



cber.co Colorado Economic Review Through July 2016

Colorado-based Business and Economic Research
Prepared
August 22, 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. Over the summer economists at the International Monetary Fund, the Federal Reserve, and the Philadelphia branch of the Federal Reserve have talked about a slowing global economy, secular stagnation, and subpar real GDP growth. Meanwhile the U.S. is on track to add 2.6 million jobs and the state is positioned to add 69,900 jobs in 2016. This review is divided into the sections listed below.

Global and United States Economy

- Global and United States GDP
 - Gross Domestic Product
- United States Economy
 - Labor
 - Inflation, Financial Markets, and the Price of Oil
 - Non-Manufacturing, Manufacturing, and Retail
 - Construction and Housing
 - Summary

The Colorado Economy

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



Global and United States Economies



Global and United States Economies

Gross Domestic Product

● A Simplistic Look at the Global and U.S. Economies

● From the IMF and the Fed

The following is a list of the titles of the IMF's recent quarterly economic outlooks. They have been far from rosy and have often included forecasts that called for modest growth that were later revised downward.

- Uncertainty in the aftermath of the U.K. referendum
- Too slow for too long
- Adjusting to lower commodity prices
- Slower growth in emerging markets and a gradual pickup in advanced economies
- Uneven growth
- Cross currents.

In the United States, economists from the Fed and other organizations have talked at length about:

- Secular stagnation
- “The new normal”
- Lower job and GDP growth.

Their “on-again off-again” discussions about raising the interest rates have been regarded by some public and private leaders as a vote of “no confidence” in the U.S. economy.

The bottom line is that through the first seven months of 2017 the U.S. economy has added jobs at a solid rate despite the dismal prognostications. What lies ahead for the future?

