



cber.co

Colorado Employment Data Through February 2017

Colorado-based Business and Economic Research
Prepared
April 5, 2017

Overview of Economic Review

This chartbook provides a series of charts, graphs, and discussions that review the Colorado wage and salary employment data published by the Bureau of Labor Statistics for the first 2 months of 2017. On average, Colorado employment through February is 48,200 workers greater than the same period in 2016. Job growth is modest, but it is trending downward. This month the review touches briefly on the national economy, compares U.S. and Colorado inflation, and looks at trends in the state's major employment categories. This information is divided into the sections listed below.

U.S. Economy

- The United States Economy
 - Leading Index, Employment, GDP, Equities, Equity Volatility
 - Leading Indices
- Inflation
 - Colorado vs. United States

The Colorado Economy

- Unemployment
- Employment in Strong Growth, Solid Growth, Volatile Categories
- Summary
- Appendix

This chartbook contains a summary of the 2017 forecast. The complete 2017 forecast can be found at <http://cber.co/economic-forecasts/>



The U.S. Economy

Employment, GDP, Equities, Equity Volatility

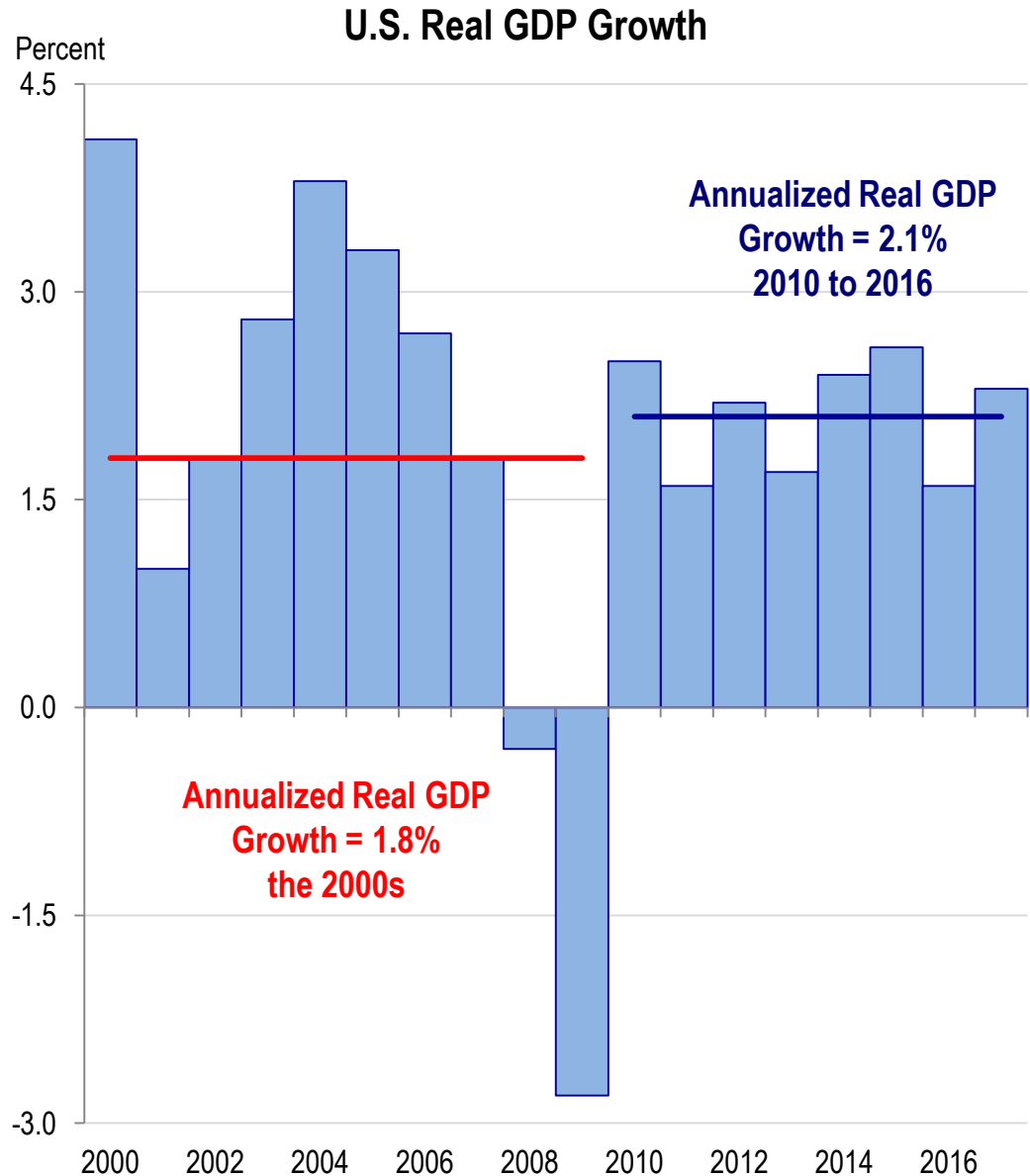
U.S. Real GDP Growth C+I+G+NX

BEA recently updated real GDP data for 2016:

- Real GDP growth for Q3 was 3.5%.
- Real GDP growth for Q4 was 2.1%
- Real GDP growth for 2016 was 1.6%.

In 2017, real GDP will grow at a rate between 2.1% to 2.5%.

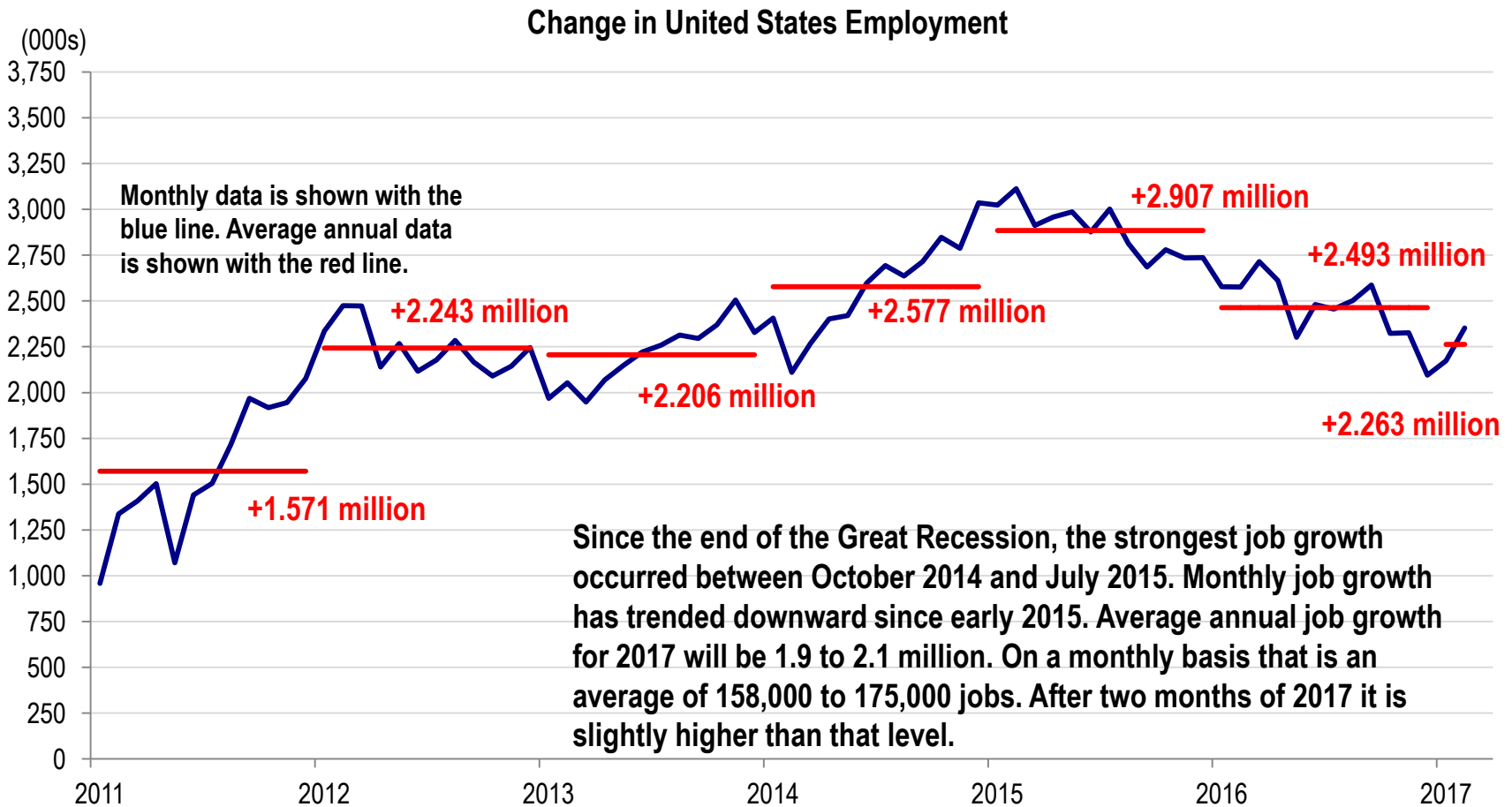
- Personal consumption will drive real GDP growth at a rate slightly greater than the rate of growth for real GDP.
- Business investment will increase if corporate tax rates are lowered. Stronger investment will benefit the economy in many ways.
- Government spending will be stronger than in 2016.
- The trade deficit will increase as a result of the lack of demand caused by a strong dollar.



Source: Bureau of Economic Analysis, cber.co, chained in 2009 dollars.

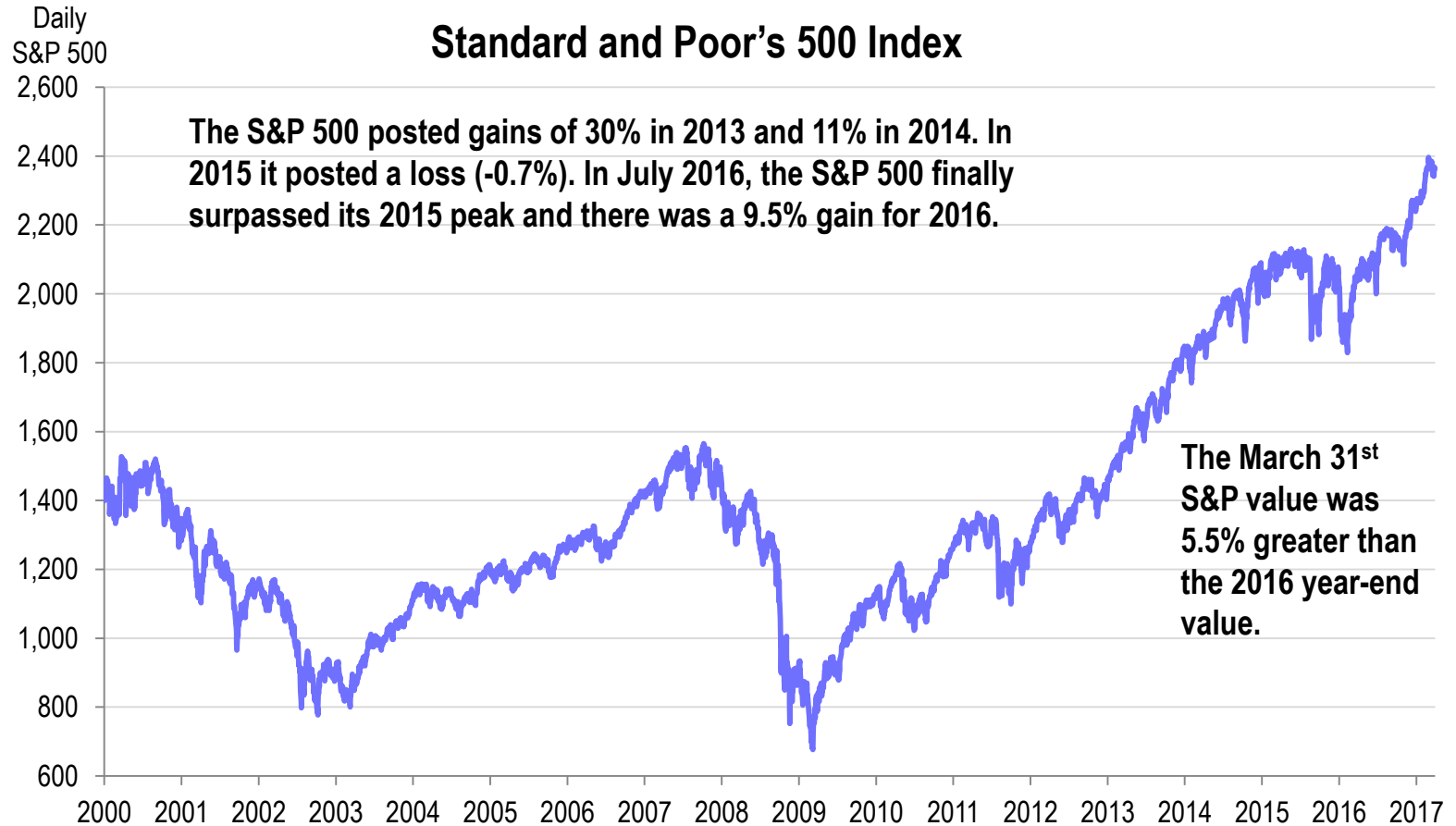
Colorado-based Business and Economic Research <http://cber.co>

Change in United States Employment Year-Over-Year



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

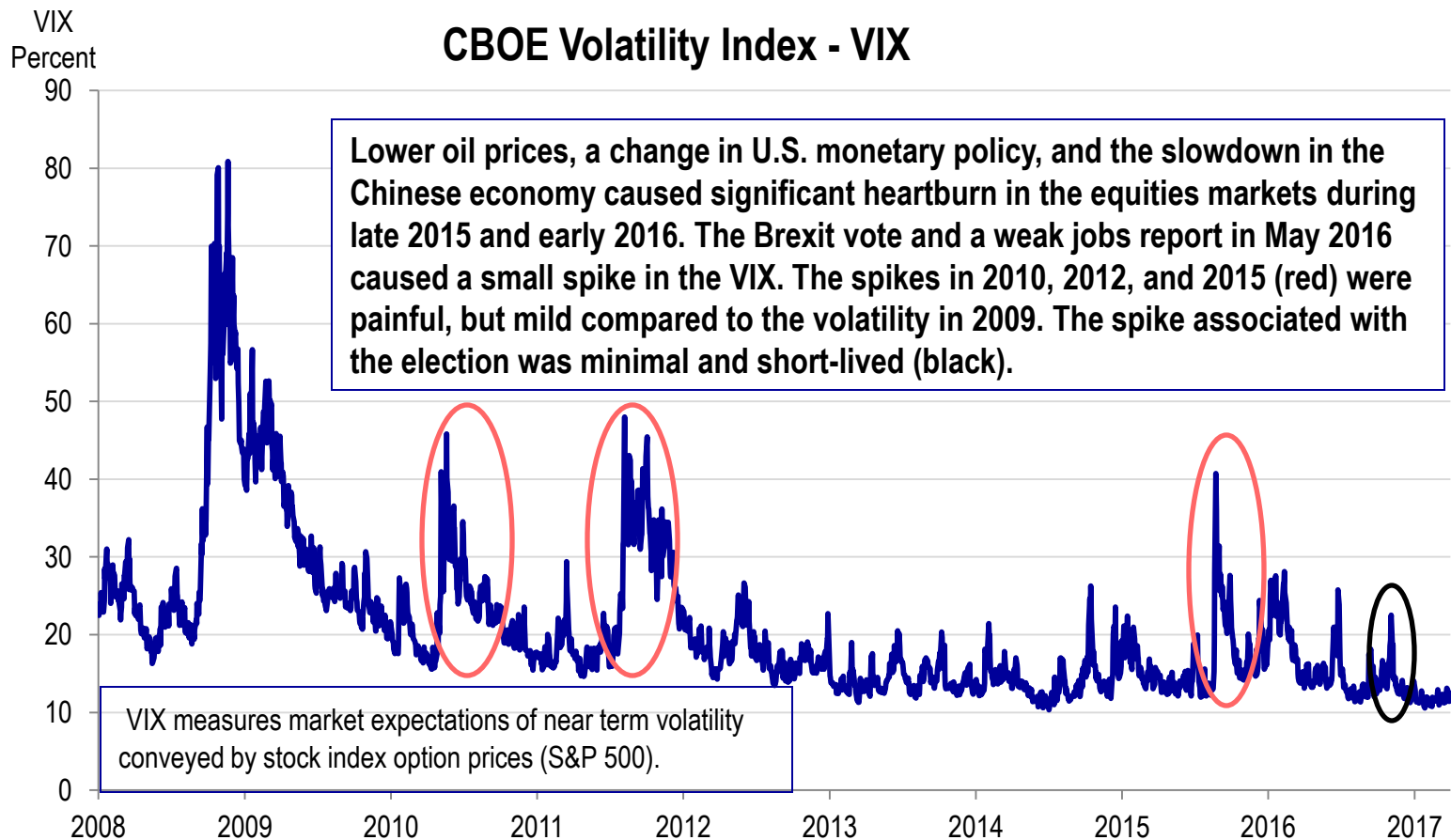
Standard and Poor's 500 Index



Source: FRED, S&P 500, cber.co.

CBOE Volatility Index

VIX (VIXCLS)



Source: FRED, Chicago Board Options Exchange, cber.co.

