



# Review of Colorado Economy Analysis of First Eleven Months of 2015

Colorado-based Business and Economic Research

December 21, 2015

# Overview

As we close out the year, the primary focus of the cber.co December economic review is on the Colorado economy. The current employment data shows the state is on track to add 58,000 jobs in 2015. Projected revisions, which will be made in March 2016, will bring Colorado job growth closer to the lower limit of the 2015 cber.co forecast, a projected increase of 73,000 to 79,000 jobs.

This brief analysis is divided into the following sections.

- Summary of Factors Impacting U.S. Growth That Will Directly or Indirectly Impact Colorado.
- Colorado GDP, Employment , and Unemployment.
- Change in Colorado Employment by Performance Category.
- Summary and Total Jobs Added.
- Appendix.

The 2015 cber.co forecast can be found at <http://cber.co/economic-forecasts/cber-co-economic-forecast/>. The 2016 forecast will be released in early January.



# Summary of Factors Impacting U.S. Growth

# Summary of Factors Impacting U.S. Growth

Overall, the U.S. economy is on solid footing. There are factors that have created headwinds that have had an impact on U.S. economic growth and/or will affect it in the months ahead. Ultimately these issues will directly or indirectly impact the Colorado economy.

- The Federal Reserve gave the economy a vote of confidence by hiking interest rates.
- The U.S. is on track to add about 2.9 million jobs in 2015. The rate of job growth has declined as the year has progressed.
- Real GDP will expand at a rate of 2.5% in 2015.
- The primary reason for slower growth in the U.S. is the slowdown in the Chinese economy and its immediate impact on trading partners.
- There is always uneasiness associated with conflict in other regions of the world. Currently, the Middle East is the location of the most prevalent conflict.
- Since the end of the recession, the services sectors have shown strong and steady growth. Manufacturing has been weaker and more volatile. It will be sluggish through the end of the year.
- Though there is typically a disconnect between the equities markets and the performance of the economy recent volatility in the stock market has caused consumers to be cautious, which in turn affects their willingness to spend.
- The price of oil has dropped below \$40 per barrel. Tier I oil production states have suffered Tier II states.



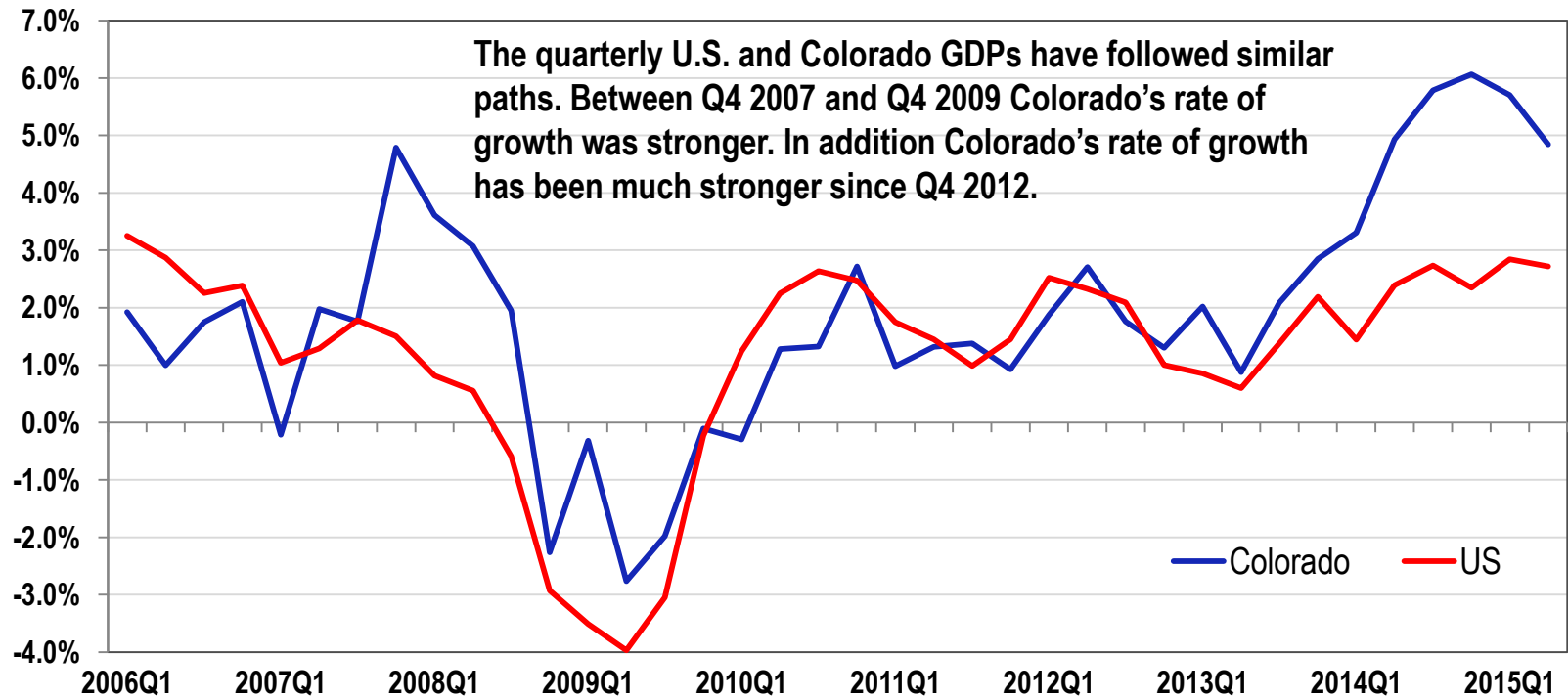
# Colorado GDP, Employment, and Unemployment

# ● Change in Real Gross Domestic Product (Year-Over-Year)



## Percentage Change in Real GDP Colorado vs. U.S.

YOY Change

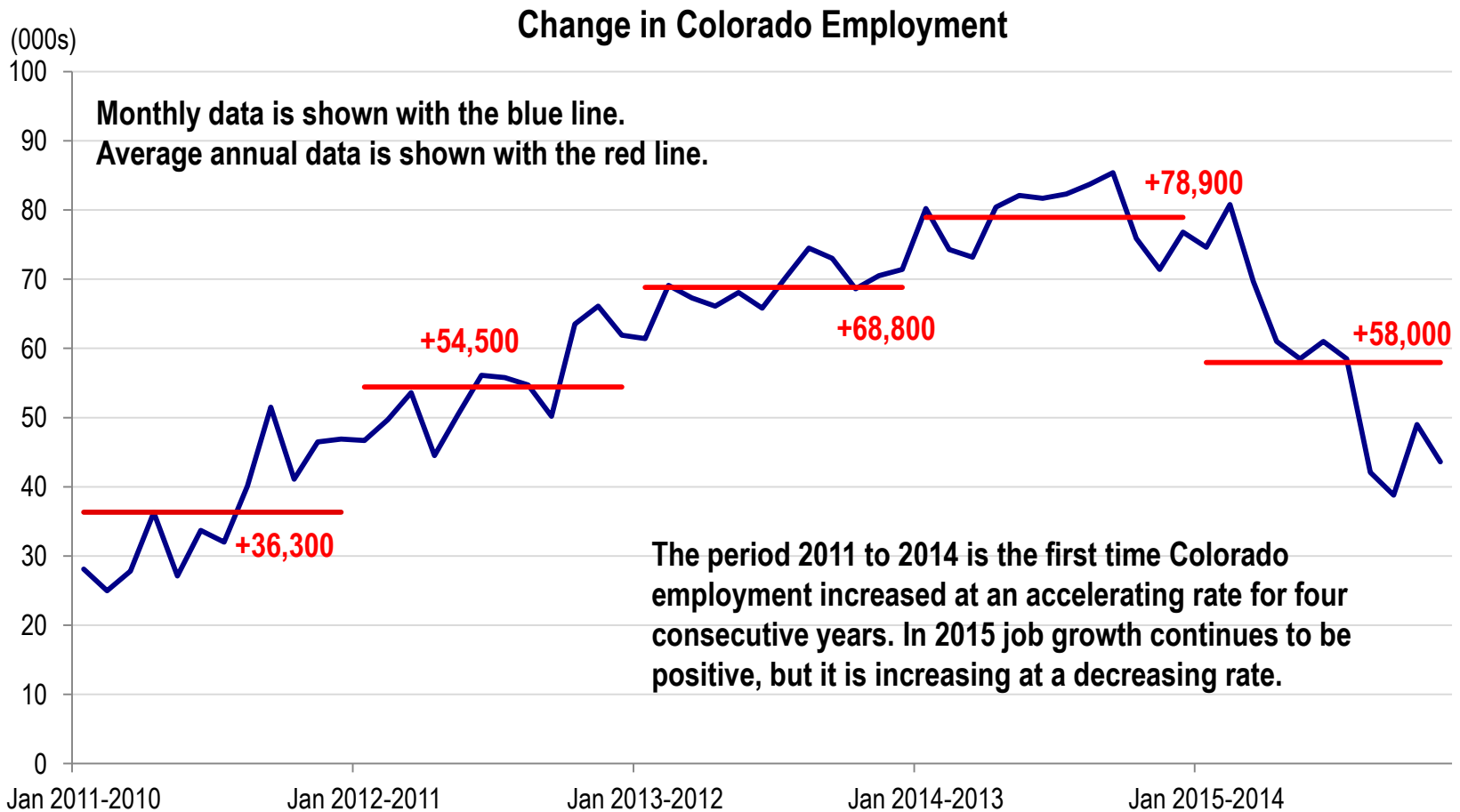


Source: Bureau of Economic Analysis.

Colorado-based Business and Economic Research

<http://cber.co>

# Change in Colorado Employment Year-Over-Year



Source: Bureau of Labor Statistics, NSA.

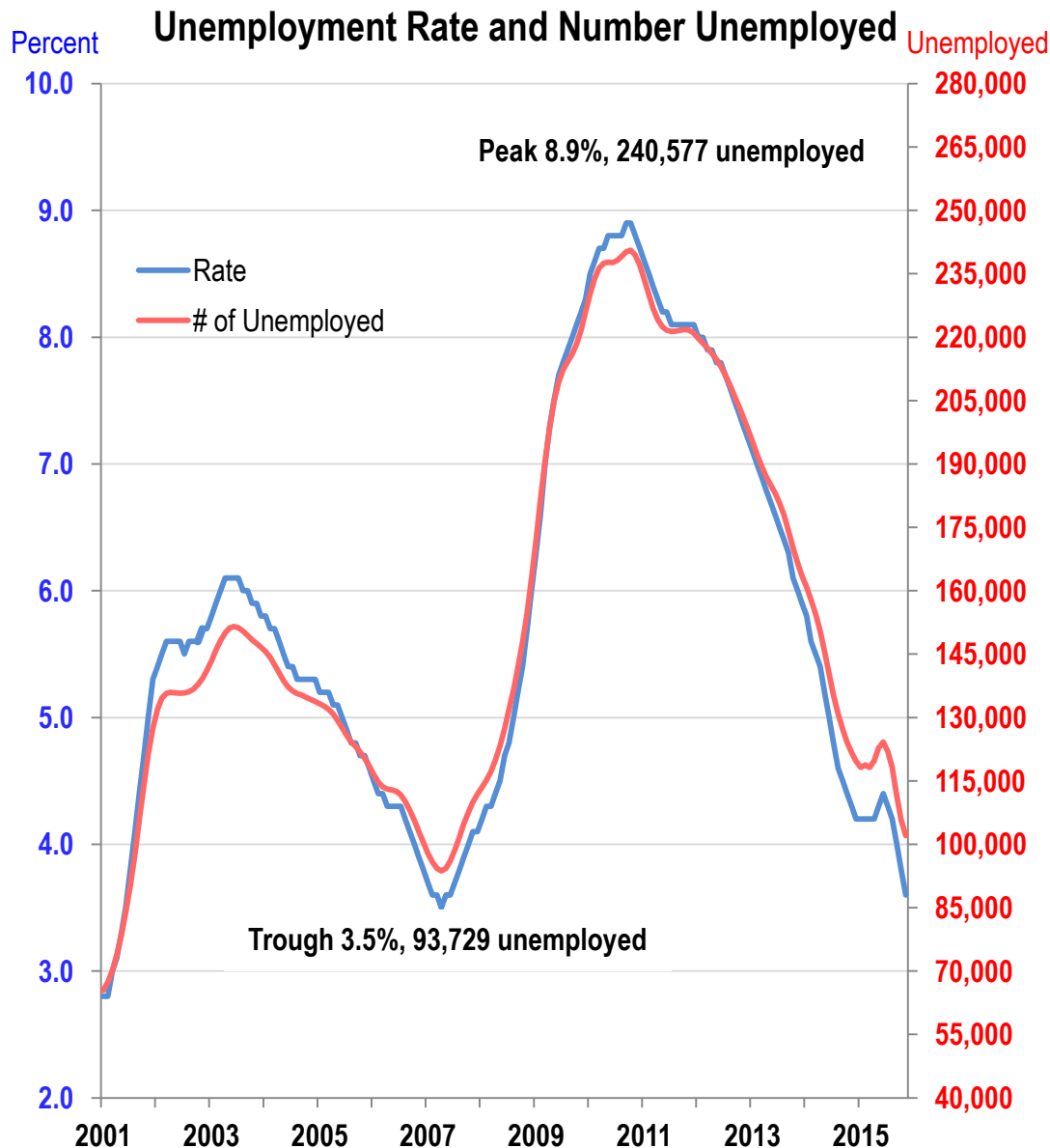
## Colorado Unemployment Rate and Number of Unemployed

The number of unemployed has slowly trended downward since peaking in late 2010.