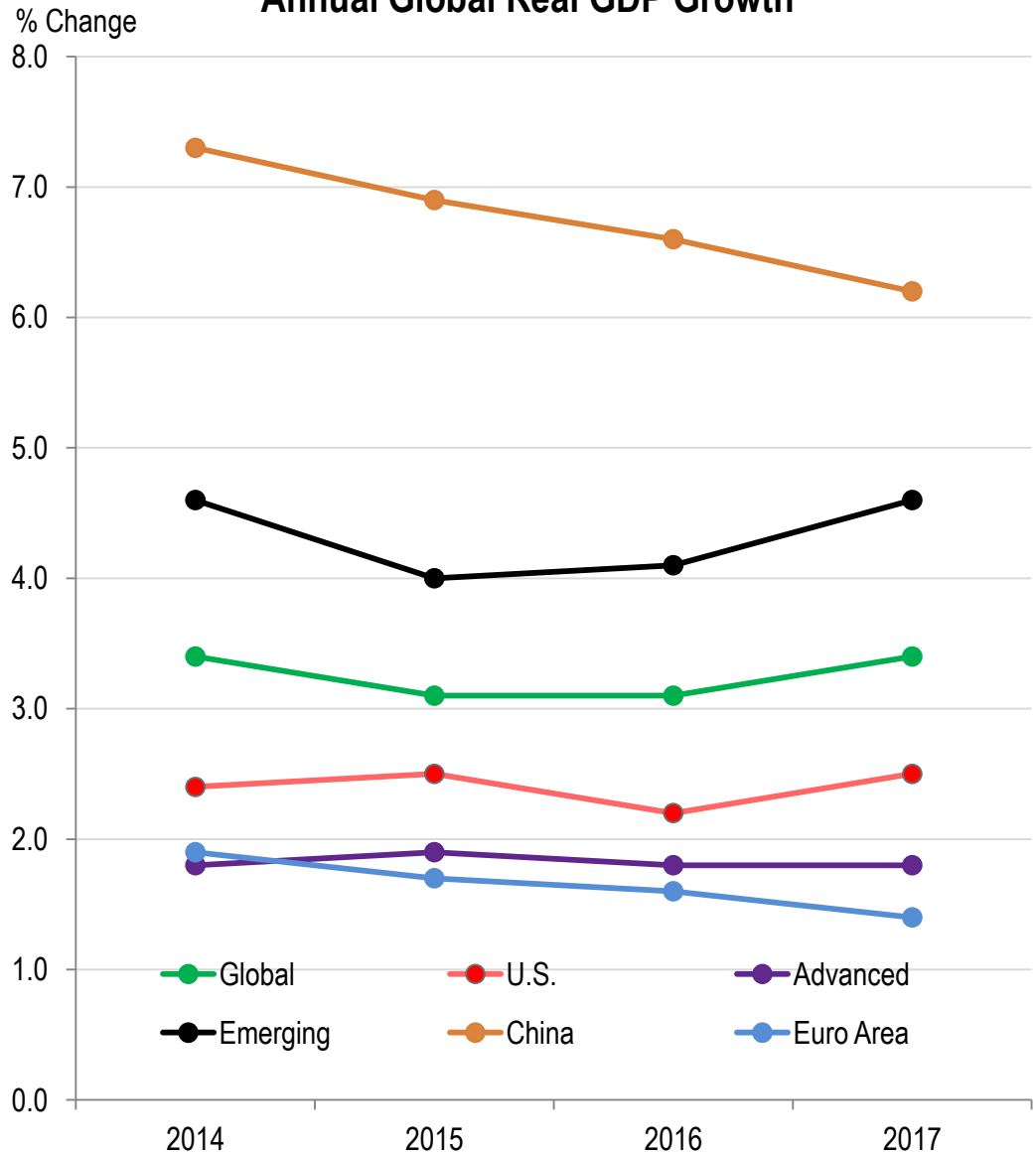
Global Real GDP Growth



In July, the International Monetary Fund updated its global forecasts. The 2016 IMF forecasts for most countries were revised downward.

The IMF projected that global GDP growth (green) in 2016 would increase at a lower than anticipated rate primarily because of uncertainty related to the decision by Great Britain to exit the European Union.

Annual Global Real GDP Growth



Source: IMF, July 2016.

Real United States GDP Growth Quarterly

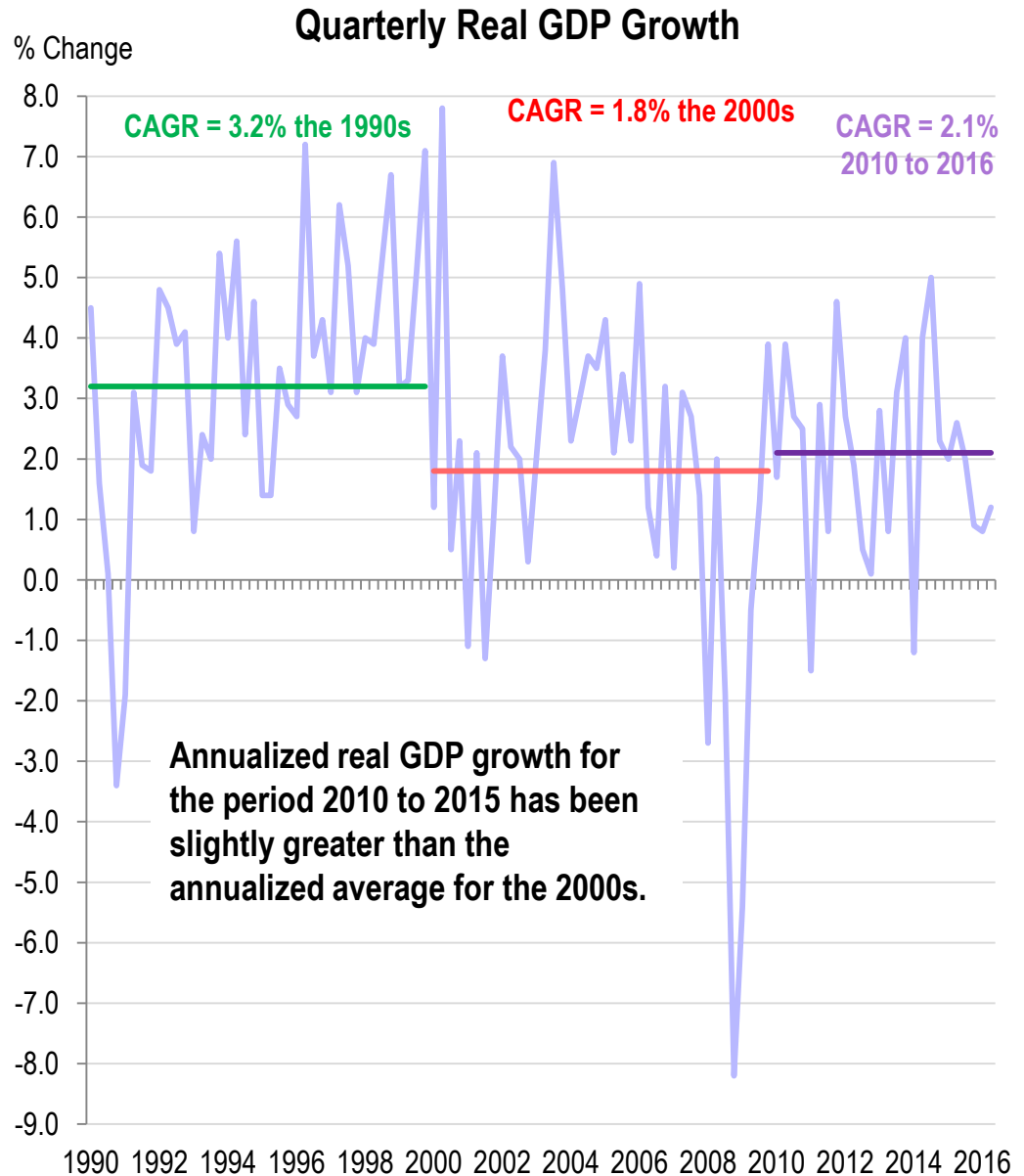
Annualized real GDP growth for the 1990s was 3.2% (green line). It was 1.8% for the 2000s (red line) and 2.1% from 2010 to 2015 (purple line).