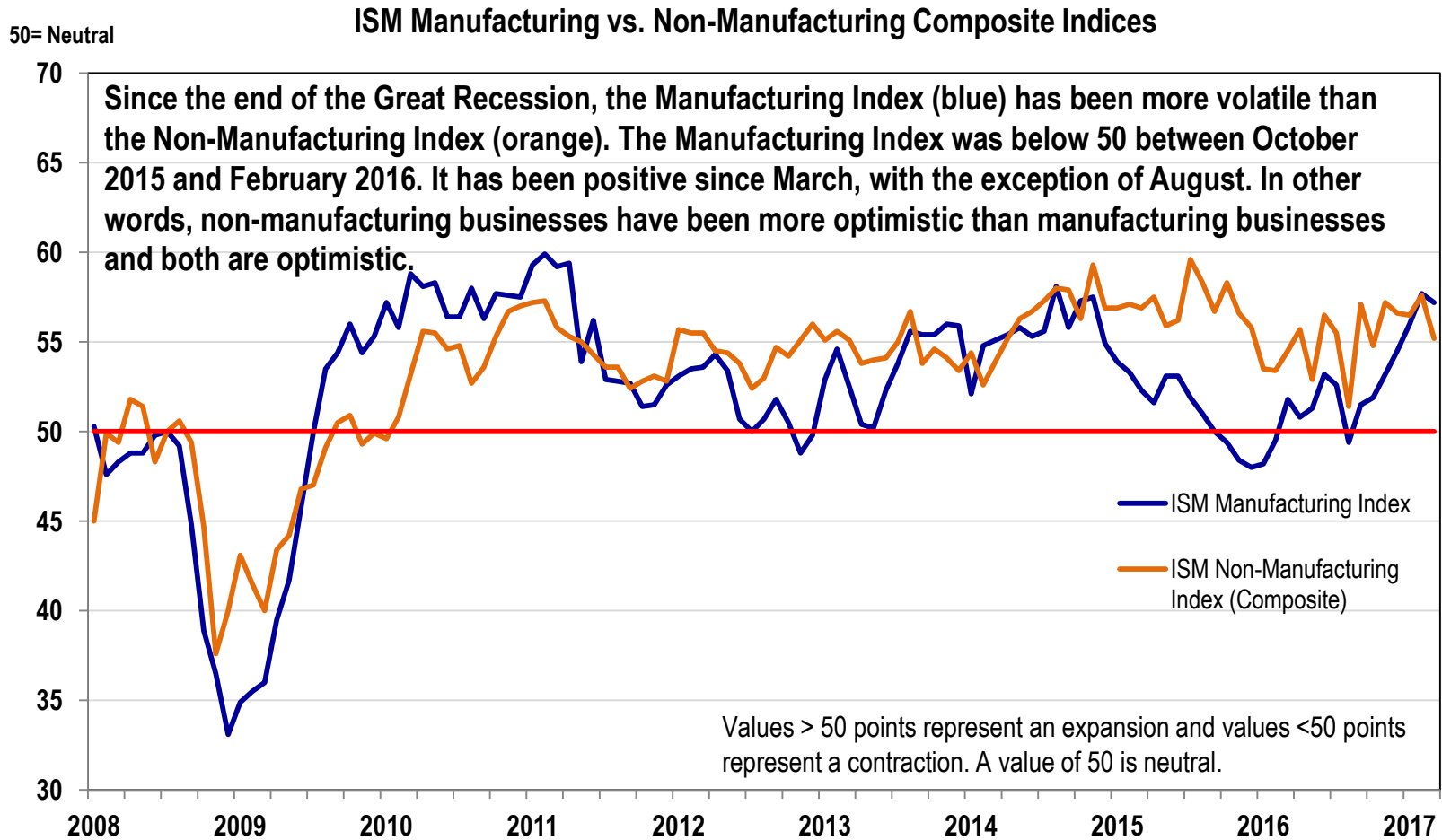


The U.S. Economy

Leading Indices

ISM PMI Composite Indices

Manufacturing vs. Non-manufacturing

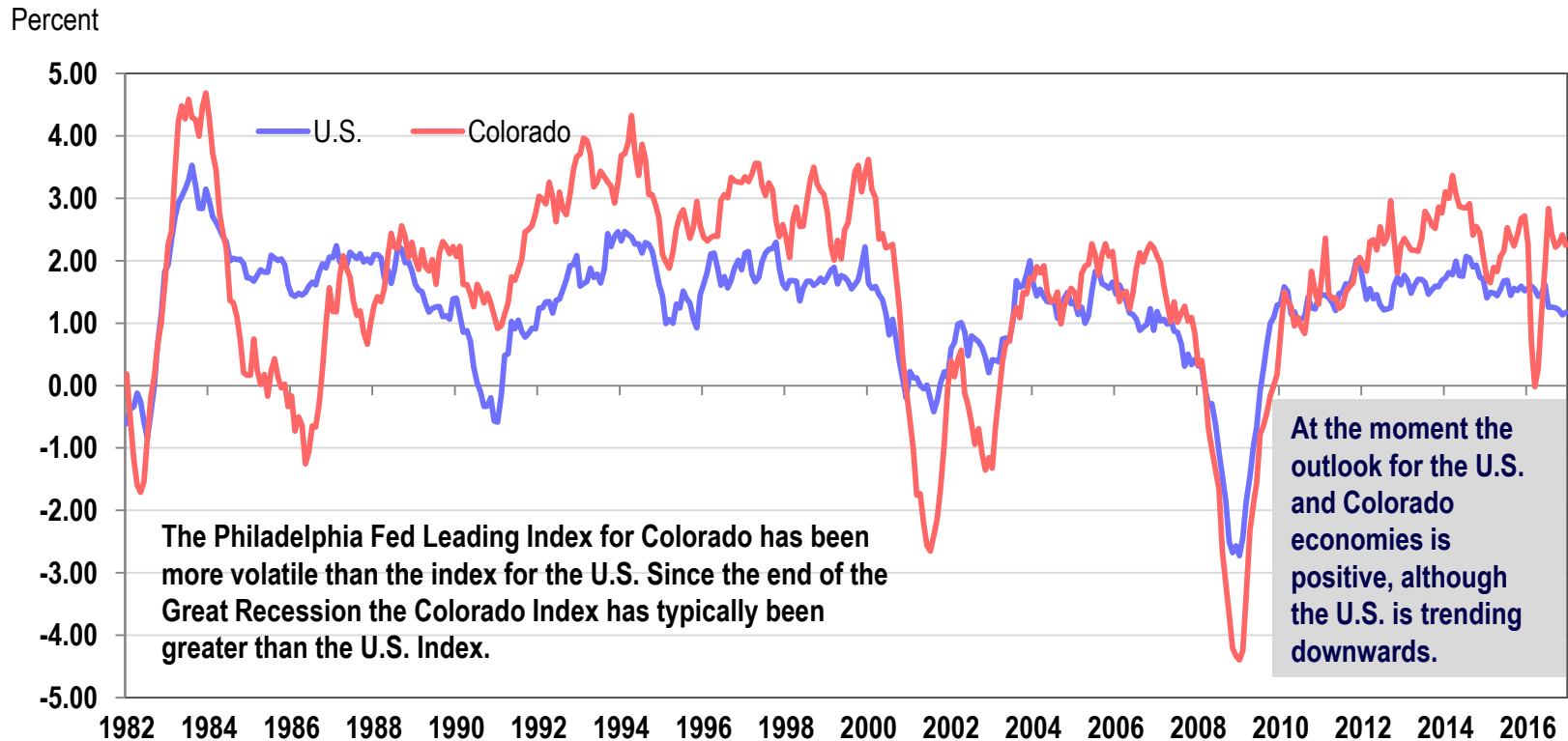


Sources: Institute for Supply Management (ISM), FRED, cber.co.

Leading Index

Colorado vs. United States

Philadelphia Federal Reserve Leading Index - Colorado vs. U.S.



Source: Philadelphia Federal Reserve, cber.co. Note: The leading index predicts the six-month growth rate of the state's coincident index.

● The Global and U.S. Economies in 2017

● Factors that Will Affect the U.S. and Colorado



1. Improved global economy (real GDP growth), 2.9%. The impact of Brexit will be felt in 2017.
2. Stronger real GDP growth for the U.S., 2.1% to 2.5%.
3. Nationally, 1.9 million to 2.1 million jobs will be added (that equates to 158,000 to 175,000 per month).
4. Good news - the Fed is optimistic about the economy. Bad news - interest rates will be raised 3 to 4 times in 2017.
5. Inflation will increase by 2.5% in the U.S. and 3.0% in CO.
6. After being down, manufacturing shipments are trending upwards.
7. Purchasing managers are optimistic about the future.
8. The price of oil is above \$50 per barrel and expected to increase.
9. The dollar will continue to be strong, which will be bad for exports.
10. Debt will continue to be a concern.

2017 will be a year of extremes – both good and bad.

There is more upside potential than downside risk.

There is a much smaller pool of potential workers!



Inflation

U.S. vs. Colorado (Denver-Boulder-Greeley)

Inflation

United States vs. Colorado

Inflation has become a topic of greater importance than in previous years because it has been low for the past 3 years and will increase significantly in 2017.

Technically, there is not a CPI for Colorado; however, the Denver-Boulder-Greeley CPI is sometimes used as a proxy for Colorado inflation. It will be used that way in this series of slides.

This section compares the cost of living for Colorado and the U.S. in 6 key areas.

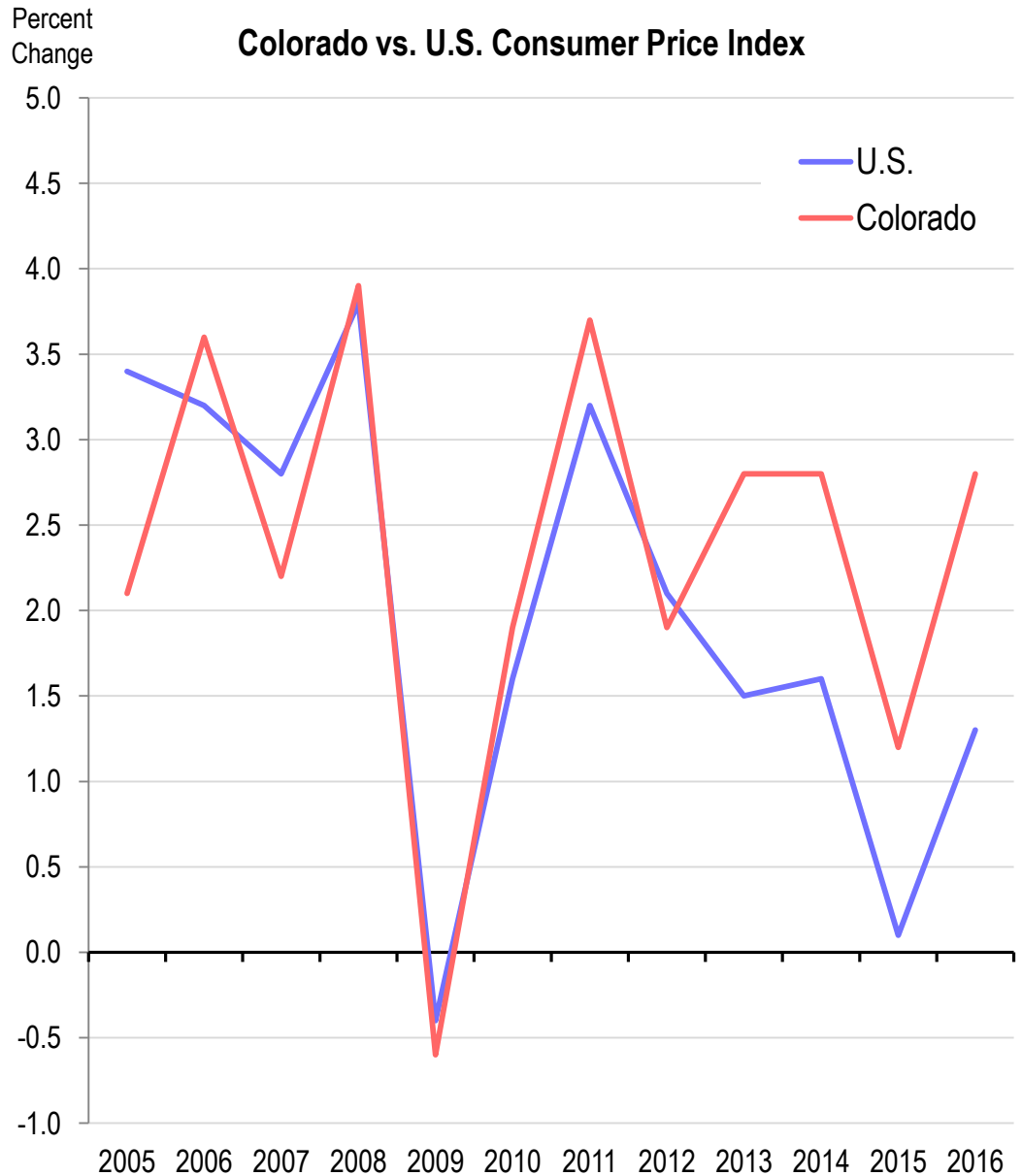
- For 5 of the past 6 years housing costs have been greater for Coloradans.
- Energy costs and food and beverage costs have changed at similar rates for the U.S. and Colorado.
- The Colorado rate of inflation for recreation has typically been higher than the U.S. rate.
- For the first time in 5 years, U.S. medical costs increased at a higher rate than Colorado costs in 2016.

The Federal Reserve is trying to manage the economy so inflation will approach their target rate of 2.0%. This is important to Colorado because for 8 of the past 12 years Colorado's rate of inflation has been greater than the U.S. In 2017 Coloradans will experience a higher cost of living than the U.S. rate. The inflation rate for Colorado will be about 3.0% this year while the U.S. rate will be 2.5%.

Consumer Price Index (CPI)

The change in the annual Colorado CPI rate (red) has been greater than the change in the U.S. CPI rate (blue) for 8 of the past 12 years. The Colorado rate has been significantly greater since 2013.

The correlation coefficient between the two variables is .78



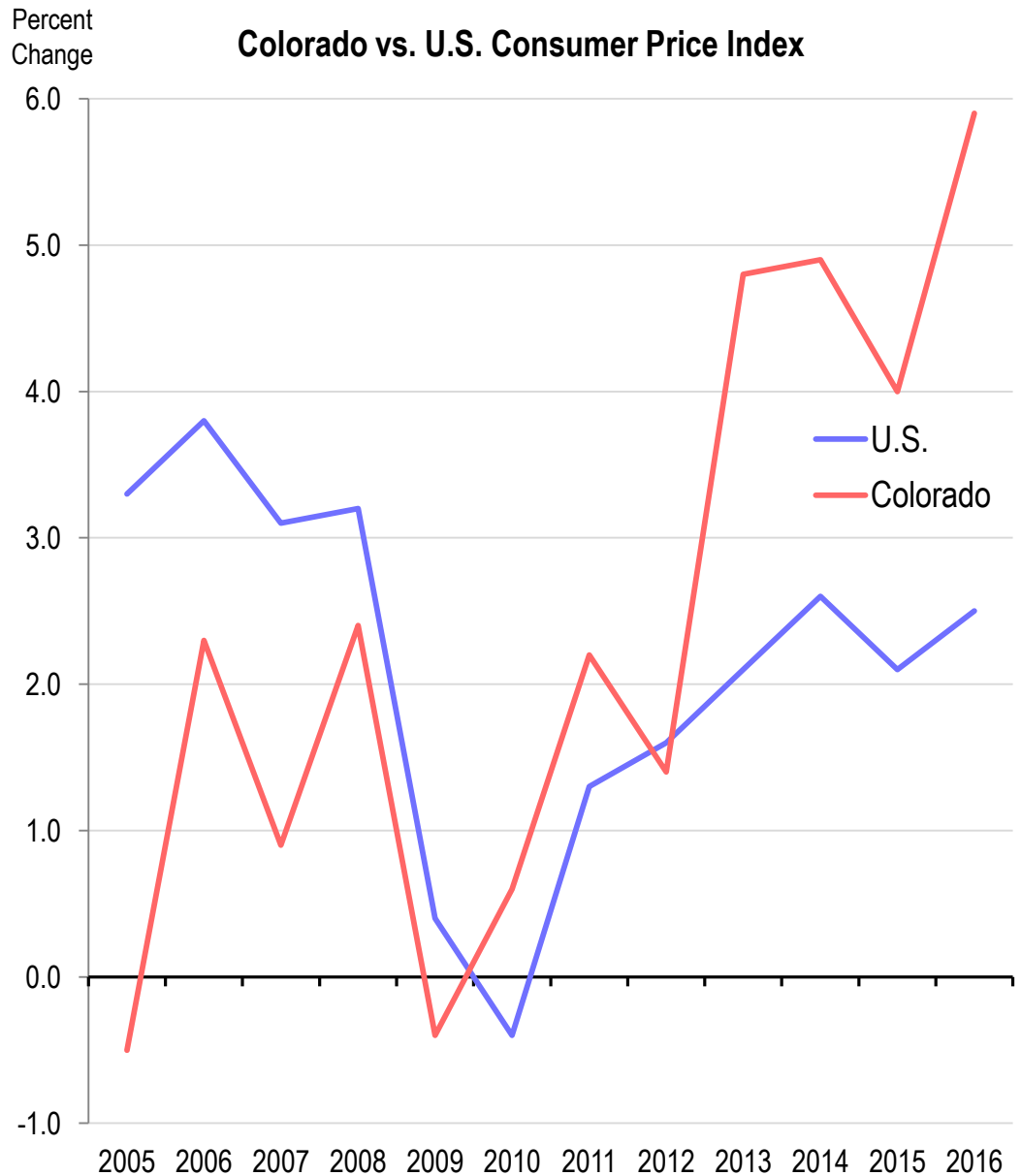
Source: Bureau of Labor Statistics, cber.co, 1982-1984=100.

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

Consumer Price Index (CPI) Housing

The change in the annual Colorado Housing CPI rate (red) has been greater than the change in the U.S. Housing CPI rate (blue) for 6 of the past 12 years. The Colorado rate has been significantly greater since 2010.

The correlation coefficient between the two variables is .25.



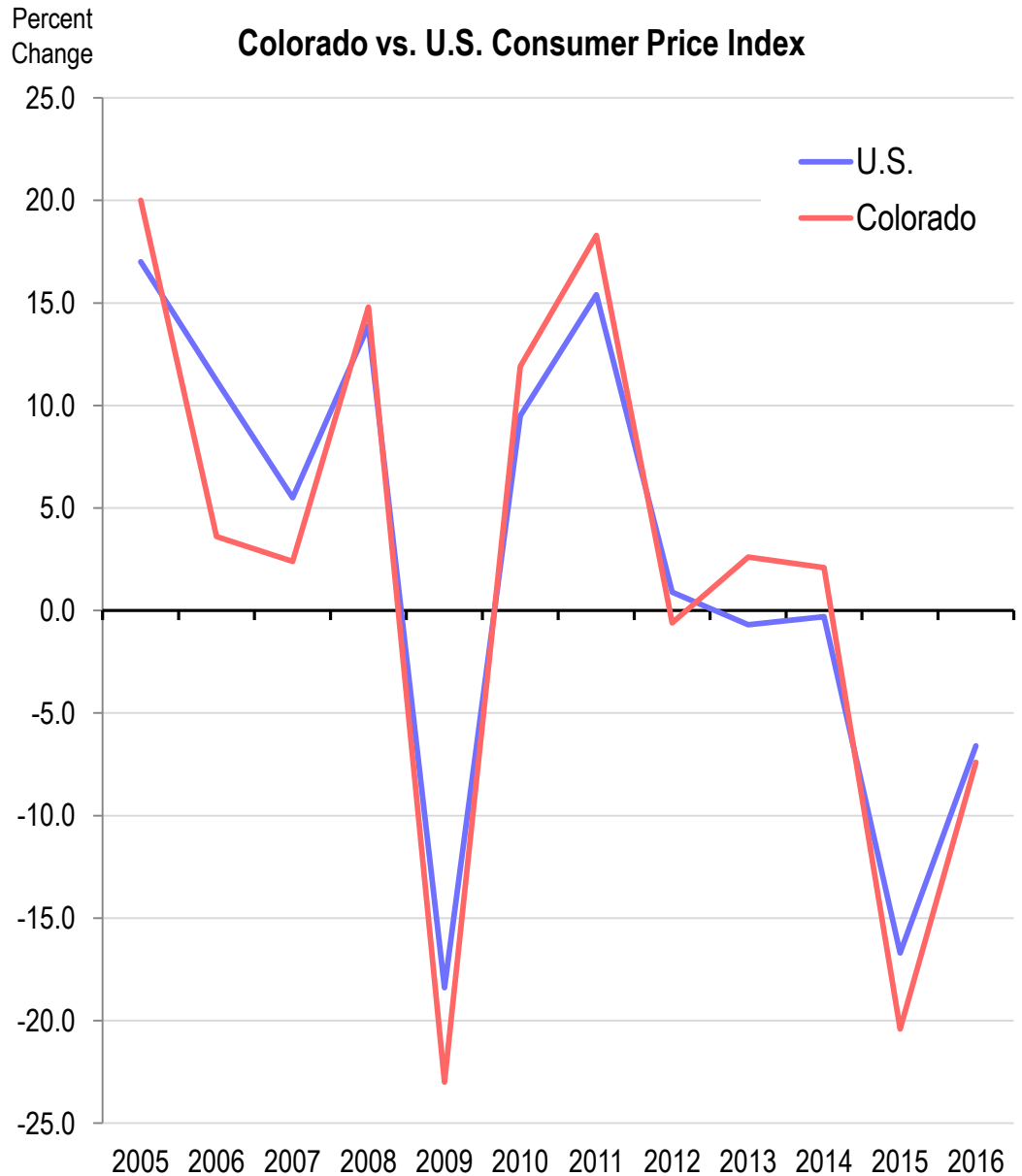
Source: Bureau of Labor Statistics, cber.co, 1982-1984=100.

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

Consumer Price Index (CPI) Energy

The change in the Colorado (red) and U.S. (blue) Energy CPI rates have been extremely volatile; they have moved in tandem since 2005. The correlation coefficient between the two variables is .97.

The Colorado rate has been greater than the U.S. Energy rate for 6 of the past 12 years.