The total number of unemployed workers (red) at the end of November 2015 was 102,035.

The total number of unemployed is 8,306 greater than the trough in May 2007 and 138,542 less than the peak in October 2010.

Lower unemployment rates have brought about shortages of trained workers in key sectors and occupations. The November 2015 unemployment rate (blue) of 3.6% is down from 4.3% in November 2014. In addition there are 19,567 fewer unemployed workers compared to a year ago.



Source: Bureau of Labor Statistics, SA, cber.co.

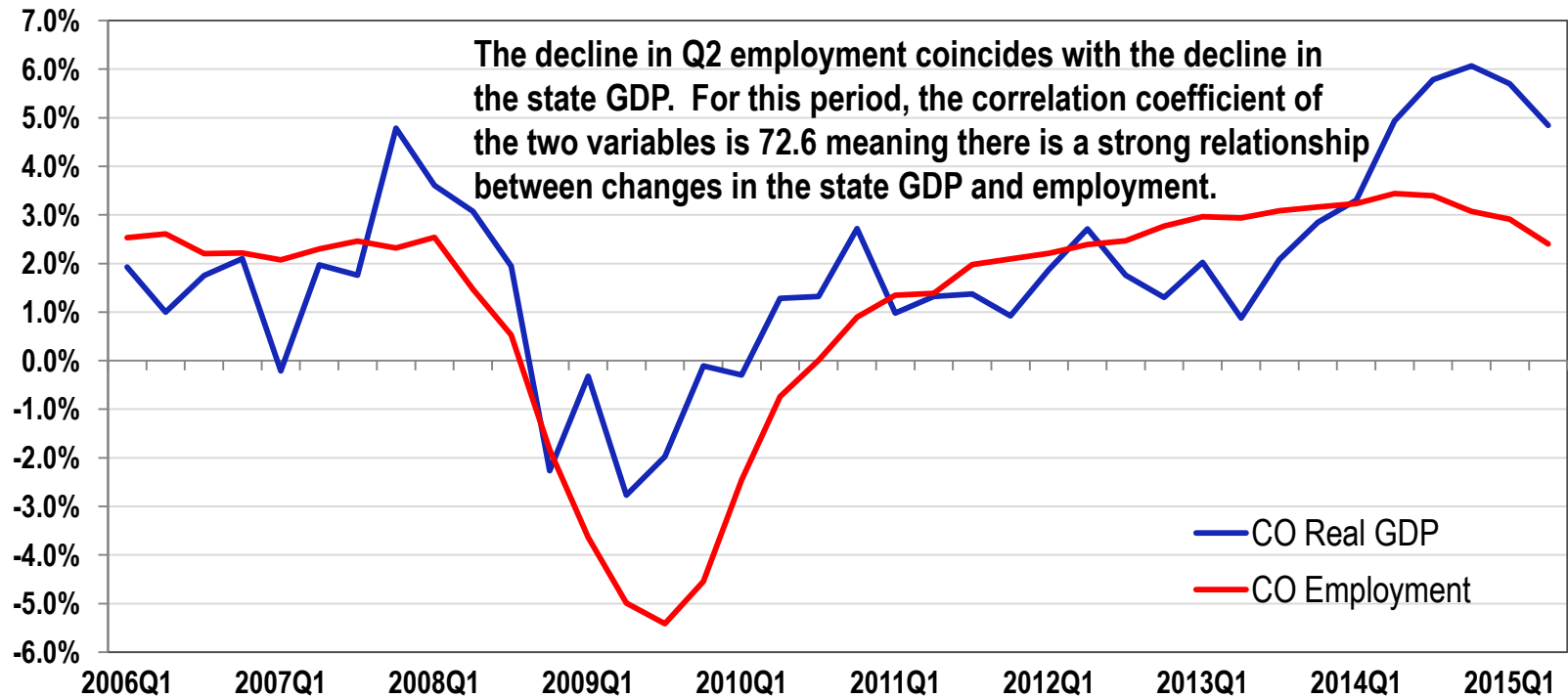
Colorado-based Business and Economic Research  
<http://cber.co>



● YOY Change in Quarterly Colorado Real Gross Domestic Product  
● Compared to the YOY Changes in Quarterly Wage and Salary  
● Employment

Year-Over-Year Change in Colorado Real GDP Colorado vs. Employment

YOY Change



Source: Bureau of Economic Analysis and Bureau of Labor Statistics.

Colorado-based Business and Economic Research

<http://cber.co>



# Change in Colorado Employment by Performance Category



# cber.co Forecast and Analysis

cber.co developed an efficient way to forecast and analyze job employment for Colorado. Twenty-two NAICS industries were divided into three categories based on the consistency, volatility, and the magnitude of their job growth. The categories are:

- Strong Growth – These industries consistently show stronger than average job growth. The focus of these industries is business and personal services.
- Solid Growth – These industries consistently show solid job growth, at levels below the Strong Growth category. Their focus is trade and government.
- Volatile – These industries have consistently been volatile. In many cases that volatility occurs for a variety of reasons such as changes in technology or industry structure.

The process for creating these categories is discussed in greater depth in the Appendix.

## Summary of Strong, Solid, and Volatile Growth Categories

In 2015, the growth of the Strong, Solid, and Volatile Growth Categories will be similar to 2014.

The Strong Growth Category of sectors (green) has consistently shown strong job growth over time. The category added jobs as expected in 2014.

Over time, the Solid Growth Category of sectors (yellow) has been more volatile than the Strong Growth Category.

Finally, the Volatile Category of sectors (red) was a significant source of growth in 2013 and 2014 and is projected to do the same in 2015. Prior to that the category was a source of weak job growth or job losses.



Source: Bureau of Labor Statistics, cber.co.

Colorado-based Business and Economic Research

<http://cber.co>

# Annual Employment Situation for the Strong Growth Category

Over the past two decades the following sectors have been the foundation for consistent growth in Colorado employment.

- Professional, Scientific, and Technical Services
- Management of Companies and Enterprises
- Administrative - Business to Business (Not Employment Services)
- Private Education
- Health Care
- Arts, Entertainment, and Recreation
- Other Services.

Total employment for this category was:

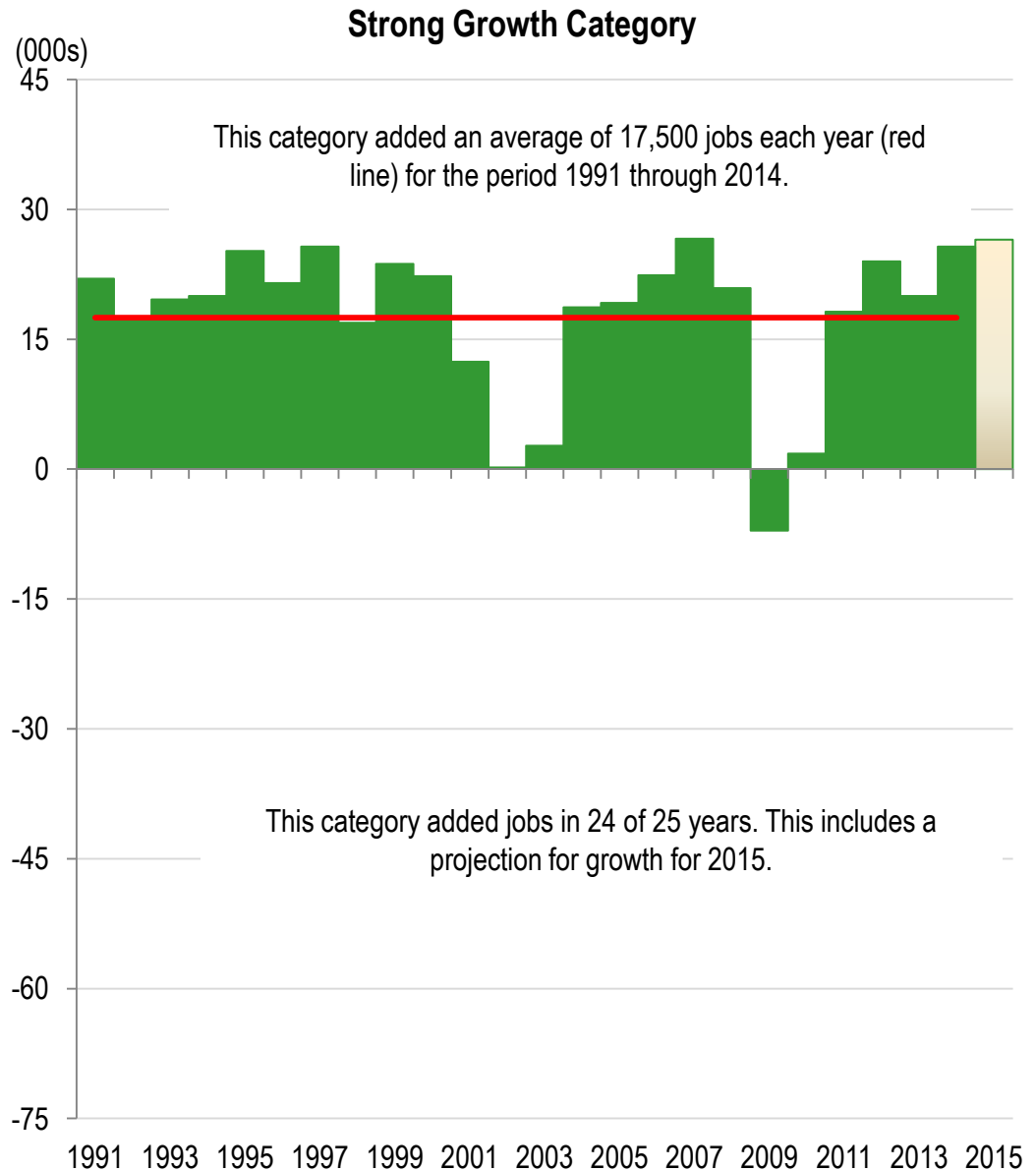
1994 445,200 workers, 25.4% of total employment  
 2004 615,900 workers, 28.3% of total employment  
 2014 786,700 workers, 32.0% of total employment

In 2015, absolute job growth of this category will be similar to job growth in 2007 and 2014.

