full recovery in 2022. Total employment is still down approximately 58,000 jobs from pre-COVID levels two years ago. Supply chain issues have largely improved, but it has done relatively little to ease inflationary pressures brought about by historically loose monetary policy. The Federal Reserve has responded to broad inflationary pressures with modest success. Continued, moderate increases in the Fed's key interest rate will bring prices further into check but at the cost of business expansion. Realistic estimates of employment expansion average around 9,000 new payroll jobs in the next six months.

**Punchline: The hard part of the COVID-19 recovery is upon us. Louisiana must grow to get us back in the neighborhood of two million jobs.**

### Figure 1: Forecasted Non-Farm Employment (Thousands)
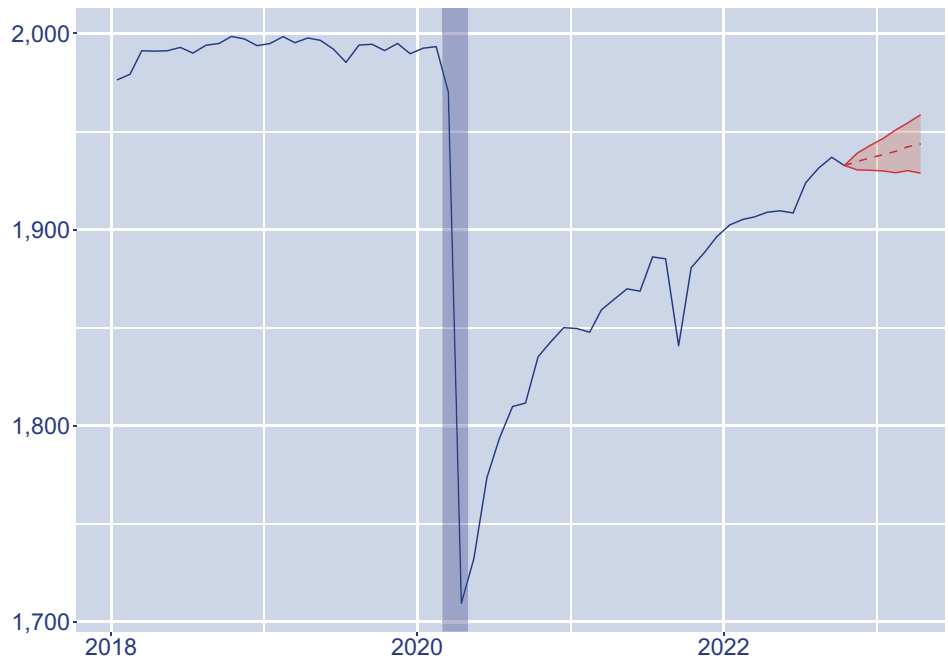


## Unemployment Rate

The headline unemployment rate for Louisiana continued to drop to a new historic low, now at its lowest level since at least the mid-1970s (where our state level data begins). In our Spring report, we thought the unemployment rate would not continue to fall, but it did from 4.1% to 3.3%. It is now lower than the national rate, which is not normal for recovery cycles historically speaking. Our best guess for future unemployment rates is that they will modestly climb to more reasonable levels (around 3.5% over the next six months) given both pricing pressure and monetary policy movements.

**Punchline: The unemployment rate is white hot, but it is an overly optimistic indicator right now.**

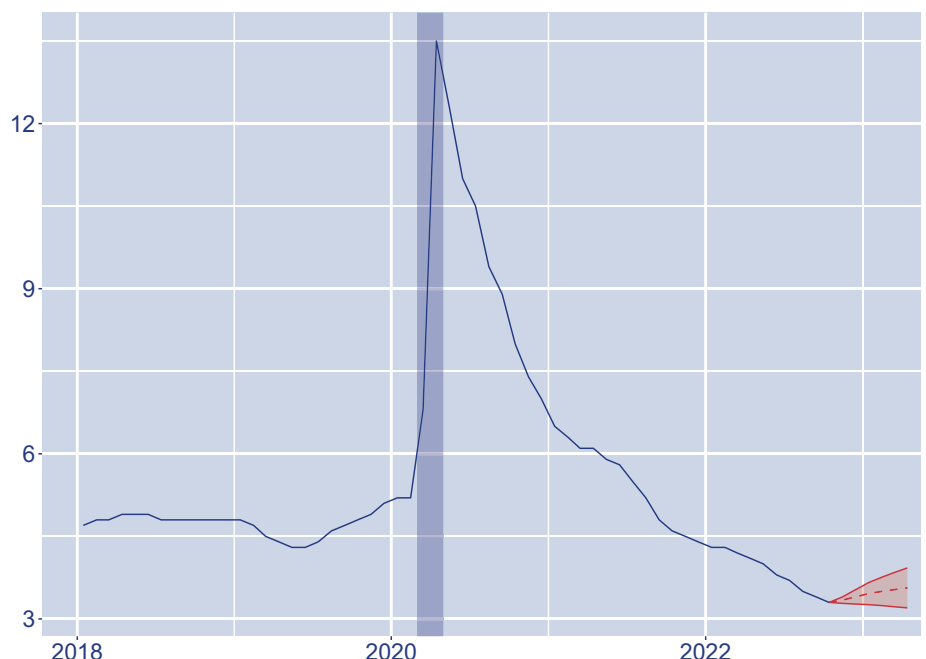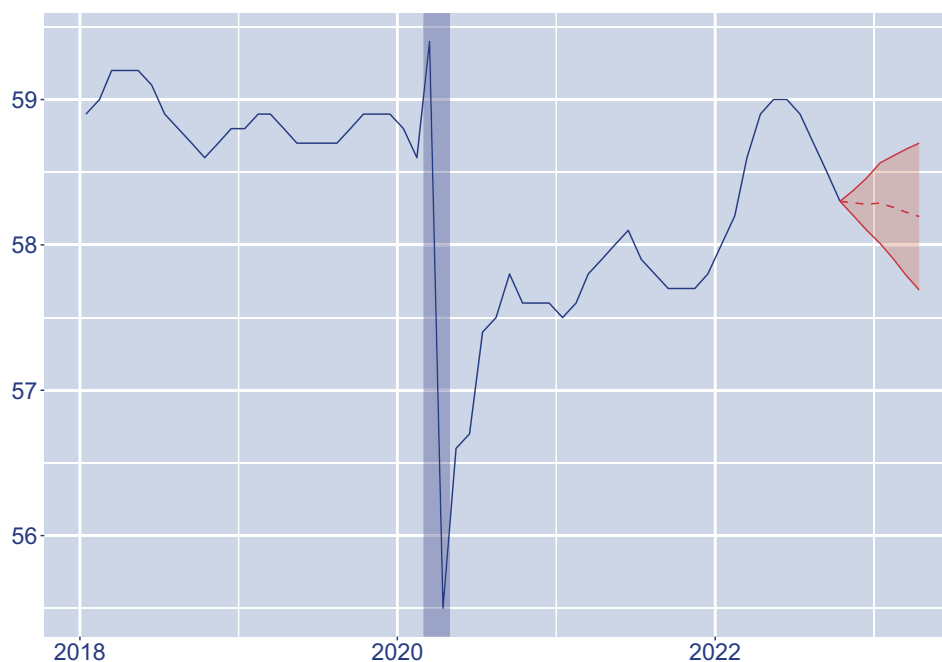### Figure 2: Forecasted Unemployment Rate (Percent)

## Figure 3: Forecasted Labor Force Participation Rate (Percent)



## Labor Force Participation Rate

The labor force participation rate (the fraction of working age population engaging labor markets) dropped modestly in the second quarter of 2022 as we reported in the Spring issue. This was not wholly unexpected given central bank policy. Forecast uncertainty is relatively wide for this indicator at the moment. The decline in working age population for the state, tightening monetary policy, high consumer spending, and slightly easing recent inflation estimates are all working against one another.

**Punchline: The tea leaves are muddled, and the near-term forecast is relatively flat.**

## Figure 4: Forecasted Wage Inflation (Percent)
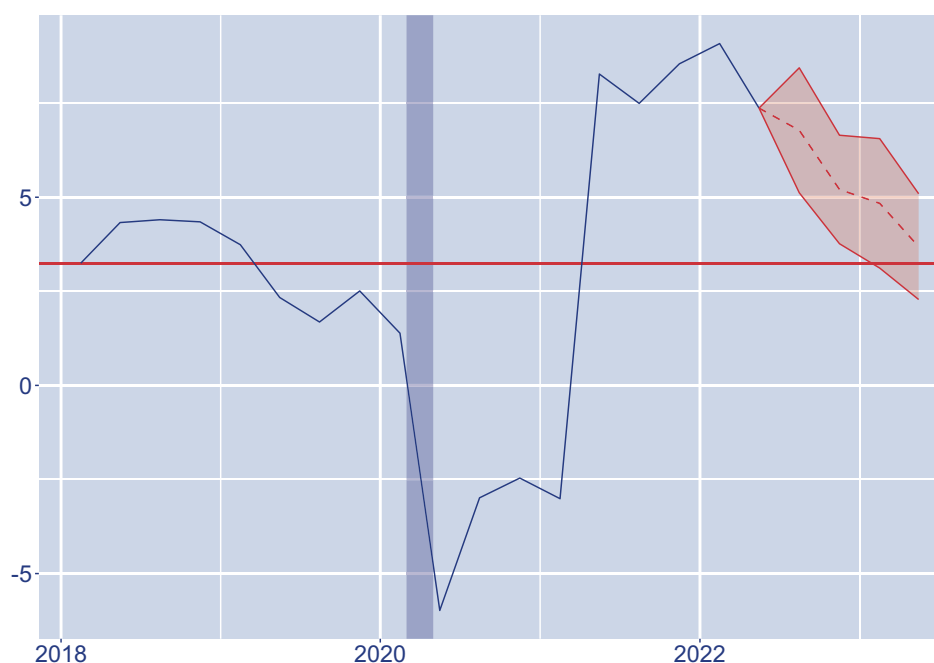


## Wage Inflation

The long-run growth rate of wages is approximately 3.2% for Louisiana (the horizontal red line). Wages have climbed more in the last nine quarters than we have seen in Louisiana for the past 30 years (as far back as our data currently goes), more than 11% in the first half of 2021 in response to pandemic-related losses. Current wage growth is holding steady, but national numbers indicate that this will not continue. Over the next year, forecasted wage growth will decline to about the long-run average for the state in 2023.