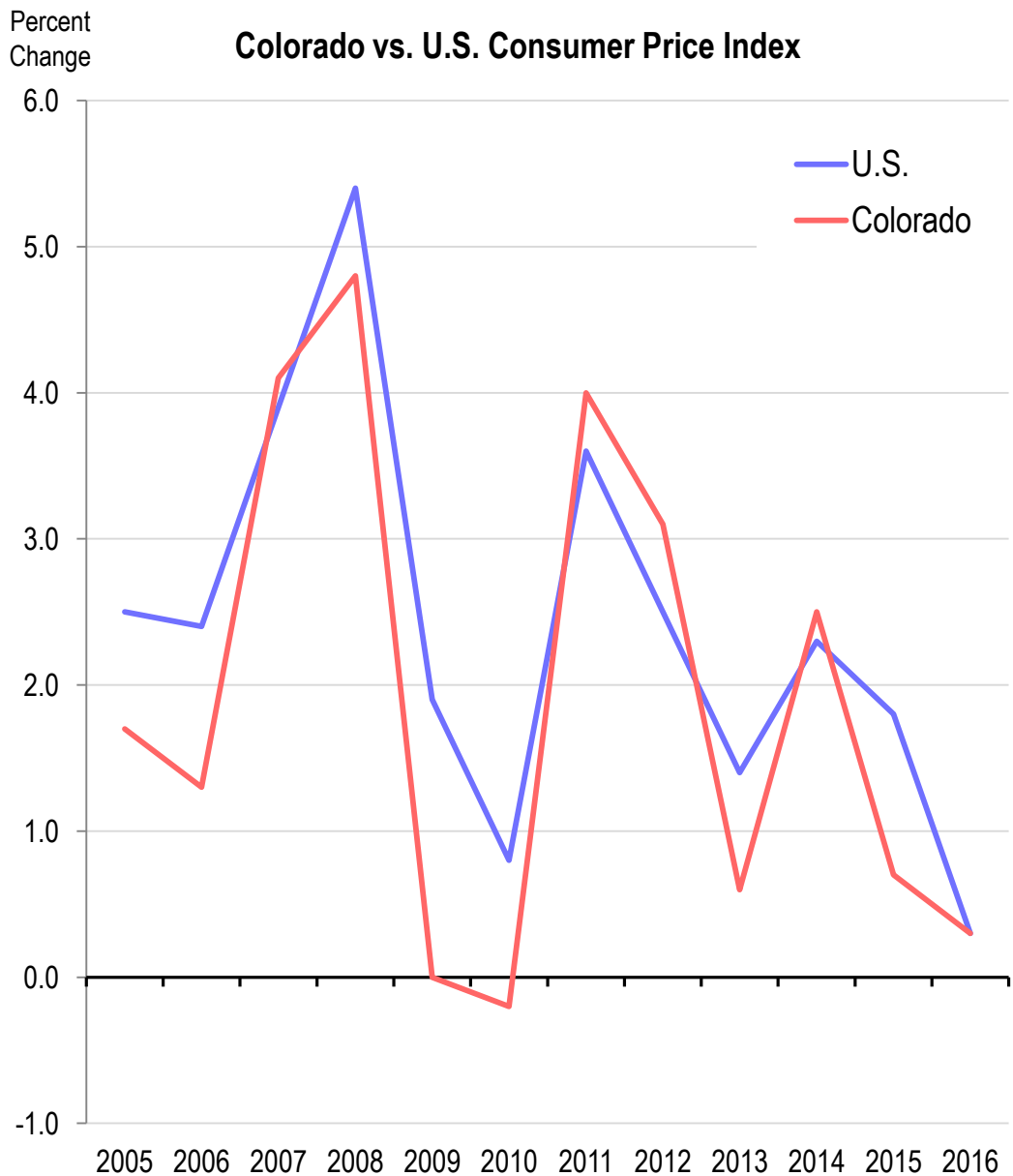
Source: Bureau of Labor Statistics, cber.co, 1982-1984=100.

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

Consumer Price Index (CPI) Food and Beverage

The change in the annual Colorado F&B CPI rate (red) has been greater than the change in the U.S. F&B CPI rate (blue) for 4 of the past 12 years.

The correlation coefficient between the two variables is .91.



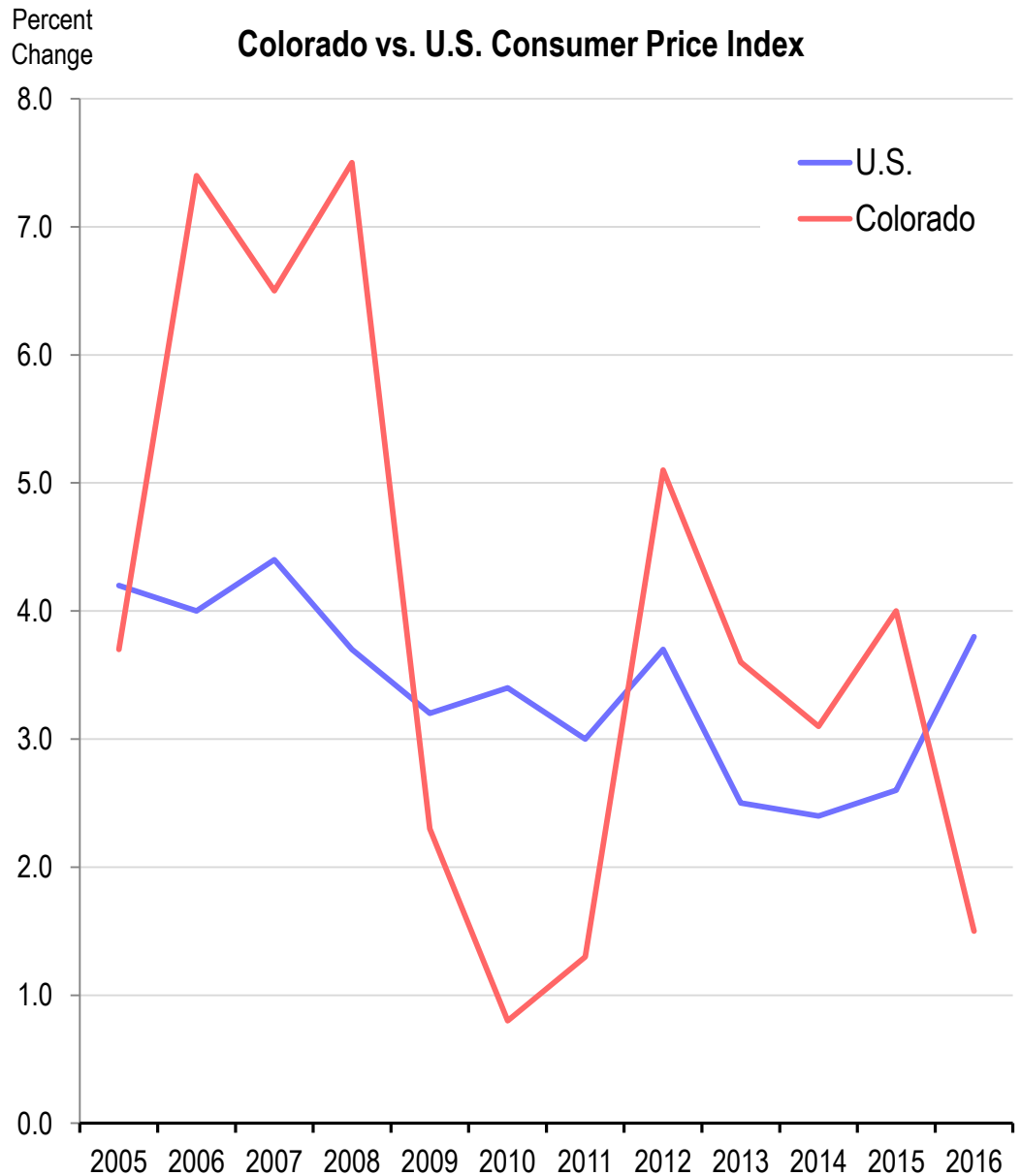
Source: Bureau of Labor Statistics, cber.co, 1982-1984=100.

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

Consumer Price Index (CPI) Medical Care

The change in the annual Colorado Medical Care CPI rate (red) has been greater than the U.S. Medical Care CPI rate (blue) for 7 of the past 12 years.

The correlation coefficient between the two variables is .43.

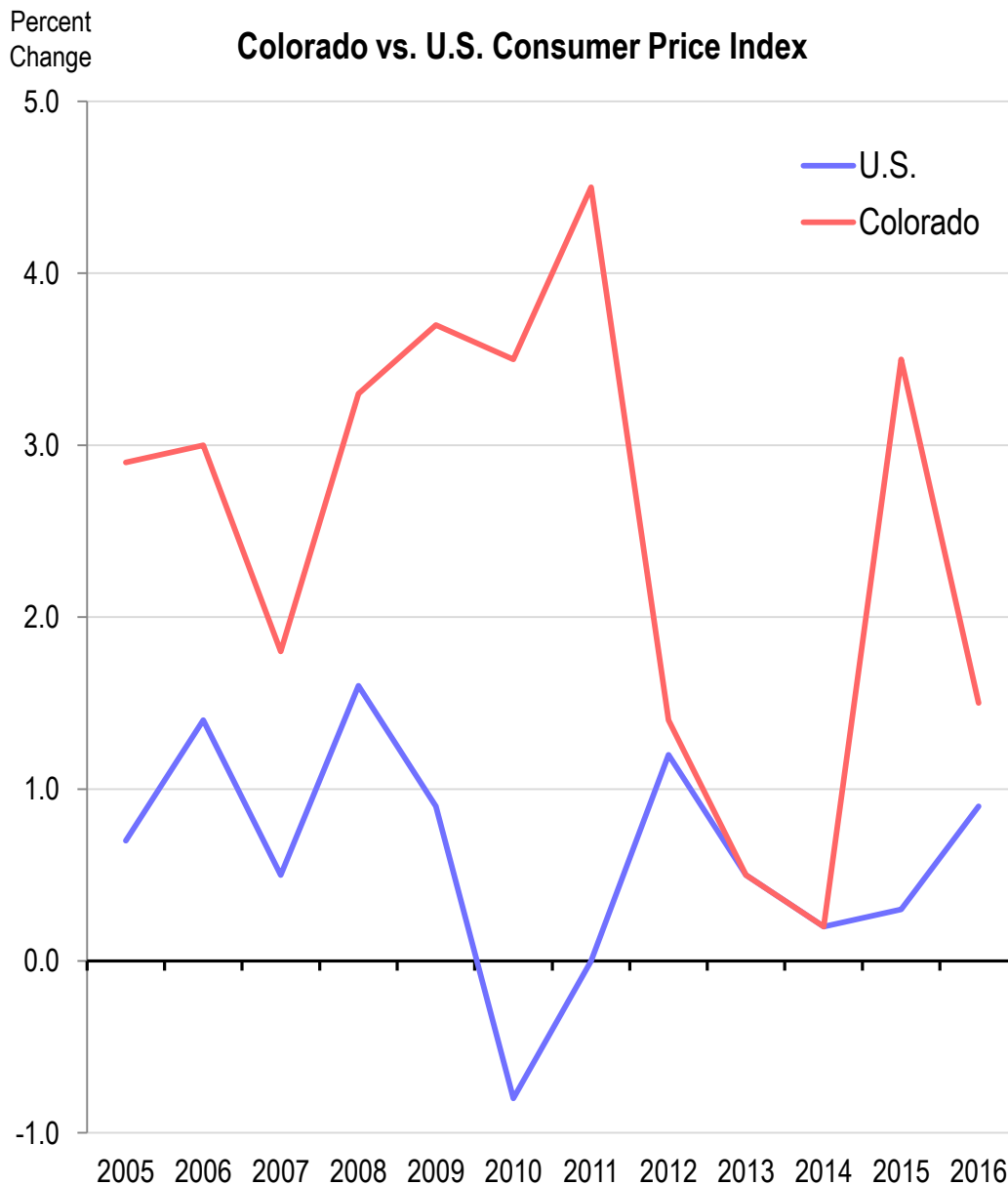


Source: Bureau of Labor Statistics, cber.co, 1982-1984=100.

Consumer Price Index (CPI) Recreation

The annual change in the rate for the Colorado Recreation CPI rate (red) has been greater than the U.S. Recreation CPI rate (blue) for 10 of the past 12 years.

The correlation coefficient between the two variables is -0.1.



Source: Bureau of Labor Statistics, cber.co, 1982-1984=100.

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



The Colorado Economy



The Colorado Economy

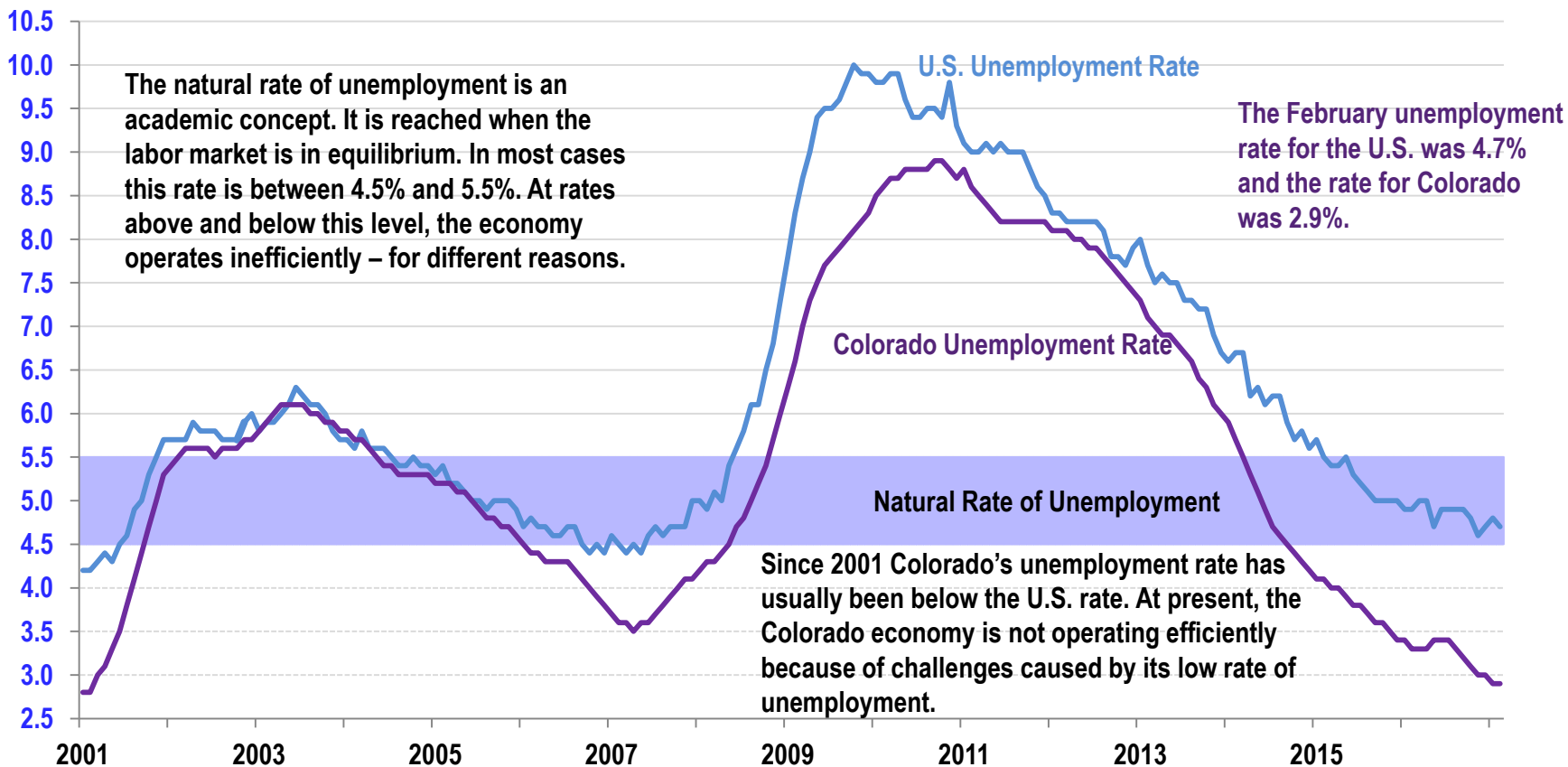
Unemployment

Unemployment Rate

United States vs. Colorado

Percent

United States vs. Colorado Unemployment Rate

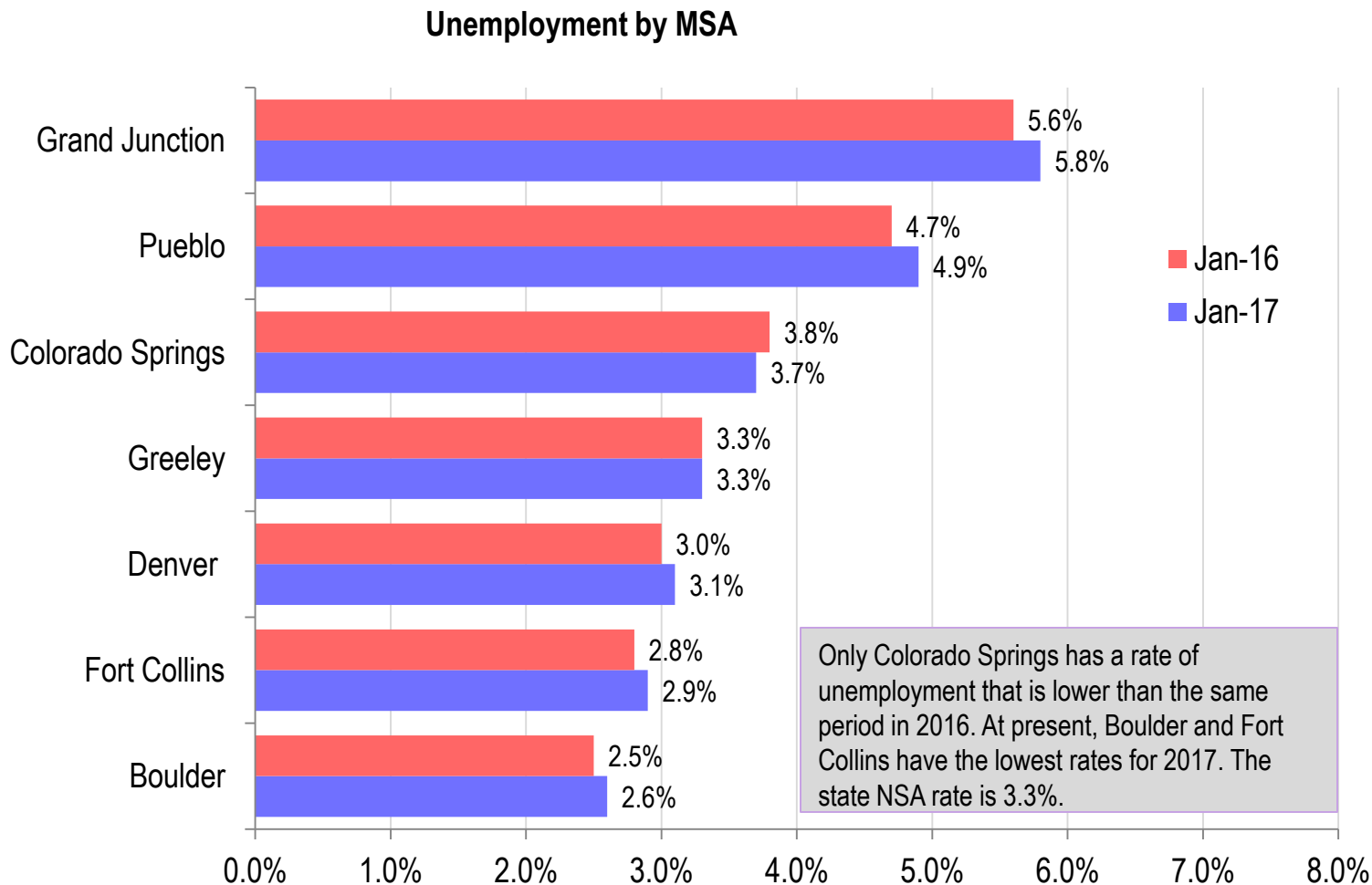


Source: Bureau of Labor Statistics, SA, cber.co.

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

Unemployment by MSA

2016 vs. 2017



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.



Colorado Economy

Employment in Strong Growth, Solid Growth, Volatile Categories

Overview of Job Growth by Category

Strong, Solid, Volatile

Strong Growth Category

- This category continues to post solid-to-strong job growth, although growth is occurring at a declining rate.
- The health care sector is posting solid-to-strong job growth, although growth is occurring at a declining rate.
- The PST sector is recording strong job growth. It is adding jobs at an increasing rate.

Solid Growth Category

- Job growth is modest; however, jobs are being added at a declining rate.
- The AFS sector is posting volatile job growth that is currently trending upwards.
- Jobs in the retail trade sector are being added at a modest pace, albeit at a slower rate than in the past.

Volatile Growth Category

- Job growth in this category is weak. Jobs are being added at a declining rate.
- There are declines in the number of jobs being added in the financial activities, construction, and manufacturing sectors.
- Jobs are being lost at a declining rate in the extractive industries.

For more information about how these categories were established, please refer to the Appendix.

