cber.co Colorado
Economic Review Through August 2016

Colorado-based Business and Economic Research
Prepared
September 25, 2016

Overview of Economic Review

This chartbook provides a series of graphs, tables, and discussions that review changes in the global, U.S. and Colorado economies. This month's analysis includes a one-page review of the global and U.S. economies and focuses primarily on Colorado. The review includes recently released data from the Census Bureau that shows demographic changes that have occurred as a result of the state's growth.

After 8 months, Colorado is on track to add 69,800 jobs in 2016, although that number may be revised downward in the BLS benchmark revisions next March. This review is divided into the sections listed below.

Global and United States Economy

- Overview of the Global and United States Economy

The Colorado Economy

- Population and Demographic Data
- Labor
- Gross Domestic Product
- 2016 Colorado Employment by Performance Category
- Employment for Major Industries from Volatile Category
- Construction and Housing
- Summary

Overview of the Global and United States Economy

Overview of the Global and United States Economy

The United States economy should continue to post solid job growth for the remainder of the year, whereas GDP growth will be lackluster. The Conference Board projects that Real GDP growth for Q3 2016 will be 2.5%, Q4 will be 1.9%, and the 2016 Real GDP growth rate will be 1.4%.

Global and U.S. Outlooks

IMF economic update

- The rate of global real GDP growth will be lower than originally projected in 2016. It will be 3.1% in 2016, but is projected to increase to 3.4% in 2017.

Philly Fed Q3 economic update (not very optimistic)

- The number of U.S. jobs will increase by 2.5 million in 2016 and by 1.9 million in 2017.
- Real GDP growth will be 1.5% in 2016, 2.3% in 2017, and 2.2% in 2018.
- Unemployment will be 4.8% in 2016, and 4.6% for the next two years. The U.S. is approaching full employment which means the number of qualified workers has declined significantly.

The Conference Board Outlook for 2017

- Real GDP growth 1.9%.
- Real Consumer Spending 2.4%.
- Real Capital Spending, 1.4%, an increase from -0.9% in 2016.
- Trade Deficit, -$647.7 billion, up from -$576.3 billion in 2016.

Reasons to be Optimistic

Job Growth

- Steady job growth is on tap for 2017, albeit at a slower pace.

Housing

- U.S. housing prices have appreciated by about 5% in 2016.

CPI

- Inflation is near 1.0%, well below the Fed's target rate of 2.0%.

Consumer spending

- Personal consumption is solid and consumers are saving.

Price of Oil

- The price for a barrel of oil is in the $45 to $50 range. Some speculators and economists think it will reach $60 in 2017.

Ag

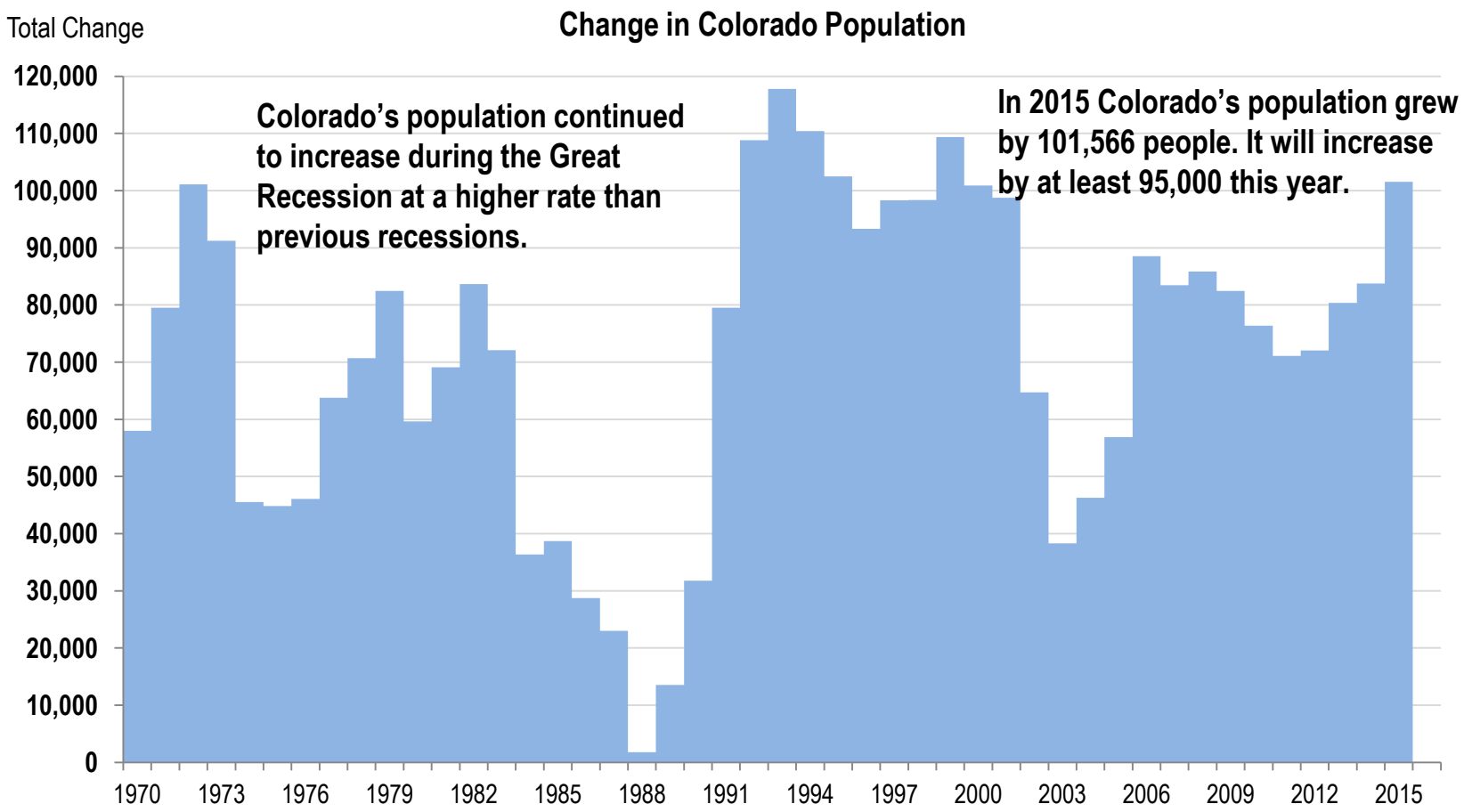
- Agriculture prices may be nearing the bottom or they have bottomed out, i.e. the future may be brighter for farmers and ranchers.

Election

- People are counting the minutes until the election is over.

The Colorado Economy
Population and New Demographic Data

Annual Change in Population



Source: Census Bureau, cber.co.

Why is Population Growth Important?

A few of the many reasons population growth is important (pros and cons) are listed below.

Pros

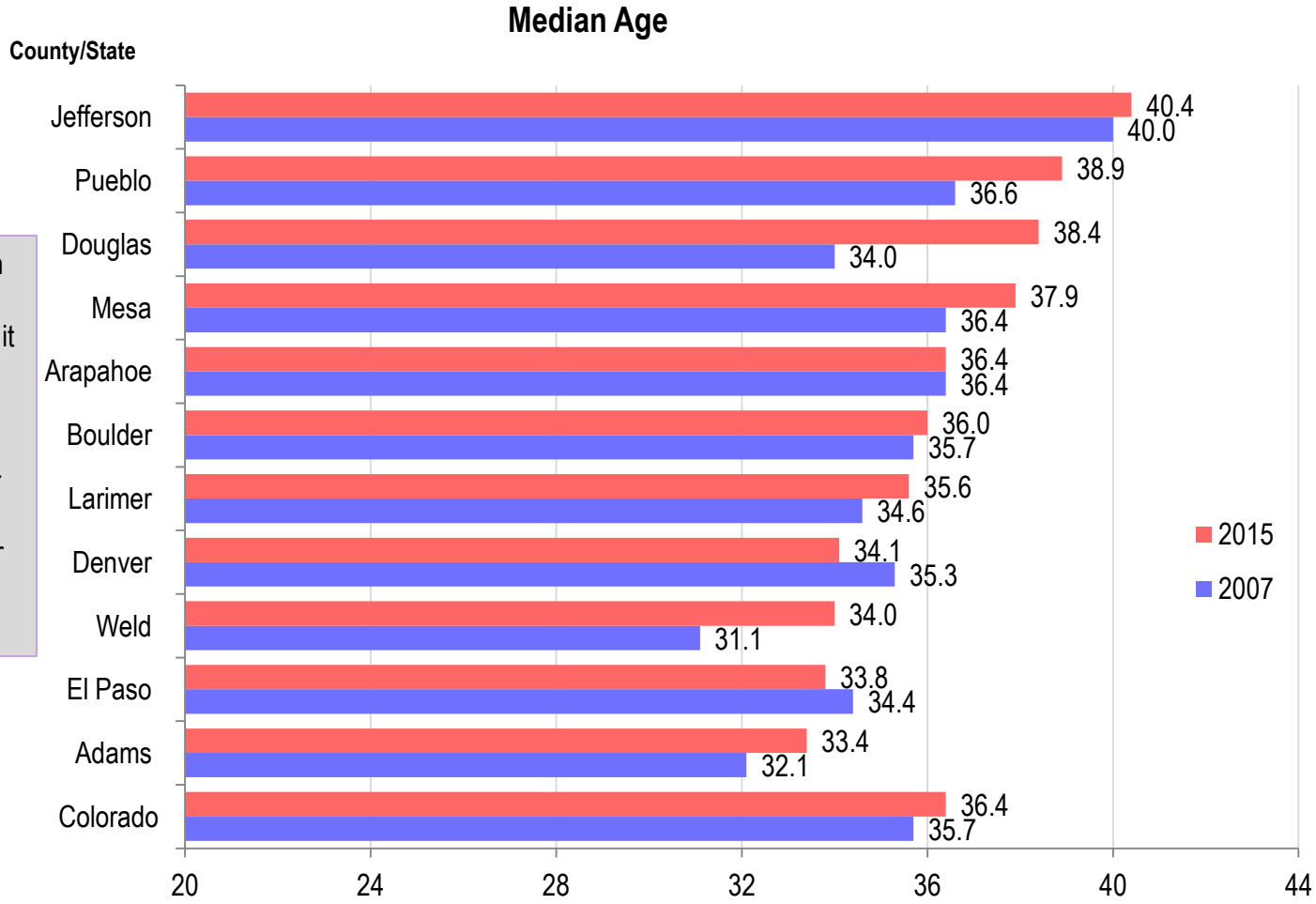
- Population growth increases the number of people paying taxes.
- In-migrants may be attracted to the state because there are jobs available in Colorado that can't be filled by qualified locals.
- Depending on the mix of in-migrants, the diversity of the state population may change.
- The influx of in-migrants may bring new ideas to the state. This is generally thought to be positive.

Cons

- Population growth increases demand for existing services.
- It increases congestion and pollution.
- It places greater demand on the state's infrastructure, water supply and other resources.
- There may be greater competition for jobs.
- There may not be funding for services or capital improvements needed to accommodate more residents.

Median Age 2007 vs. 2015

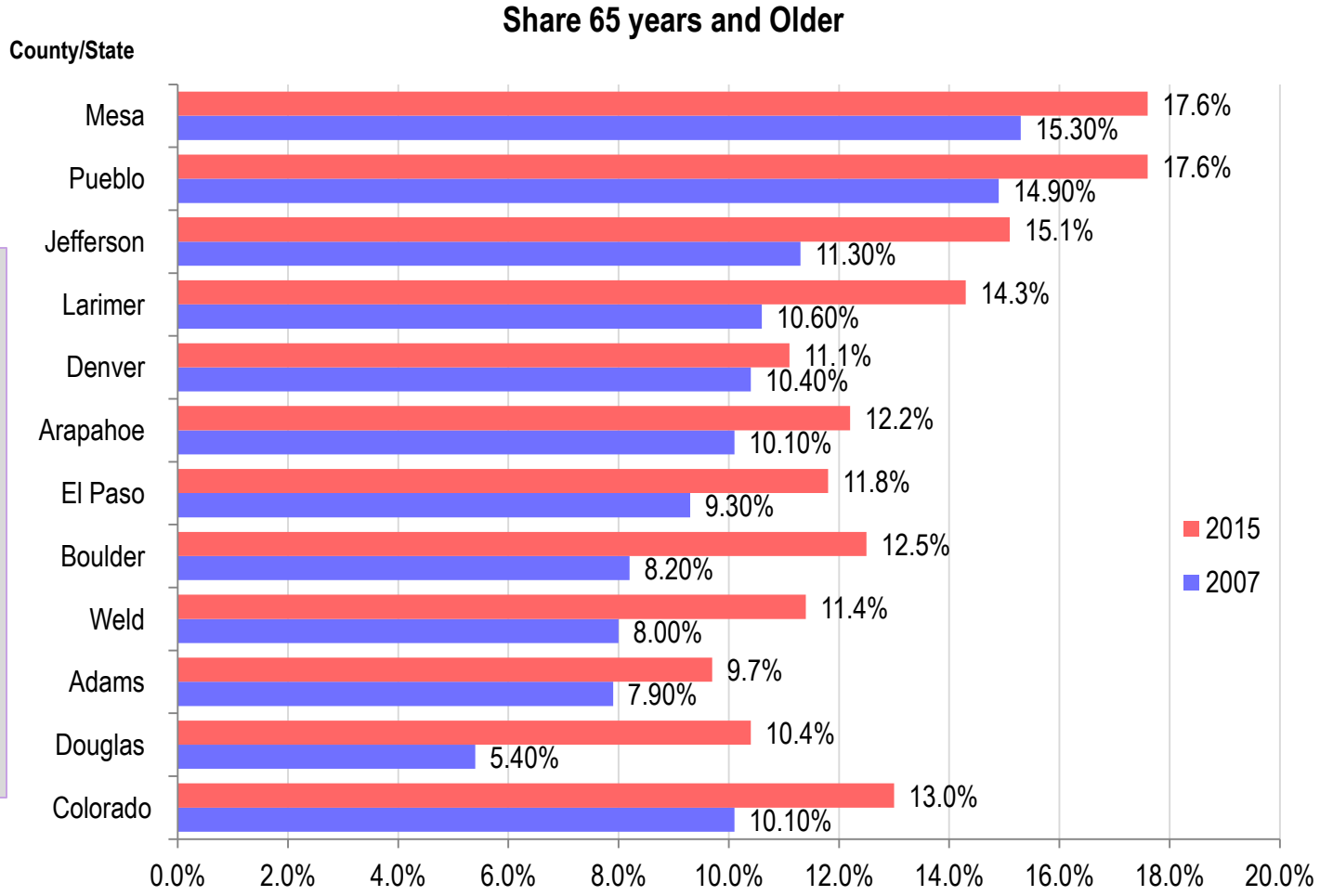
A comparison between the median age for 2007 and 2015 shows it decreased for El Paso and Denver County. The median age remained the same for Arapahoe County. The median age in all other metro counties increased.



Source: U.S. Census Bureau.

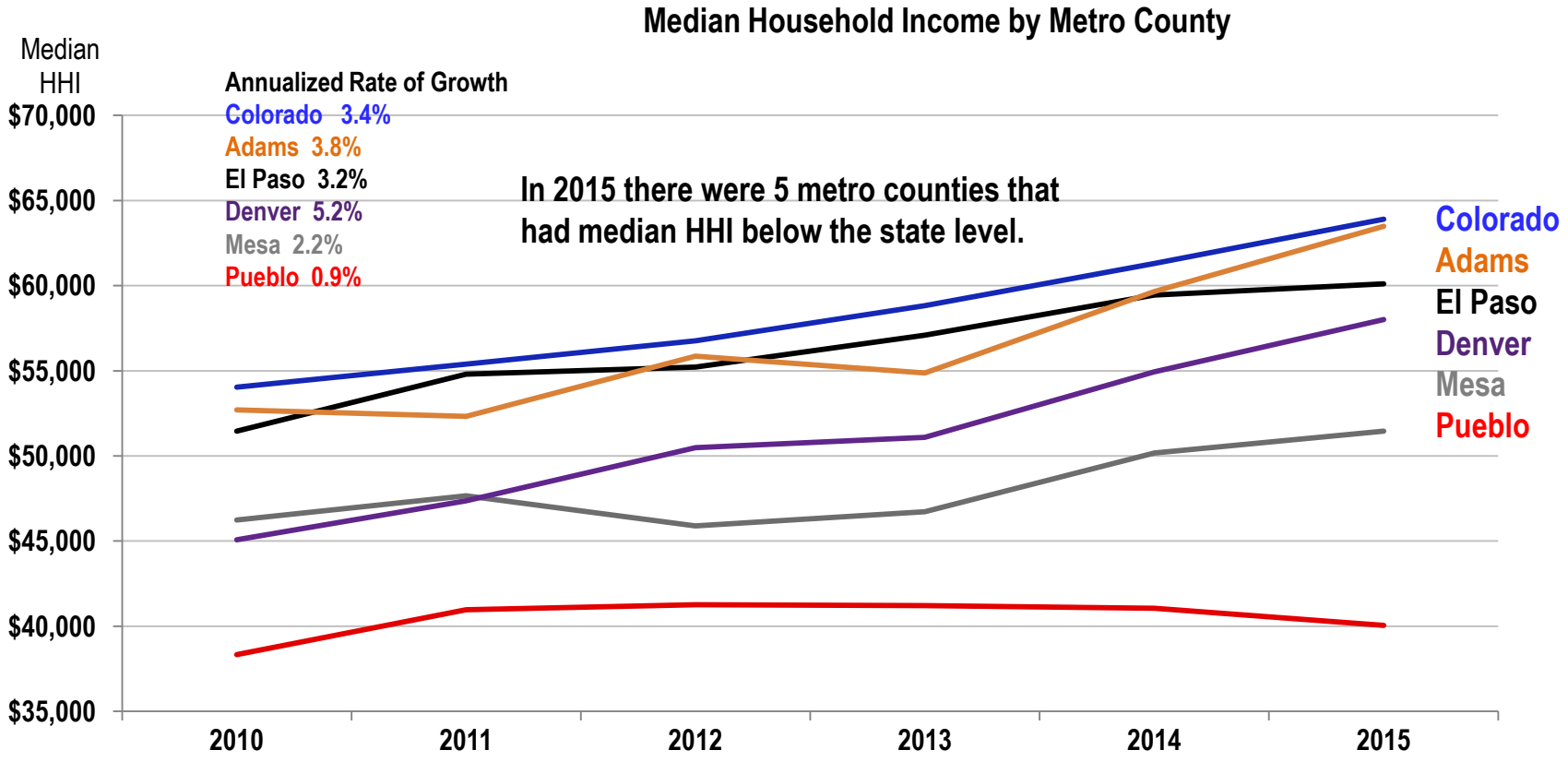
Share 65 Years and Older 2007 vs. 2015

Each of the metro counties had a higher percentage of 65+ individuals in 2015 compared to 2007 – the aging of the Baby Boomers. Only 4 metro counties had a greater percentage of 65+ people than the state percentage in 2015: Larimer, Jefferson, Pueblo, and Mesa.