Real GDP growth for Q1 2016 was revised upward to 1.1%.

A survey conducted by the Philadelphia Fed projects 2016 real GDP growth will be 1.5%. This is below the cber.co forecast (2.3 to 2.7% range).

Real GDP growth for recent years was:

- 2010 2.5%
- 2011 1.6%
- 2012 2.2%
- 2013 1.5%
- 2014 2.4%
- 2015 2.4%



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



United States Economy Labor

2016 Employment Growth

Job Growth is Uneven

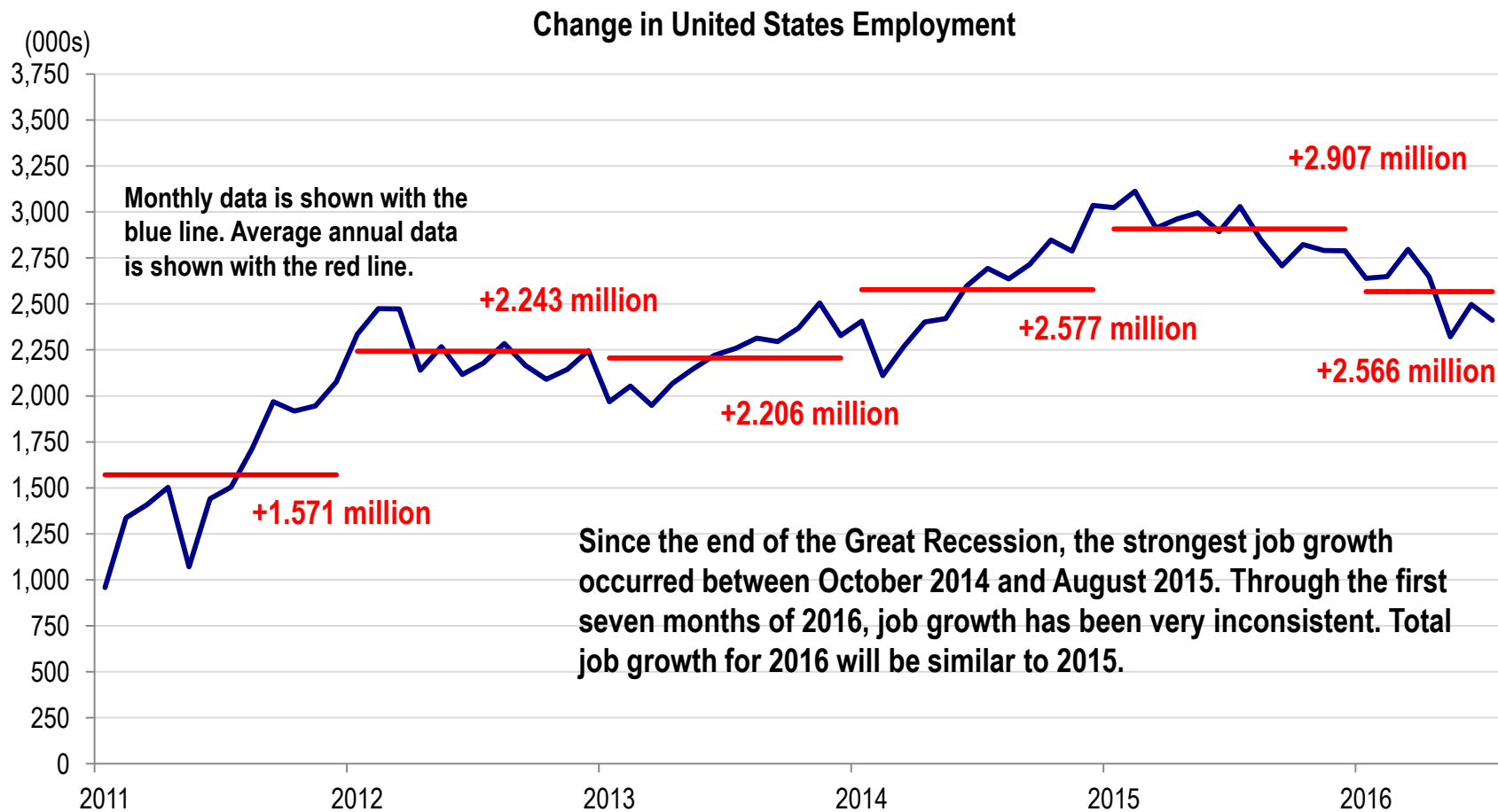
U.S. job growth for 2016 has been a little bit like the performance of the Colorado Rockies this season. There has been a little bit of everything – good, bad, and in-between.

