



cber.co Colorado Economic Review Through November 2016

Colorado-based Business and Economic Research
Prepared
December 19, 2016

Overview of Economic Review

This chartbook provides a series of charts, tables, and discussions that analyze changes in the U.S. and Colorado economies.

After 11 months, Colorado is on track to add 68,600 jobs in 2016, although that number will likely be revised downward by as much as 10,000 workers in the BLS benchmark revisions next March.

This review is divided into the sections listed below.

United States Economy

- Gross Domestic Product and Chance of Recession
- Labor
- Corporate Profits, Financial Markets, and the Price of Oil
- Non-Manufacturing, Manufacturing, Construction, and Retail
- Summary

The Colorado Economy

- Population
- Labor
- 2016 Colorado Employment by Performance Category
- Major Industries from the Volatile Category
- Housing and Construction
- Summary



United States Economy

Gross Domestic Product and Chance of Recession

Quarterly Real GDP Growth United States

Annualized real GDP growth for the 1990s was 3.2% (green line). It was 1.8% for the 2000s (red line) and 2.1% from 2010 to 2015 (purple line).

Quarterly real GDP growth for 2016 has been:

Q1 2016 0.8%

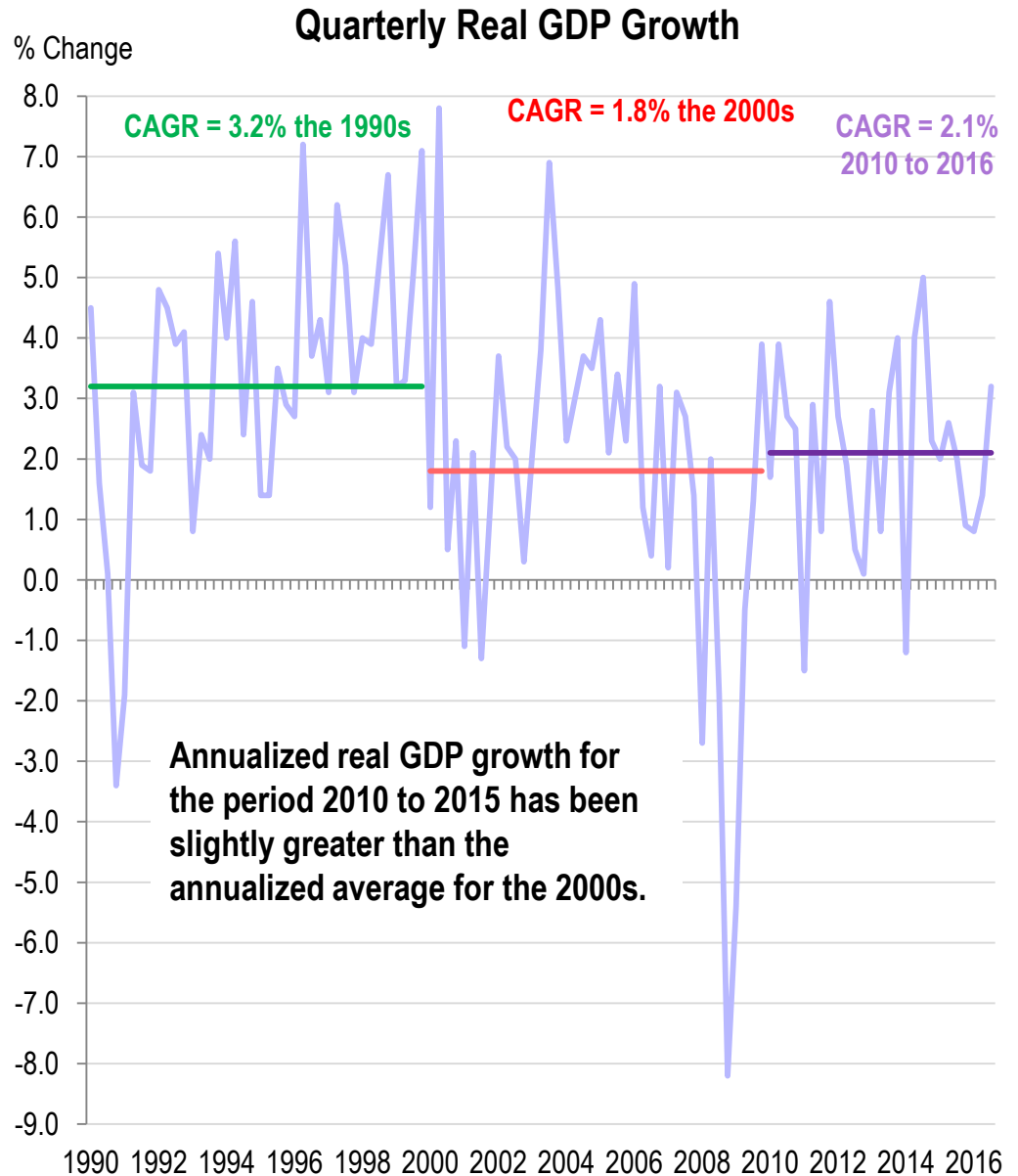
Q2 2016 1.4%

Q3 2016 (2nd estimate) 3.2%.

A survey conducted by the Philadelphia Fed projects that the real GDP growth rate for 2016 will be 1.5%. Growth will be in the range of 2.2% to 2.3% for the next four years.

Real GDP growth for recent years was:

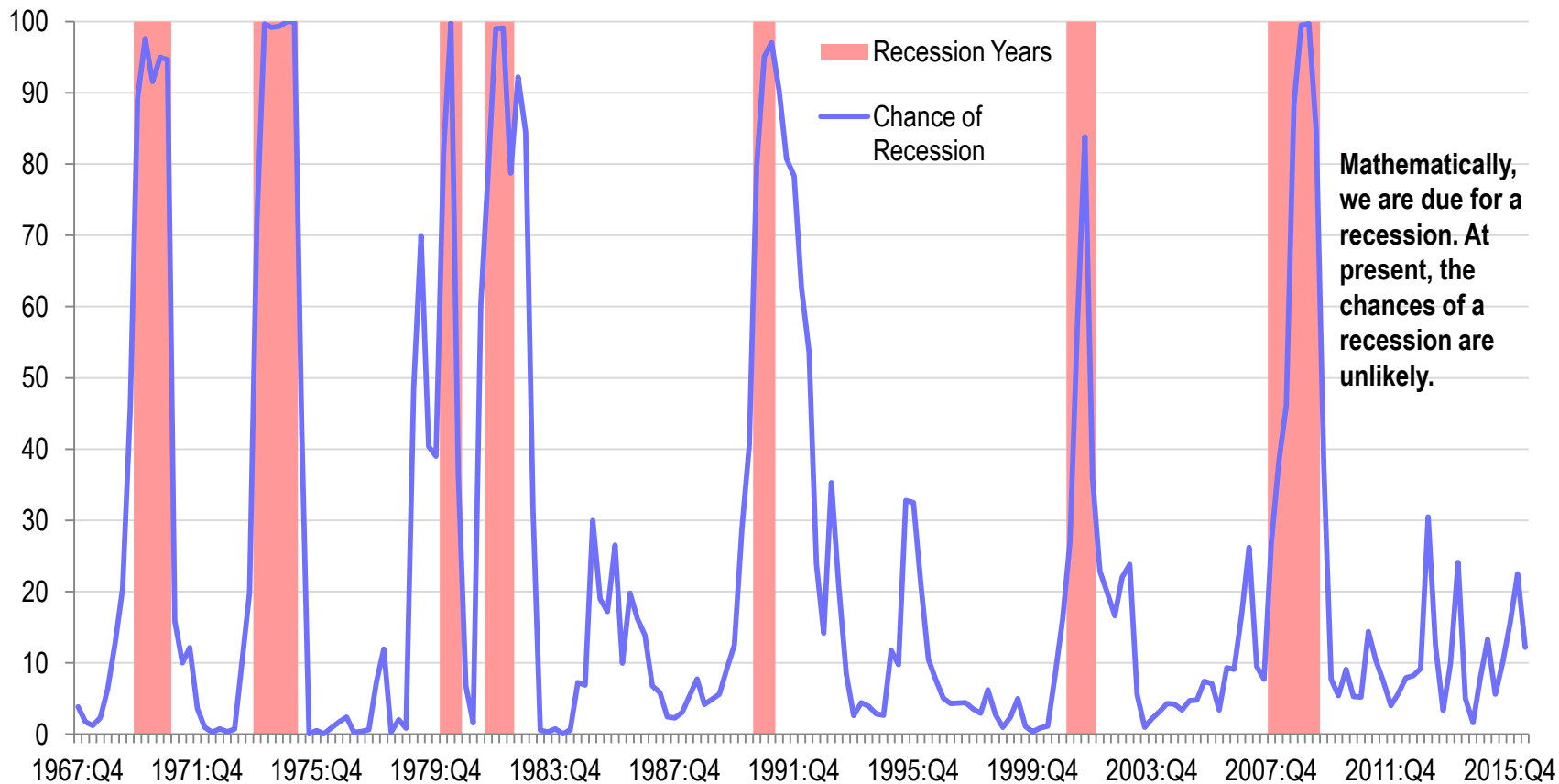
- 2010 2.5%
- 2011 1.6%
- 2012 2.2%
- 2013 1.7%
- 2014 2.4%
- 2015 2.6%.



Source: Bureau of Economic Analysis, cber.co, Note GDP chained on 2009.

GDP Based Recession Index

Recession Index



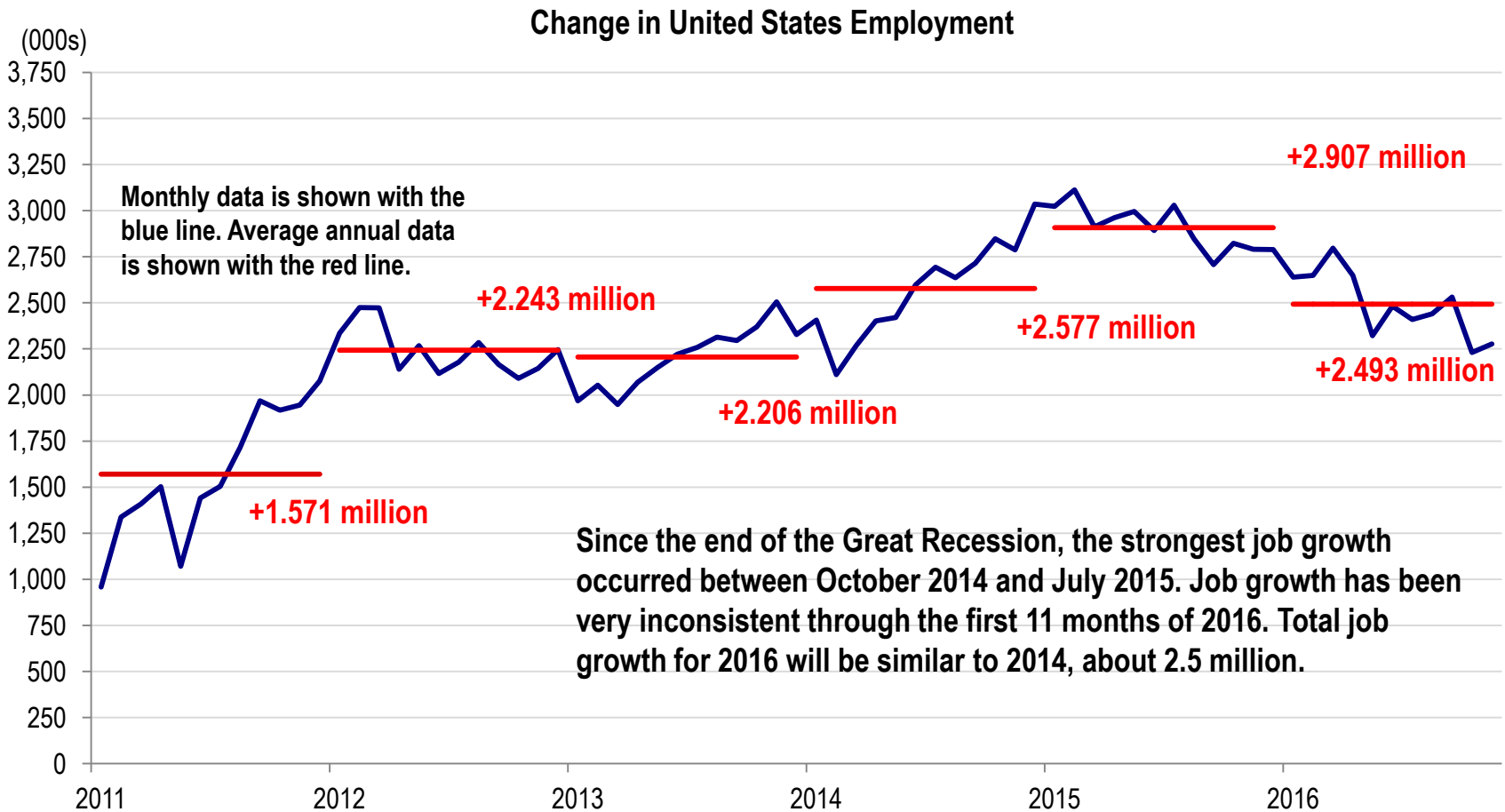
Mathematically, we are due for a recession. At present, the chances of a recession are unlikely.

Source: Atlanta Federal Reserve, cber.co.



United States Economy Labor

Change in United States Employment Year-Over-Year



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

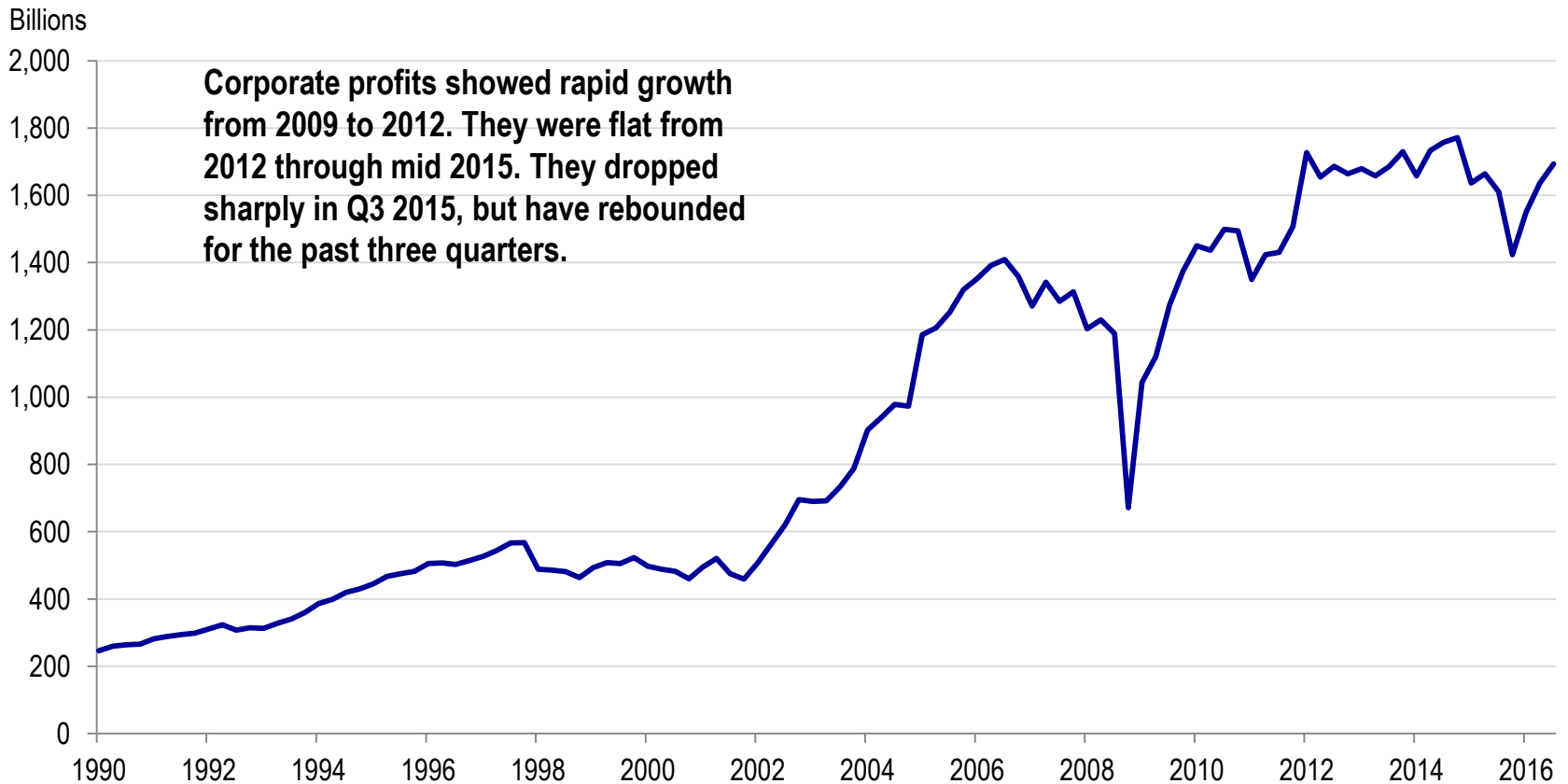


United States Economy

Corporate Profits, Financial Markets, and the Price of Oil

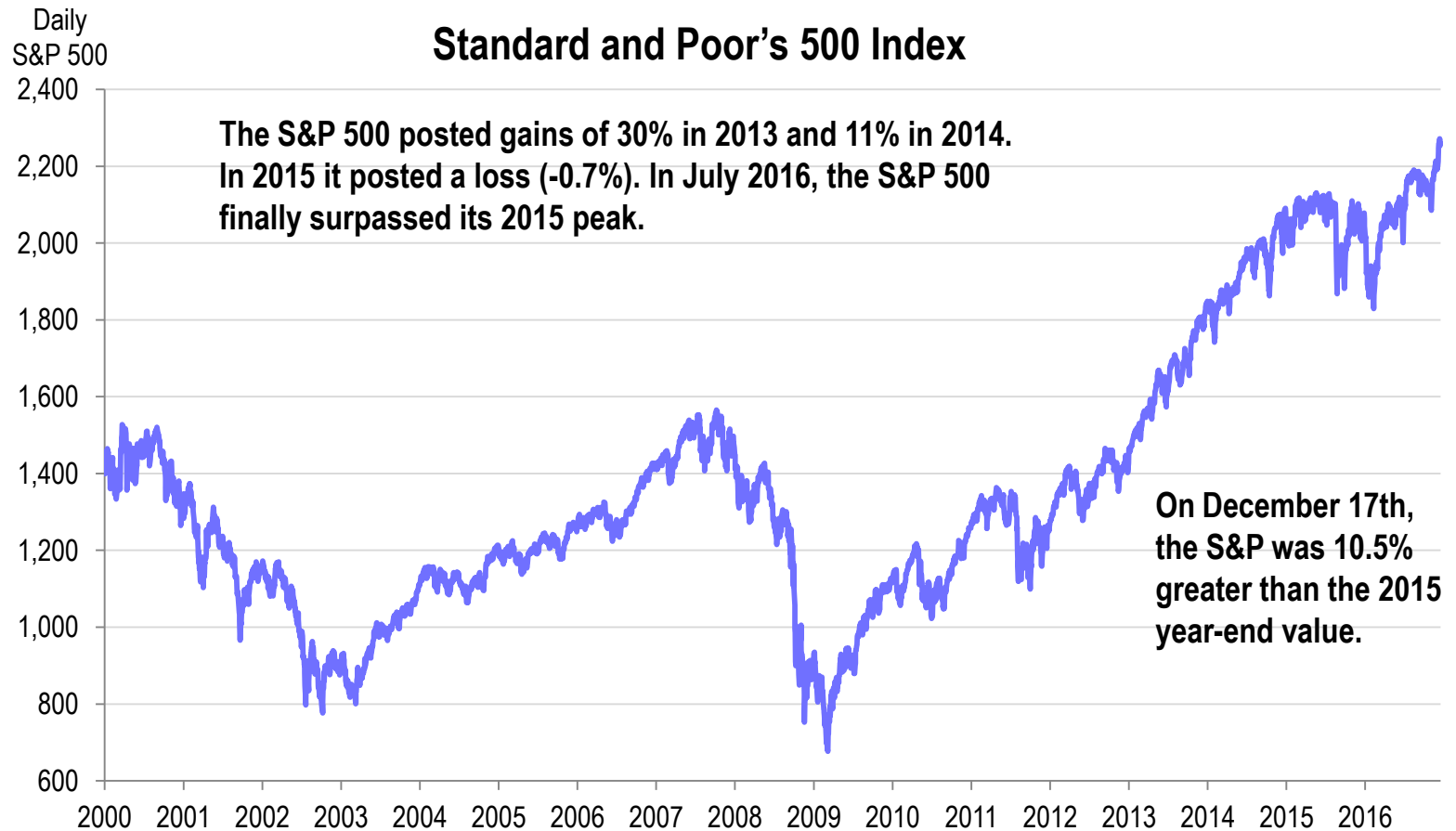
Corporate Profits After Tax (without IVA and CCAdj)

Corporate Profits After Tax



Source: FRED, BEA.