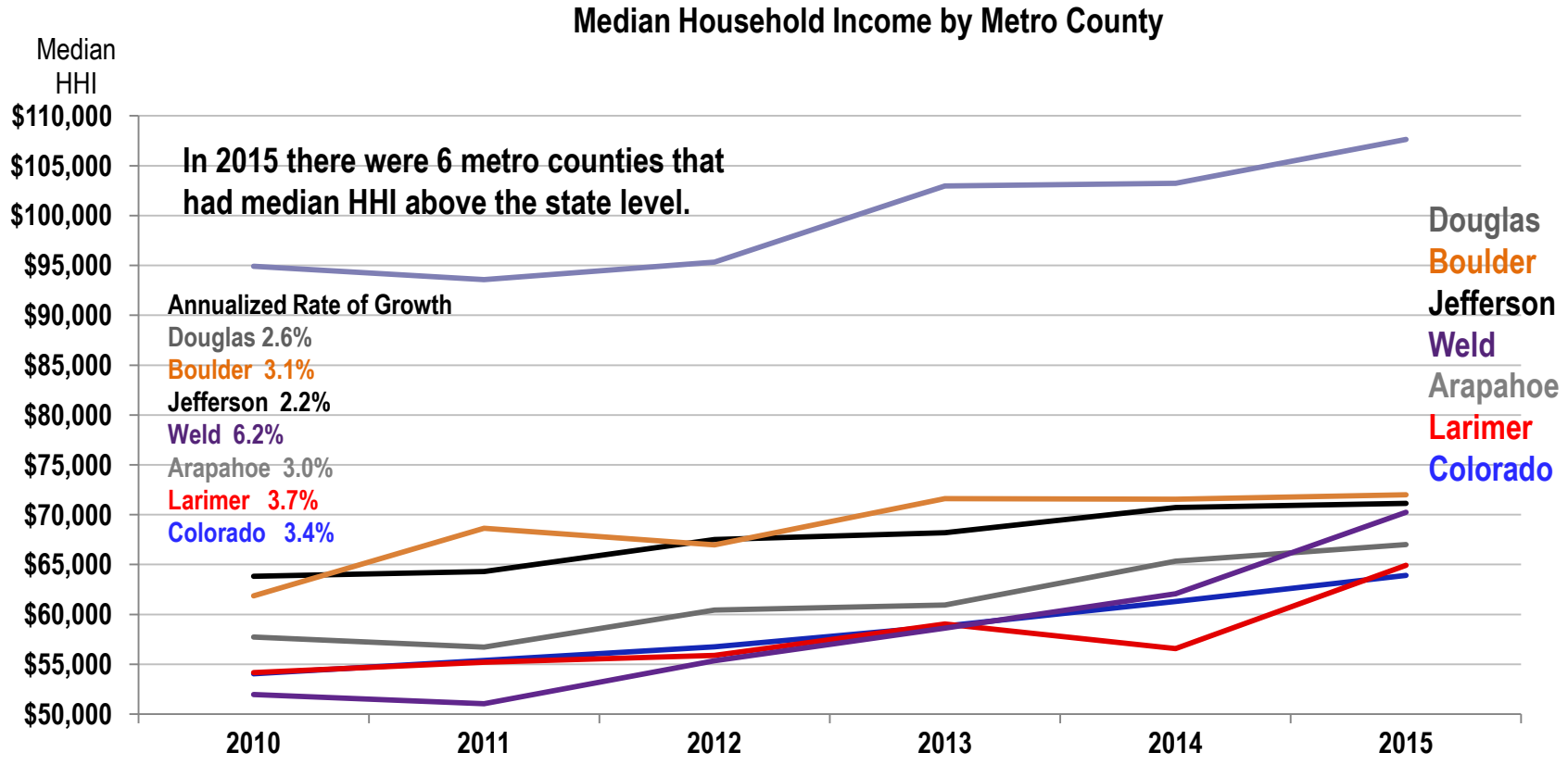
Source: U.S. Census Bureau.

Median Household Income
Metro Counties with 2015 Median HHI < Colorado Median



Source: U.S. Census Bureau.

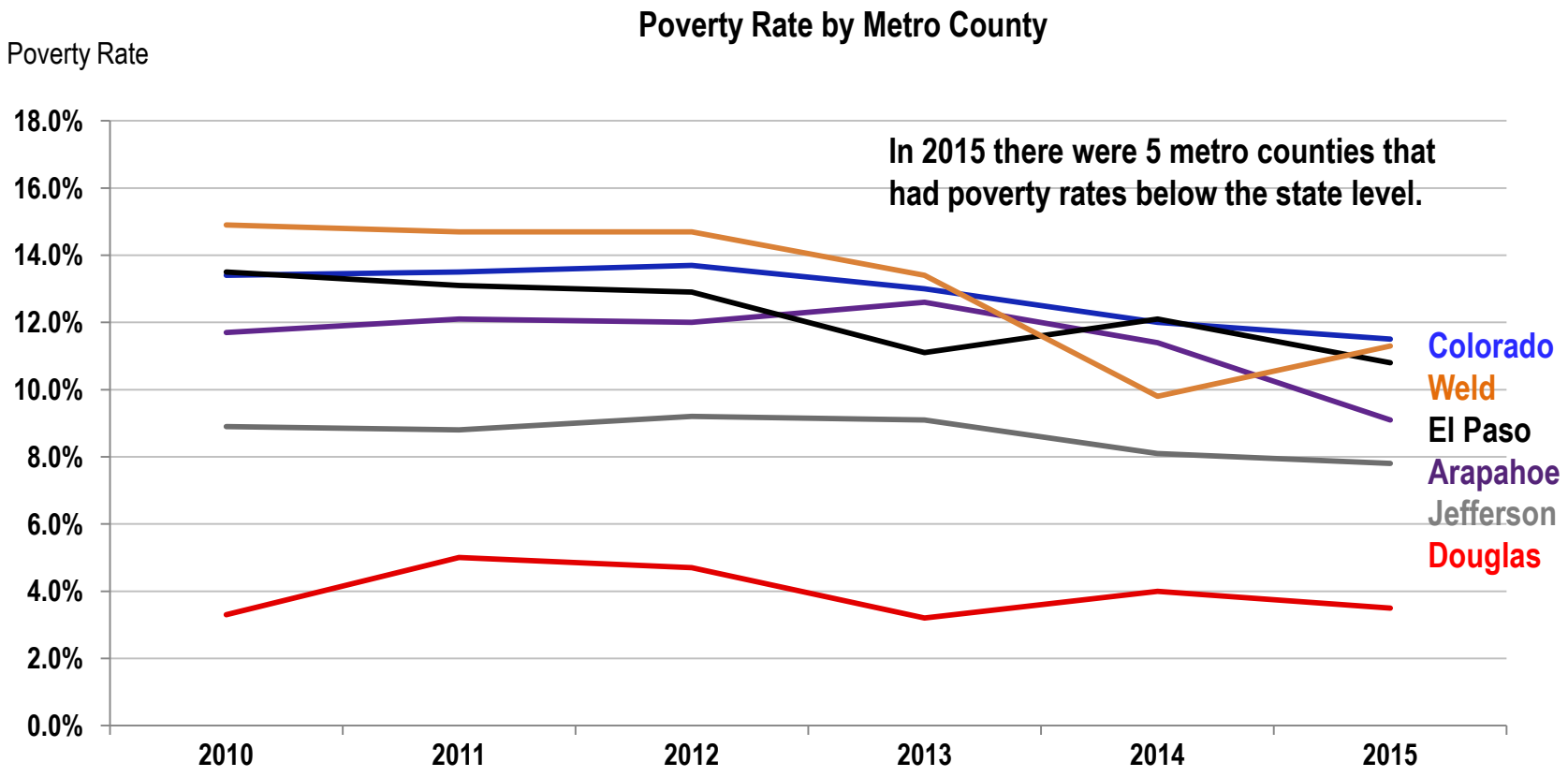
- Median Household Income
- Metro Counties with 2015 Median HHI > Colorado Median



Source: U.S. Census Bureau.

Poverty Rate

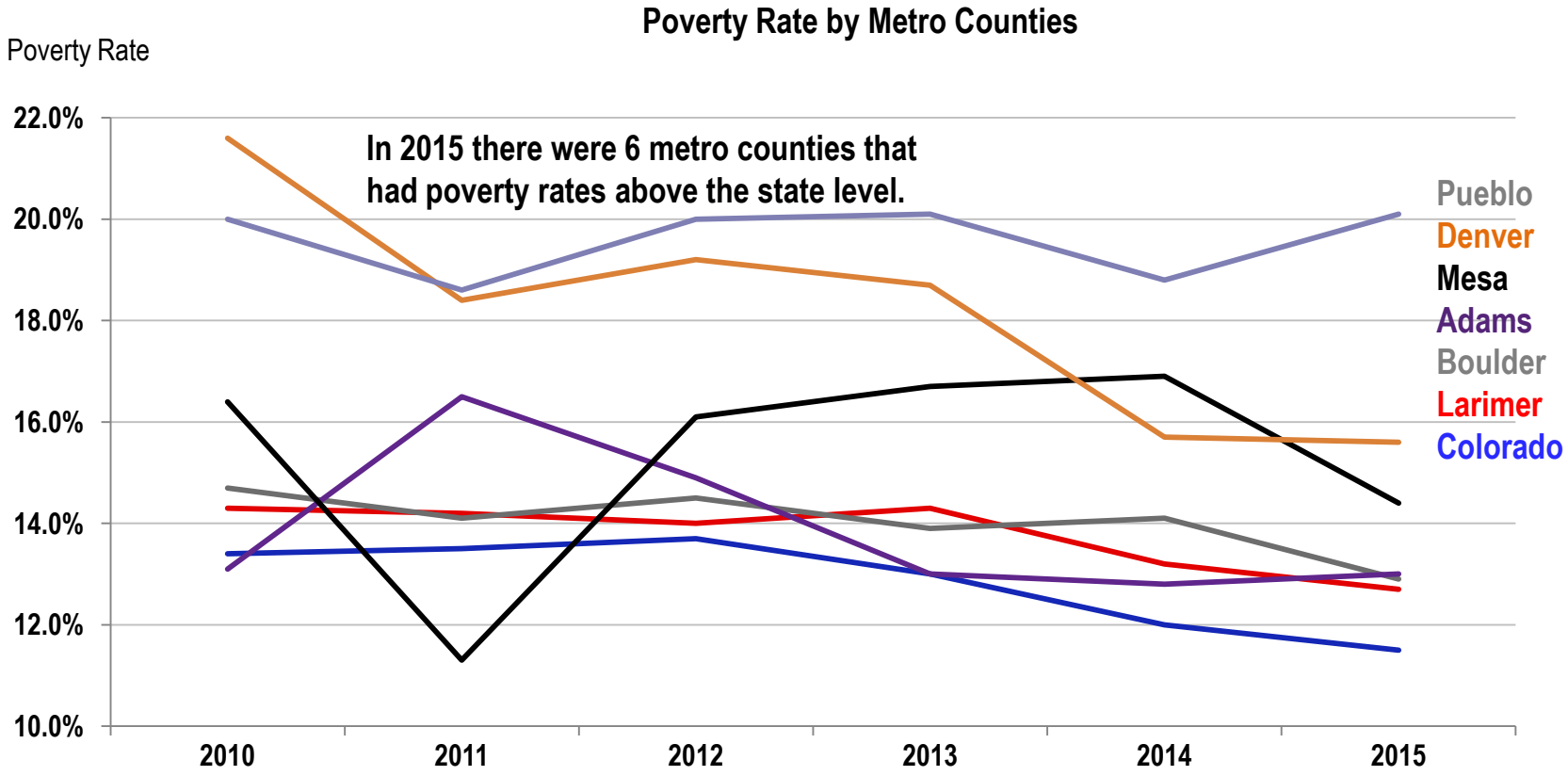
Metro Counties with Poverty Rate < Colorado Rate



Source: U.S. Census Bureau.

Poverty Rate

Metro Counties with Poverty Rate > Colorado Rate



Source: U.S. Census Bureau.

Why is Demographic Data Important?

A few of the many reasons demographic data is important are listed below.

Median Age Data

- Median age data is useful in estimating the size of the workforce and possible workforce needs.
- The data can help determine the types of services that need to be provided such as schools, police protection, medical services, transportation, types of businesses.

Median Household Income Data

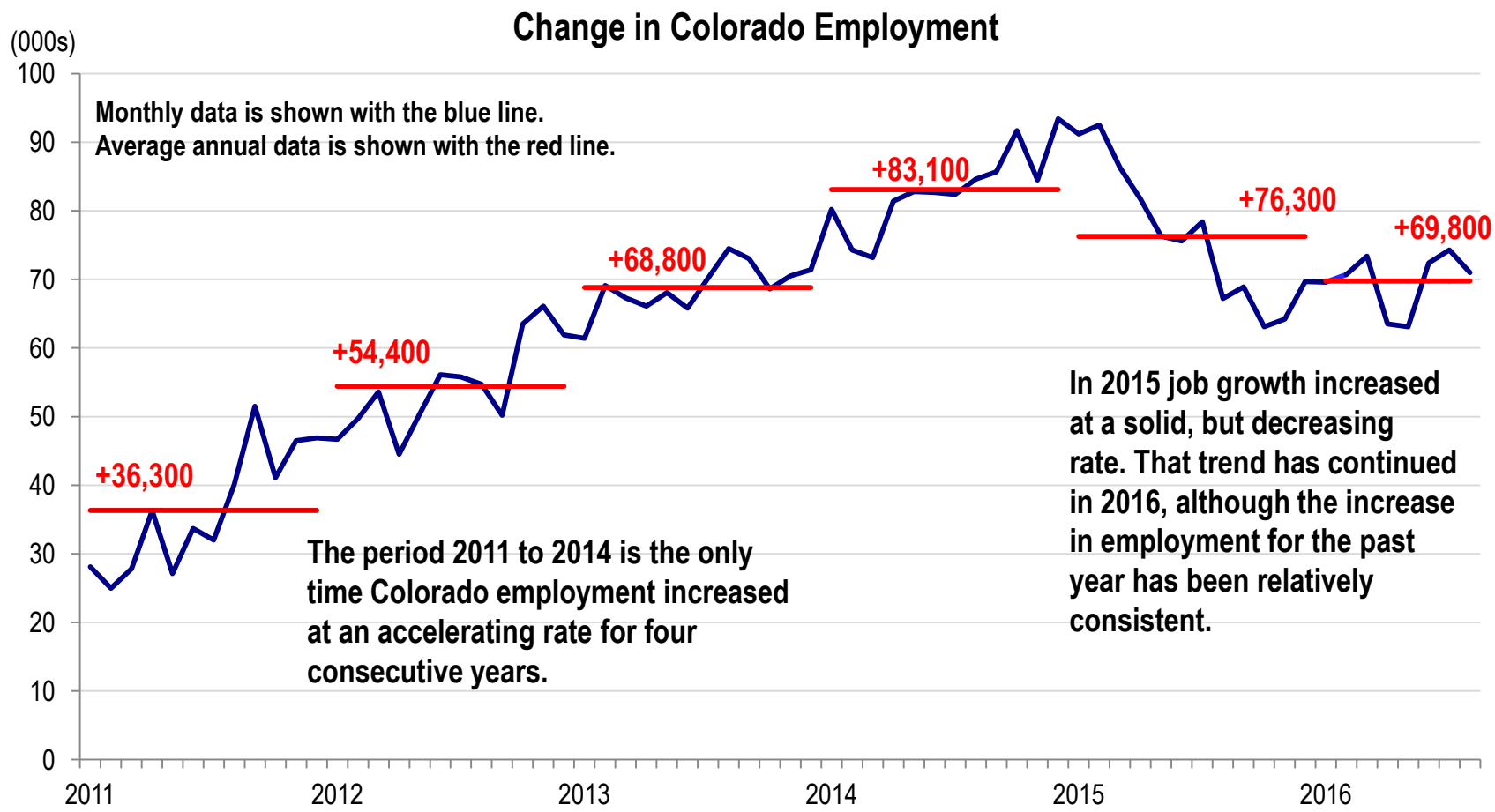
- Median HHI can be used to estimate the amount of taxes that may be generated for state and local governments from various sources.
- Changes in HHI may be a reflection of different policies, a change in the mix of the local industry structure, or the performance of the economy.

