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This special report, produced by the Research & Planning (R&P) section of the Wyoming Department of Workforce Services (DWS) in partnership with Wyoming Workforce Development Council, provides a snapshot of the labor market analysis component for Wyoming's Workforce Innovation and Opportunity Act Unified State Plan. When oil prices dropped in the fall of 2015, occupational projections, based on the continuity of historic trendlines, no longer reflected the most likely course of occupational growth in Wyoming. For this reason, R&P conducted an analysis of the condition of Wyoming's economy through 2020 using unemployment insurance (UI) claims, demographic and wage records data, and historic data from previous times of economic expansion and contraction.

Multiple economic indicators are required to fully understand events in the labor market. For example, Chapter 3 of this report discusses the components of the unemployment rate and how unemployment estimates alone are not enough to determine the health of the economy. In addition, with the knowledge that Wyoming's economy greatly depends on the mining industry, the dropping price of oil may reflect the condition of the economy as a whole; however, some industries may not experience the same losses as others.

In his book *Connections* (2007)[1], on the history of great inventions, James Burke states that, "given average intelligence and the information available to the innovators of the past, any reader could have matched their achievements." The databases available to DWS through R&P enhance discussions about solving problems to improve Wyoming's labor market. For example, with this shared knowledge, the Unified Plan was developed to guide discussions about effective training programs to reemploy out-of-work individuals and assist others in attaining self-sufficiency.

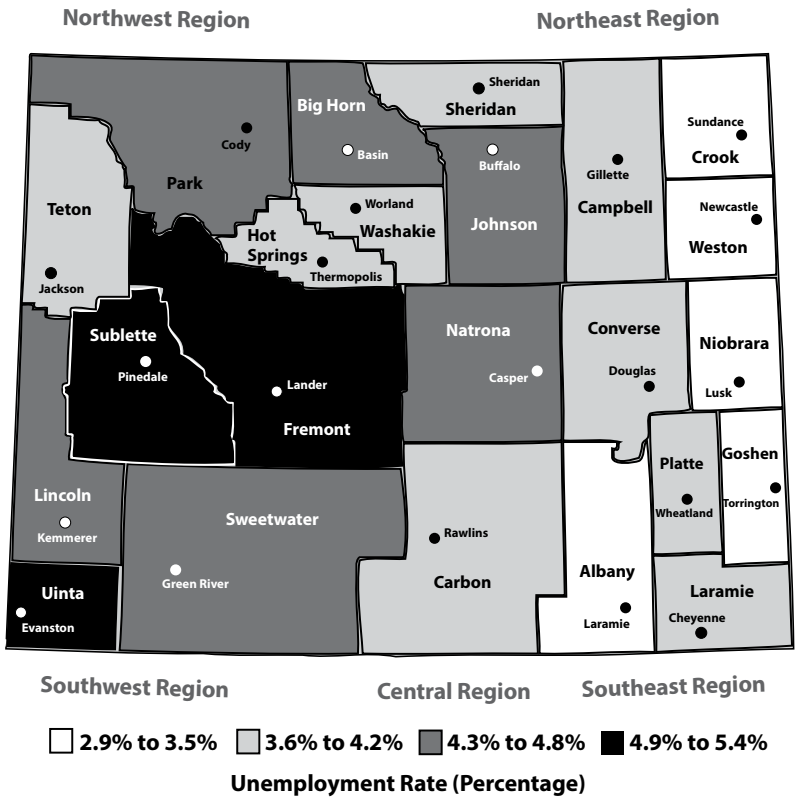
As the economy evolves and new knowledge becomes available, readers are encouraged to continue following news releases and other reports produced by R&P (found at http://doe.state.wy.us/LMI/).

1 Burke, J. (2007). *Connections*. New York: Simon & Schuster Paperbacks.

Editor's Note

- **This special issue of *Trends* includes a workforce planning report. The regular monthly and quarterly tables and figures can be found online at http://doe.state.wy.us/LMI/trends/0416/toc.htm.**

Unemployment Rate by Wyoming County, 2015 Annual Average (Not Seasonally Adjusted)



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Wyoming Labor Force Trends

A monthly publication of the Wyoming Department of Workforce Services,
John Cox, Director

Research & Planning
P.O. Box 2760
Casper, WY 82602-2760
dws-researchplanning@wyo.gov
307-473-3807

Tom Gallagher, Manager

Tony Glover, Workforce Information Supervisor

Carola Cowan, Bureau of Labor Statistics Programs Supervisor

Michael Moore, Editor

Editorial Committee: David Bullard, Valerie A. Davis, Katelynd Faler, Matthew Halama, Patrick Harris, Christine McGrath, Lynae Mohondro, and Michael Moore

Contributors to *Wyoming Labor Force Trends* this month: David Bullard, Carola Cowan, Katelynd Faler, Tom Gallagher, Patrick Harris, Lisa Knapp, Patrick Manning, Lynae Mohondro, Michael Moore, and Sherry Wen.

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Mission statement available at: http://doe.state.wy.us/LMI/mission.pdf.

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Chapter 1: Economic Analysis

by: Tom Gallagher, Research & Planning Manager

The primary sources of revenue for the state of Wyoming are minerals-based severance tax, and sales and use tax relating to purchases by the minerals industry. Property taxes supporting local government are driven by the value of minerals and the labor needed to extract, process, and ship minerals to market. Much, but not all, of the remainder of economic value in the state supports this infrastructure. The key to long-term trends (more than five years) in the demand for labor and the short-term abrupt changes in demand can be related directly to the prices of oil, natural gas, coal, and other less important minerals.

In the fall of 2015, Wyoming's economy was exposed to a substantial decline in the prices of oil, an extended period of low natural gas prices, and the erosion in the price of coal. The abrupt change in oil prices is driven largely by world policy choices in the Middle East, while an oversupply of gas is a function of deploying new extraction technology on this continent. Low gas prices compete with coal as the source of fuel for electrical generation while public utilities foster economic development through production cost control in the form of smart technologies, other conservation measures, and the adoption of renewable energy strategies. Energy, it has been observed, is the ultimate currency since it makes all else cheap. This makes a cheap energy policy an attractive national policy.

While the recent dramatic decrease in oil prices and the developing reduction in the demand for other carbon-based fuels drove the demand for labor in mining sharply downward beginning in the early spring of 2015, it also appears that the structure of demand for these commodities has made an historic turn affecting the long-run future trend for labor. Occupational projections, usually the mainstay of workforce demand planning analysis, are based on historic trends spanning several years although often, greater weight is assigned to more recent observations. The most recent long-term projections for Wyoming (http://doe.state.wy.us/LMI/projections.htm) were posted in June of 2015 using the most reliable data available through the end of fourth quarter 2014 (2014Q4). Consequently, the current long-term occupational projections are unrepresentative of the present demand for labor and are unlikely to reflect the scale of demand at any point during the foreseeable future. Much of the analysis presented in this publication reflects how commodities prices are likely to depress the demand for labor below the most recently published projections, and where we might turn instead to find opportunities for workers in the labor market.

Various sources of labor market data are available for analysis. The most recent data points for many of these sources end in mid-summer, or early fall of 2015. In 2015Q1, mining paid $1 of every $5 in total covered Unemployment Insurance (UI) wage and salary compensation in Wyoming (Bullard, 2015). Given the scope of its base export value, and the limited number of other exports from Wyoming, the movement of minerals commodities prices and the response of labor demand to those prices are significant events for Wyoming. Due in large part to collapsing oil prices, the total UI covered payroll for

mining in Wyoming declined by 11.6% in 2015Q2 compared to the same quarter one year earlier.

The 2015Q2 rate of payroll decline is comparable to the steep decrease in payroll over the period of the coal bed methane collapse from 2009Q1 through 2010Q1, and is much steeper than the decrease which took place during the four quarters beginning in 2012Q3. More recent estimates place job loss (by place of work) at 18.2%, or by 5,000, on a September 2014 to September 2015 basis in the mining industry (http://www.bls.gov/eag/eag.wy.htm). Given the failure to identify a point in time when supply and demand drive oil prices upward, an abundance of natural gas, and changing utility strategies relating to electricity supply, it is clearly not certain that employment in mining will return to 2014 levels within the next few years. Rather, the commodities market strongly suggests that the demand for labor will decline further during the period in the mining industry and consequently in other industries.

This analysis uses the rise and collapse of the coal bed methane episode to draw a limited number of parallels to the 2016-2020 period. However, there are notable exceptions described in each section of the sector analysis which follows. Over all, a significant difference between the current economic situation, compared to the coal bed methane period of rapid expansion and contraction, is the functioning of the national economy. While employment in many states lags behind the national growth in employment, several of Wyoming's surrounding states have seen extended periods of employment growth in the 2.5% to 3.5% range. This may explain why fewer than 1,000 persons were claiming UI benefits in September against an employer in the oil and gas industry. In other words, while employment declined on a September to September basis by 5,000 jobs, only one in four of those jobs lost produced an individual claiming unemployment benefits. It may be that some who lost their jobs in mining in Wyoming have taken jobs in fast growth states in the region.

Figure 1.1 (see page 5) depicts the history of employment growth and decline for most of the last decade through 2015Q2, along with hypothetical growth scenarios through 2020. During 2006, UI covered employment growth for all industries grew at a rate of 4.6% to 5.1% on an over-the-year basis per calendar quarter. (Employment growth in mining ranged between 14.9% and 18.2% in 2006.) As natural gas prices began to fall later in the decade, employment declined between 1.0% and 6.3% each quarter during 2009, with employment in mining declining at double-digit rates. Mathematically, substantial decline has a higher probability given a preceding high rate of growth. The downturn of 2009 was not possible without the rapid growth preceding it.

A slow return to growth began in 2010Q1. Most quarters exhibited a growth rate of less than 2%, which led to an employment level in 2014Q3 of 291,299 jobs, or just below the 293,901 count of UI covered jobs in 2008Q3. At this point, given the recent oil price decline, there is no econometric model that convincingly captures the impact of lower oil prices.

The historic evidence suggests that the precipitous decline experienced during the coal bed methane downturn is mathematically unreasonable. That does

not make the future of the labor market clearly discernable. For this reason, we have plotted two rates of change across the time line in order to describe the likely parameters for employment change across the near-term future. Certainly, the history of expansion and contraction and the available evidence relating to the most likely global growth forecasts and the factors driving petroleum supply suggest that with a few notable exceptions, the most reasonable rate of near-term future change is negative.

Each data point of supply and demand used in this analysis is constantly changing. Data components are measured weekly, monthly, quarterly, and sometimes less often. As these measures of supply and demand become available, they are published in news releases (http://doe.state.wy.us/LMI/news.htm) or in full, or as product announcements in *Wyoming Labor Force Trends* (http://doe.state.wy.us/LMI/trends.htm). The reader may choose to follow published updates and apply their impact to the course of analysis presented here over the 2016-2020 period.

Every labor market analysis errs. The questions are: whether or not the underlying economic and demographic assumptions are largely sound, and whether or not the producer and consumer of the analysis exercises due diligence in monitoring the market outlook. The economic and demographic analysis presented here represents one step in a longer term process and serves as one vehicle to generate information from other reliable sources such as employers, labor, academia, members of the media, and the public as a whole.