In 2015, between 24,500 and 28,500 workers will be added at a rate of 3.1% to 3.6%. This rate of growth is slightly greater than 2014

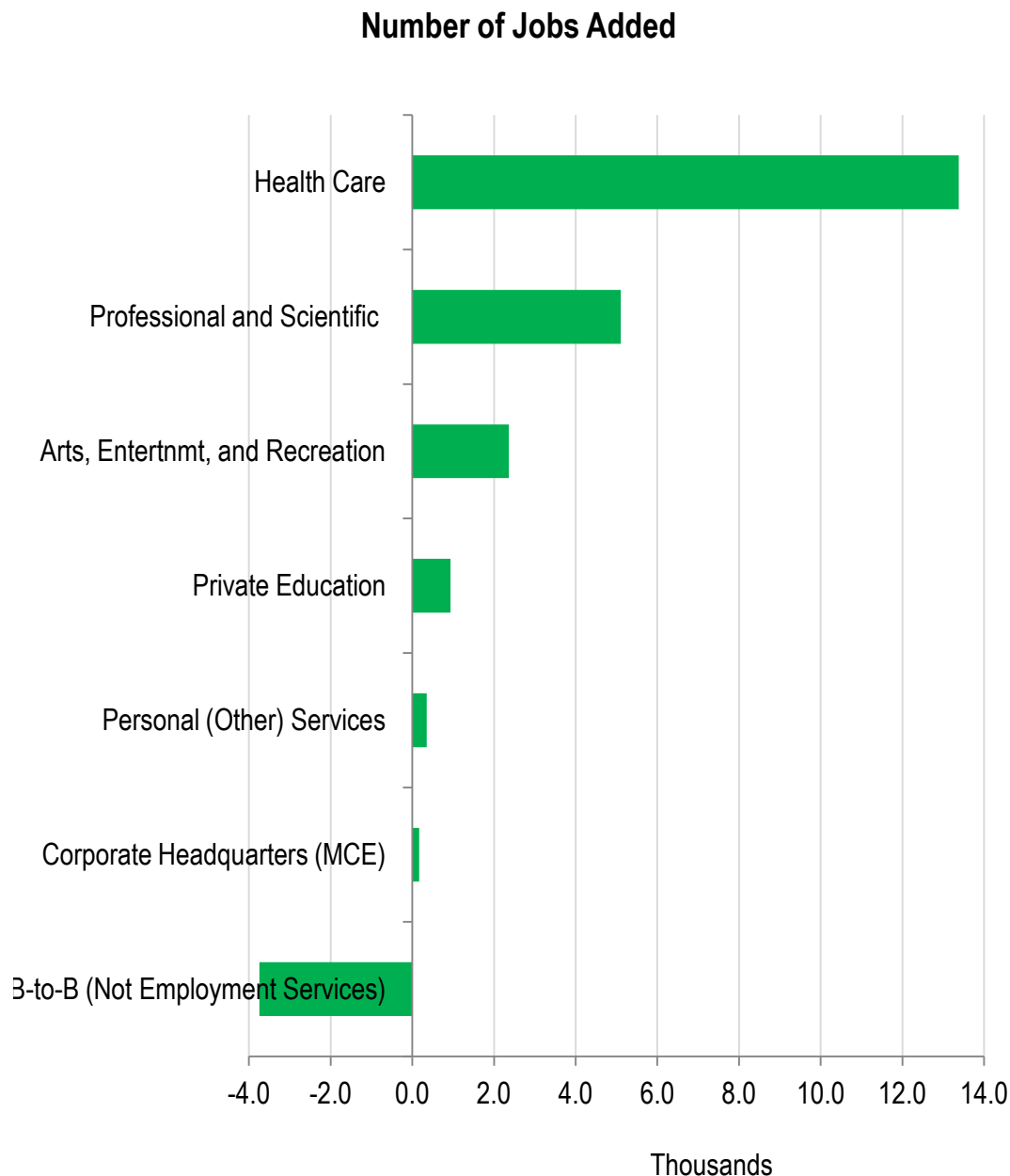
Source: Bureau of Labor Statistics, [cber.co](http://cber.co).

Colorado-based Business and Economic Research  
<http://cber.co>



## ● Strong Growth Sectors

- Through the first eleven months of 2015 this group of industries added 18,600 jobs compared to the same period in 2014.
- This category is projected to add 24,500 to 28,500 jobs for the year. To date, its performance is below the projected range.
- In 2014, these sectors accounted for 32.6% of the growth and 32.0% of total employees.
- Health Care and Professional, Scientific, and Technical Services were the sectors with the strongest growth for the first eleven months of 2015. Most likely the data for Administrative/B-to-B (Not Employment Services) is understated.



Source: Bureau of Labor Statistics.

# Annual Employment Situation for the Solid Growth Category

Over the past two decades the following sectors generally posted gains. The category posted stronger jobs gains during the 1990s than the 2000s.

- Wholesale Trade
- Retail Trade
- State (Not Higher Education)
- Higher Education
- Local (Not K-12 Education)
- K-12 Education
- Accommodations and Food Services

Total employment for this category was:

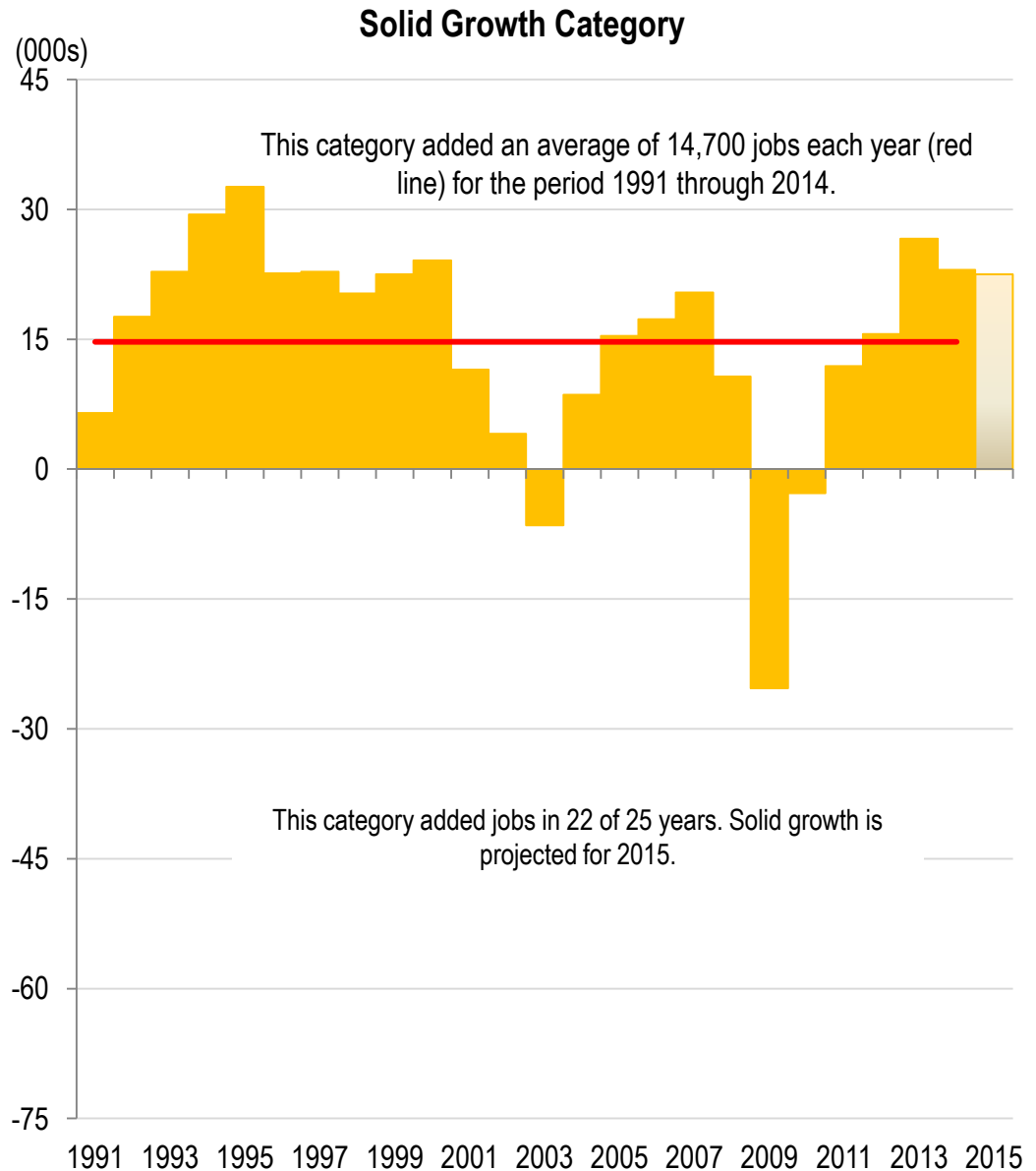
1994 685,400 workers, 39.0% of total employment

2004 848,000 workers, 38.9% of total employment

2014 961,100 workers, 39.0% of total employment

In 2015 absolute job growth in this category will be comparable to most years during the 1990s.

In 2015, between 22,500 and 26,500 workers will be added at a rate of 2.3% to 2.8%. This rate of growth is slightly less than 2014.



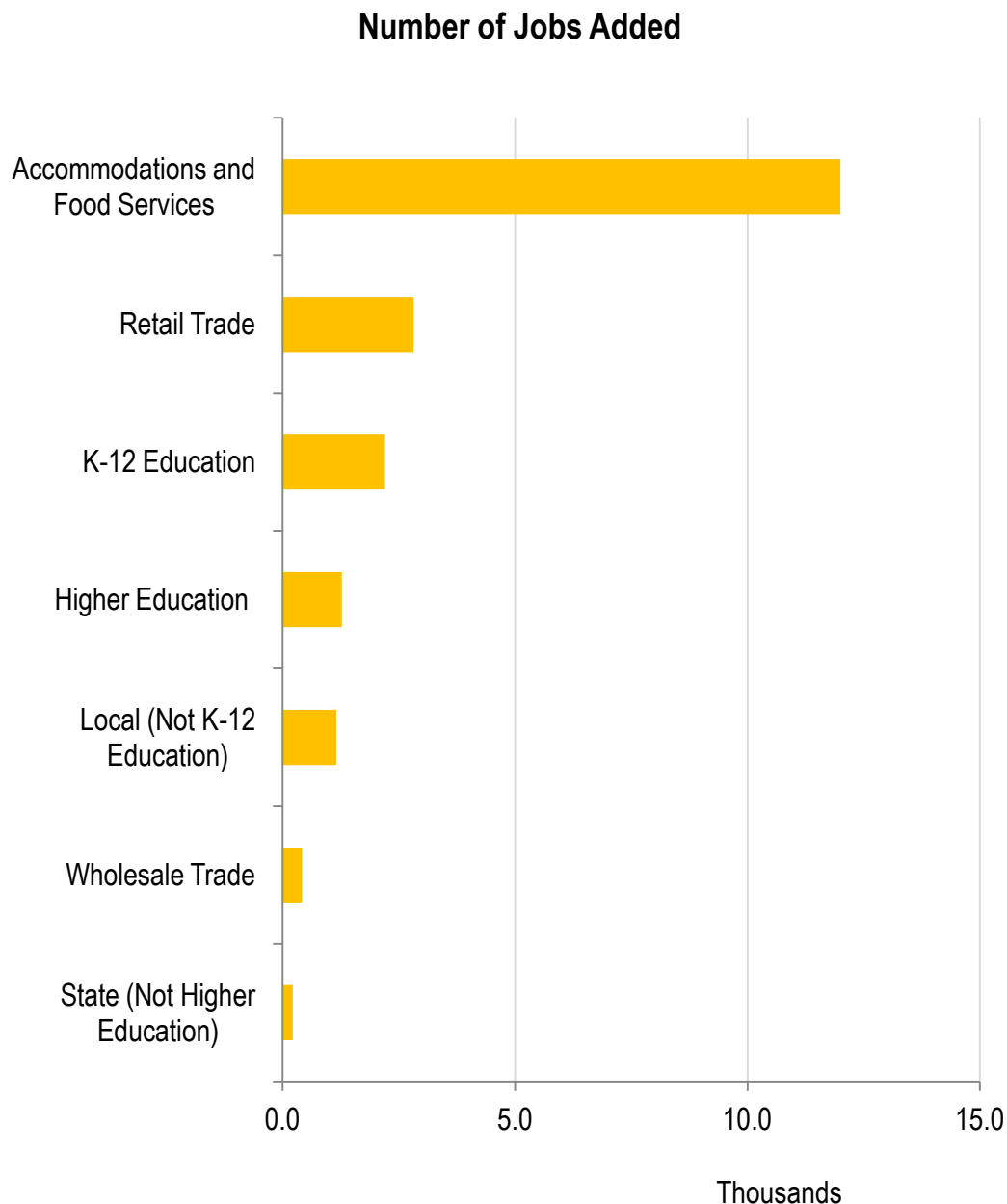
Source: Bureau of Labor Statistics, cber.co.