Poverty Data

- Poverty data may reflect changes in the median HHI or the performance of the economy.
- Changes in the poverty data may reflect the effectiveness of policies to improve the financial situation of all citizens.

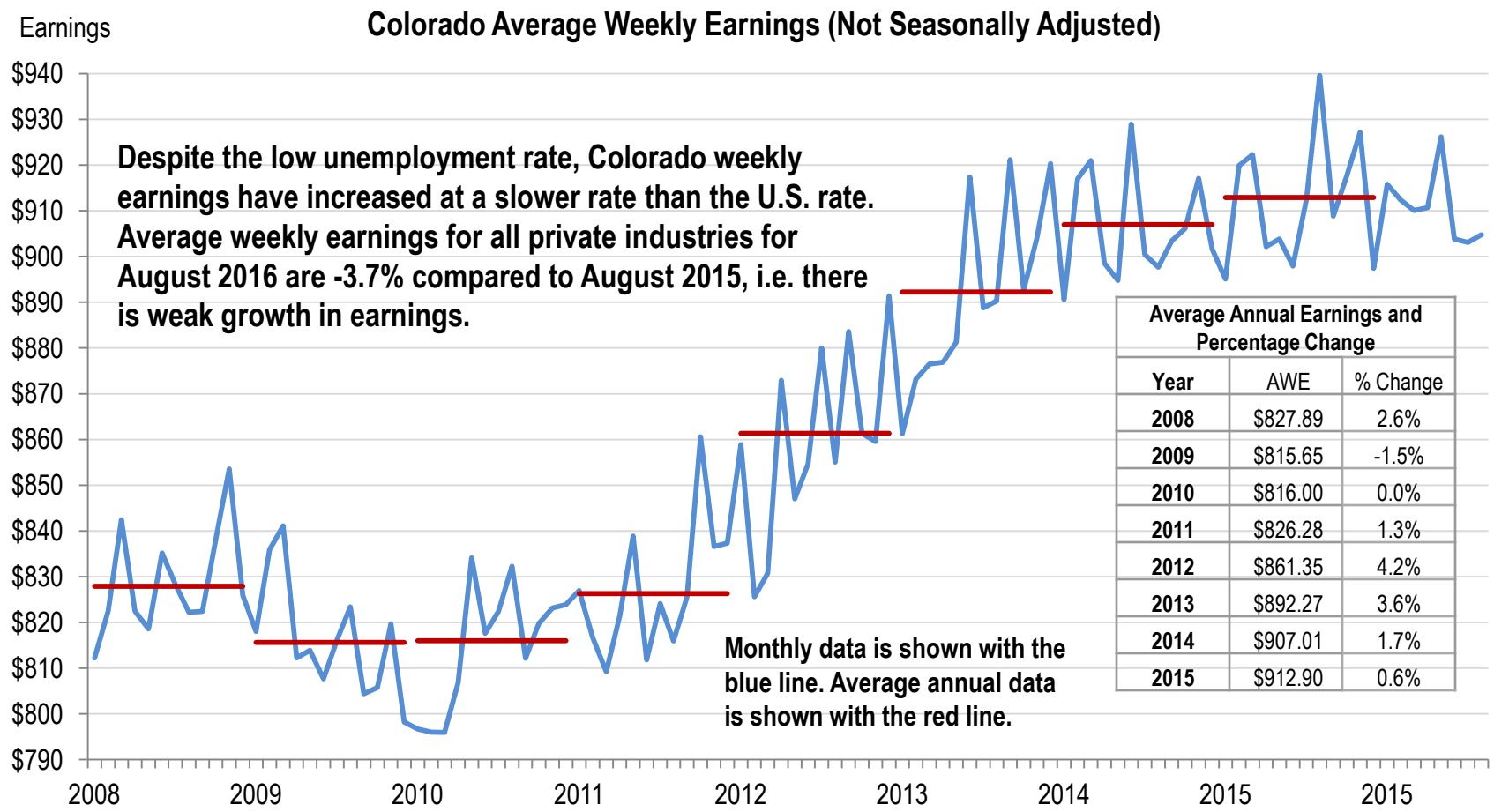
The Colorado Economy
Labor

Change in Colorado Employment Year-Over-Year



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

Colorado Average Weekly Earnings of All Employees (Private Sector)

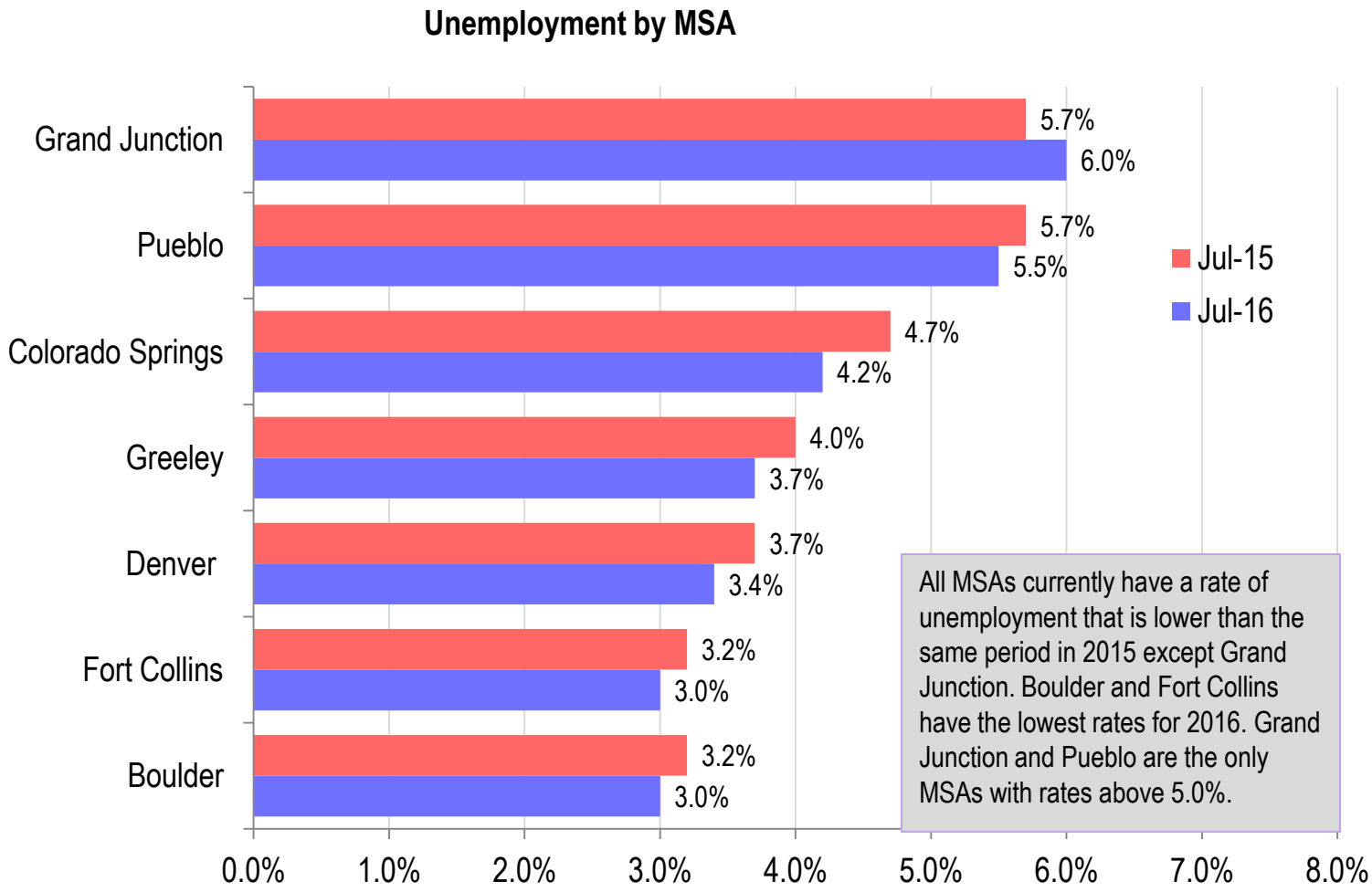


Average Annual Earnings and Percentage Change

Year	AWE	% Change
2008	$827.89	2.6%
2009	$815.65	-1.5%
2010	$816.00	0.0%
2011	$826.28	1.3%
2012	$861.35	4.2%
2013	$892.27	3.6%
2014	$907.01	1.7%
2015	$912.90	0.6%

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

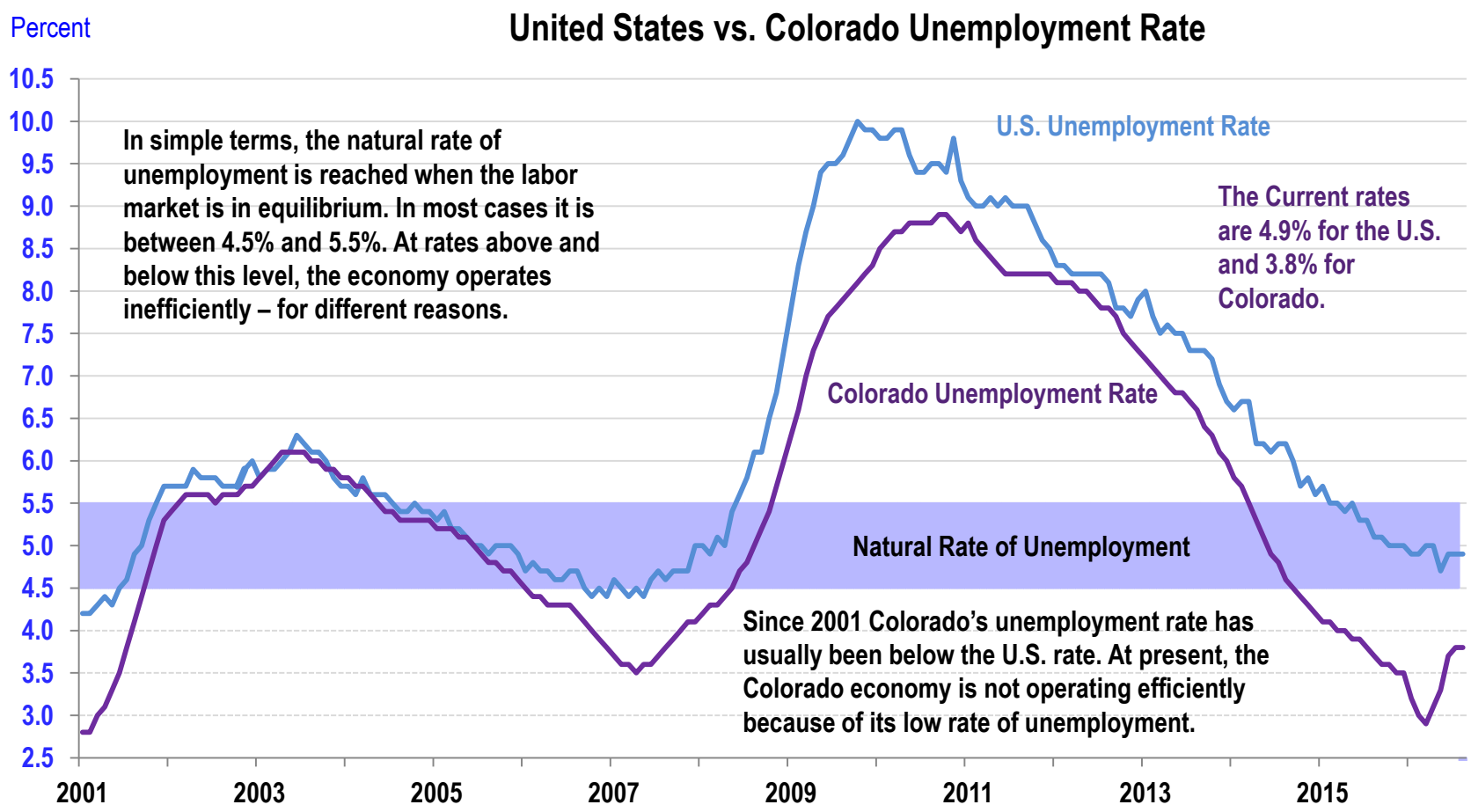
Unemployment by MSA 2015 vs. 2016



All MSAs currently have a rate of unemployment that is lower than the same period in 2015 except Grand Junction. Boulder and Fort Collins have the lowest rates for 2016. Grand Junction and Pueblo are the only MSAs with rates above 5.0%.

Source: Bureau of Labor Statistics, NSA, cber.co. Note: MSA unemployment lags by two months and is reported only on a non-seasonally adjusted basis.

United States vs. Colorado Unemployment Rate



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

August Unemployment Rate by State

Unemployment Rate < 4.0%

Rank	State	Rate
1	South Dakota	2.9%
2	New Hampshire	3.0%
3	North Dakota	3.1%
4	Nebraska	3.2%
5	Vermont	3.3%
6	Hawaii	3.4%
7	Utah	3.7%
★ 8	Colorado	3.8%
8	Idaho	3.8%
10	Arkansas	3.9%
10	Massachusetts	3.9%
10	Virginia	3.9%

Unemployment Rate < 5.0%

Rank	State	Rate
13	Maine	4.0%
13	Minnesota	4.0%
15	Iowa	4.2%
15	Wisconsin	4.2%
17	Delaware	4.3%
17	Kansas	4.3%
17	Maryland	4.3%
17	Montana	4.3%
21	Tennessee	4.4%
22	Indiana	4.5%
22	Michigan	4.5%
24	North Carolina	4.6%
25	Florida	4.7%
25	Ohio	4.7%
25	Texas	4.7%
28	New York	4.8%
29	Georgia	4.9%
29	Kentucky	4.9%

Unemployment Rate <6.0%

Rank	State	Rate
31	Missouri	5.1%
31	Oklahoma	5.1%
31	South Carolina	5.1%
34	New Jersey	5.3%
35	Alabama	5.4%
35	Oregon	5.4%
37	California	5.5%
37	Illinois	5.5%
37	Wyoming	5.5%
40	Connecticut	5.6%
40	Rhode Island	5.6%
42	Pennsylvania	5.7%
42	Washington	5.7%
42	West Virginia	5.7%
45	Arizona	5.8%

Unemployment Rate <7.0%

Rank	State	Rate
46	District of Columbia	6.0%
46	Mississippi	6.0%
48	Louisiana	6.3%
48	Nevada	6.3%
50	New Mexico	6.6%
51	Alaska	6.8%

Colorado is ranked 8th for the lowest rate of unemployment. Workers from states with higher rates may migrate to Colorado.

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

How Low Can it Go?

Natural Rate of Unemployment

The natural rate of unemployment is the rate at which an economy operates efficiently. It is typically between 4.5% and 5.5%.

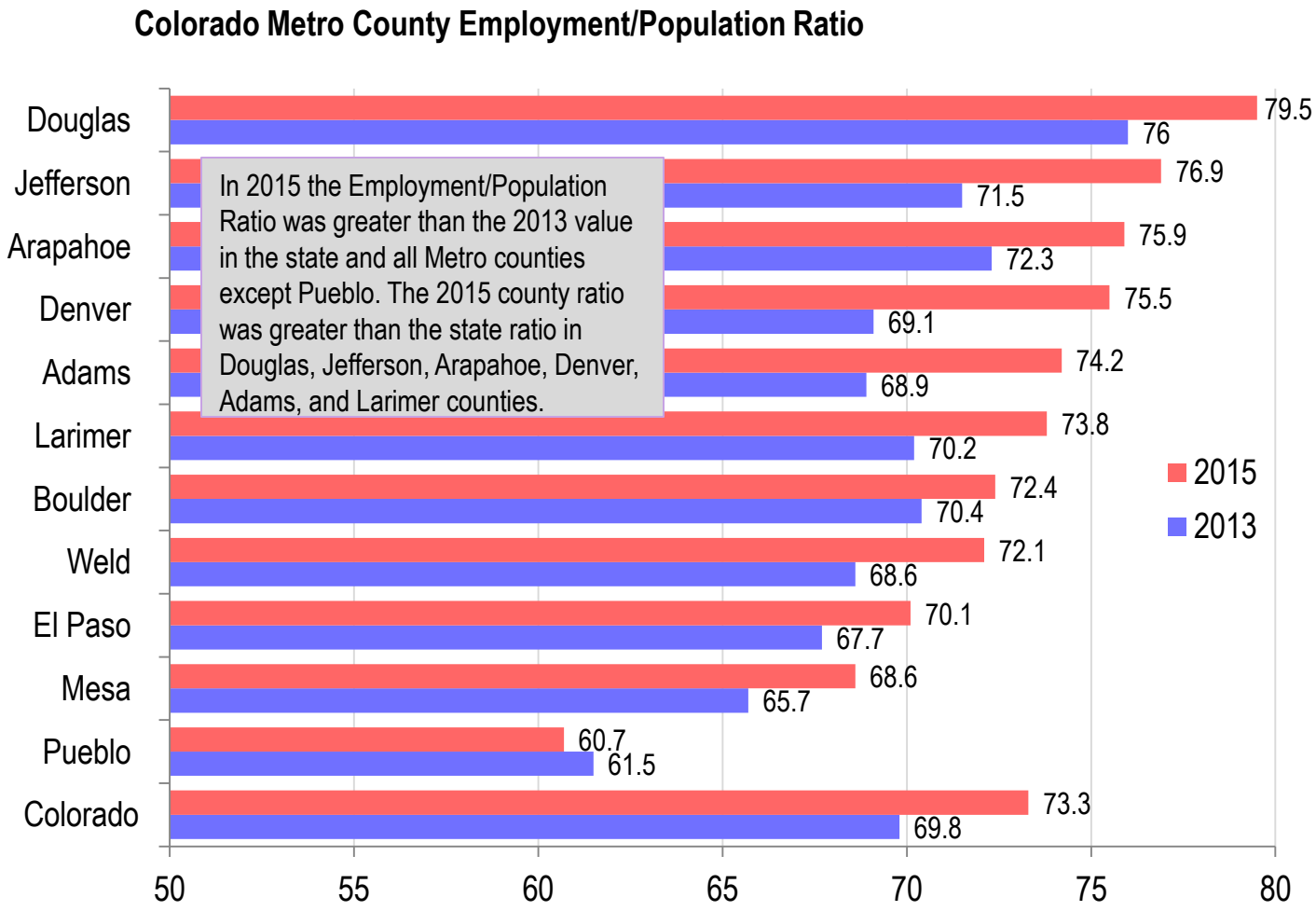
The economy operates inefficiently when:

- The rate of unemployment is too high, as it was during the Great Recession.
- The rate of unemployment is too low. The current rate of unemployment in Colorado is too low.