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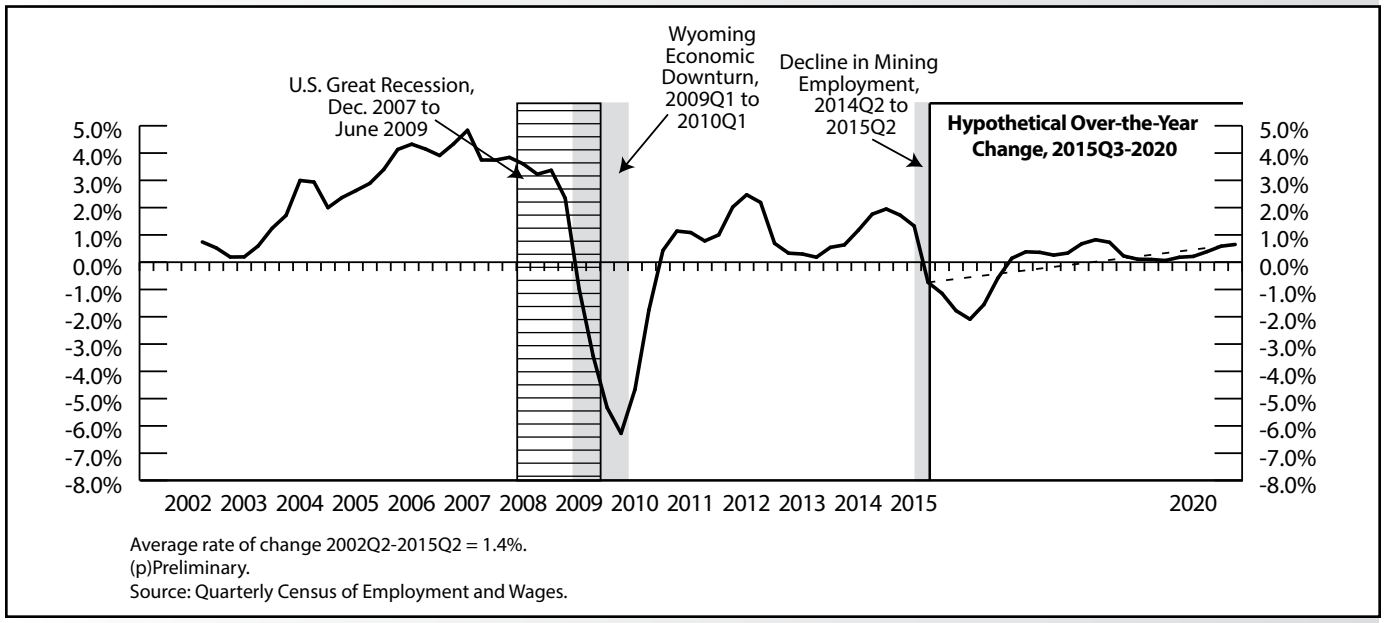


Figure 1.1: Over-the-Year Percentage Change in Average Monthly Employment for Wyoming by Year and Quarter, 2002Q2 to 2015Q2

Chapter 2: Global Demand for Oil, Gas, and Coal

by: Patrick Manning, Principal Economist

Mining is a major economic engine of the Wyoming economy, both in direct employment and all industries that stem from this activity (e.g. transportation, food service, accommodation, etc.). Coal and oil/natural gas are the predominant drivers. Therefore, market conditions for these three commodities are very important to the Wyoming economy in terms of employment, gross state product, and government revenue.

This chapter discusses the current situation and short-term forecasts for these three commodities. Most price series in this section are presented nominally, meaning the value of a good or service at the time of measurement. For more information on nominal and real prices, see Research & Planning's article on wage progression at http://doe.state.wy.us/LMI/trends/0812/a1.htm.

Crude Oil

Crude oil reached lows of less than $50 per barrel in August 2015. The two major benchmark crude oil price series are West Texas Intermediate (WTI) and Europe Brent; both had an average monthly price of $42.82 in August 2015, and have largely hovered at less than $50 per barrel since. Figure 2.1 displays the historic prices from January 2005 through September 2015 for West Texas Intermediate (WTI), Brent, and OPEC (the three major benchmark price series) as well as the first purchase price in Wyoming.

Figure 2.1 also shows forecasted prices for October 2015 through December 2016 for the WTI and Brent benchmarks (EIA, 2015c).

The U.S. Energy Information Agency (EIA) forecasts prices out to 2040 using the WTI and Brent benchmark prices (EIA, 2014a; see Figure 2.2, page 7) in both nominal and

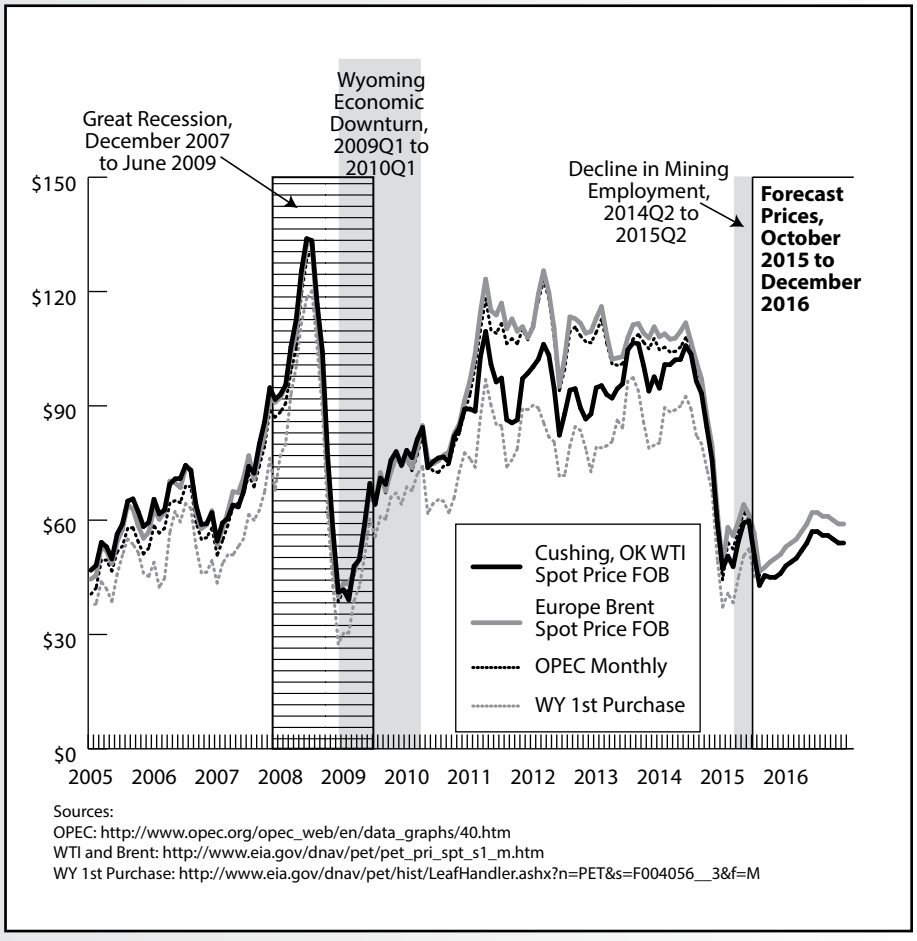
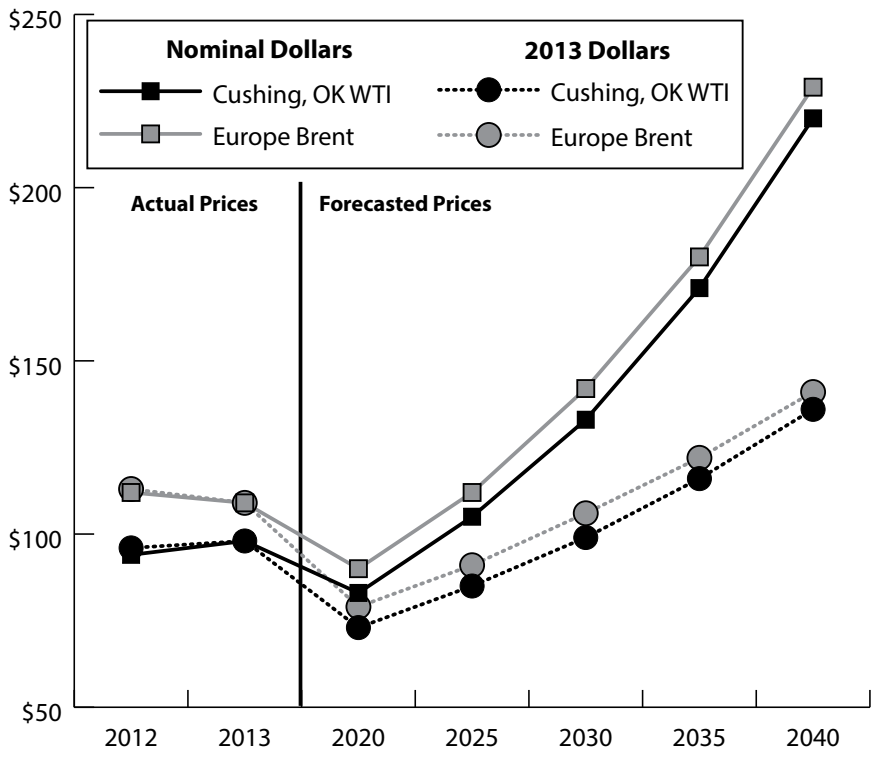


Figure 2.1: Price of Crude Oil Per Barrel in U.S. Dollars, January 2005 to December 2016

real prices. The EIA used an average GDP chain-type price index of 1.8% for the period 2013 through 2040. The nominal prices increase at a faster rate because the nominal price includes inflationary effects as well as the increase in real oil prices. For example, the forecasted nominal WTI price increases 124.5% from 2013 to 2040, while the real (inflation-adjusted) increase is 38.8%.

The Wyoming Consensus Revenue Estimating Group (CREG) stated that Wyoming crude oil is expected to continue to trade at a $7 to $10 discount to the WTI (CREG, 2015). CREG estimates that production will drop from 83 million barrels to 65 million from 2015 to 2020. Oil prices are forecast to reach $55 per barrel in 2018 and maintain this price through 2020.

Even assuming a Wyoming discount of up to $10 per barrel, the CREG forecast compared to the EIA forecast (nominal price) differs in 2020 by $18 per barrel. This difference demonstrates the uncertainty surrounding the forecasting of the crude oil market, especially in the long term.



Source: U.S. Energy Information Administration (http://www.eia.gov/forecasts/aeo/).

Figure 2.2: **Forecasted Oil Prices in U.S. Dollars per Barrel, 2012-2040**

Current global oil supply/ demand situation

In many ways, oil-export dependent economies around the world are facing similar economic issues as Wyoming. The International Monetary Fund (IMF) released projections on October 21, 2015, stating that "the Middle East, North Africa, Afghanistan, and Pakistan region as a whole continues to see subdued growth, owing to spreading and deepening regional conflict as well as lower oil prices" (IMF, 2015a). The report emphasizes that "the region's current circumstances make economic diversification away from oil all the more urgent, as low oil prices are likely to persist." This region also faces the challenge of creating jobs for more than 10 million people who are anticipated to be looking for work by 2020.

New sources of supply include the expiring export ban on Iranian oil and the U.S. Bipartisan Budget Act of 2015. While the U.S. is planning to release oil from the Strategic Petroleum Reserve starting with 5 million barrels during fiscal year 2018 and increasing to 10 million barrels in fiscal year 2025, this pales in comparison to the estimated amount of production Iran is capable

of once the export ban is lifted. Iranian oil minister Namder Zanganeh stated that "we will reach to a figure between 3.8 and 3.9 million barrels a day." To put this in perspective, Saudi Arabia – the world's largest producer – pumps about 10.5 million barrels per day (Philips and Motevalli, 2015). Using 2013 data, global consumption amounted to slightly over 99 million barrels per day (EIA, 2014a).

In addition to the ample supply of oil worldwide, global demand for these commodities has been relatively weak in the past several years and economic growth is expected to remain lower than historic long-term trends. According to the IEA:

> "Unlike earlier price drops, this one is both supply- and demand-driven, with record non-OPEC supply growth in 2014 providing only one of the factors behind it, unexpectedly weak demand growth another. On the supply side, U.S. light, tight oil (LTO) extraction technologies, which at the time of the previous market correction barely registered as a source of production, have unlocked a vast resource that long seemed off-limits, and have profoundly upended the traditional division of labor between OPEC and non-OPEC [nations]. The latest price drop is also occurring at a time when the dynamics of global demand and the place of oil in the fuel mix are undergoing dramatic change …
>
> "Emerging economies – China chief among them – which 10 years ago seemed an unstoppable engine of near-vertical demand growth have entered a new, less oil-intensive stage of development. The global economy, reshaped by the information technology revolution, has generally become less fuel intensive" (OECD/IEA, 2015).

