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B.I. Moody III College of
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Louisiana Economic Activity Forecast

2020:Q3

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The views expressed in this report are those of the author and do not necessarily represent the views of the University of Louisiana at Lafayette or the University of Louisiana System. Any errors are my own.

Executive Summary

Economic activity declined sharply in the first-half of 2020 due to the COVID-19 pandemic. Louisiana's economy contracted at an annualized rate of 6.6% in the first quarter of the year as the national economy entered its first official recession since 2008. Between the first and second quarters of 2020, the state lost more than 218,000 jobs as the unemployment rate increased to 13.0%. Consumer spending and job openings in Louisiana remain well-below historical norms. Economic activity is expected to pick up in the second-half of the year. However, the pace of recovery in Louisiana is projected to be slower than that of the nation. By the end of 2020, the Baseline projections point to the state's economy being 7% smaller than it was at the end of 2019. Compared to the 2020:Q2 report, the outlook for state tax collections and home prices have improved. Every metropolitan statistical area is also expected to experience positive job growth in the second-half of 2020. However, this job growth is not expected to be robust enough to offset the losses from the first-half of the year. Baton Rouge, Lake Charles, and the New Orleans metro areas all experienced Q1-Q2 job losses in excess of 10%. The Baton Rouge region is projected to experience the strongest job growth in the state in the coming quarters.

Every forecasting model contains uncertainty.The results in this report are intended to provide broad guidance and should not be a direct cause for decision-making. This is particularly true now in light of the evolving global pandemic surrounding COVID-19.

2020 Report Release Schedule:
Third Quarter: August 19, 2020
Fourth Quarter: November 20, 2020

-218,300

Jobs lost in Louisiana between 2020:Q1 and 2020:Q2.

+2.2%

Projected Q4/Q4 increase in home prices between 2019 and 2020.

-7.3%

Projected Q4/Q4 decline in GDP between 2019 and 2020.

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Introduction

The U.S. economy officially entered a recession in February 2020, our first since 2008. This research brief uses the latest projections for U.S. economic activity to present Baseline, Optimistic, and Pessimistic scenarios for key Louisiana economic indicators through the end of 2021. Although the state is expected to begin its path to recovery in the second-half of 2020, a full recovery from the COVID-19 pandemic recession is not expected until 2022 at the earliest. Overall, while remaining bleak from a historical perspective, the outlook for employment, unemployment, tax collections, and home prices have improved from the previous quarterly report.

Forecasting models make projections on the most likely path of future variables based on historical data, past trends, and the expected future path of other critical variables. Because these relationships change over time, no model is able to perfectly incorporate unexpected changes in economic conditions, policy decisions at the federal or state level, or shifts in consumer or firm behavior. This means that every model is embedded with uncertainty. For this reason, the projection scenarios provided in this report should be interpreted as providing broad guidance on the most probable path for economic activity in Louisiana **if** the underlying assumptions of the model evolve as anticipated. For example, all of the scenarios in this report depend strongly on how the growth in U.S. gross domestic product (GDP) evolves over the next 3 to 18 months. If U.S. growth turns out to be much stronger *or* much weaker than is currently envisioned, then the expected accuracy of the Louisiana projections decrease. To simplify the presentation of multiple scenarios, the figures in this report do not show the confidence intervals around the scenario point estimates. One should always bear in mind that a point estimate of (say) 1.1% for employment growth in the next quarter is the mid-point of a range of potential values.

The Louisiana Forecast Model (LFM) projects employment, unemployment rate, home prices, gross domestic product, and tax collections using a Vector Autoregression (VAR) framework (see the Technical Appendix for more details). The model also takes other variables into account and assumes that their future values are given with certainty. These external variables include real U.S. gross domestic product, U.S. unemployment rate, oil prices, the state's real trade-weighted exchange rate, and the global prices of soybeans and rice.

Results from a regional employment model are also presented. The Louisiana Regional Employment Model (LREM) nests the Louisiana Forecast Model by adding statewide employment projections to the external variables in order to generate projections for each of the state's metropolitan statistical areas (MSAs). Employment in these nine metro areas account for approximately 90% of non-agricultural jobs in the state.

Alternative Economic Scenarios

Three alternative scenarios are considered in this report: Baseline, Optimistic, and Pessimistic. The scenarios differ only in how they treat the future values of selected variables external to the Louisiana Forecast Model, namely U.S. gross domestic product, U.S. unemployment rate, and oil prices. The projected future values of other external variables to the model - Louisiana's trade-weighted exchange rate and the prices of soybeans and rice - are identical across scenarios so they are omitted from the table below.

Table 1 shows the future expected values for U.S. GDP, unemployment rate, and oil prices under each scenario. 2020:Q2 values for the Baseline, Optimistic, and Pessimistic scenarios are identical because this quarter has already occurred. This row is shaded gray. Values for 2020:Q3 - 2021:Q4 have yet to be realized.

Table 1: Assumed Future Values of External Variables

	U.S. GDP (% SAAR)			U.S. Unemployment Rate (%)			Oil Prices ($ per barrel)		
Quarter	Baseline	Optimistic	Pessimistic	Baseline	Optimistic	Pessimistic	Baseline	Optimistic	Pessimistic
2020:Q2	-32.90	-32.90	-32.90	13.03	13.03	13.03	27.78	27.78	27.78
2020:Q3	19.09	23.87	9.55	10.00	9.40	12.40	40.57	40.57	27.55
2020:Q4	5.81	7.26	2.90	9.50	8.80	11.70	40.50	44.55	28.55
2021:Q1	5.23	6.54	2.62	9.00	7.60	11.20	42.07	47.55	31.56
2021:Q2	3.84	4.80	1.92	8.40	7.10	10.60	45.00	52.55	33.55
2021:Q3	3.56	4.45	1.78	7.80	6.70	10.10	46.83	56.55	34.57
2021:Q4	2.89	3.61	1.45	7.10	6.20	9.40	45.02	60.56	35.59

The Baseline scenario in Table 1 shows the most likely path for U.S. GDP, unemployment rate, and oil prices based on the most current information. The expected future path for U.S. GDP and the U.S. unemployment rate are the median projections from the Federal Reserve Bank of Philadelphia's Survey of Professional Forecaster outlook released on August 14, 2020. The Baseline expected path of oil prices are from the U.S. Energy Information Administration's Short-Term Economic Outlook released on August 11, 2020.