Annual Employment Situation for the Strong Growth Category

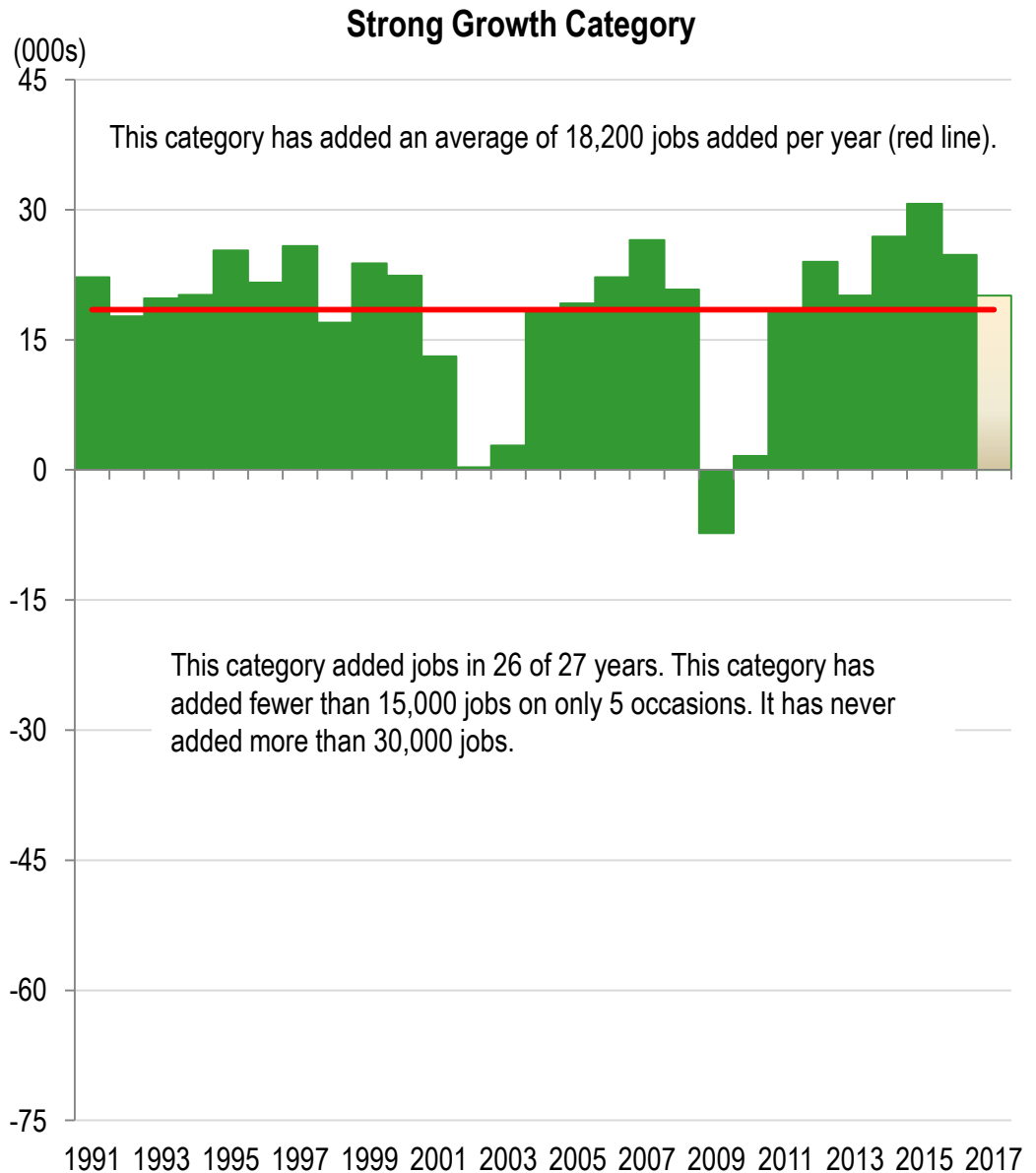
Over the past two decades the following sectors have been the foundation for consistent growth in Colorado employment.

- 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:

1997 517,900 workers, 26.2% of total employment
 2007 683,800 workers, 29.3% of total employment
 2017 857,000 workers, 32.3% of total employment

In 2017, between 19,000 and 21,000 workers will be added at a rate of 2.3% to 2.5%. This rate of growth is similar to last year.

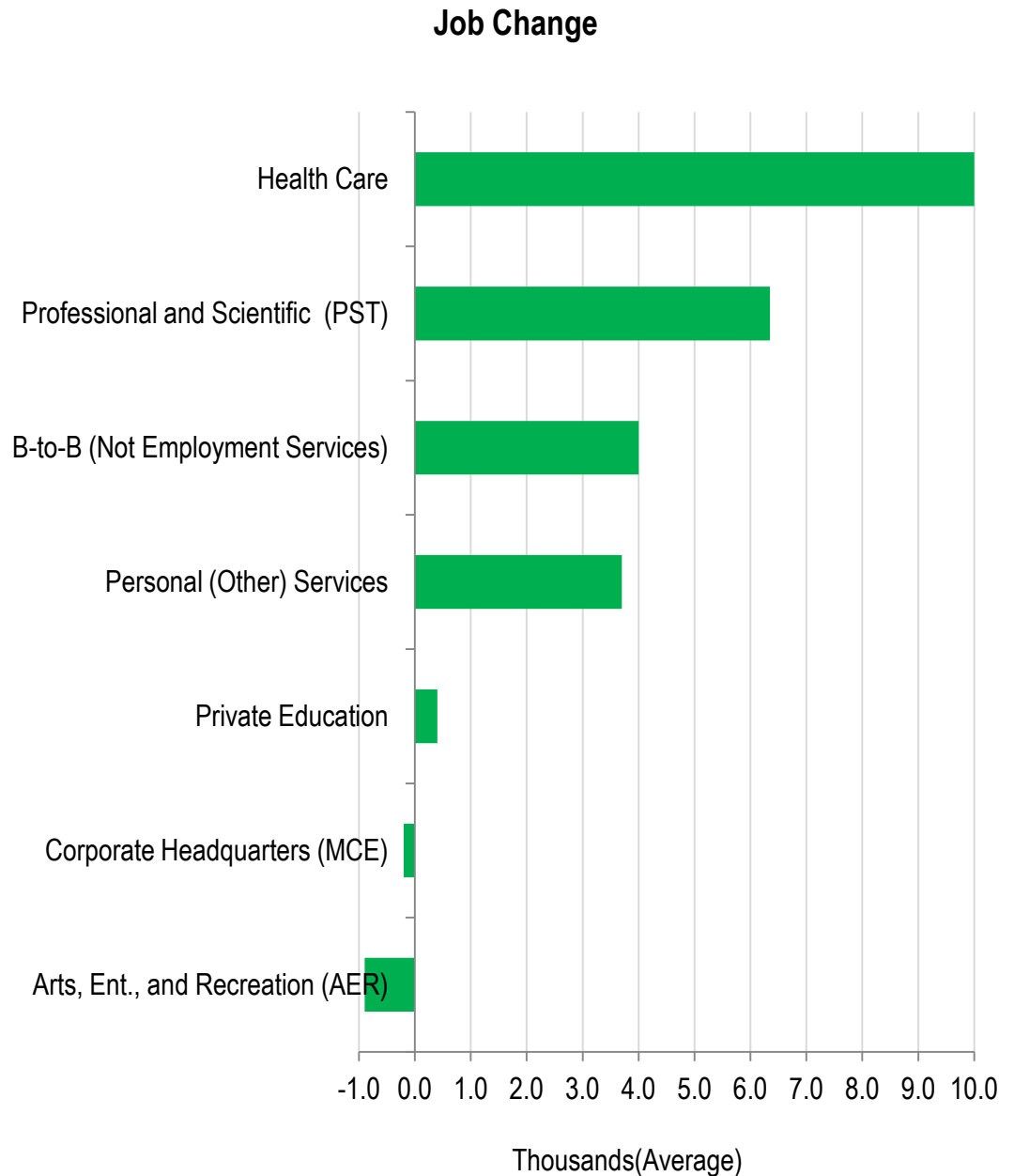


● Average Change in
● Employment for the First 2
● Months of 2017
● Strong Growth Category

- This category of sectors added 23,400 jobs compared to the same period last year.

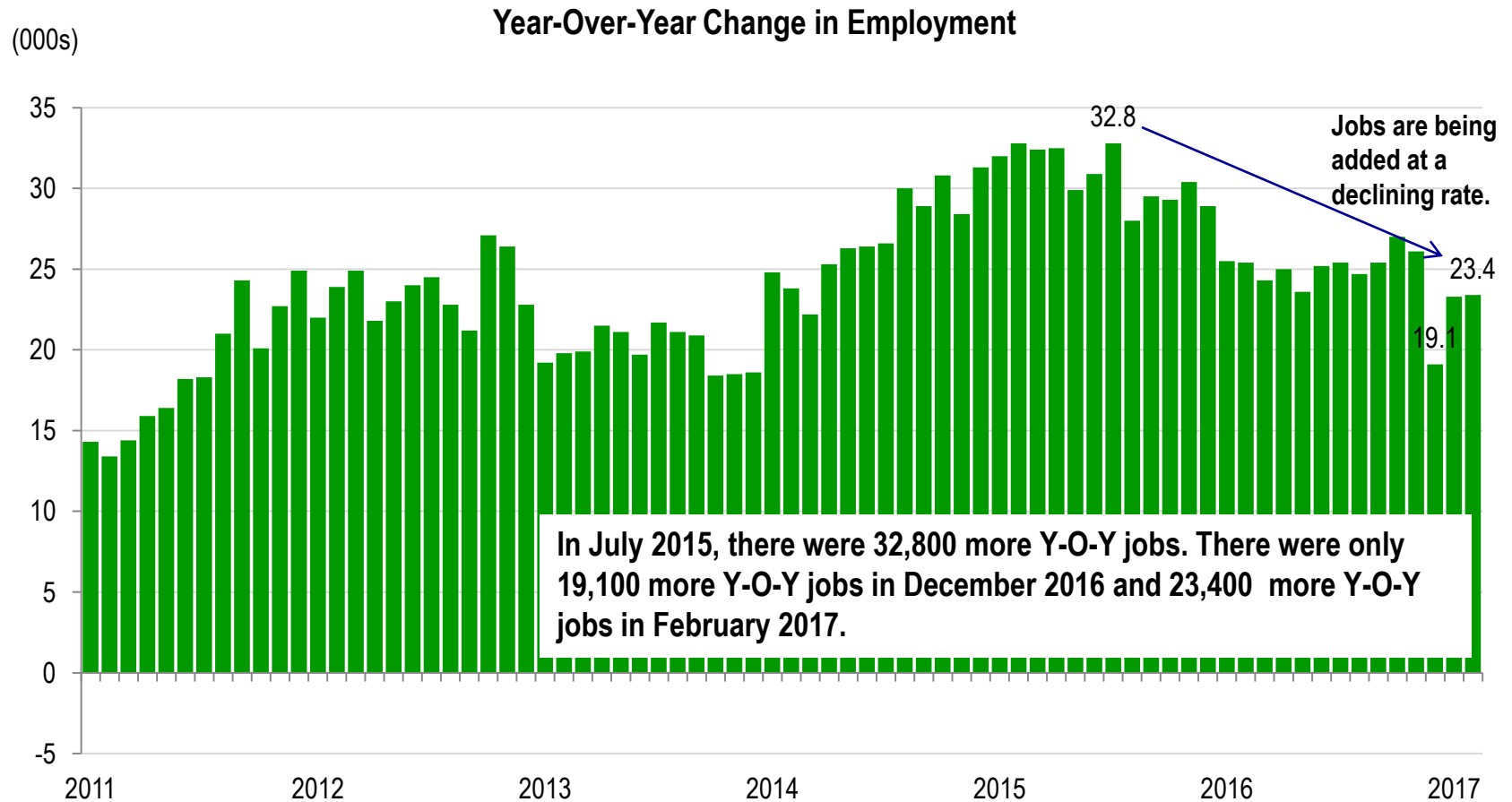
- The health care sector led job growth, followed by the PST sector.

- In 2017, this category is expected to account for 33.3% of total job gains and 32.3% of total employees.



Year-Over-Year Change in Employment

Strong Growth Category

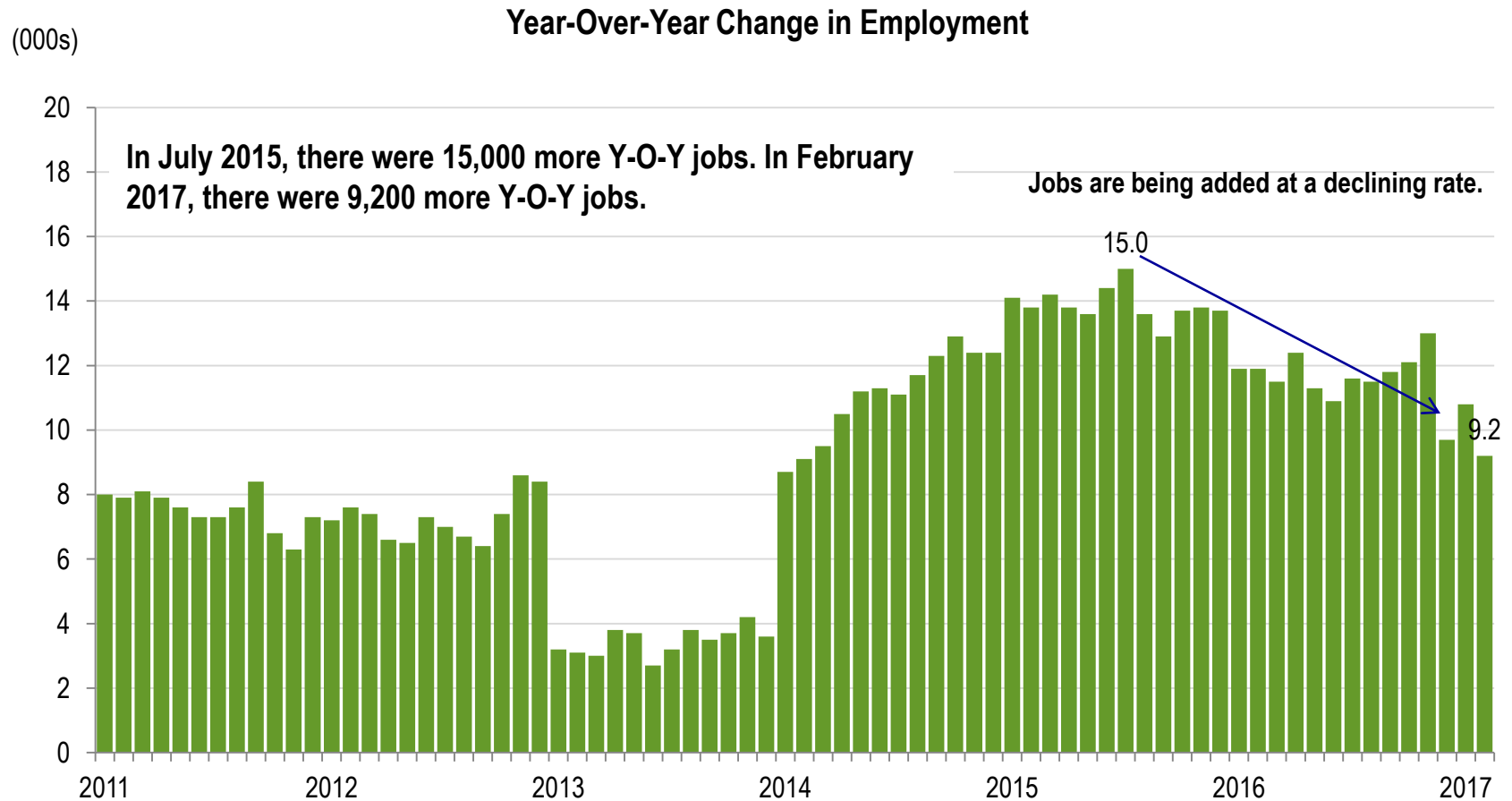


Source: Bureau of Labor Statistics, cber.co.

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

Year-Over-Year Change in Employment

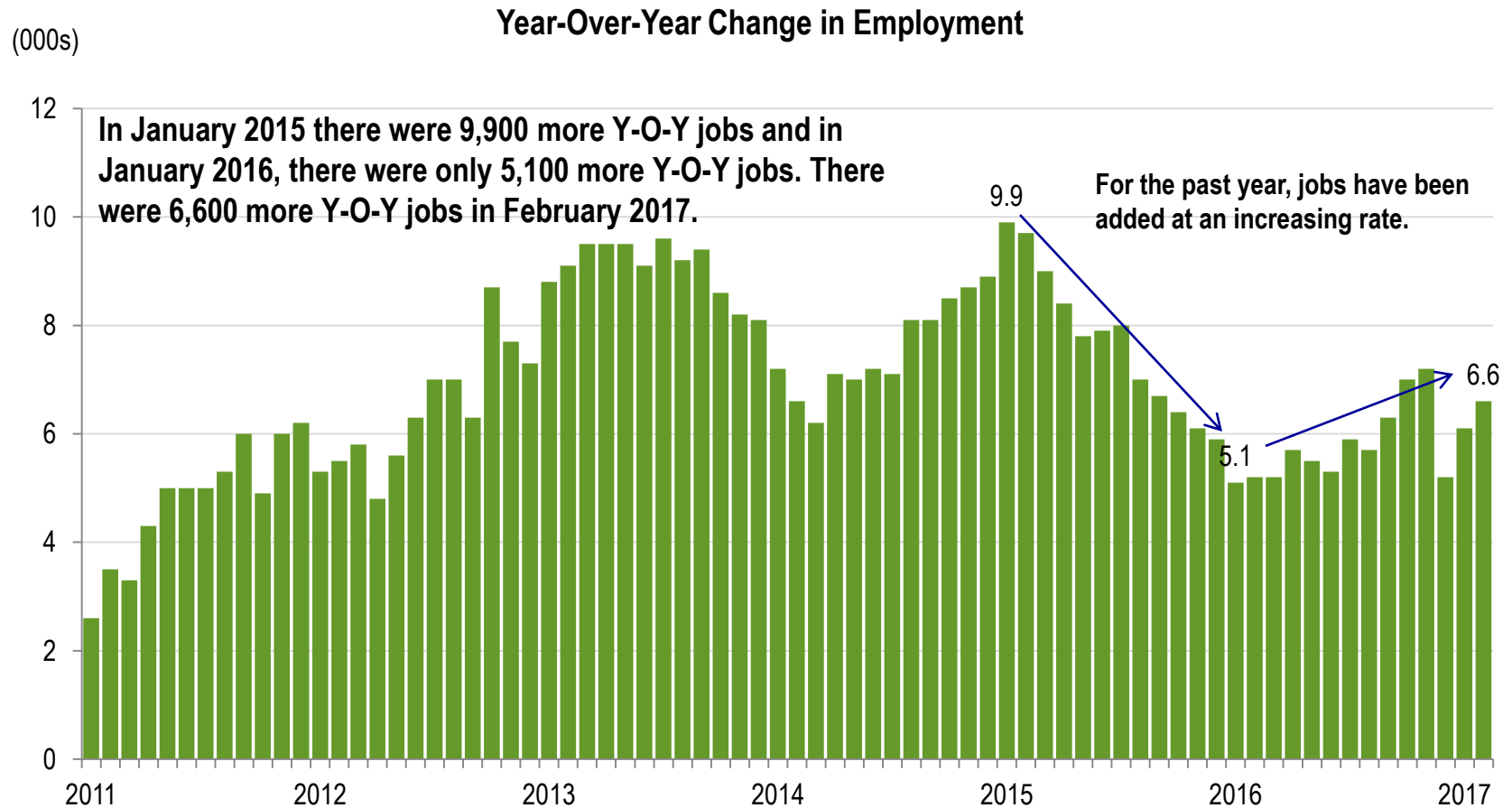
Health Care Sector



Source: Bureau of Labor Statistics, cber.co.

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

- Year-Over-Year Change in Employment
- Professional, Scientific and Technology Sector
-



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 and 2010s.