Colorado-based Business and Economic Research

<http://cber.co>

## Solid Growth Sectors

- Through the first eleven months of 2015 this group of industries added 20,100 jobs compared to the same period in 2014.
- This category is projected to add 22,500 to 26,500 jobs for the year. To date, its performance is below the projected forecast range.
- These sectors accounted for 29.1% of total job gains and 39.0% of total employees in 2014.
- A majority of the growth for the first eleven months of 2015 has occurred in the Accommodations and Food Services, Retail Trade, and K-12 Sectors.



Source: Bureau of Labor Statistics.



# Annual Employment Situation for the Volatile Category

Over the past two decades the sectors listed below were the primary source of volatility in total employment.

The sectors are:

- Natural Resources and Mining
- Construction
- Manufacturing
- Transportation, Warehousing, and Utilities
- Employment Services
- Financial Activities
- Information
- Federal Government

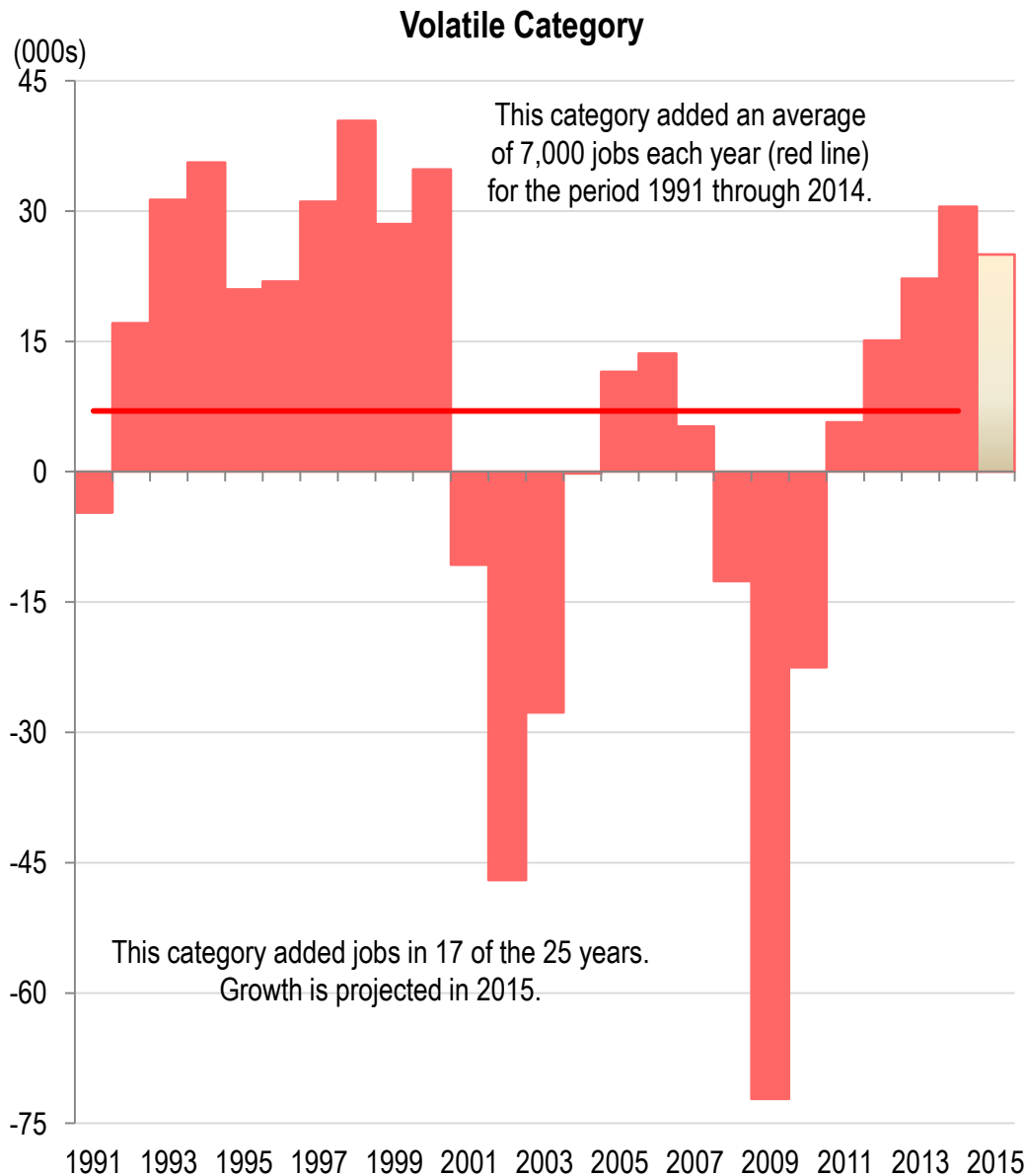
Total employment for this category was:

1994 625,400 workers, 35.6% of total employment

2004 716,000 workers, 32.8% of total employment

2014 713,000 workers, 29.0% of total employment

In 2015 between 23,000 and 27,000 jobs will be added, at a rate of 3.2% to 3.8%. This rate of growth is slower than 2014.



Source: Bureau of Labor Statistics, cber.co.

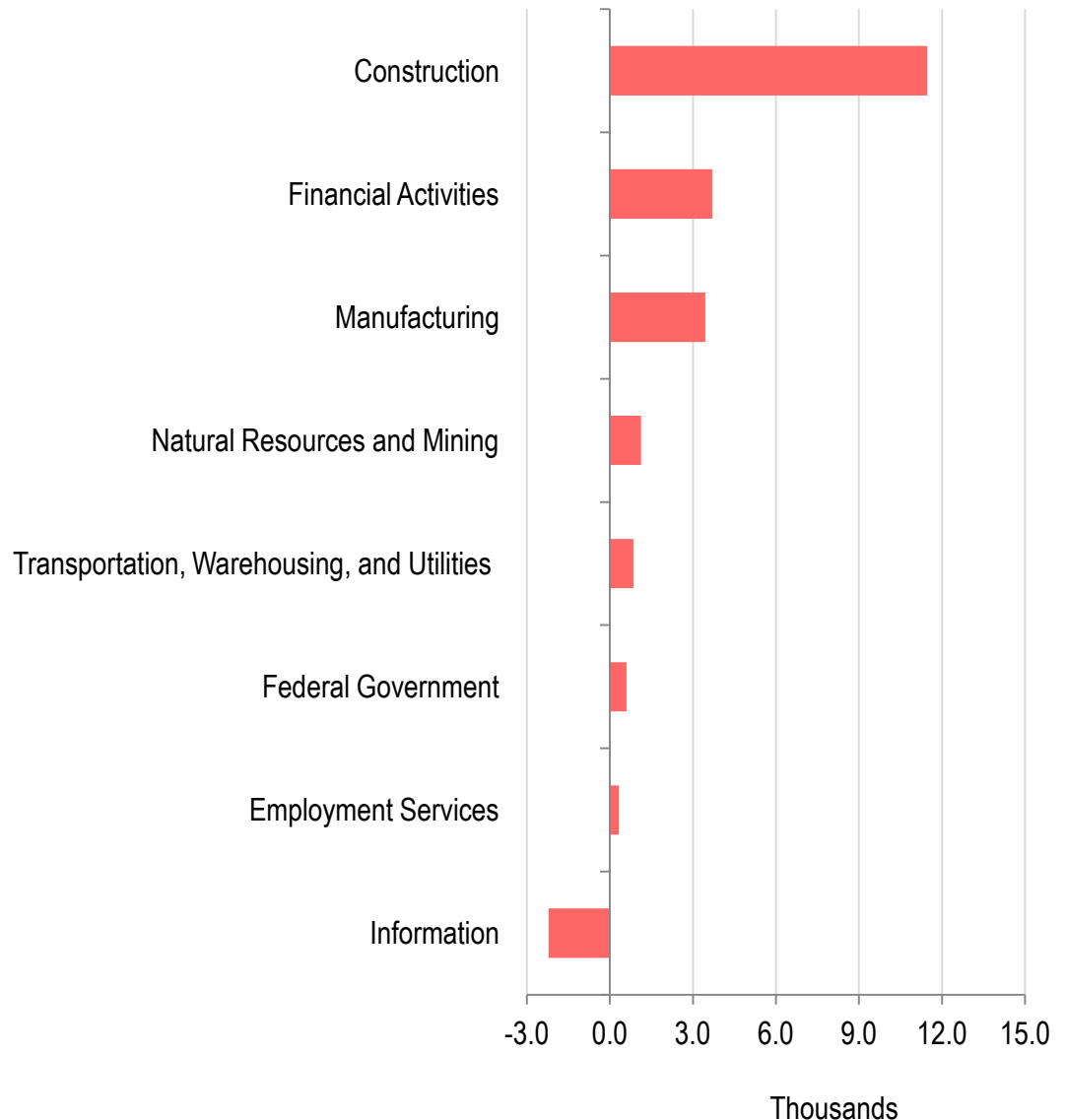
Colorado-based Business and Economic Research

<http://cber.co>

## ● Volatile Sectors

- Through the first eleven months of 2015 this group of industries added 19,300 jobs compared to the same period in 2014.
- This category is projected to add 23,000 to 27,000 for the year. To date, its performance is below the projected forecast range.
- In 2014 these sectors accounted for 32.3% of total job gains and 29.0% of total employees.
- The Construction, Financial Activities, and Manufacturing Sectors added the greatest number of jobs and the Information Sector lost jobs during the first eleven months.

Number of Jobs Added



Source: Bureau of Labor Statistics.

# Summary of Performance to cber.co 2015

## Employment Forecast



On the chart, the forecast ranges for the categories are:

- Strong Growth – green box.
- Solid Growth – yellow box.
- Volatile – pink box.
- Total Employment – grey box.

The blue lines indicate the level of employment from the current BLS data.

Through the first eleven months of 2015, all three categories were below their respective forecast ranges.

