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Louisiana Economic Activity Forecast
2021:Q4

Gary A. Wagner, Ph.D.
Acadiana Business Economist Endowed Chair
Department of Economics & Finance

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

Professional forecasters have weakened their outlook for the U.S. economy for the second consecutive quarter. Growth is expected to average 4% over the next year, a reduction of almost one percentage point from the second quarter. Despite a slowing national economy, the outlook for Louisiana remains largely unchanged. The unemployment rate fell more than expected over the past three months, primarily due to individuals continuing to drop out of the labor force. If all of the individuals who dropped out of the labor force since 2021:Q1 remained in the labor force, the state's unemployment rate is estimated to be 9.7%. This is 4 percentage points higher than the official rate. After losing almost 1,000 jobs between the first and second quarters, the state gained 3,400 jobs in the third quarter and is expected to add an additional 37,000 jobs over the next year. Hurricane Ida sharply reduced employment in the Houma-Thibodaux and New Orleans metro areas in September. Both regions are expected to grow more slowly in the near-term. Louisiana now ranks 50th in the nation in terms of the percentage of COVID-related job losses that have been recovered. Home price growth remains solid but is expected to slow in early-to-mid 2022 as inventory levels normalize.

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.

2022 Report Release Schedule:
First Quarter: February 18, 2022
Second Quarter: May 20, 2022
Third Quarter: August 19, 2022
Fourth Quarter: November 18, 2022

38%
Percentage of COVID-19 job losses recovered statewide (through Sep. 2021).

50th
Louisiana's economic job recovery ranking relative to other states (through Sep. 2021).

9.7%
Estimated unemployment rate adjusting for individuals who have dropped out of the labor force since 2021:Q1.

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Introduction

The U.S. economy expanded at an inflation-adjusted annualized rate of 2% in the third quarter of 2021, well below the expectation of professional forecasters. Growth is expected to rebound somewhat in the fourth quarter and remain above 3% through the end of 2022. While 3% growth is greater than our historical average, the current outlook is notably weaker than three months ago. 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 fourth quarter of 2022. The current outlook for the state is largely unchanged from the previous quarter. Baseline projections point to gains of 37,000 jobs over the next four quarters.

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. 2021:Q3 values for the Baseline, Optimistic, and Pessimistic scenarios are identical because this quarter has already occurred. This row is shaded gray. Values for 2021:Q4 to 2022:Q4 have yet to be realized.

Table 1: Assumed Future Values of External Variables

Quarter	U.S. GDP (% SAAR)			U.S. Unemployment Rate (%)			Oil Prices ($ per barrel)		
	Baseline	Optimistic	Pessimistic	Baseline	Optimistic	Pessimistic	Baseline	Optimistic	Pessimistic
2021:Q3	2.02	2.02	2.02	5.13	5.13	5.13	70.61	70.61	70.61
2021:Q4	4.62	5.08	3.23	4.52	4.52	4.80	80.45	80.45	80.45
2022:Q1	3.88	4.27	2.72	4.30	4.30	4.65	74.92	74.92	74.92
2022:Q2	4.00	4.40	2.80	4.10	4.10	4.35	69.44	69.44	69.44
2022:Q3	3.06	3.37	2.15	3.90	3.90	4.22	66.01	66.01	66.01
2022:Q4	3.12	3.44	2.19	3.85	3.85	3.99	62.98	62.98	62.98

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 Forecasters outlook released on November 15, 2021. The Baseline expected path of oil prices is from the U.S. Energy Information Administration's Short-Term Economic Outlook released on November 9, 2021.

Third quarter growth in the U.S. economy was fueled by consumer spending, private inventory investment, state and local government spending, and nonresidential fixed investment. The pace of consumer spending slowed in third quarter as consumers continued to reduce their spending on durable goods, particularly new and used automobiles. Household purchases of services, driven by international travel, transportation services, and healthcare, offset the reduction in goods spending. Real disposable income (after-tax) also declined in the third quarter as the extended

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federal unemployment benefits ended in September.

Consumer prices, as measured by the consumer price index (CPI) and personal consumption expenditures (PCE) index, increased at annual rates of 8.5% and 7.1%, respectively in the third quarter. Producer prices, measured by the producer price index (PPI), increased at annual rates of 10.5% and 14.4%, respectively, in the second and third quarters. Producer prices often signal future changes in consumer prices so we may be experiencing higher than normal inflation in the near-term. If the Federal Reserve raises the federal funds rate target to combat inflation, then this would be expected to dampen the pace of the economic recovery.

Job gains in the U.S. economy accelerated between the second and third quarters, adding nearly 2.4 million (net) new jobs. Employment now stands 2.9% below pre-pandemic levels. After shedding approximately 1,000 jobs in the first quarter, employment in Louisiana also rebounded in the most recent quarter, notching gains of 3,400 jobs. The impact of Hurricane Ida was evident in the September employment data in both the Houma-Thibodaux and New Orleans metropolitan statistical areas. Their employment projections have been downgraded since last quarter's report.

Relative to other states, Louisiana now ranks 50th (worst in the nation) in terms of COVID-related job losses that have been regained. Figure 9 shows the percentage of job losses in each of the state's nine MSAs due to COVID, as well as their current state of economic recovery. Employment in seven of the nine MSAs is still 5% or more below 2019:Q4 levels. At the current pace of recovery, most metro areas will not fully regain their COVID job losses for several years.

The Optimistic and Pessimistic scenarios, which I would assign a 10% and 30% probability respectively, vary the severity and recovery time for oil prices, unemployment, and U.S. GDP growth. The Optimistic scenario assumes that U.S. GDP growth will be higher than the Baseline projection, while the Pessimistic scenario assumes that GDP growth will be slower than projected. Since the U.S. Energy Information Administration's short-term outlook for oil prices has stabilized in the mid-$60 per barrel range over the past nine months, the Baseline, Optimistic, and Pessimistic scenarios for Louisiana all assume the same future path for oil prices. I would assign a 60% probability to the Baseline forecast. The largest downside risk at this time is the inflation threat.

