OKLAHOMA Economic Indicators
October 2020
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SPECIAL REPORT:
STEM Occupations and Employment: A Brief Review for Oklahoma

Introduction
The Economic Research and Analysis Division at the Oklahoma Employment Security Commission (OESC) recently updated our statewide STEM report, STEM: Occupations and Employment, first produced in 2015. Over 100 STEM Occupations were chosen in this study, including occupational groups from: Chemistry, Computer Science, Engineering, Environmental Science, Life Sciences, Mathematics, and Physics/Astronomy. Because both experience and education are needed for the STEM occupations, this study also includes managerial and postsecondary occupations. The data in this report comes from the Occupational Employment Statistics (OES) program, collaboration between the Oklahoma Employment Security Commission (OESC) and the U.S. Bureau of Labor Statistics (BLS) and the Employment Projections Program produced by the Research and Analysis Division of OESC. Below are a few of the significant findings from this study.

Chart 1

Chart 1, above, shows the top ten of Oklahoma’s employment-based occupations in 2018. Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products, Software Developers, Applications (6,610 jobs) and Computer User Support Specialists (6,550 jobs) top the list, followed by Software Developers, Applications (4,320 jobs). Computer and Information Systems Managers (3,410 jobs) and Computer Systems Analysts (3,280 jobs), were listed among the top five of the largest occupations.
Oklahoma had a total of approximately 85,340 STEM jobs in 2018, accounting for about 5.4 percent of state total employment, (see Chart 2, above). Computer Science had the largest share of jobs for STEM occupations with 39,610 jobs, and 46.4 percent of the total STEM employment followed by Engineering with 43.0 percent of the STEM employment with 36,700 jobs. The third largest STEM occupational group in 2018 was Life Sciences with 13.1 percent of the STEM occupations and 11,200 jobs. Other STEM employment shares include: Mathematics with 8,600 jobs (10.1 percent); Geosciences with 7,200 jobs (8.4 percent); Physics/Astronomy with 6,400 jobs (7.5 percent), Chemistry with 5,990 jobs (7.0 percent), and Environmental Science with 3,640 jobs (4.9 percent).

Chart 3 on the following page depicts the highest- and lowest-paying STEM occupations in Oklahoma in 2018. The STEM jobs’ average annual wage was $78,322; however, Oklahoma’s average annual wages for all occupations was $44,220.

The top paying STEM occupation for 2018 was Physicists at $164,190. The lowest paying STEM occupation at $33,970 was Agricultural and Food Science Technicians.

Rounding out the top five highest paid STEM occupations in Oklahoma in 2018: Petroleum Engineers ($146,990); Architectural and Engineering Managers ($137,560); Geoscientists, Except Hydrologists and Geographers ($123,230); and Natural Science Managers ($116,160). The lowest average annual wage STEM occupations for Oklahoma included: Environmental Science and Protection Technicians, Including Health ($44,370); Soil and Plant Scientists ($42,430); Biological Technicians ($40,930); and Animal Scientists ($40,060), (see Chart 3, next page).
Chart 4 (previous page) displays the highest eight STEM occupation location quotients in Oklahoma in 2018. The STEM occupation location quotients are calculated as a ratio comparing the STEM occupation employment concentration of Oklahoma to the nation. A location quotient less than 1.0 suggests that the STEM occupational employment is less concentrated in Oklahoma compared to the U.S., while location quotients larger than 1.0 suggests that STEM occupational employment is more concentrated in Oklahoma compared to the U.S. Figure 6 displays the highest eight STEM occupations location quotients in Oklahoma.

Most of the STEM occupations with the highest location quotients are technicians, scientists, or engineers. Geological and Petroleum Technicians had the highest location quotient of 7.54, followed by Petroleum Engineers at 5.54. Sales Representatives, Wholesale and Manufacturing, Technical and Scientific Products had the highest estimated employment level (6,610 jobs) but one of the lower location quotients at 1.92.

More Information
A copy of the full STEM: Occupations and Employment report is available on the OESC website at:

Definition & Importance

Gross Domestic Product (GDP)—the output of goods and services produced by labor and property located in the United States—is the broadest measure of economic activity. It is also the measure that is most indicative of whether the economy is in recession. In the post-World War II period, there has been no recession in which GDP did not decrease in at least two quarters, (the exceptions being during the recessions of 1960-61 and 2001).

The Bureau of Economic Analysis (BEA), U.S. Department of Commerce releases GDP data on a quarterly basis, usually during the fourth week of the month. Data are for the prior quarter, so data released in April are for the 1st quarter. Each quarter's data are revised in each of the following two months after the initial release.

Background

There are four major components to GDP:

1. **Personal consumption expenditures:** Individuals purchase durable goods (such as furniture and cars), nondurable goods (such as clothing and food) and services (such as banking, education and transportation).

2. **Investment:** Private housing purchases are classified as residential investment. Businesses invest in nonresidential structures, durable equipment and computer software. Inventories at all stages of production are counted as investment. Only inventory changes, not levels, are added to GDP.

3. **Net exports:** Equal the sum of exports less imports. Exports are the purchases by foreigners of goods and services produced in the United States. Imports represent domestic purchases of foreign-produced goods and services and are deducted from the calculation of GDP.

4. **Government:** Government purchases of goods and services are the compensation of government employees and purchases from businesses and abroad. Data show the portion attributed to consumption and investment. Government outlays for transfer payments or interest payments are not included in GDP.
The four major categories of GDP—personal consumption expenditures, investment, net exports and government—all reveal important information about the economy and should be monitored separately. This allows one to determine the strengths and weaknesses of the economy.