Reasons Low Unemployment May be Bad for the Economy

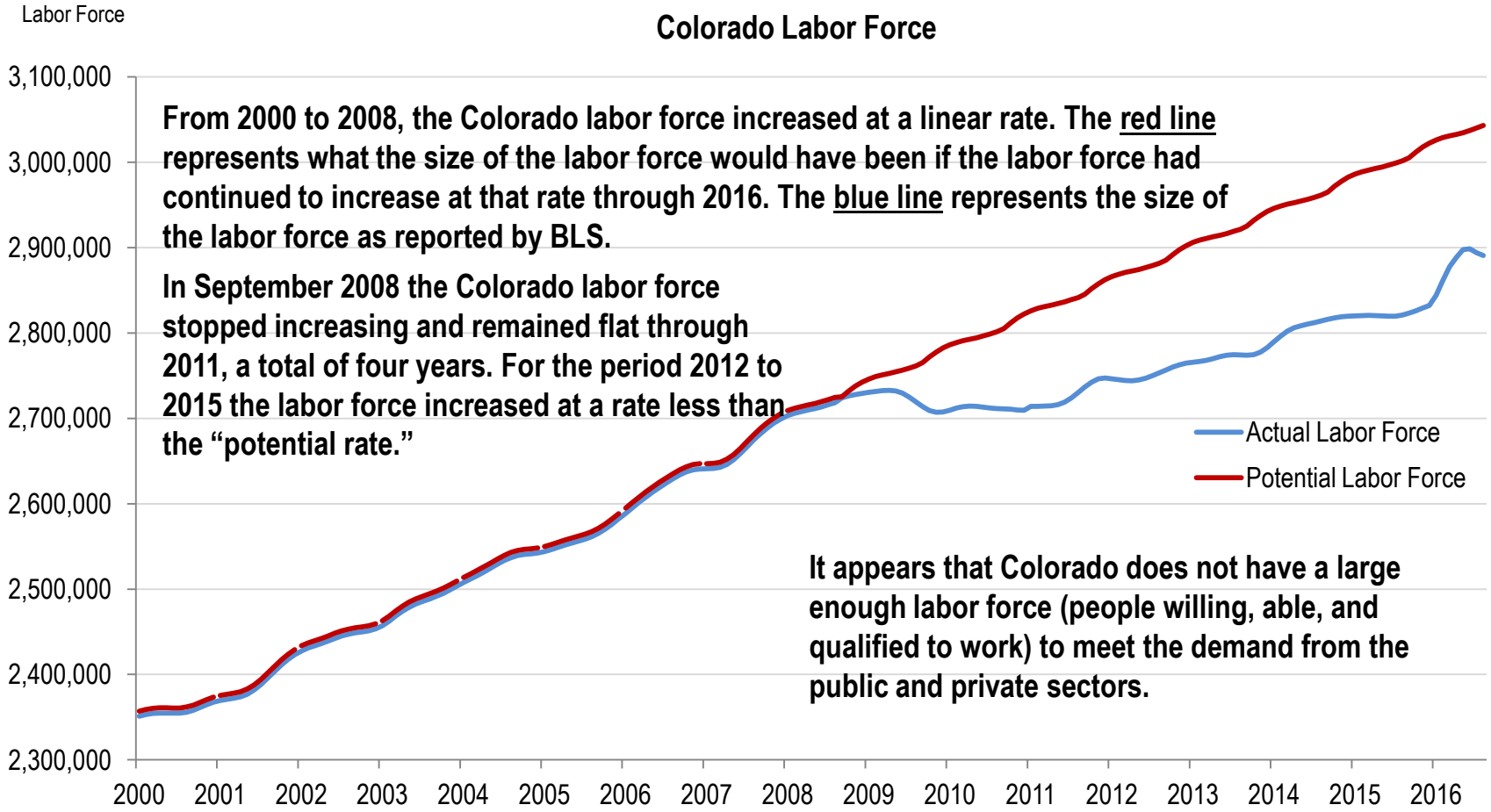
- Businesses may be forced to pay higher wages. The upside is that workers have more money to spend which theoretically stimulates the economy. On the other hand, businesses may hire fewer workers to keep costs in line or they may need to pass the added cost on to the consumer in the form of a price increase.
- Businesses may be forced to hire unqualified people and properly train them. The upside is that workers are better trained and more marketable. On the other hand, the added cost of training may have to be built into the price of the goods or services.
- During expansionary times, businesses increase their sales by adding workers and/or investing in capital projects or processes. If they cannot find workers they may invest in capital goods or processes that will reduce the need for labor in the long-run. For example, oil and gas companies have gained efficiencies by making capital expenditures that will reduce their long-term demand for employees.
- If companies cannot find qualified workers their services/goods may be of lower quality or they may simply lose business. For example, if a restaurant has wait times greater than an hour because they don't have enough kitchen help then customers may go elsewhere or the food may be lousy. Both are bad alternatives.

Metro County Employment to Population Ratios 2013 vs. 2015



Source: U.S. Census Bureau.

Colorado Labor Force



From 2000 to 2008, the Colorado labor force increased at a linear rate. The red line represents what the size of the labor force would have been if the labor force had continued to increase at that rate through 2016. The blue line represents the size of the labor force as reported by BLS.

In September 2008 the Colorado labor force stopped increasing and remained flat through 2011, a total of four years. For the period 2012 to 2015 the labor force increased at a rate less than the "potential rate."

It appears that Colorado does not have a large enough labor force (people willing, able, and qualified to work) to meet the demand from the public and private sectors.

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

What Does All This Labor Data Mean?

Labor data makes it possible to understand job and wage growth. In addition, it makes it possible to understand where workers are coming from to support an expanding economy and what happens to them when the economy declines.

Rate of Job Growth

- In simplistic terms, jobs are added at a faster rate or they are added at a slower rate. The fact that Colorado is adding jobs at a slower rate in 2016 compared to 2015 is not a bad thing. The rate of growth is solid and it is manageable.

Earnings Growth

- In Colorado worker earnings have been flat recently. The changes in earnings may make it possible to understand changes in consumption.

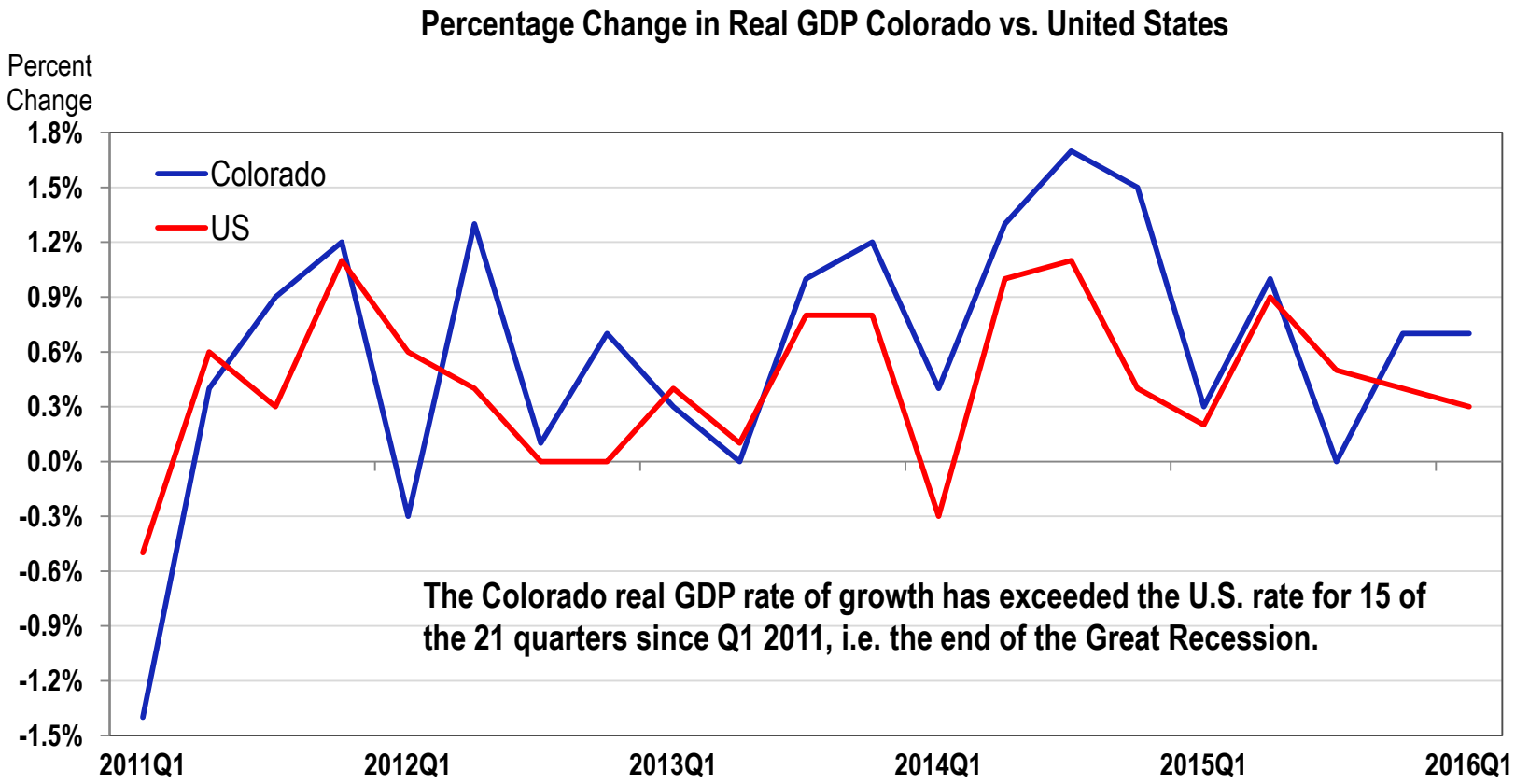
Do we have Enough Qualified Workers to Meet our Needs?

The following bullet points show how the labor data tells a story about the economy.

- Employment is increasing – that is good news.
- The Colorado employment to population ratio in increasing – that is good news – there are potentially more people working and available to work.
- The Colorado labor force is increasing at an abnormally slow rate – that is bad news – there are fewer people available to work.
- Unemployment is very low – that is bad news – there are fewer people available to work.
- Most states have higher unemployment rates than Colorado. That is good news for Colorado companies because they can encourage workers to move to Colorado.

The Colorado Economy
Gross Domestic Product

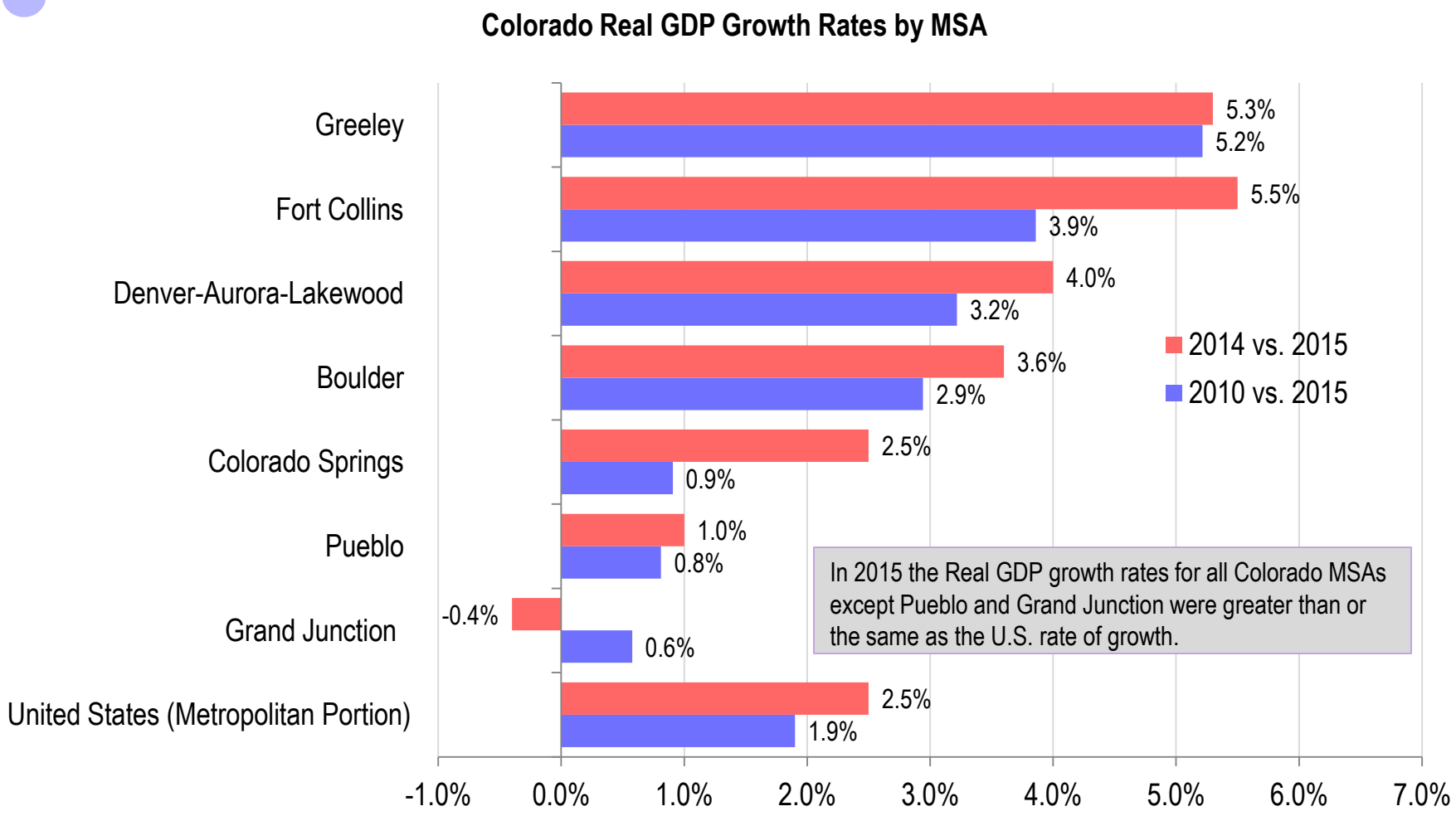
Change in Quarterly Real GDP
Over Previous Month
Colorado vs. United States



Source: Bureau of Economic Analysis. Note: U.S. GDP is summary of states GDP. Note: Real GDP growth rates are not annualized.

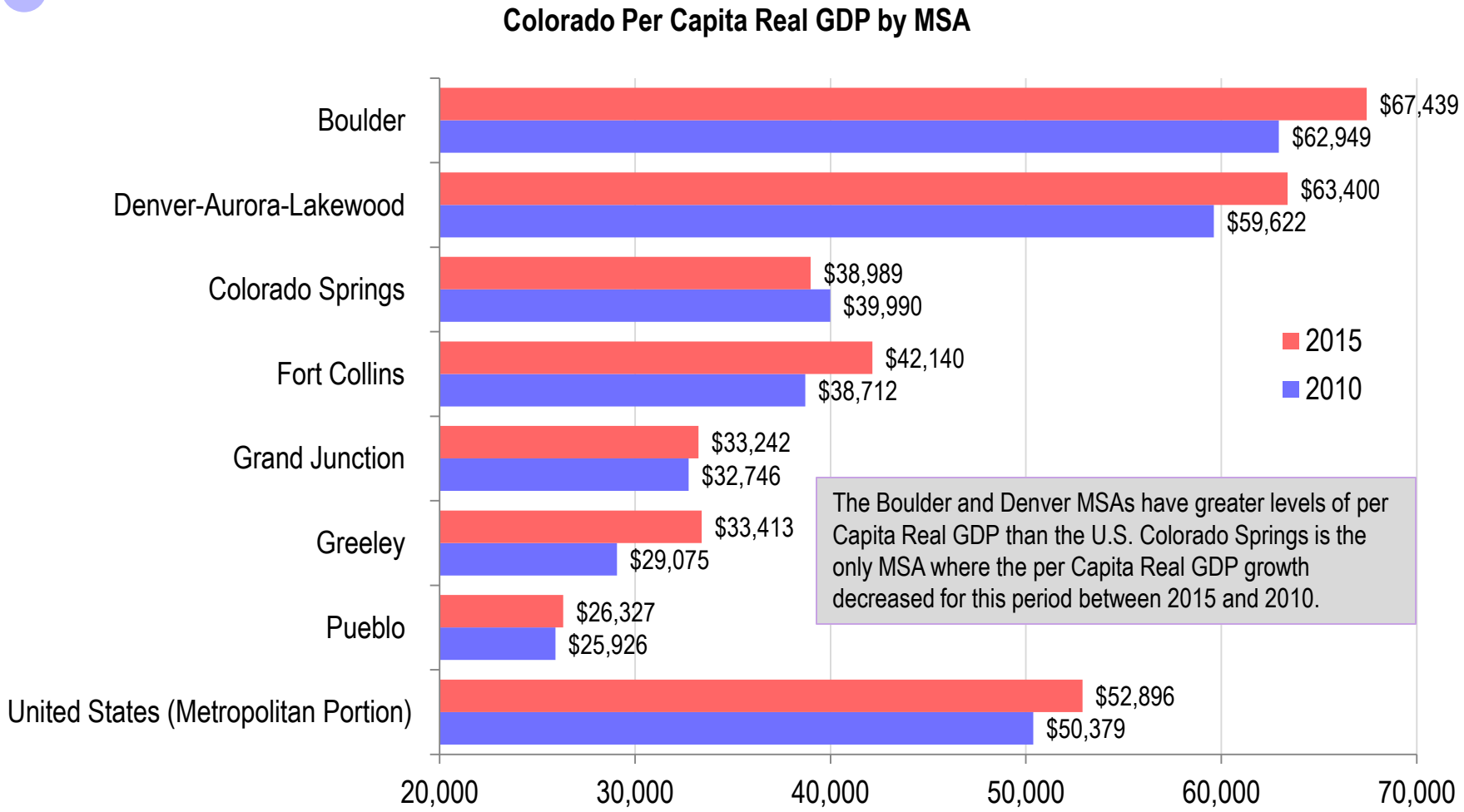
Colorado Real GDP Growth Rates by MSA

2010 vs. 2015 and 2014 vs. 2015



Source: Bureau of Economic Analysis.