**Punchline: Wage growth is holding steady but currently growing slower than inflation.**

Monthly employment, unemployment rate, and labor force participation rate data for this section extend to October 2022 and include the most current releases at the time of publication. Quarterly wage data extend through June 2022 and include the most current releases at the time of publication.

# Putting a Price on 'Home Sweet Home:' House Price Dynamics at the MSA Level

## BY TRAVIS CORUM AND LAUREN LASITER

For individuals, a house is the largest time value asset in their portfolio and represents the biggest purchase in their lives. One measure of house prices for a given area is the house price index (HPI), that serves as an indicator for potential economic conditions, such as housing demand, consumer spending confidence, and employment levels. A relative house price index, as its name implies, is a comparison that measures how affordable a house in one region is relative to another region. This report analyzes the relative house price indices across Louisiana's nine metropolitan statistical areas (MSAs) along with the percent deviations from their respective long-term growth trends.

To calculate the relative HPI for each MSA, we divide the value of each MSA's HPI value by the HPI value for the state. The trend deviations in each MSA are calculated as percent deviations from a nonlinear trend to reflect individual housing market dynamics within each MSA. From these calculations, nine figures are produced (Figures 5-13) that each contain two charts. The charts on the left represent the relative house price indices for each of Louisiana's nine MSAs. If the line is above 100, house prices within the MSA are higher than the state. Likewise, if the line is below 100, the MSA's house prices are below the state. The charts on the right show the long-term growth trend of house prices in each MSA and percent deviations from each trend line. The space between the trend line and the deviation line are the actual percent deviations from the trend. This can be interpreted as the percent above or below market fundamentals.

### Figure 5: Alexandria MSA House Price Index
RELATIVE TO STATE
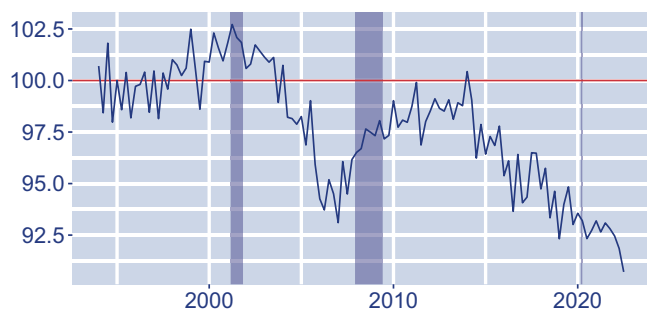
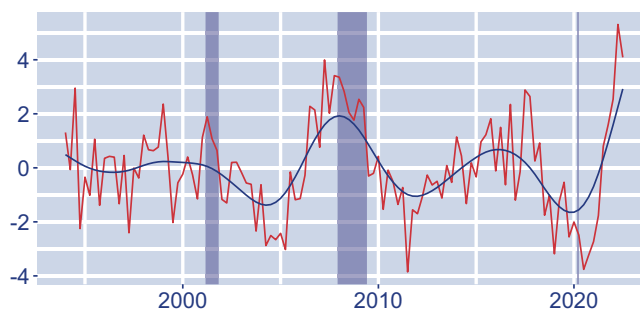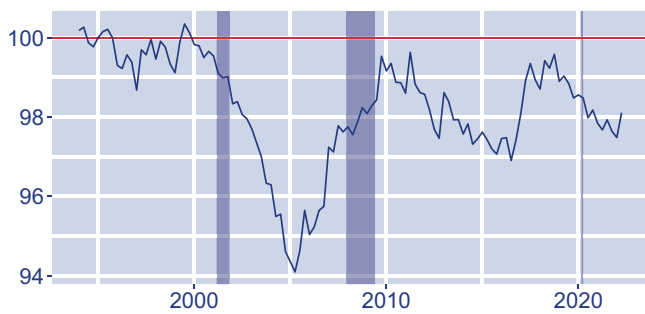DEVIATIONS FROM TREND (PERCENT)



Figure 5 shows the relative house price index, long-term growth trend, and percent deviations for the Alexandria MSA. Relative house prices in Alexandria have been on a downward trend since 2015, with current prices down approximately 8.32% compared to the state. That said, there is an upward trend in the long-term growth in house prices within the Alexandria region and house prices are above market fundamentals for the MSA. Currently, house prices are approximately 3.3% above market fundamentals and are up approximately 1.66% over the past four quarters. While the relative index indicates that house prices are weak compared to the state, the housing market in Alexandria is due for a correction. House prices are expected to decrease sharply in the next six months.

## Figure 6: Baton Rouge MSA House Price Index

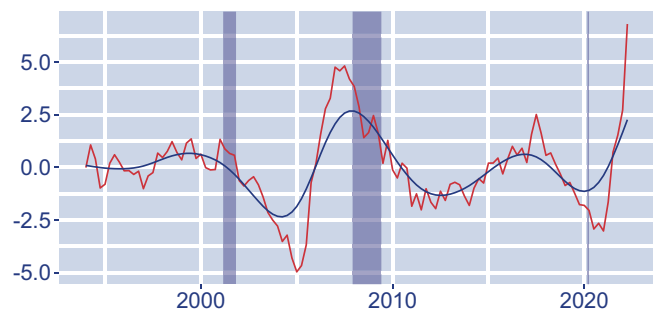RELATIVE TO STATE



DEVIATIONS FROM TREND (PERCENT)



Figure 6 shows that house prices for the Baton Rouge MSA have been relatively lower than the state since 2000. In 2005, relative house prices bottomed at approximately 6% below the state at that time. House prices in Baton Rouge appreciated and peaked in 2011 and 2018 but remained low relative to the state. A possible explanation for the steep appreciation between 2005 and 2011 is Hurricane Katrina, as East Baton Rouge Parish became the most populous parish after many individuals moved from New Orleans. House prices in Baton Rouge are currently up about 4.1% and, over the last year, up 1.53% from market fundamentals. House prices are relatively close to the state but are expected to decrease to meet market fundamentals.

## Figure 7: Hammond MSA House Price Index

RELATIVE TO STATE
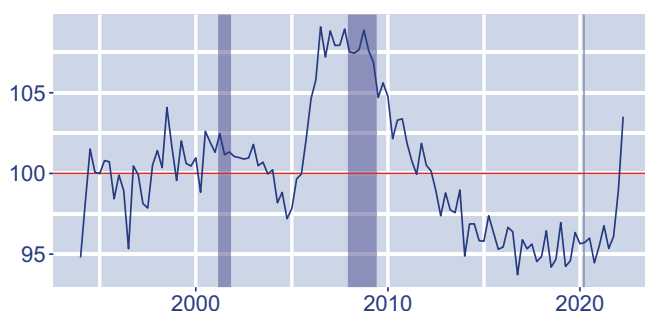


DEVIATIONS FROM TREND (PERCENT)
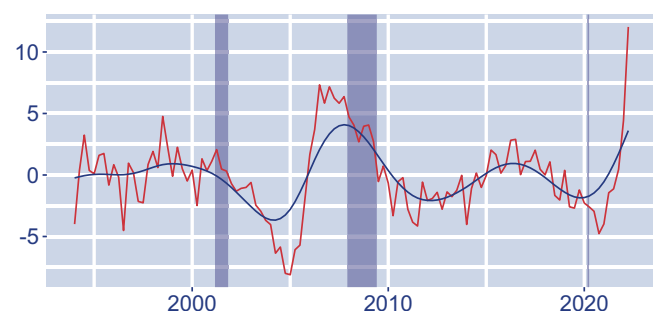


The relative house price index for the Hammond MSA experienced an increased acceleration in its value between 2005 and 2008, with relative house prices peaking around 9% above the state in 2007. This large increase in Hammond's relative index could also be explained by Hurricane Katrina's impact on the New Orleans area. For the most recent quarter, house prices in Hammond are up around 8.62%, while over the past year, house prices are up 1.72% on average. This is the largest deviation from trend among the nine MSAs. House prices in the Hammond MSA are expected to decrease, while Hammond's relative house prices are strong compared to the state.