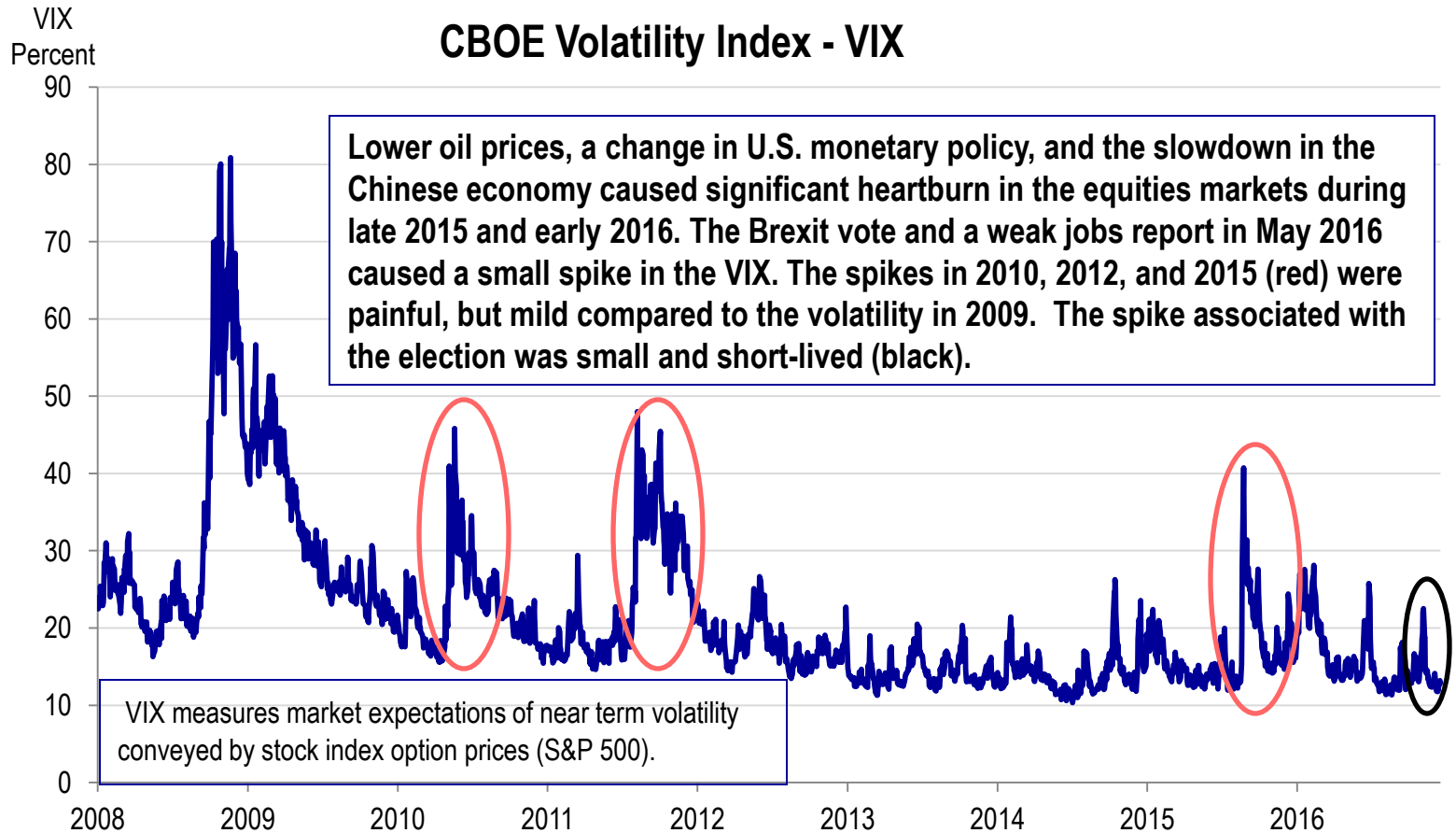
Standard and Poor's 500 Index



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

● CBOE Volatility Index

● VIX (VIXCLS)



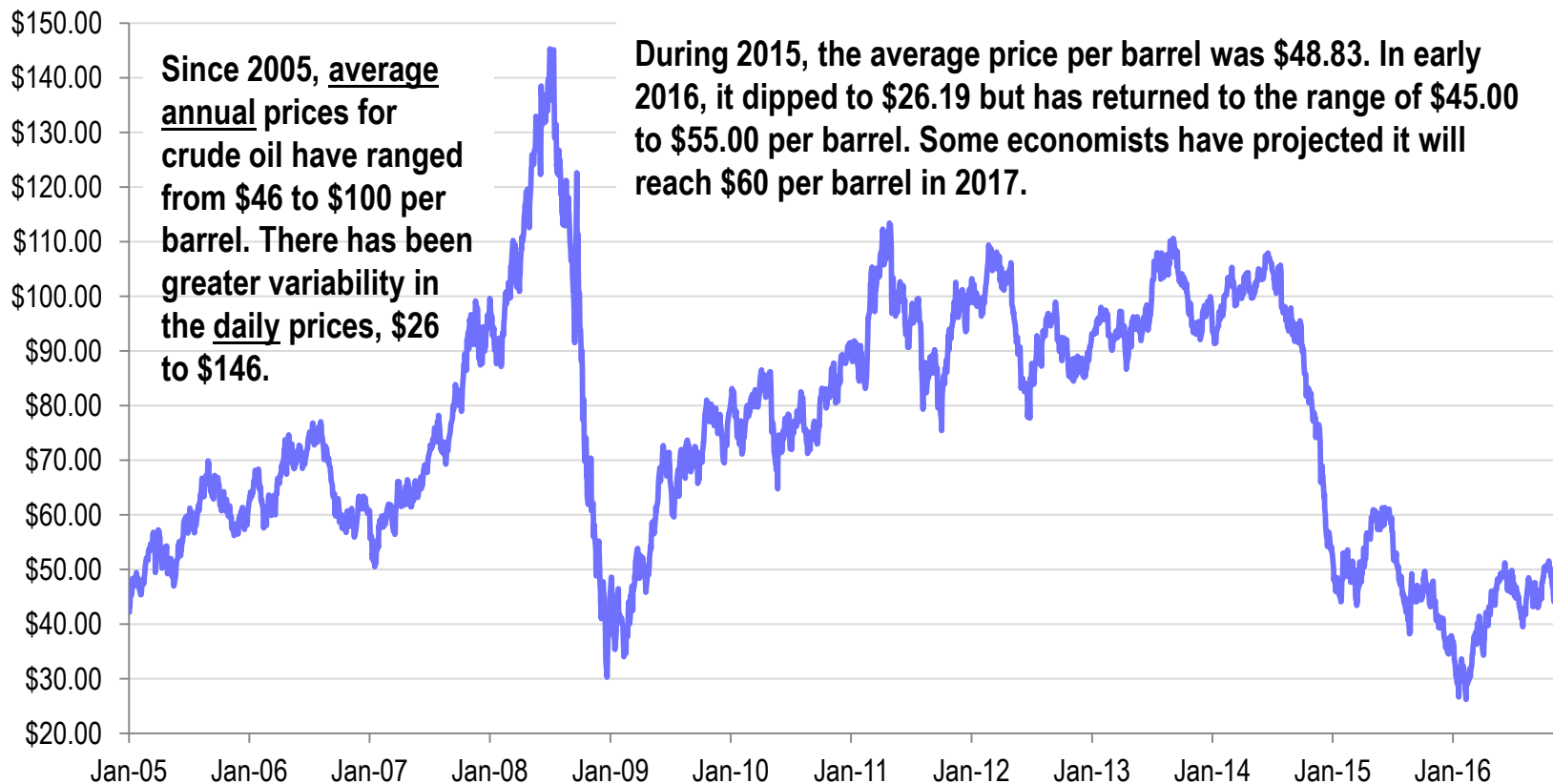
Source: FRED, Chicago Board Options Exchange, cber.co.

Crude Oil Prices

West Texas Intermediate

Dollars
per Barrel

Crude Oil Prices: West Texas Intermediate, Cushing, Oklahoma



Source: FRED, EIA, cber.co.