Over the next four quarters, the Baseline scenario projects U.S. GDP to grow at an annual pace of 4.0%. This is a reduction of nearly one percentage point from the previous quarter's outlook. 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 and is assigned a base value of 100. Real GDP is now projected to exceed its pre-COVID level (2019:Q4) by more than 6% by the end of 2022.

Figure 1: U.S. Economic Recovery Scenarios

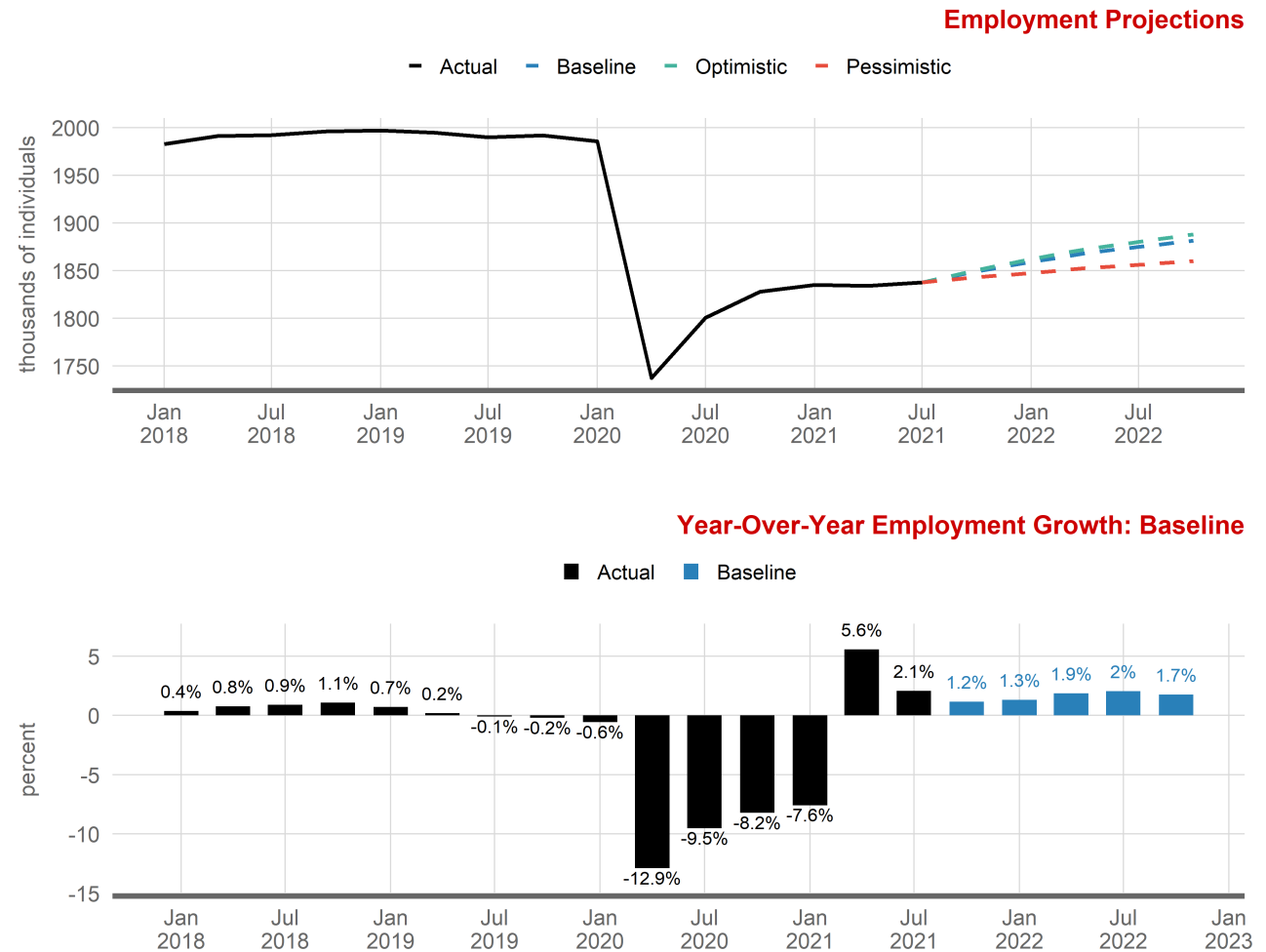B.I. Moody III College of
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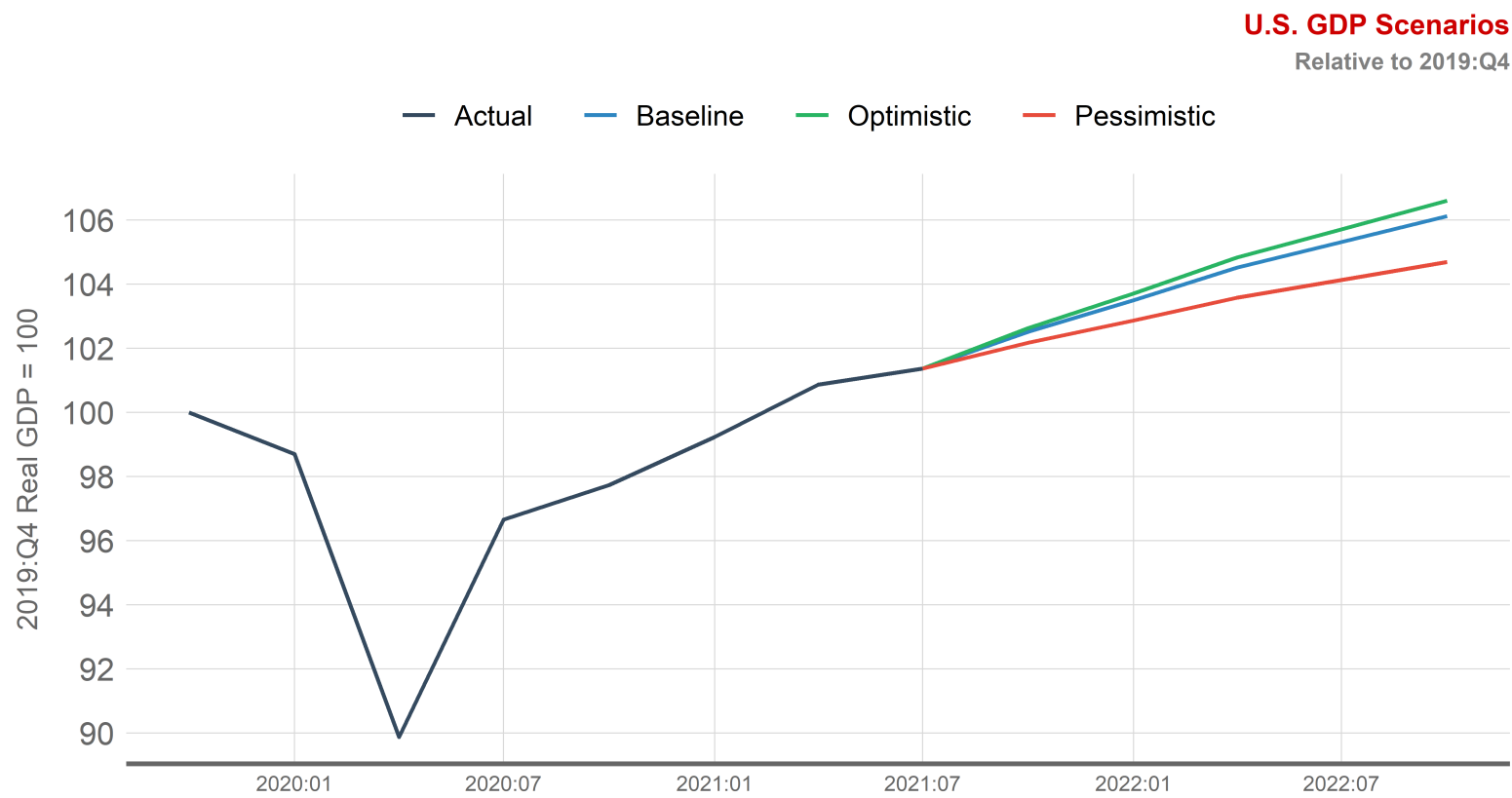
Louisiana Employment Projections