## Figure 8: Houma-Thibodaux MSA House Price Index

RELATIVE TO STATE
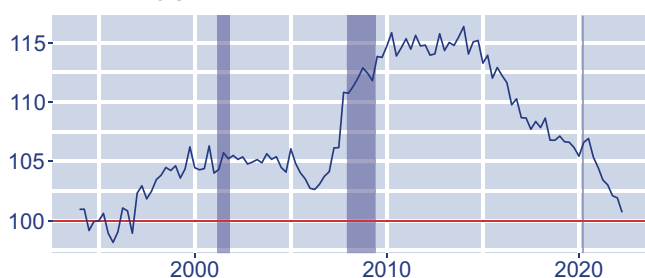


DEVIATIONS FROM TREND (PERCENT)
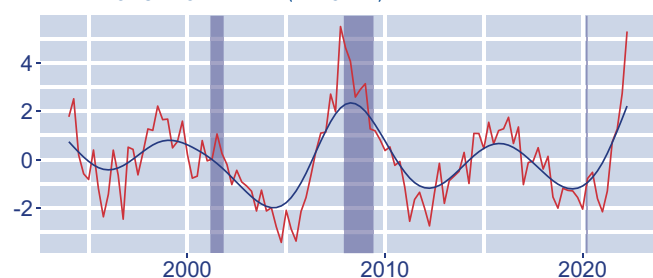


Relative house prices in the Houma-Thibodaux MSA (Figure 8) are on a downward trend since about 2015 – though house prices remain above the state. Relative house prices peaked in 2014, where they were approximately 16.33% above the state. Currently, house prices are 3.32% above trend, and on average are 1.05% above trend for the year. House prices in this region are above market fundamentals. House prices in the Houma-Thibodaux region are relatively close to the state, but they are expected to decrease to more closely reflect market fundamentals.

## Figure 9: Lafayette MSA House Price Index
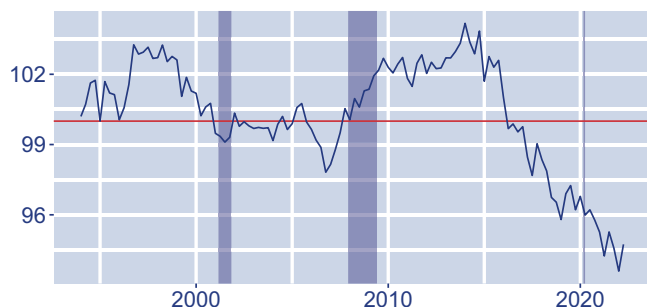
RELATIVE TO STATE



DEVIATIONS FROM TREND (PERCENT)



Figure 9 depicts the relative house prices for the Lafayette MSA. According to the left chart, Lafayette has largely depreciat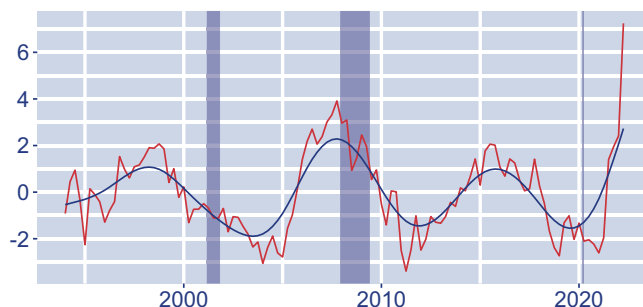ed relative to the state since 2015. Lafayette is currently 5.36% below the state on average. The right chart shows that Lafayette's house prices are above market fundamentals for the area by approximately 4.3% in Q2 2022. On average, house prices are up 1.49% for the previous year. As Lafayette's residential real estate market corrects to fundamentals, prices will continue to post below the state.

## Figure 10: Lake Charles MSA House Price Index

RELATIVE TO STATE
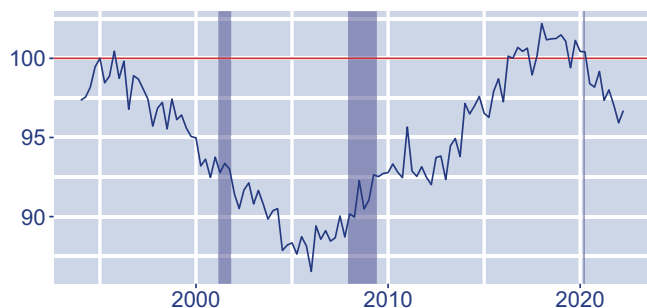


DEVIATIONS FROM TREND (PERCENT)
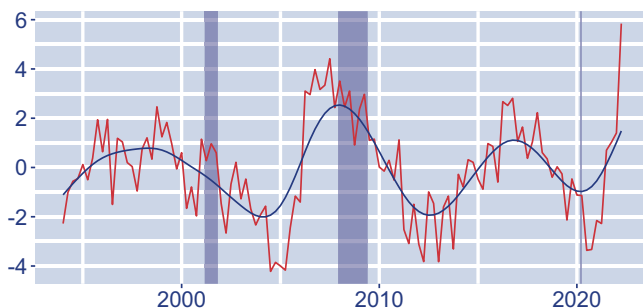


The left chart of Figure 10 shows that relative house prices in Lake Charles were slightly above the state between 2018 and 2020, while the right chart shows that Lake Charles' house prices are well above the main trend, with a positive deviation from fundamentals of 4.09% for Q2 2022 and 1.45% over the last year. We conclude that house prices in the Lake Charles MSA are expected to correct to meet market fundamentals, while relative to Louisiana, house prices are competitive and will continue to be so as price pressure eases.

## Figure 11: Monroe MSA House Price Index

RELATIVE TO STATE
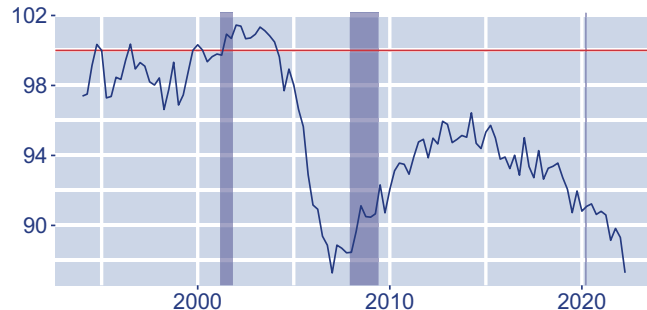


DEVIATIONS FROM TREND (PERCENT)
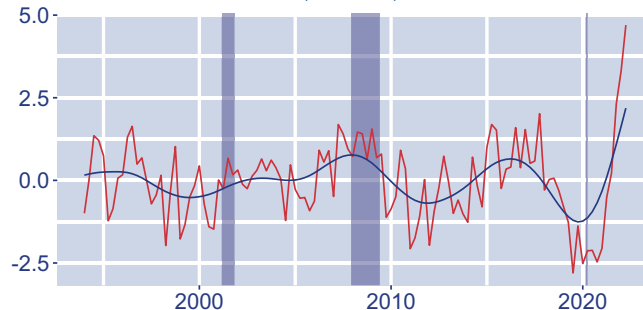


In Figure 11 we see that Monroe's relative house prices have been consistently below the state since 2004. Additionally, Monroe's average percent deviations have been relatively smoother than the other MSAs, except for increased fluctuations between 2020 and today. Currently, house prices in Monroe are 2.79% above the main growth trend and 1.26% above market fundamentals over the previous year. This is the lowest deviations observed in this analysis. House prices in Monroe are still above market fundamentals, meaning that house prices are expected to decline, while compared to the state, Monroe's house prices are ultra-competitive.