Colorado Per Capita Real GDP by MSA 2010 vs. 2015



The Boulder and Denver MSAs have greater levels of per Capita Real GDP than the U.S. Colorado Springs is the only MSA where the per Capita Real GDP growth decreased for this period between 2015 and 2010.

Source: Bureau of Economic Analysis.

What is it Important to Look at Real GDP?

. A few of the many reasons to look at Real GDP data are listed below.

Jobs vs. Real GDP

- All industries are important to the economy for different reasons. Some industry such as tourism and retail create a number of jobs, whereas there is high value added in manufacturing.

Reasons to Look at Real GDP Growth

- Real GDP is used to gauge the health of the U.S., state, or local economies. Essentially, it is the size of those economies.
- Real GDP growth is used to measure the impact of monetary and fiscal policy.
- Changes in Real GDP may measure the impact of regulatory policies.

Colorado Employment

2016 Colorado Employment by Performance Category
Average Employment First 8 Months

Colorado Employment
Performance Category Portfolio Analysis

Strong Growth, Solid Growth, and Volatile Categories

This portfolio approach has made it easy to see that some categories of industries 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.

The Process of Establishing the Categories

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.

In the short period this process has been used, it has produced a high level of accuracy in the forecast.

More importantly, it has produced a better understanding of what is driving the Colorado economy.

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.

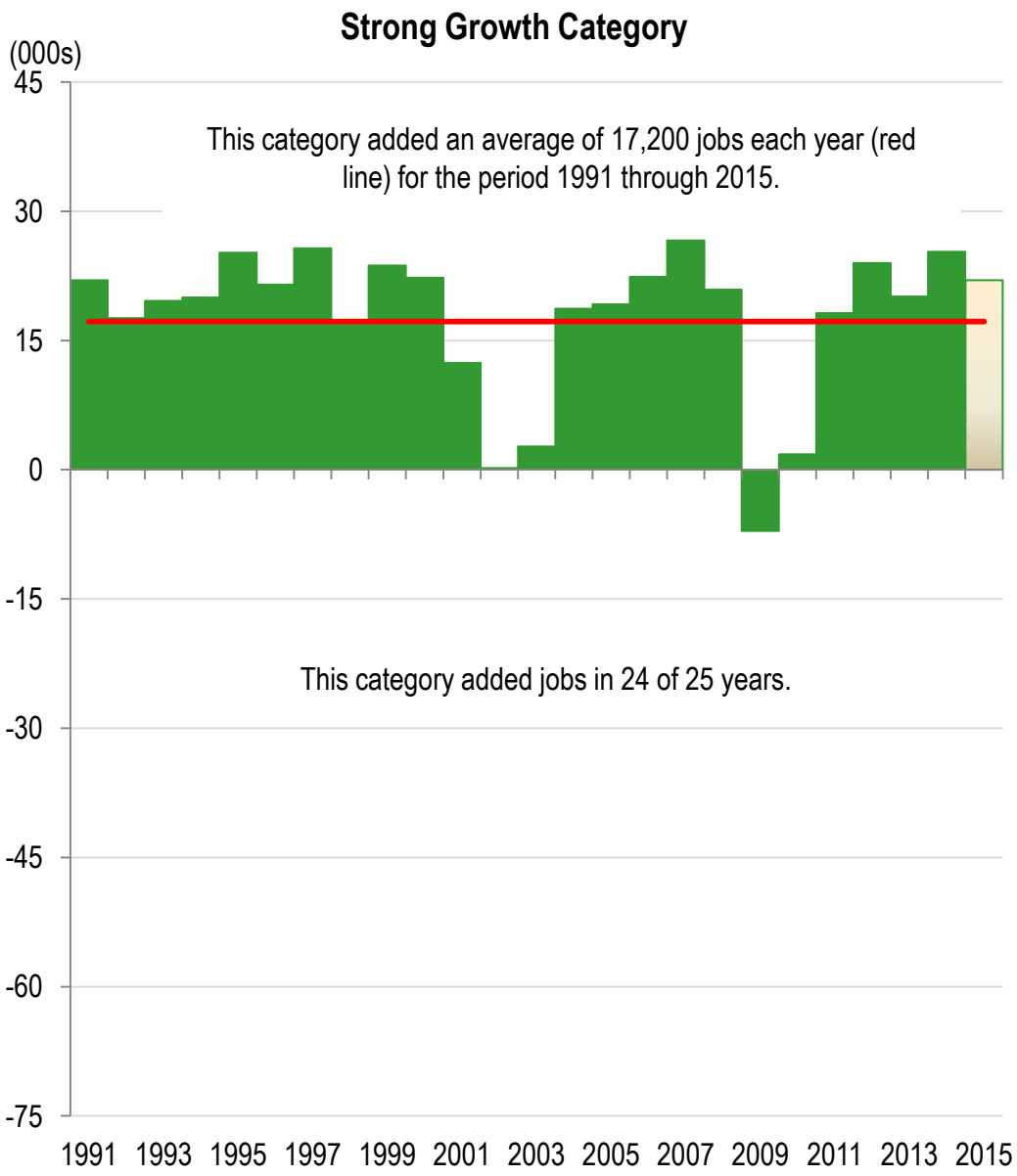
- Professional, Scientific, and Technical Services
- Management of Companies and Enterprises
- Administrative - Business to Business (Not Employment Services)
- Private Education
- Health Care
- Arts, Entertainment, and Recreation
- Other Services.

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 788,300 workers, 32.0% of total employment



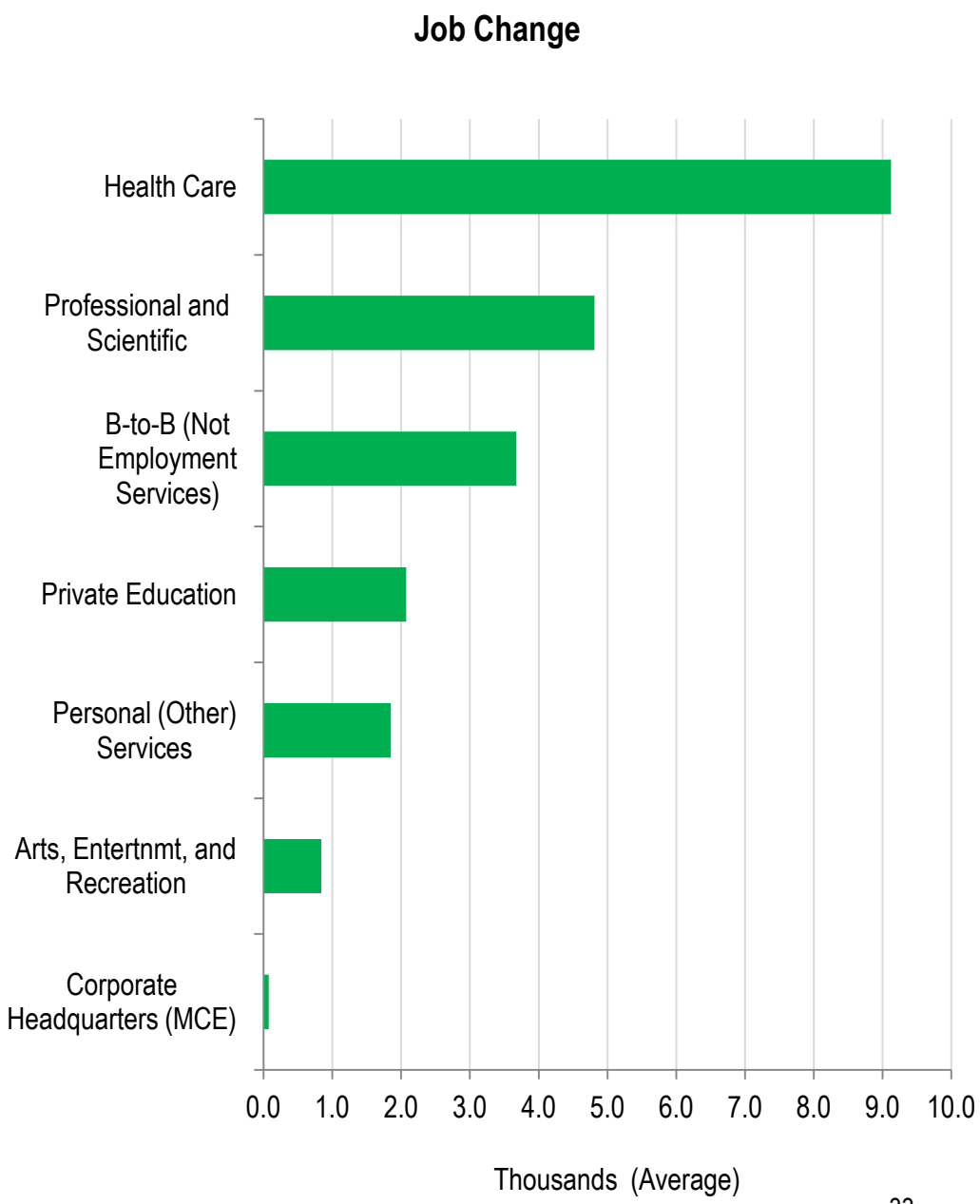
Source: Bureau of Labor Statistics, cber.co.

Solid Growth Sectors

- Average employment for the first 8 months shows this category of sectors added 22,500 jobs in 2016 compared to the same period last year.

- The Health Care Sector led job growth, followed by the PST sector.

- In 2014, this category accounted for 32.4% of total job gains and 32.0% of total employees.



Source: Bureau of Labor Statistics, cber.co.

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.

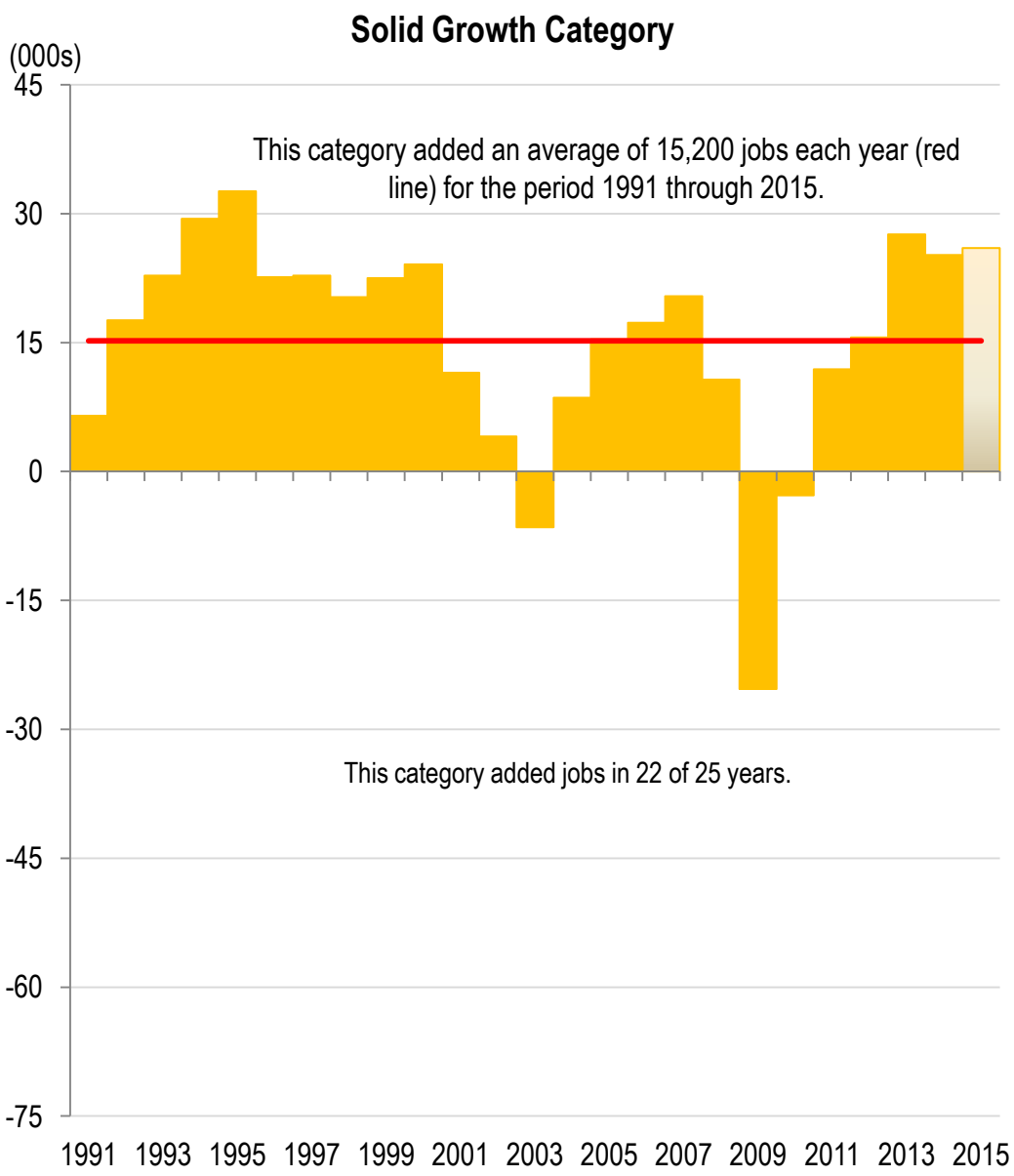
- Wholesale Trade
- Retail Trade
- State (Not Higher Education)
- Higher Education
- Local (Not K-12 Education)
- K-12 Education
- Accommodations and Food Services

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 962,500 workers, 39.0% of total employment.



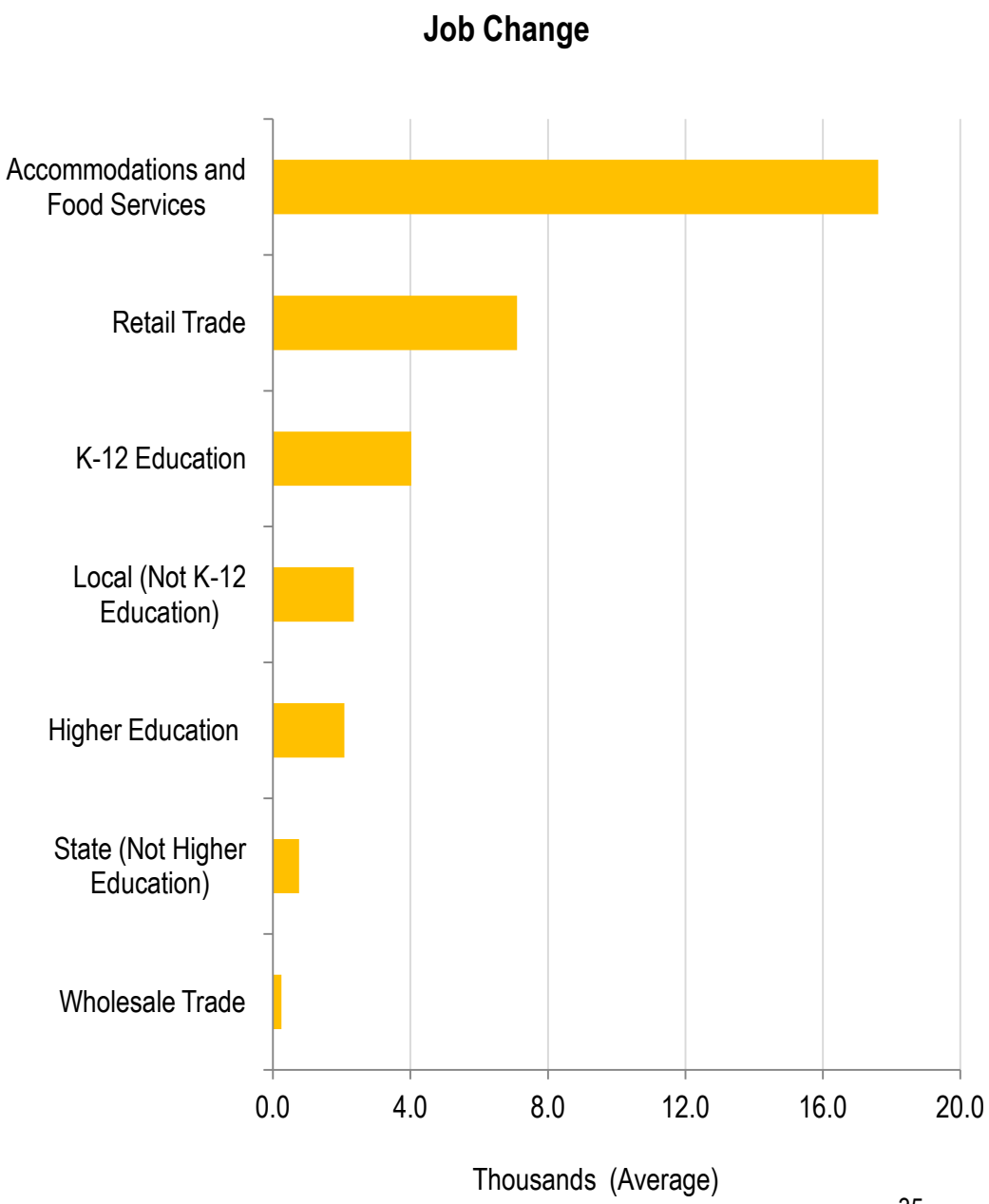
Source: Bureau of Labor Statistics, cber.co.