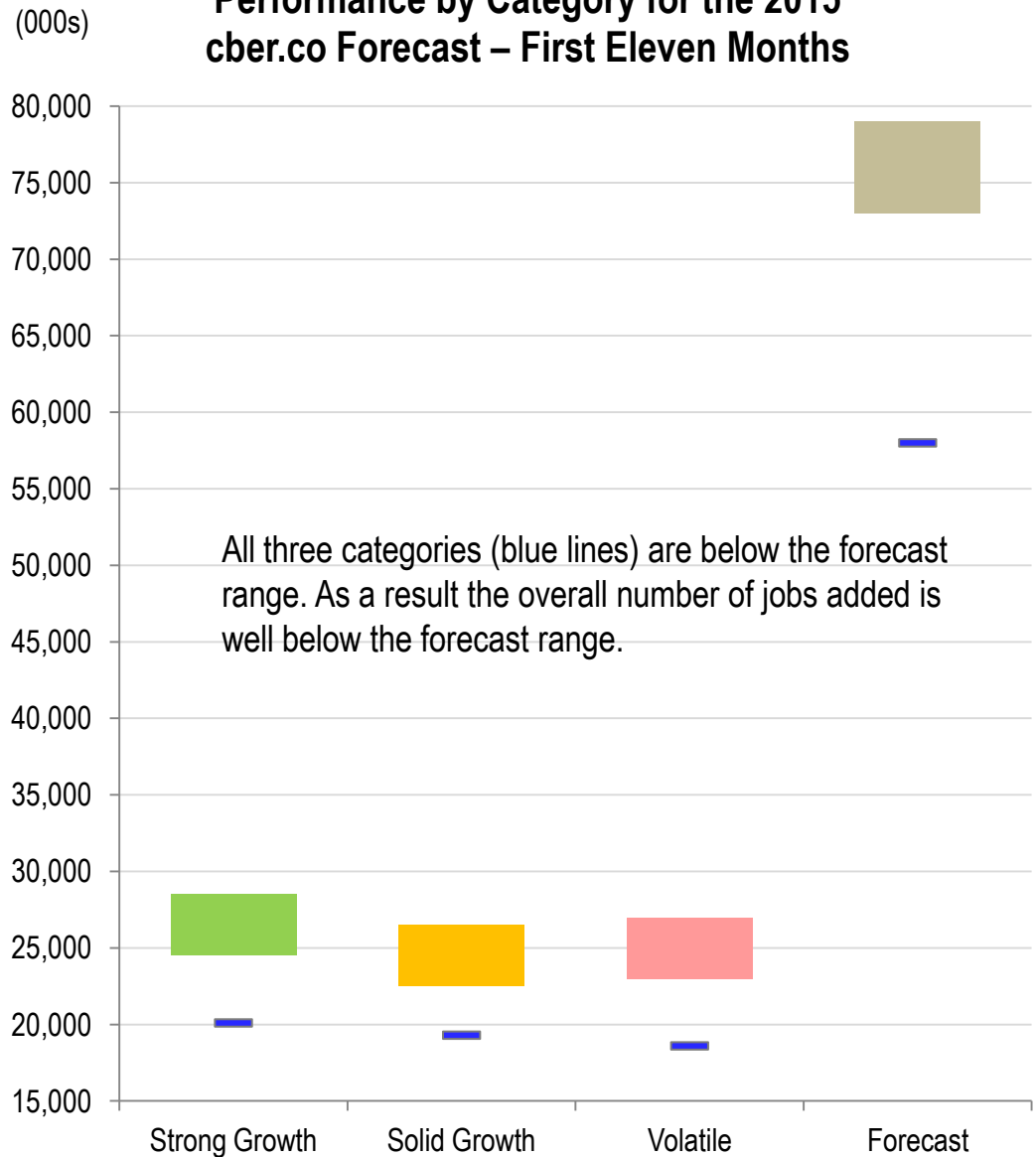
The overall forecast was below the projected range (grey box).

**This analysis does not account for projected upward revisions to employment that will take place in March 2016.**

Source: Bureau of Labor Statistics, cber.co.

Colorado-based Business and Economic Research  
<http://cber.co>

### Performance by Category for the 2015 cber.co Forecast – First Eleven Months





# Questions



# Questions

Since the last cber.co review, the following questions have been raised:

- What do the Governor's Office of State Planning and Budgeting (OSPB) and the Colorado Legislative Council (CLC) say about the economy?
- What is happening in the Extractive Industries?
- How does the growth of Colorado compare to Utah and Washington?

- Questions: What do OSPB and CLC say about the economy?
- 
-

# CLC and OSPB December 21 Quarterly Forecasts

## 2015 Estimates

The Colorado Legislative Council and the Governor's Office of State Planning and Budgeting recently released their quarterly updates. (<https://www.colorado.gov/cga-legislativecouncil> and <https://sites.google.com/a/state.co.us/ospb-live/>). The two reports provide slightly different forecasts, both of which are supported by rational explanations. A comparison of key indicators follows below.

### U.S. Economy December 2015 Estimate for 2015

Category	CLC	OSPB
Real GDP % Change	2.5%	2.4%
Employment Change %	2.9 million 2.1%	2.8 million 2.0%
Unemployment Rate	5.0%	5.3%
Inflation (CPI)	0.1%	0.1%

### Colorado Economy December 2015 Estimate for 2015

Category	CLC	OSPB
Population Change /%	+101,200 1.9%	+98,000 1.8%
Employment Change/%	+57,600 2.3%	+69,000 2.8%
Unemployment Rate	4.0%	4.1%
Retail Trade Sales (Millions)/%	\$93,191 2.8%	\$94,200 4.3%
Home Permits (000s)	28.6	31.0
Denver-Boulder Inflation Rate	1.1%	1.5%

Source: CLC and OSPB.

Colorado-based Business and Economic Research  
<http://cber.co>

# CLC and OSPB December 21 Quarterly Forecasts

## 2016 Forecasts

The Colorado Legislative Council and the Governor's Office of State Planning and Budgeting recently released their quarterly updates. (<https://www.colorado.gov/cga-legislativecouncil> and <https://sites.google.com/a/state.co.us/ospb-live/>). The two reports provide slightly different forecasts, both of which are supported by rational explanations. A comparison of key indicators follows below.

**U.S. Economy December 2015 Forecast for 2016**

Category	CLC	OSPB
Real GDP % Change	2.3%	2.3%
Employment Change/%	2.6 million 1.8%	2.4 million 1.7%
Unemployment Rate	4.8%	4.8%
Inflation (CPI)	1.6%	1.8%

**Colorado Economy December 2015 Forecast for 2016**

Category	CLC	OSPB
Population Change /%	+95,200 1.7%	+97,300 1.8%
Employment Change/%	+47,300 1.9%	+66,800 2.6%
Unemployment Rate	3.8%	3.8%
Retail Trade Sales (Millions)/%	\$98,037 5.2%	\$99,400 5.5%
Home Permits (000s)	32.0	37.9
Denver-Boulder Inflation Rate	2.4%	2.5%

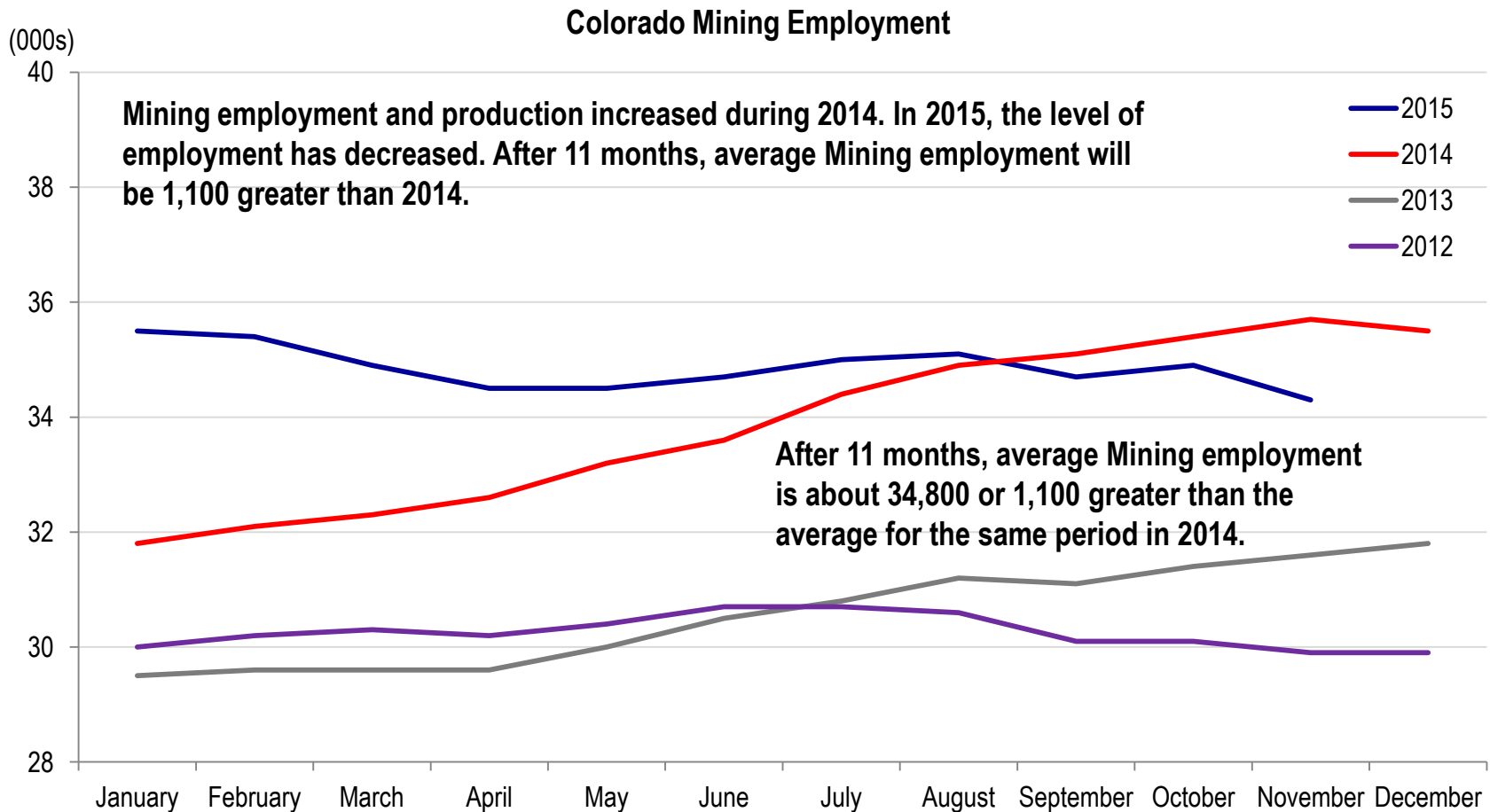
Source: CLC and OSPB.

Colorado-based Business and Economic Research  
<http://cber.co>



- Questions: What is Happening in the
- Extractive Industries?
-

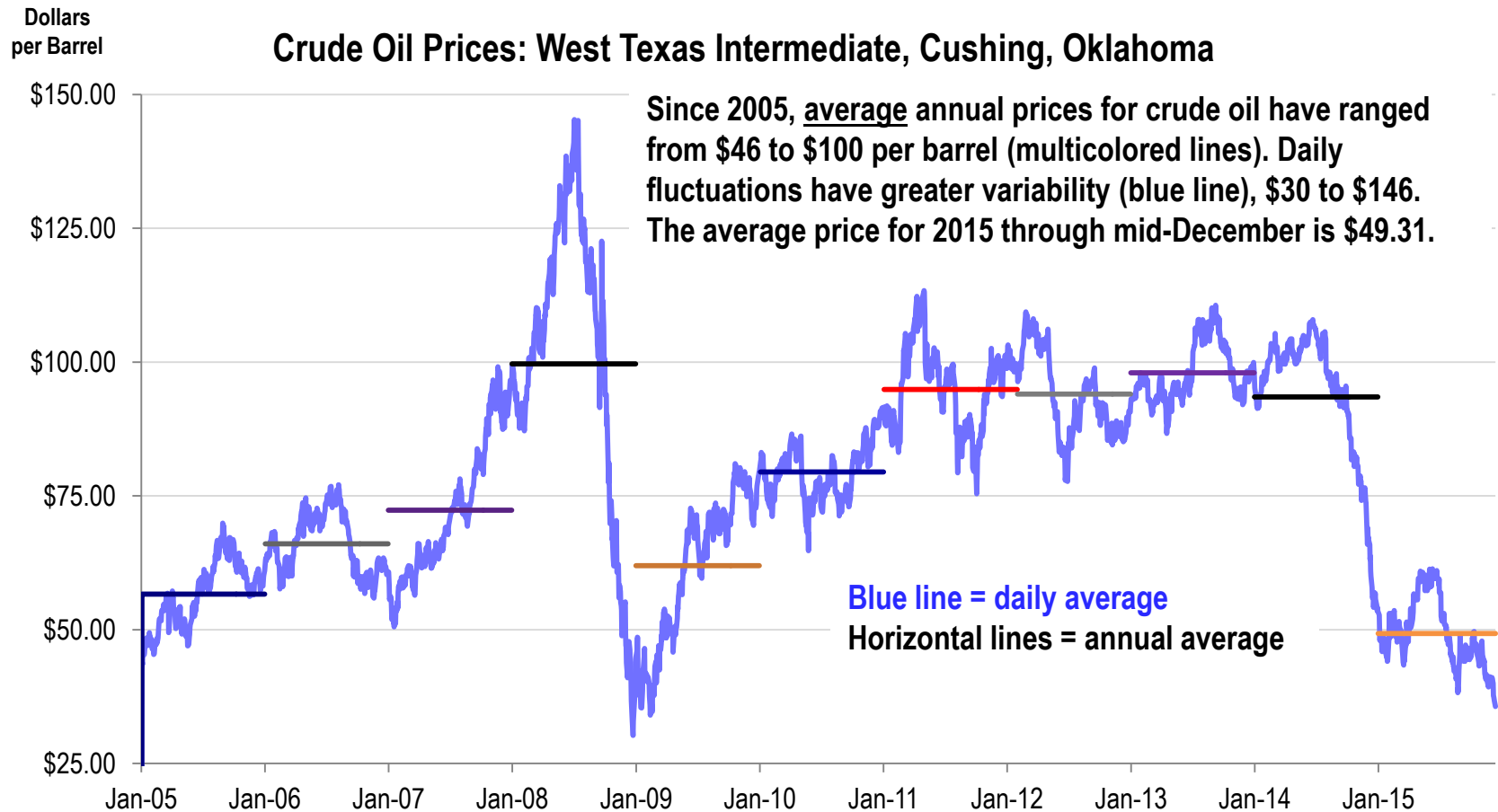
# Colorado Mining Employment 2012 to 2015



Source: Bureau of Labor Statistics, NSA.