At best, the seasonally adjusted job growth (month-over-previous-month) has been very uneven. There are no reasonable explanations for the declines in April and May and for the large increases in June and July.

- January – Modest growth (168,000)
- February – Solid to strong growth (233,000)
- March – Modest growth (186,000)
- April – Weak to modest growth (144,000)
- May – Weak growth (24,000)
- June – Strong growth (292,000)
- July - Strong growth (255,000)

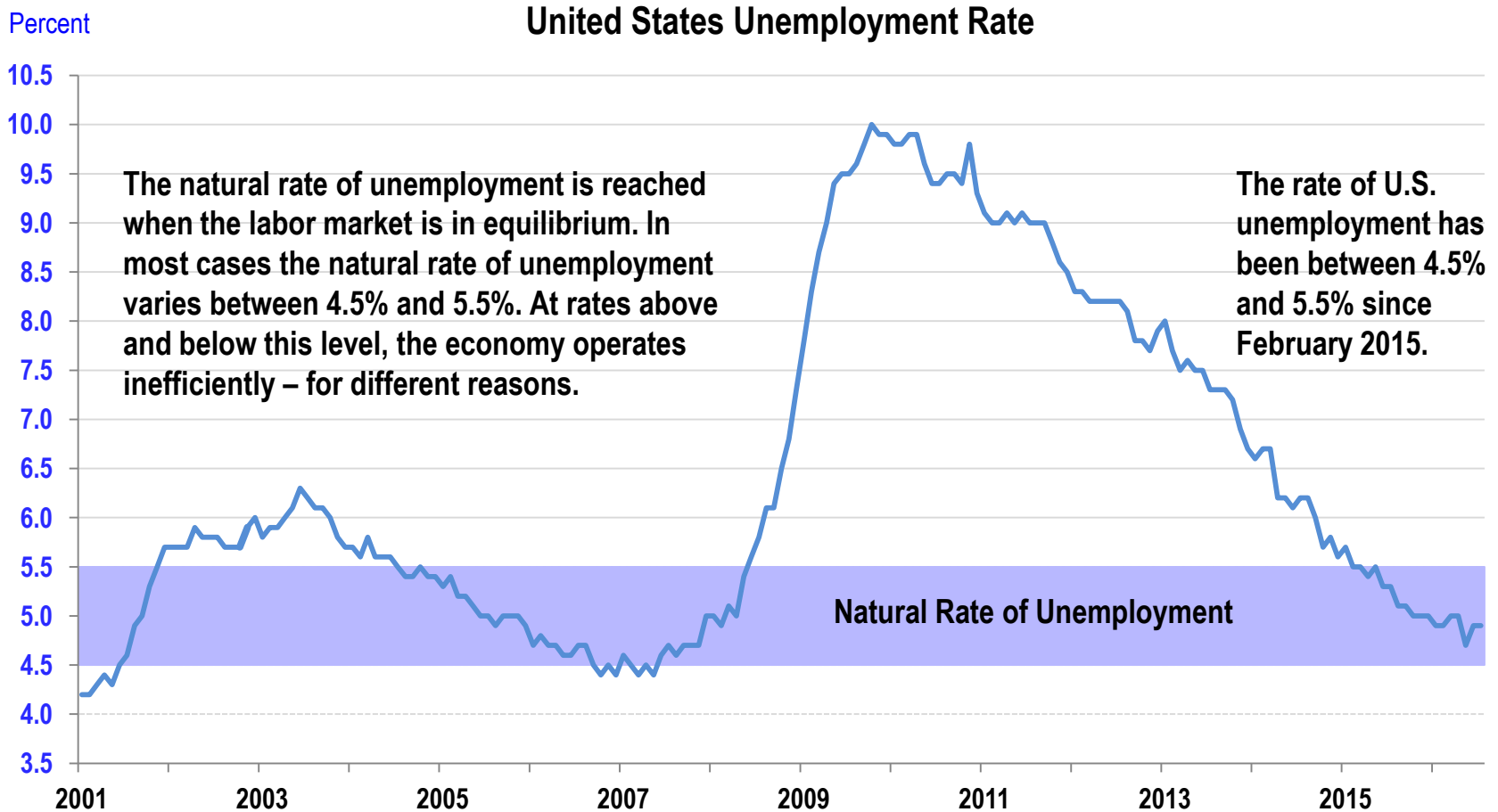
Even with the “ups and downs”, the U.S. is on track to add 2.6 million jobs this year. This would be similar to the total number of jobs added in 2014.