Limited Growth Sectors

- Average employment for the first 8 months shows this category of sectors added 34,200 jobs in 2016 compared to the same period last year.

- The Leisure and Hospitality Sector (AFS + AER) has had a strong year, but most likely the number of jobs added in the AFS sector is grossly overstated.

- In 2014, this category accounted for 29.8% of total job gains and 39.0% of total employees.



Source: Bureau of Labor Statistics, cber.co.

Annual Employment Situation for the Volatile Category

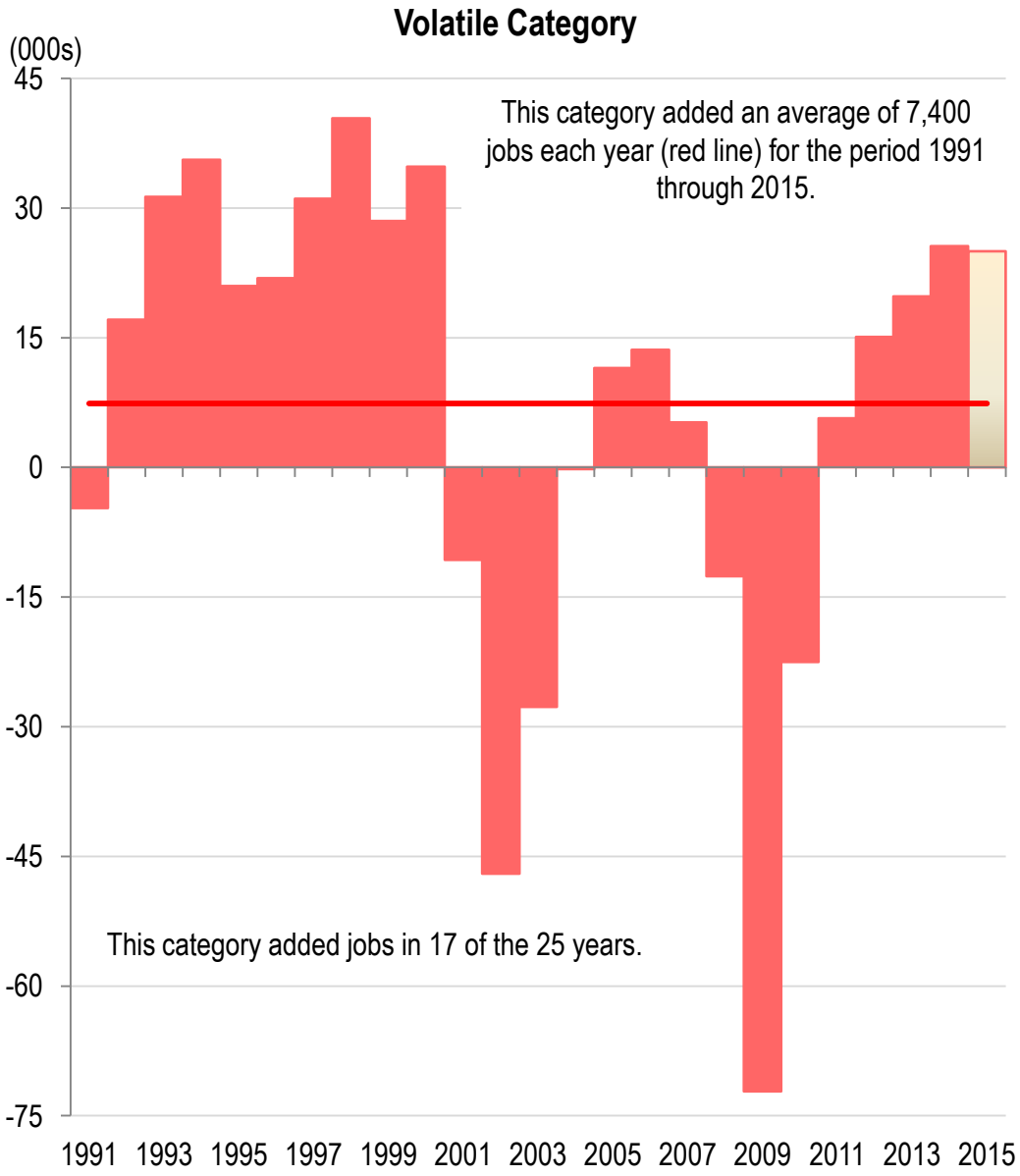
Over the past two decades the sectors listed below were the primary source of volatility in total employment.

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 714,300 workers, 29.0% of total employment



Source: Bureau of Labor Statistics, cber.co.

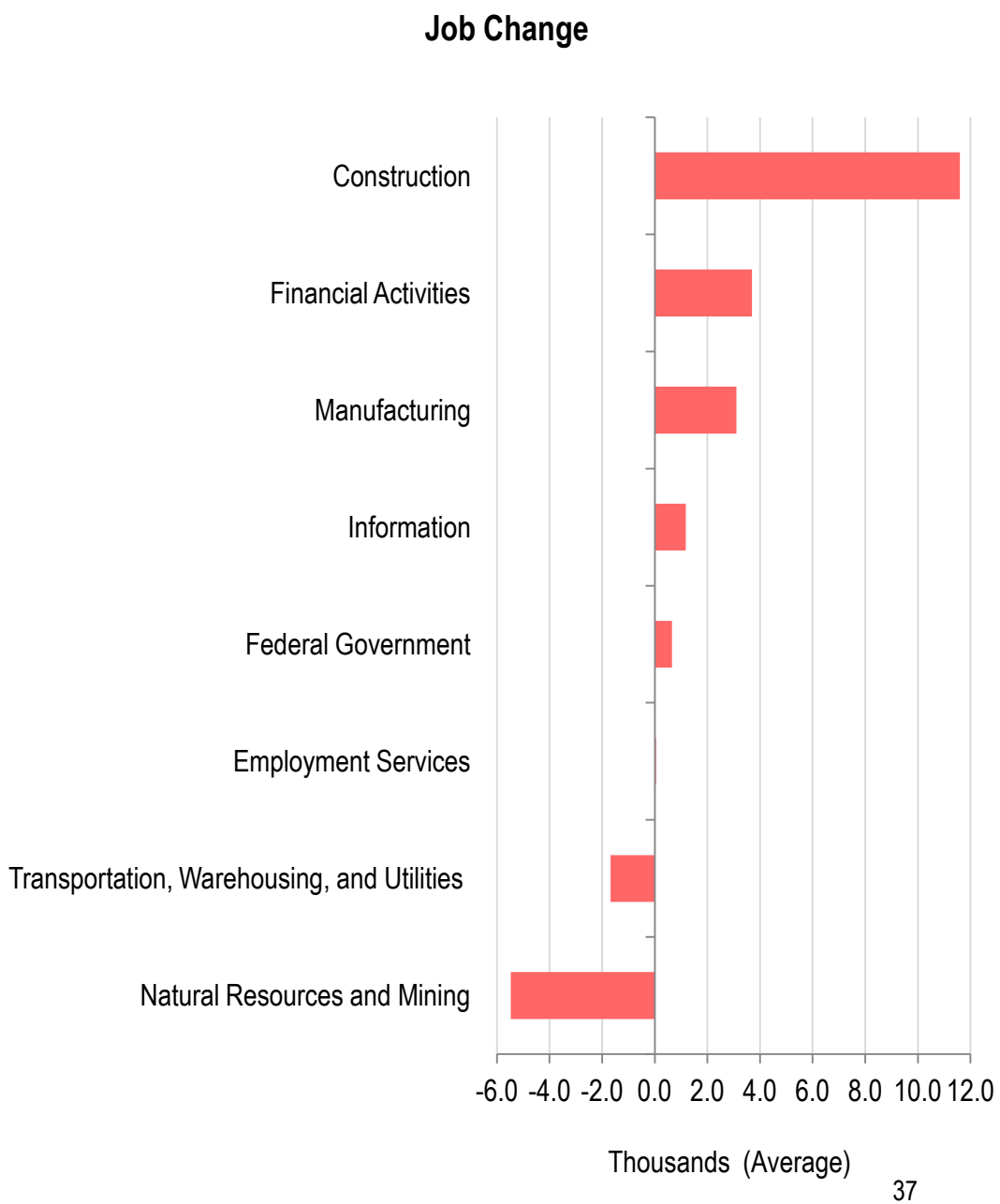
Volatile Sectors

- Average employment for the first 8 months of 2016 shows this category of sectors added 13,100 jobs in 2016 compared to the same period last year.

- For this period, the Construction, Financial Activities, and Manufacturing Sectors led job growth.

- It is likely the job data for the Employment Services and TWU sectors are understated. Unfortunately, the job losses in the extractive industries are not understated.

- In 2014, this category accounted for 38.3% of total job gains and 29.0% of total employees.



Source: Bureau of Labor Statistics, cber.co.

Summary of Performance to cber.co 2016 Employment Forecast

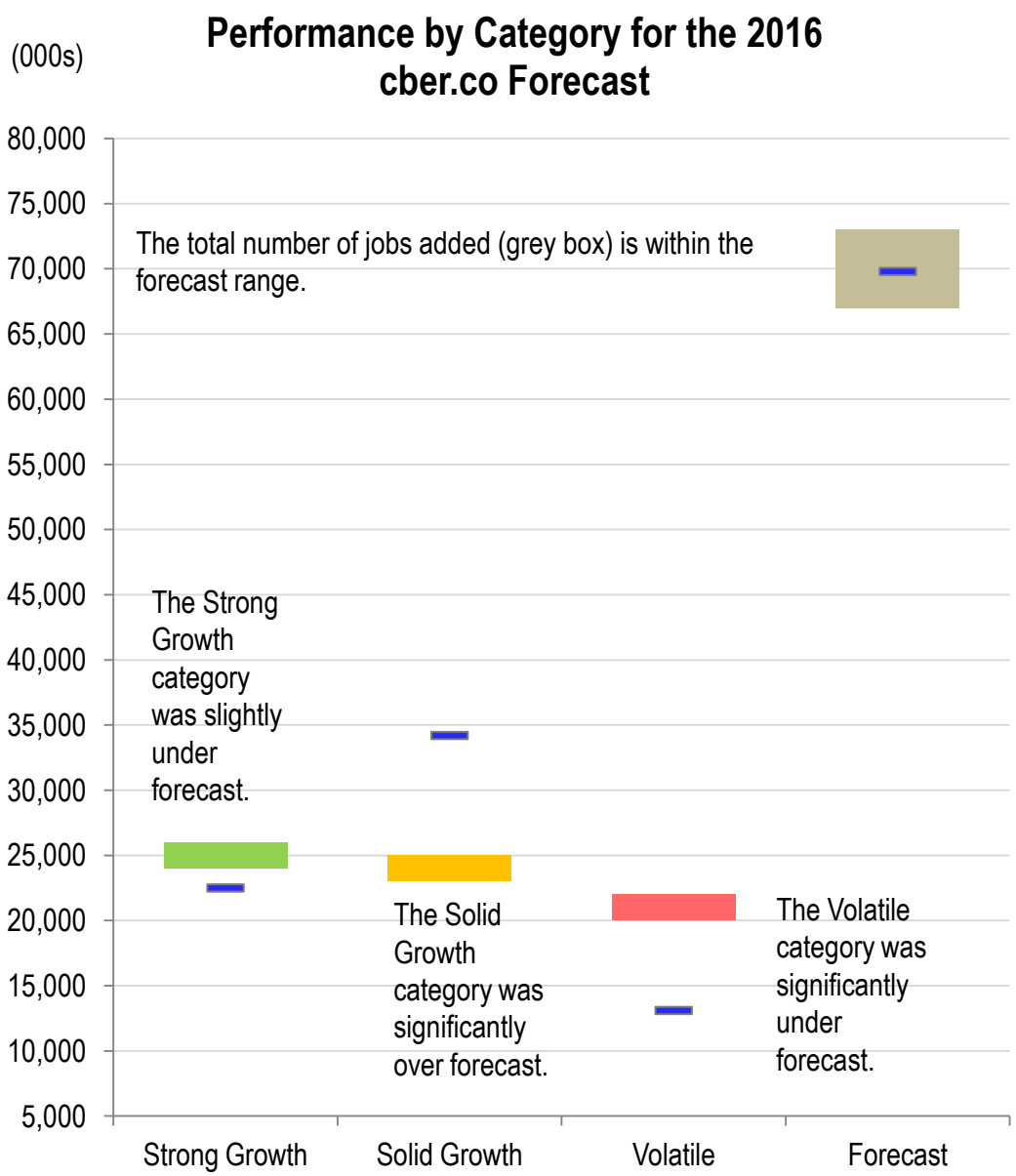
This chart shows the year–to-date accuracy of the 2016 cber.co forecast

On this chart, the forecast ranges for the categories are:
- Strong Growth – green box.
- Solid Growth – yellow box.
- Volatile – red box.
- Total Employment – grey box.

The short blue lines indicate the level of change in the average employment for the first 8 months of 2016.

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

Average employment for the first 8 months of 2016 is 69,800 greater than the same period in 2015.



Source: Bureau of Labor Statistics, cber.co.

The Colorado Economy

Employment for Major Industries from the Volatile Category

Impact of Industries in the Volatile Category

The Volatile category tends to have a greater influence on the amount of change in total job growth than the strong growth and solid growth categories. The industries do not always have a standard business cycle that dictates when jobs are added or lost.

The following charts look at employment in four industries that are responsible for the unpredictable changes in the number of workers in the Volatile category. It is obvious there are factors other than a standard business cycle that drive change in their employment.

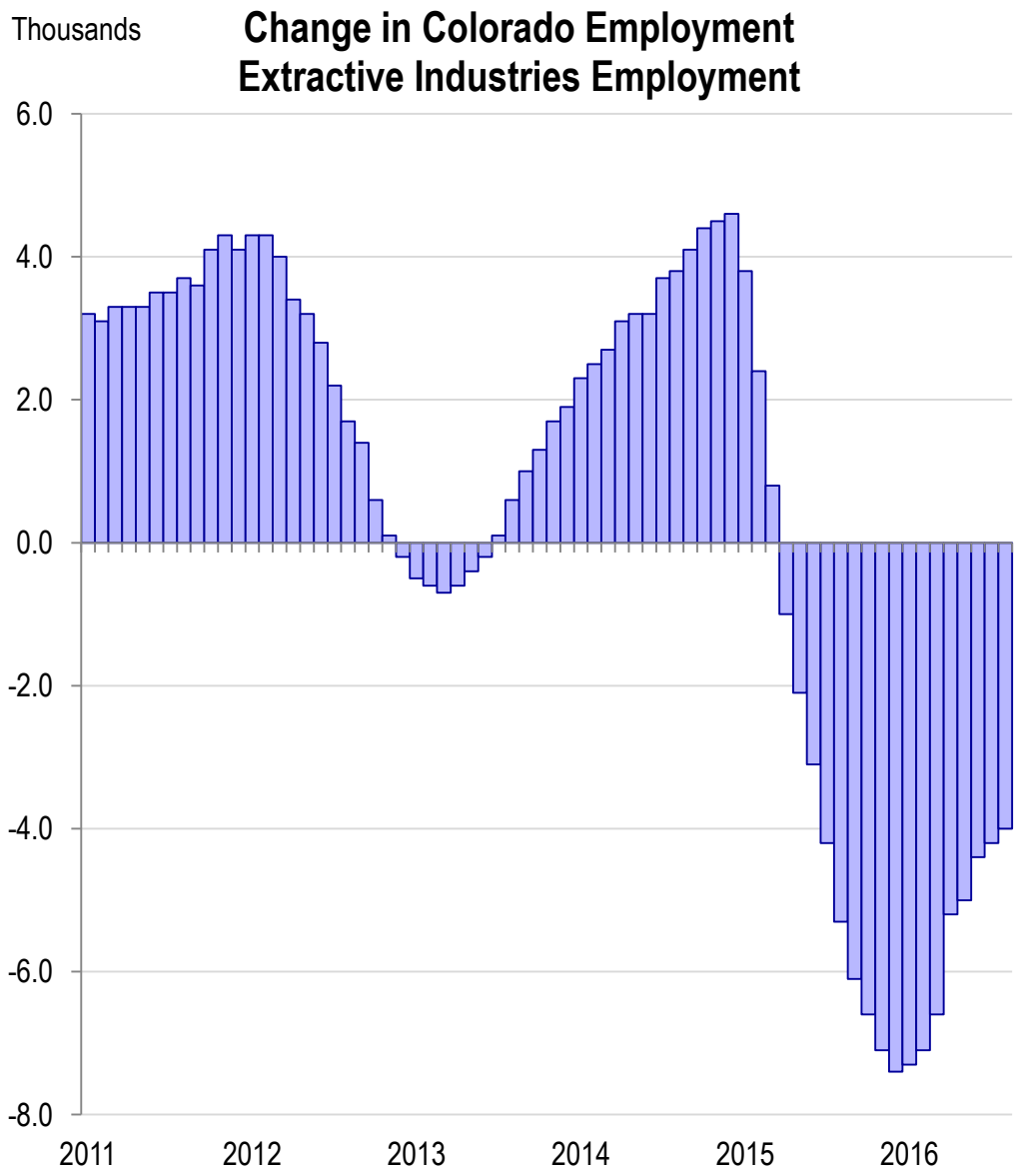
Y-O-Y Monthly Employment Change in Colorado Employment – Extractive Industries

The year-over-year monthly change in employment in the Colorado extractive industries slowed in 2012 and lost jobs through mid-2013. Beginning in the second half of 2013 the sector added jobs through 2014.