## Figure 12: New Orleans-Metairie MSA House Price Index

RELATIVE TO STATE
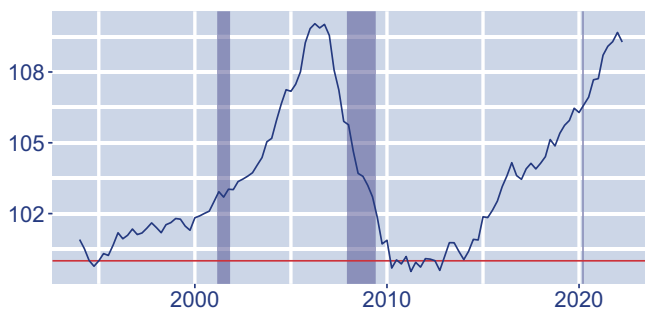


DEVIATIONS FROM TREND (PERCENT)
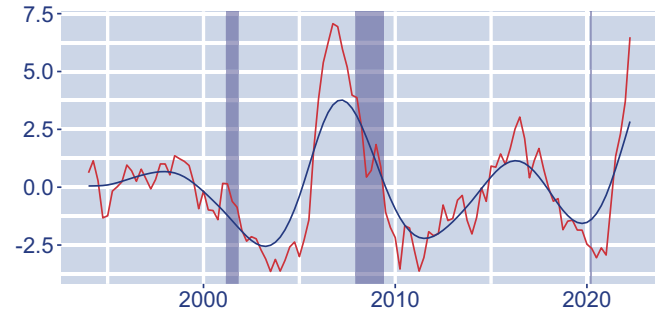


Figure 12 illustrates the relative house price index and trend deviations within the New Orleans-Metairie MSA. Relative house prices in the region have historically been above the state, peaking at approximately 10% above the state around 2006. When house prices cratered nationwide, the NOLA housing market drove statewide house prices downward. After the recession, relative house prices have grown to match the housing boom, behavior not seen in other MSAs. Prices are currently above the state by about 9.15%. House prices are currently 3.42% above the main growth trend and around 1.64% higher across the four most recent quarters. Prices in New Orleans-Metairie are expected to cool but remain strong compared to the state.
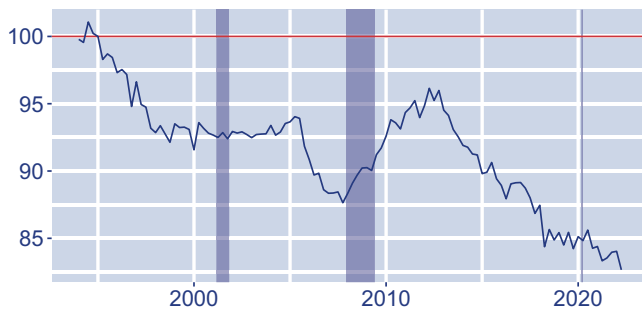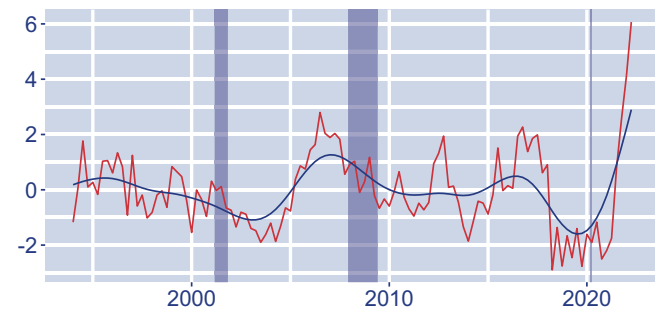
## Figure 13: Shreveport-Bossier City MSA House Price Index

RELATIVE TO STATE



DEVIATIONS FROM TREND (PERCENT)



Finally, Figure 13 visualizes the Shreveport-Bossier City MSA's residential real estate market. House prices in the Shreveport-Bossier City region have grown consistently slower than the state since 1995. House prices are currently 3.54% higher than market fundamentals, with the average trend gap in house prices being 1.47% over the previous year. The local market is expected to decline due to the high deviation above the trend. With low relative housing costs, the market is still a good buy for the fourth largest MSA in the state.

In conclusion, house prices across the nine MSAs are above market fundamentals, while relative house prices in six of the nine MSAs are lower than the state. Possible explanations for the upward trend deviations in each MSA are the COVID-19 pandemic and low mortgage rates. The reader is cautioned that the latest numbers are only though June 2022. Housing markets across the state and country are already showing signs of cooling. As for relative house prices, the three MSAs with higher relative house prices than the state likely have high consumer confidence and strong regional employment, which increase the demand for houses. We should expect to see house prices throughout the state decline given the upward deviations from each MSA's long-term growth trend.

Data for this report are provided by the U.S. Federal Housing Agency. Quarterly data extend to the third quarter of 2022.

# Employment Recovery at the Industry Level

**BY JOSEPH CURTIN**

This year, Louisiana's employment numbers continue to improve after substantial job losses following the 2020 COVID-19 pandemic, but we have yet to reach pre-pandemic employment. In February of 2020, total non-farm employment in Louisiana was just over 1.9 million. In March of 2020, we lost around 280,000 jobs, reducing total employment in the state to just over 1.7 million. As of September 2022, we are still short almost 57,000 jobs from pre-pandemic levels. Not all sectors of Louisiana's economy are behind, some have even rebounded to pre-COVID numbers. Figure 14 shows six sectors of Louisiana's economy and their levels before, during, and after the end of the pandemic.

**Figure 14: Louisiana Employment by Industry (Thousands of Workers)**
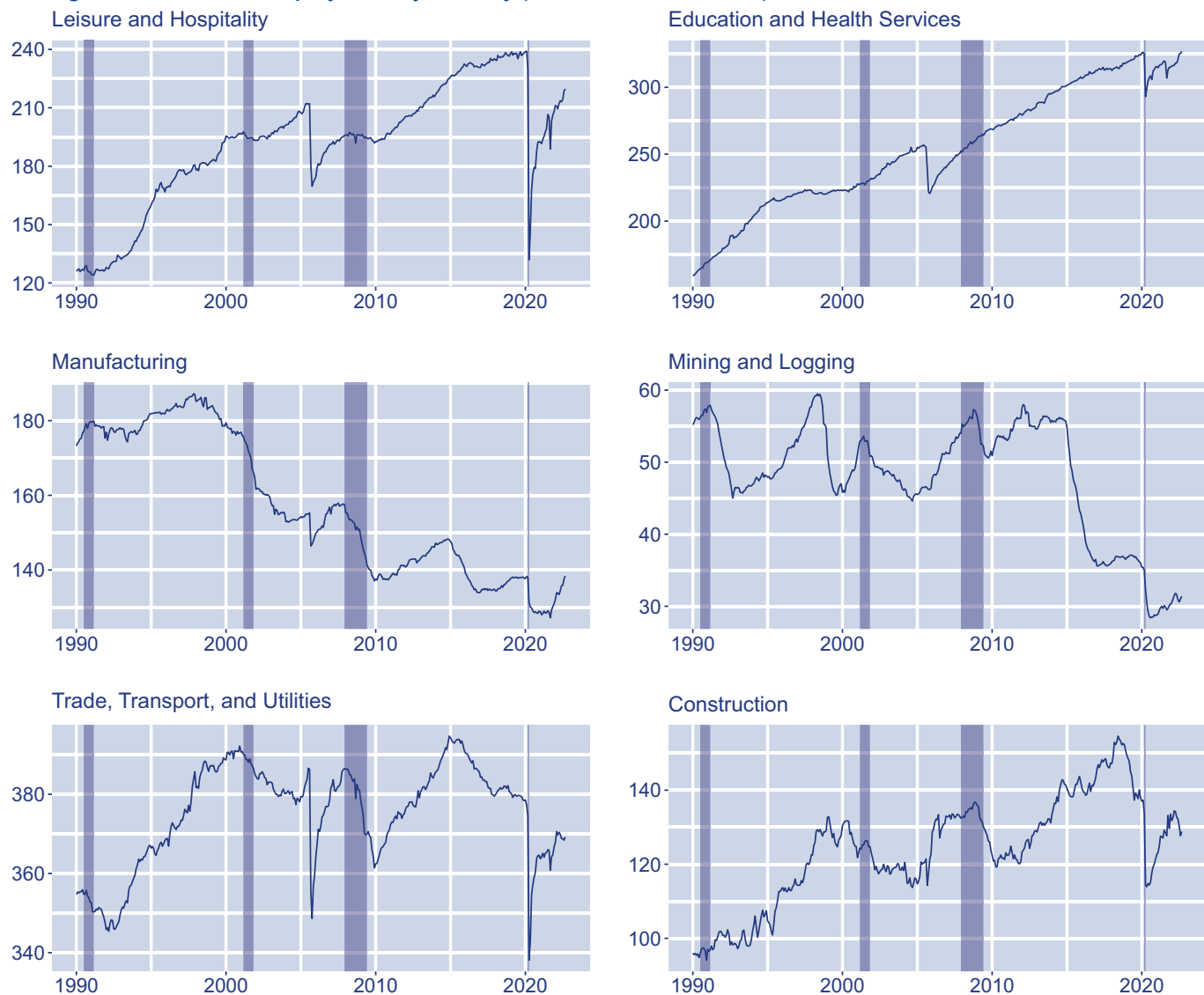
Leisure and hospitality pre-COVID numbers were just under 240,000 workers in February 2020. Employment in this sector had been growing by about 7,000 workers a year from around 2010 to 2015. Employment gains slowed to half of that rate in the five years preceding the pandemic. The onset of COVID-19 brought a decrease of roughly 108,000 jobs, dropping to around 132,000 in March 2020. The September 2022 employment report indicates we are still short around 20,000 jobs from 2020 numbers.

Education and health services employment in February 2020 was just over 326,000. We have seen steady growth in this sector of the economy since the drop in employment around 2006. In March to April of 2020, we lost almost 32,000 jobs. As of September 2022, these numbers actually surpassed pre-pandemic employment by around 600 jobs. Both education and health services industries represent skilled employment since these industries usually require post-secondary education degrees.

Manufacturing has been on a downward trend in Louisiana since the early 2000s. February 2020 employment in this sector was around 138,000, which is down about 52,000 from the industry's peak in 1997. Manufacturing lost about 10,000 jobs for about a year and half, and then employment started to recover in the third quarter of 2021. As of September 2022, manufacturing employment has fully recovered. While this is welcome news, it has recovered at a historically low level for the state because of the downward trend.

Like manufacturing, jobs in mining and logging have been on the decline. Employment in this sector exhibited more volatility seven years ago (2015 and 2016) than in the initial months of the pandemic. Post 2015, the industry shed about 20,000 jobs by the end of 2016 and about 7,000 in 2020. February 2020 employment in this sector was around 35,000 jobs. This sector has not yet made a full recovery. As of September 2022, employment numbers are around 31,000. Plans for a wood products lab in partnership with Louisiana Tech University raise hopes of increasing employment in this sector.

Trade, transportation, and utilities represents the largest aggregated sector examined in this study. Prior to COVID, employment had consistently been greater than 370,000 since around 2011. February 2020 employment was around 377,000. When the pandemic hit, this sector lost around 39,000 jobs, bringing the job total down to around 338,000. Current numbers have seen some improvement, but employment in this sector is not quite back to pre-pandemic levels. September 2022 employment for this sector is around 369,000.