# Crude Oil Prices

## West Texas Intermediate



Source: FRED, EIA.

# What is Happening in the Extractive Industries?

Estimated employment in the Oil and Gas Industry may be overstated by as much as 4,000 workers. A quick analysis using IMPLAN shows the loss of 3,200 oil and gas workers and 800 support workers would result in a loss of \$4.2 billion in economic activity and a total loss of 12,486 jobs. The direct average annual wages for the oil and gas industry are \$96,425 and the direct average annual output per worker is \$701,480.

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	4,000	\$385,699,807	\$1,495,932,215	\$2,805,918,880
Indirect Effect	4,237	\$325,199,655	\$483,426,675	\$834,280,381
Induced Effect	4,249	\$207,475,211	\$355,183,996	\$575,137,110
Total Effect	12,486	\$918,374,673	\$2,334,542,886	\$4,215,336,371
Source: IMPLAN.				

# What is Happening in the Extractive Industries?

It has been a challenging year for Colorado's Extractive Industries, i.e. the Mining Sector.

- The largest subsector of the Mining Sector is Oil and Gas. Oil prices are well below \$40 per barrel and not expected to rebound in the near future. This is the source of significant layoffs.
- Coal has fallen out of favor as a fuel source for multiple reasons. Coal Mining employment has declined.
- Low prices for rare earth metals has caused at least one Colorado mining company to go out of business and Molycorp to declare bankruptcy. Rare earth metals are critical to the security of the U.S. economy. Employment in this category has also declined.

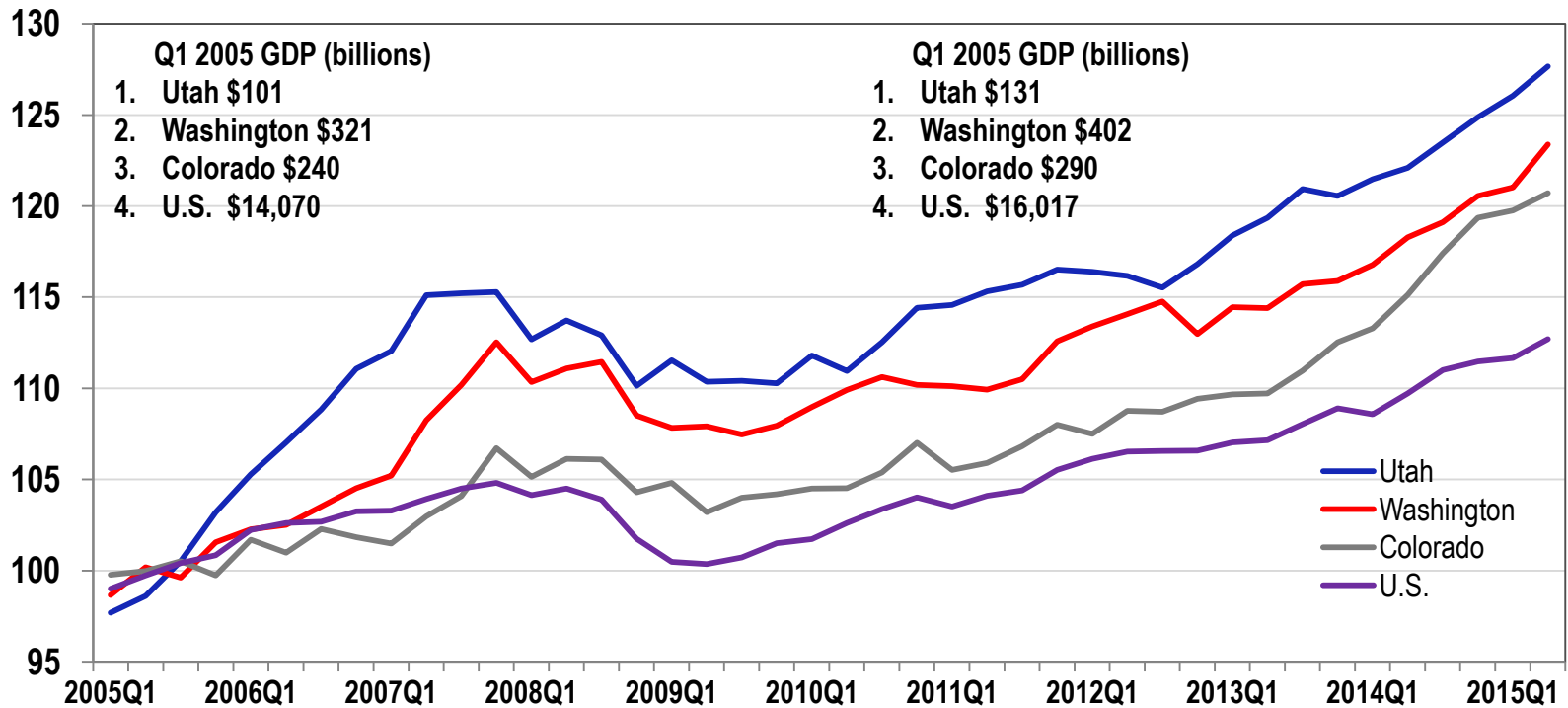
**The current BLS employment data shows that average annual Mining Sector employment for 2015 will be about 34,800. This is 1,100 greater than the same period in 2014. Initial projections suggest this data may overstate current employment by at least 4,000 workers. An IMPLAN analysis indicates that a loss of 4,000 workers would result in the loss of almost 8,500 additional workers and a total of \$4.2 billion in economic activity.**

- Questions: How does the growth of
- Colorado compare to Utah and Washington?
-

- Quarterly Growth of Real GDP (All Industries)
- Colorado, Utah, Washington, and the United States
- 

Index Quarterly Real GDP (CO, UT, WA, US)

Index 2005=100  
Chained on 2009

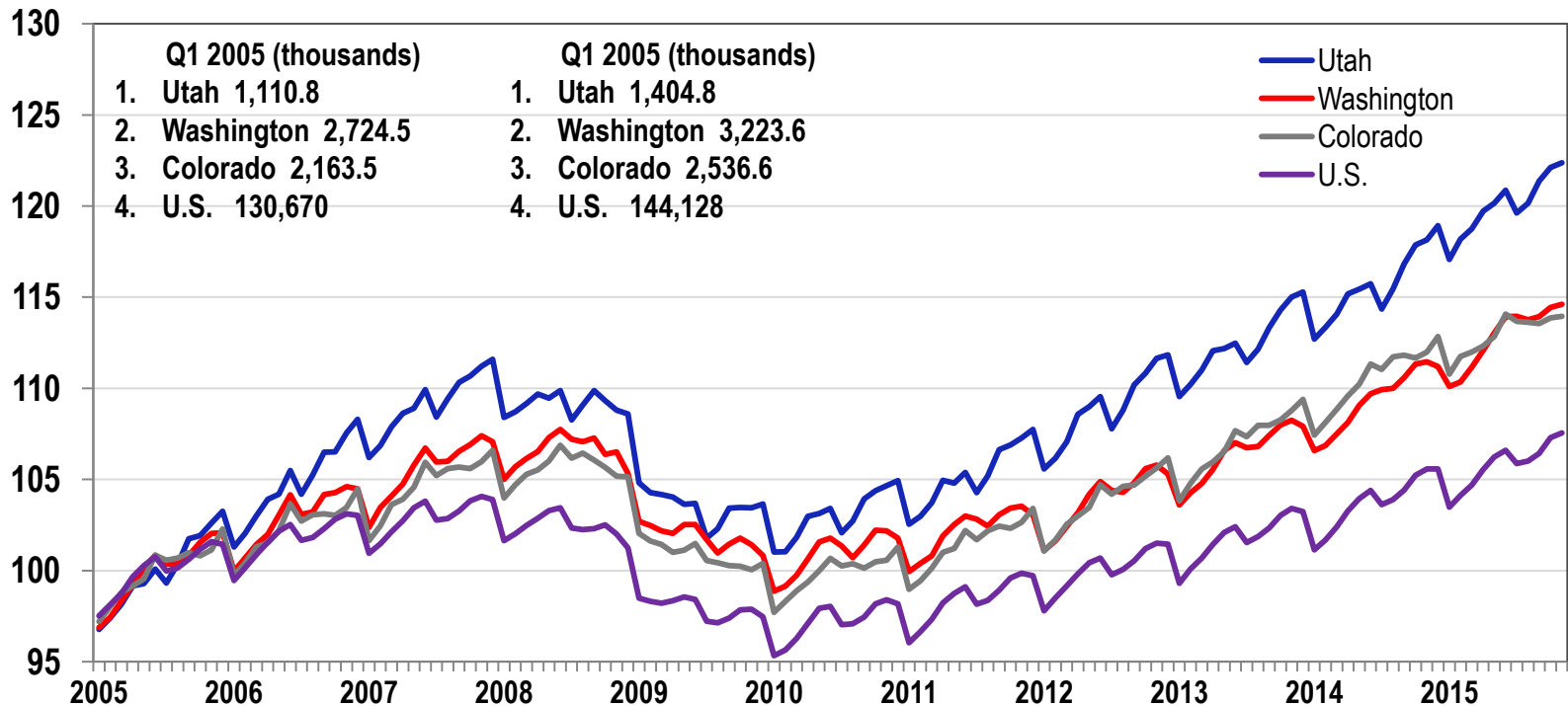


Source: Bureau of Economic Analysis.

- Growth of Employment (All Industries)
- Colorado, Utah, Washington, and the United States
- 

Index Monthly Employment (CO, UT, WA, US)

Index 2005=100  
Chained on 2009



Source: Bureau of Economic Analysis.

Colorado-based Business and Economic Research

<http://cber.co>



# How does the growth of Colorado compare to Utah and Washington?

There are many metrics that can be used to compare the economies of states. This simplistic evaluation compares the growth rates for Real GDP and employment from 2005 to the present.

## Real GDP

- The Real GDP for all three states has grown at a faster rate than the U.S.
- Utah had the fastest rate of Real GDP growth from 2005 to present.
- Colorado had the fastest rate of Real GDP growth from 2013 to present because of the rapid growth in the extractive industries. That rate of growth will decrease as a result of challenges facing the industry caused by lower oil prices.