**Current Developments**

U.S. economic activity plunged at the sharpest rate on record in the 2nd quarter, although the drop wasn’t quite as bad as previous estimates, as the response to the COVID-19 pandemic curbed consumer and business spending. Real gross domestic product (GDP) decreased at an annual rate of 31.4 percent in the 2nd quarter of 2020, the deepest decline in output since the government started keeping records in 1947, according to the "third" estimate released by the Bureau of Economic Analysis (BEA). In the 1st quarter, real GDP decreased 5.0 percent.

Consumer spending, which accounts for more than two-thirds of U.S. economic activity, cratered to a -33.2 percent rate in the 2nd quarter, less than the previous estimate of -34.1 percent. Outlays on durable goods, such as automobiles, fell 1.7 percent. Spending on nondurable goods, such as clothing, sank 15.0 percent. Outlays on services tumbled 41.8 percent in the 2nd quarter, led by a decline in health services spending. Personal consumption expenditures (PCE) slashed 24.01 percentage points from 2nd quarter GDP, after subtracting 4.75 percentage points in the 1st quarter.

Business investment spending fell for the fifth consecutive quarter—the longest stretch since 2009—tumbling to a -27.2 percent rate in the 2nd quarter and more than the previous estimate of -26.0 percent. Spending on structures dropped by a record 33.6 percent. Investment in equipment collapsed 35.9 percent, while outlays on intellectual property products, such as computer software, dipped 11.4 percent. Nonresidential fixed investment subtracted 3.67 percentage points from 2nd quarter GDP growth.

The level of businesses inventories shrank by an enormous $206.1 billion annual rate in the 2nd quarter, revised up from the earlier estimate of -$205.5 billion, as substantially lower consumer demand has reduced inventory restocking. Inventory investment lowered GDP growth by 3.50 percentage points in the 2nd quarter.

Investment in residential homebuilding also contracted in the 2nd quarter, following three consecutive quarters of growth. Residential construction dipped 35.6 percent in the 2nd quarter, shaving 1.60 percentage points from GDP growth in the April to June period.

Imports fell at a greater rate than exports, leading to a somewhat smaller trade deficit in the 2nd quarter. Exports fell 64.4 percent while imports plunged at a 54.1 percent rate. Net exports of goods and services added 1.60 percentage point to GDP growth in the 2nd quarter, up from the previous estimate of 0.90 percentage point.

The economic fallout from the steep drop in consumer spending in the 2nd quarter was partially cushioned by an unprecedented level of federal relief, including expanding unemployment insurance benefits, economic recovery rebates and emergency loans enacted as a part of the CARES Act. Federal government spending climbed to a 16.4 percent rate in the 2nd quarter, as nondefense spending jumped 37.6 percent and national defense spending increased 3.8 percent. However, state and local governments suffered a big drop in tax revenue during the 2nd quarter even as expenses soared. Consumption outlays by state and local government fell 5.4 percent in the 2nd quarter, the largest decline since 1981. Government consumption expenditures and investment added 0.77 percentage point to 2nd quarter GDP.
Definition & Importance
The U.S. Bureau of Economic Analysis (BEA) recently began producing statistics of quarterly gross domestic product (GDP) by state dating back to 2005. These new statistics provide a more complete picture of economic growth across states that can be used with other regional data to gain a better understanding of regional economies as they evolve from quarter to quarter. The new data provide a fuller description of the accelerations, decelerations, and turning points in economic growth at the state level, including key information about changes in the distribution of industrial infrastructure across states.

Current Developments
Real gross domestic product (GDP) by state—a measure of nationwide growth calculated as the sum of GDP of all states and the District of Columbia—decreased in all 50 states and the District of Columbia in the 2nd quarter of 2020, as real GDP for the nation decreased at an annual rate of 31.4 percent, according to the Bureau of Economic Analysis (BEA). The percent change in real GDP in the 2nd quarter ranged from -20.4 percent in the District of Columbia to -42.2 percent in Hawaii and Nevada.

Accommodation and food services; healthcare and social assistance; and durable goods manufacturing were the leading contributors to the decrease in real GDP nationally, according to the BEA. Accommodation and food services was the leading contributor to the decreases in Hawaii and Nevada.

Oklahoma’s real GDP decelerated to a -31.1 percent rate in the 2nd quarter of 2020, following a -7.3 percent rate in the previous quarter, ranking Oklahoma 24th among all other states and the District of Columbia. Statewide GDP was at a level of $173.1 billion (in constant 2012 dollars) in the 2nd quarter, down $22.5 billion from the revised 1st quarter level of $195.6 billion.
Accommodation and food services decreased 88.4 percent nationally and contributed to the decreases in all 50 states and the District of Columbia and was the leading contributor to the decreases in 17 states and the District of Columbia. In Oklahoma, accommodation and food services subtracted 2.9 percentage point from 2nd quarter GDP.

Healthcare and social assistance decreased 48.1 percent nationally and contributed to the decreases in all 50 states and the District of Columbia. This industry was the leading contributor to the decreases in 18 states. In Oklahoma, health care and social assistance subtracted 3.4 percentage point and was the second-leading contributor to the decrease statewide GDP in the 2nd quarter.

Durable goods manufacturing decreased 43.3 percent nationally and contributed to the decreases in all 50 states and the District of Columbia. In Oklahoma, durable goods manufacturing subtracted 2.9 percentage point from 2nd quarter GDP growth.

Finance and insurance increased 11.9 percent nationally. This industry moderated decreases in real GDP in 48 states and the District of Columbia, including Oklahoma where it added 0.8 percentage point to 2nd quarter state GDP.