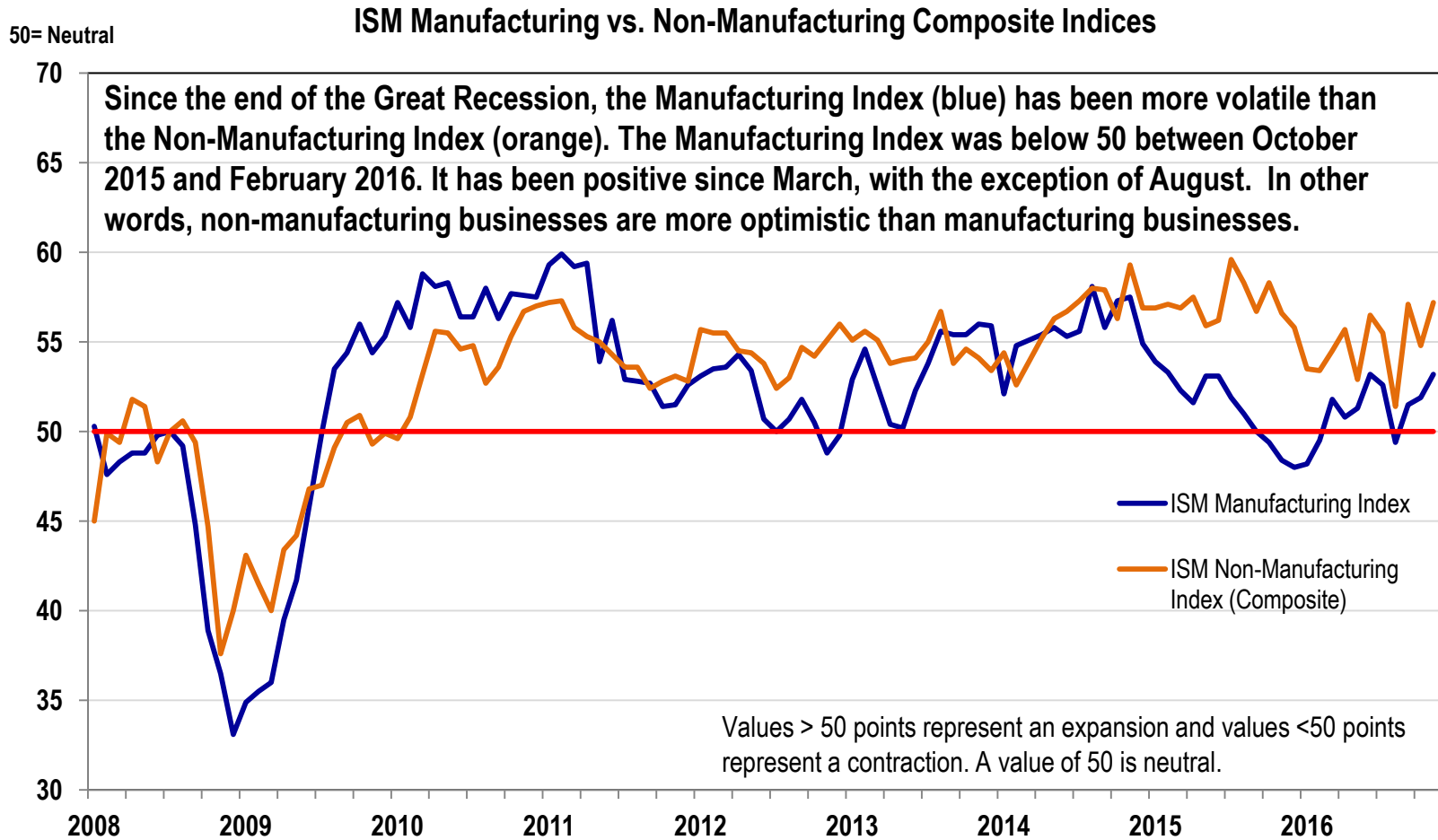


United States Economy

Non-Manufacturing, Manufacturing, Construction, and Retail

ISM PMI Composite Indices

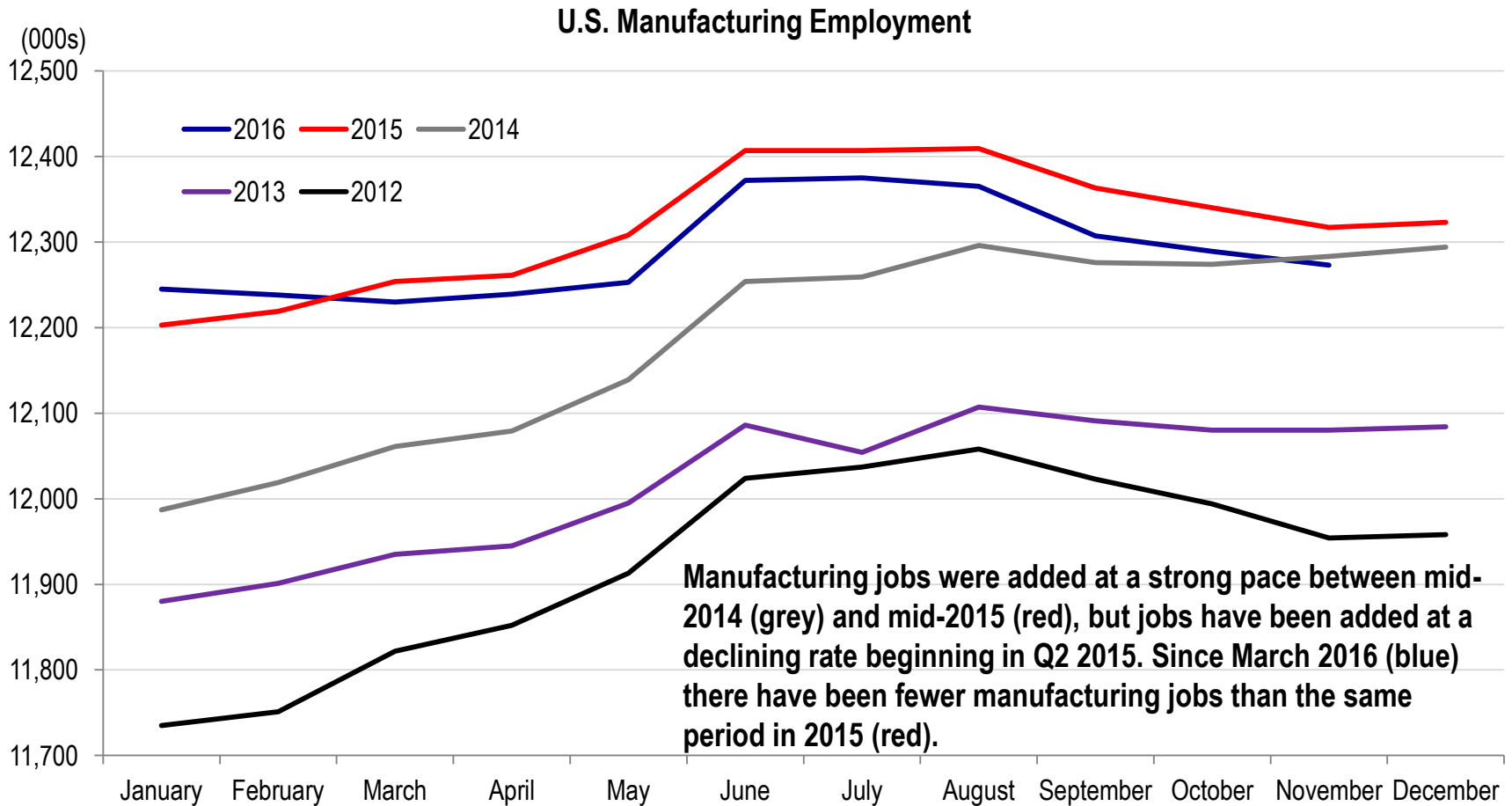
Manufacturing vs. Non-manufacturing



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

United States Manufacturing Employment

2012 to Current

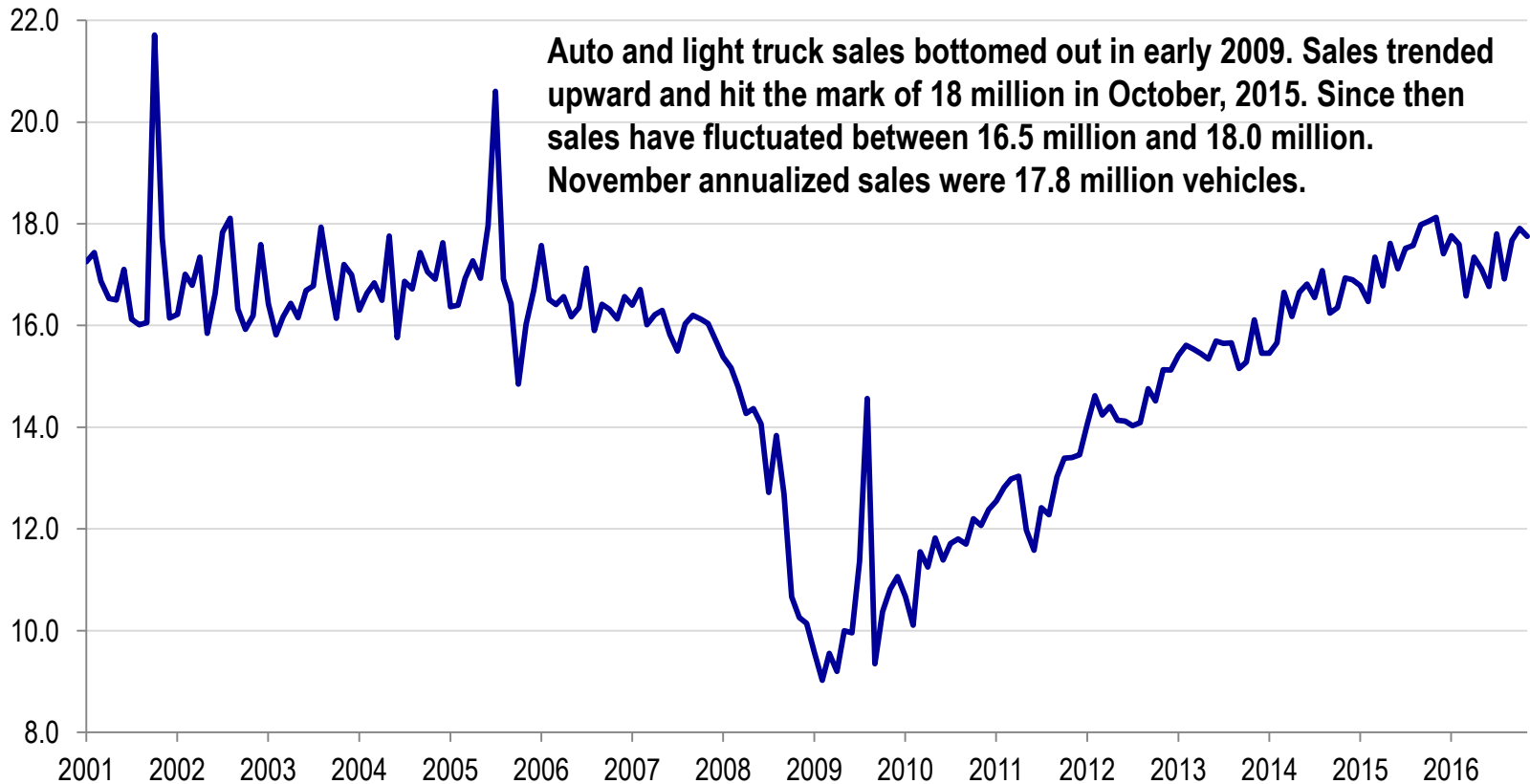


Source: Bureau of Labor Statistics, NSA, cber.co.

U.S. Weekly Auto and Light Truck Sales

Annualized
Rate Millions

United States Number of Auto and Light Trucks Sold



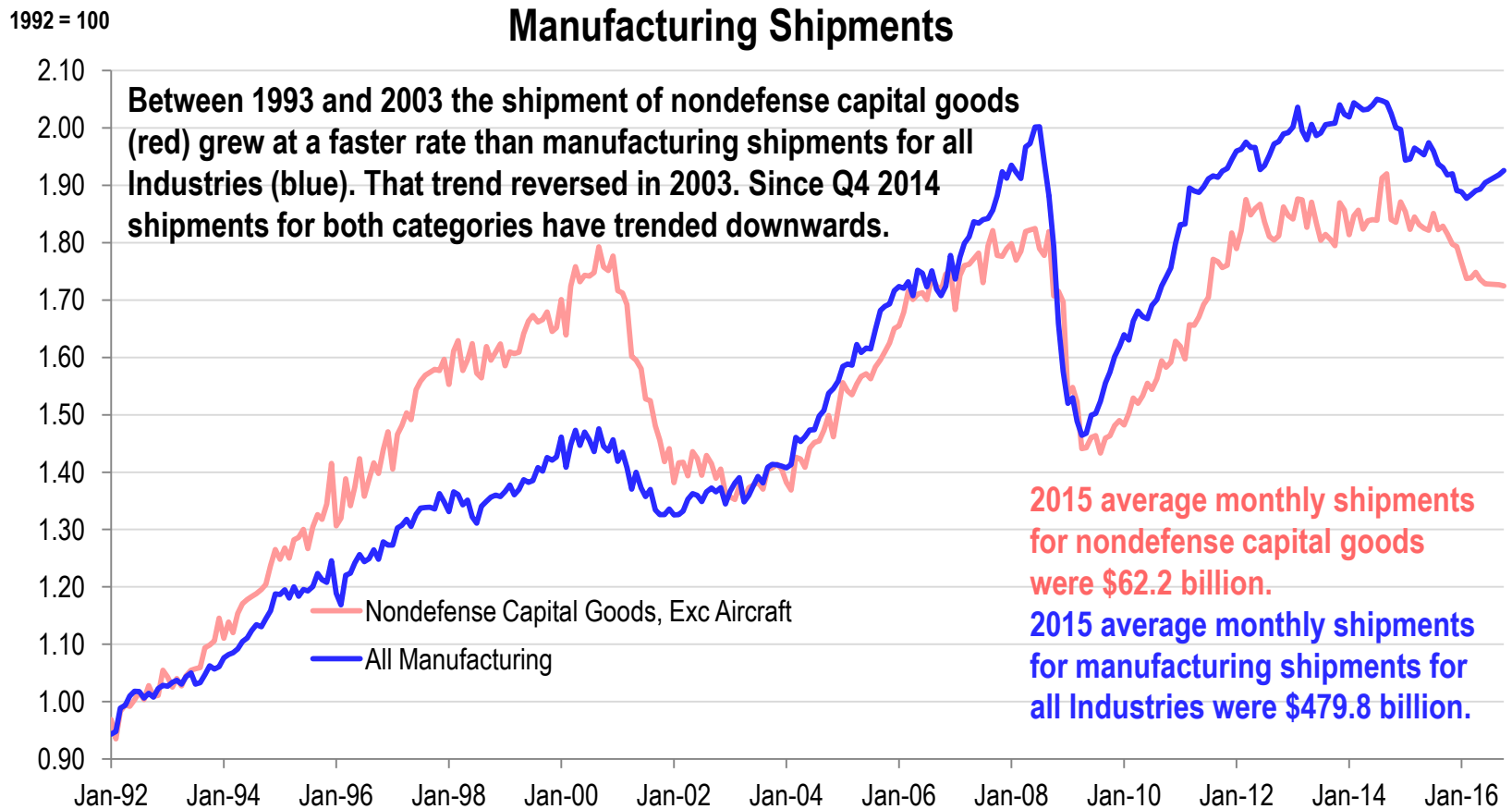
Source: FRED, BEA, cber.co.

Note: Seasonally Adjusted Annualized Rate.

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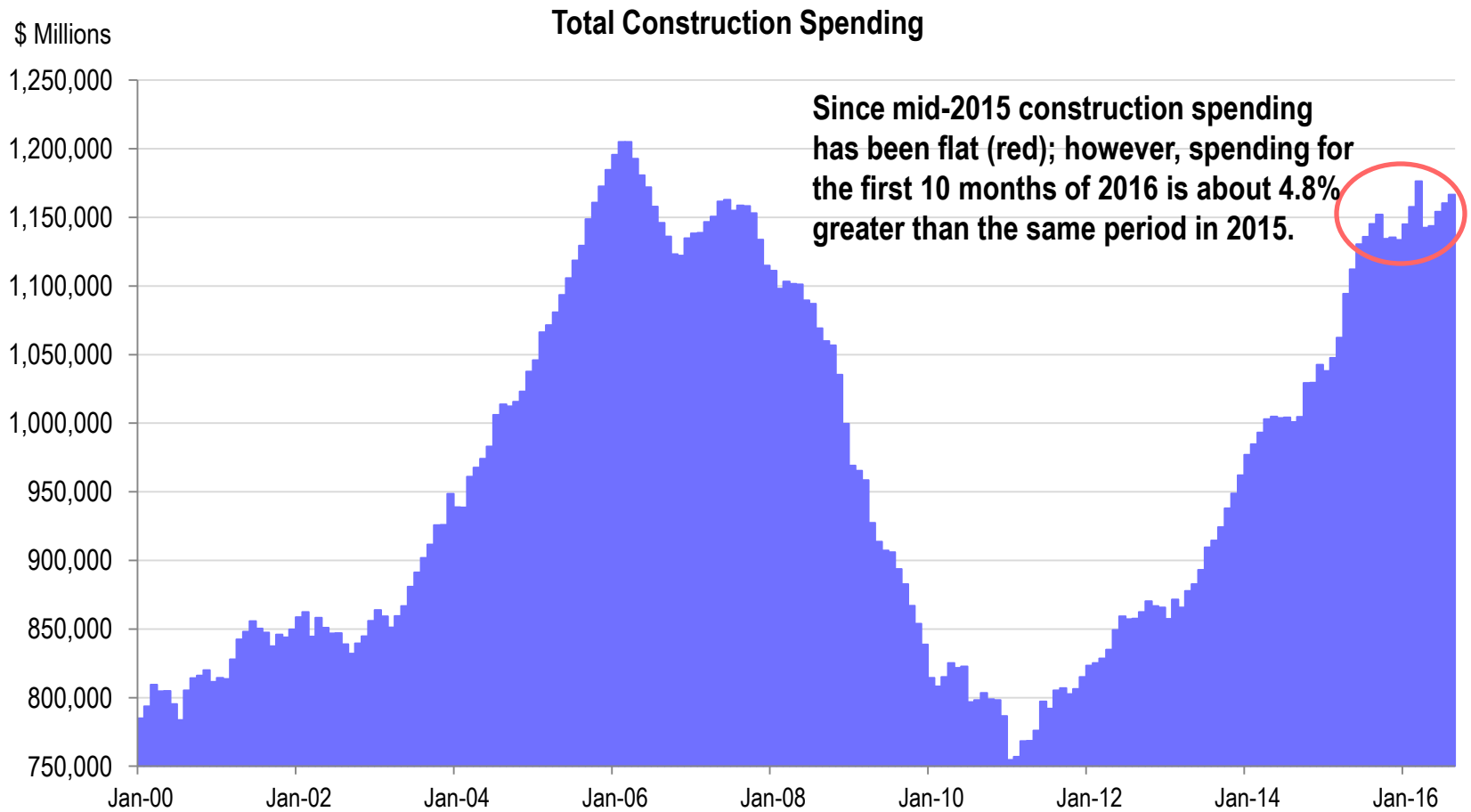
United States Manufacturing Shipments

All Industries vs. Nondefense Capital, Excluding Aircraft



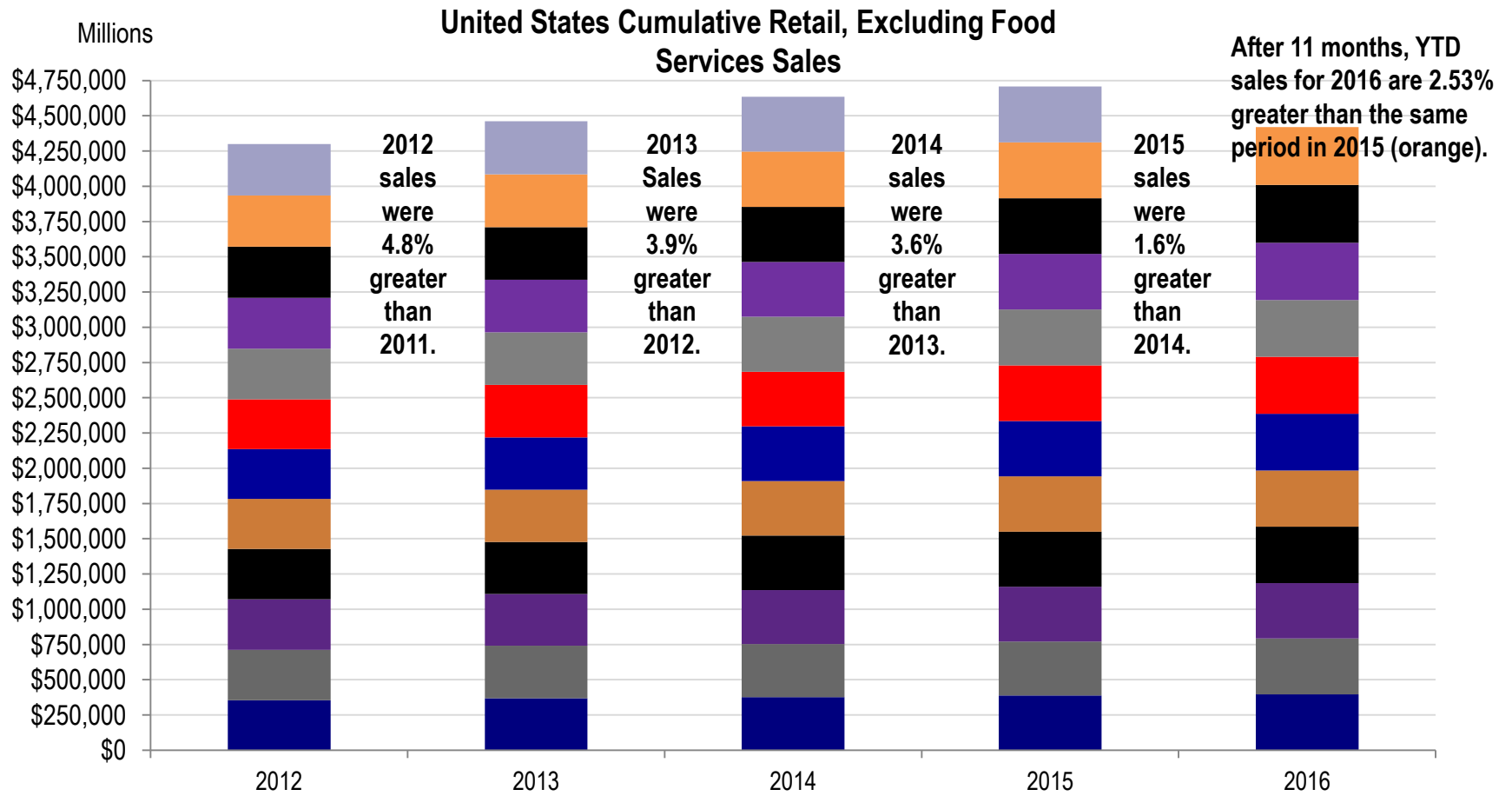
Source: FRED, SA. U.S. Bureau of the Census, cber.co. Note: Not adjusted for inflation.

Total United States Construction Spending



Source: FRED, Census Bureau, SAAR, cber.co. Data is not adjusted for inflation.

Cumulative Retail, Excluding Food Services Sales



Source: U.S. Census Bureau, FRED, cber.co .

Note: Data is in descending order with December at the top and January at the bottom, not adjusted for inflation.



United States Economy

Summary

Highlights of U.S. Economy

The U.S. economy is poised to close out the year on a comparatively strong note with stronger GDP growth in the second half of 2016. This momentum should carry into 2017.

- The Federal Reserve felt the U.S. economy was strong enough to raise interest rates earlier this month. They believe the economy can withstand three rate hikes in 2017.
- The housing market is solid, but it may be slowed by future rate hikes.
- Construction spending for the first 10 months of 2016 is 4.8% greater than the same time last year.
- Nationally, the Case-Shiller Index for home prices (September) is 5.5% greater than a year ago. In some states this is a mixed blessing.
- Manufacturing is rebounding from a soft second quarter.
- The ISM indices for both manufacturing and non-manufacturing posted increases in November.
- Since the election, the equities markets have been strong. The Dow is approaching the psychological barrier of 20,000, although the market may be over extended in the short-term. There is optimism that we are in a long-term bull market.
- Through 11 months, U.S. retail sales are 2.53% greater than the same period in 2015.
- There is optimism that some of president-elect Trump's proposed policies will benefit certain industries.
- The price of oil is about \$50 per barrel.
- The U.S. is on track to add about 2.5 million jobs in 2017.
- The GDP-Based Recession Indicator Index from the Atlanta Fed says there is only a 12% chance of recession.

● January 20th, 2017 – A Source of Uncertainty

● As has Happened in the Past – We will Survive

●

There is uncertainty about what will happen to the U.S. after Inauguration Day. In the age of sound bites it can be seen below that past presidents were remembered for reasons other than their contributions to the country.

From 1953 to 1981 we had Presidents of the United States who were known for the following:

- A general who was the first president to be term limited.
- A Catholic who had Marilyn Monroe sing at his birthday party. He was later assassinated.
- A dog lover who held his pet beagle up by the ears.
- An 18 minute gap in the Watergate tapes leading to his resignation.
- A president who was born as Leslie Lynch King Jr. He was not elected as vice president or president.

From 1981 we had Presidents of the United States who were known for the following:

- A peanut farmer.
- A movie actor.
- An incumbent president who didn't know that "It's about the economy, stupid!"
- A president who liked blue dresses.
- A managing partner of a professional baseball team.
- The first president who was born outside the continental United States.
- A president-elect with an affinity for Twitter.