Change in United States Employment Year-Over-Year



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

United States Unemployment Rate



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

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● The Effect of Low Unemployment Rates and Reduced Participation Rates on Employment Growth



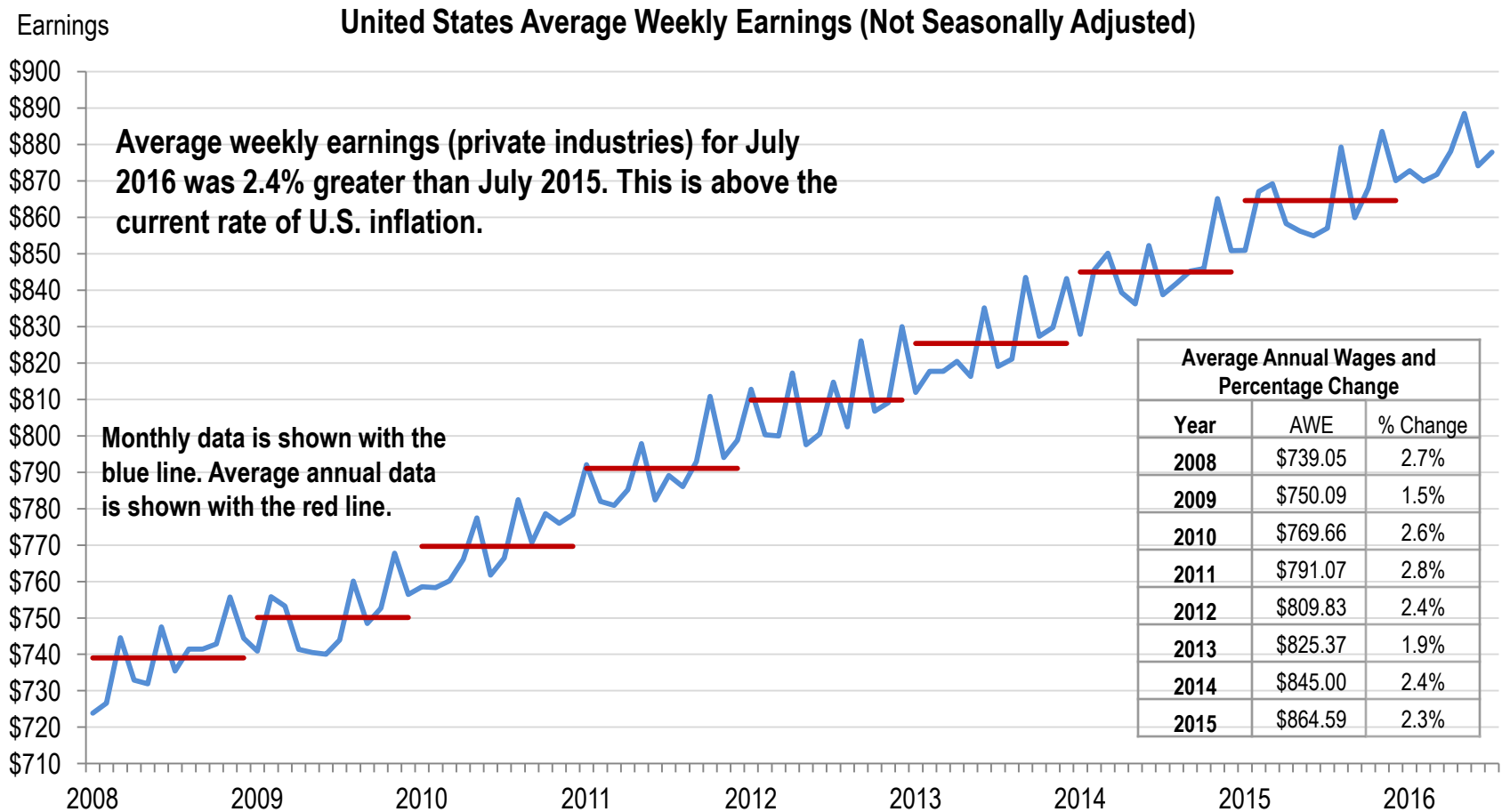
The current reduced participation rates and low levels of unemployment are areas of concern.