With the supply of oil likely to grow and despite the decline in potential growth in many of the world's energy exporters over the next several years (Aslam, et al., 2015), most forecasts indicate crude oil prices will likely increase only slightly, at least in the short term.

Changing Dynamics of U.S. Energy Production

Historically, coal has been the major fuel used in electricity production in the United States. However, natural gas has recently overtaken coal as the leading source of fuel for electricity production.

This is largely due to two factors: the relative price of natural gas compared to coal and stricter emission standards (EPA, 2014) which can be achieved more easily through the use of natural gas. Many utility companies are replacing or retro-fitting coal-fired power plants with natural gas fueled plants (PacifiCorp, 2015 and Mohave Daily News, 2015).

EIA's April 2015 data shows that for the first time, natural gas (31.5%) was the leading fuel utilized in total electric generation, followed by coal (30%; Penn State Extension, 2015). This is a substantial shift; in 2013, electrical generation by fuel in percentage terms were: coal (39%), natural gas (27%), nuclear (19%), and renewable sources (13%; EIA, 2015a). The EIA forecasts that in 2040, generation by fuel source will

be: coal (34%), natural gas (31%), nuclear (16%), and renewable sources (18%). However, the EIA states that "considerable variation in the fuel mix results when fuel prices or economic conditions differ from those in the reference case." The EIA may not have anticipated the price differential and regulatory requirements that are driving the shift from coal to natural gas.

Coal

The coal industry hopes to mitigate decreased domestic demand with increased exports to China and other areas. However, decreased overseas demand (Storrow, 2014) and challenges from environmental groups and other affected parties (Storrow, 2014 and Bagley, 2015) have dampened the prospect of these export opportunities. In the October 2015 CREG forecast, prices received are expected to remain constant from 2015 through 2020 at $13.50 per ton, while production is expected to drop from 375 million tons to 360 million (CREG, 2015).

Natural gas

Natural gas has many uses, including electricity production, home and commercial heating, and as a transportation fuel, among others. Approximately half of U.S. households use natural gas as their main heating fuel (Friedman, 2015). Unlike the markets for oil and coal, the demand for natural gas is at record levels (CREG, 2015). Therefore, the low prices are largely due to new sources of supply. According to Friedman (2015):

> "The North American natural-gas market has been mired in a supply glut for years amid robust output. Companies continue to grow more efficient at extracting the fuel from shale rocks in Pennsylvania, Texas and elsewhere, and they're able to maintain production even as gas prices plumb three-year lows."
> … and On October 26, 2015, "November natural gas slid 22.4 cents, or 9.8% to 2.062 million British thermal units on the New York Mercantile Exchange, the lowest close since April 2012."

The changing patterns of consumption and production nationally of natural gas will necessitate changing distribution patterns, such as pipeline realignment (EIA, 2015). For example, Pennsylvania produced and marketed 2.4 times more natural gas than Wyoming in calendar year 2014. In contrast, just five years earlier in calendar year 2009, Wyoming produced 8.5 times more natural gas than Pennsylvania (CREG, 2015). Natural gas was selling for $2.74 per metric cubic foot in September 2015. The EIA forecasts that this price will increase to $3.45 by the end of 2016.

Renewable fuels

Two of the driving factors in the growth of the use of renewable fuels are the effort to reduce emissions and to satisfy the renewable portfolio (fuel) standards adopted by some states. For example, California hopes to meet its electricity needs by using 33% renewable fuels by 2020 (California Energy Commission, 2015).

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Chapter 3: What Does Wyoming's Unemployment Rate Really Mean?

by: Carola Cowan, BLS Programs Supervisor, and David Bullard, Senior Economist

Wyoming's average annual unemployment rate for 2015 was 4.2%, up slightly from 4.1% in 2014 (not a significant change). This chapter explains how Wyoming's unemployment rate remained relatively low in 2015, even with large job losses in Wyoming's mining sector.

The Current Population Survey (CPS) is a monthly survey of households that the U.S. Census Bureau conducts in each state for the Bureau of Labor Statistics. Reviewing the detailed data underlying the total estimate of unemployment can provide clues as to the functioning of Wyoming's labor market.

The drop in crude oil prices has caused job losses in the mining and related sectors, but these job losses don't seem to be reflected in Wyoming's unemployment rate in 2015. In order to be counted as unemployed in Wyoming, a worker has to reside in the state and must be available to work and actively looking for a job. Detailed tabulations from the CPS for Wyoming can help provide some insight as to why Wyoming's unemployment rate remains low.

Data collected from the CPS include reasons why civilians are not in the labor force, reasons for unemployment, duration of unemployment, and full- and part-time work status. Due to the small Wyoming sample for the CPS, the data lack reliability on a monthly basis. Therefore, this chapter begins with a look at annual average data (12 months of labor force estimates divided by 12). Generalized sampling error information for the CPS annual average data for states can be found in appendix tables B-4 and B-5 of the Geographic Profile bulletin at http://www.bls.gov/opub/gp/gpapndb.htm. Additional limitations of state data from the CPS can be found at http://www.bls.gov/gps/notescps.htm. The data used in this chapter are unofficial, unpublished estimates from the CPS.

Wyoming's Average Annual Unemployment Rate

2014: 4.1% **2015:** 4.2%

The labor force is the sum of employed and unemployed persons. People who are not in the labor force are those who do not have a job and are not looking for one. The unemployment rate is calculated by dividing the number of unemployed by the labor force. Therefore, if people leave Wyoming's labor force, the unemployment rate might not drop as much as job losses would suggest. People might leave Wyoming's labor force by moving out of state or by losing their job and not looking for a new one.

The CPS collects five reasons for unemployment (Bureau of Labor Statistics, 2006):

- *Job losers* include persons on temporary layoff, meaning they expect to return to work within six months, and *permanent job losers*, whose employment ended involuntarily and who began looking for work. In most cases, unemployment insurance (UI) claimants would be in the job loser category.

- *Job leavers* are persons who voluntarily quit their job and started

looking for a new job.

- Persons who completed temporary jobs, and started looking for a new job when their previous job ended.
- *Reentrants* are persons who previously worked but who were out of the labor force prior to beginning their job search.
- *New entrants* are persons who have never worked.

Table 3.1 shows that on an annual average basis, the number of job losers increased from 4,800 to 5,600 from 2014 to 2015. Of those, 2,800 were permanent job losers in 2014. In 2015 this number rose to 3,400. These data are consistent with reports of layoffs in Wyoming's oil & gas sector.

The number of entrants into the labor force was down from 5,400 in 2014 to 3,700 in 2015. This includes new entrants and reentrants.

Some individuals may be delaying entry or reentry into Wyoming's labor market because they believe that there are few jobs available. Thus, while a downturn in the state's economy can cause an increase in one component of unemployment (job losers), it may also be associated with decreases in other components (e.g. entrants). Additionally, some job losers may have moved to other states and no longer count in Wyoming's labor force.

In contrast to Table 3.1, which shows averages for 12 months of 2014 and 2015, Table 3.2 focuses on the fourth quarter (October, November, and December). From fourth quarter 2014 (2014Q4) to fourth quarter 2015 (2015Q4), the estimated number of unemployed rose from 12,400 to 14,300, an increase of 1,900 people (15.3%). The number of unemployed individuals classified as job losers rose by 48.0%, while the number of job leavers (-4.5%) and entrants (-7.7%) decreased.

Figure 3.1 (see page 14) illustrates the data in a bar chart and shows that the largest increase from 2014Q4 to 2015Q4 was in the job loser category. This is consistent with a large increase in unemployment insurance (UI) claims in Wyoming. The number of continued UI weeks claimed rose from 19,747 in December 2014 to 27,479 in December 2015, an increase of 39.2% (Research & Planning, 2016).

In conclusion, it is widely known that the decrease

(Text continued on page 14)

Table 3.1: Unemployed Persons by Reason for Unemployment in Wyoming, 2014 and 2015 Annual Averages

	2014	2015	Change	% Change
Total Unemployed	**13,500**	**12,500**	**-1,000**	**-7.4%**
Job Losers	4,800	5,600	800	16.7%
Permanent Job Losers	2,800	3,400	600	21.4%
Job Leavers	2,100	1,800	-300	-14.3%
Entrants	5,400	3,700	-1,700	-31.5%
Reentrants	4,500	3,200	-1,300	-28.9%
New Entrants	900	500	-400	-44.4%

Source: Current Population Survey, unpublished data.

Table 3.2: Unemployed Persons by Reason for Unemployment in Wyoming, Fourth Quarter 2014 (2014Q4) and Fourth Quarter 2015 (2015Q4)

	2014	2015	Change	% Change
Total Unemployed	**12,400**	**14,300**	**1,900**	**15.3%**
Job Losers	5,000	7,400	2,400	48.0%
Permanent Job Losers	2,100	3,700	1,600	76.2%
Job Leavers	2,200	2,100	-100	-4.5%
Entrants	5,200	4,800	-400	-7.7%
Reentrants	4,500	4,200	-300	-6.7%
New Entrants	700	600	-100	-14.3%

Source: Current Population Survey, unpublished data.

Unemployment Update: February 2016

by: David Bullard, Senior Economist

Wyoming's seasonally adjusted[1] unemployment rate increased significantly from 3.8% in February 2015 to 5.0% in February 2016. This was slightly higher than the U.S. unemployment rate of 4.9% in February 2016 (Bullard, 2016).

As shown in the Map, Wyoming was one of only nine states that experienced an increase in its seasonally adjusted unemployment rate from February 2015 to February 2016.

In February 2016, unemployment rates were higher than a year earlier in 21 counties and lower in two counties. The largest over-the-year increases were seen in Natrona (up from 4.2% to 7.2%), Campbell (up from 3.6% to 6.3%), Converse (up from 3.4% to 5.8%), Fremont (up from 5.8% to 8.1%), and Sweetwater (up from 4.5% to 6.0%) counties. Unemployment rates fell in Teton (down from 3.7% to 3.0%) and Albany (down from 3.3% to 3.1%) counties.

The lowest unemployment rates were found in Teton (3.0%), Albany (3.1%), and Niobrara (3.5%) counties. The highest unemployment rates occurred in Fremont (8.1%), Natrona (7.2%), and Johnson (7.0%) counties.

For more information, see http://doe.state.wy.us/LMI/news.htm.