The Colorado Economy Population

Change in Colorado Population

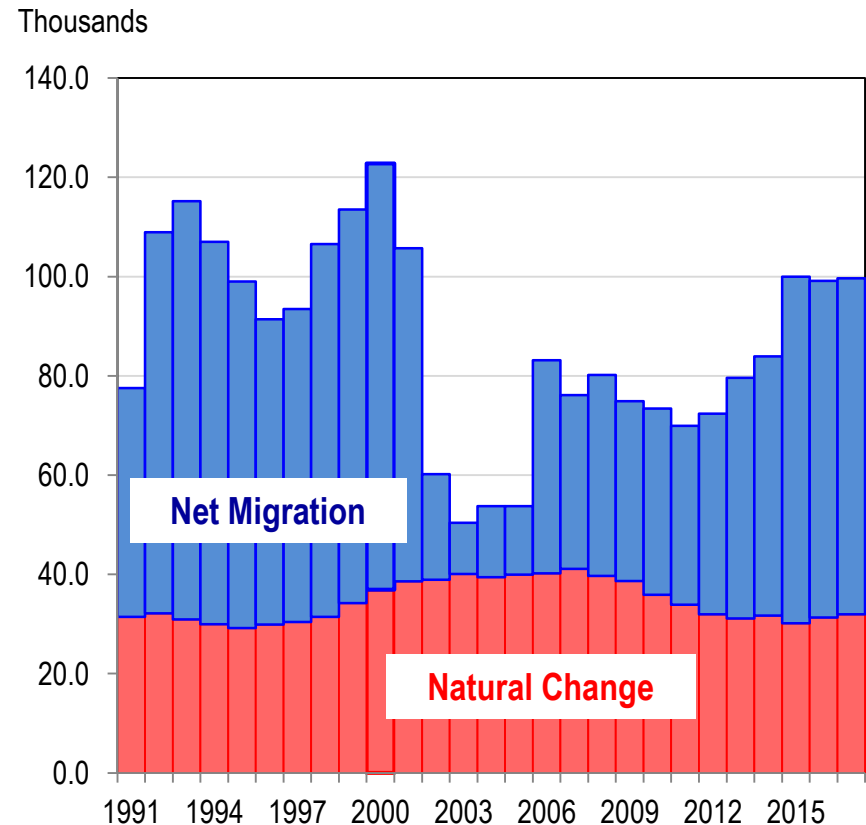
The population increases and decreases are a result of the natural rate of change (births minus deaths) and the change in net migration (people moving into the state minus people moving out of the state).

Over the past 2½ decades the natural rate of change (red bars) varied from a low of 29,145 in 1995 to a peak of 41,124 in 2007. For the past 10 years it has been slightly above 30,000.

Changes resulting from net migration (blue bars) are closely tied to the strength of the economy and the change in state employment. For example, there were five years, from 1986 to 1990, when net migration was negative (not shown on this chart). More people moved out of state than moved into the state to escape a regional recession. During the past two recessions, net migration declined, but did not turn negative because it was difficult for people to move - anywhere.

The Colorado population will increase by about 100,000 in 2015 through 2017. In 2017 the state's population will increase by 1.8% to 5,655,405.

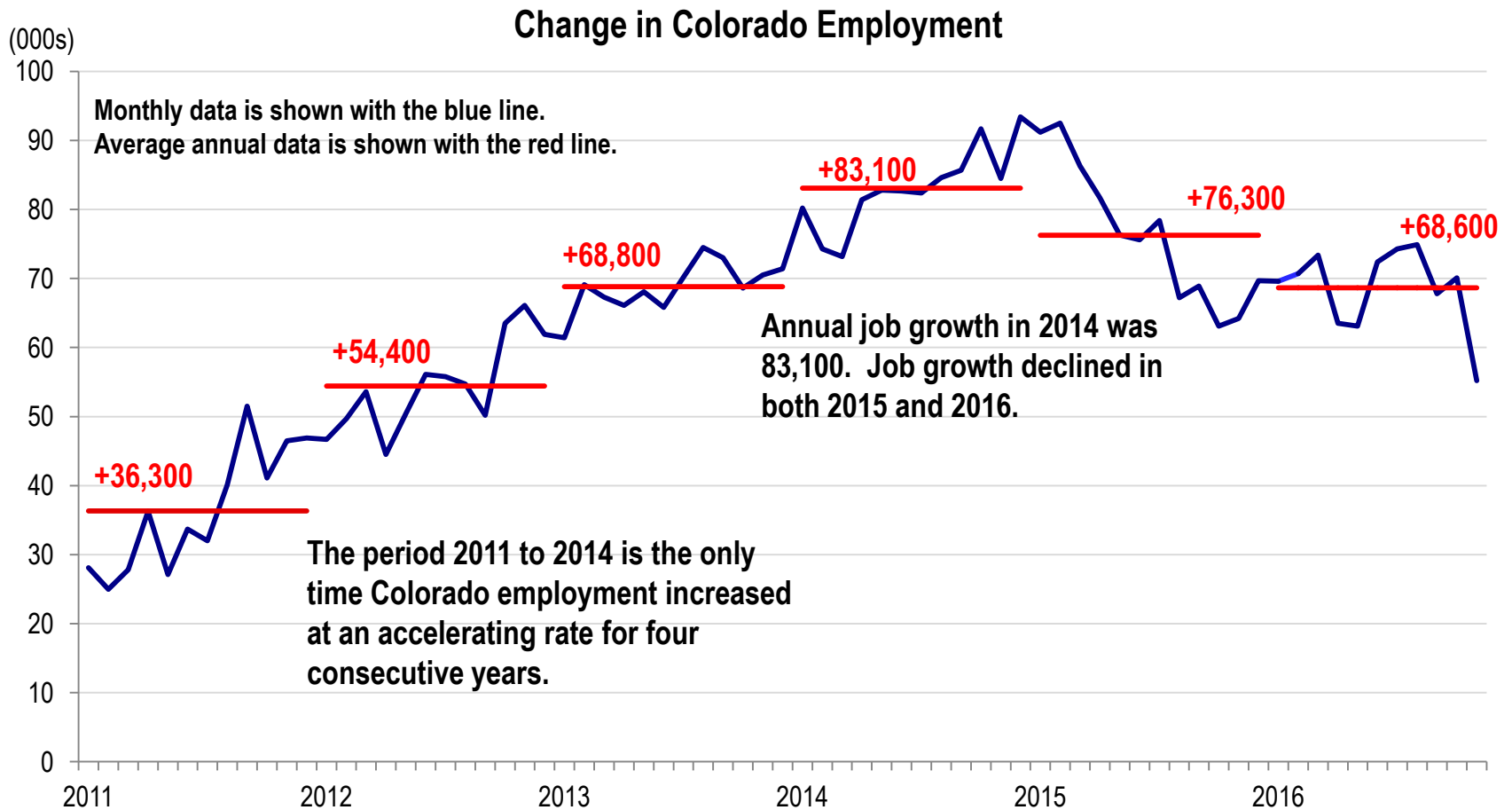
Change in Colorado Population 1991 - 2016





The Colorado Economy Labor

Change in Colorado Employment Year-Over-Year

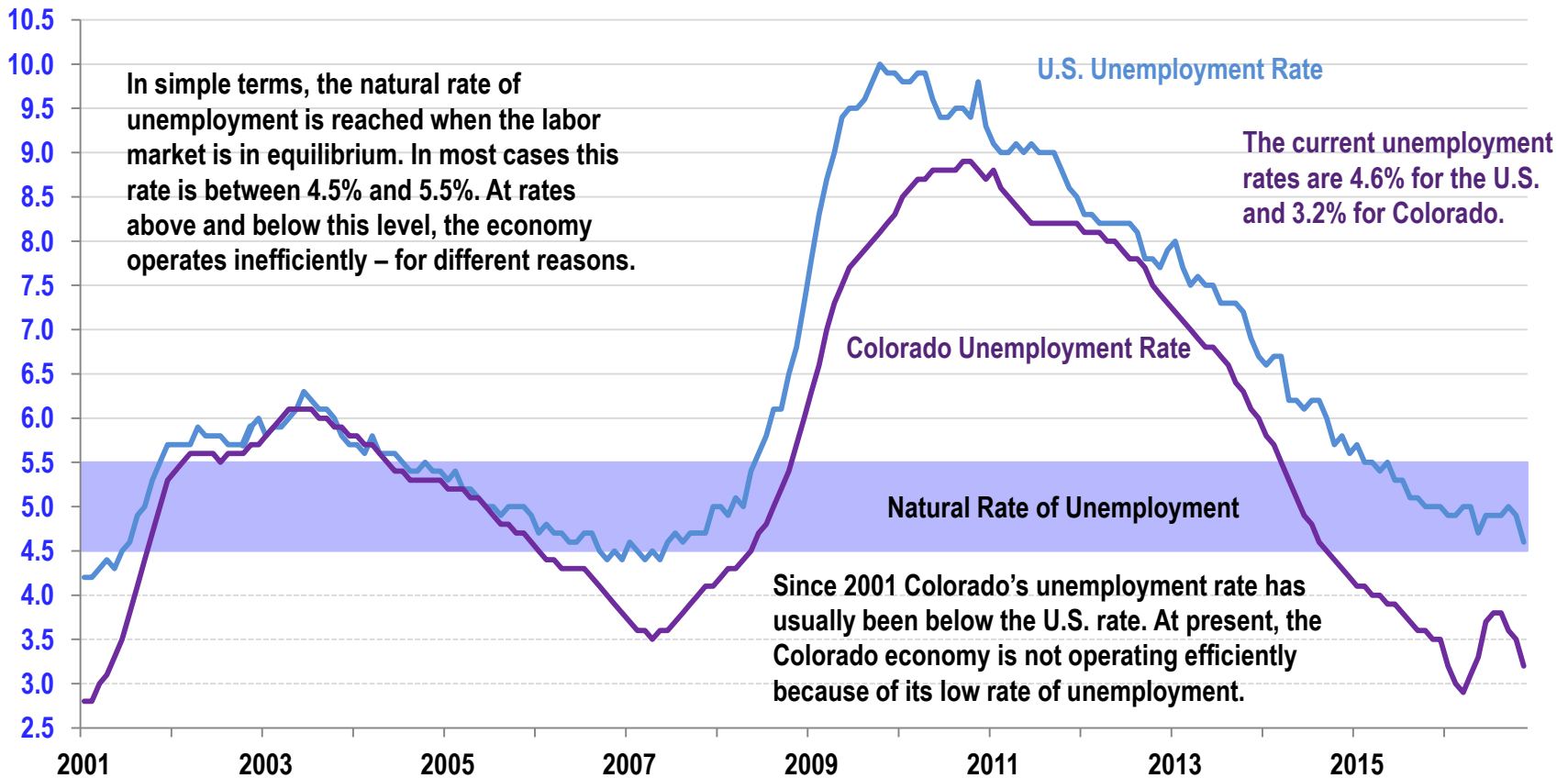


Source: Bureau of Labor Statistics, NSA, cber.co.

United States vs. Colorado Unemployment Rate

Percent

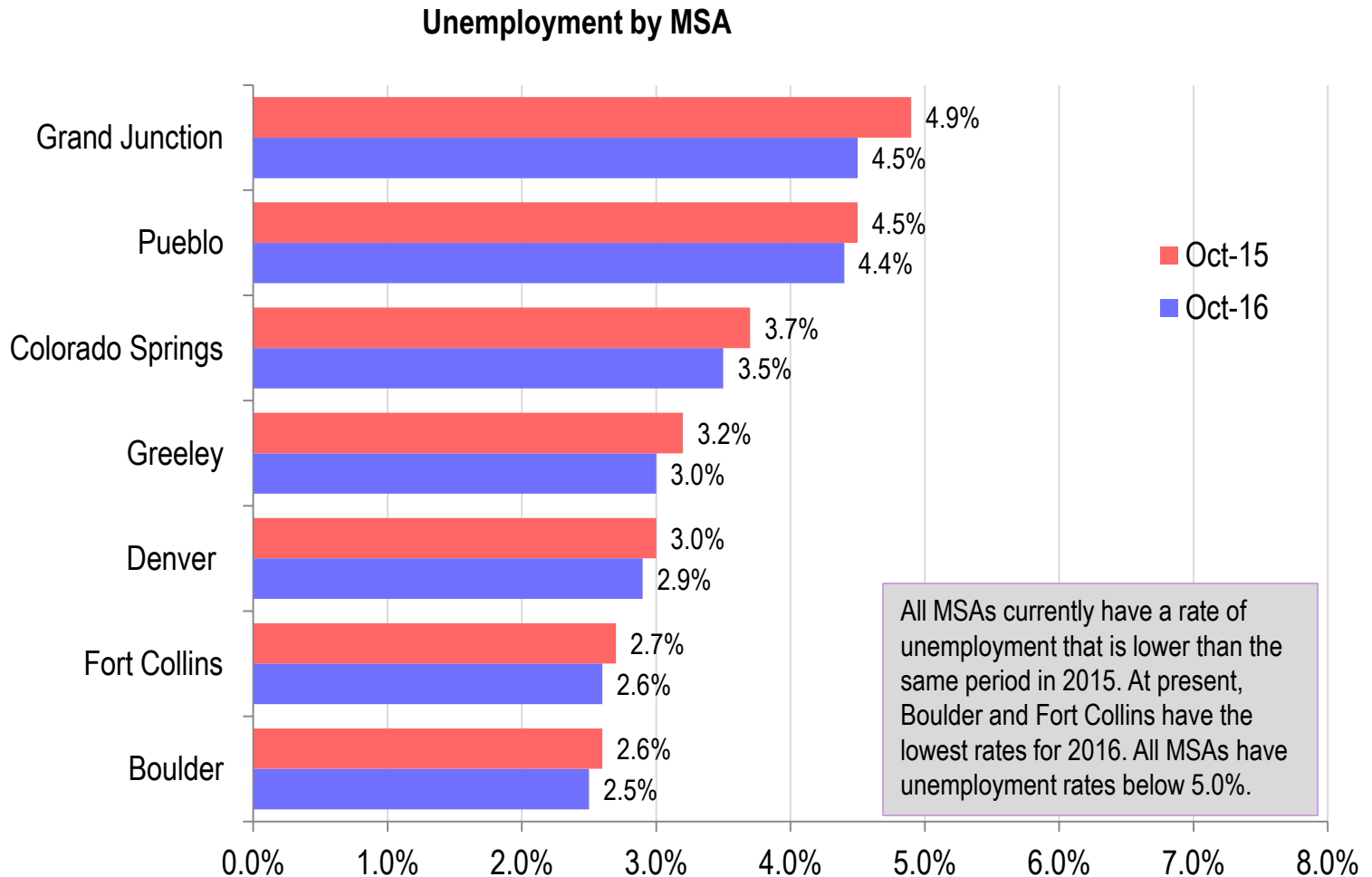
United States vs. Colorado Unemployment Rate



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

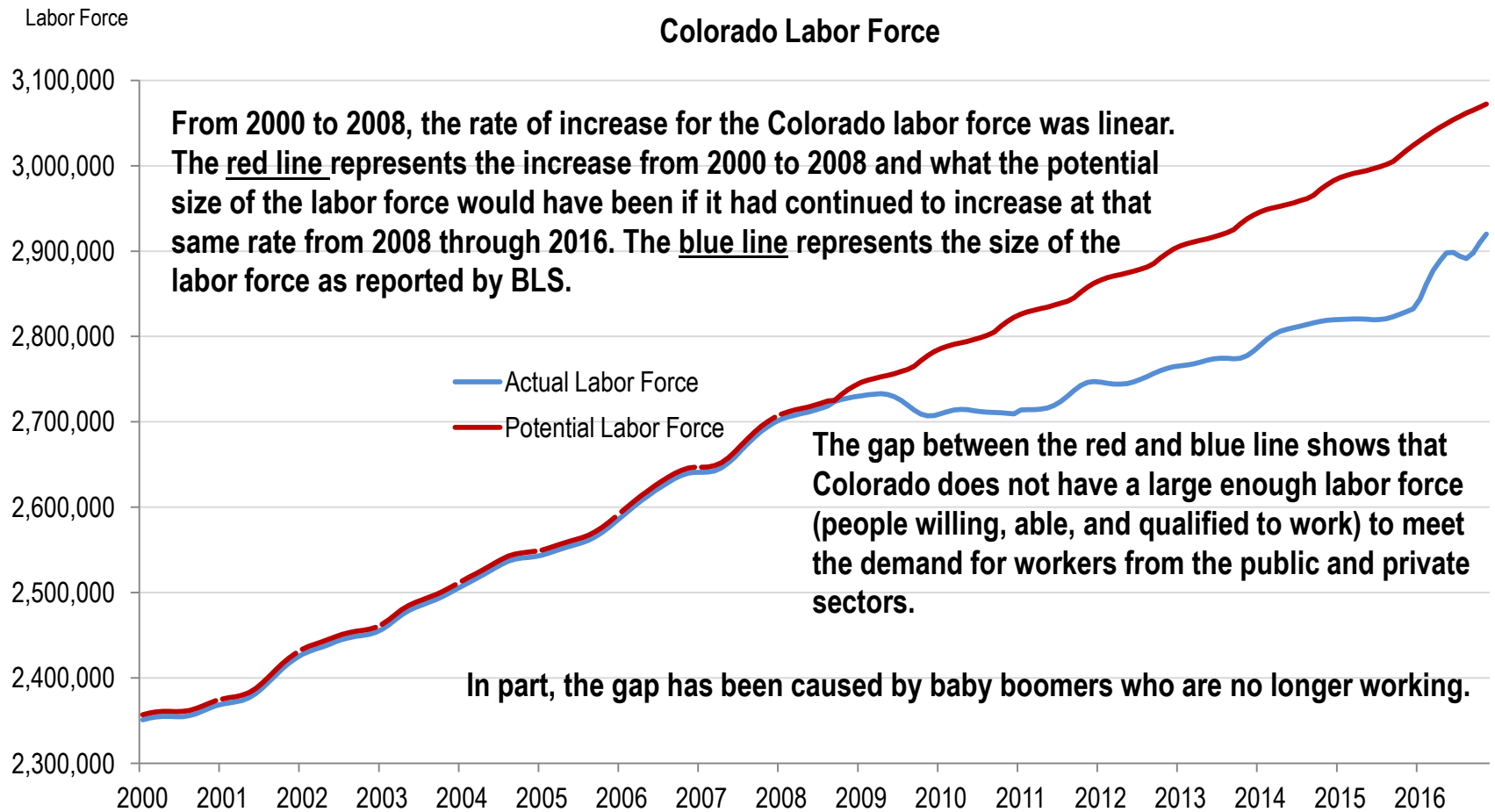
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Unemployment by MSA 2015 vs. 2016



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 Labor Force



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



Colorado Employment

2016 Colorado Employment by Performance Category
Average Employment First 11 Months



Colorado Employment Performance Category Portfolio Analysis

Strong Growth, Solid Growth, and Volatile Categories

This portfolio approach to evaluating job growth makes it easy to see that some categories of industries consistently create jobs at a higher rate of growth, some show solid growth, while 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.