After losing nearly 1,000 jobs between the first and second quarters, job growth rebounded by +3,400 in 2021:Q3. As of September 2021, there are still 160,000 fewer jobs in the state than there were in the fourth quarter of 2019. This represents a gap of 8%, which is larger than the statewide job losses from Hurricane Katrina. Louisiana now ranks 50th among the states in terms of COVID job losses recovered (the state ranked 49th before Hurricane Ida). Sectors such as financial activities, wholesale trade, oil and gas extraction, and manufacturing have continued to shed jobs since the COVID recovery began in April 2020.

Statewide job growth is projected to grow an average of 1.6% (year-over-year) over the next 5 quarters. At this pace, the total number of jobs will not reach 2019:Q4 levels until the first quarter of 2026. The employment forecast error from the previous report was 0.31%. See Table 2 for forecast errors from the previous report.
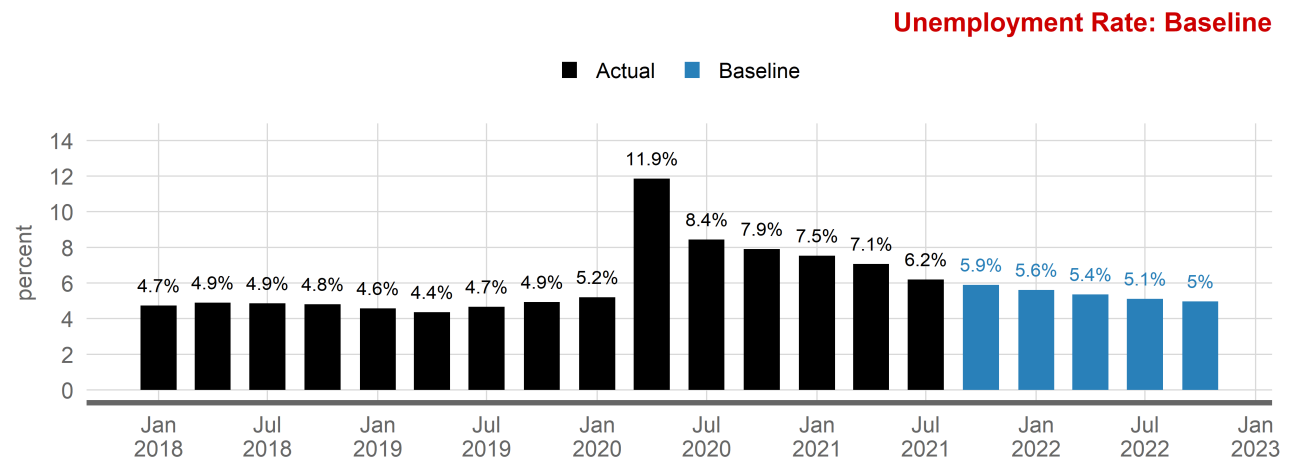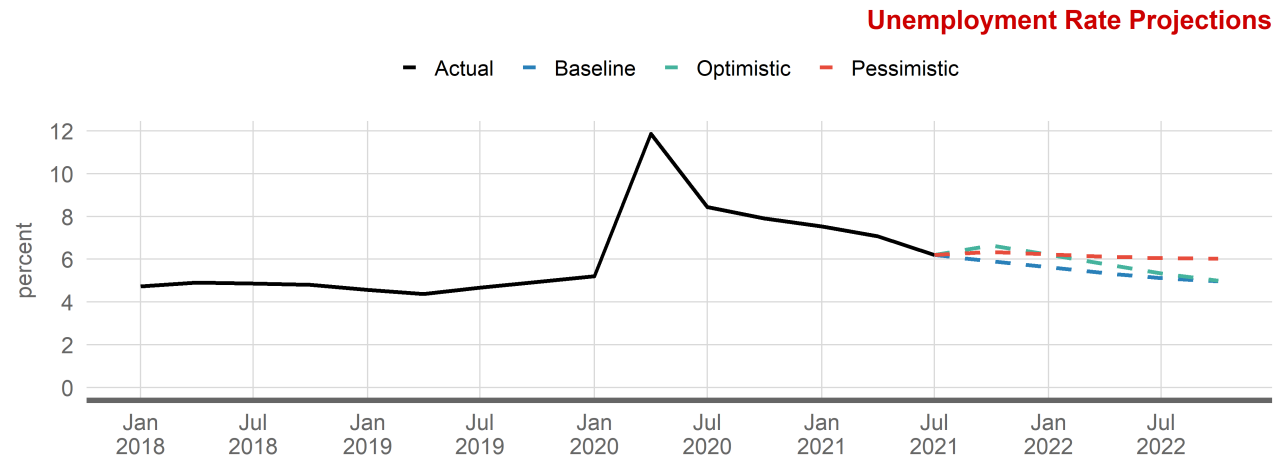
Figure 2: Louisiana Employment Projections