Reference

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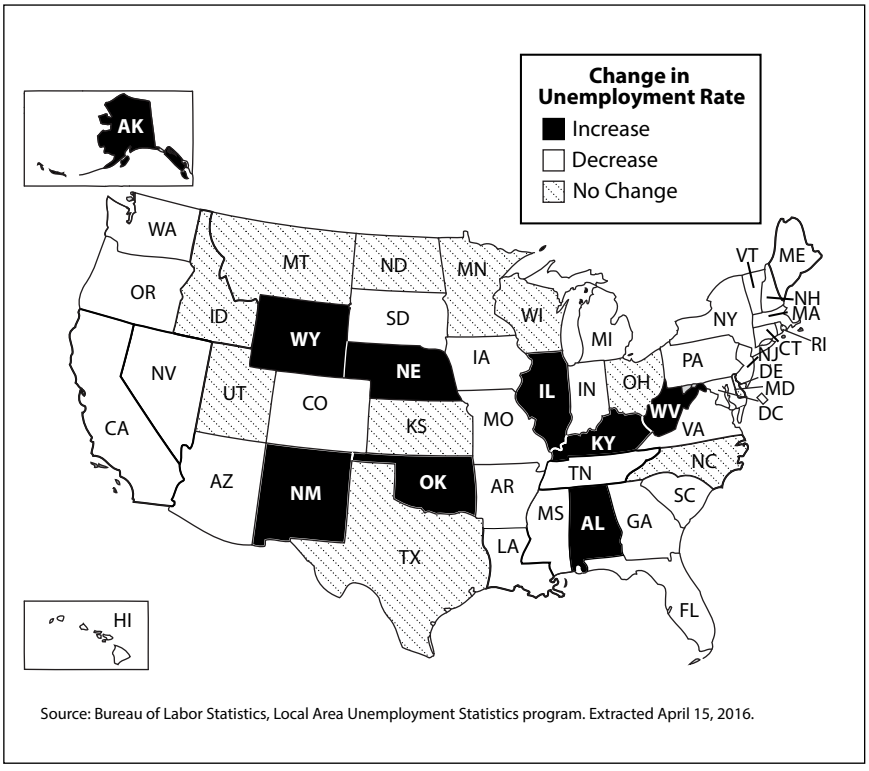


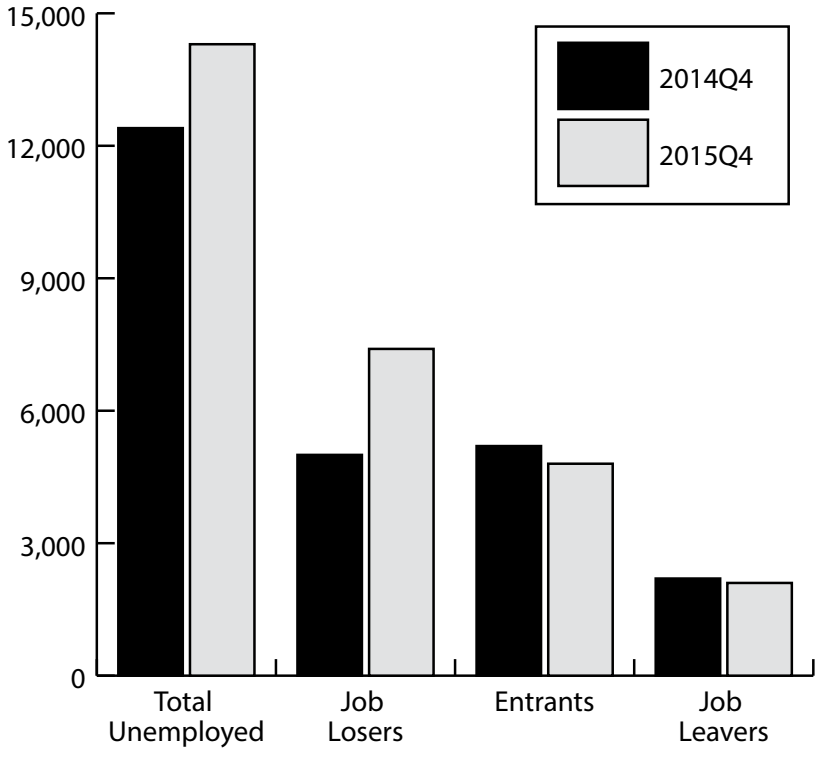
Source: Bureau of Labor Statistics, Local Area Unemployment Statistics program. Extracted April 15, 2016.

Map: **Over-the-Year Change in Seasonally Adjusted Unemployment Rate by State, February 2015 to February 2016**

1 Seasonal adjustment is a statistical procedure to remove the impact of normal regularly recurring events (such as weather, major holidays, and the opening and closing of schools) from economic time series to better understand changes in economic conditions from month to month.

(Text continued from page 12)

in crude oil prices in 2015 contributed to large job losses in Wyoming's energy sector. However, these job losses did not directly translate into an increase in the state's unemployment rate, because the increase in job losers was partially offset by a decline in entrants. Even when the unemployment rate remains stable over time, the underlying components (job losers, entrants, and job leavers) can change dramatically, and changes in these components provide valuable clues as to the health of Wyoming's labor market. The analysis presented in this article also supports the notion that similar unemployment rates can mean different things at different times in the business cycle. Individuals or programs that rely exclusively on a state's unemployment rate as a measure of its economic condition face many risks, including completely misunderstanding the direction of the state's economy (NASWA, 2015). All data users would be well-advised to review a cross-section of economic indicators when evaluating a state's economy.



Source: Current Population Survey, unpublished data.

Figure 3.1: **Unemployed Persons by Reason for Unemployment in Wyoming, Fourth Quarter 2014 (2014Q4) and Fourth Quarter 2015 (2015Q4)**

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Chapter 4: Initial Unemployment Insurance Claims Increase 22.9% in 2015

by: Sherry Wen, Principal Economist

Wyoming's unemployment insurance claims have historically been correlated to oil, gas, and coal prices. Low energy prices have persisted for more than a year, leading to questions about Wyoming's economic future. This chapter describes the 2015 trends in unemployment insurance (UI) claims data and compares them to the previous downturn of 2009.

Over the last decade, Wyoming has experienced two periods of economic downturn: first quarter 2009 (2009Q1) to first quarter 2010 (2010Q1) and second quarter 2015 (2015Q2) to present. For the purposes of this article, a *downturn* is defined as "a period of at least two consecutive quarters when Wyoming experienced an over-the-year decrease in total wages, average monthly employment, and average weekly wage" (Moore, 2016). In this article, the term previous downturn refers to the period of 2009Q1 to 2010Q1, while the term most recent downturn refers to the period that began in 2015Q2.

In 2015, Wyoming had 25,447 new initial unemployment insurance (UI) claims – an increase of 4,739 (22.9%) from 2014. New initial claims represent the number of workers who experienced job loss in 2015 and applied for UI benefits. As shown in Figure 4.1, the number of initial claims in Wyoming mostly decreased from prior-year levels from 2010Q1 to 2014Q4. During each quarter of 2015, the number of initial claims increased compared to the same quarter in 2014. However, the increase in claims in 2015 was much smaller than the increase that occurred in 2009. The decreased demand for natural resources and lower energy prices did not result in as many job losses in 2015 as in 2009.

From 2014 to 2015, 13 industries experienced an increase in new initial claims, while seven experienced a decrease. As shown in Table 4.1 (see page 16), the most substantial over-the-year increase was seen in the mining sector (2,956 more initial claims from 2014 to 2015, or 209.1%). The majority of new initial claims in mining

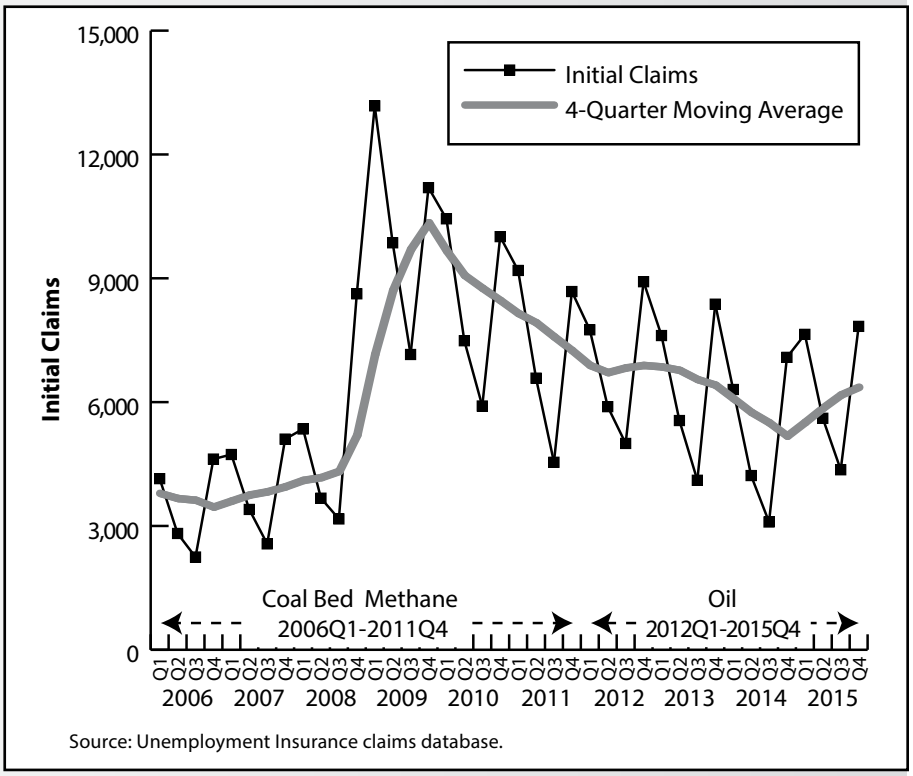

Figure 4.1: New Initial Unemployment Insurance (UI) Claims in Wyoming, 2006Q1 to 2015Q4

were in oil & natural gas in both 2009 and 2015 (87.1% and 91.5%, respectively), with coal mining comprising 4.4% in 2009 and 2.7% in 2015. An article discussing UI claims in Wyoming's mining sector can be found in the March 2016 issue of *Wyoming Labor Force Trends* at http://doe.state.wy.us/LMI/trends/0316/a1.htm.

Other industries that experienced significant increases in new initial claims from 2014 to 2015 included real estate & rental & leasing services (89.8%, or 246 more claims) and transportation & warehousing (73.7%, or 567 more claims). These two sectors may have been indirectly impacted by lower energy prices due to their relation to the mining sector.

Industries that experienced double-digit decreases in new initial claims from 2014 to 2015 included agriculture (-25.7%, or 43 fewer claims); finance & insurance (-24.8%, or 59 fewer claims); health care & social assistance (-11.6%, or 162 fewer claims); arts, entertainment, & recreation (-11.4%, or 31 fewer claims); and accommodation & food services (-11.2%, 337 fewer claims).

In conclusion, lower prices for crude oil, natural gas, and coal contributed to more job losses and a contraction of Wyoming's economy in 2015 (Storrow, 2015). Current UI claims data indicate that the downturn from 2014 to 2015 was far less severe than the downturn from 2008 to 2009. However, it is uncertain whether these economic trends will continue, or whether they have hit their lowest point; this will be influenced by political changes and the international and domestic market supply and demand situation. Although UI claims have decreased over the last seven years, they have never returned to pre-2009 levels.

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Storrow, B. (2015, December 12). Wyoming one of four states with shrinking economy. *Casper Star-Tribune*. Retrieved March 22, 2016, from http://tinyurl.com/trib0316

Table 4.1: New Initial Unemployment Insurance (UI) Claims by Industry in Wyoming, 2014 to 2015

Industry	New Initial Claims 2015	2014	Change N	%
Agriculture	124	167	-43	-25.7%
Mining	4,370	1,414	2,956	209.1%
Utilities	42	45	-3	-6.7%
Construction	5,309	4,717	592	12.6%
Manufacturing	1,082	818	264	32.3%
Wholesale Trade	751	503	248	49.3%
Retail Trade	1,463	1,432	31	2.2%
Transportation & Warehousing	1,336	769	567	73.7%
Information	153	128	25	19.5%
Finance & Insurance	179	238	-59	-24.8%
Real Estate & Rental & Leasing	520	274	246	89.8%
Professional & Technical Services	677	489	188	38.4%
Mgmt. of Companies & Enterprises	10	10	0	0.0%
Administrative & Waste Services	1,086	1,055	31	2.9%
Educational Services	332	358	-26	-7.3%
Health Care & Social Assistance	1,229	1,391	-162	-11.6%
Arts, Entertainment, & Recreation	241	272	-31	-11.4%
Accommodation & Food Services	2,676	3,013	-337	-11.2%
Other Services (Exc. Public Admin.)	567	451	116	25.7%
Public Administration	597	573	24	4.2%
Nonclassified	2,703	2,591	112	4.3%
Total	**25,447**	**20,708**	**4,739**	**22.9%**

Source: Unemployment Insurance claims database.

Chapter 5: Wyoming Employment Growth Lags Behind Surrounding States

by: Michael Moore, Editor

Wyoming has a porous labor market and competes for labor with other states that have more complex economies. Some Wyoming residents commute to other states for work, and Wyoming employers rely on workers from other states to fill a relatively large number of jobs. Cowan and Bullard (2015) found that, during each quarter from 2012Q3 to 2013Q2, Wyoming residents commuted to a surrounding state in each quarter to work in retail trade (more than 2,500 in each quarter), accommodation & food services (approximately 2,500 in each quarter), health care & social assistance (nearly 2,500 in each quarter), and construction (approximately 2,000 in each quarter). This analysis is available online at http://doe.state.wy.us/LMI/trends/0415/a2.htm.