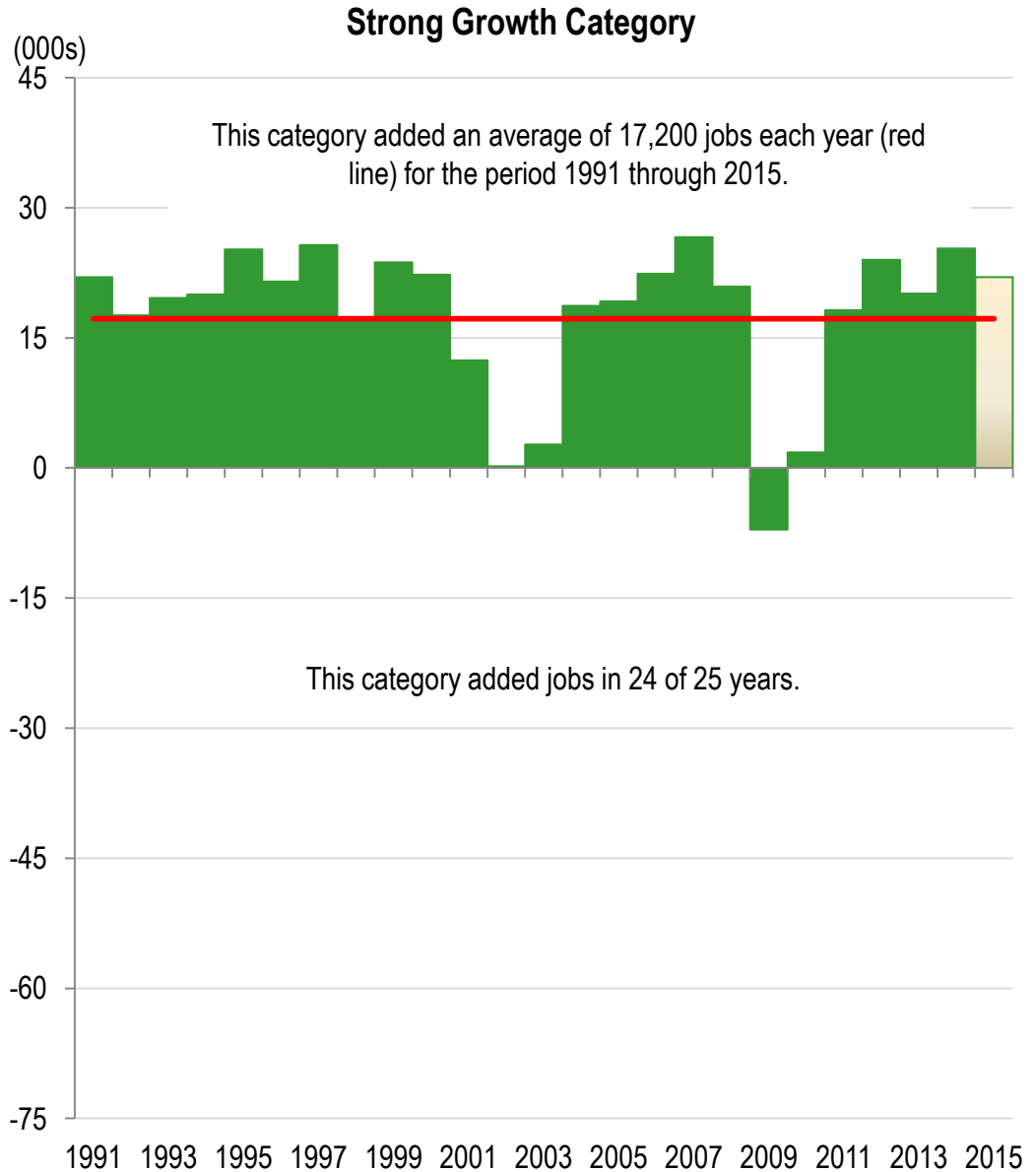
Annual Employment Situation for the Strong Growth Category

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

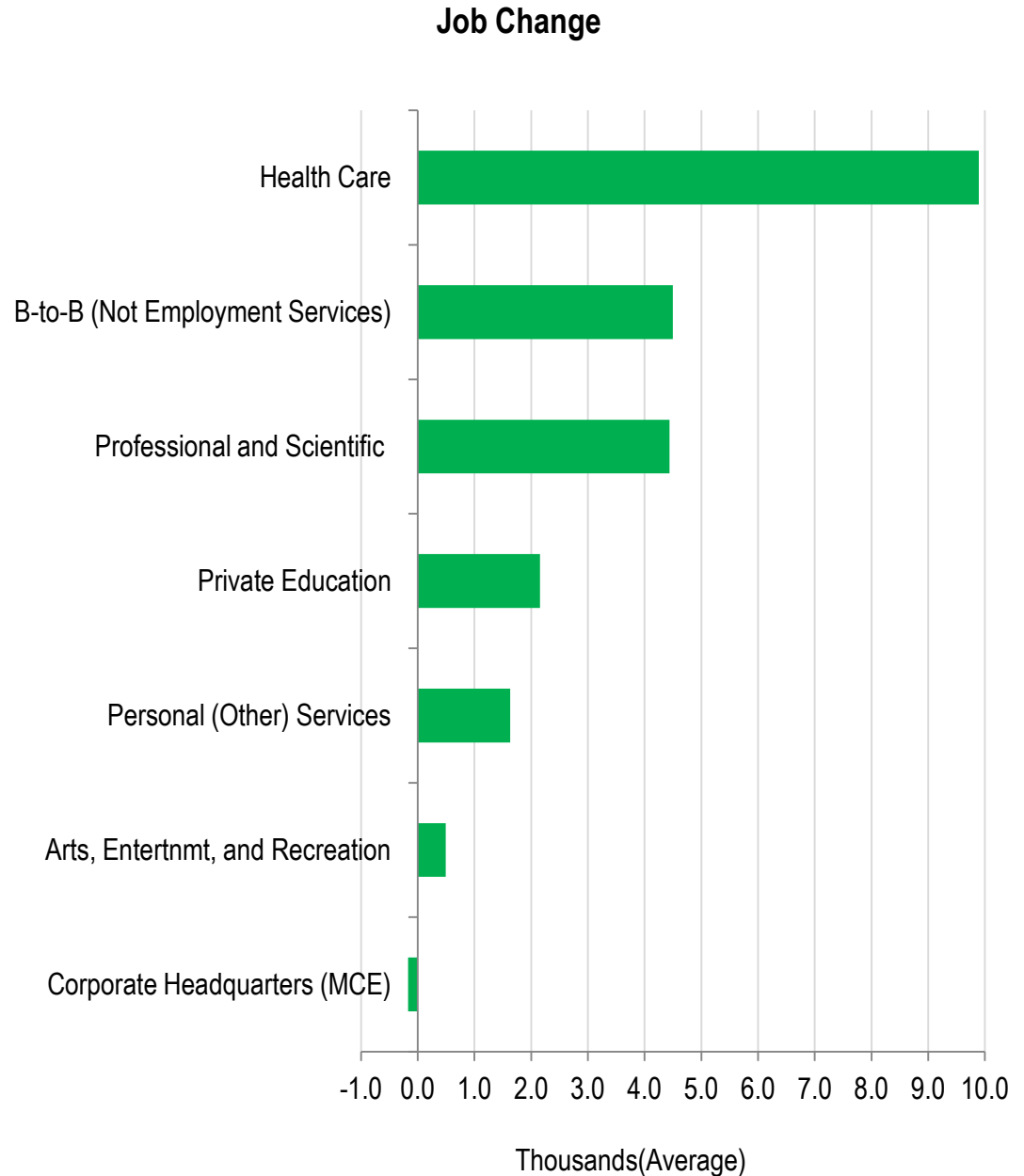


Solid Growth Sectors Average Employment for the First 11 Months

- This category of sectors added 22,900 jobs compared to the same period last year.

- The Health Care Sector led job growth, followed by the PST sector. On the other hand, the Management of Corporations and Enterprises Sector showed a slight decline from last year.

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



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.

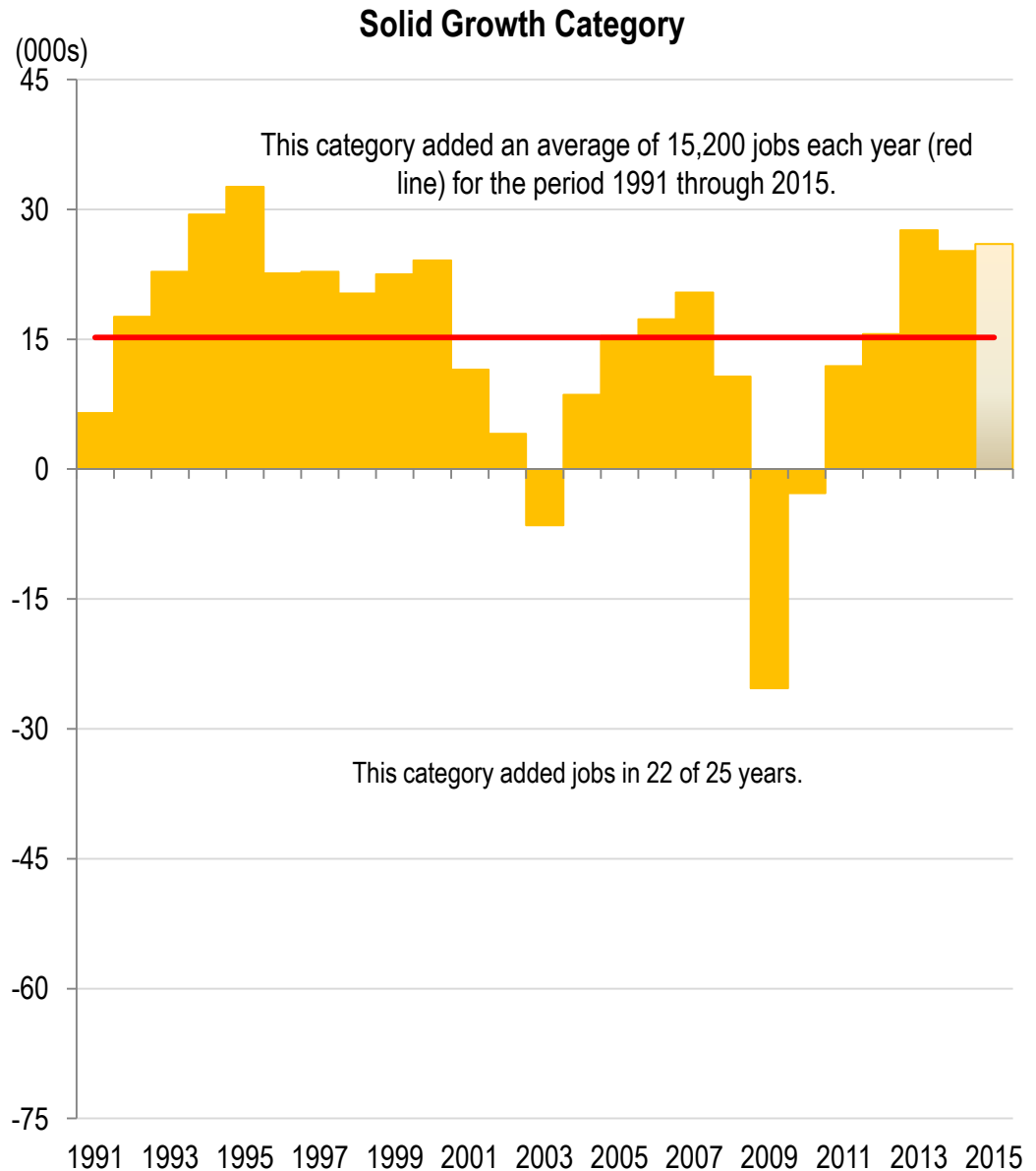
- Wholesale Trade
- Retail Trade
- State (Not Higher Education)
- Higher Education
- Local (Not K-12 Education)
- K-12 Education
- Accommodations and Food Services

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.



Limited Growth Sectors Average Employment for the First 11 Months

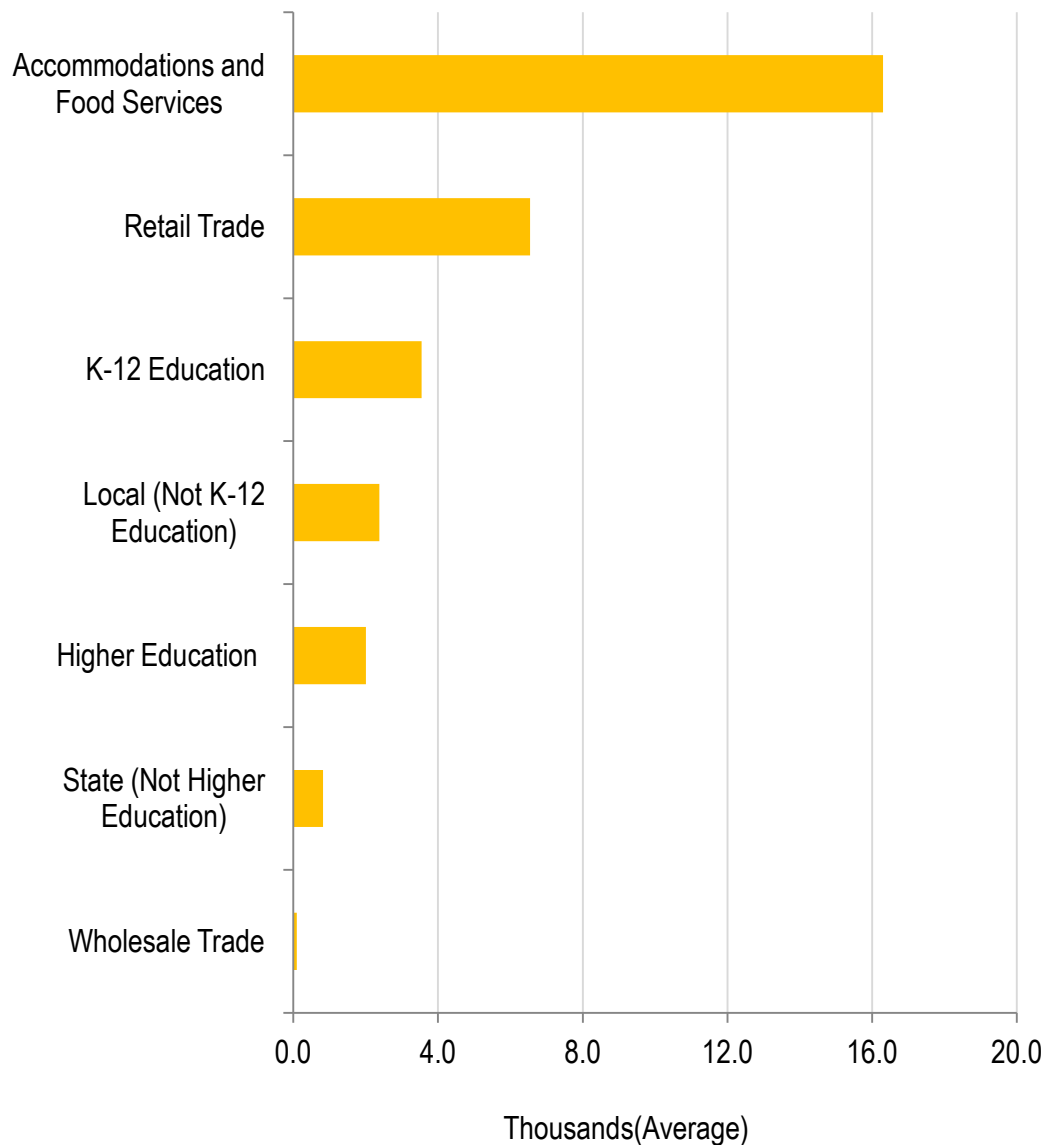
- This category of sectors added 31,700 jobs compared to the same period last year.

- The Leisure and Hospitality Sector (AFS + AER) has had a strong year. Most likely the number of jobs added in the AFS sector is overstated and will be lowered in the March 2017 benchmark revisions.

- Retail trade has also posted strong job gains as a result of population and job growth and another strong tourism season.

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

Job Change



Source: Bureau of Labor Statistics, cber.co.

Annual Employment Situation for the Volatile Category

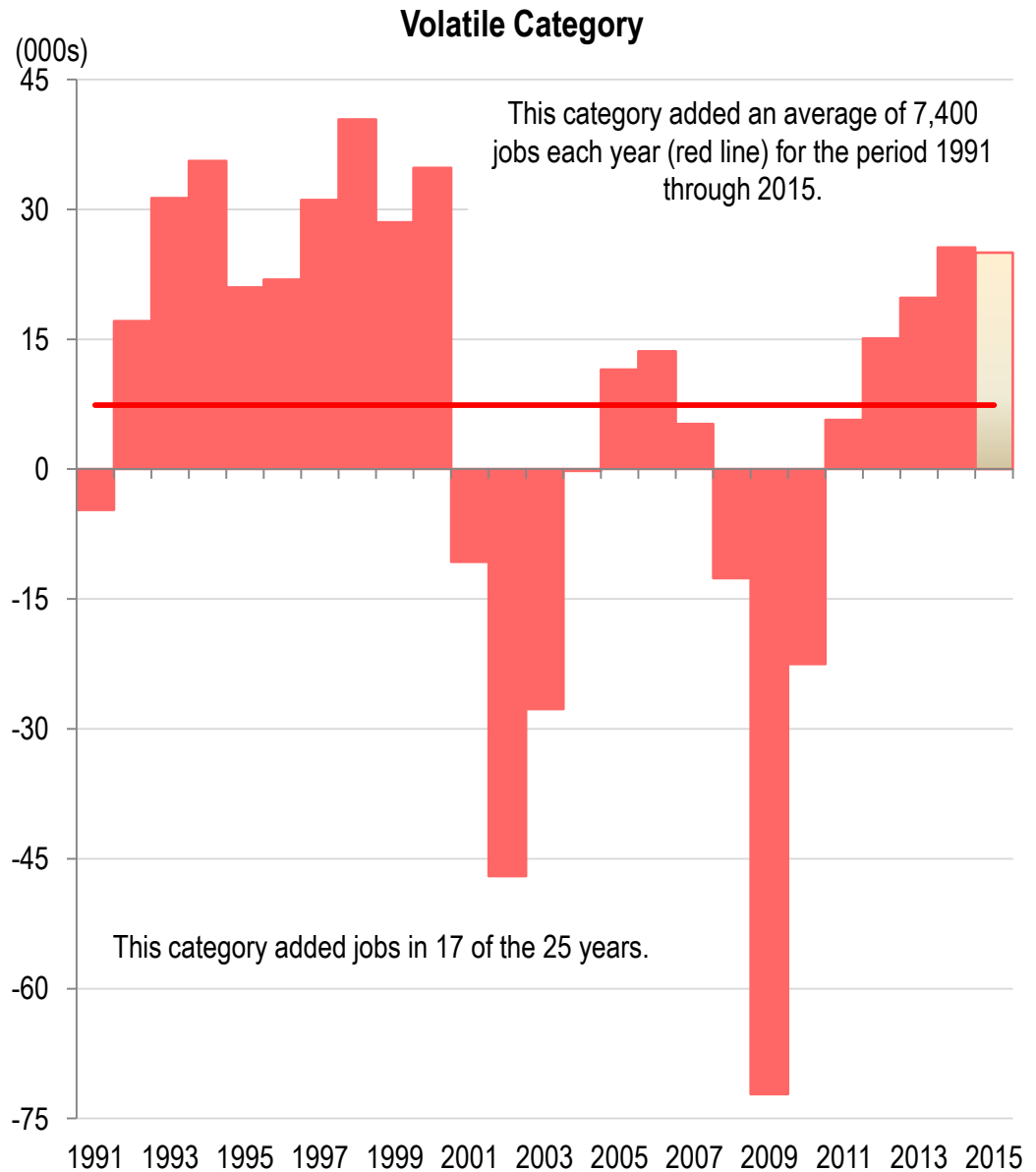
Over the past two decades the sectors listed below were the primary source of volatility in total employment.