Employment Projections

Year-Over-Year Employment Growth: Baseline

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Louisiana Unemployment Rate Projections

Louisiana's unemployment rate declined more than projected in last quarter's report, falling to an average of 6.2 percent in Q3 (the projected value was 6.8 percent). Unfortunately, however, this is not a positive economic sign. A large percentage of the reduction in the unemployment rate over the past three months was caused by people continuing to drop out of the labor force.

Figure 10 estimates the unemployment rate assuming the labor force was the same size as 2021:Q1. If all of these people remained part of the labor force and are counted as being unemployed, then the state's unemployment rate would currently be 9.7%. This is 4 percentage points higher than the official figure.

The unemployment rate forecast error from the previous report was 9.68%. See Table 2 for forecast errors from the previous report.

Figure 3: Louisiana Unemployment Rate Projections

Unemployment Rate Projections

Unemployment Rate: Baseline

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Louisiana GDP Projections

Louisiana's GDP expanded at an annualized rate of 4.0% in the second quarter of 2021, which was slower than projected from last quarter's report (the US economy grew 6.7% in Q2). Consistent with the outlook for the national economy, Louisiana's GDP is now projected to grow more slowly over the next six quarters, averaging 2.7% under the Baseline scenario. Based on these Baseline projections, Louisiana's GDP may surpass pre-COVID levels (2019:Q4) as early as the first quarter of 2023. This is two quarters slower than previously projected.

The GDP forecast error from the previous report was 3.19%. See Table 2 for forecast errors from the previous report.