As shown in Table 5.1, Wyoming sectors such as construction, mining, and leisure & hospitality (tourism) are reliant on nonresident labor. For example, in 2014, 35.2% of the 41,831 individuals working in Wyoming's construction industry were nonresidents, as were 30.8% of the 53,676 individuals working in leisure & hospitality.

As illustrated in Figures 5.1 and 5.2 (see pages 18 and 19), in 2015 employment growth in Wyoming lagged behind the

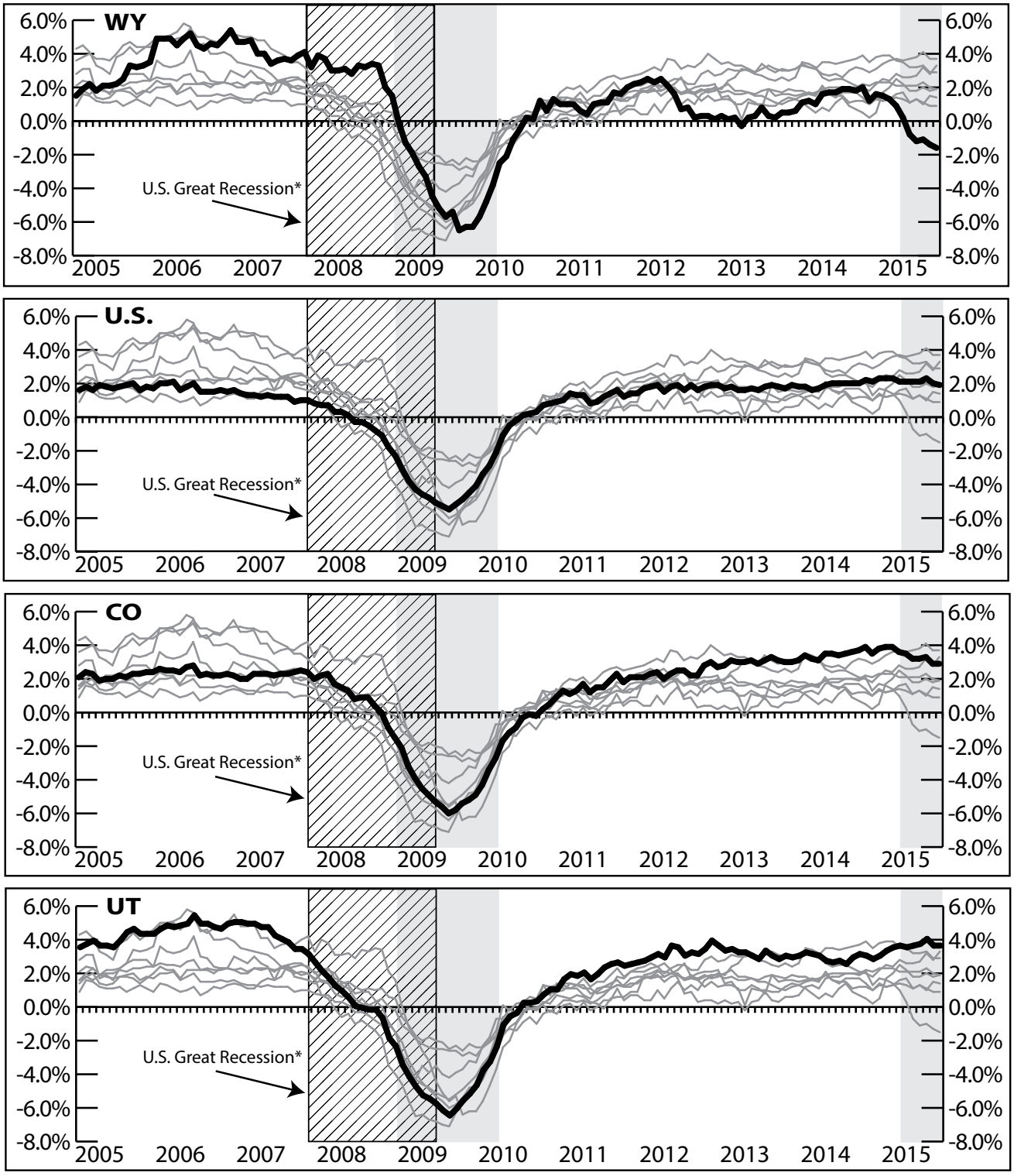
(Text continued on page 20)

Table 5.1: **Selected Characteristics of Persons Working in Wyoming at Any Time by Industry, 2014**

Industry	N	Percent: Age 55 and Older	Percent: Nonresidents[a]	Average Annual Wage
11 - Agriculture, Forestry, Fishing, & Hunting	3,756	23.5	22.1	$23,198
12 - Mining	34,423	16.1	16.5	$68,244
23 - Construction	41,831	11.9	35.2	$28,943
31,32 &,33 - Manufacturing	12,092	22.0	9.4	$50,282
42,48,49 &,22 - Wholesale Trade, Transportation, Utilities, & Warehousing	26,297	22.6	10.9	$48,146
44 & 45 - Retail Trade	41,123	17.2	14.0	$20,277
51 - Information	4,399	19.8	9.1	$37,827
52 & 53 - Financial Activities	13,131	23.5	8.3	$44,388
54 & 55 - Professional & Business Services	26,279	19.2	18.7	$35,543
61 - Educational Services	34,177	28.1	8.0	$35,080
62 - Health Services	35,050	21.4	7.6	$38,784
71 & 72 - Leisure & Hospitality	53,676	8.3	30.8	$11,817
81 - Other Services	9,564	19.8	14.2	$28,369
92 - Public Administration	30,706	25.5	6.2	$37,944
Total, All Industries	**366,504**	**18.4**	**17.1**	**$34,562**

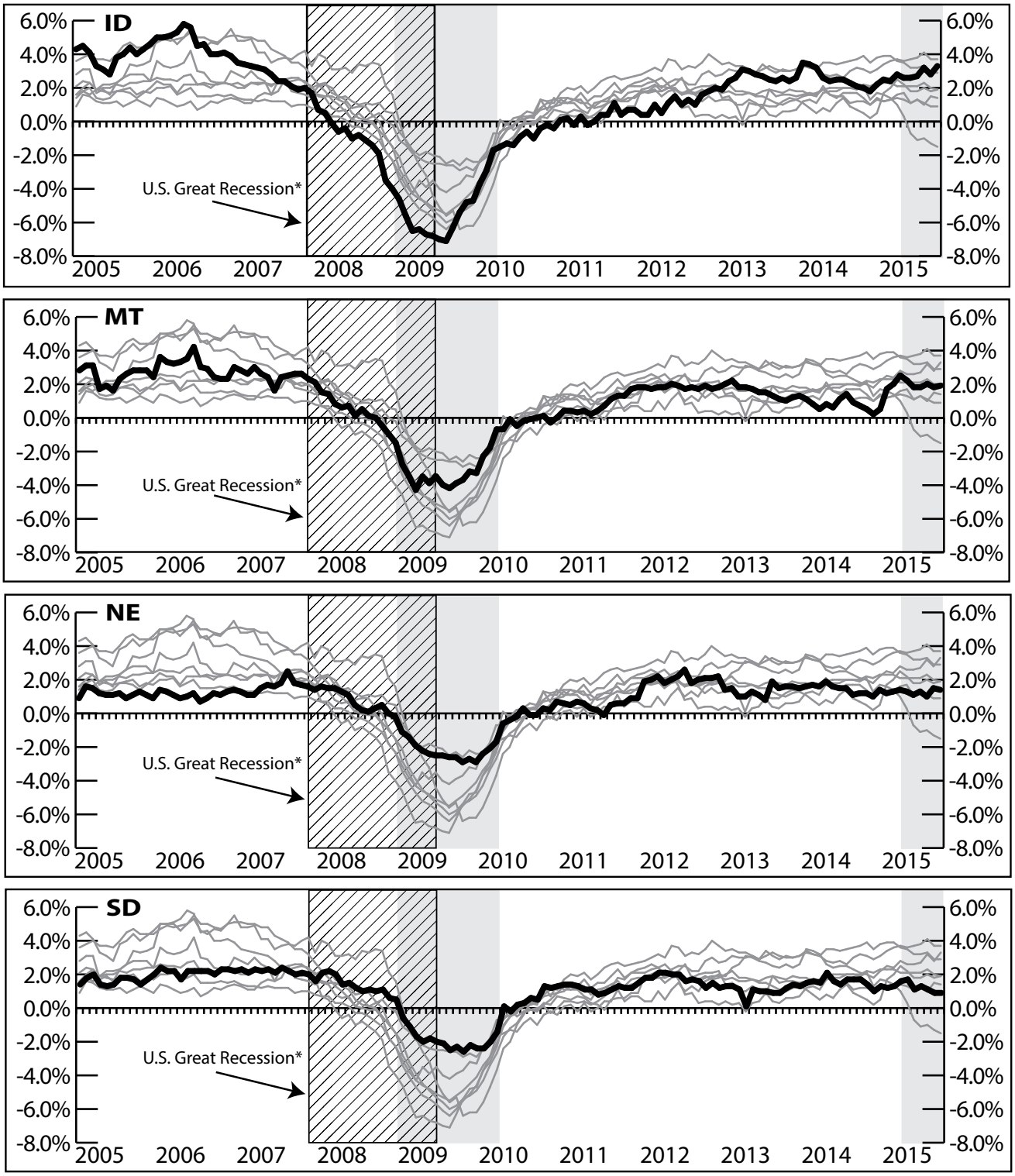
"[a]Nonresidents are individuals for whom demographic data could not be found in any of R&P's administrative databases, such as the driver's license file obtained through a memorandum of understanding with the Wyoming Department of Transportation."

Source: Research & Planning, WY DWS. Earnings in Wyoming by County, Age & Gender, 2000-2014 (http://doe.state.wy.us/LMI/earnings_tables/2015/index.htm).



*U.S. Great Recession: December 2007 to June 2009. Source: National Bureau of Economic Research.
Shaded areas indicate periods of economic downturn in Wyoming (2009Q1 to 2010Q1 and 2015Q2 to 2015Q3).
Source: U.S. Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages (QCEW).

Figure 5.1: Over-the-Year Percentage Change in Total Unemployment Insurance Covered Employment for Wyoming, Border States, and the U.S., January 2005 to September 2015



*U.S. Great Recession: December 2007 to June 2009. Source: National Bureau of Economic Research.
Shaded areas indicate periods of economic downturn in Wyoming (2009Q1 to 2010Q1 and 2015Q2 to 2015Q3).
Source: U.S. Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages (QCEW).

Figure 5.2: Over-the-Year Percentage Change in Total Unemployment Insurance Covered Employment for Wyoming, Border States, and the U.S., January 2005 to September 2015

(Text continued from page 17)

U.S., Colorado, Utah, Idaho, Montana, Nebraska, and South Dakota. During 2015Q3, employment growth for Colorado and Utah was nearly 4% from 2014Q2, while Wyoming's employment contracted by nearly 2%.

National and regional conditions during the economic slowdown that occurred in Wyoming from 2014Q2 to 2015Q2 were considerably different from those that occurred during the U.S. Great Recession from December 2007 to June 2009 and Wyoming's economic downturn that lasted from 2009Q1 to 2010Q1. As Figures 5.1 and 5.2 show, by the time Wyoming entered into its economic downturn in 2009Q1, all of the surrounding states and the U.S. in general had already felt the effects of the Great Recession and experienced a decline in employment. During that time, Wyoming did not face much competition for labor from surrounding states.

However, in 2015Q2 and 2015Q3, all of Wyoming's surrounding states experienced over-the-year growth in employment. As previously explained in the introduction, even though employment in Wyoming's mining sector declined by approximately 5,000 jobs from September 2014 to September 2015, only one in four of those lost jobs produced an individual claiming UI benefits. Given the growth in surrounding states, it is possible that those who who lost jobs in Wyoming were able to find work in another state.