With the 2nd quarter GDP by state release, the BEA also noted that ‘the decline in 2nd quarter GDP reflected the response to COVID-19, as "stay-at-home" orders issued in March and April were partially lifted in some areas of the country in May and June, and government pandemic assistance payments were distributed to households and businesses. This led to rapid shifts in activity, as businesses and schools continued remote work and consumers and businesses canceled, restricted, or redirected their spending. The full economic effects of the COVID-19 pandemic cannot be quantified in the GDP estimate for the 2nd quarter of 2020 because the impacts are generally embedded in source data and cannot be separately identified.’
Definition & Importance
Metropolitan Statistical Areas (MSA) are county-based definitions developed by the Office of Management and Budget for federal statistical purposes. A metropolitan area is defined as a geographic area consisting of a large population nucleus together with adjacent communities having a high degree of economic and social integration with the nucleus.

GDP by metropolitan area is the sub-state counterpart of the Nation's gross domestic product (GDP), the BEA's featured and most comprehensive measure of U.S. economic activity. GDP by metropolitan area is derived as the sum of the GDP originating in all the industries in the metropolitan area. Nationally, metropolitan statistical areas represent approximately 90 percent of total GDP. In Oklahoma, the four MSAs of Oklahoma City, Tulsa, Lawton and Enid accounted for 71.8 percent of total state GDP in 2018.

Current Developments
Real gross domestic product (GDP) increased in 366 out of 384 metropolitan areas in 2018, according to the U.S. Bureau of Economic Analysis (BEA). The percent change in real GDP by metropolitan area ranged from 21.9 percent in Midland, TX to -6.1 percent in Farmington, NM. Real GDP for U.S. metropolitan areas increased 3.0 percent in 2018, led by growth in professional and business services; information; and educational services, health care, and social assistance.

In 2018, all of Oklahoma’s four metropolitan areas experienced positive growth. Natural resources and mining was the leading contributor to growth in Enid MSA (1.4 percent), ranking it 299th among 384 metro areas in 2018. Natural resources and mining was also the leading contributor to GDP growth in Lawton MSA adding 0.7 percent in 2018 and ranked 231st among U.S. metro areas. Oklahoma City MSA grew 3.1 percent to $79.7 billion and ranked 126th, lifted by professional & business services and natural resources & mining. Tulsa MSA’s GDP also grew 3.1 percent to a level of $57.7 and ranked 122nd in 2018, boosted by durable-goods manufacturing.
The Federal Reserve Bank of Philadelphia produces leading indexes for each of the 50 states. The indexes are calculated monthly and are usually released a week after the release of the coincident indexes. The Bank issues a release each month describing the current and future economic situation of the 50 states with special coverage of the Third District: Pennsylvania, New Jersey, and Delaware.

The leading index for each state predicts the six-month growth rate of the state's coincident index. In addition to the coincident index, the models include other variables that lead the economy: state-level residential housing permits (1 to 4 units), state initial unemployment insurance claims, delivery times from the Institute for Supply Management (ISM) manufacturing survey, and the interest rate spread between the 10-year Treasury bond and the 3-month Treasury bill.

The Federal Reserve Bank of Philadelphia has released the leading indexes for the 50 states for February 2020. Forty-nine state coincident indexes, including Oklahoma's, were projected to grow over the next six months, while one was expected to decrease. For comparison purposes, the Philadelphia Fed has also developed a similar leading index for its U.S. coincident index, which is projected to grow 1.7 percent over the next six months.

Oklahoma’s leading index rose for a third straight month in February to a level of 1.79 percent.

The Philadelphia Fed noted that the February 2020 release of the state leading indexes was based on data from the time period largely unaffected by the COVID-19 outbreak. Given the extreme impact on initial unemployment claims in recent weeks, their standard approach for estimating the six-month change in coincident indexes may not be reliable in coming months. Therefore, they expect to suspend the release of upcoming state leading indexes until further notice.
**Definition & Importance**

The Bureau of Labor Statistics Local Area Unemployment Statistics (LAUS) program produces monthly estimates of total employment and unemployment from a national survey of 60,000 households. The unemployment rate measures the percentage of people who are without work and is calculated by dividing the estimated number of unemployed people by the civilian labor force. The result expresses unemployment as a percentage of the labor force.

The unemployment rate is a lagging indicator of economic activity. During a recession many people leave the labor force entirely. As a result, the jobless rate may not increase as much as expected. This means that the jobless rate may continue to increase in the early stages of recovery because more people are returning to the labor force as they believe they will be able to find work. The civilian unemployment rate tends towards greater stability than payroll employment on a monthly basis and reveals the degree to which labor resources are utilized in the economy.

**Current Developments**

The U.S. unemployment rate dropped in September, but that decline was mostly driven by a significant number of people exiting the labor force. In September, the unemployment rate declined by 1.8 percentage points to 8.4 percent, according to the Bureau of Labor Statistics (BLS). The decline in the unemployment rate came along with a 0.3 percentage point drop in the labor force participation rate to 61.4 percent, representing a decline of nearly 700,000.

Oklahoma’s seasonally adjusted unemployment rate fell 1.4 percentage point to 5.7 percent in August. Over the year, Oklahoma’s seasonally adjusted unemployment rate was 2.4 percentage points higher than August 2019. In July, Latimer County posted Oklahoma’s highest county non-seasonally adjusted unemployment rate of 11.6 percent, while Cimarron County had the lowest county unemployment rate at 2.0 percent. Unemployment rates in July were higher than a year earlier in all 77 counties.
**Oklahoma Initial Weekly Claims for Unemployment Insurance**

*January 2, 2010 to September 26, 2020 (Not Seasonally Adjusted)*

Source: U.S. Department of Labor, Employment and Training Administration

**Definition & Importance**

Initial unemployment claims are compiled weekly by the U.S. Department of Labor, Employment and Training Administration and show the number of individuals who filed for unemployment insurance benefits for the first time. This particular variable is useful because it gives a timely assessment of the overall economy.