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

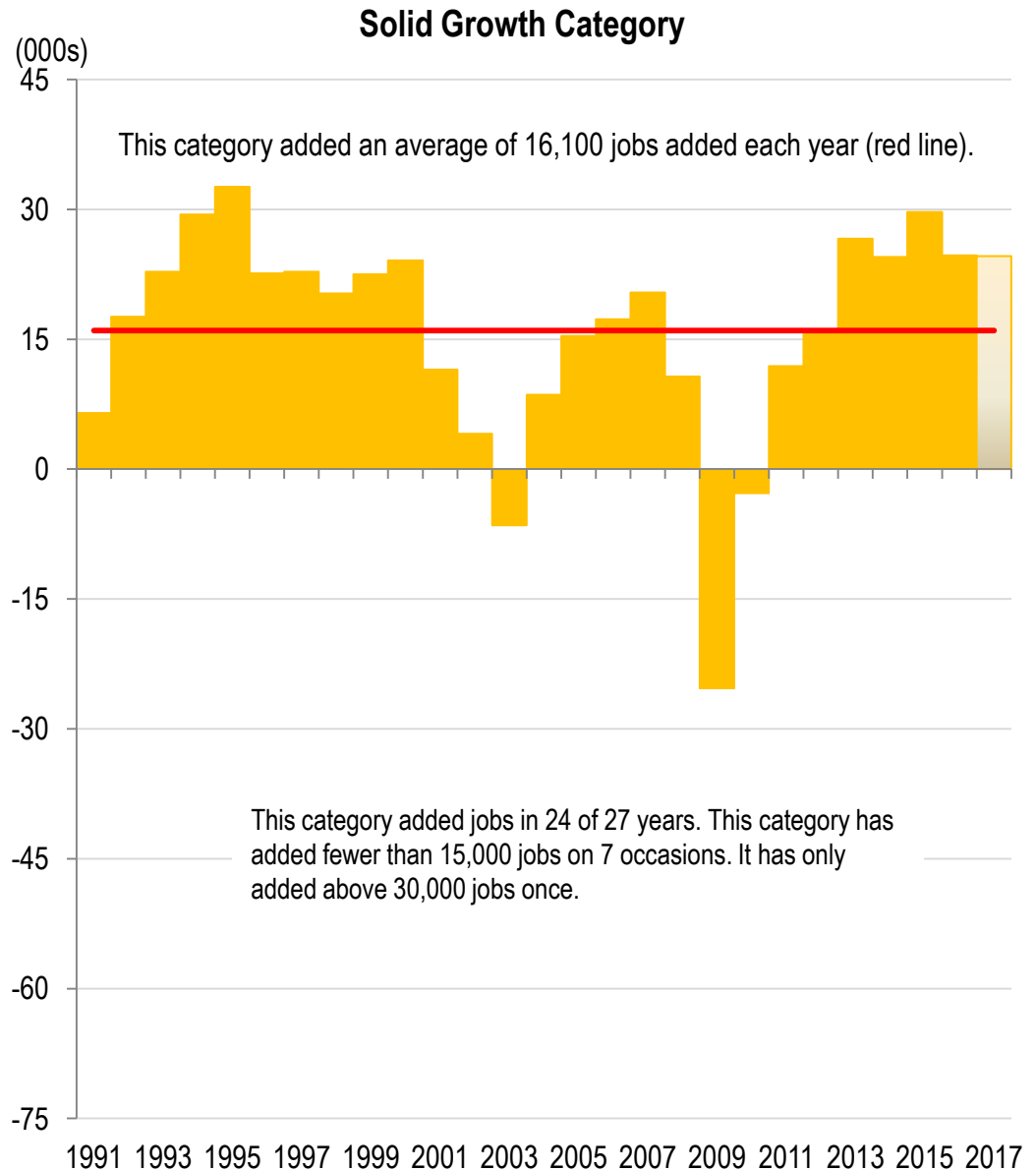
Total employment for this category was:

1997 763,400 workers, 38.6% of total employment

2007 901,100 workers, 38.6% of total employment

2017 1,045,200 workers, 39.3% of total employment

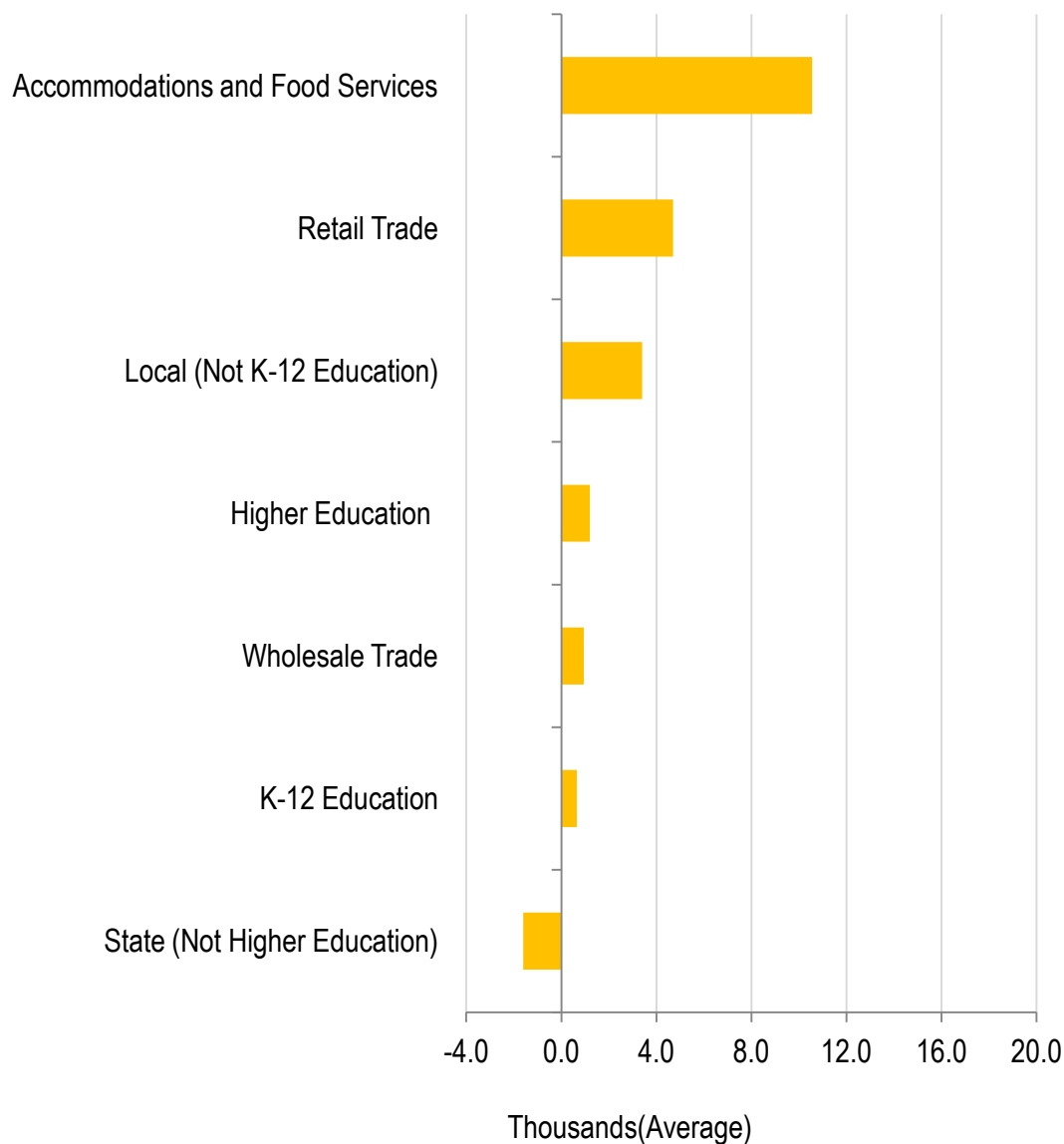
In 2017, between 24,000 and 26,000 jobs will be added, at a rate of 2.3% to 2.5%. This level of growth is similar to 2014.



● Average Change in
 ● Employment for the First 2
 ● Months of 2017
 ● Solid Growth Category

- This category of sectors added 19,900 jobs compared to the same period last year.
- The leisure and hospitality sector (AFS + AER) has had a strong year.
- Retail trade has also posted modest job gains as a result of population and job growth. In addition, Colorado has enjoyed another strong winter tourism season.
- In 2017, this category is expected to account for 41.7% of total job gains and 39.3% of total employees.

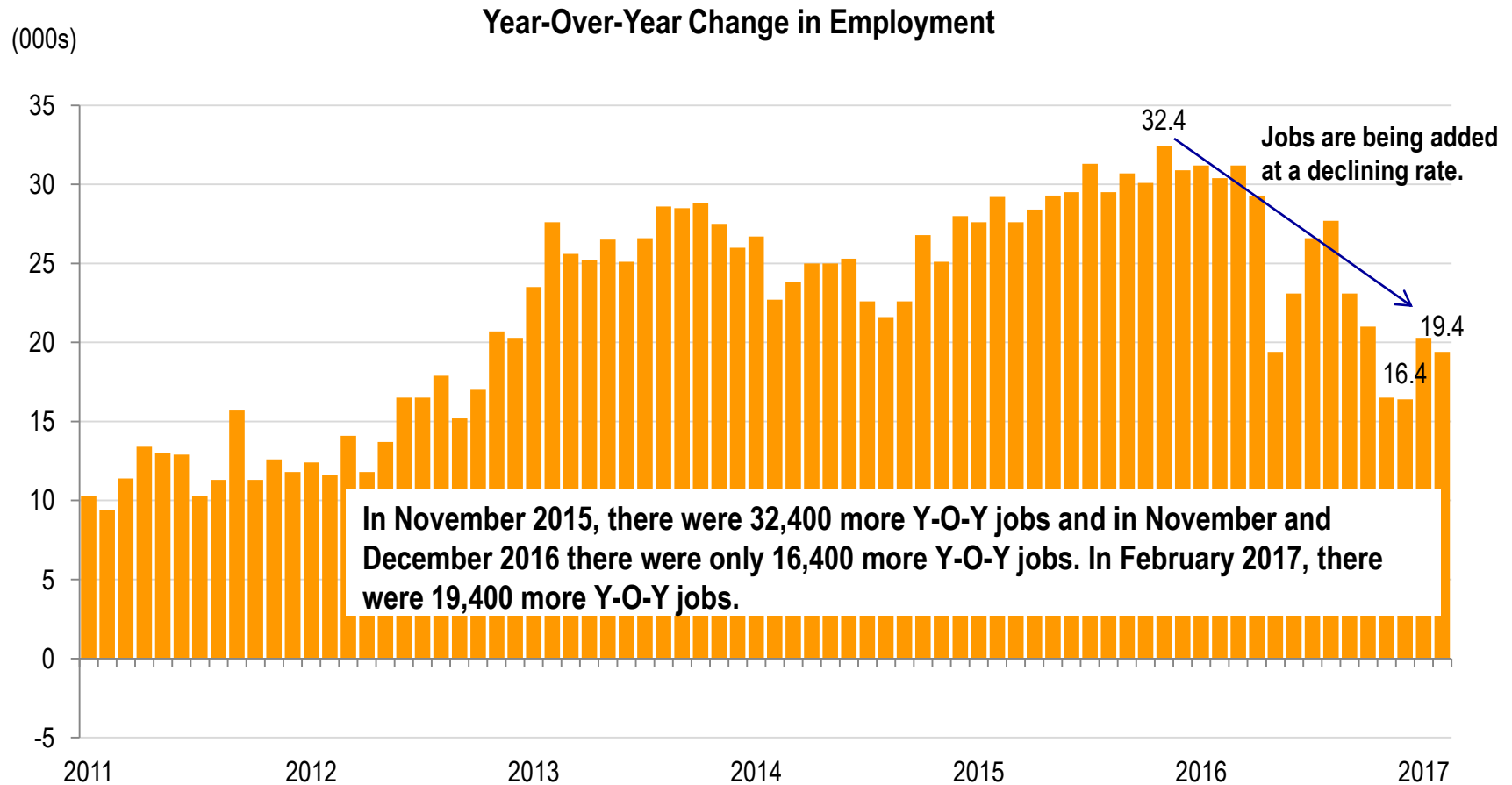
Job Change



Source: Bureau of Labor Statistics, cber.co.

● Year-Over-Year Change in Employment

● Solid Growth Category

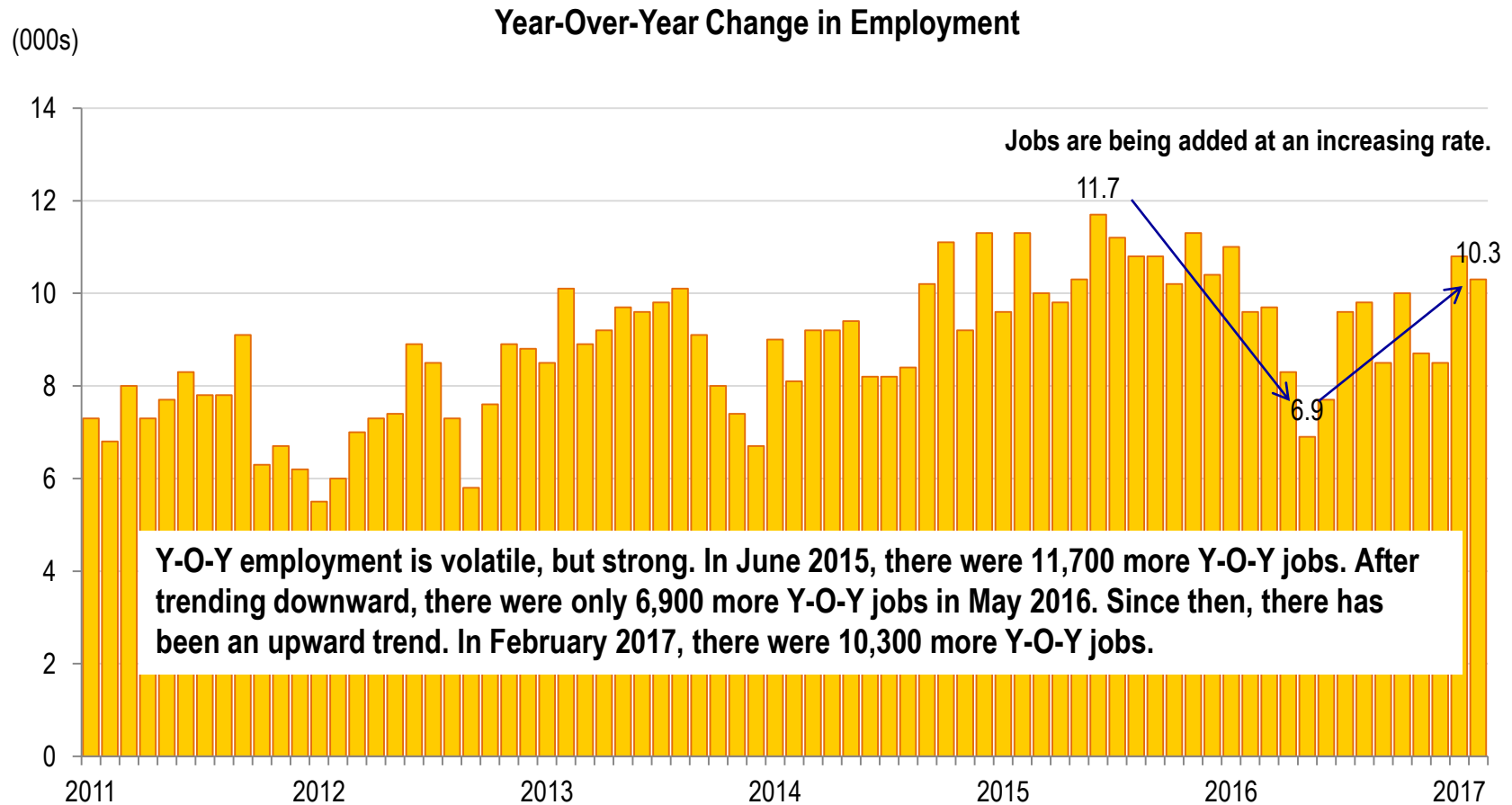


Source: Bureau of Labor Statistics, cber.co.

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

Year-Over-Year Change in Employment

Accommodations and Food Services

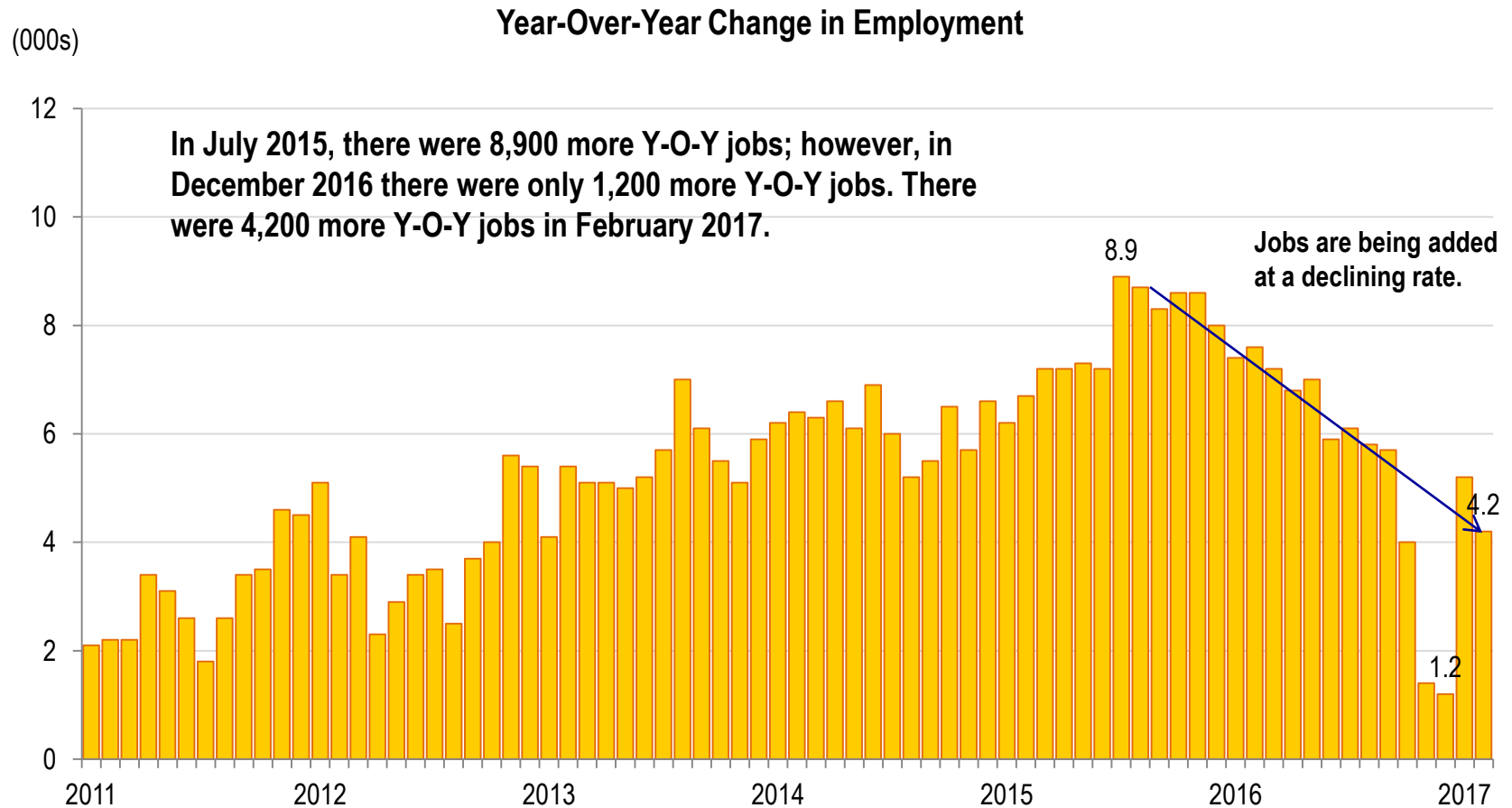


Source: Bureau of Labor Statistics, cber.co.

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

Year-Over-Year Change in Employment

Retail Trade



Source: Bureau of Labor Statistics, cber.co.

Colorado-based Business and Economic Research <http://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

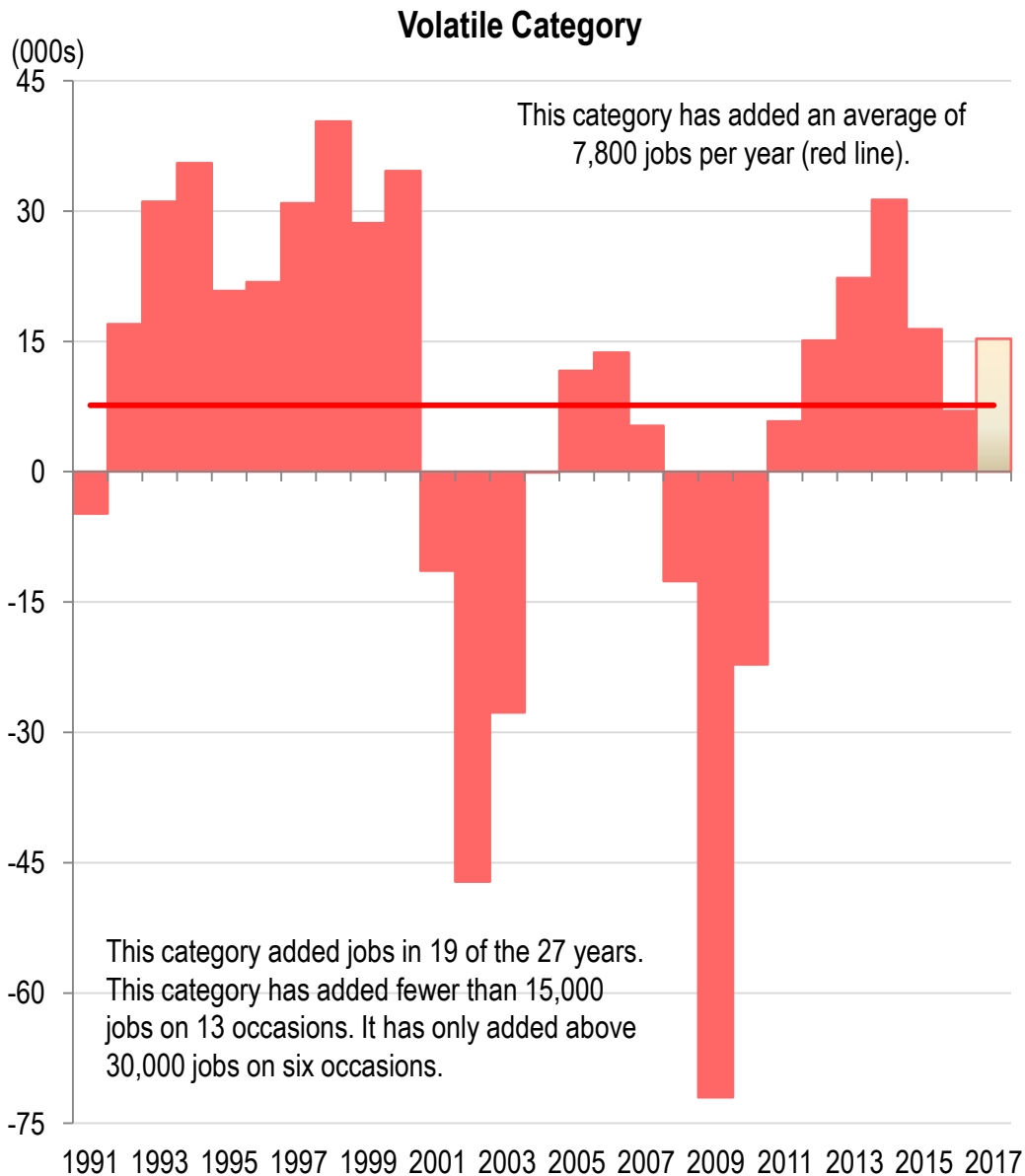
Total employment for this category was:

1997 698,900 workers, 35.3% of total employment

2007 746,600 workers, 32.0% of total employment

2017 756,600 workers, 28.5% of total employment

In 2017 between 14,000 and 16,000 jobs will be added, at a rate of 2.0% to 2.2%. This rate of growth is similar to 2012 and 2015.