- When unemployment rates are low, there are fewer available people to work.
- When participation rates are low, there are fewer people willing to work.

In turn, a company's sales may not increase if they cannot find qualified workers to fill vacant positions. To meet demand, companies may be forced to:

- Invest in processes or capital expenditures to meet demand for their goods and services.
- Raise wages or increase other benefits.
- Outsource or offshore work.
- Allow employees to work overtime.
- Leave money on the table by not meeting the demand for goods and services or by selling inferior products or services.

United States Average Weekly Earnings of All Employees (Private Sector)



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



United States Economy

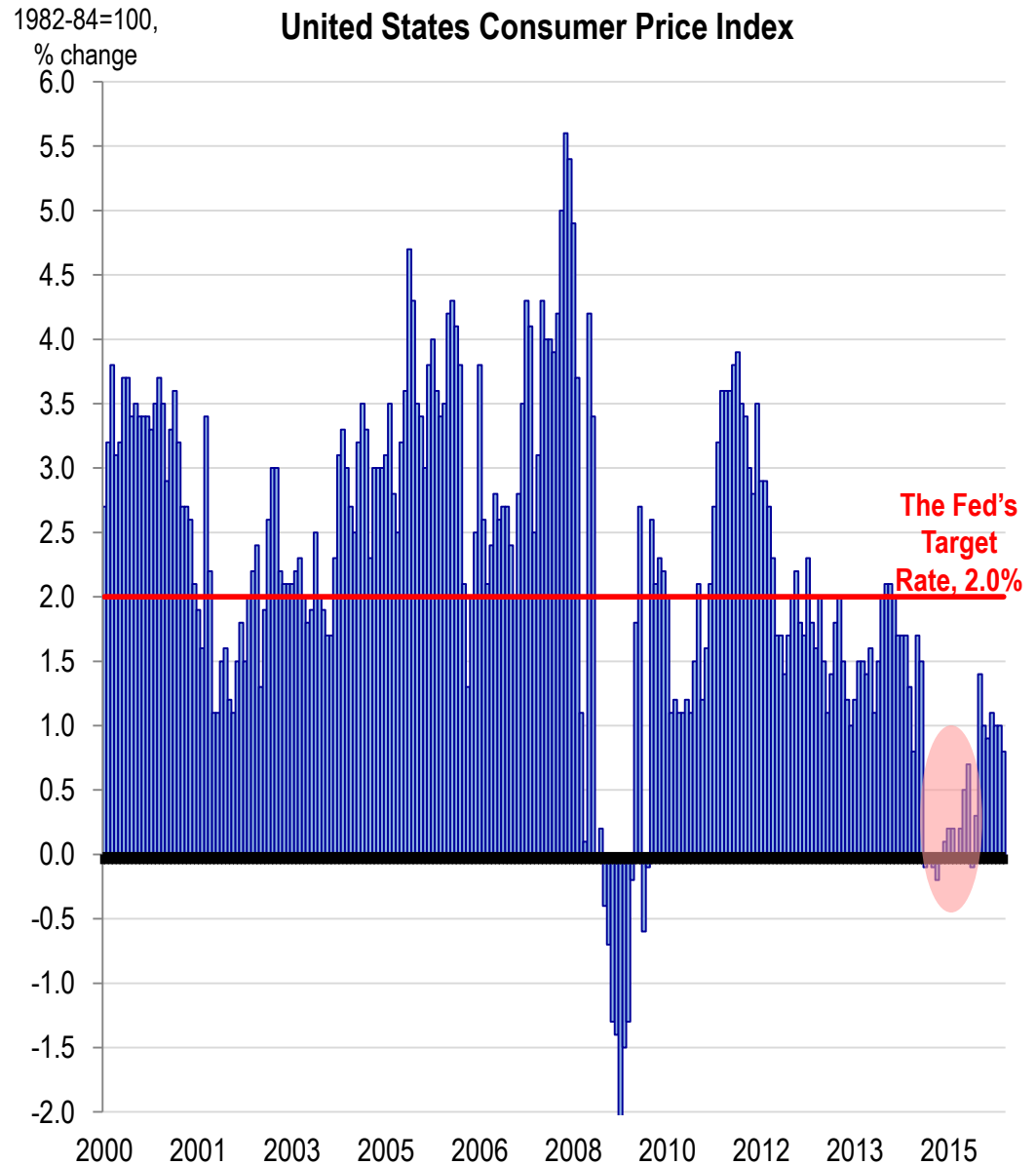
Inflation, Financial Markets and Price of Oil