Initial claims are a leading indicator because they point to changes in labor market conditions. An increasing trend signals that layoffs are occurring. Conversely, a decreasing trend suggests an improving labor market. The four-week moving average of initial claims smooths out weekly volatility and gives a better perspective on the underlying trend.

**Current Developments**

The number of Americans filing for unemployment benefits declined at the end of September but remain historically high. In the week ending September 26, the advance figure for seasonally adjusted initial claims was 837,000, a decrease of 36,000 from the previous week's revised level of 873,000, according to the Department of Labor (DOL). The less volatile 4-week moving average was 867,250, a decrease of 11,750 from the previous week's average of 879,000.

Initial and continued claims for jobless benefits in Oklahoma continued to trend down in September, after reaching historic levels earlier this year. For the file week ending September 26, the number of initial claims, unadjusted, totaled 5,258, a decrease of 176 from the previous week's level of 5,434. For the same file week, the less volatile initial claims 4-week moving average was 5,723 a decrease of 190 from the previous week's average of 5,913.

For the file week ending September 26, the unadjusted number of continued claims totaled 97,912, a decrease of 6,996 from the previous week's level of 104,908. For the same file week, the less volatile continued claims 4-week moving average was 108,112, a decrease of 5,415 from the previous week's average of 113,526.
Definition & Importance
Nonfarm payroll employment data is produced by the Current Employment Statistics (CES) program of the Bureau of Labor Statistics (BLS). The CES Survey is a monthly survey of approximately 145,000 businesses and government agencies representing approximately 697,000 worksites throughout the United States. The CES program has provided estimates of employment, hours, and earnings data by industry for the nation as a whole, all States, and most major metropolitan areas since 1939. In order to account for the size disparity between U.S. and Oklahoma employment levels, we have indexed the data with January 2001 as the start value.

Payroll employment is one of the most current and reliable indicators of economic conditions and recessionary trends. Increases in nonfarm payrolls translate into earnings that workers will spend on goods and services in the economy. The greater the increases in employment, the faster the total economic growth.

Current Developments
U.S. payroll employment growth slowed significantly in September, weakening for a third straight month. Total nonfarm payroll employment rose by 661,000 in September, following larger gains in the prior 4 months, according to the Bureau of Labor Statistics (BLS). In September, nonfarm employment was below its February level by 10.7 million, or 7.0 percent. Notable job gains occurred in leisure and hospitality (318,000 jobs), in retail trade (142,000 jobs), in health care and social assistance (108,000 jobs), and in professional and business services (89,000 jobs).

Oklahoma’s nonfarm employment jumped by 11,100 jobs (0.7 percent) in August, to a level of 1,621,600 while July’s estimate was downwardly revised to 1,610,500. In August, seven of Oklahoma’s supersectors added jobs as trade, transportation, and utilities (4,600 jobs) posted the largest monthly gain followed by professional and business services (3,700 jobs). Mining and logging (-900 jobs) saw the largest over-the-month job losses.
Definition & Importance
Employment growth by industry identifies the types of jobs being created in the state. Conversely, industries with a declining employment trend indicate those which are becoming less important in the state’s economy. There may also be industries which behave more cyclically, growing during expansion and decreasing in times of economic slowdown or contraction. These changes are crucial in that they help to recognize the types of jobs being lost by individuals. Anticipating what will happen in recovery helps identify whether those jobs will return or what types of new jobs will be created. Consequently, key information for planning re-employment, retraining, and other workforce and economic development programs is contained within these data. For this analysis, we are using CES non-seasonally adjusted annual averages to compare year-over-year employment changes.

Current Developments
Oklahoma’s annual average employment grew at a moderate pace in 2019, with job gains in both goods-producing and services-providing industries. Total nonfarm employment added a non-seasonally adjusted 14,300 jobs (0.8 percent) in 2019. For comparison, in 2018, 26,600 jobs were gained for a 1.6 percent increase.

In 2019, nine out of 11 statewide supersectors recorded job gains. Government led all other supersectors adding 4,600 jobs (1.3 percent) with local government adding the bulk of the job gains. Leisure and hospitality added 3,000 jobs (1.7 percent), while education and health services gained 2,500 jobs (1.1 percent). Professional and business services employment grew by 2,400 jobs (1.3 percent). Construction and manufacturing added 2,200 jobs each for 2.7 percent and 1.6 percent gains respectively. The broad trade, transportation and utilities supersector added a non-seasonally adjusted 1,500 jobs (0.5 percent). Financial activities grew by 300 jobs (0.4 percent) and other services added 100 jobs (0.1 percent) over the year.

The largest annual average over-the-year job losses were seen in mining and logging which shed a non-seasonally adjusted 4,100 jobs (-7.8 percent), followed by information dropping 300 jobs (-1.5 percent).
Definition & Importance
Manufacturing employment data is also produced by the Bureau of Labor Statistics’ Current Employment Statistics (CES) program. Manufacturing and production are still important parts of both the U.S. and Oklahoma economies. During the 2007-09 recession, employment in manufacturing declined sharply. Although manufacturing plunged in 2008 and early 2009 along with the rest of the economy, it is on the rebound today while other key economic sectors, such as construction, still suffer. In Oklahoma, manufacturing accounts for one of the largest shares of private output and employment in the state. In addition, many manufacturing jobs are among the highest paying jobs in the state. In order to account for the size disparity between the U.S. and Oklahoma employment levels, we have indexed the data with January 2001 as the starting value.