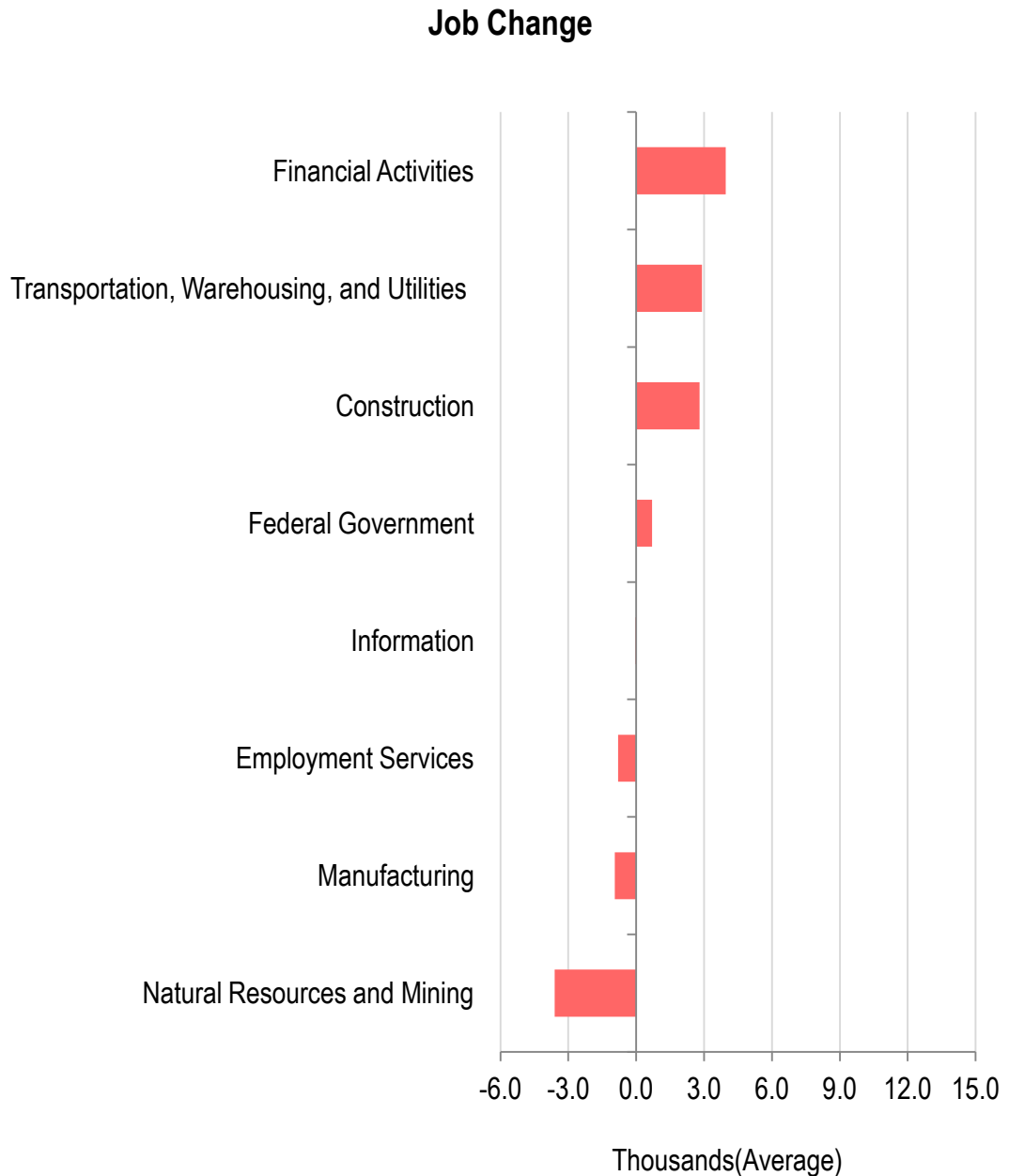
● Average Change in ● Employment for the First 2 ● Months of 2017 ● Volatile Growth Category

• This category of sectors added 4,900 jobs compared to the same period last year.

• For this period, financial activities, TWU, and construction led job growth. information, employment services, manufacturing, and the extractive industries are areas of concern.

• It was thought the job losses in the extractive industries had subsided - obviously not.

• In 2017, this category is expected to account for 25.0% of total job gains and 28.5% of total employees.

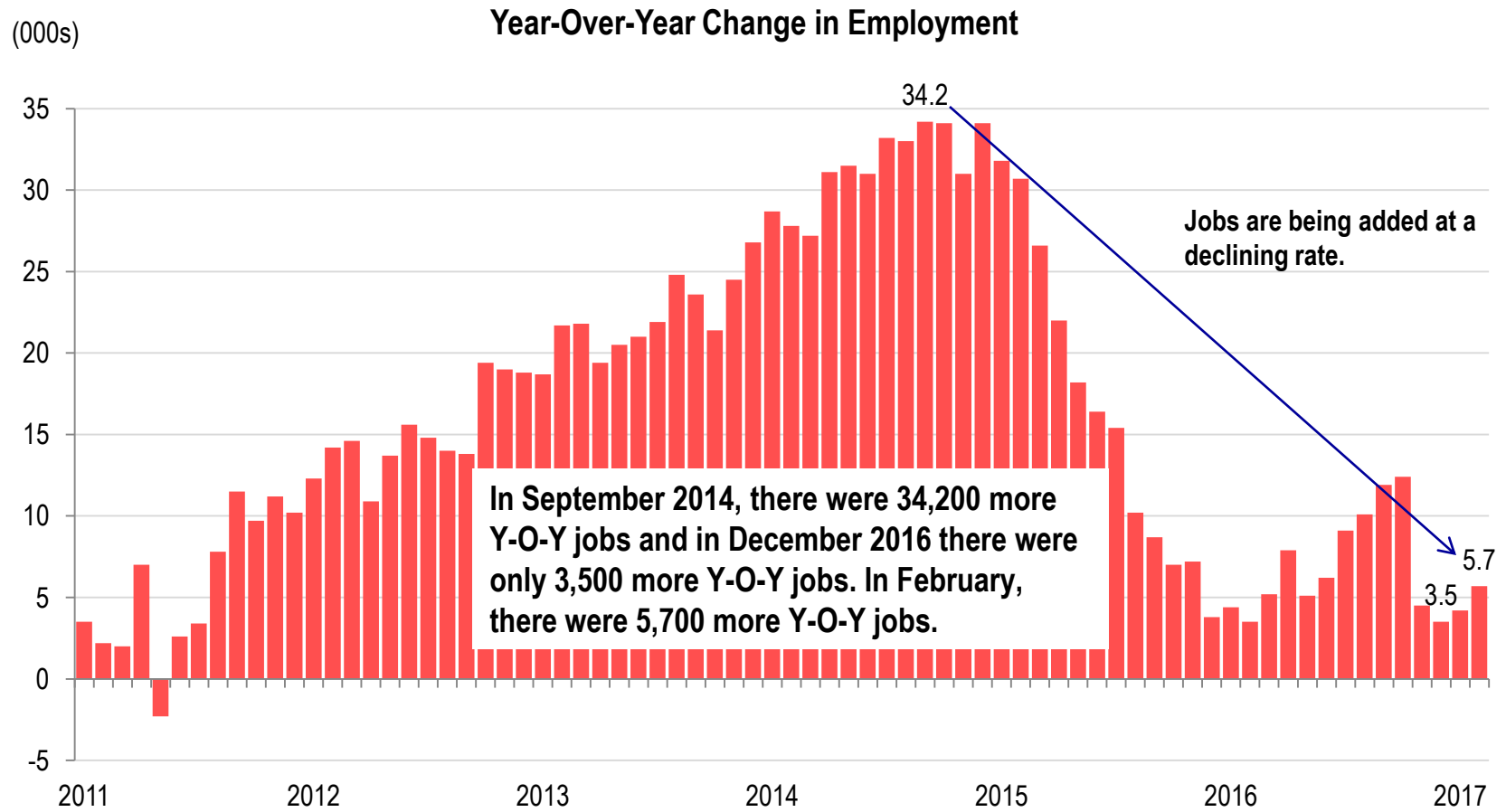


Source: Bureau of Labor Statistics, cber.co.

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

● Year-Over-Year Change in Employment

● Volatile Category

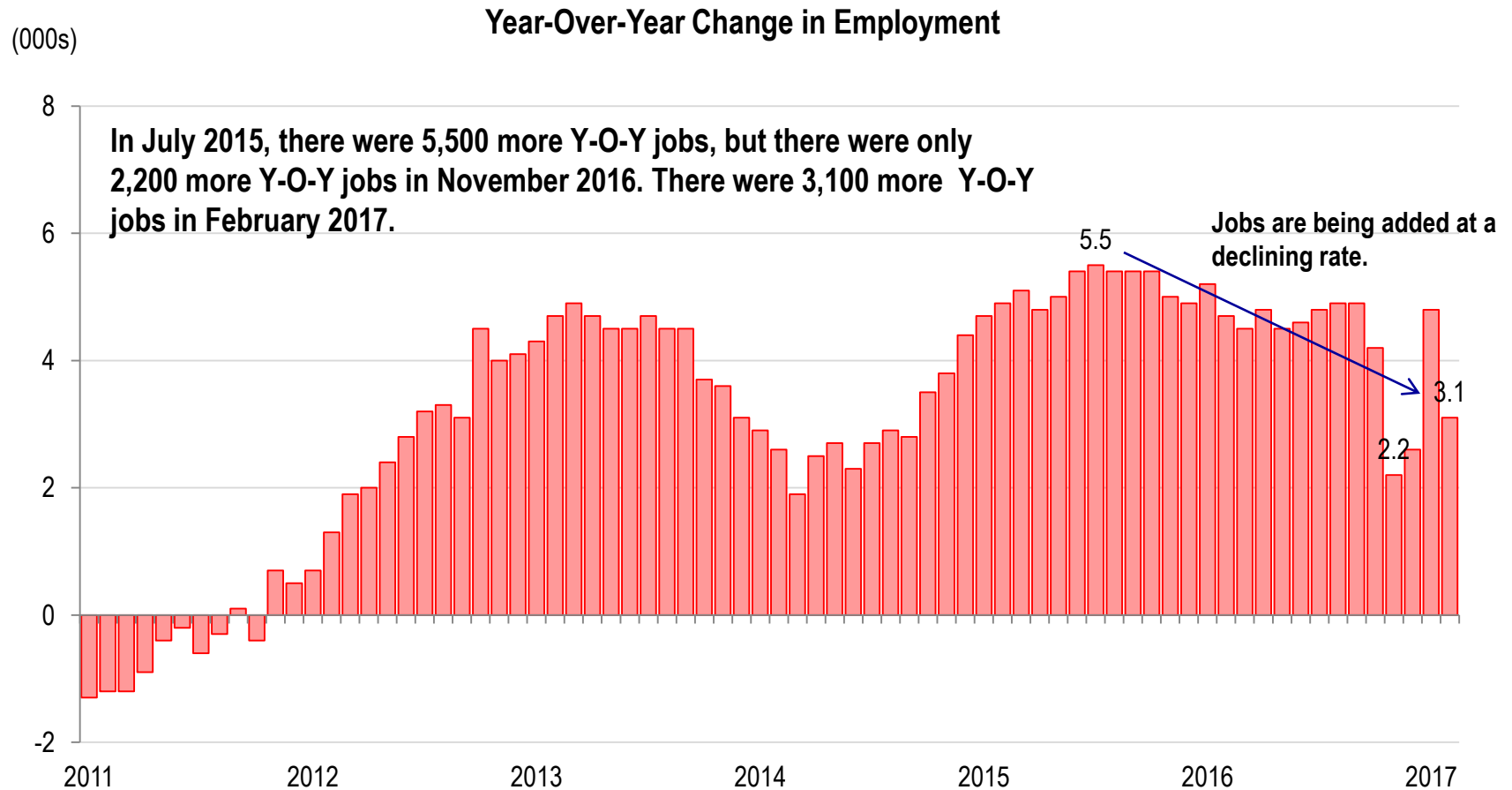


Source: Bureau of Labor Statistics, cber.co.

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

Year-Over-Year Change in Employment

Financial Activities

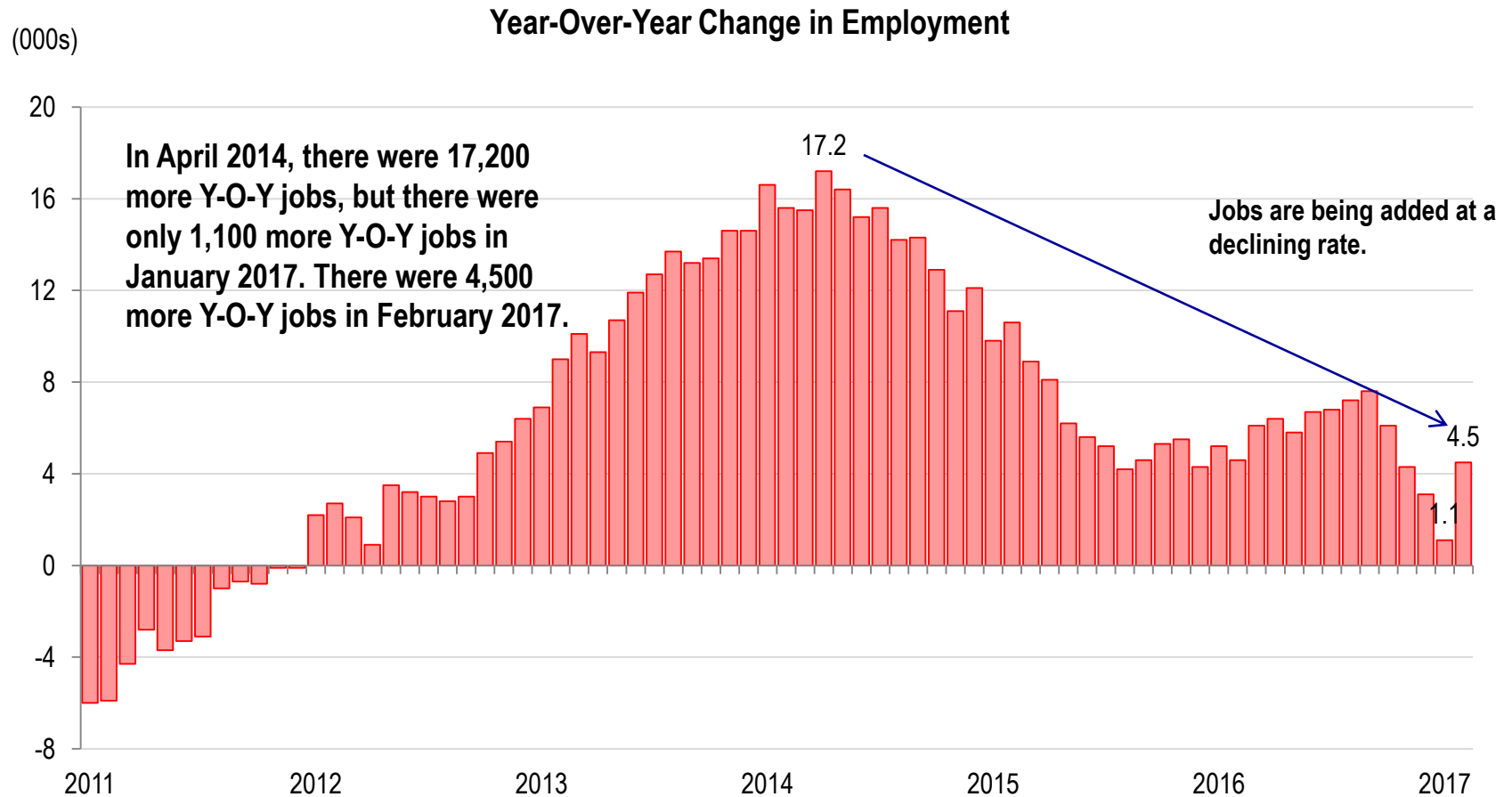


Source: Bureau of Labor Statistics, cber.co.

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

Year-Over-Year Change in Employment

Construction

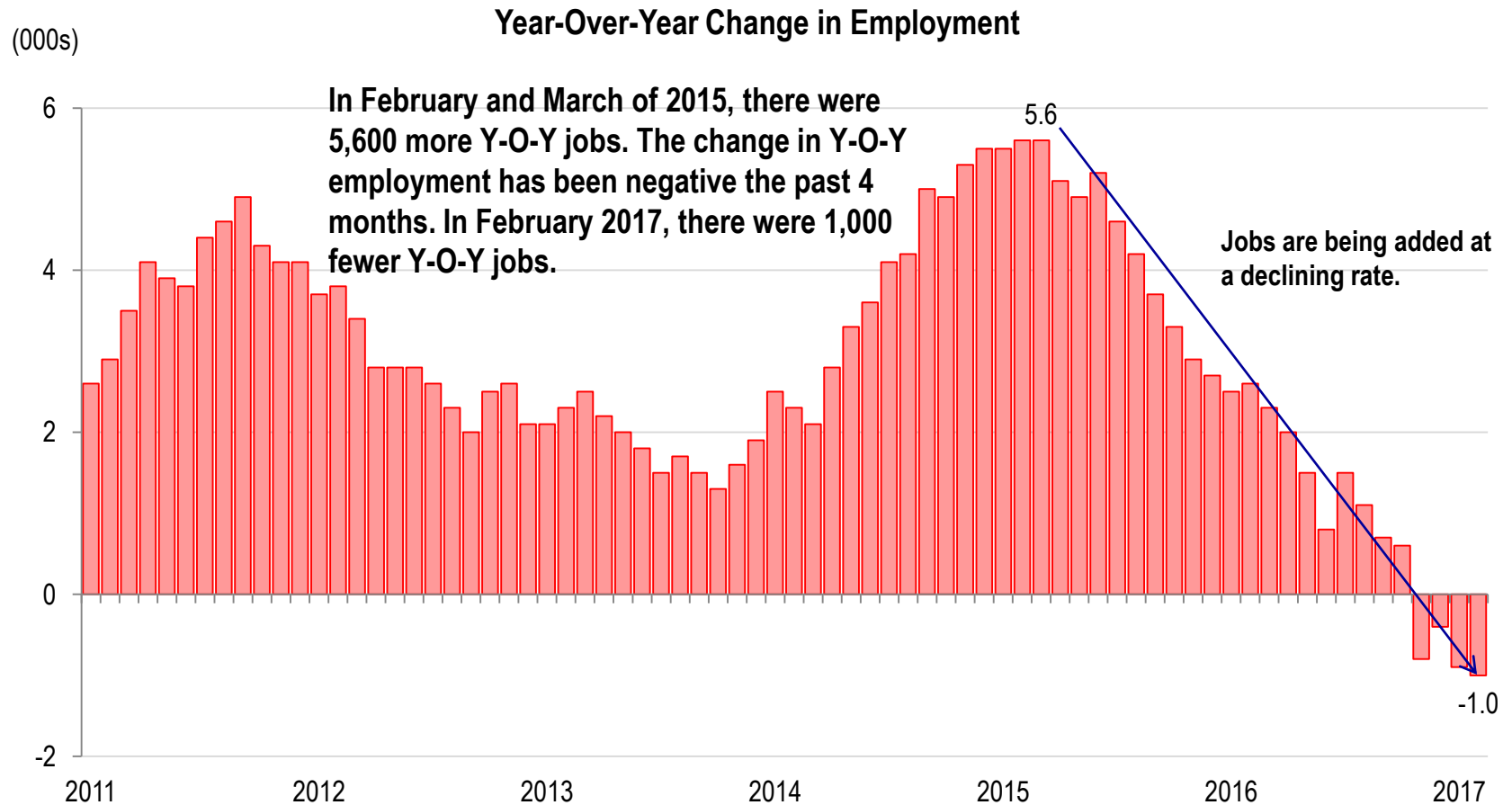


Source: Bureau of Labor Statistics, cber.co.