Consumer Price Index (CPI)

In 2015 (red oval), lower fuel costs played a major role in the precipitous decline in U.S. inflation, as measured by the CPI.

Inflation will continue to increase as the Fed raises interest rates (gradually), housing prices increase, gasoline prices rise, and wages increase.

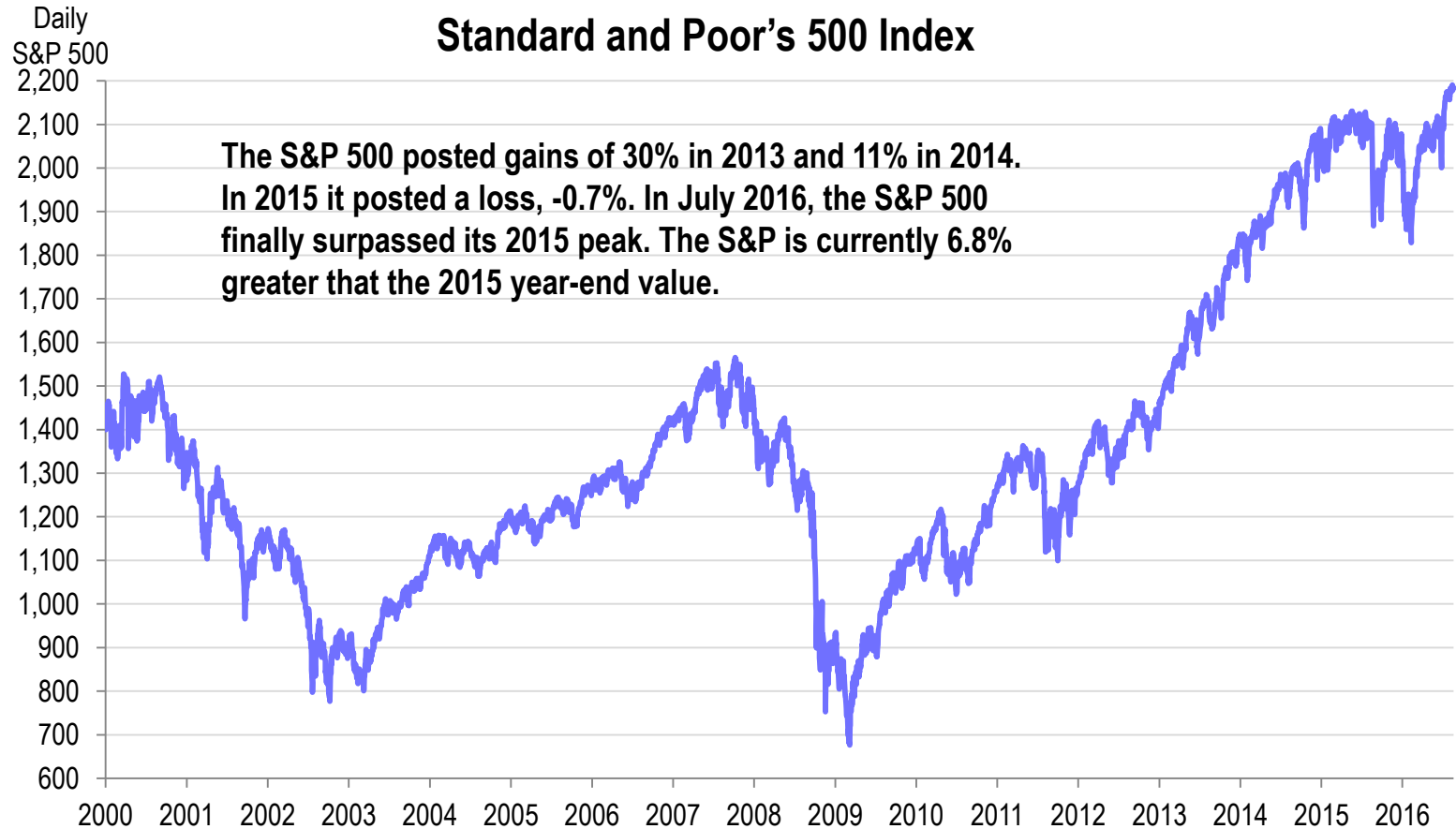
It is the Fed's intent to manage inflation so that it approaches their target rate of 2.0%. As can be seen from the chart, that is easier said than done.