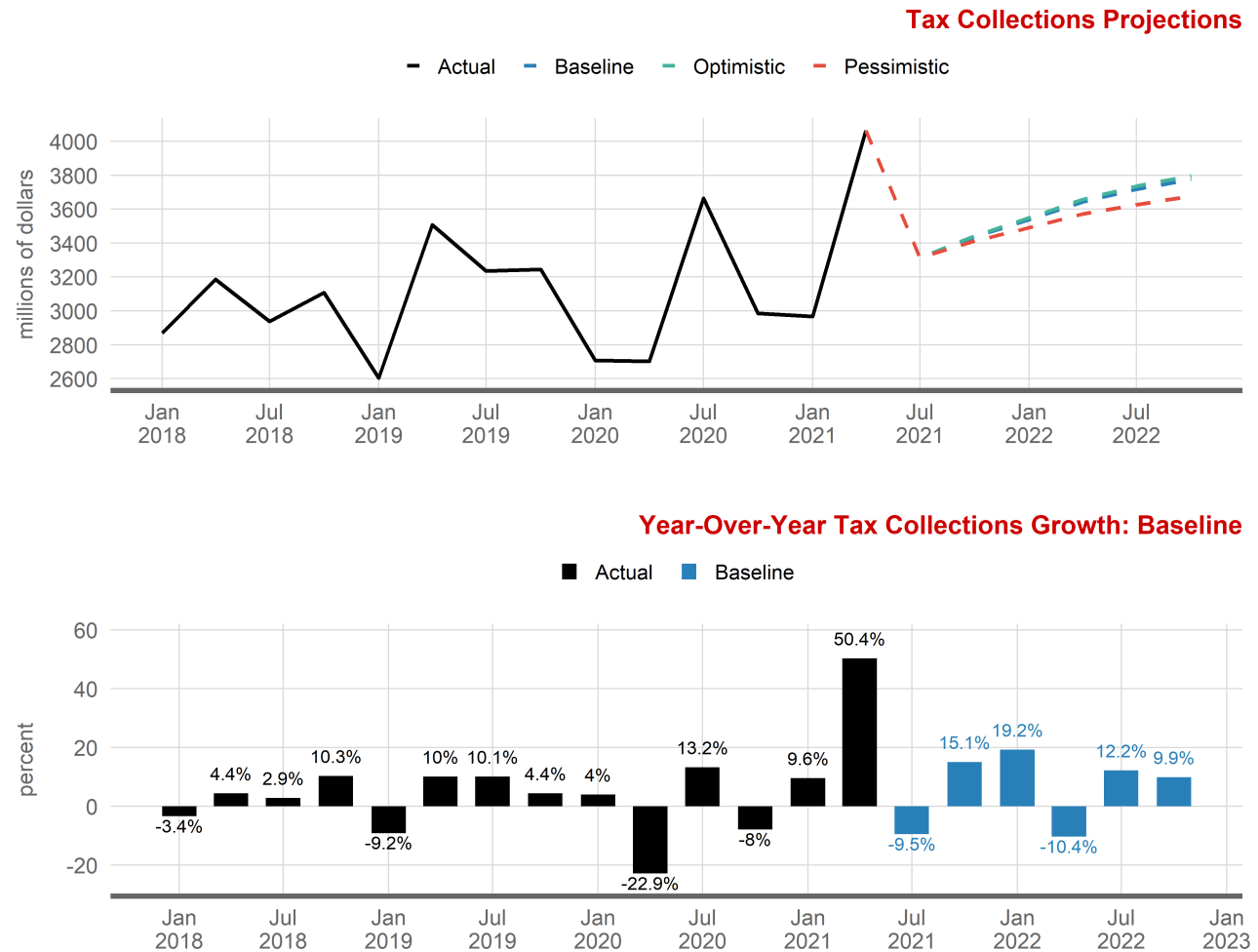

Figure 4: Louisiana GDP Projections
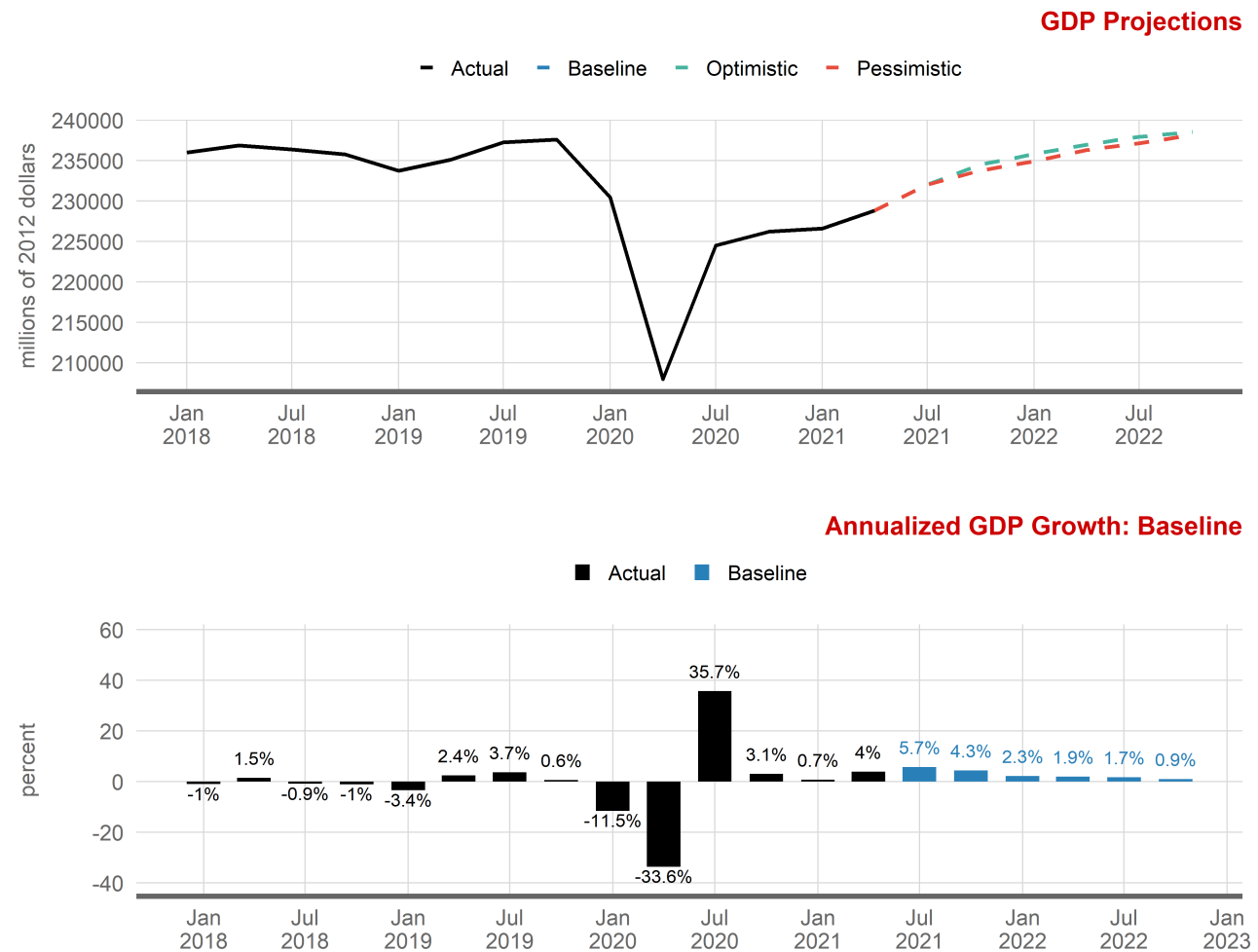
Louisiana Tax Collections Projections

Figure 5: Louisiana Tax Collections Projections

Year-over-year quarterly tax collections in the second quarter of 2021 were 50% higher than collections in the second quarter of 2020. This is due to a combination of shut-down orders suppressing economic activity in 2020 and COVID-related stimulus payments that boosted personal income in early-to-mid 2021.

Year-over-year tax collections are expected to average roughly 6% over the next six quarters, with a fair amount of variability because of the timing of past stimulus payments and delayed tax collections that artificially inflated collections in recent quarters.

Tax Collections Projections

Legend: — Actual — Baseline — Optimistic — Pessimistic

Year-Over-Year Tax Collections Growth: Baseline

Legend: ■ Actual ■ Baseline

Values shown: -3.4%, 4.4%, 2.9%, 10.3%, -9.2%, 10%, 10.1%, 4.4%, 4%, -22.9%, 13.2%, -8%, 9.6%, 50.4%, -9.5%, 15.1%, 19.2%, -10.4%, 12.2%, 9.9%

Louisiana Home Price Projections

Year-over-year home price growth accelerated by 6% in the second quarter. This was higher than projected in the previous LEAF report and the highest quarterly growth rate since the first quarter of 2007. Year-over-year growth has now exceeded 3% for seven consecutive quarters. Inventory levels remain below pre-COVID norms in each of the state's nine MSAs.