U.S. GDP contracted at an annualized rate of 32.9% in the second quarter of 2020. This was the largest quarterly reduction in measured history. The Baseline projection is pointing to a relatively strong rebound in GDP in the third quarter (19%) before moderating to less than 3% by the end of 2021. The change in the unemployment rate and oil prices mirrored the sharp reduction in GDP. The unemployment rate in the U.S. increased from 3.8% in Q1 to 13.0%

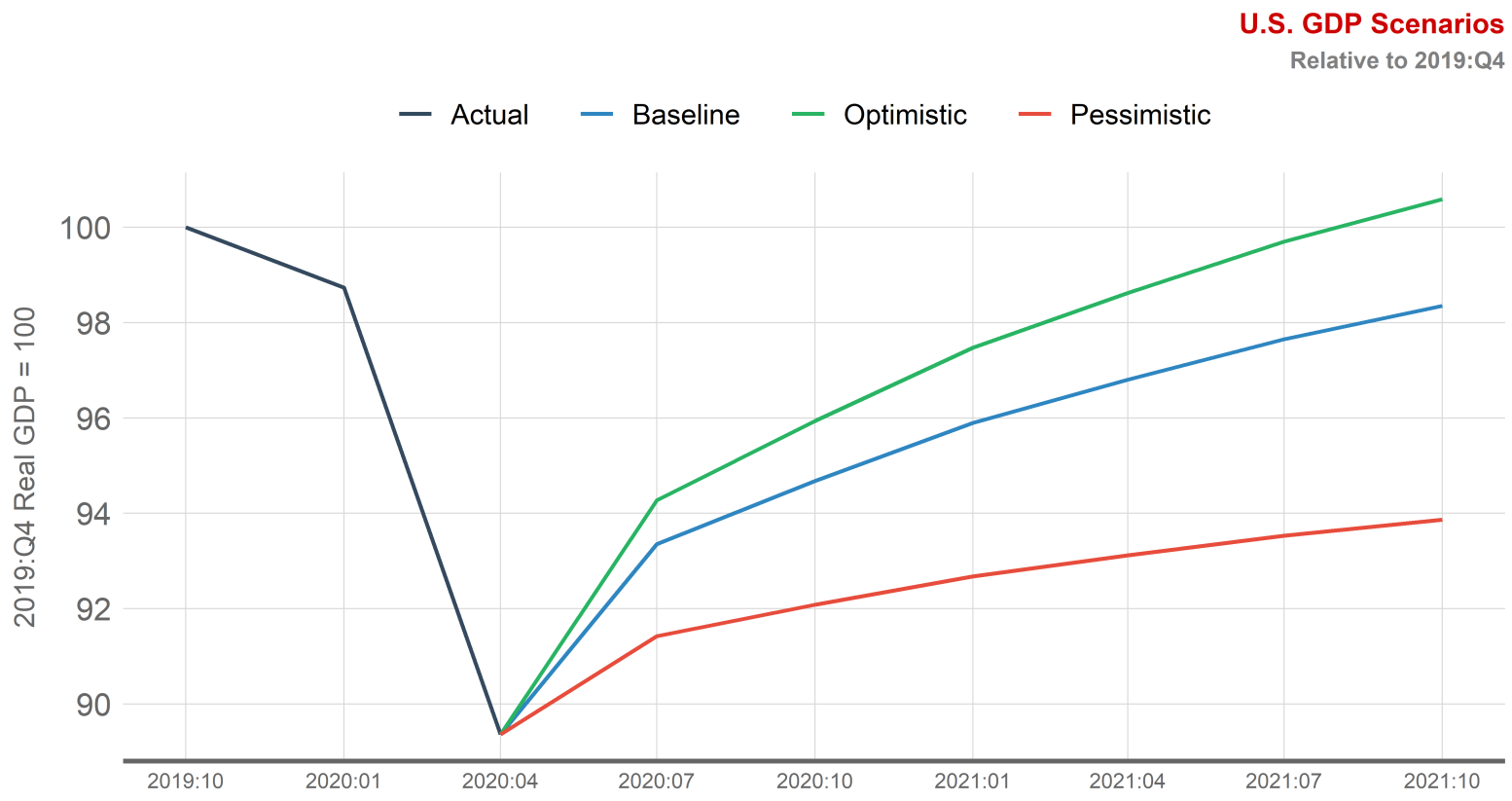
in Q2. Oil prices also fell sharply in late February due to the COVID-19 pandemic and have remained soft, ending the most recent quarter at an average of $27.78 per barrel. According to a recent energy survey conducted by the Federal Reserve Bank of Dallas, many oil companies require prices in excess of $30 per barrel just to cover operating expenses at existing wells. The Energy Information Administration's latest projections have oil prices increasing to the mid-$40s by the end of 2021. Prior to the pandemic, oil prices were projected to be in the range of $60 a barrel throughout 2020. The Baseline scenario does not anticipate continued contraction in economic activity in the U.S. beyond Q2. Growth is expected to remain positive through the end of 2021. I would assign a 70% probability to the Baseline forecast.

The Optimistic and Pessimistic scenarios, which I would assign a 5% and 25% probability respectively, vary the severity and recovery time for oil prices, unemployment, and GDP growth. The Optimistic scenario assumes that U.S. GDP growth will be 25% higher than the Baseline projection, while the Pessimistic scenario assumes it will be 50% lower. Figure 1 plots the three scenarios to make these differences more concrete.

It is worthwhile to note that the U.S. economy is not projected to recover from this recession until 2022 under the Baseline projection. If the Optimistic scenario unfolds, current projections show the U.S. economy recovering at the end of 2021. Recovery in this context means that we return to the 2019:Q4 level of GDP. Figure 1 on the next page shows U.S. GDP under the three scenarios considered. The chart is indexed so that each scenario begins relative to 2019:Q4 that is assigned a base value of 100.