The industry added jobs at a slower rate in Q1 2015, but has lost jobs since then.

The greatest number of jobs lost was in December 2015. Throughout 2016 the number of y-o-y jobs lost has decreased each month.

Monthly employment appears to have bottomed out around 26,000 workers. This is down from a peak of 36,400 workers in December, 2014.



Source: Bureau of Labor Statistics, cber.co.

Y-O-Y Monthly Employment Change in Colorado Employment - Manufacturing

Since Q4 2010 the year-over-year monthly change in Colorado manufacturing employment has been both positive and volatile.

Between 2011 and 2016 the monthly y-o-y change in employment has fluctuated between 1,300 and 5,600 jobs.

In August 2016, there were 2,100 more manufacturing jobs than the same period in 2015. Since December 2015, manufacturing jobs have been added at a declining rate.

Source: Bureau of Labor Statistics, cber.co.

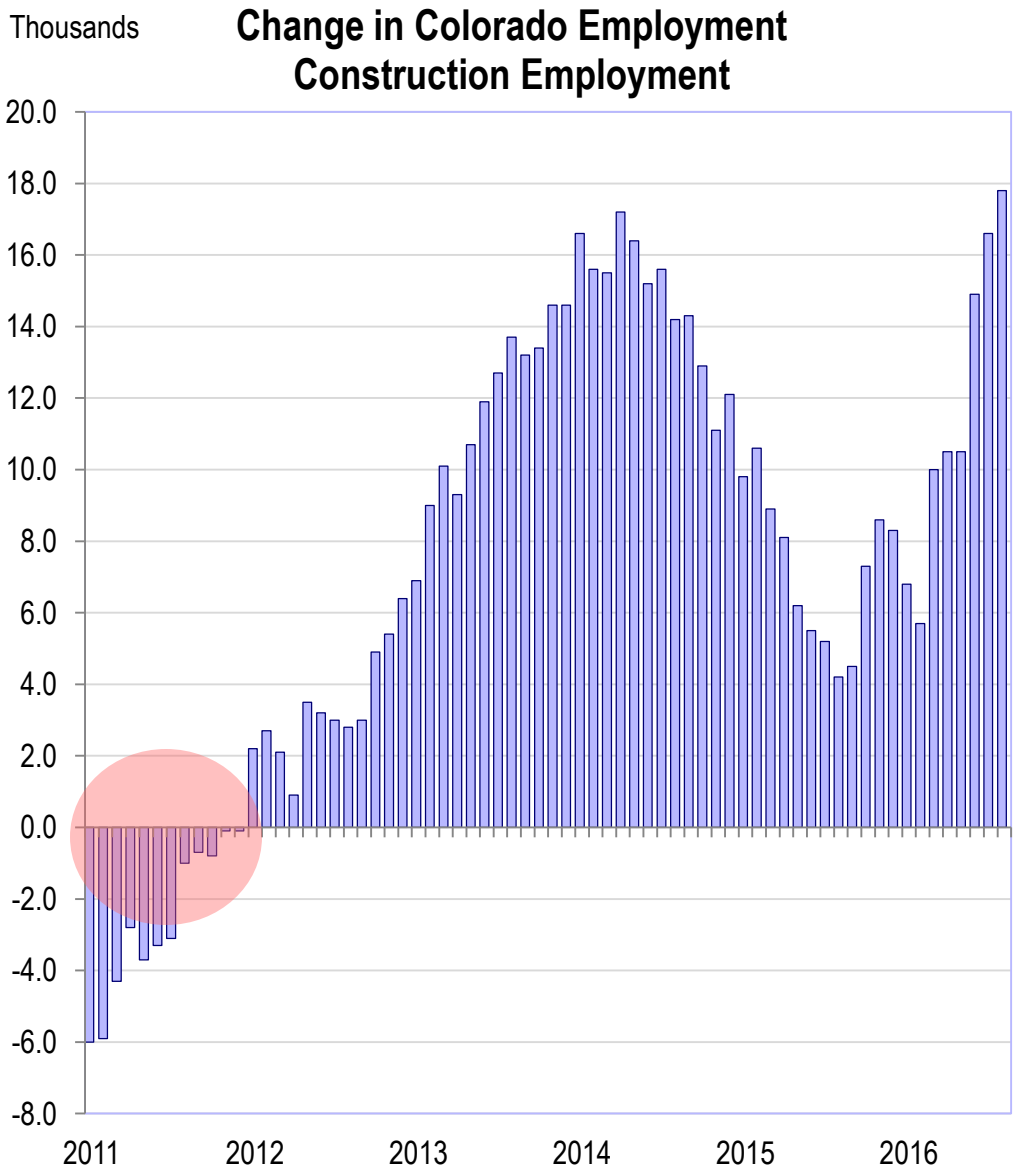
Y-O-Y Monthly Employment Change in Colorado Employment – Construction

The year-over-year monthly change in Colorado construction employment was negative throughout 2011 (red).

For this 5+ year period (2011 through 2016) the monthly y-o-y change has been volatile (which is normal for the industry). The largest change for the period 2011 through 2015,17,200 jobs, occurred in April 2014.

Between that peak and August 2015 construction employment increased at a decreasing rate. After bottoming out in August 2015, the level of job growth has trended upwards.

In August 2016, there were 17,900 more construction jobs than the same period in 2015, a new peak for the period 2011 to 2016.



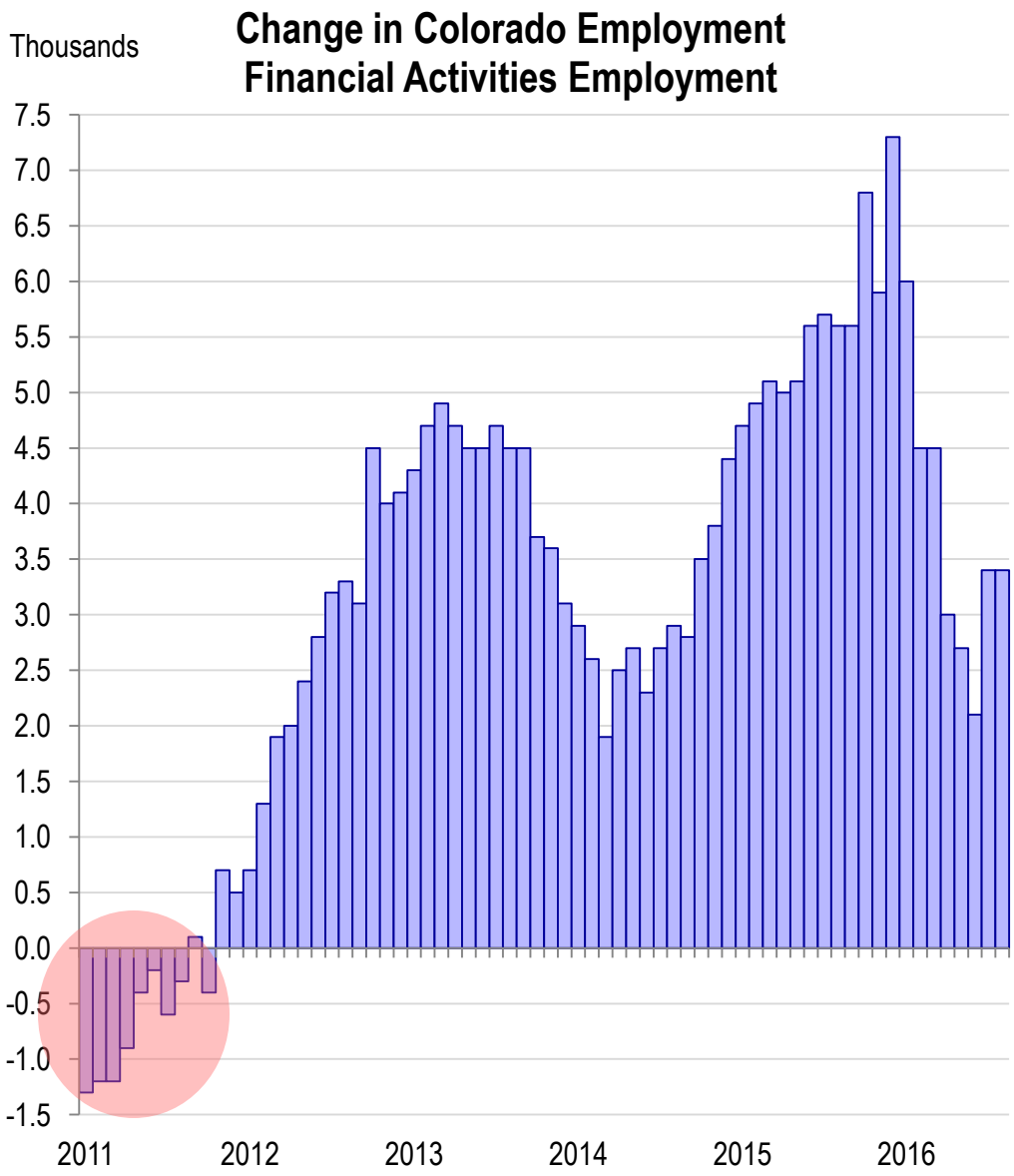
Source: Bureau of Labor Statistics, cber.co.

Y-O-Y Monthly Employment Change in Colorado Employment – Financial Activities

After the Great Recession, the financial sector recorded :

- Job losses throughout most of 2011.
- Strong job growth in 2012
- Steady job growth for the first 3 quarters of 2013.
- Job growth at a slower rate for Q4 2013 through Q3 2014.
- Job growth at an accelerating rate from Q4 2014 through Q4 2015.
- Job growth at a declining rate for most of 2016.

In August 2016, there were 3,400 more financial activities jobs than the same period in 2015.

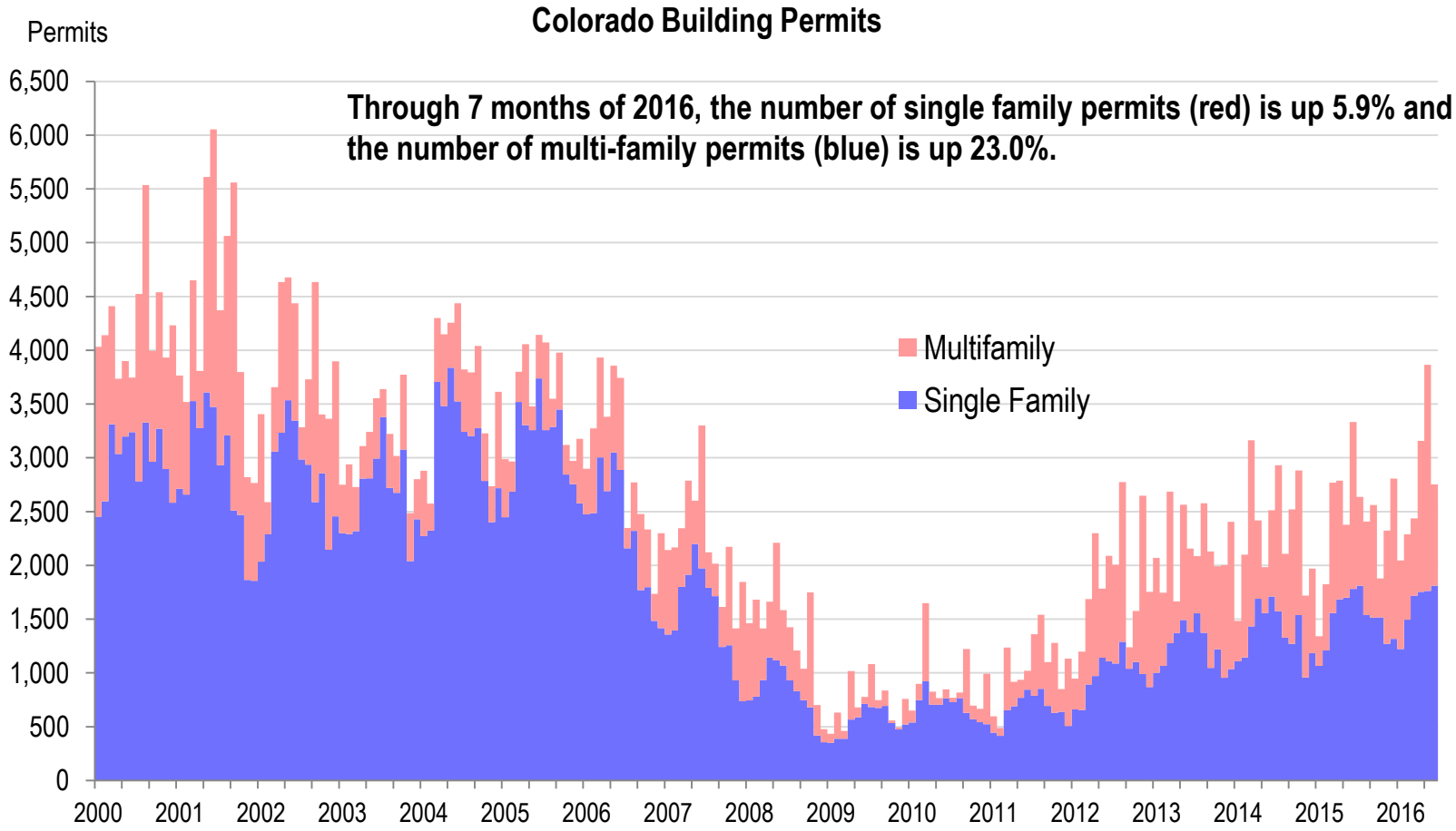


Source: Bureau of Labor Statistics, cber.co.