Current Developments
U.S. factory hiring picked up in September, but manufacturing employment levels remain significantly lower than earlier this year. In September, manufacturing added 66,000 jobs over the month, according to the Bureau of Labor Statistics (BLS). Durable goods accounted for about two-thirds of the gain, led by motor vehicles and parts (+14,000 jobs) and machinery (+14,000 jobs). Despite gains over the past 5 months, employment in manufacturing is 647,000 below February’s level.

Oklahoma manufacturing employment added a seasonally adjusted 700 jobs (0.5 percent) over the month in August to a level of 128,000. In August, non-durable goods manufacturing added 400 jobs (0.9 percent), while durable goods manufacturing added 300 jobs (0.4 percent) over the month.

Over the year, statewide manufacturing employment contracted by a seasonally adjusted 12,800 jobs (-9.1 percent) in August, as 12,500 jobs (-12.9 percent) were lost in durable goods manufacturing and another 300 jobs (-0.7 percent) in non-durable goods manufacturing.
Definition & Importance
Economists consider the Institute for Supply Management’s Purchasing Managers’ Index (PMI™) a key economic indicator. The Institute for Supply Management (ISM®) surveys more than 300 manufacturing firms on employment, production, new orders, supplier deliveries, and inventories. The ISM® manufacturing index is constructed so that any level at 50 or above signifies growth in the manufacturing sector, which accounts for about 12 percent of the U.S. economy. A level above 43 or so, but below 50, indicates that the U.S. economy is still growing even though the manufacturing sector is contracting. Any level below 43 indicates that the economy is in recession.

For the region, since 1994, the Creighton Economic Forecasting Group at Creighton University has conducted a monthly survey of supply managers in nine states (including Arkansas, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota, Oklahoma and South Dakota), to produce leading economic indicators for the Mid-America economy using the same methodology as the national survey by the ISM®.

Current Developments
U.S. factory activity expanded for the 4th consecutive month in September although at a slower pace, after the coronavirus pandemic brought manufacturing activity to historic lows earlier this year. The September PMI® registered 55.4 percent, down 0.6 percentage point from the August reading of 56 percent, according to the latest ISM Manufacturing Report On Business®.

Demand expanded in September, as the New Orders Index grew, although at a slower rate of 60.2, and New Export Orders increased 1.0 percentage point to 54.3. Consumption, measured by the Production and Employment Indexes, contributed positively for a combined 0.9-percentage point increase, while factory employment remained in contraction territory with a reading of 49.6. Inputs, (expressed as supplier deliveries, inventories and imports), continued to indicate input-driven constraints to further production expansion, as inventory levels contracted again due to strong production output and supplier delivery difficulties.
The Creighton University Mid-America Business Conditions Index, a leading economic indicator for a nine-state region stretching from North Dakota to Arkansas, expanded to its highest level in more than two years in September. In April of this year, COVID-19 pushed the overall index to its lowest level in 11 years. Since April, the overall index has risen five consecutive months with four straight months above growth neutral 50.0. The September Business Conditions Index, which ranges between 0 and 100, increased to 65.1 from August’s 60.0.

“Creighton’s monthly survey results have mirrored the national manufacturing survey results indicating that the manufacturing sector has been expanding at a solid pace since sinking to a post-2008 recession low in April. Even so, current output in the regional and U.S. manufacturing sectors remains well below pre-COVID-19 levels,” said Ernie Goss, Ph.D., director of Creighton University’s Economic Forecasting Group and the Jack A. MacAllister Chair in Regional Economics in the Heider College of Business.

Oklahoma’s Business Conditions Index remained above growth neutral in September. The overall index declined to a solid 58.6 from August’s 61.8. Components of the overall September index were: new orders at 76.9, production or sales at 66.8, delivery lead time at 51.5, inventories at 38.8, and employment at 59.2.
Definition & Importance
Crude oil is an important commodity in the global market. Prices fluctuate depending on supply and demand conditions in the world. Since oil is such an important part of the economy, it can also help determine the direction of inflation. In the U.S. consumer prices have moderated whenever oil prices have fallen but have accelerated when oil prices have risen. The U.S. Energy Information Administration (EIA) provides weekly information on petroleum inventories in the U.S., whether produced here or abroad.

The Baker Hughes rig count is an important indicator for the energy industry and Oklahoma. When drilling rigs are active they consume products and services produced by the oil service industry. The active rig count acts as a leading indicator of demand for products used in drilling, completing, producing and processing hydrocarbons.

West Texas Intermediate (WTI-Cushing) is a light crude oil produced in Texas and southern Oklahoma which serves as a reference or "marker" for pricing a number of other crude streams and which is traded in the domestic spot market at Cushing, Oklahoma.

Background
Oklahoma produces a substantial amount of oil. Excluding federal offshore areas, Oklahoma was the 4th-largest crude oil producer among the states in 2019, accounting for nearly 5 percent of the nation's crude oil production (at 211,808,000 barrels). Crude oil wells and gathering pipeline systems are concentrated in central Oklahoma. Two of the 100 largest oil fields in the United States are found in Oklahoma.

The city of Cushing, in central Oklahoma, is a major crude oil trading hub connecting Gulf Coast producers to Midwest refining markets. In addition to Oklahoma crude oil, the Cushing hub receives supply from several major pipelines that originate in Texas. Traditionally, the Cushing Hub has pushed Gulf Coast and Mid-Continent crude oil supply north to Midwest refining markets. However, production from those regions is in decline, and an underused crude oil pipeline system has been reversed to deliver rapidly expanding heavy crude oil supply produced in Alberta, Canada to Cushing, where it can access Gulf Coast refining markets. For this reason,
Cushing is the designated delivery point for the New York Mercantile Exchange (NYMEX) crude oil futures contracts. Crude oil supplies from Cushing that are not delivered to the Midwest are fed to Oklahoma’s five refineries. As of January 2018, those refineries had a combined distillation capacity of more than 522,000 barrels per day—roughly 3.0 percent of the total U.S. refining capacity.