Year-over-year median list prices also decreased in six of the state's nine MSAs in the third quarter, likely signaling a return to normalcy in the housing market. With building permits continuing to be above normal, the Baseline projection is for home prices to slow in early-to-mid 2022.
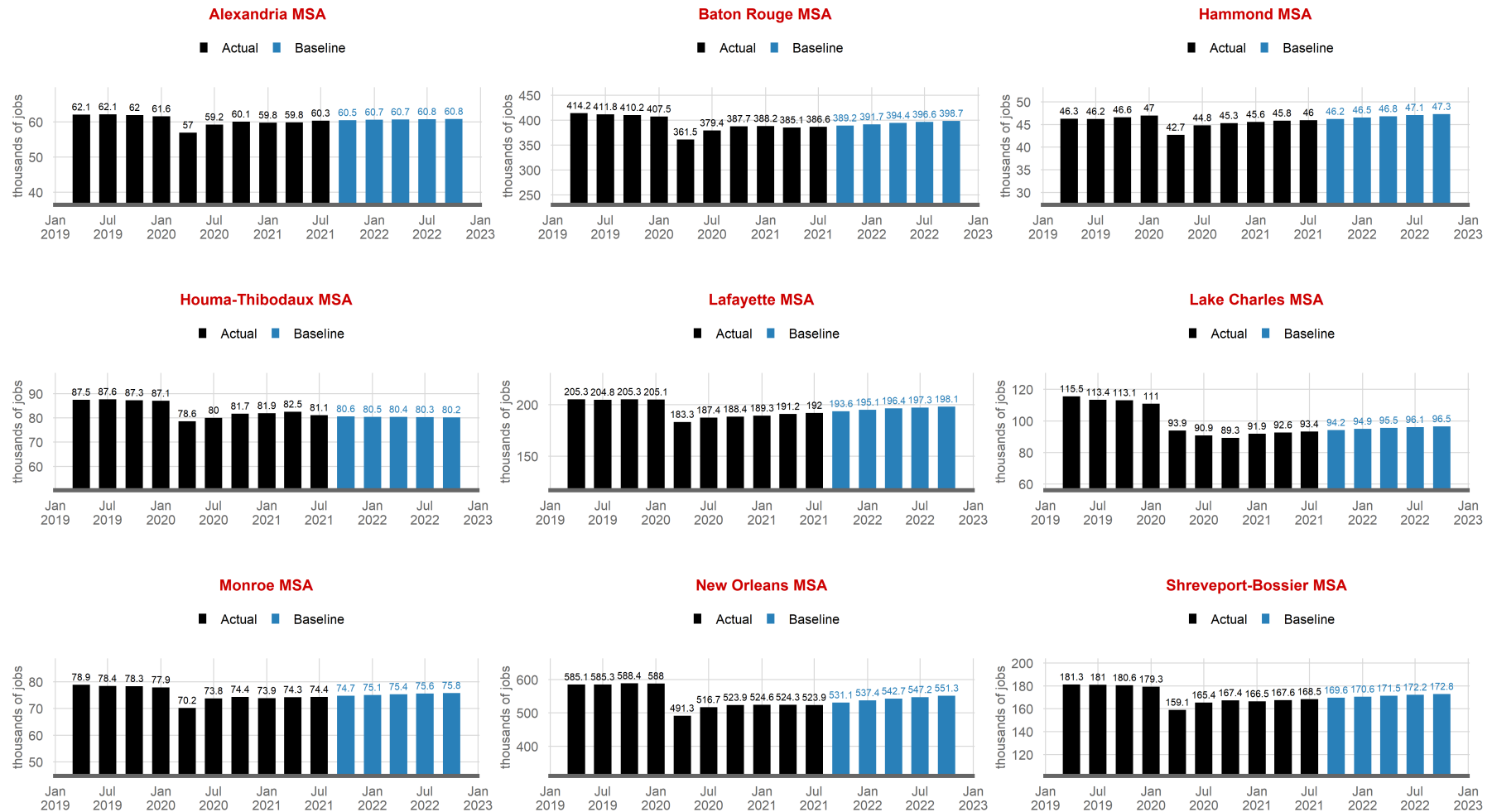
The previous LEAF report's forecast error for home prices was 1.64%. See Table 2 for forecast errors from the previous report.