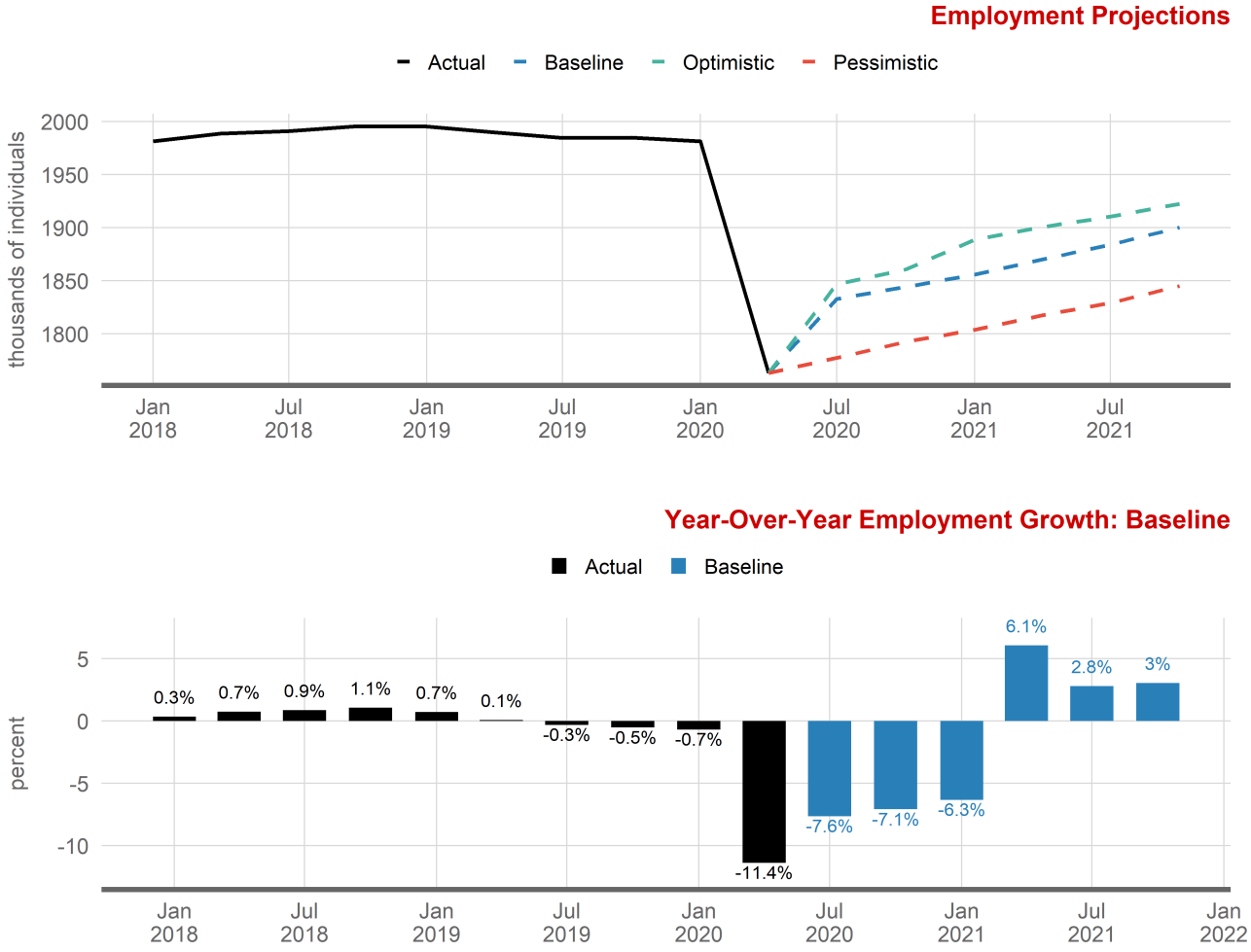
The current Baseline scenario leaves the economy at 98.3 at the end of 2021, or 1.7% *below* where we were in 2019:Q4. Under the Pessimistic scenario, which assumes growth is half the Baseline rate, U.S. GDP would be almost 7% below 2019:Q4 levels at the end of 2021. The Optimistic scenario shows a "full recovery" by the fourth quarter of 2021. This is one quarter later than the projections from the Louisiana Economic Activity Forecast (LEAF) 2020:Q2 report.

Figure 1: U.S. Economic Recovery Scenarios



Louisiana Employment Projections

Figure 2: Louisiana Employment Projections



Louisiana lost more than 218,000 payroll jobs between the first and second quarters of 2020. This represents an 11% reduction and is the largest quarterly loss in jobs for periods in which we have economic data. To put this figure into perspective, the state lost just over 6% of its jobs in 2005 because of Hurricane Katrina. Quarterly jobs losses for Louisiana during the entire Great Recession (2008:Q4 to 2010:Q1) were less than 4%. On the positive side, the job losses experienced in Q2 were lower than the losses projected in the 2020:Q2 LEAF report.

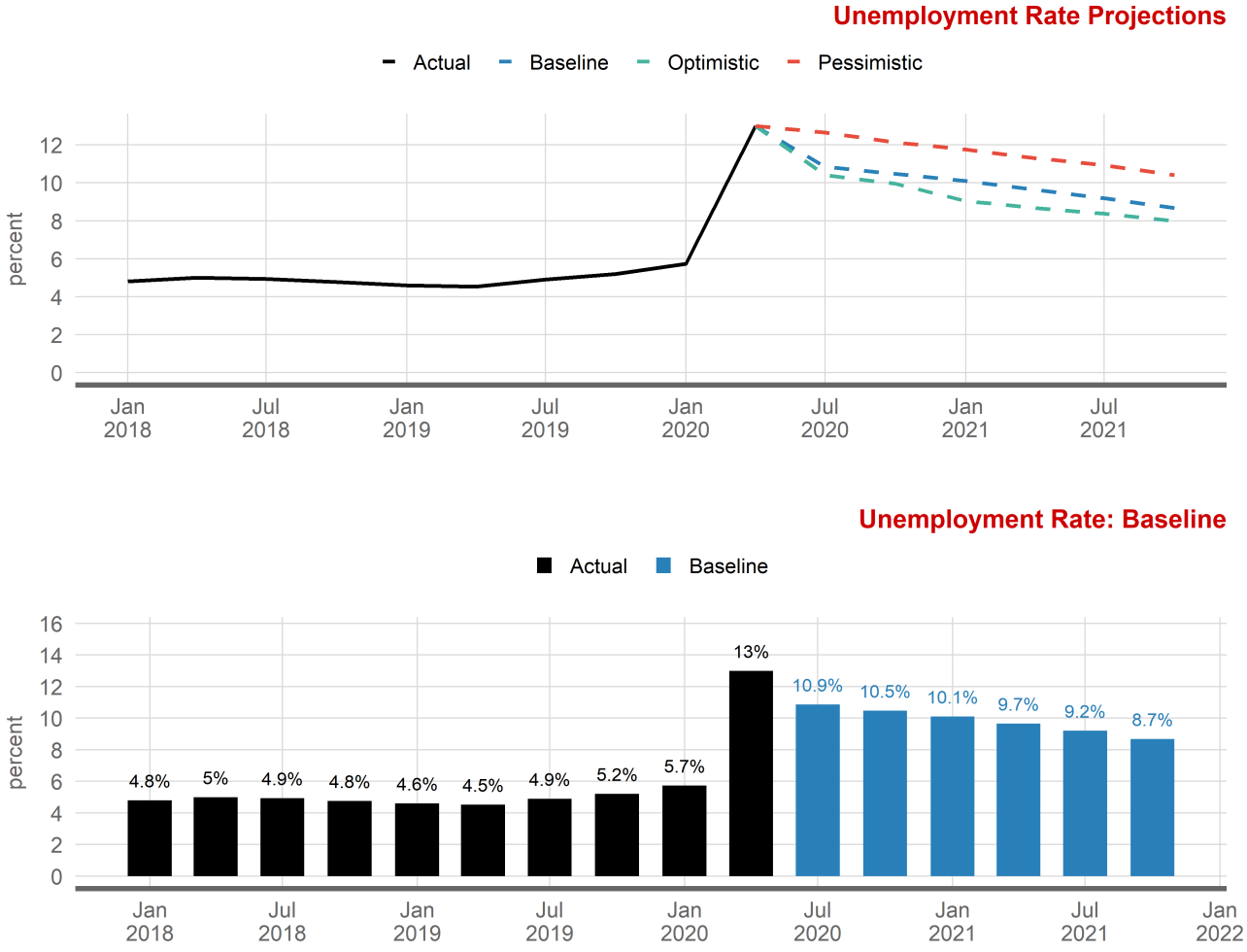
Year-over-year job growth is expected to remain negative until the first quarter of 2021. This is a slower recovery than is anticipated for the nation. Under the Baseline scenario, the state is expected to have 1.9 million jobs at the end of 2021, or about 84,000 fewer jobs than in 2019:Q4.