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



● Volatile Sectors

● Average Employment for the First 11 Months

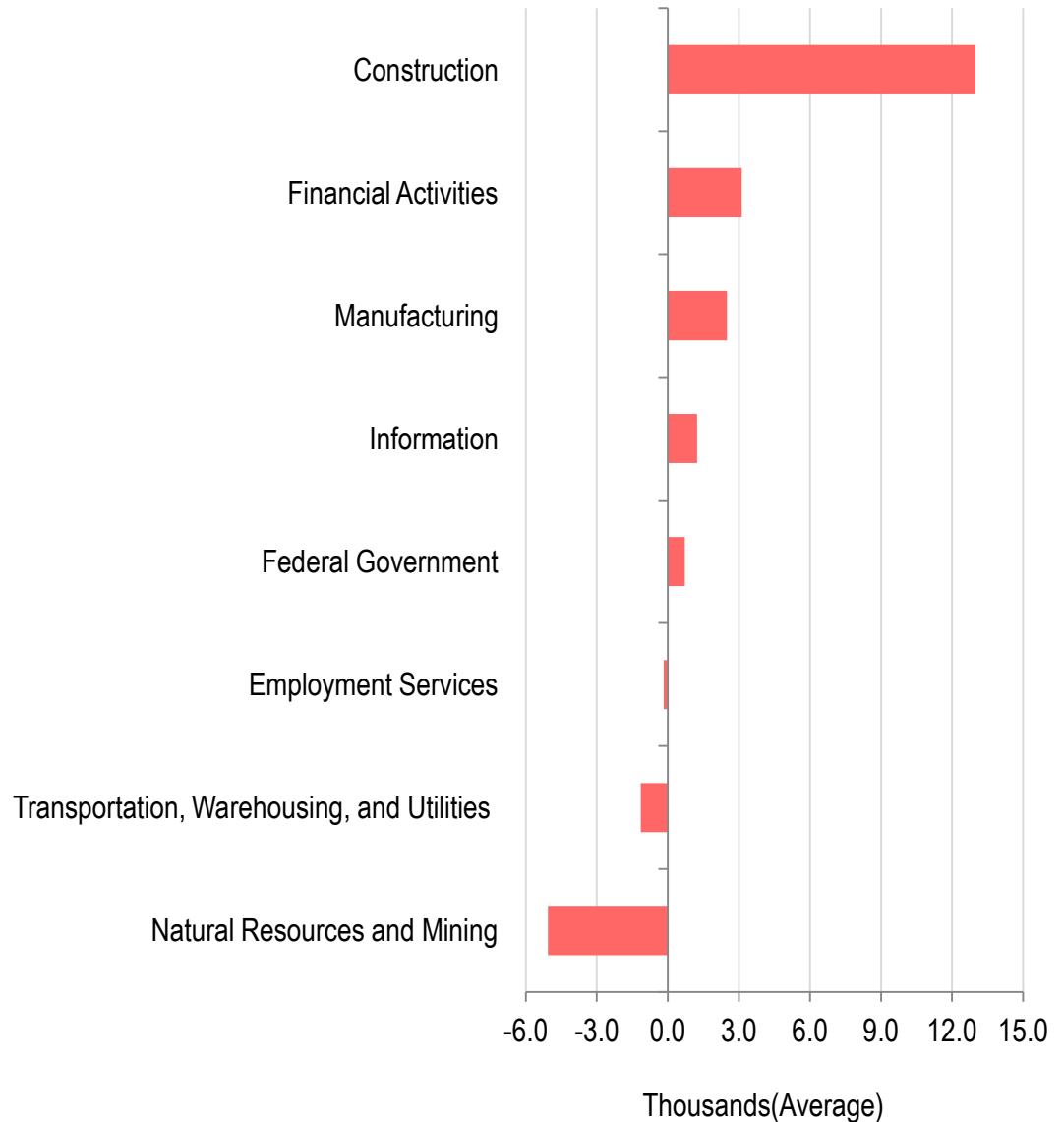
- This category of sectors added 14,000 jobs in 2016 compared to the same period last year.

- For this period, the Construction, Financial Activities, and Manufacturing Sectors led job growth, although the Manufacturing Sector has become a source of concern.

- It is likely the job data for the Employment Services and TWU sectors are understated. The job losses in the extractive industries are continuing, but at a declining rate.

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

Job Change



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

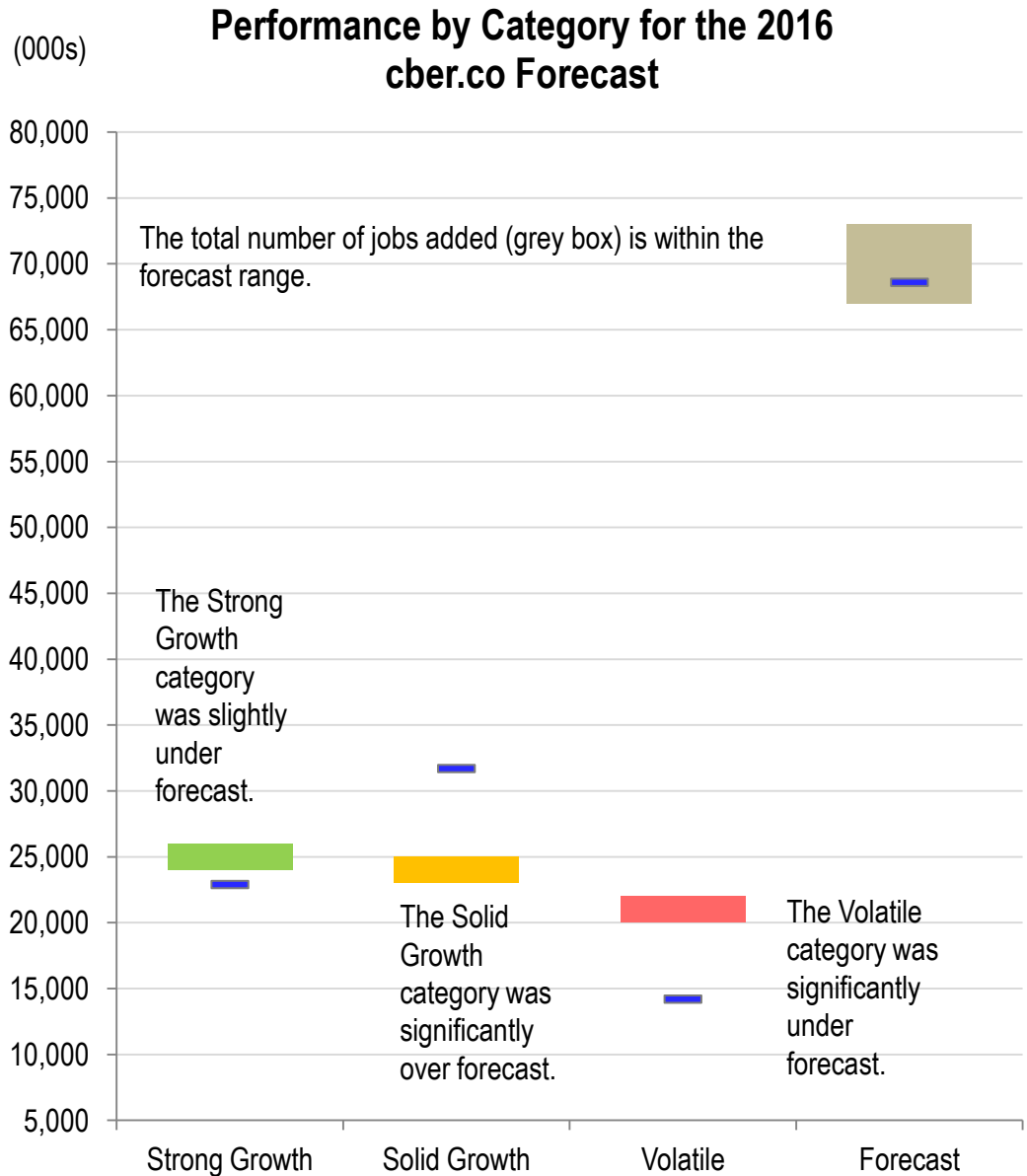
On this chart, the forecast ranges for the categories are:

- 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 11 months of 2016.

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

Average employment for the first 10 months of 2016 is 68,600 greater than the same period in 2015.



Source: Bureau of Labor Statistics, cber.co.

Projected Revisions in Benchmark Revisions to be Made in March 2017

In March 2017, the BLS will make benchmark revisions to the Nonfarm Employment series (also called Wage and Salary or CES). The updates are based on data from the QCEW series. The QCEW data for the first half of 2016 indicate the current Nonfarm Employment for Colorado is about 10,000 jobs too high. That is not alarming because these monthly estimates are always too high or too low. That is why they are called estimates.

These revisions will alter the magnitude of the change, but they should not significantly change the basic story about the change. The Strong Growth and the Solid Growth categories added jobs as expected. The Volatile category lived up to its name. The number of jobs added in this category were much less than expected. The projected upwards/downwards revisions are provided below.

The following Super Sectors will be revised upwards:

- Trade, Transportation, Utilities
- **Financial Activities**
- Education and Health Services
- Other Services

The following Super Sectors will be revised downwards:

- **Extractive Industries**
- **Construction**
- **Manufacturing**
- **Information**
- Professional, Business Services
- Leisure and Hospitality
- Government

Categories in red are from the Volatile category



The Colorado Economy

Major Industries from the Volatile Category

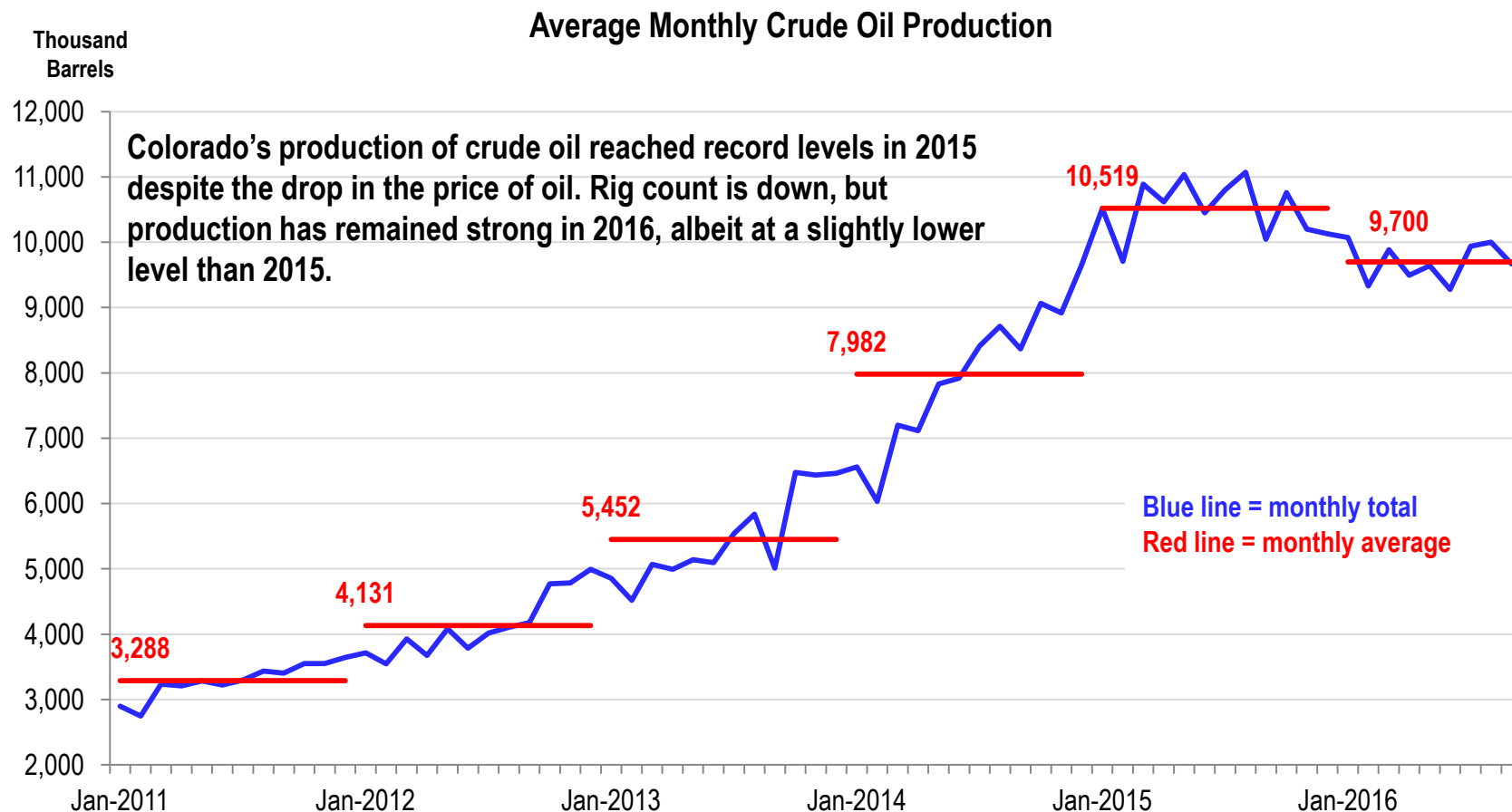
Impact of Industries in the Volatile Category

The Strong Growth and Solid Growth categories provide consistent job growth over time.

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 because the industries in the Volatile category 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. They illustrate that there are factors other than a standard business cycle that drive change in their employment.

Average Monthly Colorado Crude Oil Production 2011 to 2016 (Thousand Barrels)



Source: EIA, cber.co.

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

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

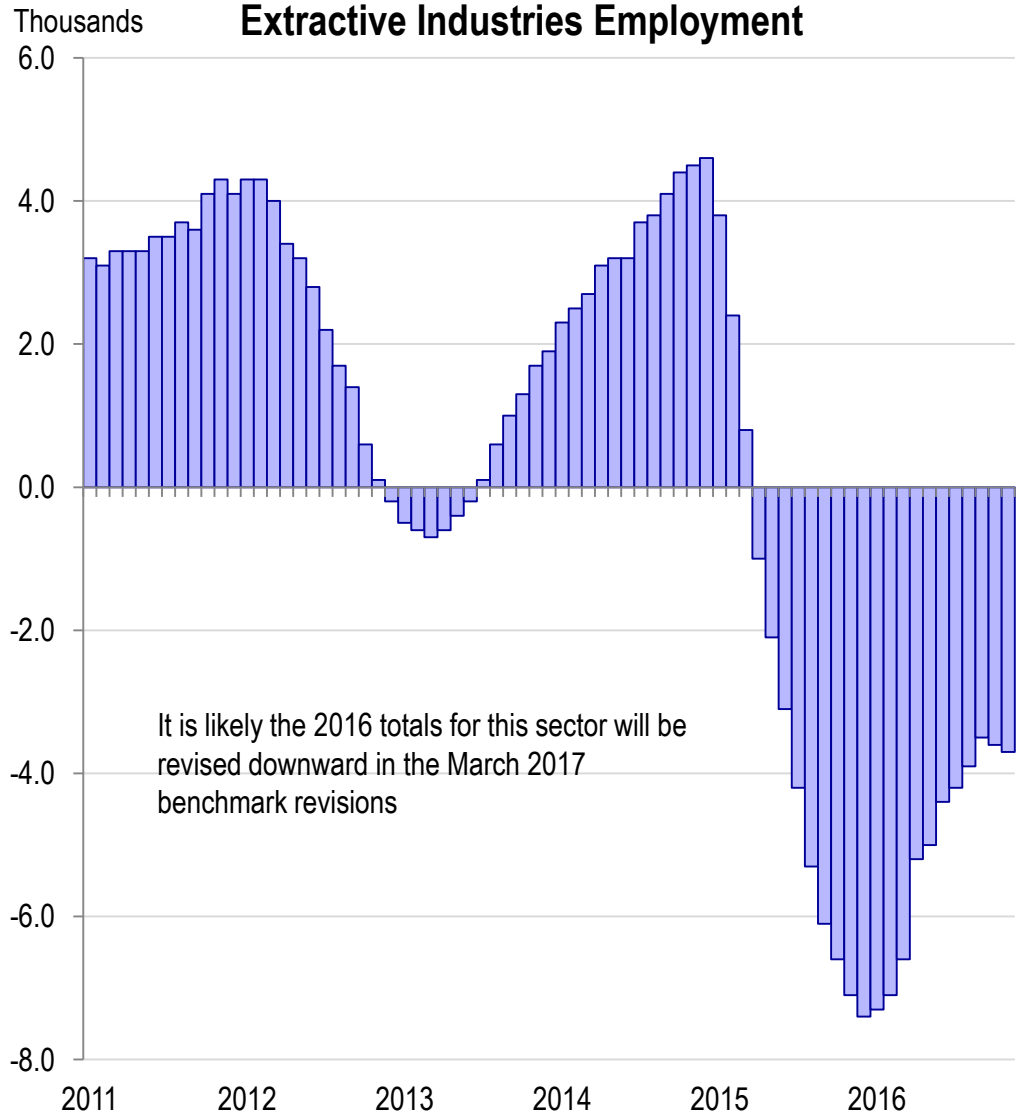
The year-over-year monthly change in employment in the Colorado extractive industries slowed in 2012. Jobs were lost between December 2012 and June 2013. The sector added jobs beginning in the second half of 2013. That growth continued through 2014. The industry added jobs at a slower rate in Q1 2015, 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.

The volatility has been caused by changes in demand, prices, and policy.

Monthly employment appears to have bottomed out around 25,000 workers. This is down from a peak of 36,400 workers in December, 2014.