Construction employment has slowly increased in Louisiana over the last 30 years preceding the pandemic, adding about 45,000 jobs to state payrolls. During the pandemic, construction companies shed about 23,000 jobs due not only to virus threats, but also the shock to private investment. As of September 2022, employment in this sector is back at 129,000 jobs but still down about 26,000 jobs from industry highs in 2017.

The Louisiana unemployment rate has recovered to pre-pandemic levels. In addition, the labor force participation rate has also made a full recovery. This begs the question: With such low unemployment and such high labor force participation, how are we short jobs in several sectors of the economy? As stated earlier, we are still down around 57,000 jobs statewide from pre-pandemic levels. This is explained by a decrease in state population. Census data shows that Louisiana has lost about 48,000 people to either emigration or death since 2020. Many also have left the labor force through retirement, since we have seen increased retirement nationwide over the last two years. This means that we can only bring back somewhere between 5,000 and 8,000 jobs with the current available labor force before we run out of people to fill those jobs. To return to or exceed our pre-COVID employment numbers statewide, Louisiana would have to grow the available labor force by increasing the working-age population. The only way this could be accomplished in the short-term is to incentivize new immigration to Louisiana.

Data for this report are provided by the Bureau of Labor Statistics. Monthly data extend to October 2022.

# Factors Behind Health Insurance Struggles in the Deep South

## BY MARSHALL KEEN

An analysis of health insurance data within the state of Louisiana indicates the burden that the state's citizens are bearing for their healthcare coverage. This article provides insight into the primary sources of funding for insurance coverage contrasted with the success (or failure) of the companies providing it. How much are residents paying for health insurance relative to the national average expenditures? How much is the profit that insurance companies are yielding from these expenditures? How much are Louisianians relying upon federal and state programs such as Medicare and Medicaid for their insurance coverage? The three metrics analyzed to answer these questions are the costs that employees are paying for their employer-sponsored healthcare plans, the percentage of residents uninsured or covered by Medicare/Medicaid, and the gross margin of insurance companies within the state.

Data on the costs that Louisiana employees are paying toward their employer-sponsored healthcare plans serve to indicate the burden that the average employee bears within each state. Figure 15 represents the ratio of employee costs to total costs for each state divided by the ratio of employee costs to total costs for the national average. This figure reveals that Louisiana, alongside surrounding states in the region, consistently ranks higher than the national average in terms of employee costs relative to total costs. Of particular

**Figure 15: Employee Burden of Total Health Insurance Premiums Relative to U.S. (Index Value: 1 is Parity)**
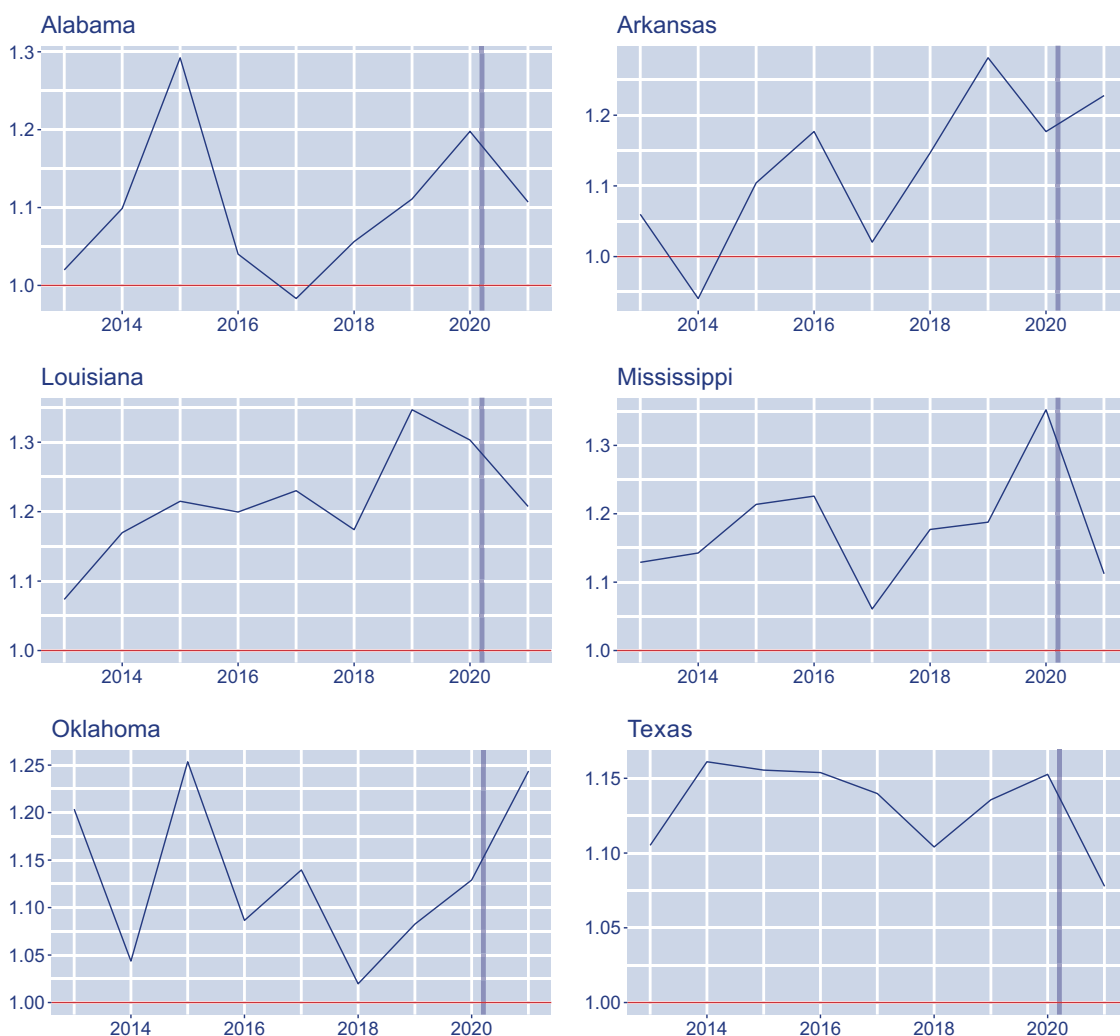
concern is the fact that these high employee contribution margins seem to be worsening over time in Louisiana, with the state-level estimates rising to approximately 35% of the national average in 2019 (although this falls to 20% in recent years). Relative to other states in the region, Louisiana appears to be one of the worst (and especially so within the past four years). The closest rival for this index in the region is Mississippi, though the index for this state has dropped far more rapidly in the past two years than it has for Louisiana. One factor behind this disparity could be the substantially higher uninsured rate in the state of Mississippi than Louisiana, and the fact that this uninsured rate has improved in Louisiana for this time frame while remaining relatively constant in Mississippi according to the U.S. Census Bureau.

The gross margin of insurance companies within the region is of importance for noting the financial success

(by gross profit) of insurance companies for each state. Gross margin is caluclated by subtracting total insurance *claims* from total insurance *premiums*. Gross margin is a gauge for whether the high costs of medical insurance directly result from the expense of insuring a given state's population. In economic terms, gross margin indicates the return on investment for health insurance coverage. The higher the gross margin, the lower the return on investment for the insured population. Data reported by the Kaiser Family Foundation from the years 2011-2020 suggest that Louisiana had an average gross margin of $64 per member per month, which is $15 higher than the same estimate for the national average. This indicates that there must be other factors at hand rather than the high expense of healthcare claims to which the high costs of health insurance in Louisiana must be attributed.

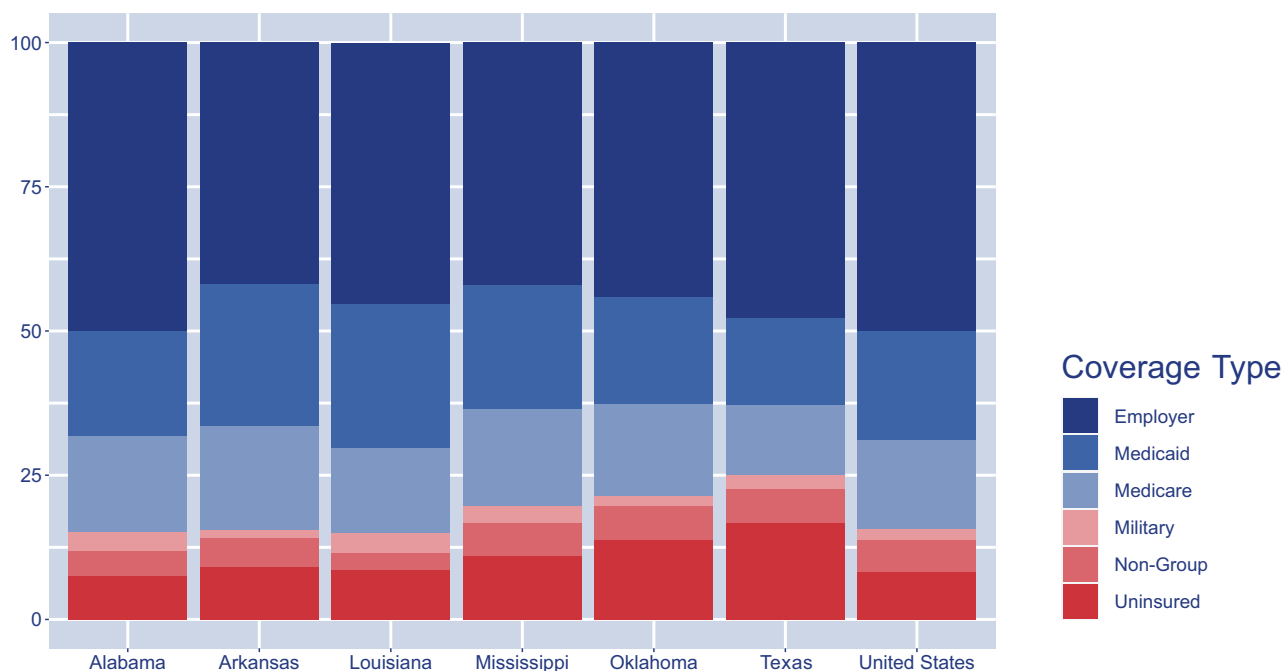**Figure 16: Health Insurance Coverage Type by State (Percent)**