Louisiana Unemployment Rate Projections

The state's unemployment rate also increased sharply between 2020:Q1 and 2020:Q2, ending the second quarter at 13.0%. This is just below the state's previous high unemployment rate of 13.1% in 1986. More than 800,000 individuals have applied for initial unemployment claims since March 14, 2020 *in excess* of the state's historical average. Dating back to 1986, the state averages around 3400 new unemployment claims per week in August. The last two reported figures are still 3 to 4 times larger than the historical average. Figure 8 shows initial unemployment claims (statewide) relative to monthly historical norms.

The Baseline, Optimistic, and Pessimistic projections are very close for the unemployment rate. The Baseline projection has the state's (quarterly) rate remaining above 10% through the end of 2020.

Figure 3: Louisiana Unemployment Rate Projections

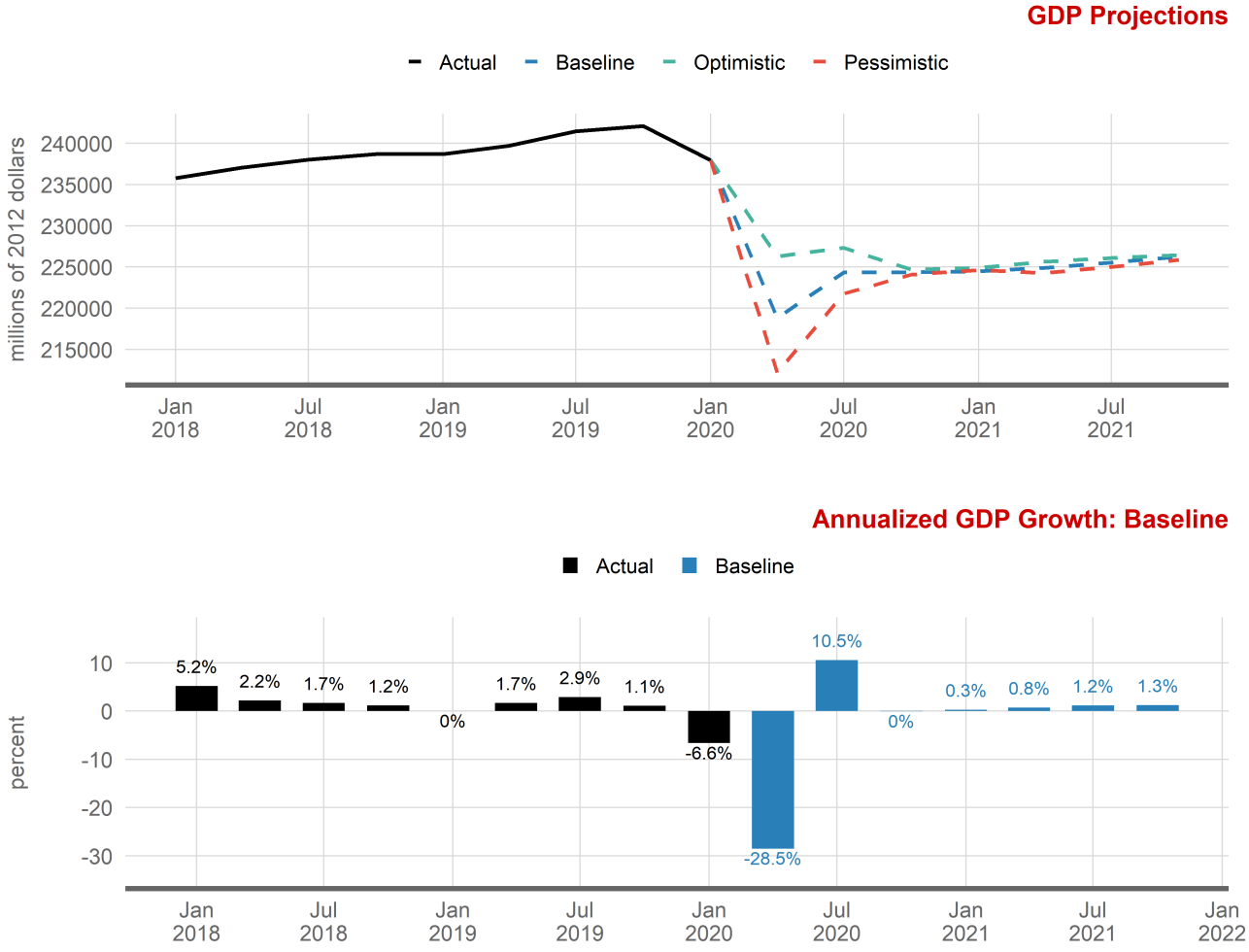


Louisiana GDP Projections

Growth in (inflation-adjusted) GDP contracted in every state in 2020:Q1. Louisiana's contraction of 6.6% was one of the sharpest drops in the nation. Only Michigan, New York, Nevada, and Hawaii experienced larger downturns in economic activity. Consistent with employment and unemployment, the Baseline projection points to a slower GDP recovery in Louisiana than the nation.

The Baseline projection has the state's economy declining at an annualized rate of -28.5% in the second quarter, followed by a bounce-back of 10.5% in the third quarter. After that point, all three scenarios point to relatively stagnant growth through the end of 2021. Under the Baseline scenario, Louisiana's GDP is projected to be 7.3% below 2019:Q4 levels at the end of 2020.