Chapter 6: Wyoming Employment and Sector Analyses

by: Research & Planning Staff

Because of Wyoming's dependence on oil, coal, and gas, the existing demand for labor relies heavily on commodity prices and production. Since the year 2000, there have been two large commodity price changes; the first during the latter half of the U.S. Great Recession, 2007 to 2009 and the second in late 2014 and early 2015 (see Figure 6.1, page 21). The over-the-year percentage change in average monthly employment in Wyoming, shown in Figure 1.1 (see page 5), closely follows the price of oil.

Table 6.1 (see page 21) shows the employment level for industry sectors that experienced a substantial decline in employment during the economic downturn from 2009Q1 to 2010Q1. The industries that experienced the largest decline in employment during this period were mining (-4,100 jobs, or 14.6%), construction (-2,591 jobs, or -11.6%), retail trade (-1,583 jobs, or -5.2%), and accommodation & food services (-1,466 jobs, or -5.1%). Mining (-3,196 jobs, or -11.8%) and construction (-913 jobs, or -3.7%) also experienced substantial declines from 2014Q2 to 2015Q2.

Not all industries experienced a decline in employment during the economic downturn of 2009Q1 to 2010Q1. As shown in Table 6.1, industries such as public administration, health care & social assistance, and educational services grew during the economic downturn of 2009Q1-2010Q1. During the period from 2014Q2 to 2015Q2, total employment in public administration declined slightly

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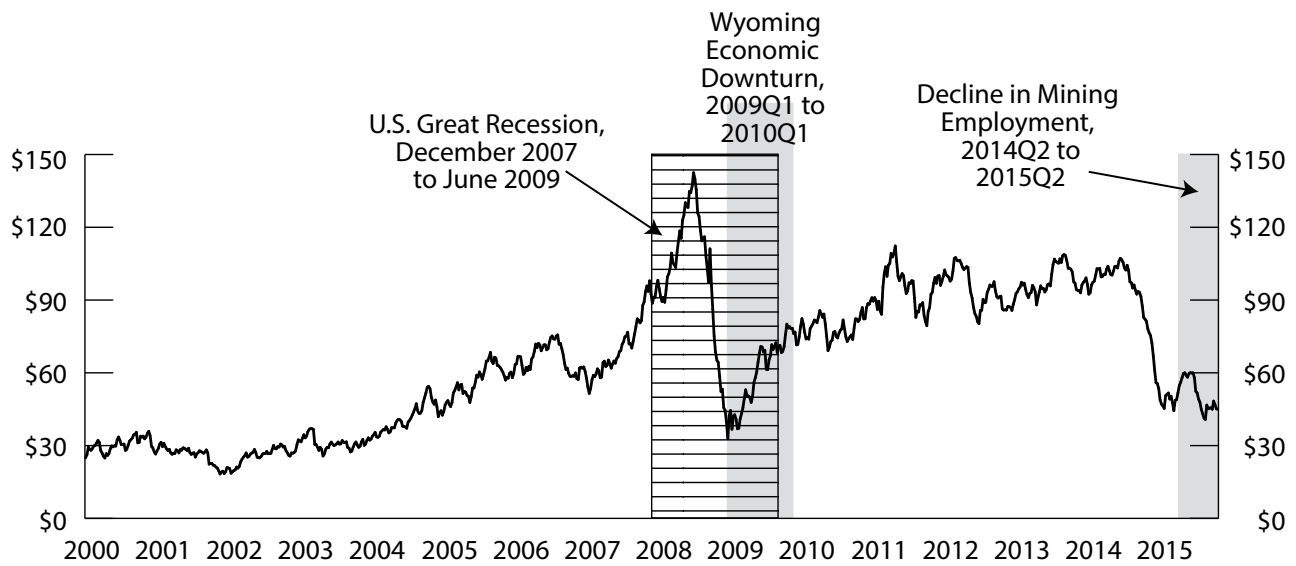


Source: Weekly Cushing, OK WTI Spot Price FOB (Dollars per Barrel).
U.S. Energy Information Administration (http://www.eia.gov/dnav/pet/hist/LeafHandler.ashx?n=pet&s=rwtc&f=w).

Figure 6.1: **Weekly Price of Oil in U.S. Dollars Per Barrel, January 2000 to October 2015**

Table 6.1: **Change in Average Monthly Employment During Periods of Economic Downturn in Wyoming by Industry, 2009Q1-2010Q1 and 2014Q2-2015Q2**

Industry	2009Q1	2010Q1	Change N	Change %	2014Q2	2015Q2	Change N	Change %
Agriculture, Forestry, Fishing & Hunting	2,063	2,113	50	2.4%	2,720	2,687	-32	-1.2%
Mining	28,114	24,014	-4,100	-14.6%	27,024	23,828	-3,196	-11.8%
Utilities	2,501	2,451	-50	-2.0%	2,493	2,540	47	1.9%
Construction	22,284	19,693	-2,591	-11.6%	24,437	23,523	-913	-3.7%
Manufacturing	9,277	8,479	-797	-8.6%	9,641	9,629	-13	-0.1%
Wholesale Trade	8,986	8,351	-635	-7.1%	9,522	9,589	68	0.7%
Retail Trade	30,323	28,740	-1,583	-5.2%	29,766	30,714	948	3.2%
Transportation & Warehousing	10,544	9,660	-883	-8.4%	11,360	11,428	68	0.6%
Information	3,982	3,886	-96	-2.4%	3,771	3,794	23	0.6%
Finance & Insurance	7,129	6,904	-225	-3.2%	6,764	6,808	44	0.6%
Real Estate & Rental & Leasing	4,177	3,810	-367	-8.8%	4,419	4,266	-153	-3.5%
Professional, Scientific, & Tech. Services	9,616	9,070	-546	-5.7%	9,523	9,291	-232	-2.4%
Mgmt. of Companies & Enterprises	751	858	107	14.2%	1,018	1,049	31	3.1%
Administrative & Support & Waste Management & Remediation Services	6,762	6,045	-717	-10.6%	8,149	8,316	166	2.0%
Educational Services	28,600	29,337	737	2.6%	29,793	29,901	108	0.4%
Health Care & Social Assistance	30,745	31,025	281	0.9%	32,853	33,156	304	0.9%
Arts, Entertainment, & Recreation	2,284	2,300	16	0.7%	3,052	3,241	189	6.2%
Accommodation & Food Services	28,704	27,238	-1,466	-5.1%	32,301	32,949	648	2.0%
Other Services (except Public Admin.)	8,269	7,628	-641	-7.7%	7,902	7,787	-114	-1.4%
Public Administration	28,359	29,126	768	2.7%	30,192	30,047	-145	-0.5%
Total, All Industries	**273,471**	**260,730**	**-12,741**	**-4.7%**	**286,699**	**284,545**	**-2,154**	**-0.8%**

Source: Quarterly Census of Employment and Wages (QCEW).

(Text continued from page 20)

and remained flat in health care & social assistance and educational services. These industries have an older workforce and R&P has demographic data for selected occupations for these industries.

Sector Analyses

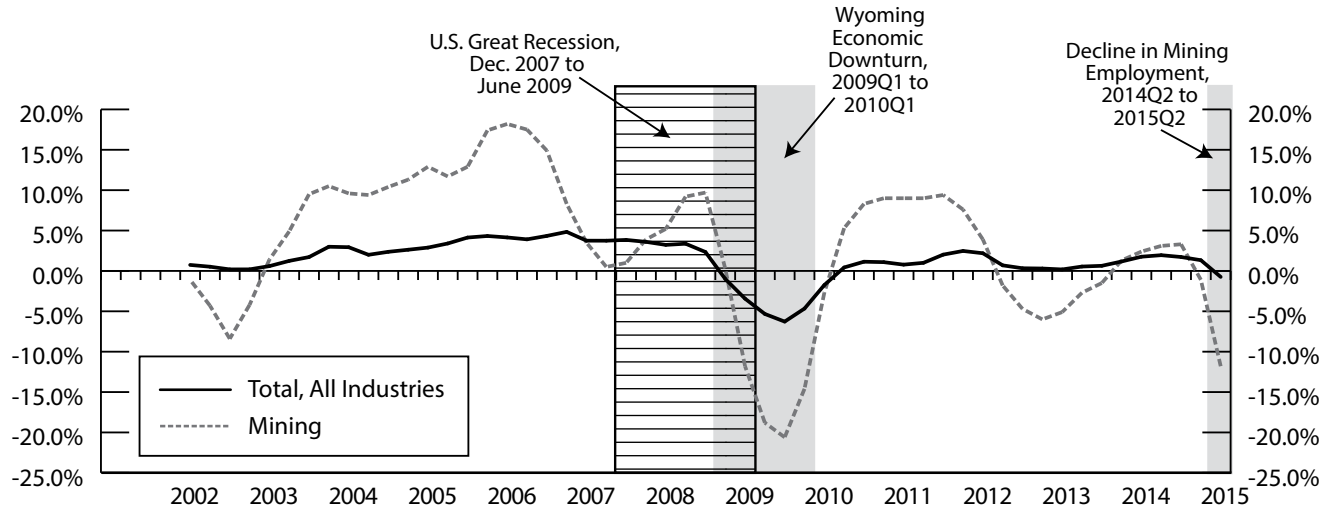
Mining

The natural resources and mining industry plays a significant role in Wyoming's economy. According to NAICS, the mining industry "comprises establishments that extract naturally occurring mineral solids, such as coal and ores: liquid minerals, such as crude petroleum; and gases, such as natural gas." (U.S. Census Bureau, n.d.).

The overall change in employment in Wyoming across all industries followed that of the mining sector. During the last economic downturn (2009Q1 to 2010Q1), mining experienced a 14.6% decrease in employment (see Table 6.1). Figure 6.2 shows the over-the-year employment change in mining which followed the same trend as total employment across all industries, though with substantially greater peaks and troughs. As mentioned in the introduction, the price of oil and coal experienced a substantial decline in the fall of 2015. Between 2014Q2 and 2015Q2, employment in mining experienced a decline of 3,196 jobs (11.8%), which was the largest percentage decline for any industry.

Construction

The construction sector, which represented about 9.0% of total Wyoming employment in 2014, includes "erecting buildings and other structures (including additions); heavy construction other than buildings; and alterations, reconstruction, installation, and maintenance and



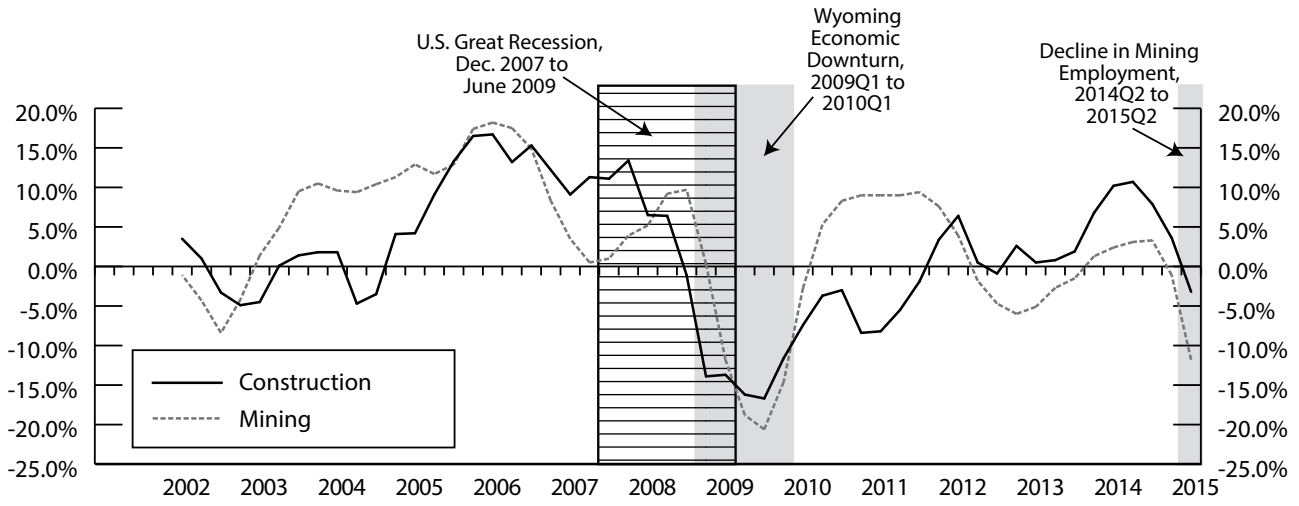
Average rate of change 2002Q2-2015Q2 = 1.4%.
(p)Preliminary.
Source: Quarterly Census of Employment and Wages.