Current Developments

In the October Short-Term Energy Outlook (STEO), the U.S. Energy Information Administration (EIA) noted that U.S. crude oil production averaged 11.0 million barrels per day (bbl/d) in July (the most recent month for which historical data are available), up 0.5 million bbl/d from June. In May, U.S. crude oil production reached a two-and-a-half-year low of 10.0 million bbl/d, resulting from curtailed production amid low oil prices. Since then, U.S. production has increased mainly because tight oil operators have brought wells back online in response to rising prices. EIA estimates that production rose to 11.2 million bbl/d in September. However, EIA expects U.S. crude oil production to generally decline to average of 11.0 million bbl/d in the 2nd quarter of 2021 because new drilling activity will not generate enough production to offset declines from existing wells. EIA expects drilling activity to rise later in 2021, contributing to U.S. crude oil production returning to 11.2 million bbl/d in the 4th quarter of 2021. On an annual average basis, EIA expects U.S. crude oil production to fall from 12.2 million bbl/d in 2019 to 11.5 million bbl/d in 2020 and 11.1 million bbl/d in 2021.

After dropping steeply earlier this year, statewide crude production rebounded for a second consecutive month in July but remains well below levels seen prior to the economic slowdown caused by the COVID-19 pandemic. Oklahoma field production of crude oil for July 2020 was at a level of 14,936,000 bbl, 1,120,000 bbl (8.1 percent) more than the downwardly revised June level of 13,816,000 bbl, according to data reported by the EIA. For 2019, statewide crude production was at an estimated level of 211,809,000 bbl—11,123,000 bbl (5.5 percent) more than the record-setting 2018 level of 200,686,000 bbl.

West Texas Intermediate (WTI-Cushing) crude oil spot prices averaged $39.63 per barrel ($/bbl) in September, down $2.71/bbl from the August average of $42.34/bbl but up more than $23/bbl from the multi-year low monthly average price of $16.55/bbl in April.

After falling the lowest number of oil and natural gas drilling rigs on record in August, U.S. producers added rigs in September. As of Friday, September 25 there were 261 active rigs searching for oil and gas. Of that total, 183 rigs (70.1 percent) drilled for oil while 75 (28.7 percent) explored for natural gas. In August, the U.S. rig count dropped to the lowest weekly level (244 rigs) in the Baker Hughes rig count data series dating back to 1987. Compared to a year ago, the nation’s rig count was 599 less than 860 rigs reported on September 27, 2019.

Oklahoma’s active rig count rose in September but remained at a near-record low in the last week of September. For the week ending Friday, September 25 the state’s active rig count was unchanged from the previous week at 12 but up one from the August average of 11, according to oil field services company Baker Hughes. Oil-directed rigs accounted for 92 percent of total rig activity during September. Over the year, Oklahoma’s active rig count was down 54 from 66 active rigs operating September 27, 2019.
Definition & Importance

The U.S. Energy Information Administration (EIA) provides weekly information on natural gas stocks in underground storage for the U.S., and three regions of the country. The level of inventories helps determine prices for natural gas products. Natural gas product prices are determined by supply and demand—like any other good or service. During periods of strong economic growth, one would expect demand to be robust. If inventories are low, this will lead to increases in natural gas prices. If inventories are high and rising in a period of strong demand, prices may not need to increase at all, or as much. However, during a period of sluggish economic activity, demand for natural gas may not be as strong. If inventories are rising, this may push down oil prices.

The Henry Hub in Erath, Louisiana is a key benchmark location for natural gas pricing throughout the United States. The Henry Hub is the largest centralized point for natural gas spot and futures trading in the United States. The New York Mercantile Exchange (NYMEX) uses the Henry Hub as the point of delivery for its natural gas futures contract. Henry Hub “spot gas” represents natural gas sales contracted for next day delivery and title transfer at the Henry Hub. The settlement prices at the Henry Hub are used as benchmarks for the entire North American natural gas market. Approximately 49 percent of U.S. wellhead production either occurs near the Henry Hub or passes close to the Henry Hub as it moves to downstream consumption markets.

Background

Oklahoma is one of the top natural gas producers in the nation, ranking 4th among all states in U.S. gross production in 2019, (excluding offshore production), and accounting for about 9 percent of U.S. marketed production. More than a dozen of the 100 largest natural gas fields in the country are found in Oklahoma and proven reserves of conventional natural gas have been increasing in recent years.

Most natural gas in Oklahoma is consumed by the electricity generation and industrial sectors. About three-fifths of Oklahoma households use natural gas as their primary energy source for
home heating. Nevertheless, only about one-third of Oklahoma’s natural gas output is consumed within the state. The remaining supply is sent via pipeline to neighboring states, the majority to Kansas, including the natural gas trading hubs in Texas and Kansas.

Current Developments
In the October Short-Term Energy Outlook (STEO), the U.S. Energy Information Administration (EIA) forecasts U.S. dry natural gas production will average 90.6 billion cubic feet per day (Bcf/d) in 2020, down from an average of 93.1 Bcf/d in 2019. In the forecast, monthly average production falls from a record 97.0 Bcf/d in December 2019 to 85.9 Bcf/d in May 2021, before increasing slightly. Natural gas production declines the most in the Permian region, where EIA expects low crude oil prices will reduce associated natural gas output from oil-directed rigs. EIA’s forecast of dry natural gas production in the United States averages 86.8 Bcf/d in 2021. EIA expects production to begin rising in the 2nd quarter of 2021 in response to higher natural gas and crude oil prices.