Figure 6: Louisiana Home Price Projections
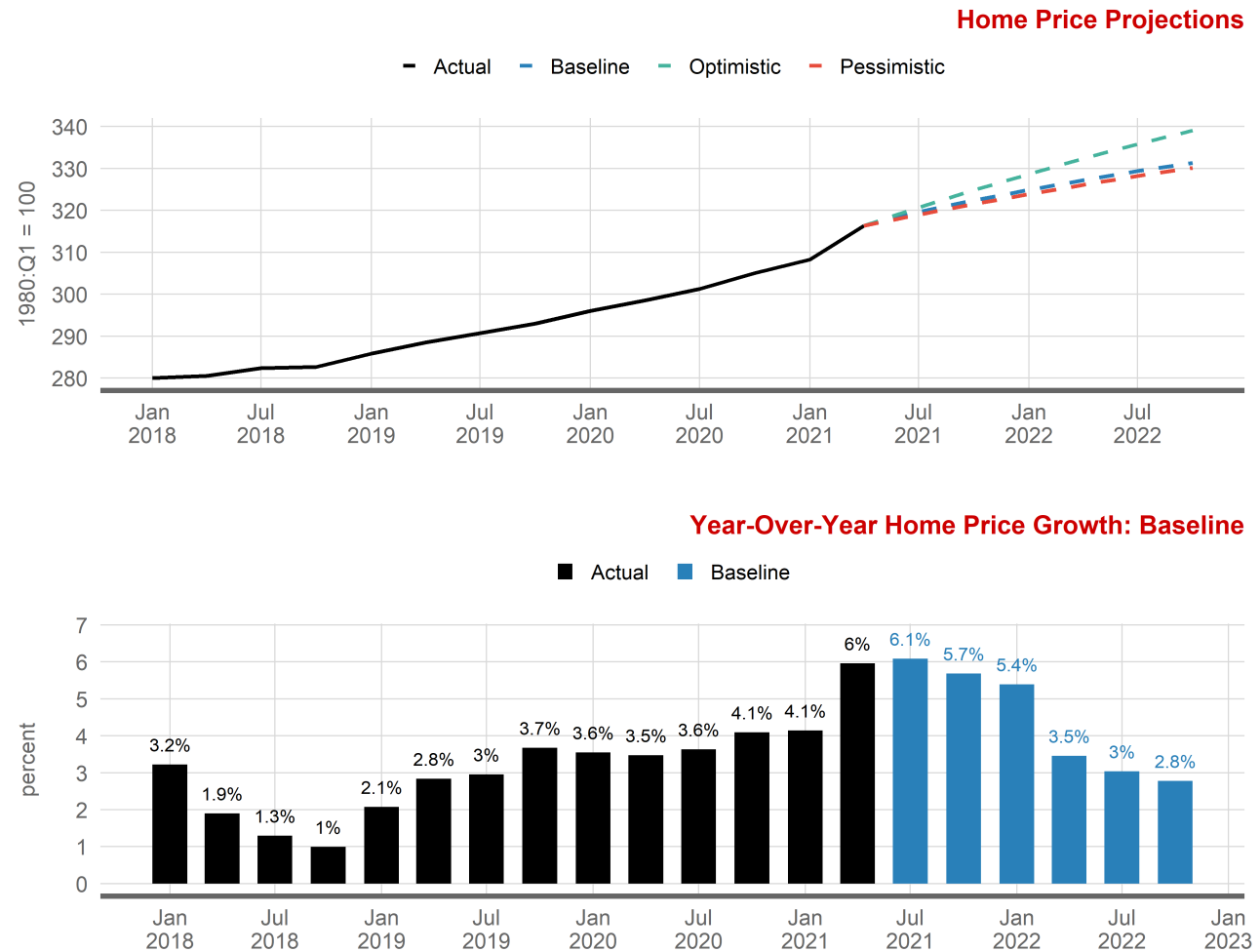
Metro Area Employment Projections

Figure 7: Metro Employment Projections

Metro Area Employment Projections: Year-over-Year Growth

Figure 8: Metro Area Employment Projections: Year-over-Year Growth

Employment Projections in Louisiana Metro Areas

Year-over-Year Change: Next 4 Quarters
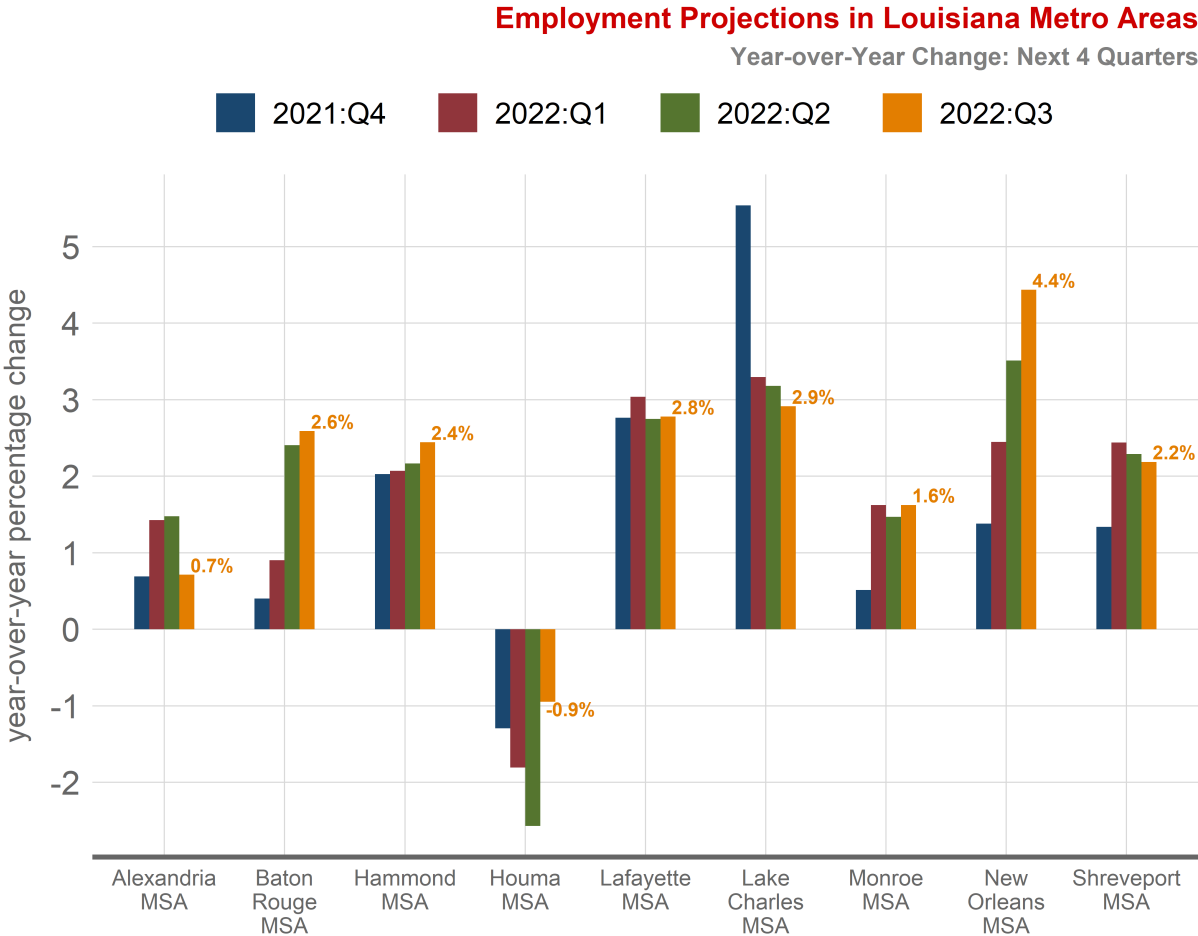
Source: Raw data from the Bureau of Labor Statistics. Projections by Gary A. Wagner, Ph.D.