Figure 6.2: **Over-the-Year Percentage Change in Average Monthly Employment for All Industries and Mining in Wyoming by Year and Quarter, 2002Q2 to 2015Q2**

repairs" (U.S. Census Bureau, n.d.). The nature of construction is highly seasonal, with employment peaking in the summer months. The long-term quarterly employment growth rate in construction is 1.2%. However, between 2005Q2 and 2008Q4, construction grew rapidly (9.8% per quarter) and then declined quickly between 2009Q1 and 2010Q1 at an average quarterly rate of -14.5% per quarter.

State and federal government are large players in total demand for construction. Between 2010 and 2026, the Wyoming Department of Transportation anticipates spending $5 billion on the Highway Improvement Program from its total of $9.88 billion in expected revenue; about half of the expected revenue may take the form of federal aid, but 25.4% of the remainder (or $1.24 billion) is projected to come from state sources, including "royalties and other severance taxes on oil, natural gas, and coal" (Wyoming Department of Transportation, 2010). An unanticipated decrease in commodity prices could result in lower-than-expected income from royalties and severance taxes, leaving fewer state dollars available for the Highway Improvement Program. As part of this construction sector analysis, this section will present historical construction employment data, review the changing demographics of the construction industry, take a closer look at Wyoming's construction industry's most employed occupations, and conclude with possible government initiatives which could influence aggregate demand for construction in Wyoming.

During the most recent period of rapid economic expansion (2005Q2 to 2008Q4), construction employment grew at an average rate of 9.8% per quarter, and then decreased by approximately 14.5% per quarter between 2009Q1 and 2010Q1. Aside from the rapid expansion and following contraction, employment growth in the construction sector has maintained an over-the-year growth rate of about 1.2% per quarter since 2001Q1.



Average rate of change 2002Q2-2015Q2 = 1.2%.
(p)Preliminary.
Source: Quarterly Census of Employment and Wages.

Figure 6.3: Over-the-Year Percentage Change in Wyoming's Construction and Mining Sectors, 2002Q2 to 2015Q2

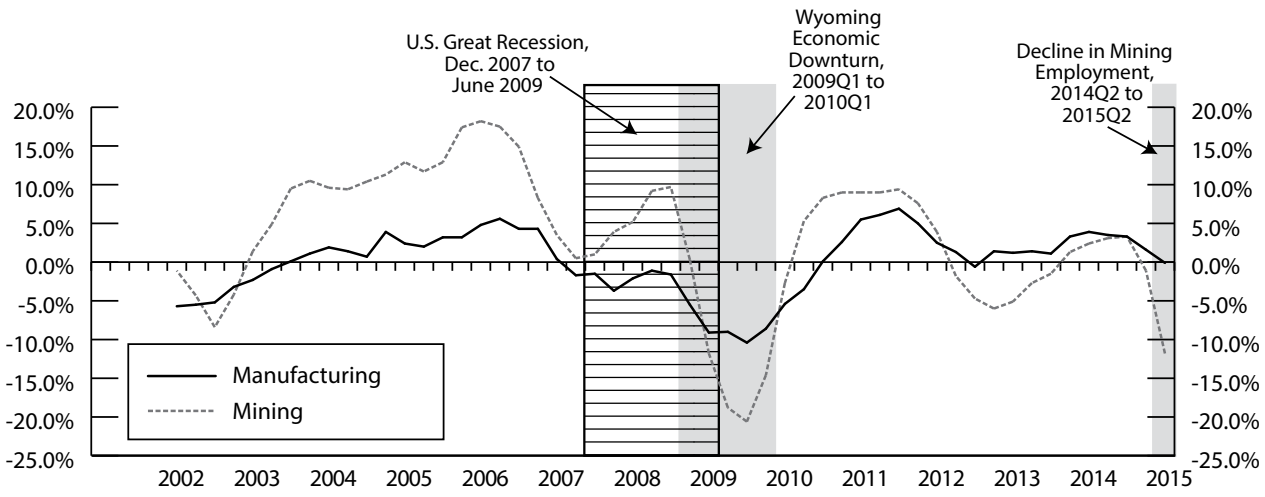
Over-the-year construction employment, as a share of total statewide employment, has maintained an 8.6% average since 2001Q1, when omitting the high growth period leading up to the economic downturn of 2009Q1 to 2010Q1 and the economic downturn itself. Including all quarters since 2001Q1, the share of construction employment relative to total employment is slightly higher at 8.9%.

The mining industry is a major driver of the Wyoming economy, and the percent change in construction employment over time closely follows the changes in mining employment, but with a higher degree of seasonality (see Figure 6.3, page 23). The over-the-year change in employment in both construction and mining is also correlated to the over-the-year change in the Henry Hub Spot Price of natural gas. As previously noted, royalties and severance taxes from the mining industry contribute to the funds available for state construction projects.

Manufacturing

The manufacturing industry is defined by NAICS as "establishments engaged in the mechanical, physical, or chemical transformation of materials, substances, or components into new products. Establishments in the Manufacturing sector are often described as plants, factories, or mills and characteristically use power-driven machines and materials-handling equipment. However, establishments that transform materials or substances into new products by hand or in the worker's home and those engaged in selling to the general public products made on the same premises from which they are sold, such as bakeries, candy stores, and custom tailors, may also be included in this sector. Manufacturing establishments may process materials or may contract with other establishments to process their materials for them. Both types of establishments are included in manufacturing" (U.S. Census Bureau, n.d.).

As shown in Figure 6.4, the over-the-year



Average rate of change 2002Q2-2015Q2 = 0.1%.
(p)Preliminary.
Source: Quarterly Census of Employment and Wages.

Figure 6.4: **Over-the-Year Percentage Change in Wyoming's Manufacturing and Mining Sectors, 2002Q2 to 2015Q2**

percentage change in manufacturing followed that of the mining industry. The over-the-year percentage change was not as rapid in the manufacturing industry as in the mining industry, but the changes did take place at roughly the same time. During the economic downturn of 2009Q1-2010Q1, both mining and manufacturing experienced declines in over-the-year change in employment and after the downturn, the manufacturing industry grew at a much slower rate than the mining industry.

During the previous economic downturn (2009Q1-2010Q1), employment among all industries in Wyoming declined 4.7% (12,741 jobs) and 8.6% (797 jobs) in manufacturing. Prior to the economic downturn of 2009Q1 to 2010Q1, the average monthly employment in the manufacturing industry showed fluctuations during the year, due to the change of the seasons, with a small decline in the 12-month moving average in 2002 and 2003. After 2010Q1, the trend in average monthly employment in the manufacturing industry continued to increase, but had not reached the pre-downturn levels in 2015Q2. From 2014Q2 to 2015Q2, the average monthly employment in manufacturing declined 0.1% (13 jobs) and declined 0.8% (2,154 jobs) among all industries in Wyoming.

Educational Services

The educational services sector (NAICS 61) includes elementary and secondary schools; colleges, universities, and professional schools; exam preparation and training; and educational support services. In 2014, this sector represented approximately 10.0% of total Wyoming employment.

Employment in educational services may also be affected by population changes, as the loss of jobs in other industries may influence population out-migration as school-age children may move out of state with parents searching for employment elsewhere, especially in light of relatively strong regional employment growth.

As shown in Figure 6.5 (see page 26), employment in educational services grew steadily between 2000 and 2015. In January 2001, there were 25,377 jobs in educational services and in June 2015 there were 29,181 jobs, a net gain of 3,804 jobs. During this period, the largest growth occurred in 2004 and 2009. Employment growth in educational services has been mostly flat since 2010.

Employment in educational services could be affected by several factors including an aging population of workers, state population trends, and budgetary issues. In 2013, R&P prepared a report detailing wages, turnover, workforce retirement trends, and data on an aging workforce and replacement need within state elementary and secondary schools (NAICS 6111). This report can be found at http://doe.state.wy.us/LMI/education_costs/2013/monitoring_2013.pdf.

In 2014, 28.1% of people employed in educational services were age 55 or older, compared to a statewide average of 18.4%. However, nonresidents only made up 8.0% of people working in educational services, compared to the statewide average of 17.1% for total employment. This indicates that many employees working in educational services are nearing the traditional retirement age of 65 and hiring tends to be local. This may provide potential workers for jobs that could be filled by people who have lost their jobs in other sectors, such as mining or construction.

Budget deficits due to declining tax revenues from mining may also affect employment in the educational services sector. Community colleges in the state receive "about 60 percent of their budget revenue from the state based on enrollment" (Richards, 2015). Some of these schools are currently introducing hiring freezes similar to those in state government. It's possible the University of Wyoming could be similarly affected in the future.

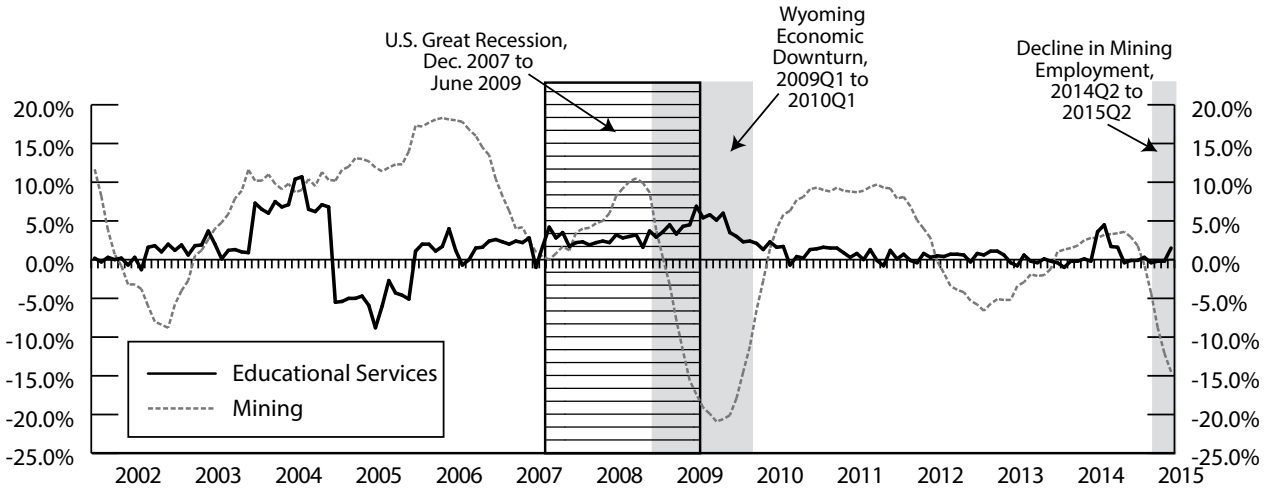
Public Administration

The public administration sector, which represented about 10.4% of total Wyoming employment in 2014, includes "federal, state, and local government agencies that administer, oversee, and manage public programs and have executive, legislative, or judicial authority over other institutions within a given area" (U.S. Census Bureau, n.d.).

Public sector employment has less seasonality, or quarter-to-quarter fluctuation, than the economy as a whole. On average, public administration employment has kept pace with total employment with a long-term average quarterly growth rate of 1.0% from 2002Q2 to 2015Q3 (see Figure 6.6, page 27).

During the economic expansion that lasted from 2005 to 2008, total employment grew at an average over-the-year rate of 3.8% per quarter, compared to 2.7% for public administration. Public employment continued to grow during the economic downturn of 2009Q1 to 2010Q1, at a rate of 2.1%, when total employment was decreasing by 4.1%. However, since 2010Q2, average over-the-year employment in public administration has decreased by 0.7% per quarter, in contrast with the total employment increase of 0.9% per quarter.

As a percent of total quarterly employment, public administration



Average rate of change 2002Q2-2015Q2 = 1.4%.
(p)Preliminary.
Source: Quarterly Census of Employment and Wages.