Oklahoma natural gas production levels rose for the third month in a row in July, after dipping to the lowest level in six years in May. Statewide natural gas gross withdrawals were at a level of 229,700 million cubic feet (MMcf) in July, up 2,933 MMcf (1.3 percent) from the June level of 226,767 MMcf. For 2019, statewide natural gas production was at an estimated level of 3,175,009 MMcf, which is 228,894 MMcf (7.8 percent) more than the record-setting 2018 level of 2,946,115 MMcf.

In September, the Henry Hub natural gas spot price averaged $1.92 per million British thermal units (MMBtu), down from an average of $2.30/MMBtu in August. Lower natural gas spot prices reflected declining demand for natural gas from the U.S. electric power sector as a result of cooler-than-normal temperatures during the second half of September and relatively low demand for U.S. liquefied natural gas (LNG) exports amid hurricane-related activity in the Gulf of Mexico.

The number of active natural gas rigs in the United States rose two (2) rigs from the previous week to 75 for the week ending September 25, according to data from Baker Hughes Company. After no activity for 11 weeks, Oklahoma producers reported the addition of one (1) active natural gas-directed rig in September. Over the year, statewide gas-directed rig activity was down three (3) from four (4) reported for the week ending September 27, 2019.
Definition & Importance
The U.S. Census Bureau and the Department of Housing and Urban Development jointly provide monthly national and regional data on the number of new housing units authorized by building permits; authorized, but not started; started; under construction; and completed. The data are for new, privately-owned housing units (single and multifamily), excluding "HUD-code" manufactured homes. Because permits precede construction, they are considered a leading indicator for the residential construction industry and the overall economy. Most of the construction begins the same month the permit is issued. The remainder usually begins construction during the following three months; therefore, we also use a three-month moving average.

While home construction represents a small portion of the housing market, it has an outsized impact on the economy. Each home built creates an average of three jobs for a year and about $90,000 in taxes, according to the National Association of Home Builders. Overall, homebuilding fell to its lowest levels in 50 years in 2009, when builders began work on just 554,000 homes.

Current Developments
U.S. homebuilding dipped in August after solid gains in the previous three months. Privately-owned housing units authorized by building permits in August were at a seasonally adjusted annual rate of 1,470,000, 0.9 percent below the revised July rate of 1,483,000 and 0.1 percent below the August 2019 rate of 1,471,000, according to the U.S. Census Bureau and the U.S. Department of Housing and Urban Development.

Single-family building permits rose 6.0 percent to a rate of 1,036,000 units in August, while permits for the construction of apartments dropped 17.4 percent to 381,000 units.

The National Association of Home Builders/Wells Fargo Housing Market Index (HMI) reached to an all-time high in September with a reading of 83.
Definition & Importance
The data services of the Federal Reserve Bank of St. Louis produce a seasonally adjusted series including monthly state level data on the number of new housing units authorized by building permits. These adjustments are made using the X-12 Procedure of SAS to remove the seasonal component of the series so that non-seasonal trends can be analyzed. This procedure is based on the U.S. Bureau of the Census X-12-ARIMA Seasonal Adjustment Program.

Current Developments
Statewide residential permitting activity slipped in August, after two months of solid gains following the disruption caused by the coronavirus pandemic earlier this year. Total residential permitting was at a seasonally adjusted level of 1,079 in August, down 129 permits (-10.7 percent) from the July level of 1,208, and the same level as August 2019, according to figures from the U.S. Census Bureau and the Federal Reserve Bank of St. Louis.

In August, permits for single-family homes were at a seasonally adjusted level of 1,052, up 28 permits (2.7 percent) from a level of 1,024 in July. Multi-family permitting slumped to a seasonally adjusted level of 27 units in August, down 157 permits (-85.3 percent) from the previous month’s level of 184 permits. Single-family permitting accounted for 97.5 percent of total residential permitting activity in August while the more volatile multi-family permitting accounted for only 2.5 percent.

Year to date, there have been a seasonally adjusted total of 8,308 permits issued for residential construction in Oklahoma through August, 505 permits (6.5 percent) more than 7,802 total permits issued during the same period in 2019.
Definition & Importance
Personal income is a broad measure of economic activity and one for which relatively current data are available. Personal income includes earnings, property income such as dividends, interest, and rent and transfer payments, such as retirement, unemployment insurance, and various other benefit payments. It is a measure of income that is available for spending and is seen as an indicator of the economic well-being of the residents of a state. Earnings and wages make up the largest portion of personal income.

To show the vastly different levels of total personal income for the U.S. and Oklahoma on the same chart, these data have been converted to index numbers. This chart shows a comparison of Oklahoma and U.S. growth in real personal income with 1st quarter 2000 as the base year.

Current Developments
U.S. household spending slowed in August and personal income fell, as the Federal Pandemic Unemployment Compensation program which provided a temporary weekly supplemental payment of $600 for those receiving unemployment benefits expired on July 31. Personal income decreased $543.5 billion (2.7 percent) in August, according to estimates released the Bureau of Economic Analysis (BEA). Disposable personal income (DPI) decreased $570.9 billion (3.2 percent) and personal consumption expenditures (PCE) increased $141.1 billion (1.0 percent). Real DPI decreased 3.5 percent in August and Real PCE increased 0.7 percent. The PCE price index increased 0.3 percent. Excluding food and energy, the PCE price index increased 0.3 percent.

Spending on durable goods such as motor vehicles and recreational goods and vehicles rose 0.9 percent in August following a 2.2 percent increase in July. Purchases of nondurable goods such as food and clothing declined 0.1 percent while outlays on services, such as utilities and doctor visits increased 1.4 percent.