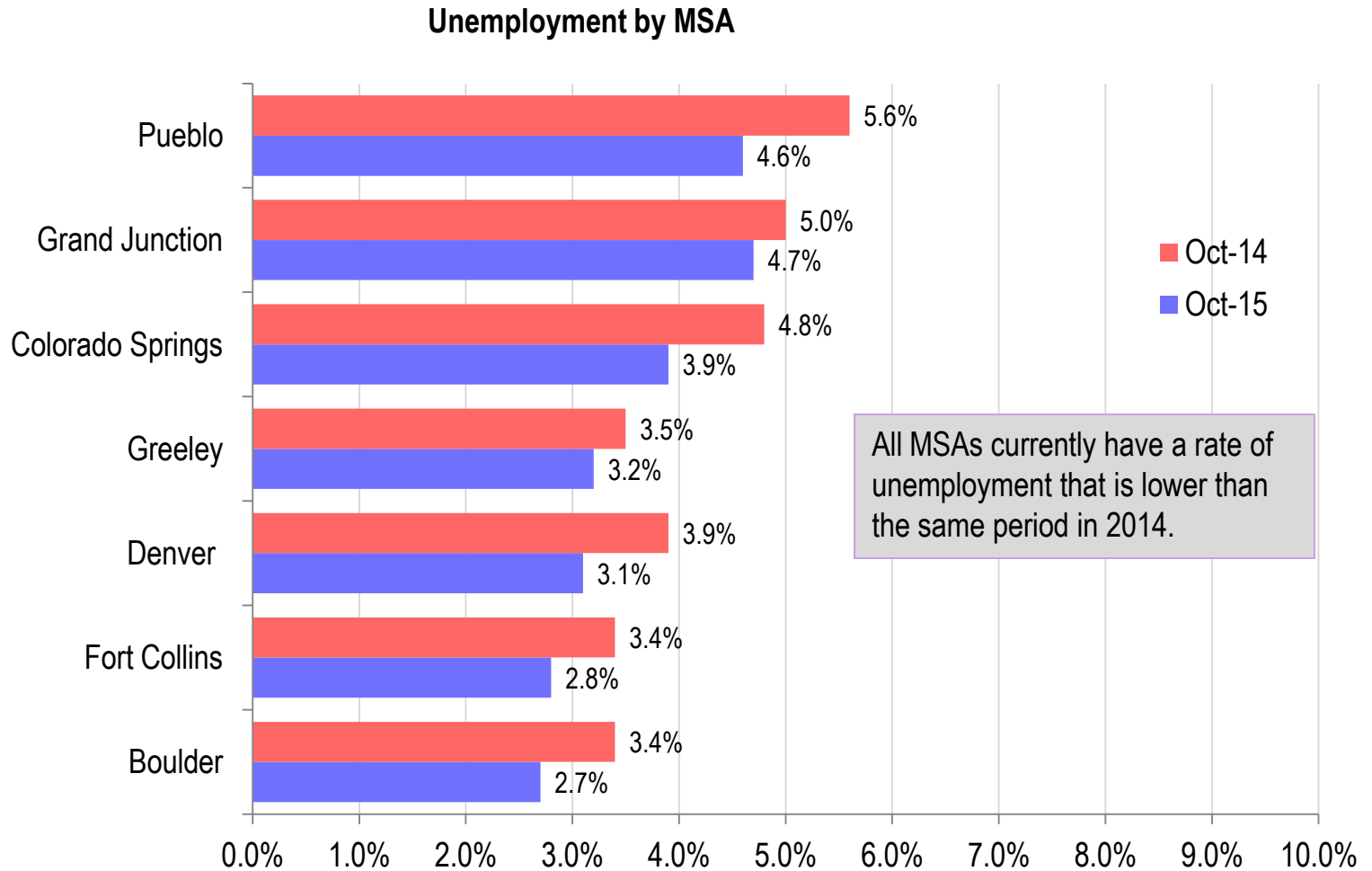
## Employment

- Employment for all three states has grown at a faster rate than the U.S. That rate of growth has accelerated since 2010.
- Utah had the fastest rate of growth of the three states.
- Colorado and Washington have grown at similar rates; however, Washington's rate of growth has been off a higher base of employment.



# Summary and Total Jobs Added

# Unemployment by MSA 2014 vs. 2015



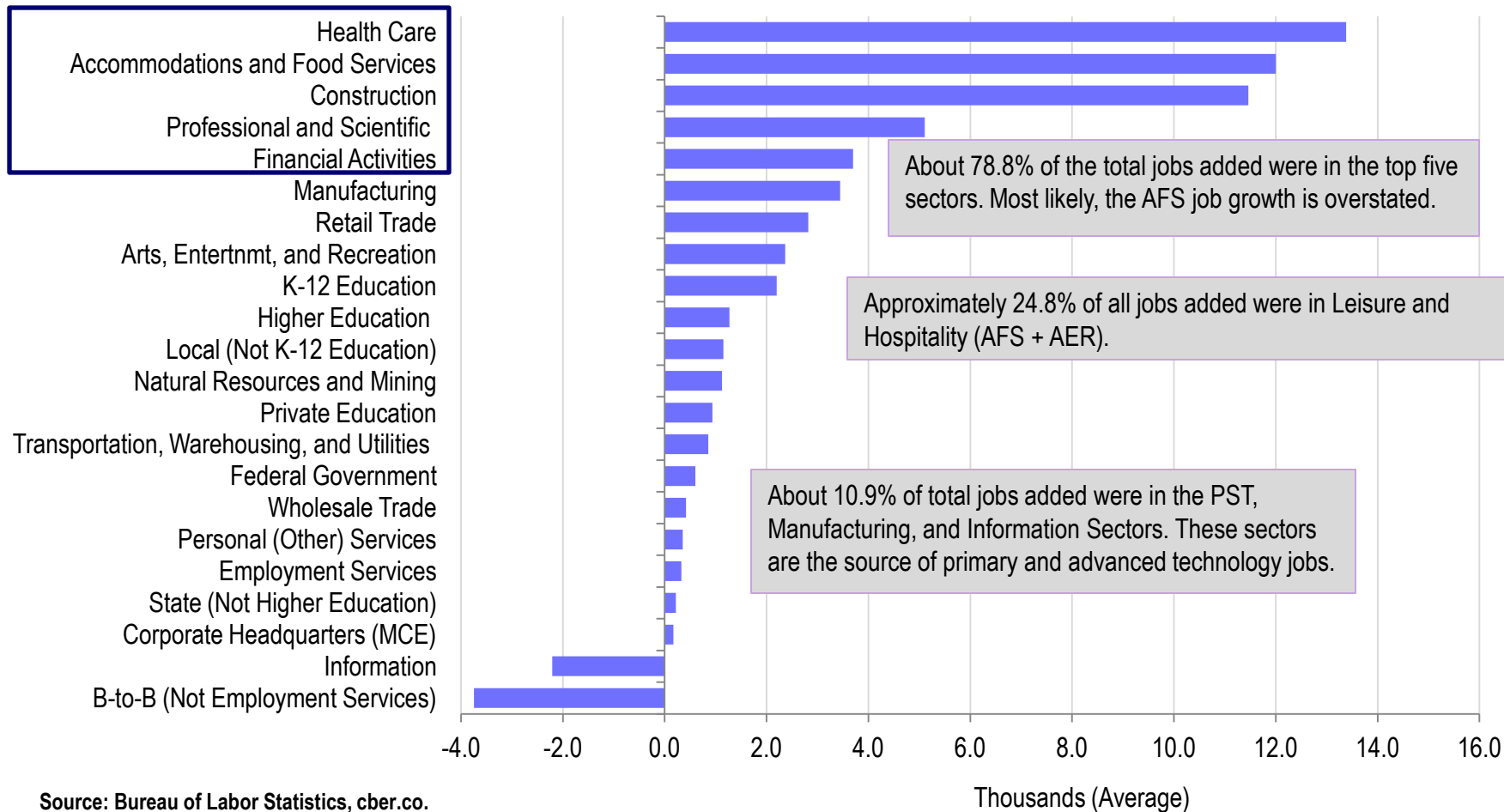
Source: Bureau of Labor Statistics, NSA. Note: MSA unemployment lags by one month and is reported on a non-seasonally adjusted basis.

Colorado-based Business and Economic Research

<http://cber.co>

# Change in Employment First Eleven Months 2015

Number of Jobs Added



Source: Bureau of Labor Statistics, cber.co.

Colorado-based Business and Economic Research

<http://cber.co>

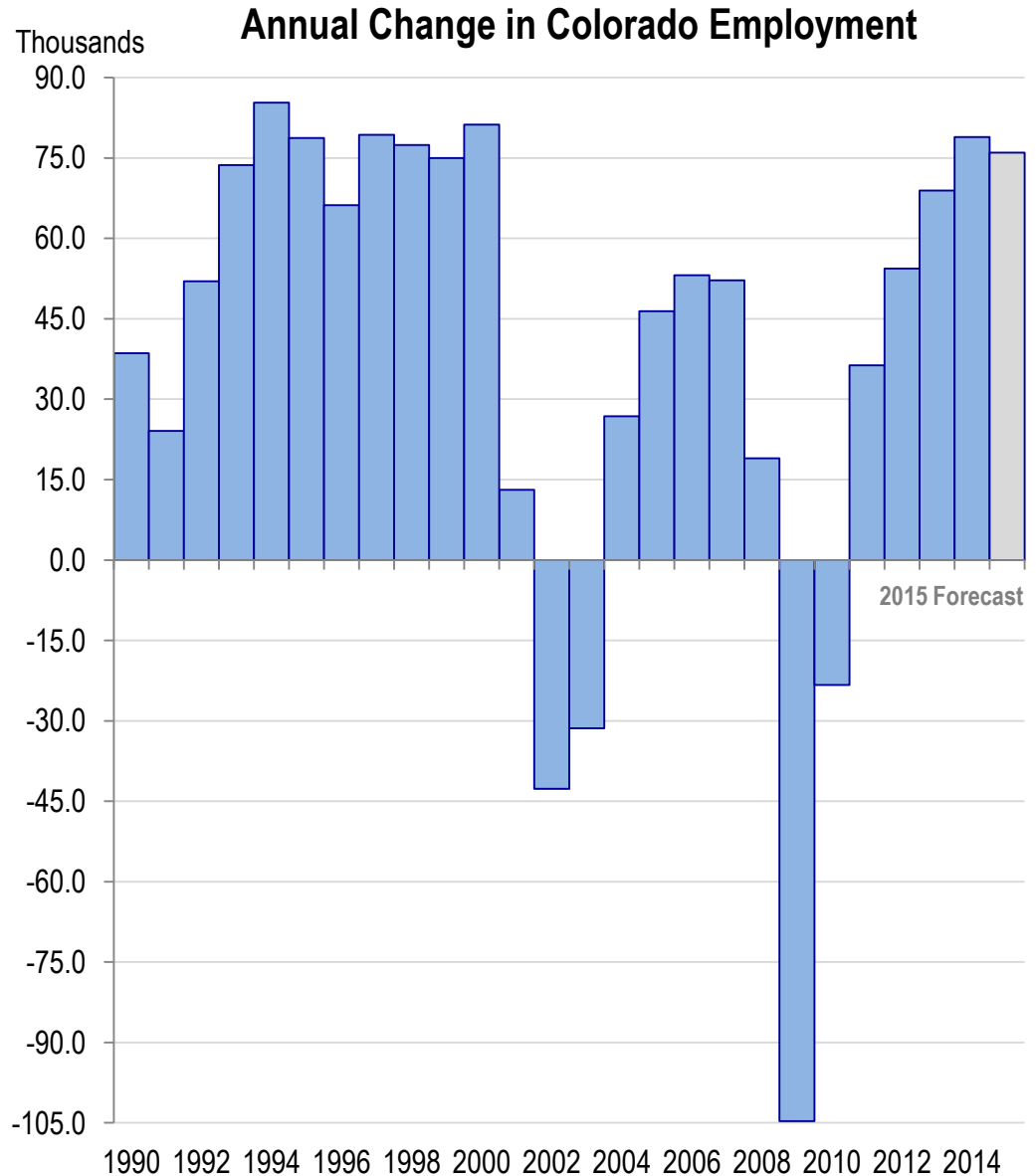
## Annual Employment Change in Colorado

In 2014, Colorado experienced accelerating job growth for the fourth consecutive year. The state added 78,900 workers, an increase of 3.3% on a base of 2,381,900 jobs.

The state is projected to add 73,000 to 79,000 jobs in 2015, an increase of 3.0% to 3.2%.

For the first eleven months of 2015 Colorado employment is 58,000 jobs greater than the same period last year. The published data shows the state is growing at a solid, but decreasing rate of growth.