Figure 16 reveals percentage of our population falling into the lowest-quality categories of health insurance coverage (Medicare, Medicaid, and uninsured) for Louisiana and surrounding states. These proportions are relatively high compared to the national average. A combination of these categories for Louisiana represents over half the healthcare status distribution for the state, compared to a national average of approximately 42% (for Medicare, Medicaid, and uninsured categories

combined). Other states in the region seem to follow the same general trend as Louisiana with low variation between results, though it is worth noting that Louisiana ranks among the lowest in the region for the uninsured category of this calculation. Texas appears to have the highest uninsured category within the region (by percentage), and Arkansas showed the highest combined Medicare and Medicaid category by percentage for the given year.

Data for this report are provided by the Bureau of Economic Analysis and the Kaiser Family Foundation. Annual data extend to 2021.

# Oil and Gas Industry Employment Across Louisiana

## BY GEORGIA CARROWAY

Louisiana is home to the second largest natural gas pipeline network in North America. Louisiana's oil and gas industry fuels 12% of the state's overall employment, nearly 65,000 full-time equivalent workers in oil, natural gas, and adjacent industries. The combined industry accounted for nearly $4.5 billion of state and local tax revenue in 2019. This represents about 14% of total state taxes, licenses, and fees collected.

The economic impact of this employment is not evenly dispersed across the Pelican State. Some parishes benefit more than others depending upon the richness of natural resources and the abundance of a qualified labor force. One tool used to analyze this phenomenon is a location quotient. Location quotients are ratios of a region's industrial employment relative to the same total proportion for the state. A more formal definition of this can be seen in Equation 1.

**Equation 1:**

$$Location\ Quotient = \frac{Parish\ Industry\ Employment\ /\ Total\ Parish\ Employment}{State\ Industry\ Employment\ /\ Total\ State\ Employment}$$

If the quotient is equal to one, then the region is in parity with the state. However, if the quotient falls below or rises over one, the region is not in parity due to under or over employment. The interpretation of this is more nuanced, especially when we consider the oil and natural gas industry. Values of less than one can represent both areas of potential investment in some cases or lack of supply in others. Likewise, values greater than one can indicate either abundant access to supply or a relatively large potential pool of skilled workers to employ.

Figure 17 depicts the location quotient calculations from Equation 1 among the parishes in Louisiana for the year 2020. While the oil and gas industries are a relatively large contributor to the state's overall revenue, the figure exemplifies the disparity that a few dominant parishes have on overall output. These parishes predominantly lie along the natural gas pipelines that extend primarily along the northern and southern parts of the state. Two of the largest revenue generating parishes are located on Louisiana's coast. This is primarily due to the offshore oil port located 18 miles south of the Grand Isle.

Oil and natural gas employment is above or proportional to the state for 27 parishes (42%). Fifteen of these 27 parishes represent outliers that skew aggregate employment numbers for the state. This means that these 15 parishes not only represent most of the employment and output for the state, but also realize most of the economic benefit. Since oil and natural gas are generally inputs into the production process (not final goods themselves), when these economic benefits leak out of the region of impact, they tend to leak out of the state as well.

Table 1 displays location quotient, industry-wide employment, and average real salary figures for the top five and bottom five parishes in the state. These parishes represent the outliers from Figure 17. Most of the parishes in the bottom five are either at the furthest edges of the natural gas plays or have little oil well activity (or both). Among the top five parishes in the state, DeSoto and Claiborne Parishes employ a disproportionately large number of natural gas workers due to their location to the Haynesville-Bossier Shale play. Iberville, Plaquemines, Terrebonne, St. James, and La Salle Parishes employ the largest number of workers and all have average salaries above $120,000 annually. Average salaries among the bottom five parishes also tend to be lower than the average salaries of the top five. This indicates that for the oil and natural gas industry, higher location quotients represent more vibrant labor markets and not over-saturation within the industry.

**Figure 17: Oil Industry Employment Location Quotient by Parish (Index Value: 1 is Parity)**
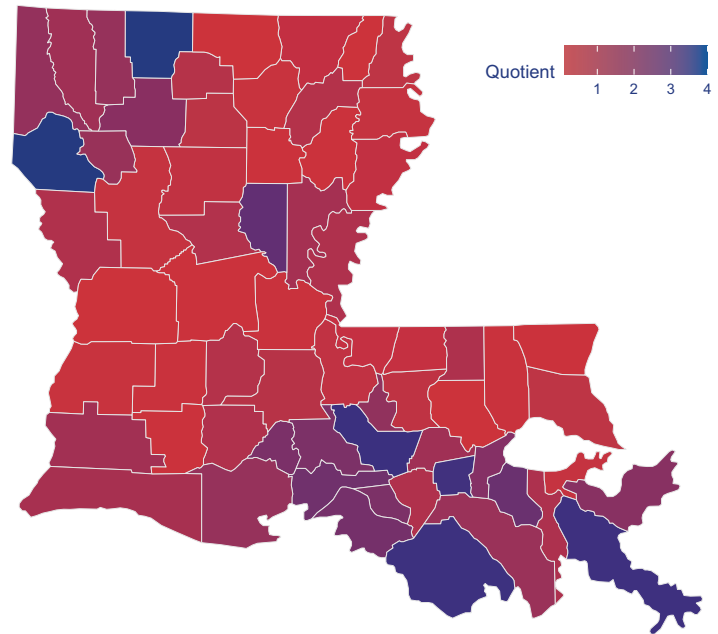


**Table 1: Oil and Natural Gas Industry Statistics (Top and Bottom Five Parishes)**

| Parish | Location Quotient | Industry Employment | Average Salary |
| --- | --- | --- | --- |
| DeSoto | 4.01 | 1,126 | $108,483 |
| Claiborne | 4.00 | 498 | $90,844 |
| Iberville | 3.57 | 1,689 | $124,645 |
| Plaquemines | 3.55 | 1,488 | $158,059 |
| Terrebonne | 3.53 | 5,439 | $135,601 |
| Rapides | 0.13 | 232 | $94,920 |
| Livingston | 0.11 | 130 | $83,191 |
| Vernon | 0.11 | 68 | $48,677 |
| Union | 0.10 | 21 | $73,794 |
| West Carroll | 0.10 | 8 | $73,336 |

Data for this report are provided by the Bureau of Economic Analysis. Parish level data are produced with a year-long lag. Current annual data extend to 2020. 2021 estimates are expected in December 2022.

# Forecasting Industrial Natural Gas Prices both In-State and Nationally

## BY ELLIS GRIFFIN

The Louisiana economy is heavily reliant on natural gas production and exports. Natural gas is one of Louisiana's most important economic assets, as it ranks third in the country for natural gas production, and it ships over half of the nation's liquefied natural gas exports. Louisiana is home to six major unconventional hydrocarbon plays which represent stores of organic rich matter that require nontraditional mining means to extract them from the light rock formations. The most notable of these is the Haynesville Shale in Northwest Louisiana.

Natural gas prices in the EU have risen, mostly due to the Russia-Ukraine conflict. Many U.S. companies have begun to export a large portion of their natural gas productions, decreasing domestic supply. Industrial prices have spiked by more than 50% domestically, from $5.46 to $8.84 per thousand cubic feet. The price has more than doubled in Louisiana, from $4.49 to $9.70 per thousand cubic feet (MCF). The analysis below details price trends and point forecasts of the next 12 months for national and Louisiana industrial spot prices. The prices, while currently high, are projected to begin to decrease as we enter the winter months, with this price drop mellowing out as we reach the summer months, going from $9.80/MCF currently to a more reasonable $8/MCF by September of next year.