The personal savings rate—personal saving as a percentage of disposable personal income—was 14.1 percent in August after a 17.7 percent rate in July.
Definition & Importance
Quarterly estimates of state personal income are seasonally adjusted at annual rates by the Bureau of Economic Analysis (BEA). Quarterly personal income estimates are revised on a regular schedule to reflect more complete information than the data that were available when the estimates were initially prepared and to incorporate updated seasonal factors.

Current Developments
State personal income—a measure of nationwide income calculated as the sum of personal income of all states and the District of Columbia—increased 34.2 percent at an annual rate in the 2nd quarter of 2020, an acceleration from the 4.1 percent increases in the 1st quarter, according to estimates by the Bureau of Economic Analysis (BEA). Personal income increased in every state and the District of Columbia in the 2nd quarter.

Oklahoma’s personal income grew at a 47.1 percent rate in the 2nd quarter of 2020, to a level of $208.4 billion, ranking the state 12th among all states. For the 1st quarter of 2020, Oklahoma’s personal income was revised downward to $189.2 billion (2.2 percent) from the previous estimate of $191.8 billion (2.4 percent).

For the nation, earnings decreased 27.5 percent in the 2nd quarter of 2020, after increasing 3.4 percent in the 1st quarter, reflecting the partial economic shutdown following the outbreak of the COVID-19 pandemic in the 1st quarter of 2020. The declines were moderated by Paycheck Protection Program (PPP) loans to proprietors. In Oklahoma, net earnings dropped 21.0 percent in the 2nd quarter for a decline of $6,659 million from the 1st quarter.

Transfer receipts increased $2.5 trillion for the nation in the 2nd quarter of 2020, after increasing $80.3 billion in the 1st quarter, reflecting increases in state unemployment insurance compensation provided by the CARES Act, all other transfer receipts and Medicaid benefits. Transfer receipts increased in every state, ranging from $3.8 billion in Wyoming to $342.6 billion in California. In Oklahoma, transfer receipts increased 722.0 percent, accounting for $26,315 million (64.7 percent) of the $19,157 million increase in statewide personal income in the 2nd quarter of 2020.
Definition & Importance
Retail sales measure the total receipts at stores that sell merchandise and related services to final consumers. Sales are by retail and food services stores. Data are collected from the Monthly Retail Trade Survey conducted by the U.S. Bureau of the Census. Essentially, retail sales cover the durables and nondurables portions of consumer spending. Consumer spending accounts for roughly two-thirds of the U.S. GDP and is therefore essential to Oklahoma’s economy. Retail sales account for around one-half of consumer spending and economic recovery calls for consumption growth.

Current Developments
U.S. retail spending slowed in August as extended unemployment benefits were cut for millions of Americans at the end of July. Advance estimates of U.S. retail and food services sales for August 2020, adjusted for seasonal variation and holiday and trading-day differences, but not for price changes, were $537.5 billion, an increase of 0.6 percent from the previous month, and 2.6 percent above August 2019, according to the U.S. Census Bureau. Total sales for the June 2020 through August 2020 period were up 2.4 percent from the same period a year ago. The June 2020 to July 2020 percent change was revised from up 1.2 percent to up 0.9 percent.

Sales at auto dealerships was flat in August, following a 0.9 percent decline in July. Gasoline sales increased 0.4 percent, mostly reflecting higher pump prices. Excluding the volatile automobile and gasoline categories, retail sales rose 0.7 percent in August.

In August, typically a big month for back-to-school shopping, consumers stepped up their purchases at clothing stores (2.9 percent) and electronics & appliance stores (0.8 percent). Spending at grocery stores dropped 1.6 percent, while sales at nonstore retailers, which include online merchants, were flat.

The less volatile “core” or retail-control group sales which are used to calculate gross domestic product, and strips out automobiles, gasoline, building materials, and food services sales fell 0.1 percent last month after a downwardly revised 0.9 percent increase in July.
Definition & Importance
The Center for Economic and Management Research (CEMR) Price College of Business, at the University of Oklahoma produces the Oklahoma Monthly Retail Sales Series containing monthly estimates of retail sales for Oklahoma, the Oklahoma City, Tulsa and Lawton Metropolitan Statistical Areas and 48 selected cities in Oklahoma. The series is based on sales tax collection data provided by the Business Tax Division, Oklahoma Tax Commission (OTC). In order to take out monthly volatility, we have used a six-month moving average.

Current Developments
Statewide retail spending rose in July, although at a slower pace, as businesses continued to struggle to re-open after being shut in response to the COVID-19 pandemic. Total adjusted retail trade in July was at a level of $3.28 billion, a 2.0 percent increase from the revised June level of $3.23 billion. Over the year, total adjusted retail trade was down 7.6 percent from the July 2019 level of $3.57 billion. Excluding estimated gasoline sales, total retail sales for July rose 0.5 percent over the month.

In July, total durable goods sales declined 0.4 percent. Declining durable goods categories were miscellaneous durable goods (-2.3 percent); auto accessories & repair (-1.0 percent); electronics & music stores (-2.8 percent); and used merchandise (-3.9 percent). The only advancing durable goods category in June was lumber & hardware (1.6 percent).

Non-durable goods purchases increased 2.9 percent in July as rising pump prices pushed estimated gasoline sales up 37.8 percent over the month. Other advancing non-durable goods categories in July were general merchandise stores (1.3 percent); food stores (2.6 percent); liquor stores (3.8 percent); miscellaneous non-durables (0.9 percent); and drug stores (0.4 percent). Declining non-durable goods categories in July were eating & drinking places (-4.9 percent); and apparel (-14.8 percent).
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