Figure 4: Louisiana GDP Projections

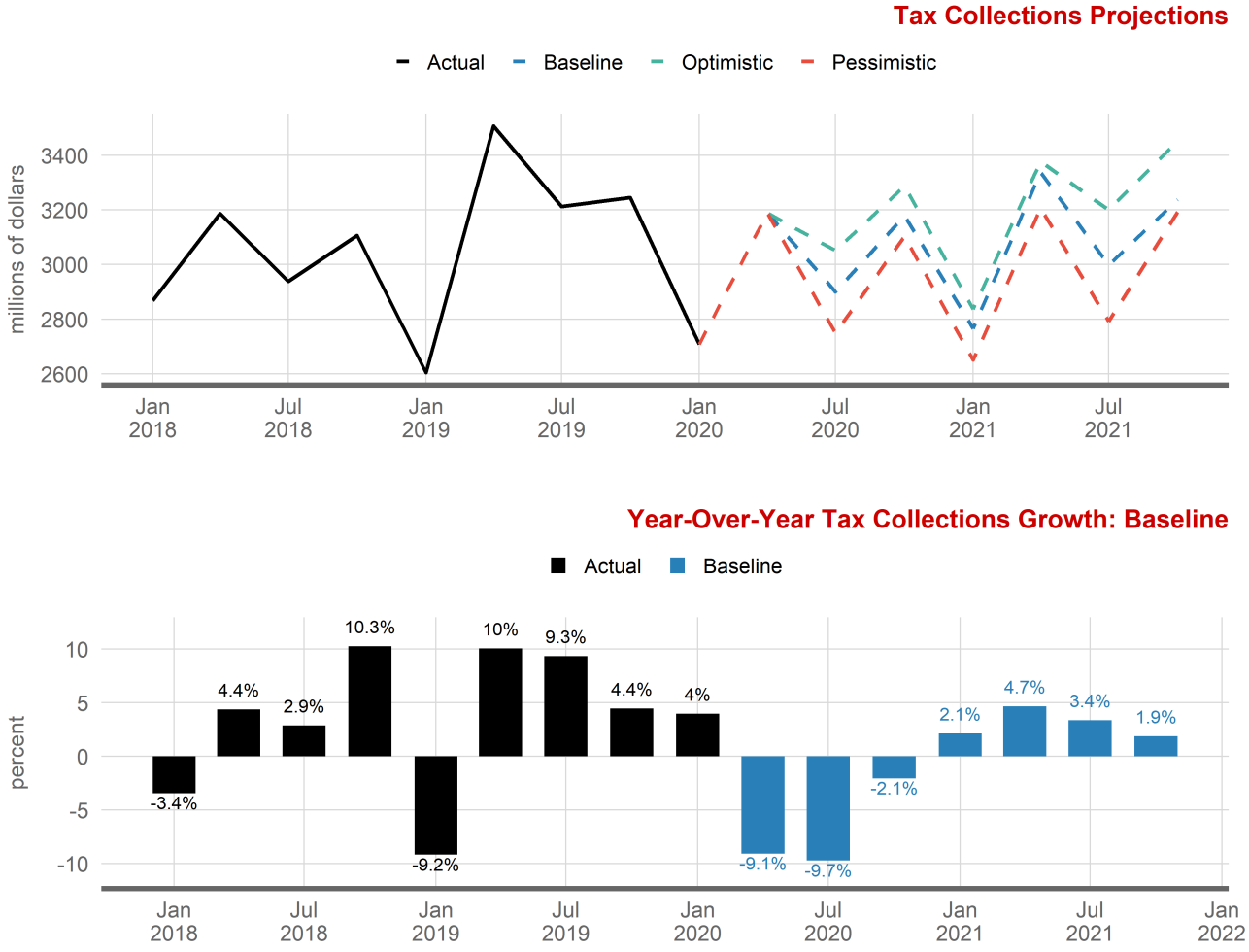


Louisiana Tax Collections Projections

Figure 5: Louisiana Tax Collections Projections

Quarterly tax collections are projected to decline less sharply than the previous forecast. This is due to the expanded federal unemployment benefits that are expected to last through the end of 2020.

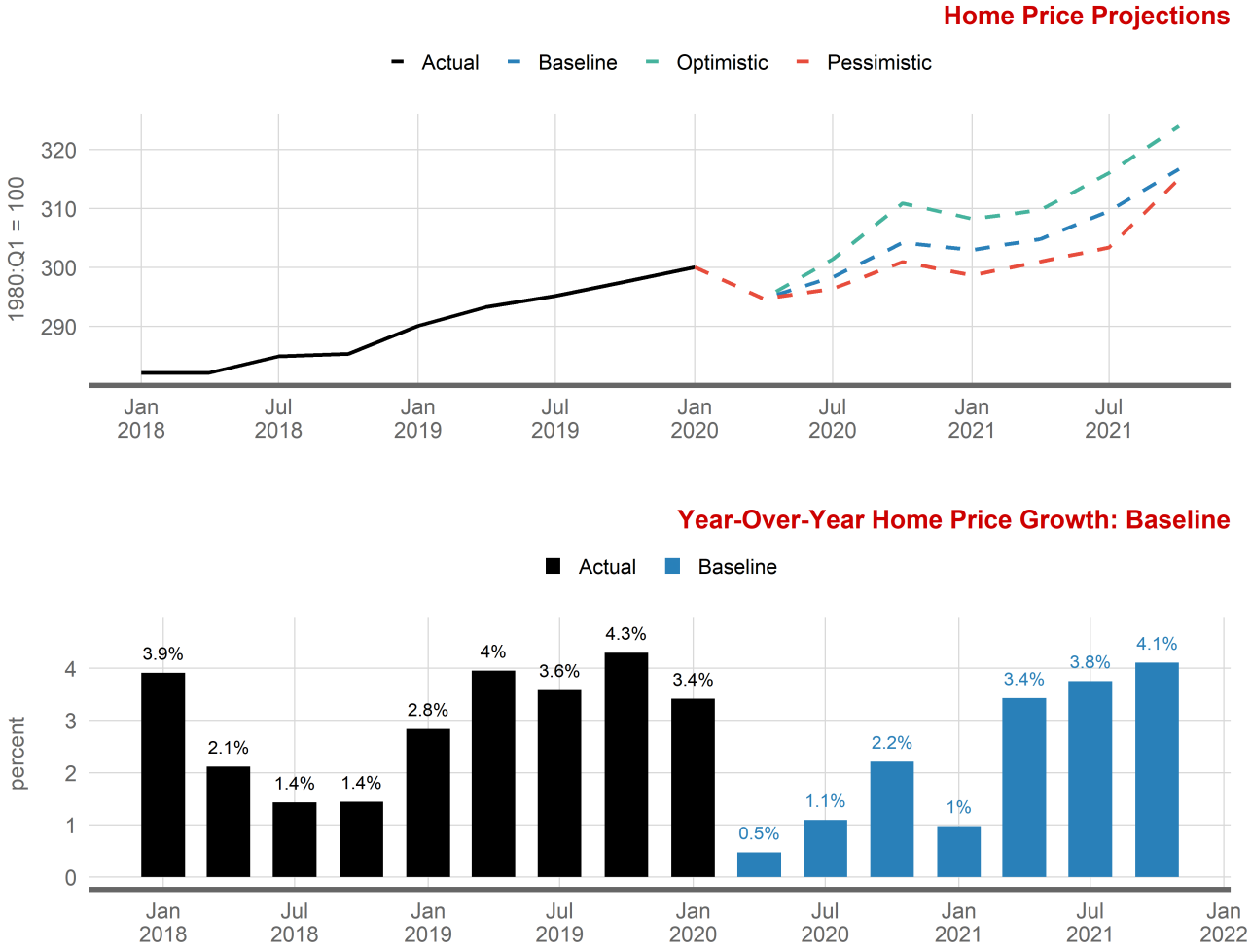
The Baseline projection shows year-over-year quarterly tax collections declining for each of the next three quarters (previously this was four). The Baseline model is also pointing to positive year-over-year tax collections for all four quarters in 2021.