**Figure 18: Louisiana and National Industrial Natural Gas Prices (Dollars per Thousand Cubic Feet)**
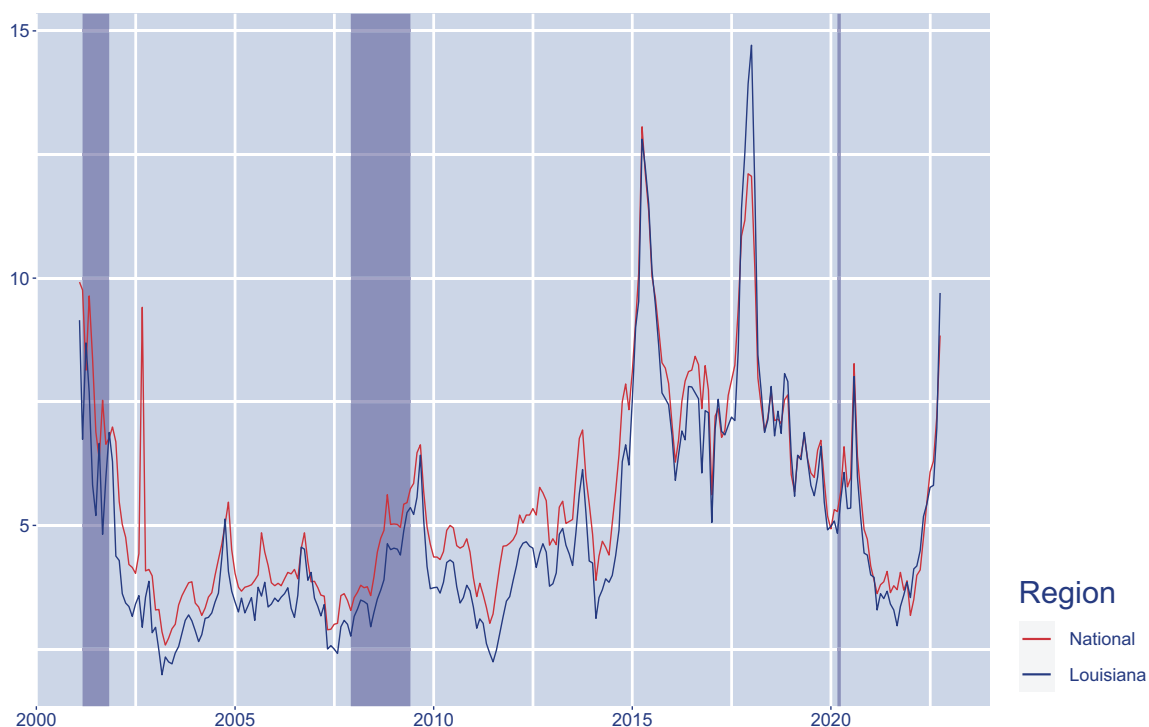


Figure 18 shows both the average Louisiana price (blue) and the average National Industrial Price (red) of natural gas since January 2000. This data was gathered using the U.S. Energy Information Administration website. This figure shows that, since 2000, the price of natural gas per MCF has had quite a large range, with the highest in Louisiana being $14.71 in October of 2017 and the lowest being $1.98 in January of 2003. In addition, we see significant price spikes in both 2002 and 2017, with the large price spike in early 2002 caused by a demand shock that stemmed from an unseasonably cold winter, and the price spike in 2017 caused by an international supply deficit. In early 2022, prices began to increase, both on the national and state level, due to production companies exporting relatively more output.

Data for this report are provided by the U.S. Energy Information Administration. Monthly data extend to October 2022.

## Figure 19: Forecasted Industrial Natural Gas Prices

**Louisiana (Dollars per Thousand Cubic Feet)**



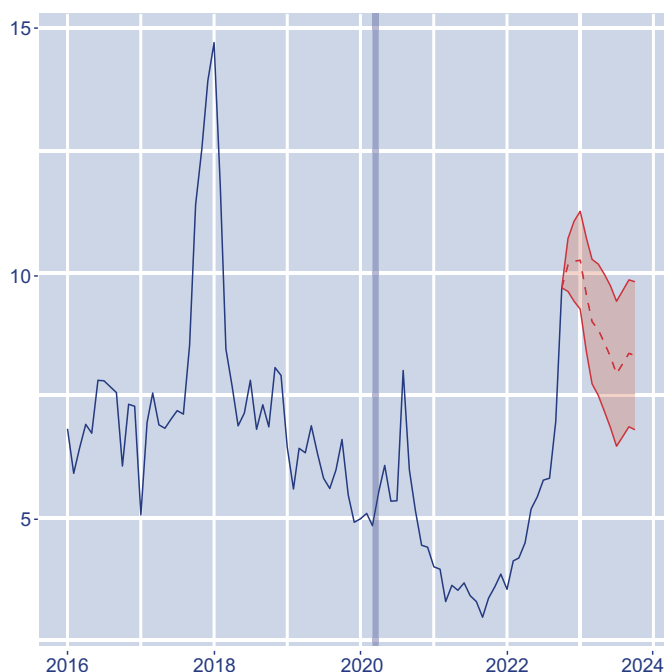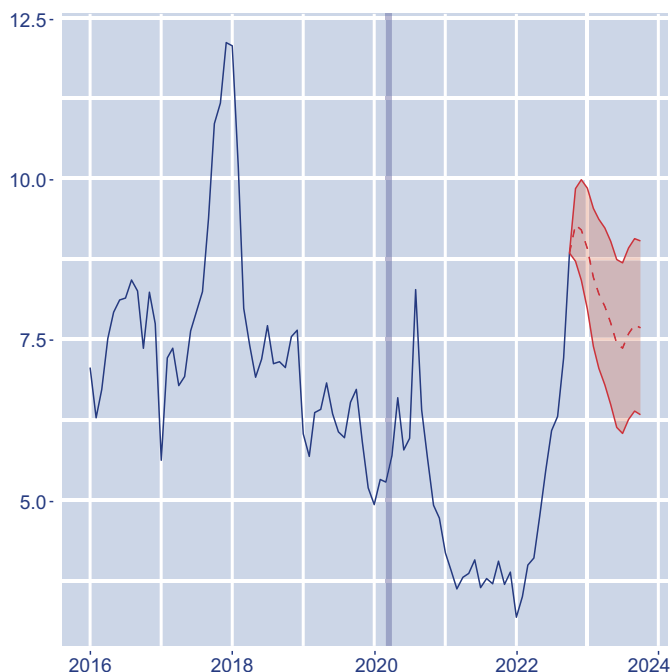**National (Dollars per Thousand Cubic Feet)**



Figure 19 depicts point forecasts from a bivariate 4-lag vector autoregressive (VAR) model for natural gas prices over the next 12 months. A VAR model is a multivariable model that relies upon multiple time series being used together (in this case, the two data series in Figure 18). It models current data as a function of past values, as lagged responses to the predictors, along with trends. The shaded red region represents the forecasted price (both national and state) and the relative uncertainty around that estimate. The model predicts optimistic, realistic, and pessimistic ranges for natural gas prices, with optimistic in this context being the lower bound, and pessimistic

being the upper bound. This internalizes the notion that lower prices are more likely to induce higher levels of consumption but may impact profit margins.

The results of our forecast in Figure 19 are quantified in Table 2. According to the forecast, both Louisiana prices and national prices follow a similar trend. They both continue upwards for the winter months, then begin to modestly decrease over the remainder of the forecast horizon. Industrial prices are projected to drop below $9/CFM in the early spring months and drop down near $8/CFM as summer ends.

### Table 2: Forecasted Louisiana & National Industrial Natural Gas Prices (Dollars per Thousand Cubic Feet)

| Date | LOUISIANA | | | NATIONAL | | |
| --- | --- | --- | --- | --- | --- | --- |
| | Pessimistic | Realistic | Optimistic | Pessimistic | Realistic | Optimistic |
| Nov. 2022 | $9.63 | $10.17 | $10.71 | $8.71 | $9.28 | $9.84 |
| Dec. 2022 | $9.43 | $10.24 | $11.06 | $8.42 | $9.20 | $9.98 |
| Jan. 2023 | $9.26 | $10.26 | $11.26 | $7.97 | $8.91 | $9.85 |
| Feb. 2023 | $8.39 | $9.55 | $10.71 | $7.39 | $8.46 | $9.53 |
| Mar. 2023 | $7.74 | $9.01 | $10.28 | $7.05 | $8.21 | $9.36 |
| Apr. 2023 | $7.50 | $8.84 | $10.18 | $6.79 | $8.01 | $9.23 |
| May 2023 | $7.18 | $8.58 | $9.98 | $6.49 | $7.75 | $9.02 |
| Jun. 2023 | $6.84 | $8.29 | $9.74 | $6.13 | $7.43 | $8.74 |
| Jul. 2023 | $6.46 | $7.94 | $9.42 | $6.04 | $7.36 | $8.69 |
| Aug. 2023 | $6.66 | $8.15 | $9.64 | $6.25 | $7.59 | $8.92 |
| Sep. 2023 | $6.86 | $8.36 | $9.86 | $6.38 | $7.72 | $9.06 |
| Aug. 2023 | $6.80 | $8.31 | $9.82 | $6.33 | $7.68 | $9.03 |

# The Little Engine that Could...Supply Passenger Transit from Baton Rouge to New Orleans

## BY LIAM MOPPERT AND DR. PATRICK SCOTT

Since the passing of the $1.2 trillion Infrastructure Investment and Jobs Act, which will give way to a national updating of passenger train travel through Amtrak, Louisiana is now expected to have a passenger train service from downtown Baton Rouge to downtown New Orleans. This expansion connects via rail the two most populated areas of the state, which has not had the benefit of passenger train service since 1969. The project is expected to cost in excess of $420 million, about 80% of which is funded by the federal government. While numerous estimates exist which outline the infrastructure construction costs, this report is designed to enumerate the economic impact of the expanded passenger transit service among the parishes that it connects. Ticket sales, employment of workers, the effect of job creation due to reduced opportunity costs of commuting, and increased demand in adjacent industries that support these activities are modeled and summarized below. While the construction impacts from increased investment are important, it is the sustained consumer demand that drives the long-term economic effects to Louisiana.