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Metro Area Employment: COVID Job Losses and Recovery Relative to 2019:Q4

Figure 9: Metro Area Employment: COVID Job Losses and Recovery Relative to 2019:Q4

Employment data through Sep 2021

Figure 10: Reported versus Estimated Unemployment Rate

Louisiana's Reported Versus Estimated Unemployment Rate
Based on 2020:Q1 Labor Force Size
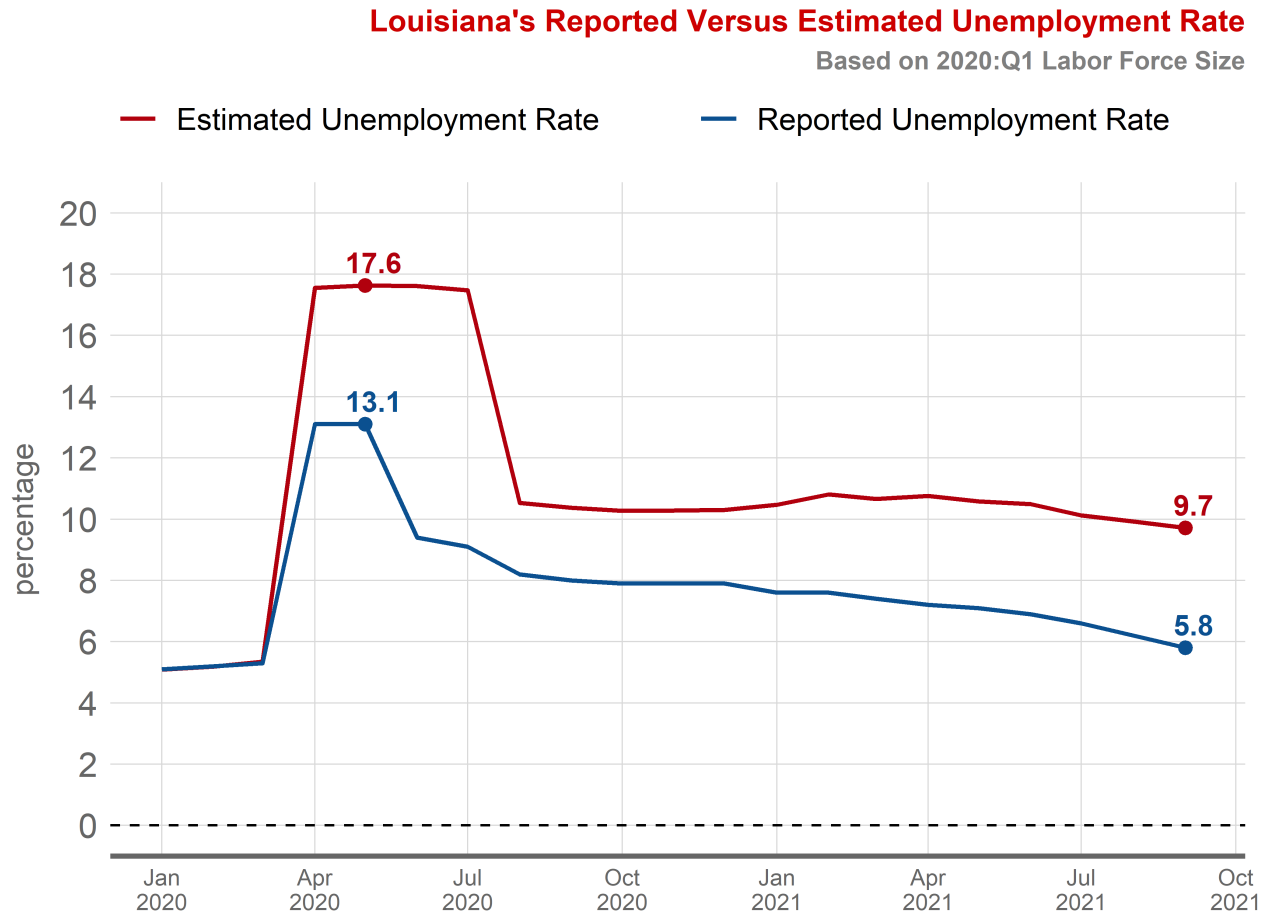
Source: Bureau of Labor Statistics.
Months plotted Jan 2020 to Sep 2021.
The chart assumes that everyone who dropped out of the labor force since 2020:Q1 remained in the labor force and is unemployed.

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Table 2: One-Quarter Ahead Projection Errors: 2021:Q2 Projections for 2021:Q3

Variable	Baseline Projection	Actual Value	Absolute % Error
employment (statewide)	1843.30	1837.60	0.31
unemployment rate	6.80	6.20	9.68
GDP	236123.60	228814.40	3.19
quarterly tax collections	2969.40	4064.00	26.93
FHFA home price index	311.10	316.30	1.64
Alexandria MSA employment	60.00	60.30	0.50
Baton Rouge MSA employment	387.10	386.60	0.13
Hammond MSA employment	46.00	46.00	0.00
Houma-Thibodaux MSA employment	82.70	81.10	1.97
Lafayette MSA employment	192.90	192.00	0.47
Lake Charles MSA employment	93.40	93.40	0.00
Monroe MSA employment	74.60	74.40	0.27
New Orleans MSA employment	530.70	523.90	1.30
Shreveport-Bossier MSA employment	169.20	168.50	0.42

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).

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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.

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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*, *Journal of Economic Behavior and Organization*, *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.

Contact information:
Phone: (337) 482-5381
Email: gary.wagner@louisiana.edu

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