Louisiana Home Price Projections

Consistent with the 2020:Q2 LEAF report, home price growth is expected to remain positive under all three scenarios being considered. The Baseline projections point to below-average growth in year-over-year home prices for the next four quarters before rebounding to average levels in the second-half of 2021.

Figure 6: Louisiana Home Price Projections



Metro Area Employment Projections

Figure 7: Metro Employment Projections

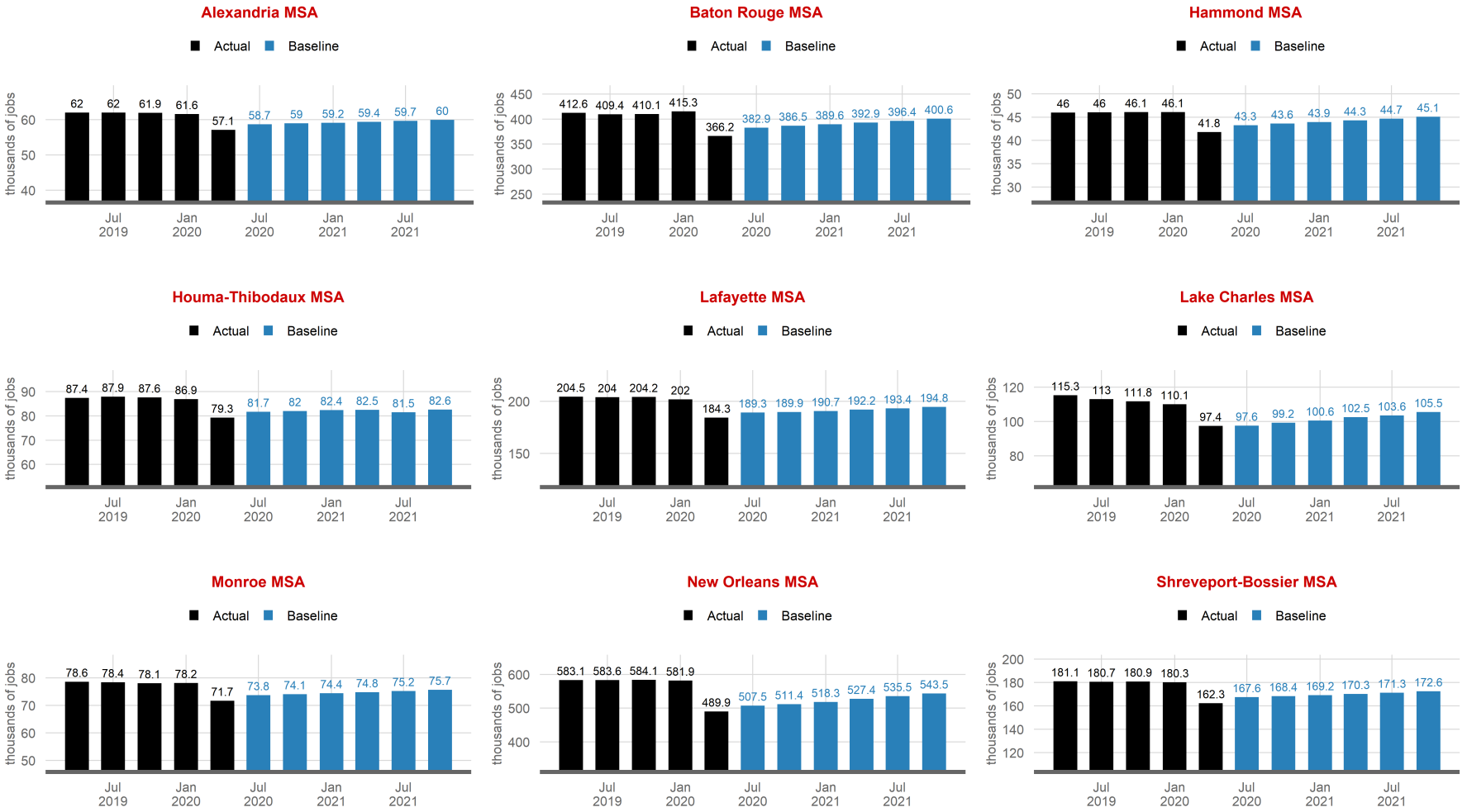
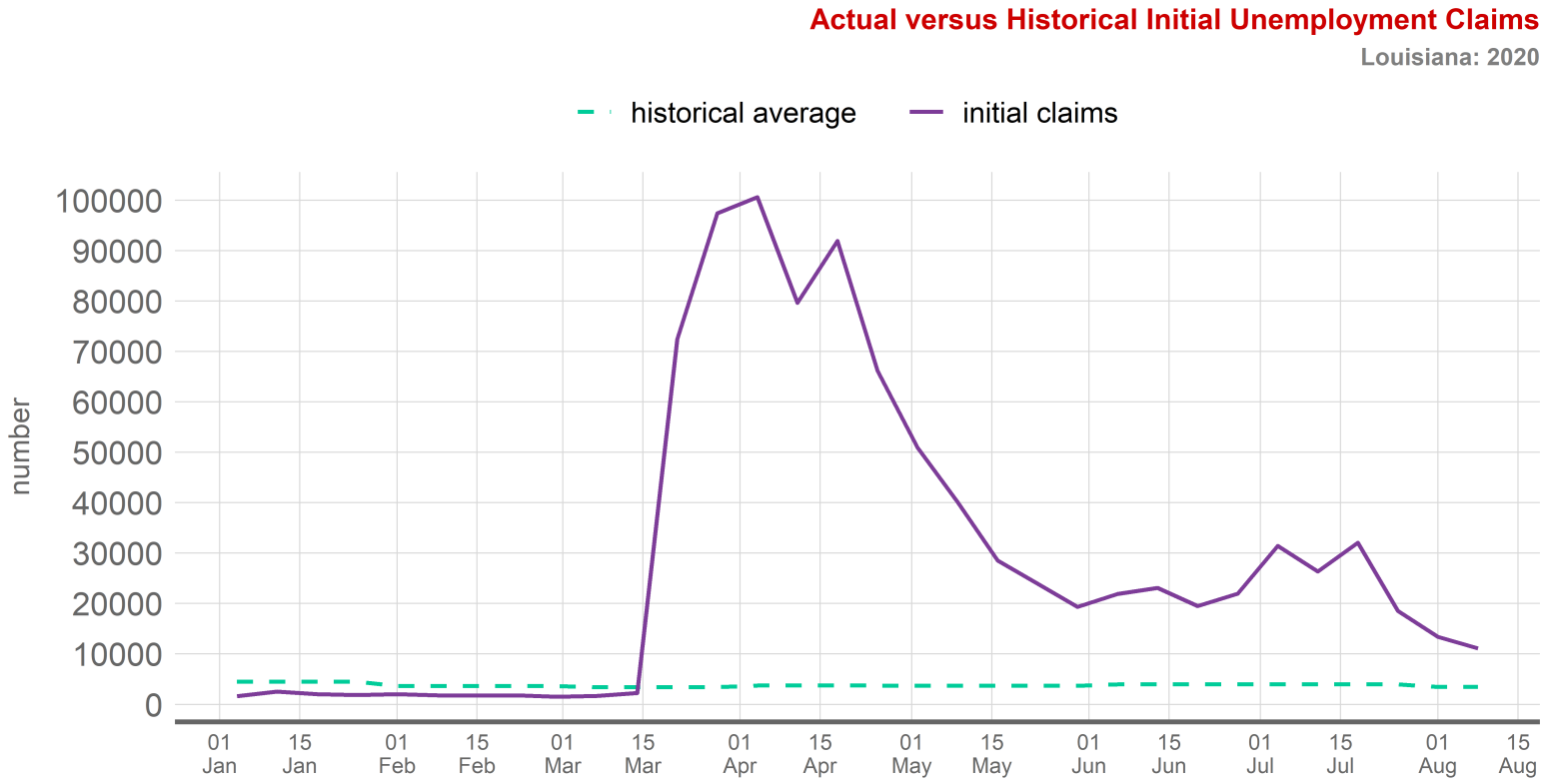
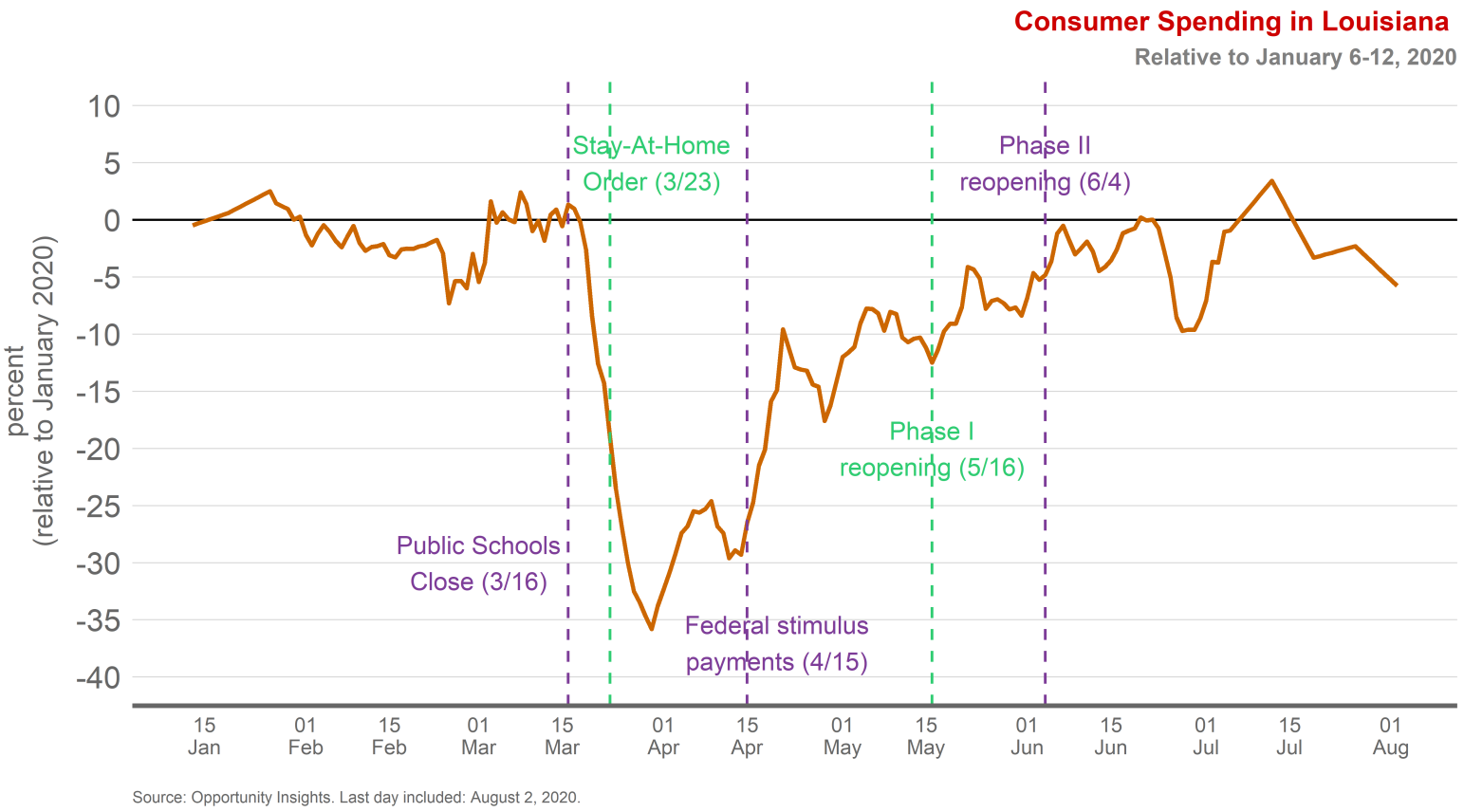


Figure 8: Initial Unemployment Claims in Louisiana



Source: Federal Reserve Bank of St. Louis FRED database. Last week included: August 8, 2020.
Historical monthly averages use data from 1986-2019.

Figure 9: Consumer Spending in Louisiana



Source: Opportunity Insights. Last day included: August 2, 2020.