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

Year-Over-Year Change in Employment

Manufacturing

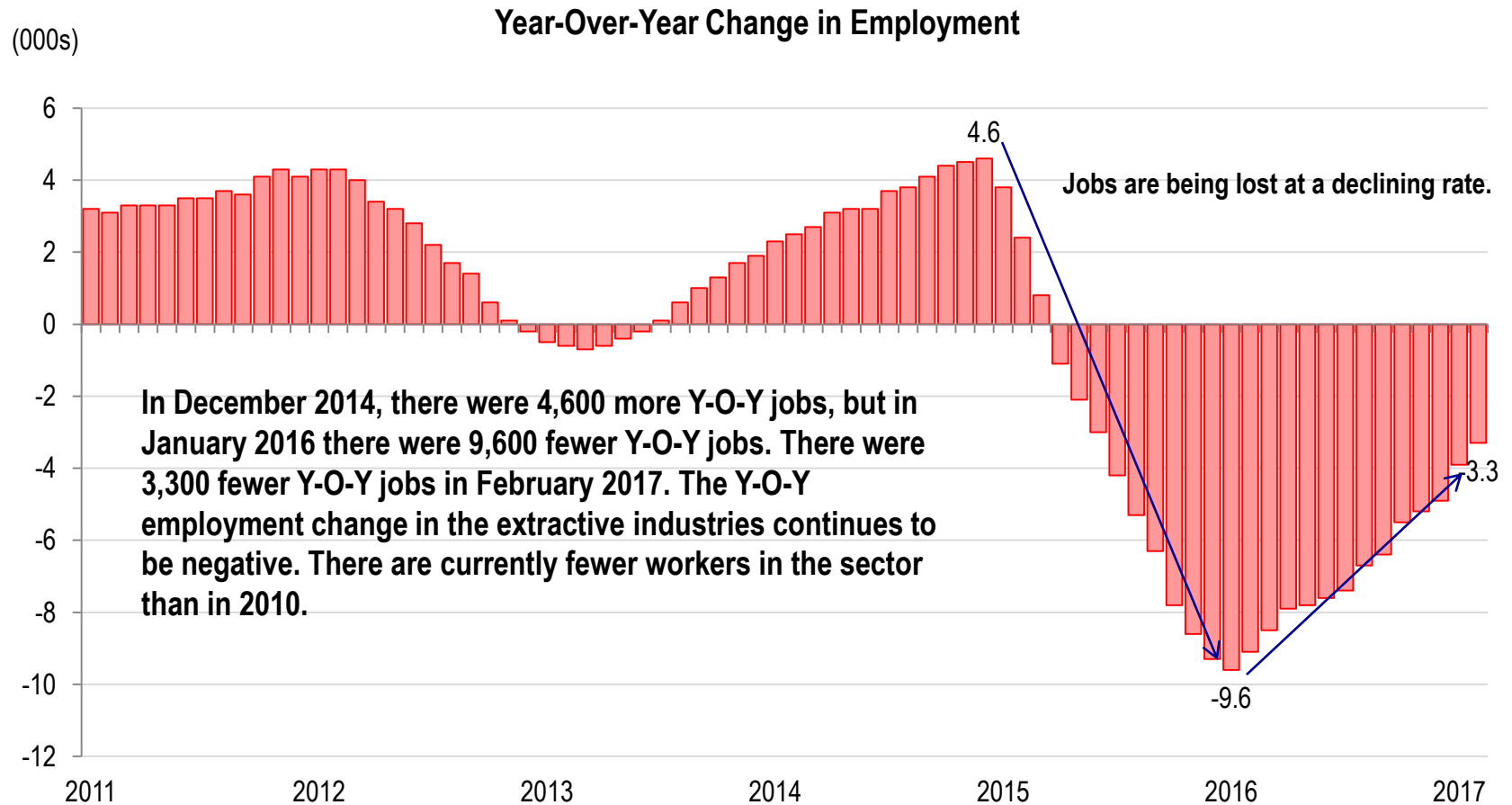


Source: Bureau of Labor Statistics, cber.co.

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

Year-Over-Year Change in Employment

Extractive Industries



Source: Bureau of Labor Statistics, cber.co.

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



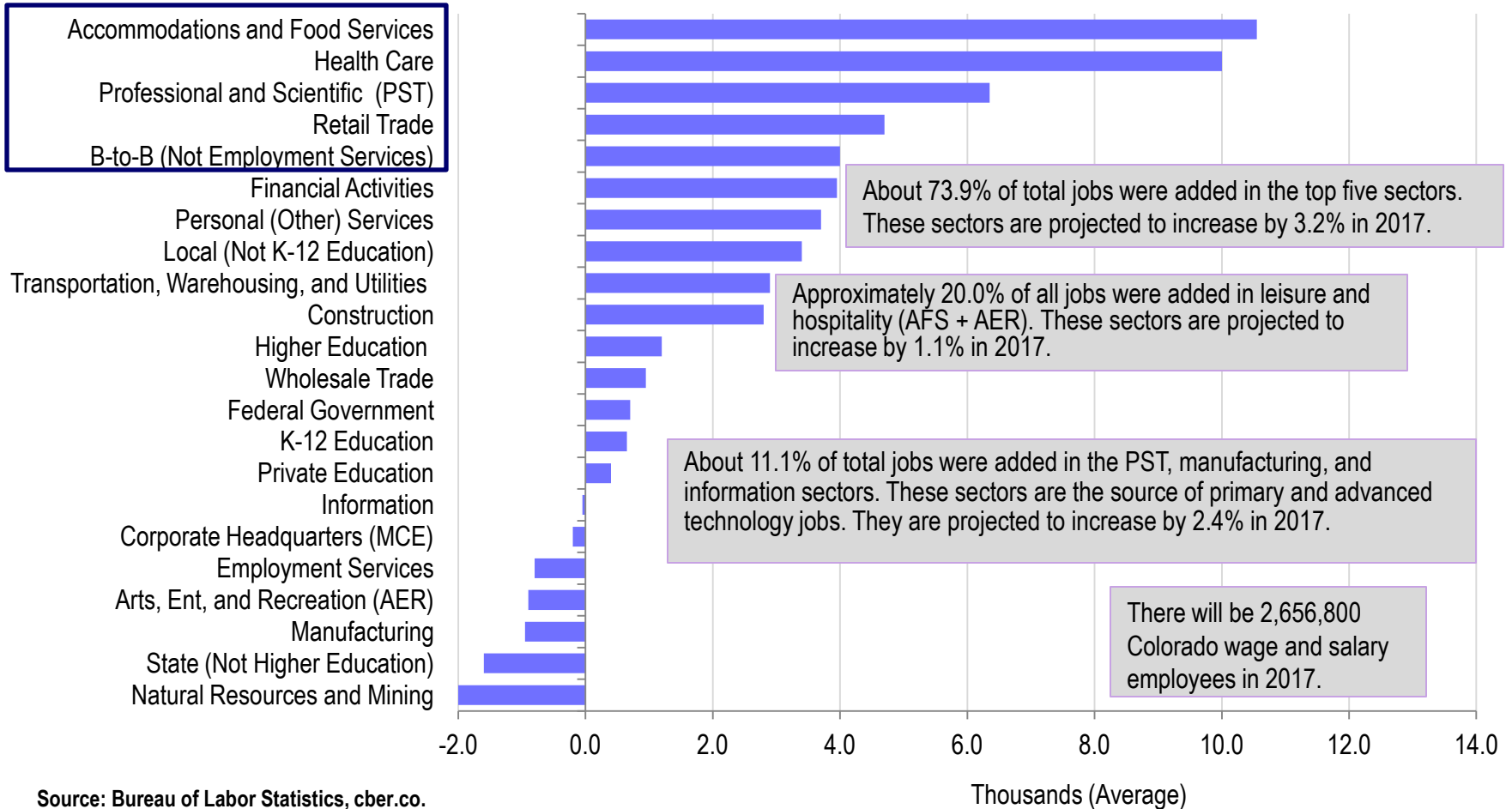
The Colorado Economy

Summary

Job Changes

2017 YTD Through February

Job Change All Sectors



Source: Bureau of Labor Statistics, cber.co.

Change in Employment

Summary of Strong, Solid, and Volatile Growth Categories

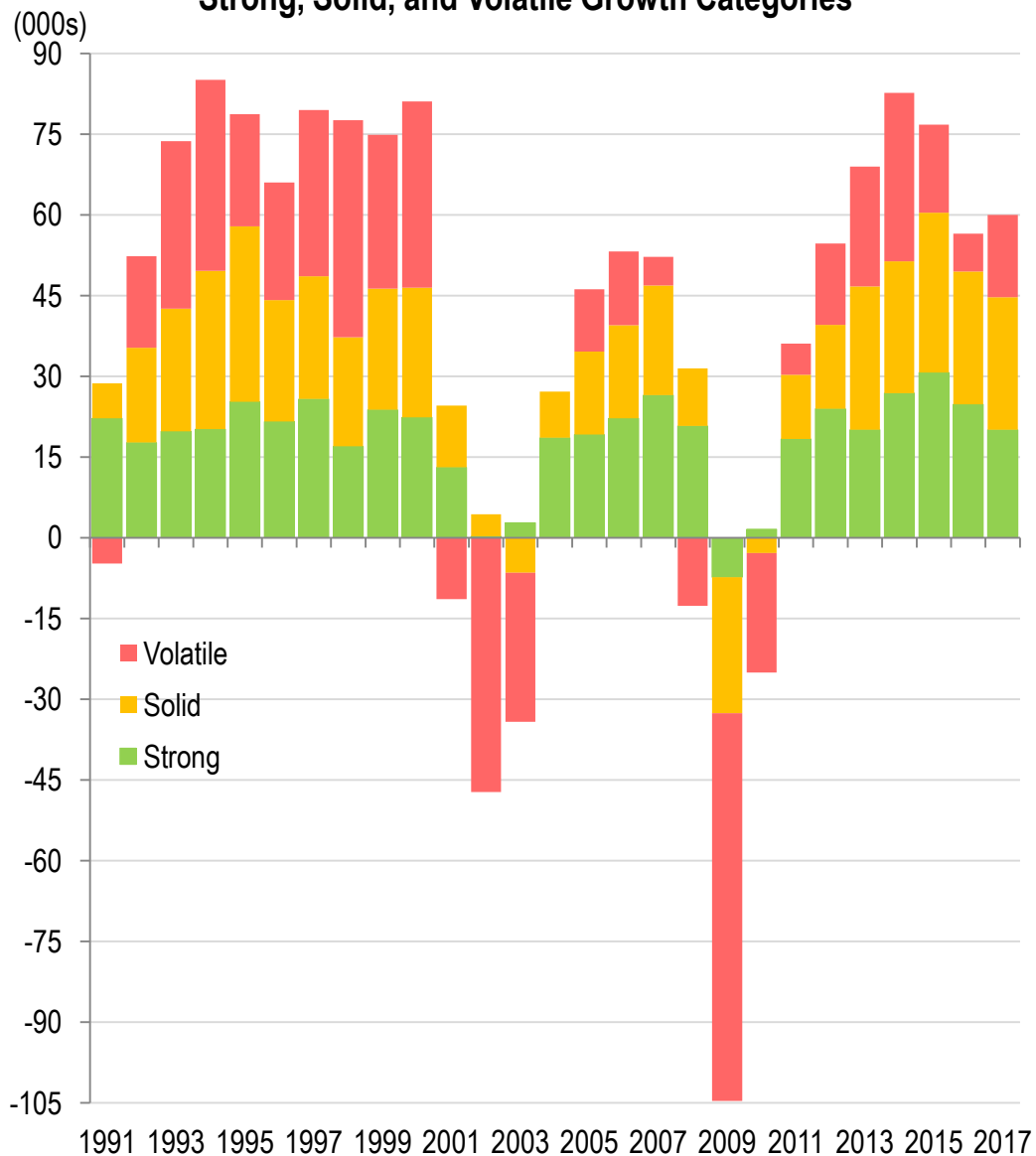
In 2017, the growth of the Strong and Solid Growth categories will be similar to 2016 and the Volatile category will be more aggressive. Overall growth will be in the range of 2.1% to 2.5% in 2017, or 57,000 to 63,000 jobs.

The Strong Growth category of sectors (green) has performed consistently over time. The category expanded at a rate of 2.5% in 2016 and will grow at a rate of 2.3% to 2.5% in 2017.

The Solid Growth category of sectors (yellow) will continue to post moderate growth. In 2016, this category grew at a rate of 2.7% and will add jobs at a rate of 2.3% to 2.5% in 2017.

Finally, the Volatile category of sectors (red) was a very disappointing source of job growth in 2016. The category added jobs at a rate of 1.3%. Jobs will be added at a rate of 2.0% to 2.2% in 2017.

Strong, Solid, and Volatile Growth Categories



Source: Bureau of Labor Statistics, cber.co.

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

● The Colorado Economy in 2017

● Key Factors



1. State real GDP growth will be similar to or slightly greater than the U.S. rate.
2. The Philadelphia Federal Reserve Leading Index points to continued growth for Colorado.
3. There will be modest, but diverse establishment and job growth.
4. Construction will experience solid growth.
5. The extractive industries should bottom out.
6. The state will continue to enjoy strong population growth.
7. State government will continue to have budget challenges that will have an impact on the infrastructure.
8. New and used car sales will remain solid.
9. DIA passenger activity will continue to be strong.
10. It will continue to be difficult to find attainable and affordable housing.

The state will likely see positive and negative changes resulting from policies put in place by the current administration.

The three major categories (strong, solid, and volatile) are adding jobs at declining rates. This appears to be a normal fluctuation in the business cycle rather than a downturn in the economy.

The growth of the economy will be limited by the very small pool of potential workers.



Appendix



Summary of the 2017 cber.co forecast

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.

From 2012 through 2015 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 this short period that 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.

Scenarios for the 2017 Colorado Economic Outlook

The recovery from the Great Recession has been less than robust, but it has been **steady**. Job growth in the U.S. and Colorado will not reach its potential because of a number of factors that are causing the economy to operate inefficiently.

Overall Job Growth

In 2017 Colorado employment will increase by 2.2% to 2.4%. Average employment for 2017 will be slightly less than 2.7 million workers.

Strong Growth Category (About 32% of total employment)

In 2017, the rate of job growth for this category will be **2.3% to 2.5%**.

Solid Growth Category (about 39% of total employment)

In 2017, the rate of job growth will be **2.3% to 2.5%**.

Volatile Growth Category (29% of total employment)

In 2017, the rate of job growth will be **2.0% to 2.2%**.

The performance of the Volatile Growth Category will determine the accuracy of the cber.co 2017 forecast. There is more upside potential than downside risk to the forecast.

Source: cber.co.

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

2017 Economic Outlook

Optimistic Scenario

- U.S. Real GDP will be greater than 2.5%.
- The U.S. will add more than 2.2 million workers.
- Colorado will add more than 63,000 workers, job growth will be greater than 2.4%.

Most Likely Scenario

- U.S. Real GDP will be 2.1% to 2.5%.
- The U.S. will add 1.9 to 2.1 million workers.
- Colorado will add 57,000 to 63,000 workers, job growth will be 2.2% to 2.4%.

Pessimistic Scenario

- U.S. Real GDP less than 2.1%.
- The U.S. will add less than 1.9 million workers
- Colorado will add less than 57,000 workers, job growth will be less than 2.2%.

The probability of these scenarios follows:

- Most Likely 52%
- Optimistic 41%
- Pessimistic 7%.

There is more upside potential than downside risk.

2017 Employment Forecast

Most Likely Scenario

Strong Growth Category +19,000 to 21,000 Employees

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

Solid Growth Category +24,000 to 26,000 Employees

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

*In 2017 Colorado will add 57,000 to 63,000 jobs
(2.2% to 2.4%).*

Twenty-two sectors and subsectors have been placed into three categories based on their growth patterns over the past two decades. Projections for these categories are used in the development of the 2017 employment forecast.

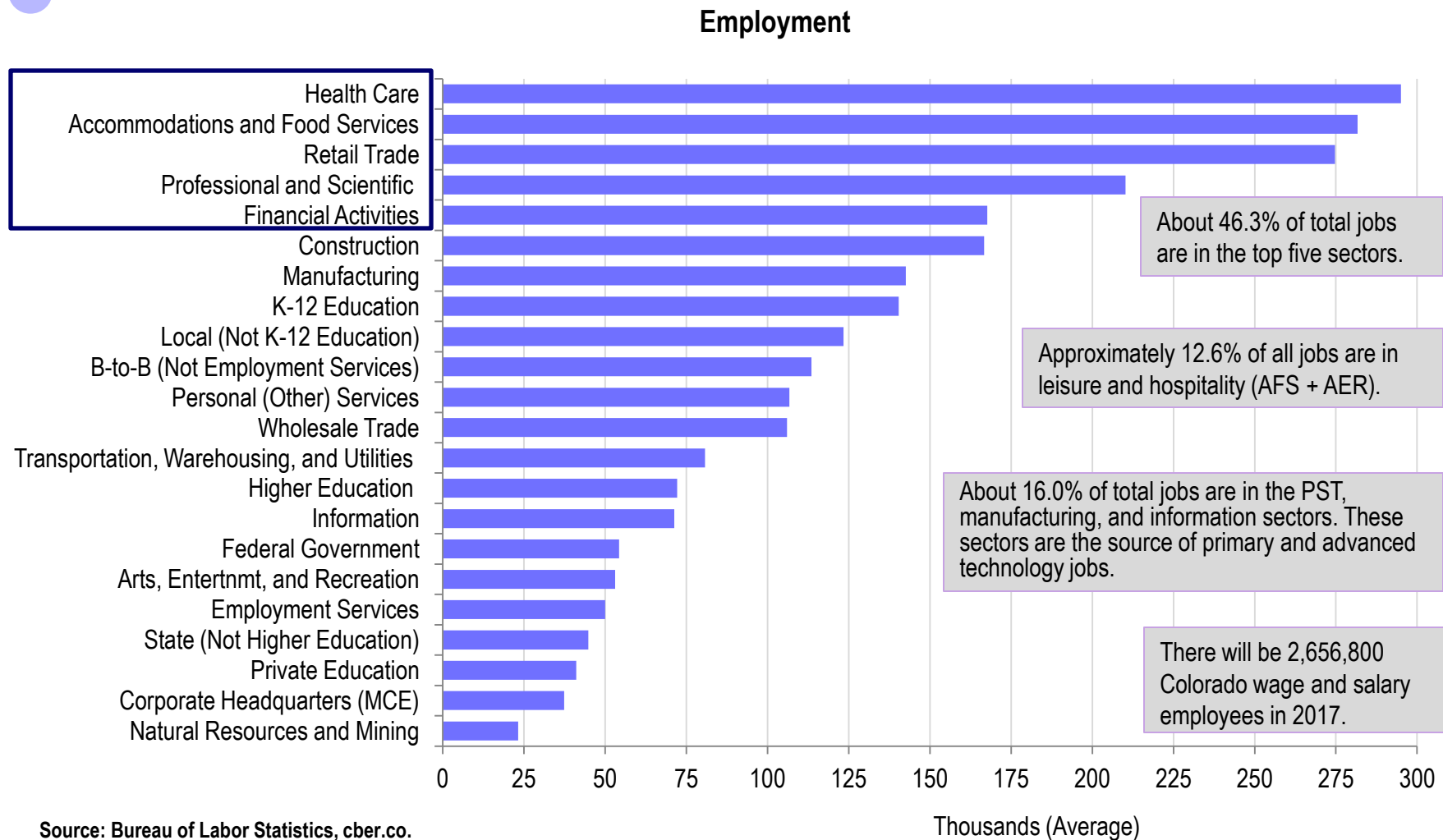
Volatile Growth Category +14,000 to +16,000 Employees

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

Source: cber.co.

Colorado Wage and Salary Employment

2017 Forecast



About 46.3% of total jobs are in the top five sectors.

Approximately 12.6% of all jobs are in leisure and hospitality (AFS + AER).