Change in Colorado Employment Extractive Industries Employment



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

Y-O-Y Monthly Employment Change in Colorado Manufacturing

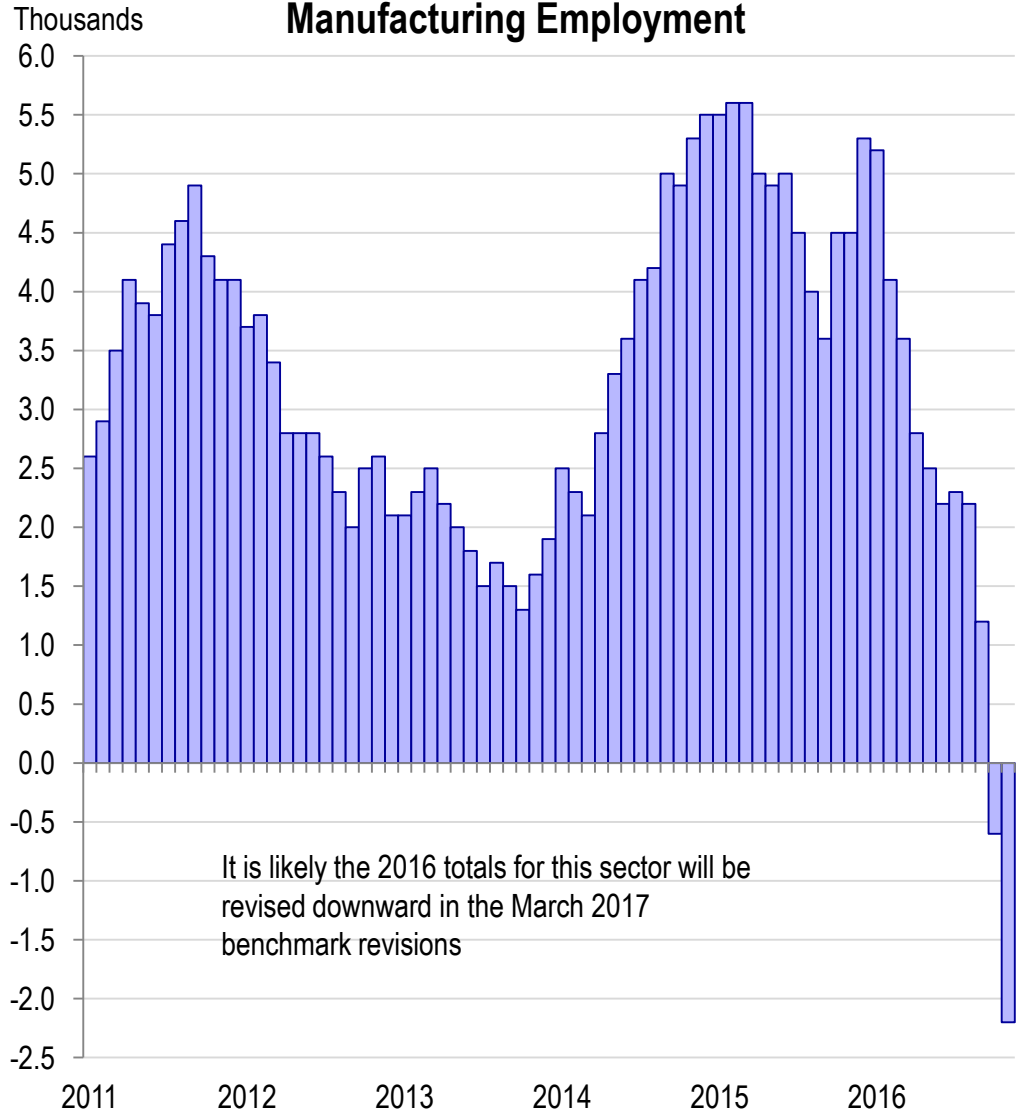
Since Q4 2010 the year-over-year monthly change in Colorado manufacturing employment has been volatile. The monthly y-o-y change in employment has fluctuated between -2,200 and 5,600 jobs.

Since December 2015, manufacturing jobs have been added at a declining rate; however, jobs were lost for the first time in October. There were 2,200 fewer manufacturing jobs in November than the same period in 2015.

The volatility has been caused by changes in productivity, automation, demand (alternate energy), and offshoring.

Colorado manufacturing is performing better than U.S. manufacturing.

Change in Colorado Employment Manufacturing Employment



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

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

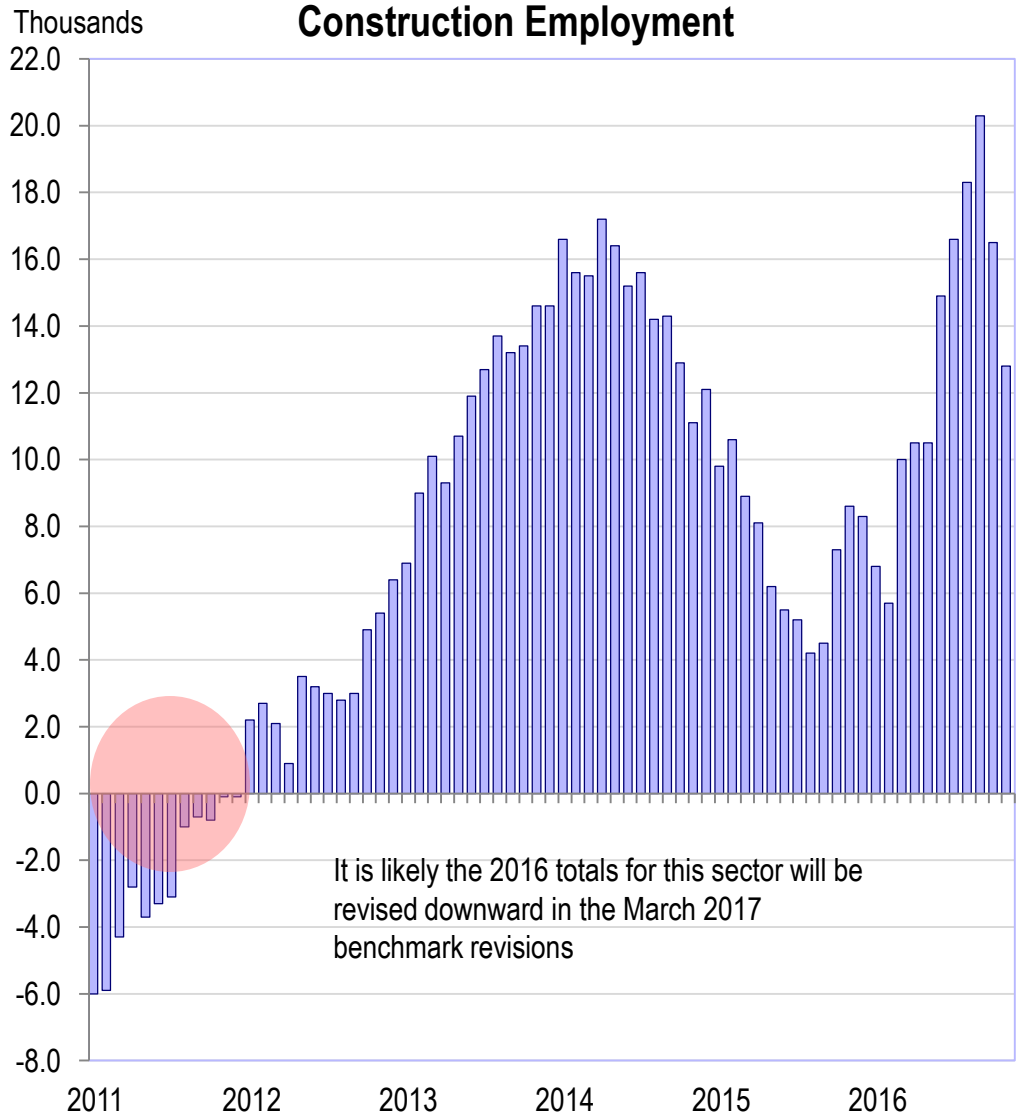
The year-over-year monthly change in Colorado construction employment was negative throughout 2011 (red).

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 rapidly trended upwards.

In September 2016, there were 20,100 more construction jobs than the same period in 2015, a new peak for the period 2011 to 2016. This number may be overstated.

Change in Colorado Employment Construction Employment



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

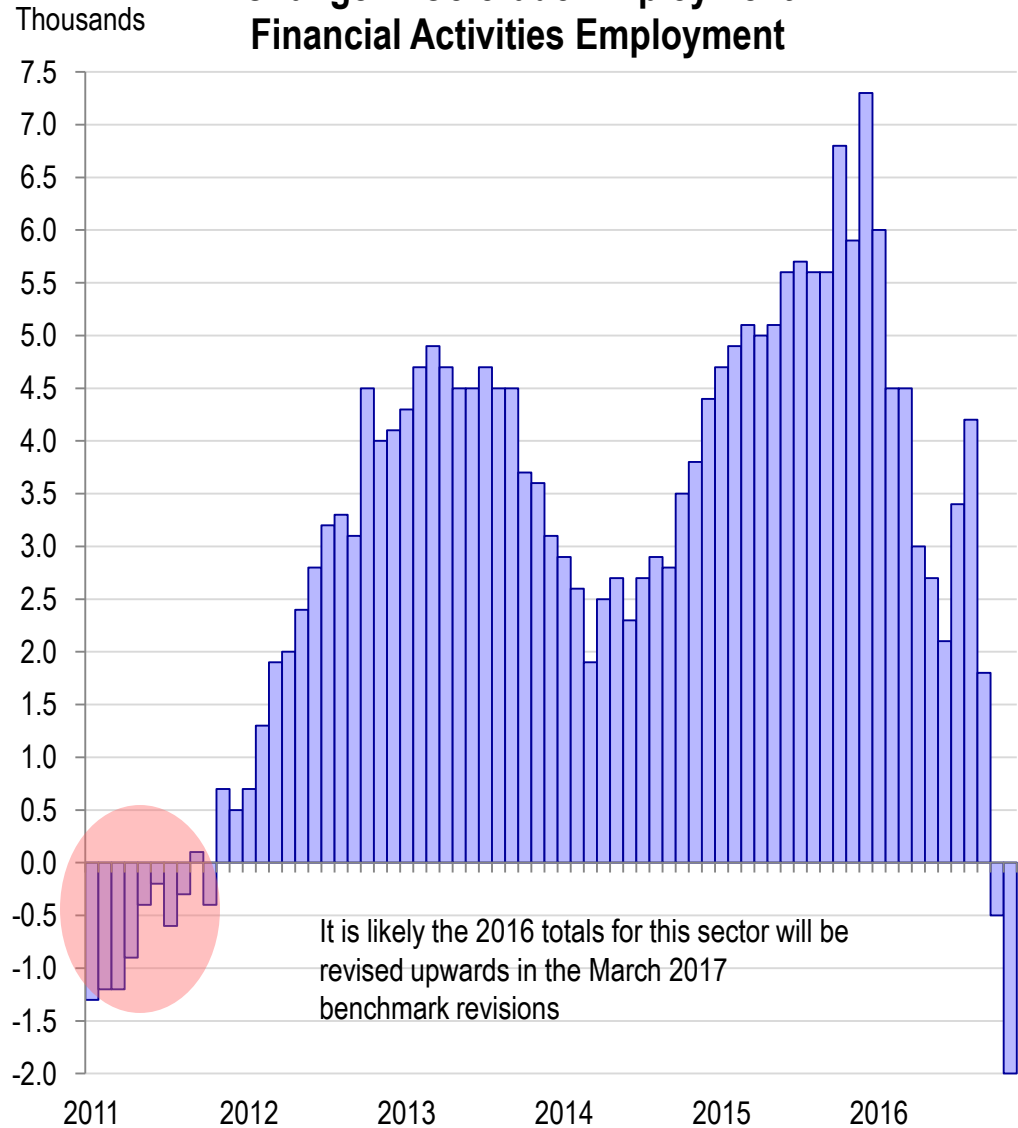
Y-O-Y Monthly Employment Change in Colorado Employment – Financial Activities

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 November 2016, there were 2,000 fewer financial activities jobs than the same period in 2015.