The Colorado Economy

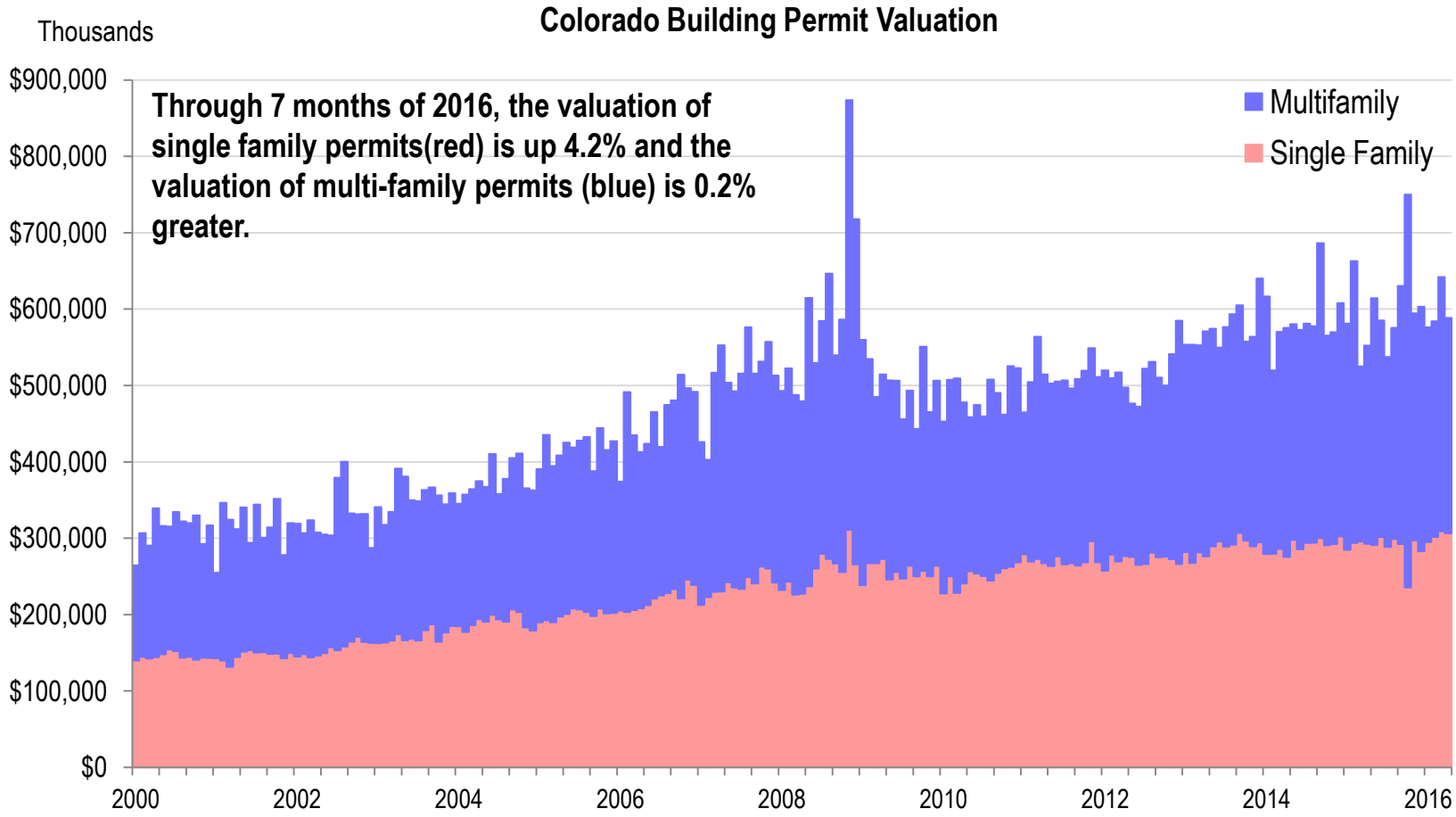
Construction and Housing

Colorado Residential Building Permits - Units



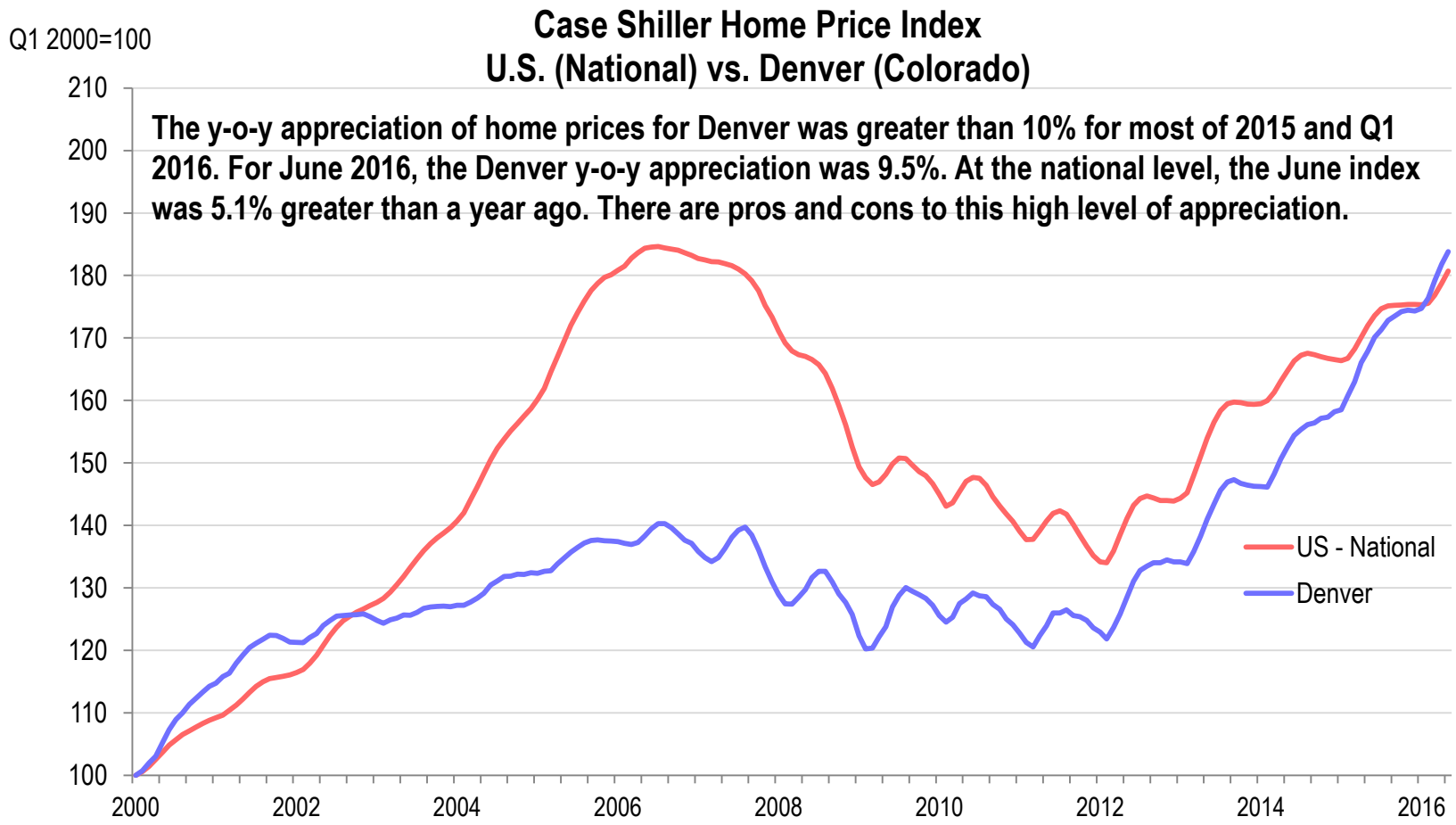
Source: TAMU Real Estate Center, U.S. Census Bureau, cber.co.

Colorado Residential Building Permits - Valuation



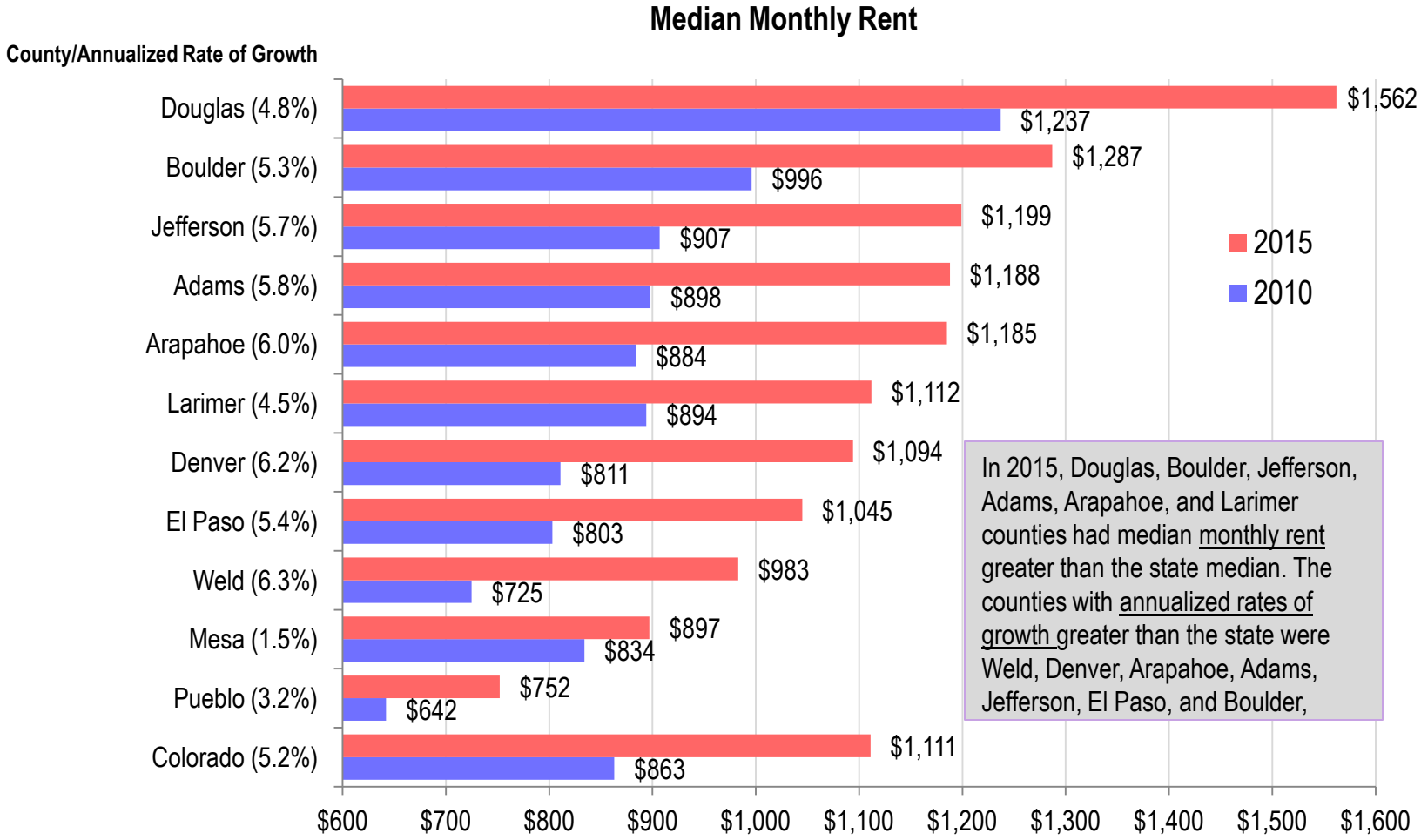
Source: TAMU Real Estate Center, U.S. Census Bureau, cber.co. Note: Not adjusted for inflation.

Case Shiller Home Price Index National vs. Denver (Colorado)



Source: S&P Case-Shiller, cber.co.

Median Monthly Rent 2010 vs. 2015



In 2015, Douglas, Boulder, Jefferson, Adams, Arapahoe, and Larimer counties had median monthly rent greater than the state median. The counties with annualized rates of growth greater than the state were Weld, Denver, Arapahoe, Adams, Jefferson, El Paso, and Boulder,

Source: U.S. Census Bureau.

Tracking Residential Construction and Housing Prices

Several of the reasons to track residential construction and housing price data are listed below.

Residential Construction

- Changes in the numbers of residential permits issued are thought to be an indicator of the health of an economy, except in special situations, such as when construction is limited because of the supply of land. This is the case in some of the mountain communities.
- It is important to compare residential permits to other indicators to prevent overbuilding. This happened in Colorado during the 1980s.
- It is also important to monitor other economic data to determine what types of housing to build. For example, when single family houses become too expensive, then it may be appropriate to build more multi-family units.

Housing Prices

- Housing prices change based on supply and demand and that change can occur at the drop of a hat for a variety of reasons.
- Housing prices can impact the mobility of the workforce and constrain the growth of an economy if the prices are too high.
- Fluctuations in housing prices can cause home owner's wealth to move up or down.
- Rent is a major component in the calculation of inflation. Rapid increases in rent or the cost of housing will cause inflation to rise.

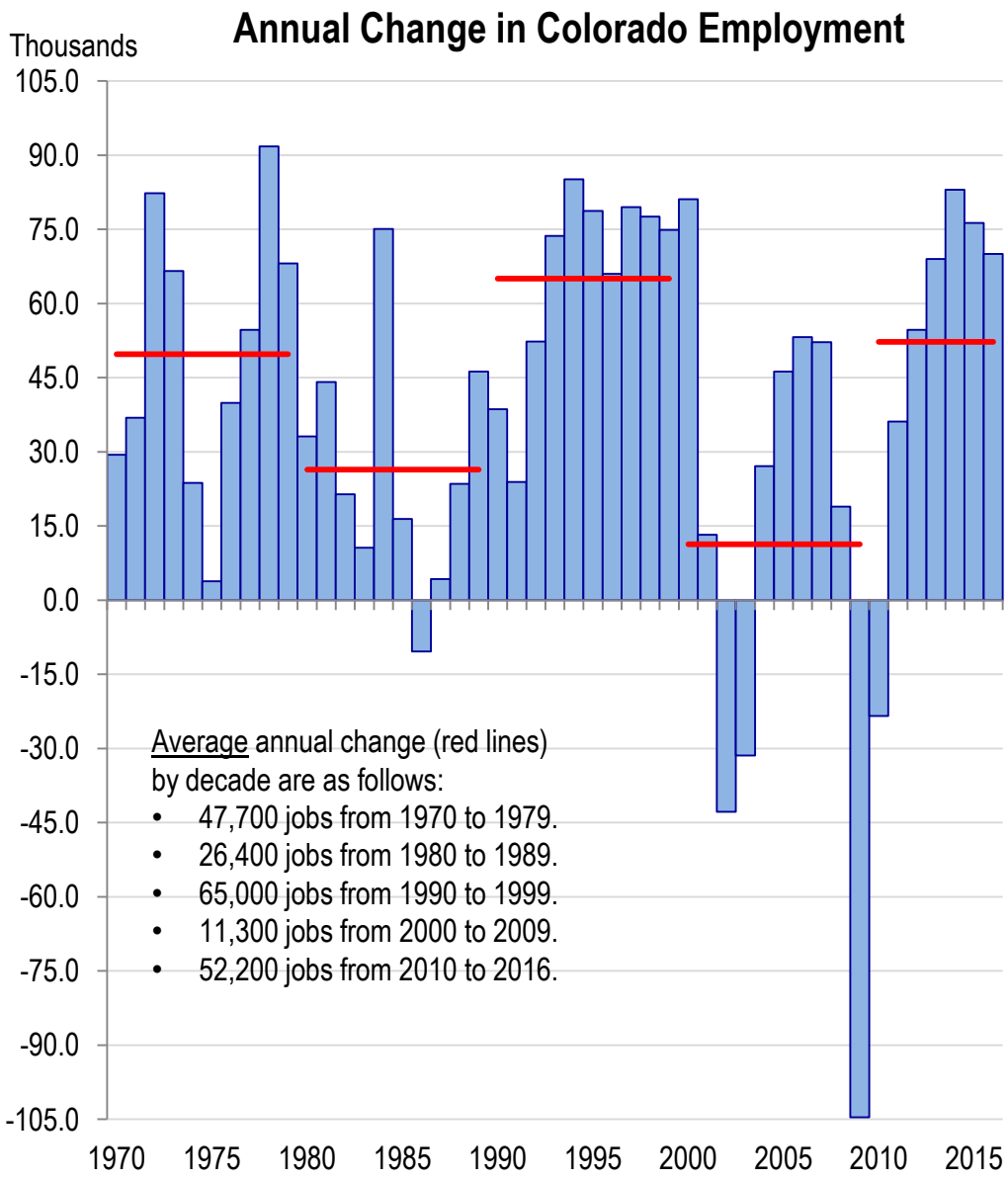
The Colorado Economy
Summary

Annual Employment Change in Colorado Employment

The state will add 67,000 to 73,000 jobs in 2016. Colorado employment will increase by 2.7% to 2.9%.

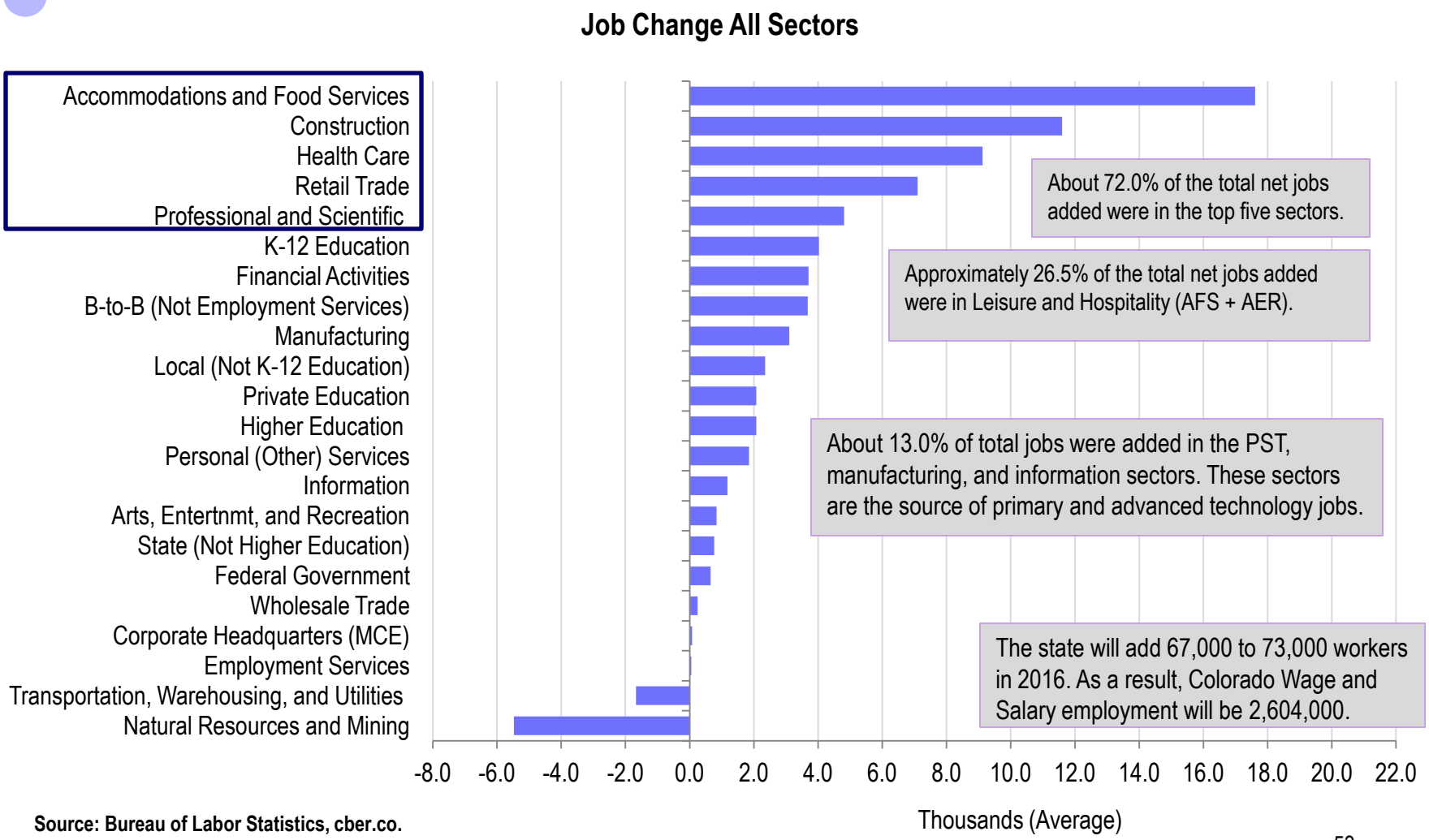
After 8 months, the state is on track to add 69,800 jobs this year, prior to the BLS benchmark revisions.

The Colorado Department of Labor and Employment has indicated that the Q1 2016 jobs data may be overstated by as much as 10,000.



Source: Bureau of Labor Statistics, cber.co.

Job Changes First 8 Months of 2016 vs. Same Period in 2015



Source: Bureau of Labor Statistics, cber.co.

cber.co Colorado Economic Review
Through August of 2016

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).

For additional information contact cber.co at 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 roadmap 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 grant programs.