Figure 6.5: **Over-the-Year Percentage Change in Wyoming's Educational Services and Mining Sectors, 2002Q2 to 2015Q2**

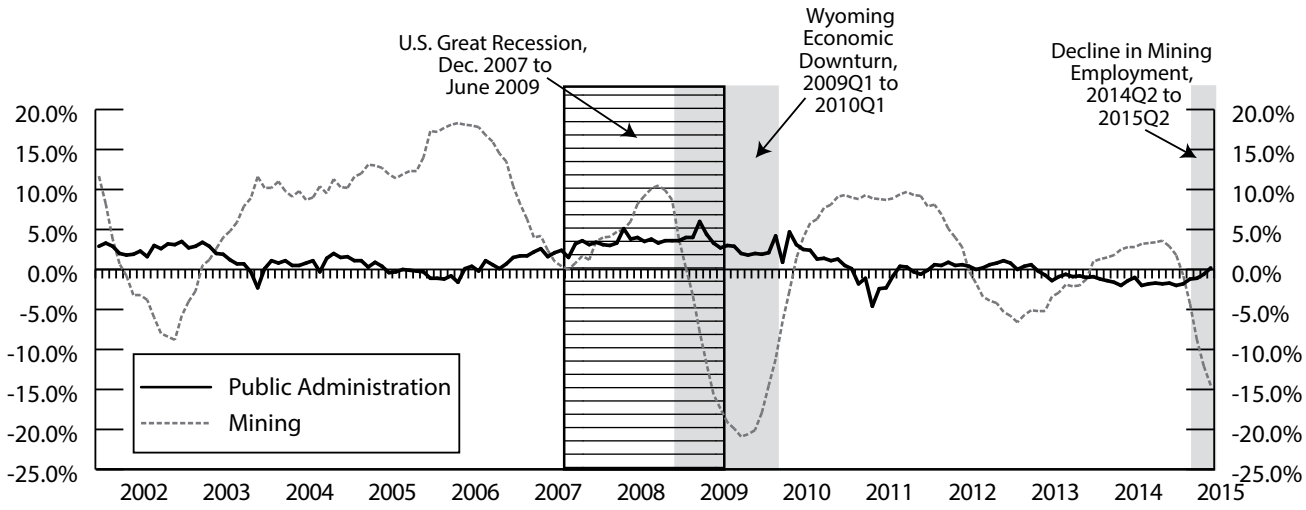
accounted for an average of 10.7% between 2000Q1 and 2015Q2; public employment as a percent of total employment peaked at 11.5% in the second and third quarters of 2010, up from a low of 9.8% in 2007Q4. Percent changes in the share of public employment are mainly a result of changes in total employment, as the number employed in public administration has remained relatively constant over time. The percent change in public administration employment over time is relatively independent of changes in mining employment, which is closely related to the price of natural gas.

Government shutdowns, such as the federal shutdown of October 2013, and hiring freezes, such as the Wyoming state government hiring freeze initiated by Governor Matt Mead in October 2015, are key drivers in public administration employment. As noted by Barron (2013), Governor Mead's goal has been "a smaller and more efficient state government" since his inauguration in 2011, and in response to the reduced revenues forecasted by the Census Revenue Estimating Group report of October 2015, Governor Mead announced a hiring freeze for state employees (Hancock, 2015). Since the state receives royalties and severance taxes based on the price of coal, oil, and natural gas, future employment in public administration may depend on the future of these commodities.

Tourism (Leisure & Hospitality)

While lower crude oil prices certainly hurt Wyoming oil producers and the associated employment generated by the mining industry, lower prices of gasoline, diesel, and jet fuel benefit consumers nationally.

Lower transportation costs for



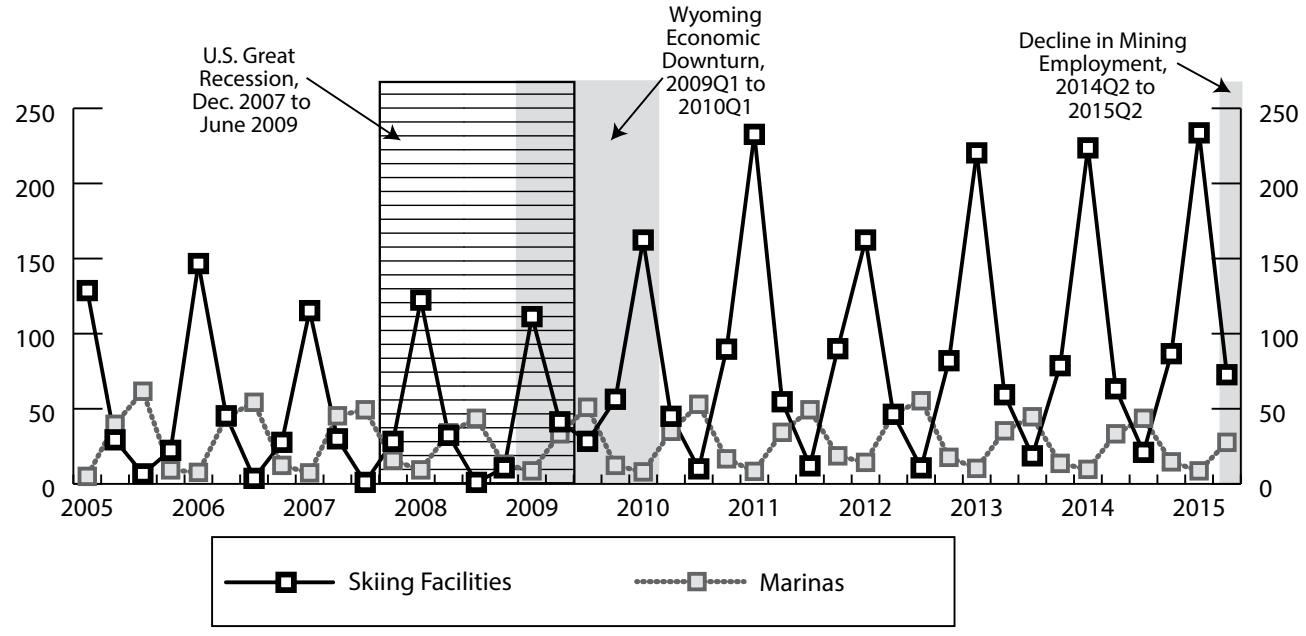
Average rate of change 2002Q2-2015Q2 = 1.0%.
(p)Preliminary.
Source: Quarterly Census of Employment and Wages.

Figure 6.6: **Over-the-Year Percentage Change in Wyoming's Public Administration and Mining Sectors, 2002Q2 to 2015Q2**

consumers leave them with more discretionary income. Ferrell and Greig (2015) estimate that for every dollar saved at the gasoline pump, consumers spend at least 73 cents on other items. The total extra spending is likely to be higher, since the institute could not necessarily account for all purchases.

Declining gasoline and diesel prices tend to lead to more vehicle miles traveled (VMT). Wyoming leads the nation in VMT per capita at 16,272 based on 2011 data (Baxandall, 2013). That is more than 20% higher than the next highest state, Alabama. Therefore, Wyoming consumers are aided proportionally more than consumers in other areas. Additionally, Hopper Research (2015) found that airfare prices were 17% lower in October 2015 than the previous October. Hopper Research attributed this decline to this year's dramatic decline in oil prices. For November and December 2015, prices were projected to be 16% lower than 2014, and prices were projected to bottom out in January 2016 (Hopper Research, 2015).

This increase in discretionary income and cheaper travel costs may lead to increased tourism, which could help Wyoming's economy. For example, Yellowstone National Park had record attendance in 2015 (Reuters, 2015). While increased tourism cannot fully alleviate the negative impacts from low energy prices, it does lend some stability to the economy, in part due to its contribution to the diversification of Wyoming's economy that policymakers have been striving to achieve. While tourism and related industries only comprise approximately 3.3% of gross state product (GSP; U.S. Bureau of Economic Analysis, 2015), these industries account for approximately 12.3% of overall employment based on 2013 data (Research & Planning, 2015). Note that some of the activity in industries



Source: Quarterly Census of Employment and Wages.

Figure 6.7: **Mean Quarterly Employment of Selected Tourism-Related Industries in Wyoming, 2005Q1-2015Q2**

such as food service and accommodations is not fully attributable to tourism.

Even if consumers' destination is not in Wyoming, increased VMT along major Interstates 25, 80, and 90 will add sales tax and fuel tax to Wyoming's tax revenue.

While the effects of increased VMT are relatively stable in terms of employment – such as moderate increases in employment at restaurants and gas stations or convenience stores – consumer demand for many of the tourist attractions in Wyoming is highly seasonal. Therefore, employment in tourism-related industries fluctuates with demand. Figure 6.7 (see page 28) displays two industries that are highly seasonal: skiing facilities (NAICS 713920) and marinas (NAICS 713930). For example, skiing facilities employ the most workers in the first quarter of each year while marinas employ the most workers in the second and third quarters of each year (Research & Planning, 2015). In addition to seasonal-related demand, societal factors such as the start and the end of the school year and holidays are also factors.

At the national level, consumers benefit from lower fuel prices in two main ways: an increase in discretionary income, and the suppression of inflation due to the impact on transportation costs of consumer goods. Lower fuel prices provide consumers with more discretionary income, which can lead to more VMT and leisure spending, such as vacations. Some of this spending may occur in Wyoming, such as trips to Yellowstone and Grand Teton National Parks.

While tourism and related industries in Wyoming provide a substantial amount of employment (12.3%), these jobs tend to pay much lower wages than jobs in the mining sector and the value added component (3.3% of GDP) is much lower than mining.

Wyoming's economy is highly dependent on the production of crude oil (along with natural gas, coal, and other extractive resources). The mining sector provided 33.0% of GDP and 9.5% of employment in 2013. Therefore, the net effect of lower energy prices is extremely detrimental to Wyoming's economy.

Technology-Related Industries

Research & Planning publishes quarterly wage and employment estimates for industries that have been identified as technology related in Wyoming. Technology-related subsectors can be found in manufacturing technology (measuring & control instruments), communications services (wireless telecommunications carriers), software & technology services (computer systems design & related services), and engineering services. During 2015Q2, technology-related industries made up a small portion of Wyoming's total employment and payroll. As shown in Table 6.2 (see page 30), the 924 establishments in technology-related industries made up 3.5% of all establishments, and the 4,981 jobs in these industries accounted for 1.8% of total employment. Technology-related industries also accounted for 2.4% of total wages. However, the average weekly wage for technology-related industries ($1,199) was considerably higher (138.1%) than Wyoming's average weekly wage across all industries ($868).

According to Brennan (2014), the proportion of technology-related employment and wages in Wyoming has

remained consistent for the last decade. Since 2005, technology-related industries have accounted for between 1.7% and 1.8% of Wyoming's average annual employment and 2.3% and 2.5% of the state's total wages.

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Table 6.2: **Wyoming Technology-Related Industries Employing Units, Average Monthly Employment, Total Wages, and Average Wage, 2015Q2**

	Establishments		Average Monthly Employment		Total Wages		Average Weekly Wage	
Industry	N	%	N	%	$	%	$	%
Total, All Industries	**26,050**	**100.0%**	**284,545**	**100.0%**	**$3,211,250,267**	**100.0%**	**$868**	**100.0%**
Total, Technology Industries	924	3.5%	4,981	1.8%	$77,610,969	2.4%	$1,199	138.1%
Manufacturing Technology	19	0.1%	286	0.1%	$3,682,632	0.1%	$990	114.1%
Communications Services	129	0.5%	1,667	0.6%	$24,909,350	0.8%	$1,149	132.4%
Software & Tech Services	525	2.0%	1,832	0.6%	$28,933,624	0.9%	$1,215	140.0%
Engineering Services	251	1.0%	1,196	0.4%	$20,085,363	0.6%	$1,292	148.8%

Source: Quarterly Census of Employment and Wages.
Prepared by N. Brennan, Research & Planning, WY DWS, 11/05/2015.
Preliminary: Subject to Revision.

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