Change in Colorado Employment Financial Activities Employment

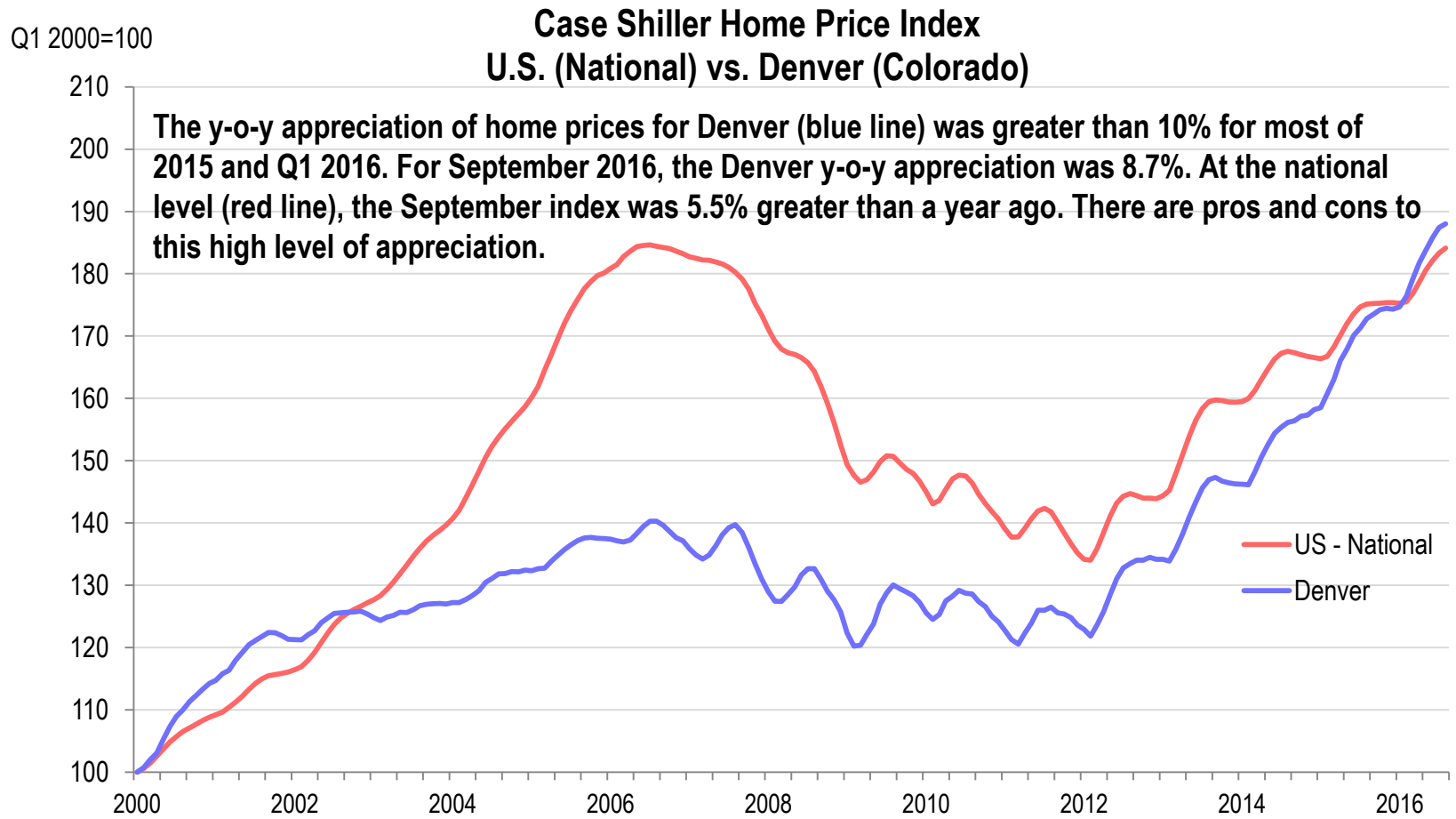




The Colorado Economy

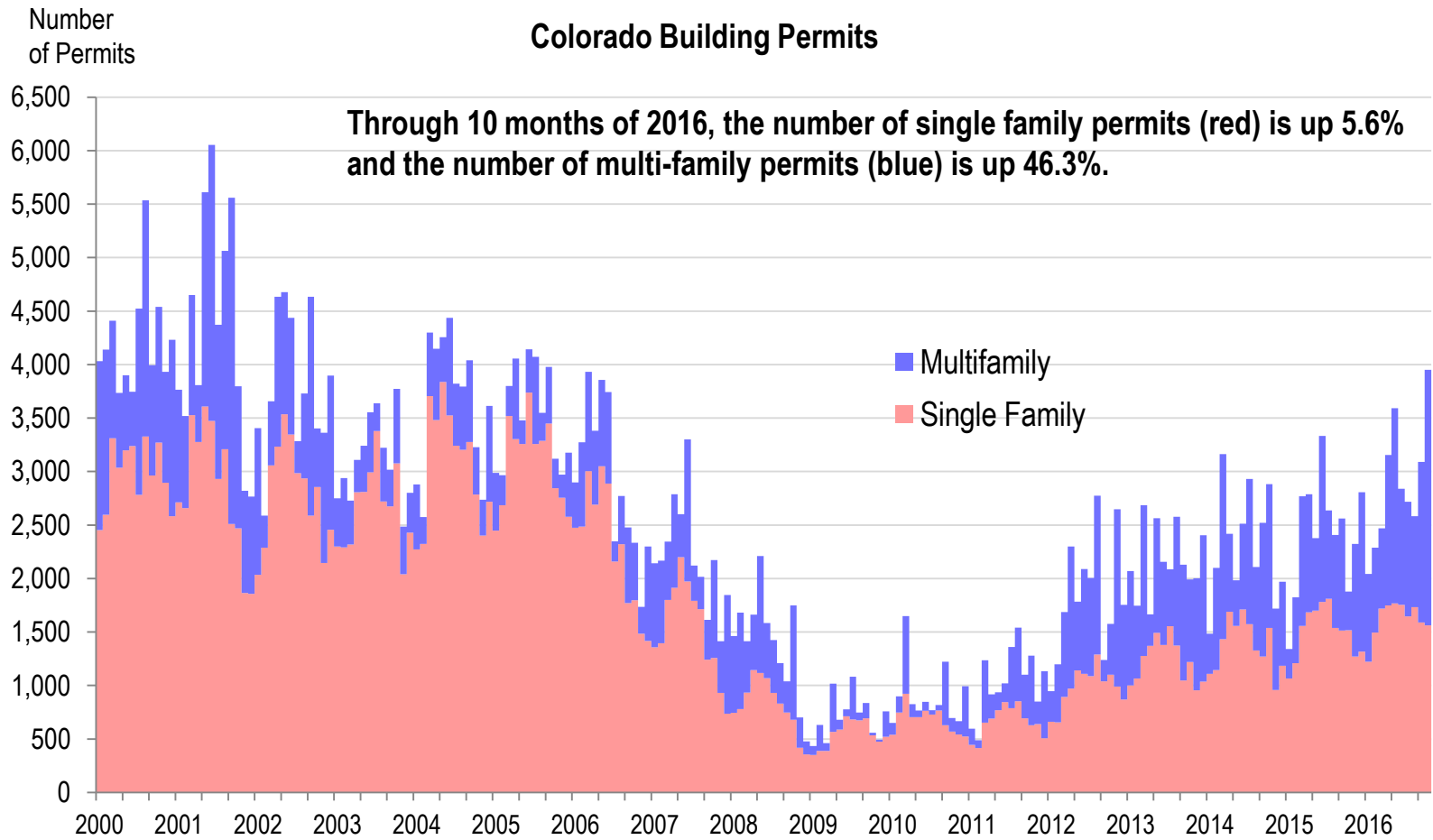
Housing and Construction

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



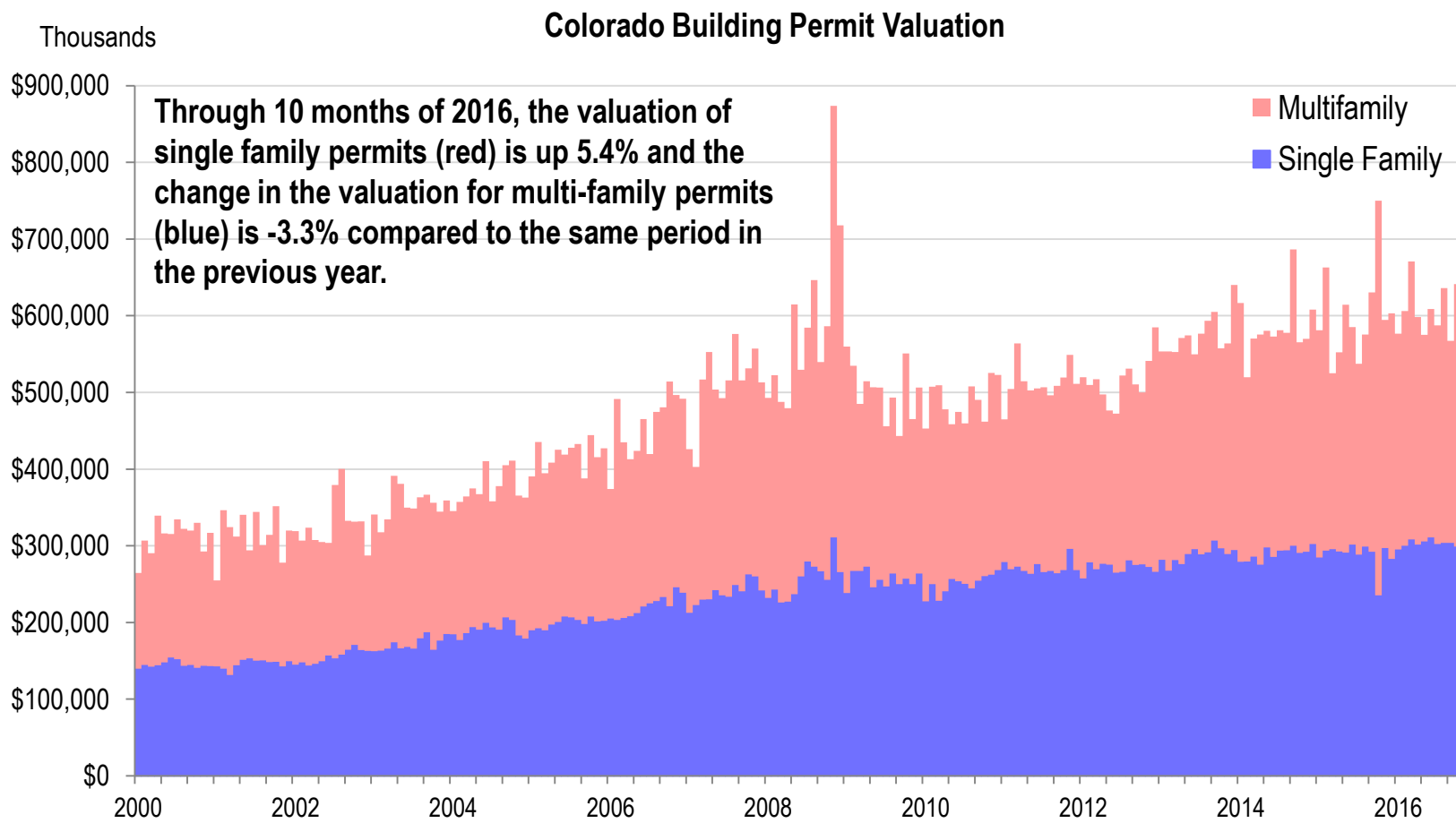
Source: S&P Core-Logic Case-Shiller, cber.co.

Colorado Residential Building Permits - Units



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

Colorado Residential Building Permits - Valuation



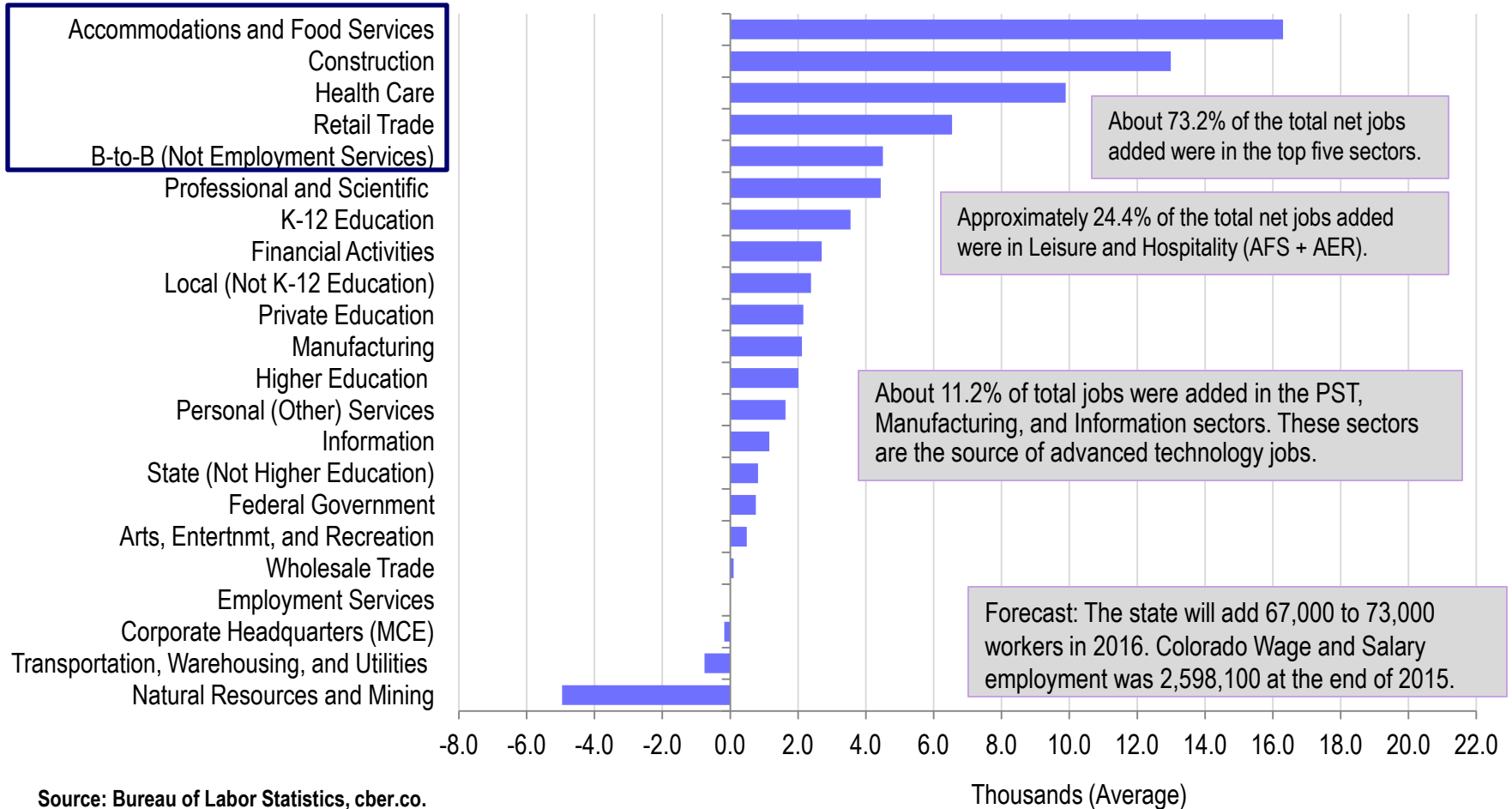
Source: TAMU Real Estate Center, U.S. Census Bureau, cber.co. Note: Not adjusted for inflation.



The Colorado Economy Summary

Job Changes First 11 Months of 2016 vs. Same Period in 2015

Job Change All Sectors



Source: Bureau of Labor Statistics, cber.co.

- Demand Mismatch
- Supply \neq Demand
-

Job growth in 2016 will be positive, but lackluster.

To use a sports analogy, the 2016 Colorado economy has been similar to the 2016 Broncos football season. There have been bright spots, but the home team has demonstrated it is not possible to win the Super Bowl every year. Likewise, it is not possible for the state to have an efficient, high performance economy every year.

If anything the theme for the Colorado economy in 2016 would be supply \neq demand. The economy underperformed because the supply of workers did not match the demand from employers.

● The Colorado Economy is Not Functioning Efficiently

● Supply ≠ Demand



In 2016, the Demand From Employers Exceeded the Supply of Qualified Workers.

There are always challenges in matching supply and demand. This year, those challenges have been greater than in the past.

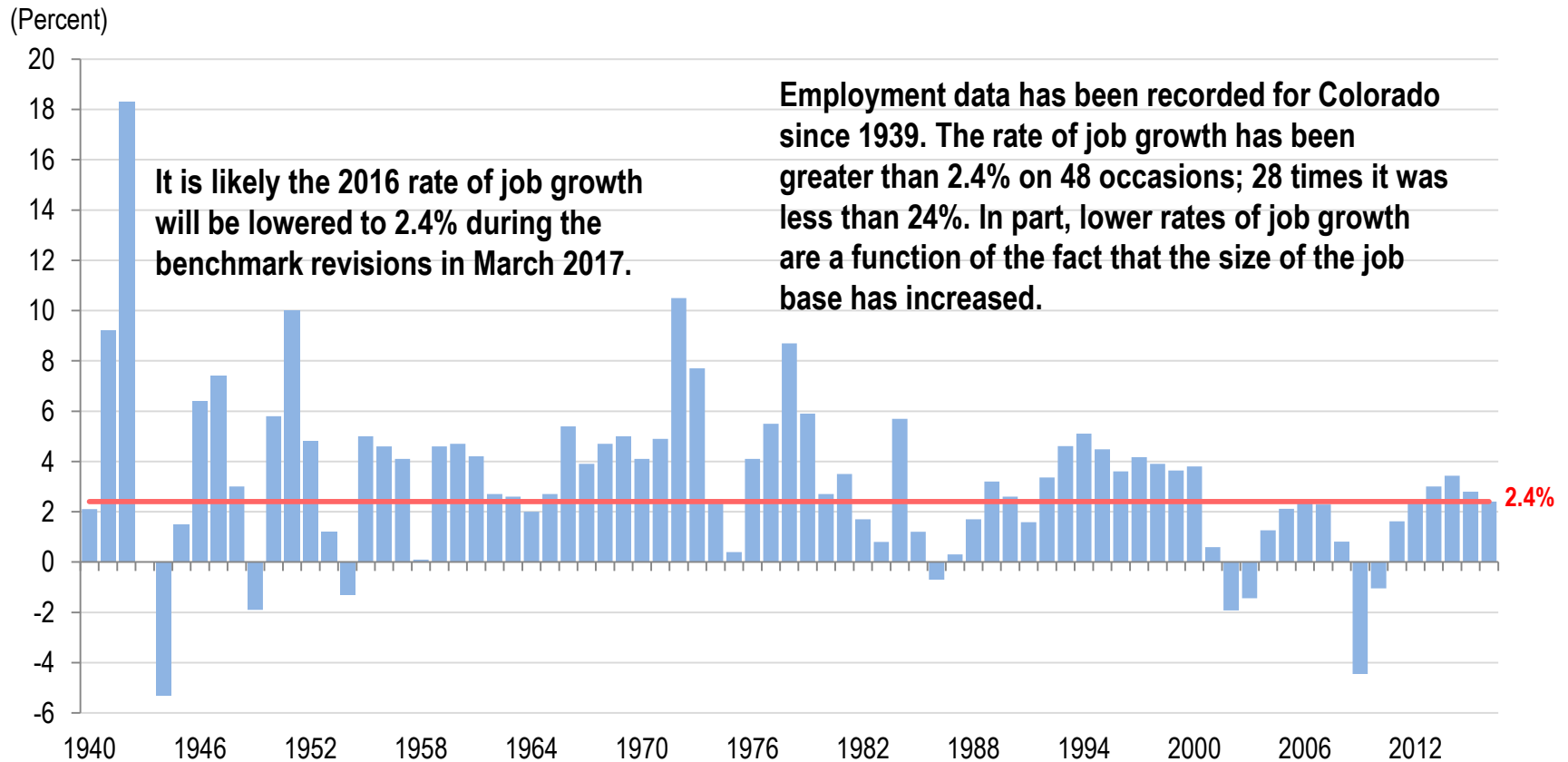
- Some people are not able to work because of injuries, illness, retirement, age, or family situations.
- Some people do not want to take a long or congested drive to work.
- For a variety of reasons, some people don't want to move to a new location to work.
- The wages for some jobs may be too low to make ends meet.
- Some jobs are perceived as undesirable or not sexy enough.
- Some jobs may be desirable, but the work shifts are not.
- The job qualifications for some jobs are often too specific.
- There may be a skills gap between the qualifications of the workers and what the company needs.

The fact that the supply and demand are not more closely aligned causes the economy to function inefficiently.

- It is taking companies longer to fill job vacancies. In cases such as this, quality may be compromised.
- In the short-term, companies may choose to pay overtime rather than hire additional workers.
- Companies may not fill vacant or hard-to-fill positions. Instead they will increase their staff's workload.
- Some businesses may not be able to hire additional workers because of increased regulations, such as minimum wages.
- Whenever possible, companies have automated their operations. In the long-run this decreases opportunities for jobs.
- Companies may outsource. look for alternatives offshore or contract the work out.

- The Revised Rate of Colorado Job Growth for 2016, 2.4%,
- will be the 49th Strongest in 77 Years
-

Percentage of Jobs Added



Source: Bureau of Labor Statistics, cber.co.

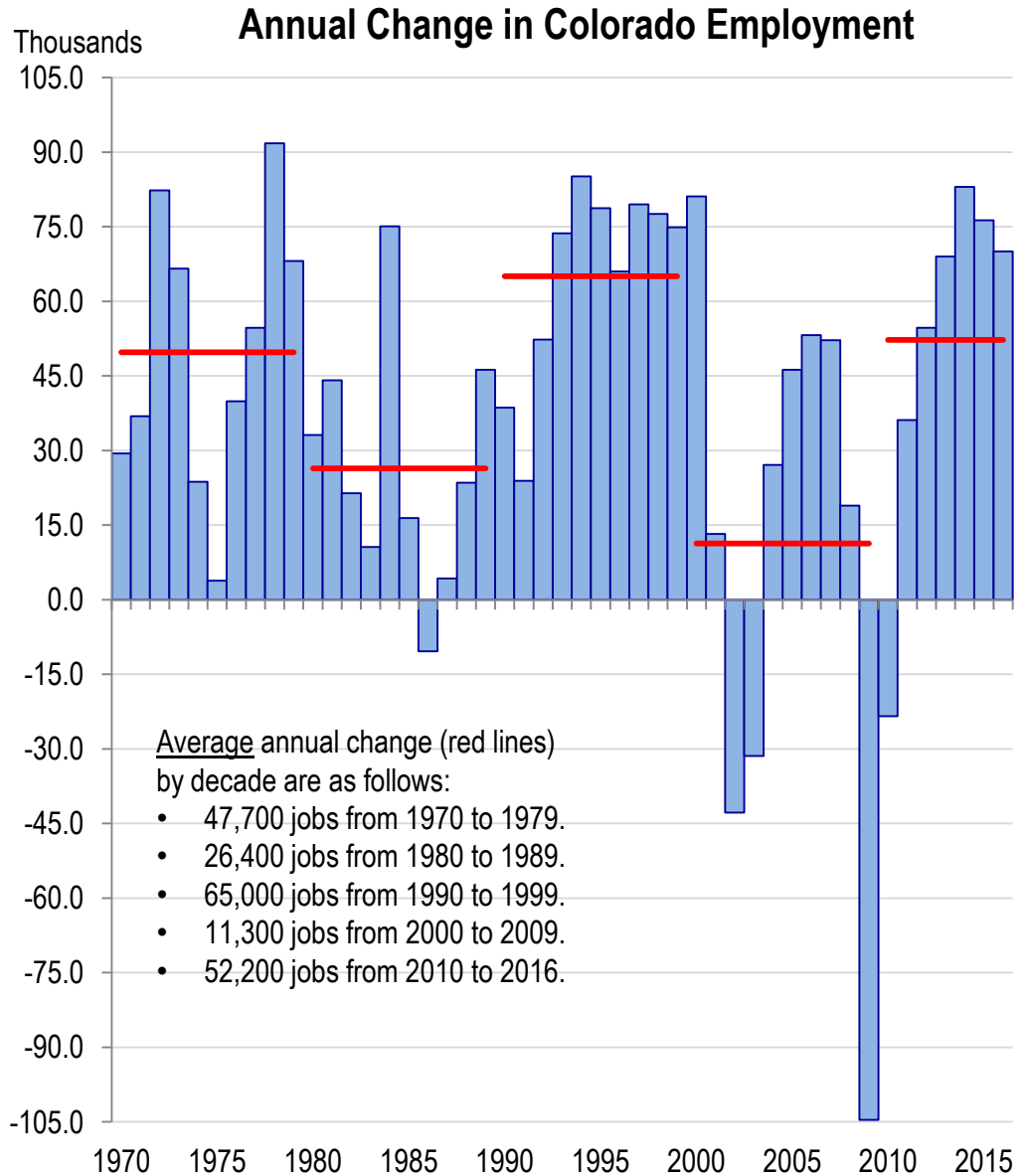
Colorado-based Business and Economic Research <http://cber.co>

● Annual Employment
 ● Change in Colorado
 ● Employment

The cber.co 2016 forecast projected the state would add 67,000 to 73,000 jobs in 2016. Colorado employment will increase by 2.7% to 2.9%.

After 11 months, the state is on track to add 68,600 jobs this year, prior to the BLS benchmark revisions.

The Colorado Department of Labor and Employment has indicated that the Q1 and Q2 2016 jobs data may be overstated by as much as 10,000.



Source: Bureau of Labor Statistics, cber.co.

Happy Holidays





cber.co Colorado Economic Review Through November 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.

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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.