About 16.0% of total jobs are in the PST, manufacturing, and information sectors. These sectors are the source of primary and advanced technology jobs.

There will be 2,656,800 Colorado wage and salary employees in 2017.



Colorado Employment Forecast

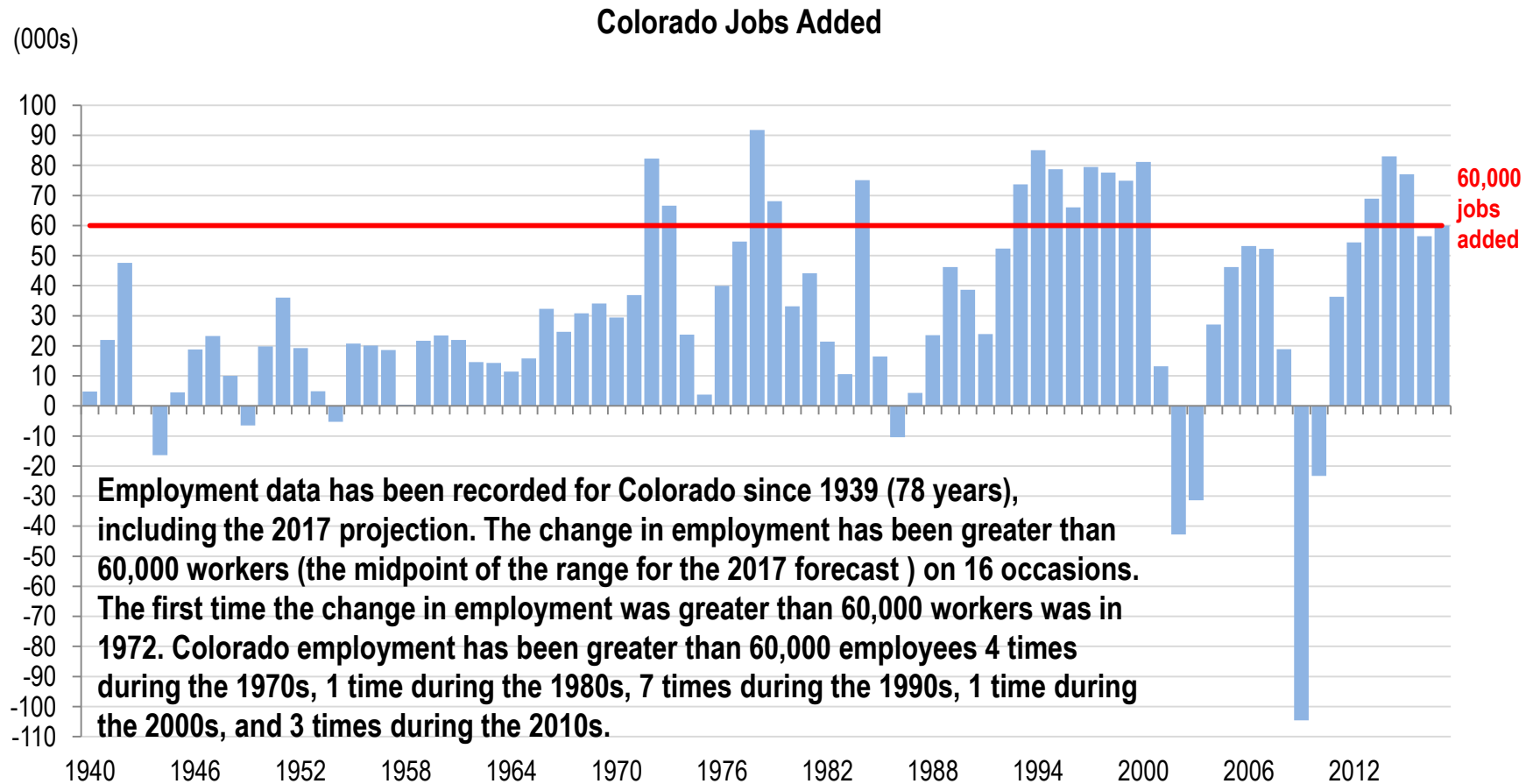
Putting the Forecast in Perspective

Putting the Forecast in Perspective

In 1954, Darrell Huff wrote a classic book about analyzing data called *How to Lie with Statistics*. Using concepts from Huff, the following charts put the 2017 forecast in perspective.

- The first two charts tell different stories about the rate of Colorado's job growth. If you look at absolute job growth since employment data was first collected, 2017 will be a strong year for job growth.
- On the other hand, if you look at relative growth for the same period, 2017 will be a weak year.
- Which is correct? They both are!
- Another way to look at Colorado's job growth is to compare it to the nation. This data illustrates that Colorado employment has increased at a faster rate than U.S. employment.

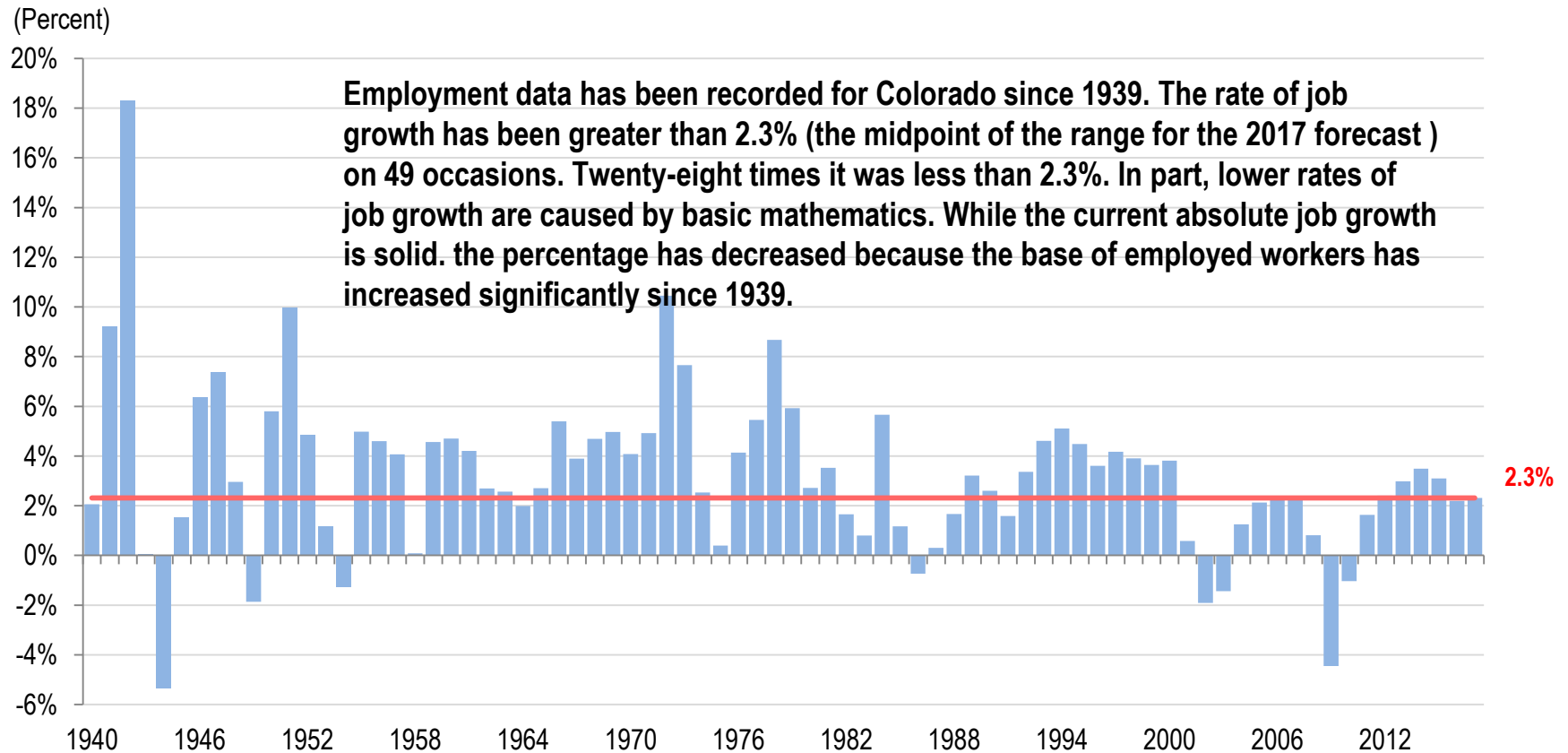
- The Projected Absolute Job Growth for 2017 (Total Jobs Added) will be the 17th Strongest since 1939.
-
-



Source: Bureau of Labor Statistics, cber.co.

- The Projected Rate of Colorado Job Growth for
- 2017 will be the 50th Strongest in 78 Years
-

Percentage of Jobs Added

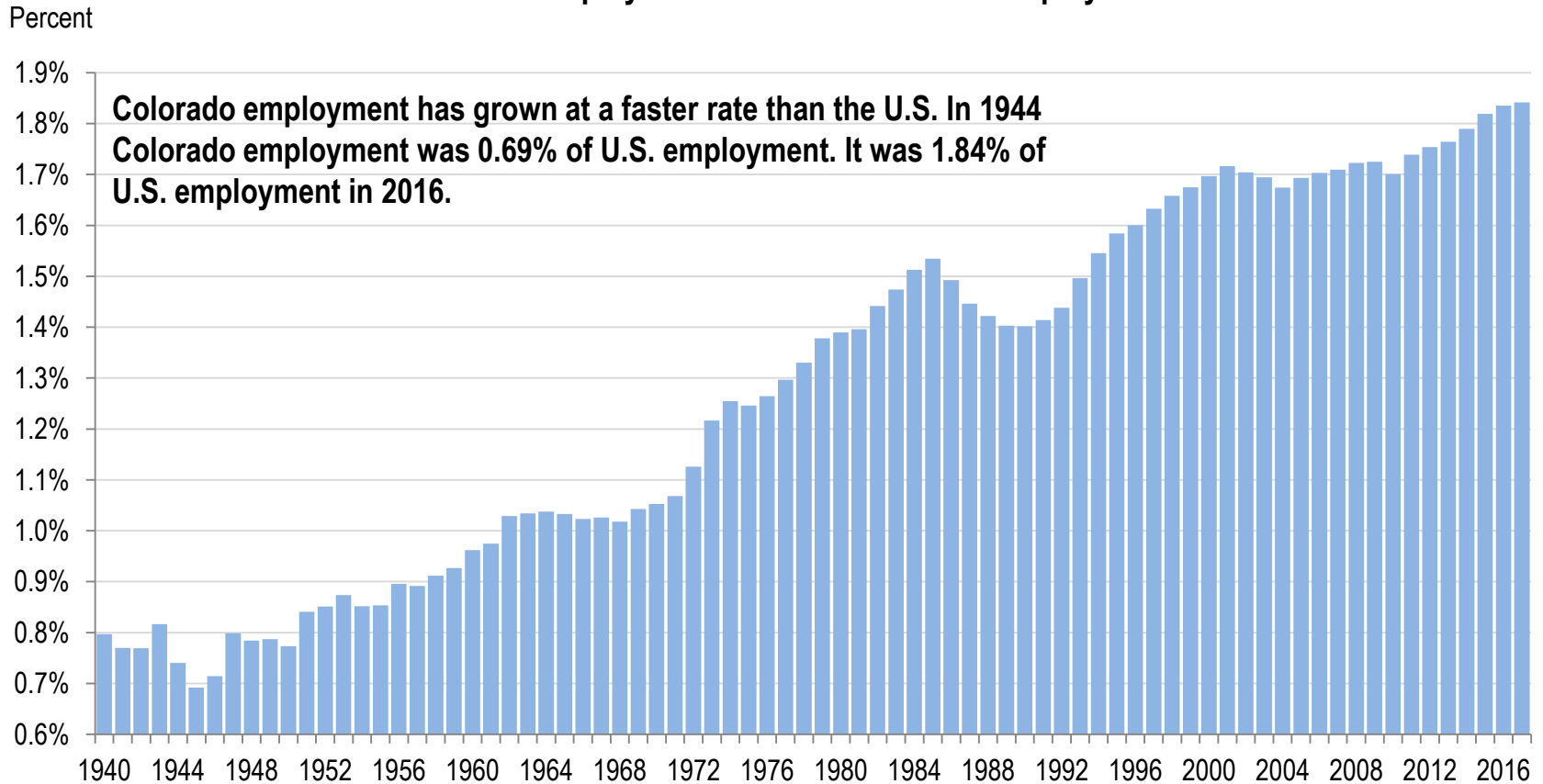


Source: Bureau of Labor Statistics, cber.co.

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

Colorado Employment as a Percent of U.S. Employment

Colorado Employment as a Percent of U.S. Employment



Source: Bureau of Labor Statistics, cber.co.

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



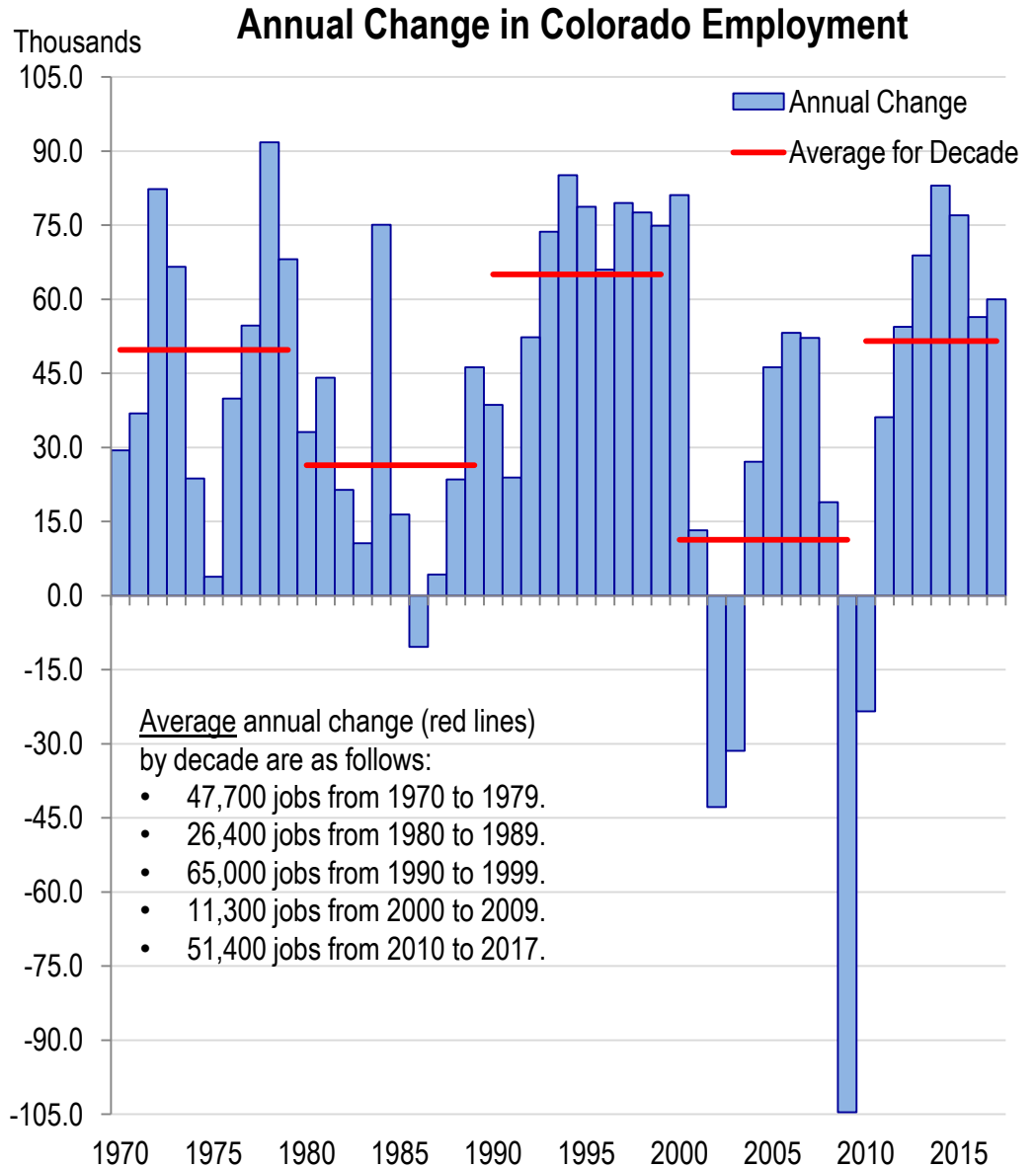
Comparison of Job Growth to Prior Years

● Annual Employment
 ● Change in Colorado
 ● Employment

Colorado added 77,000 jobs in 2015 and 56,400 jobs in 2016.

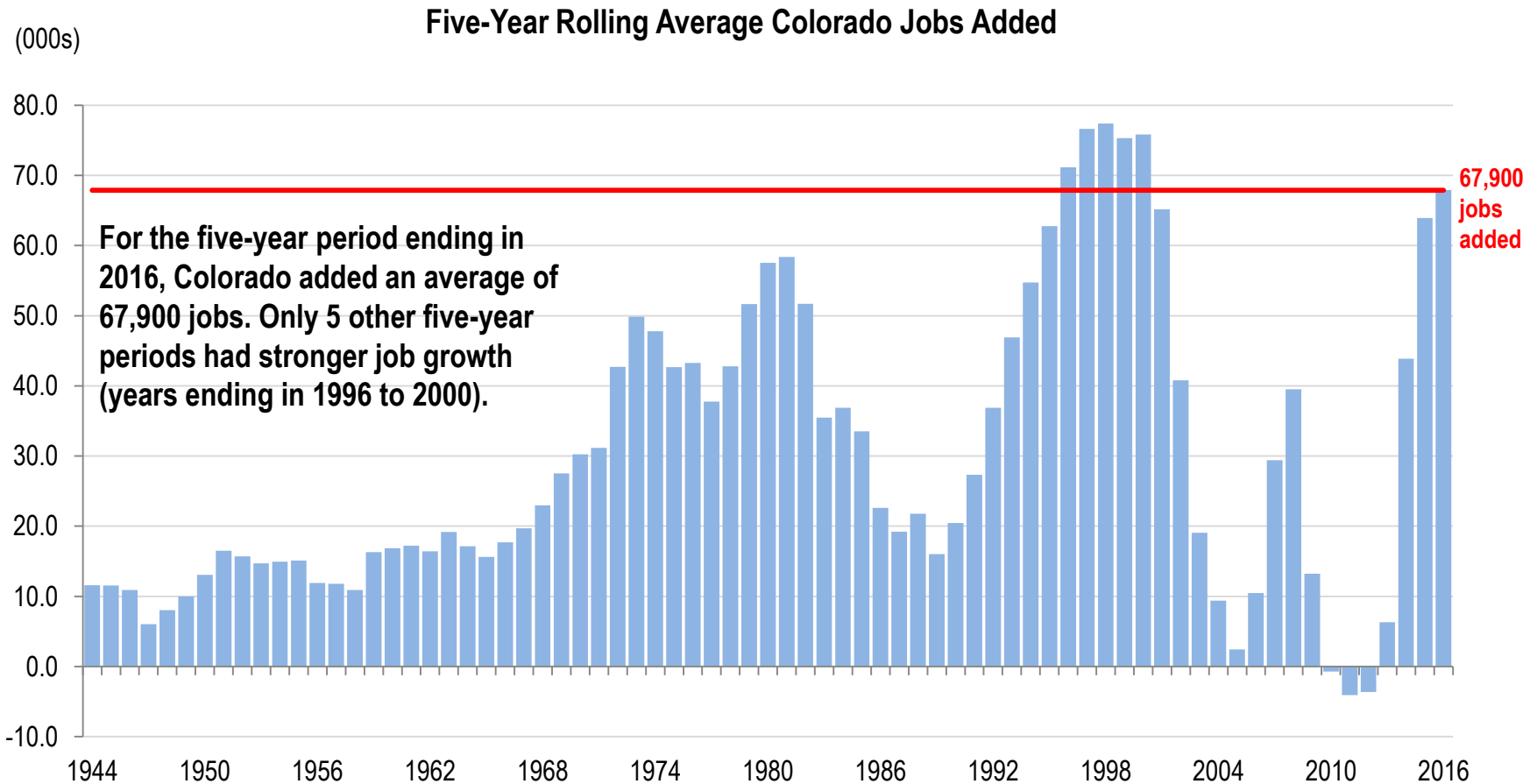
For the first 7 years of this decade, Colorado has added an average of 50,400 jobs.

The state will add 57,000 to 63,000 jobs in 2017. Colorado employment will increase by 2.2% to 2.4%.



Source: Bureau of Labor Statistics, cber.co.

Five-Year Rolling Average Absolute Job Growth



Source: Bureau of Labor Statistics, cber.co.

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



Review of Colorado Employment Data Through February 2017

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 2017 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.

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 programs.