The Colorado Department of Labor and Employment has projected that a significant upward adjustment will be made to the Q4 2014 data and data for the first four months of 2015. These revisions will be made in March 2016. Total employment for 2015 should be near the bottom of the range of 73,000 to 79,000. This is the level of job growth forecasted by cber.co for 2015.



Source: Bureau of Labor Statistics, cber.co.

Colorado-based Business and Economic Research  
<http://cber.co>

# Reasons to Feel Good about the Colorado Economy

There are a number of reasons to feel good about the Colorado economy. Fortunately, the reasons to be optimistic, listed below, outweigh the risks.

<p><b>Momentum</b> – Revised employment data for Q4 2014 will show the Colorado economy had strong momentum coming into 2015. Q1 was equally as strong. These revisions to the 2015 data will be made in March 2016.</p>	<p><b>Consumer Sentiment</b> – Unofficial measures of consumer sentiment (rising prices and longer lines in restaurants, shoppers carrying bags out of retail stores, lower gas prices) indicate the Colorado economy is healthy.</p>
<p><b>New Car Registrations</b> – Colorado new car registrations remain strong.</p>	<p><b>Construction</b> – Cranes and cone zones are abundant.</p>
<p><b>Job and Establishment Growth</b> – Current job growth is increasing at a decreasing rate, but it remains solid.</p>	<p><b>Tourism</b> – The Colorado Tourism Sector is closing out another strong year and there is good snow in the high country.</p>
<p><b>Property Taxes</b> - Local governments and school districts will benefit from higher property values and property taxes.</p>	<p><b>Government Spending</b> – Local governments have demonstrated their revenue streams are stronger and they have money they are willing to spend.</p>
<p><b>Oil and Gas Industry</b> – Despite direct, indirect, and induced job losses in the Oil and Gas industry, the overall economy appears to have weathered the storm.</p>	

# Economic Risks and Concerns

As always there are risks and headwinds in the Colorado economy. Collectively, they could be problematic.

<p><b>Low Unemployment Rate</b> – Industries such as construction, software, and advanced manufacturing have had difficulty finding trained workers because of low unemployment rates in key occupations. The problem will increase as the unemployment rate drops further.</p>	<p><b>Affordable Housing</b> - It will be more difficult to find attainable and affordable housing as a result of the continued increases in housing prices. There is not evidence this has been detrimental to the state – yet.</p>
<p><b>Manufacturing</b> – Between 2010 and 2014 the Manufacturing Sector added jobs at a CAGR of 2.4%, primarily as a result of demand for renewable energy products. The Manufacturing Sector is important because it provides primary jobs – jobs that bring in wealth from outside Colorado.</p>	<p><b>State Government</b> - The state government will collect record revenues this fiscal year, but experience significant shortfalls caused in part by Amendment 23, the Gallagher Amendment, and TABOR. The result will be reduced government services. This situation is a legislative nightmare.</p>
<p><b>Population</b> – Twenty-seven of the state’s 64 counties experienced declines in population between 2010 and 2014. Many are small rural counties.</p>	<p><b>Information Sector</b> – The sector continues to shed jobs at an alarming rate.</p>
<p><b>Layoffs</b> - Layoffs at BNSF and Union Pacific have been caused by regulatory issues and a lack of demand for coal, oil, agricultural products, and industrials goods.</p>	<p><b>Oil and Gas Industry</b> – The Bureau of Labor Statistics has grossly overstated 2015 employment in the Oil and Gas industry. Revisions will be published in March 2016.</p>

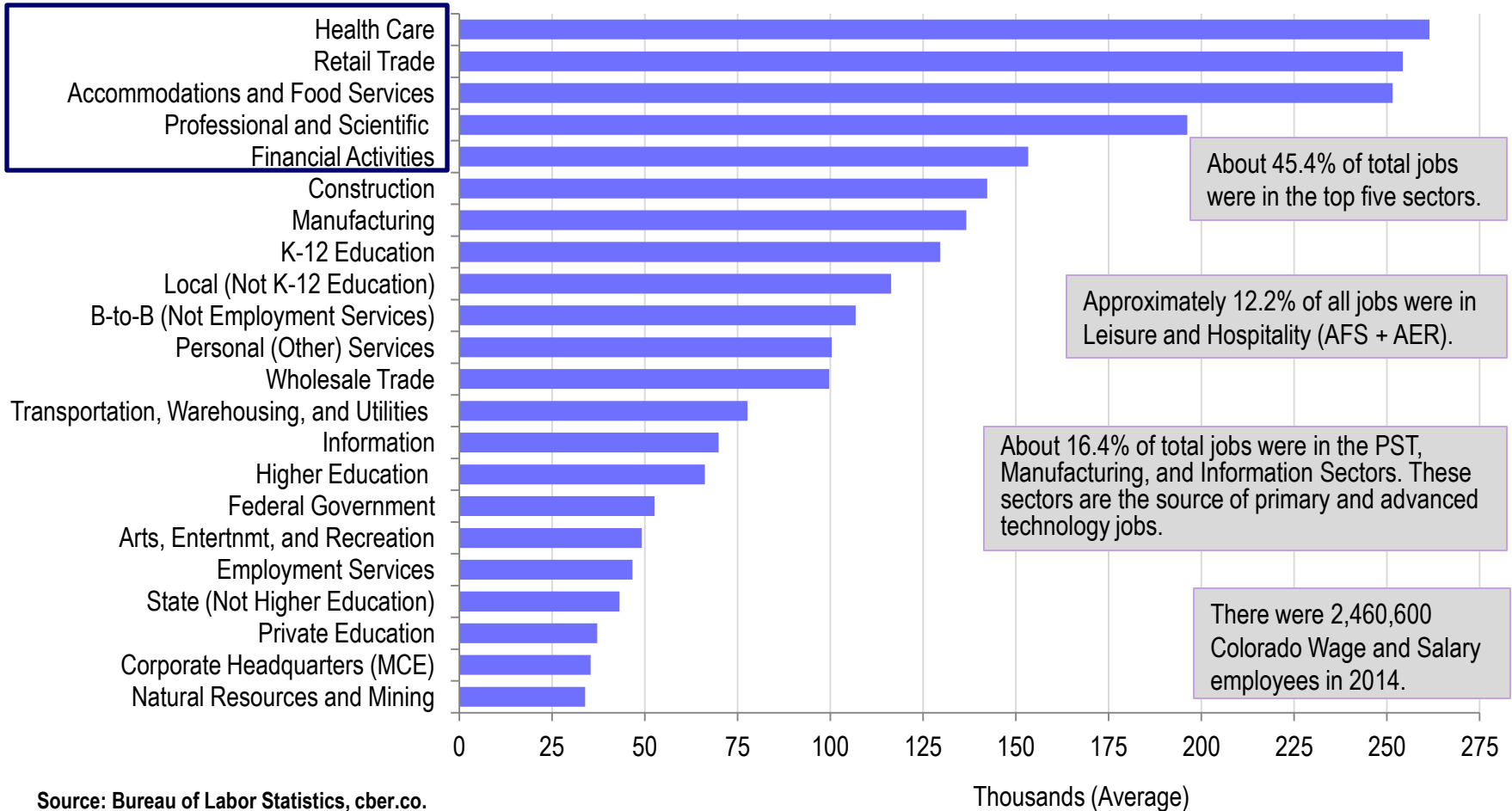


# Appendix



# 2014 Colorado Wage and Salary Employment

## Employment



Source: Bureau of Labor Statistics, cber.co.

Colorado-based Business and Economic Research

<http://cber.co>



# Colorado Economic Forecast

## Sector Portfolio Analysis

### Attempt to Improve Forecast Accuracy

The primary focus of most state economic forecasts is to project total employment.

Some economists also produce sector forecasts. They usually add projections for the sectors to derive the state total, an approach that introduces more variables for error.

cber.co feels the most accurate forecast is achieved by projecting total employment based on projections for categories of sectors. Sectors are grouped into three categories based on their past performance.

Projections for the categories and overall employment are based on trends, feedback from business leaders, economic developers, and other economists. The sum of these categories are then compared to the projections for overall total employment. Minor adjustments are made and the final forecast is produced for three scenarios. The most likely scenario is used as the final cber.co forecast. This final step helps create a better understanding of upside and downside risk.

### Strong Growth, Solid Growth, and Volatile Categories

This portfolio approach has made it easy to see that some sectors consistently create jobs at a higher rate of growth, some show solid growth, and others are more volatile. Ultimately, the volatile category tends to have a greater influence on the amount of change in total job growth than the sectors with steady growth.

In 2012, 2013, and 2014 cber.co evaluated the performance of 23 sectors over the past two decades and refined the manner in which the sectors are grouped. The evaluation factors for grouping include the rate of growth, number of years with positive job growth, size of the sector, and volatility in job growth. The data used for classifying the sectors is available in the Appendix of the original forecast. In the short period this process has been used, it has produced a high level of accuracy in the final forecast. More importantly, it has produced a better understanding of what is driving the economy.

# Measuring Change in Employment

## Methods of Measuring Change in Employment

- Month-over-prior-month – This method can be used only with seasonally adjusted data.
- Year-over-prior-year – This method can be used with seasonally adjusted or non-seasonally adjusted data. The results are usually similar.
- Rolling average – Average employment for a period, such as 12-months, compared to average employment to the average for the prior period of “rolled” data.

## Measurement Used by cber.co

- cber.co typically uses a derivative of a rolling average. For example, the average of the first quarter of 2015 will be compared to the average for the first quarter of 2014. It is also important to look for trends.
- This methodology is preferred to seasonally adjusted month-over-prior month data, particularly with employment data. Advances in technology and the past two recessions have made it difficult to accurately adjust for seasonality.



# BLS/LMI Data Revision Process


## BLS and LMI Data Projections

In recent years, data-producing federal agencies have been asked to deliver more accurate data, in a shorter time frame, using fewer staff, with lower research budgets. The data used for most short-term forecasts is the Current Employment Survey, also called Nonfarm or Wage and Salary data. It is possible for the CES data to be revised up to four times.

## BLS and LMI Data Revision Process

The CES projection process is outlined below:

1. Around the 20<sup>th</sup> of a month, preliminary data for the prior month will be published and the month prior to that will be updated (For example, around June 20<sup>th</sup> preliminary data for May will be produced and April will be updated.) These revisions are usually minor. Most short-term forecasts use this data.
2. In March of the following year, the previous two years will be revised. (For example, the 2014 employment data will be revised in March 2015 and finalized in March 2016).
3. The initial March update is usually the most significant revision, and the two-year update is often minor (In the case of 2014, some of the monthly totals will see significant upward revisions when revised in March 2015.)
4. Periodically, BLS updates the entire data series back to 1990. This usually occurs when they recalibrate their projection models or redefine NAICS codes.



## Review of Colorado Economy Analysis of First Eleven Months of 2015

This analysis is for informational purposes only. Any opinions or interpretations of data are those of the presenter. As such, they do not represent the viewpoints of any group or particular organization.

For further information contact Colorado-based Business and Economic Research (cber.co).  
©Copyright 2015 by cber.co.

Data contained in the tables, charts, and text of this presentation is from sources in the public domain. With appropriate credit, it may be reproduced and shared without permission. Please reference, “Colorado-based Business and Economic Research” (cber.co). Additional presentations are available at <http://cber.co>.

For additional information contact cber.co at [cber@cber.co](mailto:cber@cber.co).

### ABOUT THE AUTHOR

Gary Horvath has produce annual employment forecasts of the state economy for over 25 years. They have been supplemented by monthly economic updates and indices that track economic performance over the short term. In addition he has directed three statewide analyses that included reviews of all 64 county economies.

In addition, Horvath was the principal investigator for a state and federally funded project to prepare a nanotechnology road map for Colorado. As well, he was a co-founder of the Colorado Photonics Industry Association, a trade group for Colorado’s Photonics cluster. Horvath has been an active board member of the group since its inception.

Horvath has also served on the Board of Directors for the Economic Development Council of Colorado, Northwest Denver Business Partnership, Adams County Economic Development, and Broomfield Economic Development Corporation. Horvath has also been the lead for the photonics/electronics cluster, which is part of OEDIT’s early stage and proof of concept programs.