Technical Appendix

The Louisiana Forecast Model (LFM) is based on a Vector Autoregression (VAR) system of equations. VAR models can be used to generate forecasts of the future values of multiple variables simultaneously (called endogenous variables) based on the past behavior of these variables and on the behavior of other variables whose values are taken as given (called exogenous variables). Endogenous variables (or the variables ones wishes to forecast) in the LFM include gross domestic product (or total production), non-farm payroll employment, unemployment rate, home prices, and state tax collections. Exogenous variables in the current version of the LFM include U.S. gross domestic product, U.S. unemployment rate, oil prices, the state's real trade-weighted exchange rate, and the global prices of soybeans and rice. Hence, the forecast or projection of each endogenous variable is based on the historical relationship with its own past values, the past values of every other endogenous variable, and the values of every exogenous variable. The Louisiana Regional Employment Model (LREM) is a nested Vector Autoregression (VAR) of total payroll employment in the state's nine MSAs. In addition to the exogenous variables used in the LFM, the Louisiana Regional Employment Model incorporates statewide employment projections and statewide GDP projections as additional external variables.

The VAR methodology is a widely-accepted approach for generating economic and business forecasts. Academic studies have repeatedly shown that small-scale VAR models perform well in terms of prediction errors relative to alternative forecasting models. VAR systems also model the underlying dynamics of economic relationships in the system without imposing behavioral assumptions about the relationships between the variables or how they evolve over time.

The model is estimated using quarterly data beginning in 1994:Q1. Quarterly average values are used for data series that are available at a weekly or monthly frequency. All variables enter the model in log difference form. Real quarterly Louisiana gross domestic product, which the Bureau of Economic Analysis did not begin reporting until 2005, is backcasted using the estimated relationship between the observable data on state GDP and real U.S. quarterly gross domestic product and real quarterly state personal income.

Future values of the exogenous variables are required to make projections for the endogenous variables. The future growth rate in real U.S. GDP and the future level of the U.S. unemployment rate are the median median projections from the Survey of Professional Forecasters. Future projections for oil prices are from the U.S. Energy Information Administration. Future trade-weighted exchange rates and the prices of soybeans and rice were estimated using an Akaike Information Criterion (AIC) weighted average of univariate autoregressive moving-average (ARMA) models that range from (0,0) to (4,4). The data appendices provide complete documentation for all underlying source data used in the model.

Data Appendix: Endogenous Variables

- **Employment (statewide)**
  Total seasonally adjusted non-farm payroll employment. Source: Bureau of Labor Statistics via the Federal Reserve Bank of St. Louis FRED database (mnemonic = LANA). Units: thousands of individuals.

- **Unemployment rate**
  Seasonally adjusted unemployment rate. Source: Bureau of Labor Statistics via the Federal Reserve Bank of St. Louis FRED database (mnemonic = LAUR). Units: percent.

- **Home prices**
  All-transactions home price index. Source: U.S. Federal Housing Finance Agency via the Federal Reserve Bank of St. Louis FRED database (mnemonic = LASTHPI). Units: 1980:Q1 = 100. Seasonally adjusted prior to estimation.

- **GDP**
  Total Real Gross Domestic Product for Louisiana (seasonally adjusted annual rate). Source: U.S. Bureau of Economic Analysis via the Federal Reserve Bank of St. Louis FRED database (mnemonic = LARQGSP). Units: Millions of chained 2012 dollars. Pre-2005 figures were backcasted following the approach described in the Technical Appendix.

- **Tax collections**
  Total state tax collections for Louisiana. Source: U.S. Census Bureau via the Federal Reserve Bank of St. Louis FRED database (mnemonic = QTAXTOTALQTAXCAT3LANO). Units: Millions of dollars. Seasonally adjusted prior to estimation.

- **Employment (metro area)**
  Total seasonally adjusted non-farm payroll employment. Source: Bureau of Labor Statistics via the Federal Reserve Bank of St. Louis FRED database. Units: thousands of individuals. Alexandria (ALEX722NA), Baton Rouge (BATO922NA), Hammond (SMU22252200000000001SA), Houma (HOUM322NA), Lafayette (LAFA122NA), Lake Charles (LAKE322NA), Monroe (MONR722NA), New Orleans (NEWO322NA), and Shreveport (SHRE322NA).

Data Appendix: Exogenous Variables

- **U.S. GDP**
  Total Real Gross Domestic Product for the U.S. (seasonally adjusted annual rate). Source: U.S. Bureau of Economic Analysis via the Federal Reserve Bank of St. Louis FRED database (mnemonic = GDPC1). Units: Millions of chained 2012 dollars. Future values are from the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters.

- **Oil prices**
  West Texas intermediate crude oil price. Source: U.S. Energy Information Administration via the Federal Reserve Bank of St. Louis FRED database (mnemonic = DCOILWTICO). Units: dollars per barrel. Future values are from the U.S. Energy Information Administration Short-Term Energy Outlook. Seasonally adjusted prior to estimation.

- **Trade-weighted exchange rate**
  Real trade-weighted exchange rate for Louisiana's major trading partners relative to the U.S. dollar. Source: Federal Reserve Bank of Dallas. Units: January 1988 = 100.

- **Price of rice**
  Global price of rice. Source: International Monetary Fund via the Federal Reserve Bank of St. Louis FRED database (mnemonic = PRICENPQUSDM). Units: U.S. dollars per metric ton. Seasonally adjusted prior to estimation.

- **Price of soybeans**
  Global price of soybeans. Source: International Monetary Fund via the Federal Reserve Bank of St. Louis FRED database (mnemonic = PSOYBUSDM). Units: U.S. dollars per metric ton. Seasonally adjusted prior to estimation.

- **Unemployment rate**
  U.S. unemployment rate (seasonally adjusted). Source: U.S. Bureau of Economic Analysis via the Federal Reserve Bank of St. Louis FRED database (mnemonic = UNRATE). Units: Percent. Future values are from the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters.

About the Author

Dr. Gary A. Wagner currently holds the Acadiana Business Economist Endowed Chair at the University of Louisiana at Lafayette. In this role, he monitors the region's economic environment, conducts research and analysis, and engages with external stakeholders on behalf of the Moody College of Business and University.

His research interests range from regional economics to state and local public finance issues, with a particular focus on tax structures and economic development, borrowing costs, and pension systems. He has authored or coauthored more than 60 professional articles and reports, and has delivered more than 300 presentations to public audiences on national and regional economic conditions. Dr. Wagner served on the Governor's Council of Economic Advisors in Arkansas from 2008-2011, and he is a quarterly participant in the Federal Reserve Bank of Philadelphia's Survey of Professional Forecasters projecting national economic conditions.

Dr. Wagner holds a Ph.D. in Economics from West Virginia University. His professional research has appeared in many leading economics journals including *The Journal of Law and Economics*, *National Tax Journal*, *Economics and Politics*, *Regional Science and Urban Economics*, *Papers in Regional Science*, *Public Choice*, and *Public Finance Review*. Prior to joining the University of Louisiana at Lafayette, he was Vice-President & Senior Regional Officer for the Federal Reserve Bank of Cleveland.

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