This analysis is based on annualized estimates of ridership revenue published by the Department of Transportation and Development which outlines annual operating expenses, revenues, and operating subsidies. These calculations are used as shocks in an input-output model with 546 reporting sectors among the five parishes that are reported to have rail connections along the transit line. The calculations also account for the backward linkages of the various regions by accounting for the initial multiplier in the primary regions. In this fashion, the direct, indirect, and induced economic impacts can be calculated and aggregated. The estimated employment multiplier is a 2.24 while the economic output multiplier is 1.8. This implies that for every worker that is employed, an additional 2.24 jobs are supported and for every

**Figure 20: Economic Impacts of Expanded Consumer Rail Transit by Parish (Real 2020 Dollars)**
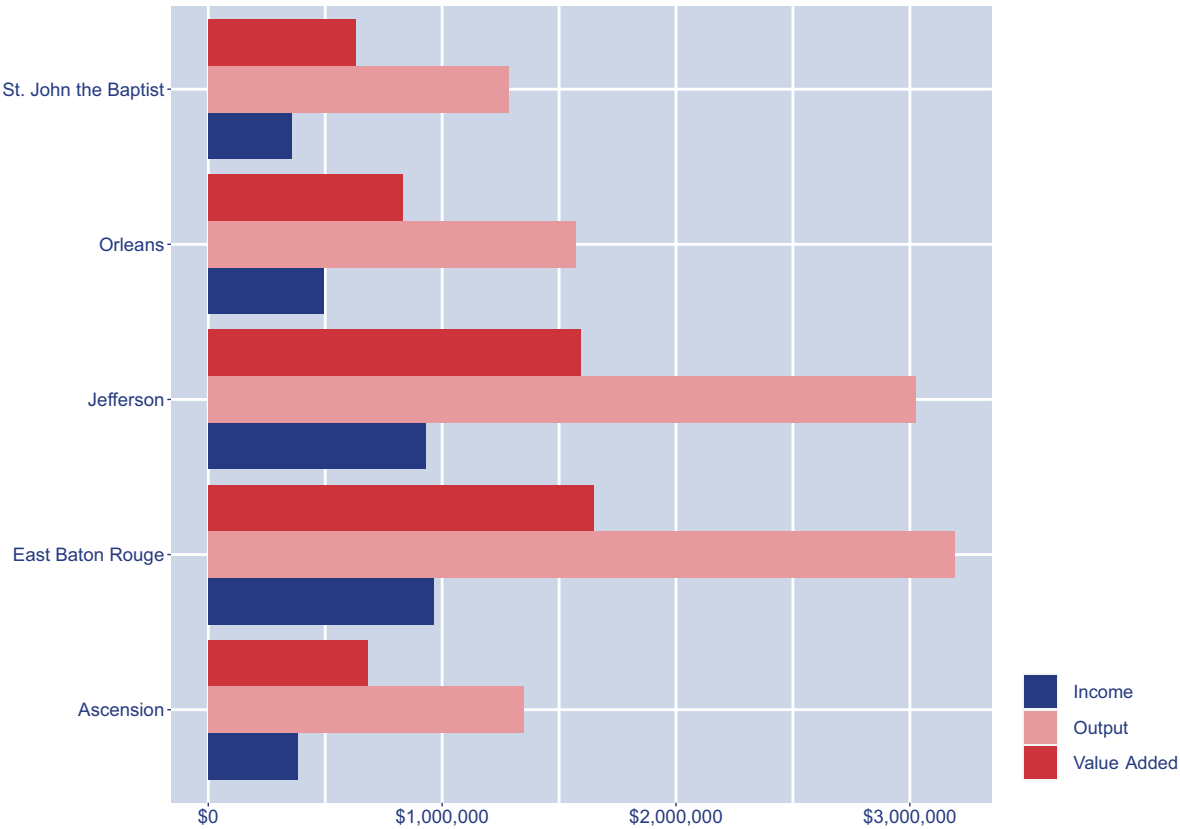
dollar that is invested, an additional $1.80 in output is produced. Aside from the direct increase in employment in rail transportation, security services, marketing research, wholesale of durable goods, commercial and industrial machinery, employment services, and monetary institutions are all within the top 10 industries expected to support additional job growth.

Figure 20 graphically depicts the estimated income, value added, and total economic output of expanded commuter rail service categorized by parish. Expanded rail services generate approximately $3.1 million in labor income and $10.4 million in economic output annually. The largest economic impact is located within East Baton Rouge Parish which is currently expected to have two rail connections. Given the size of both Jefferson and East Baton Rouge Parishes, it is of little surprise that they capture most of the economic and labor impacts. Since these two parishes are also the terminus of the rail line on either end, this is intuitive. Ascension and

St. John Parishes account for the smallest portion of income, value added, and total economic output among the five parishes in the study.

Figure 21 tabulates annual tax revenues generated at the federal, state, and parish level by each of the parishes along the expanded rail line. Federal tax revenues exceed $540,000 annually of the nearly $850,000 in total tax revenues of all types. Among the state taxes (around $161,000), approximately 41% are generated due to direct economic effects. The remaining 59% are comprised of indirect (supply chain) and induced (additional consumer spending) economic effects. This once again is intuitive since expanded rail service decreases transportation costs not only for intermediate goods and services but for final goods as well. Approximately 81% of state tax revenues for all parishes are comprised of sales taxes and personal income taxes which reflects the nature of the state's tax code.

**Figure 21: Parish Level Tax Revenues by Tax Types (Real 2020 Dollars)**
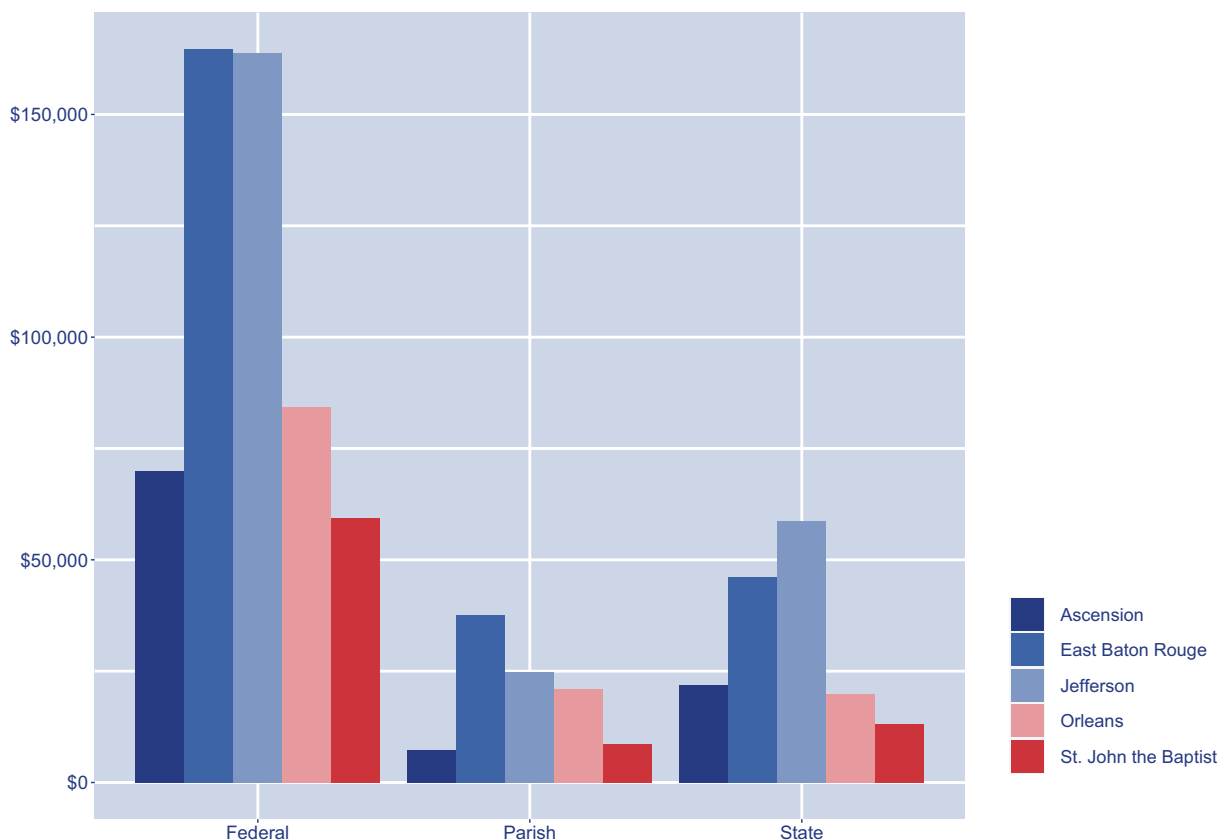


Data for this report are provided by the Bureau of Economic Analysis. Parish level data are produced with a year-long lag. Current annual data extend to 2020. 2021 estimates are released after this issue went to press.

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