Source: Bureau of Labor Statistics, cber.co, nsa, y-o-y monthly.

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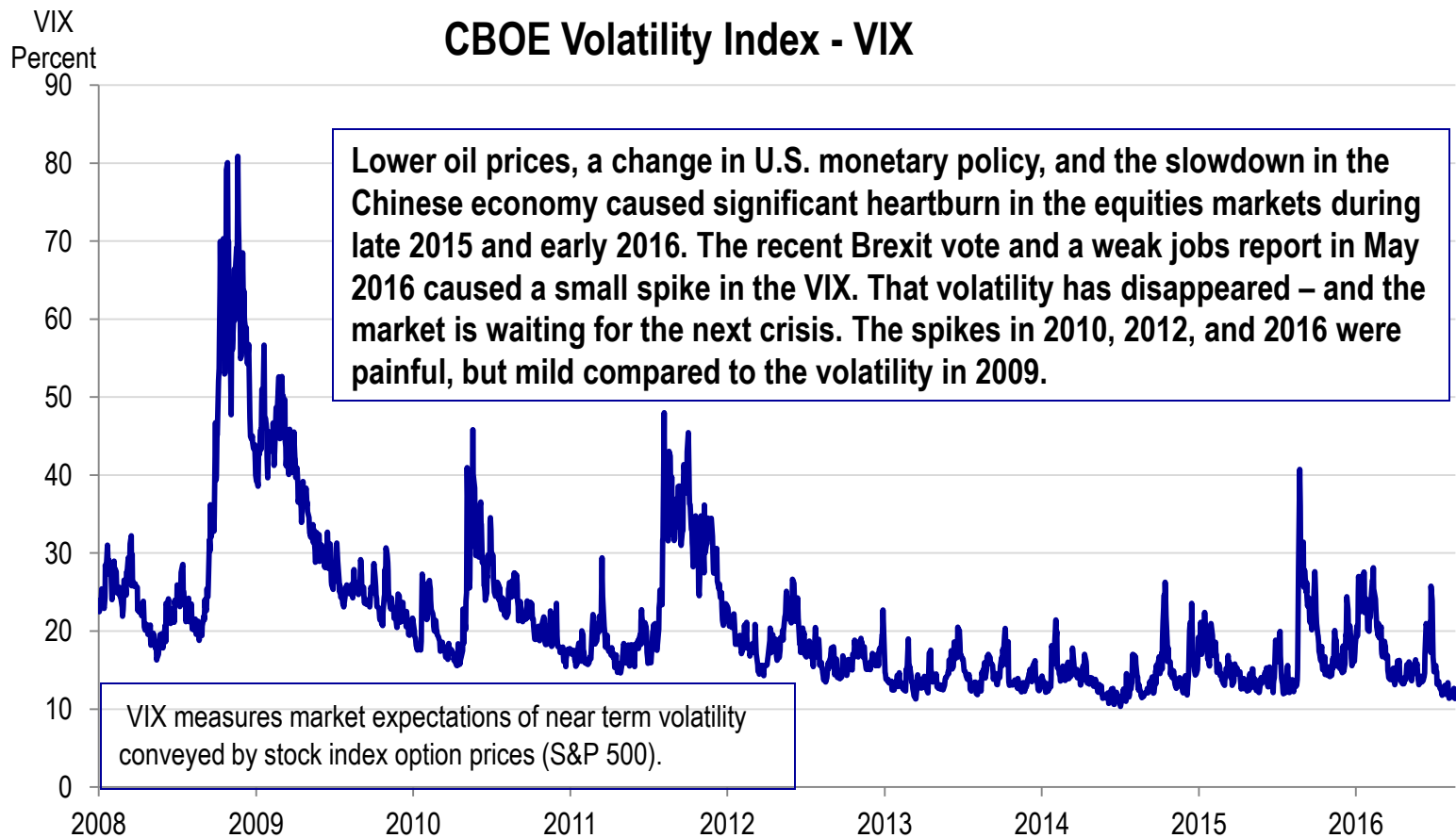
Standard and Poor's 500 Index



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

● CBOE Volatility Index

● VIX (VIXCLS)



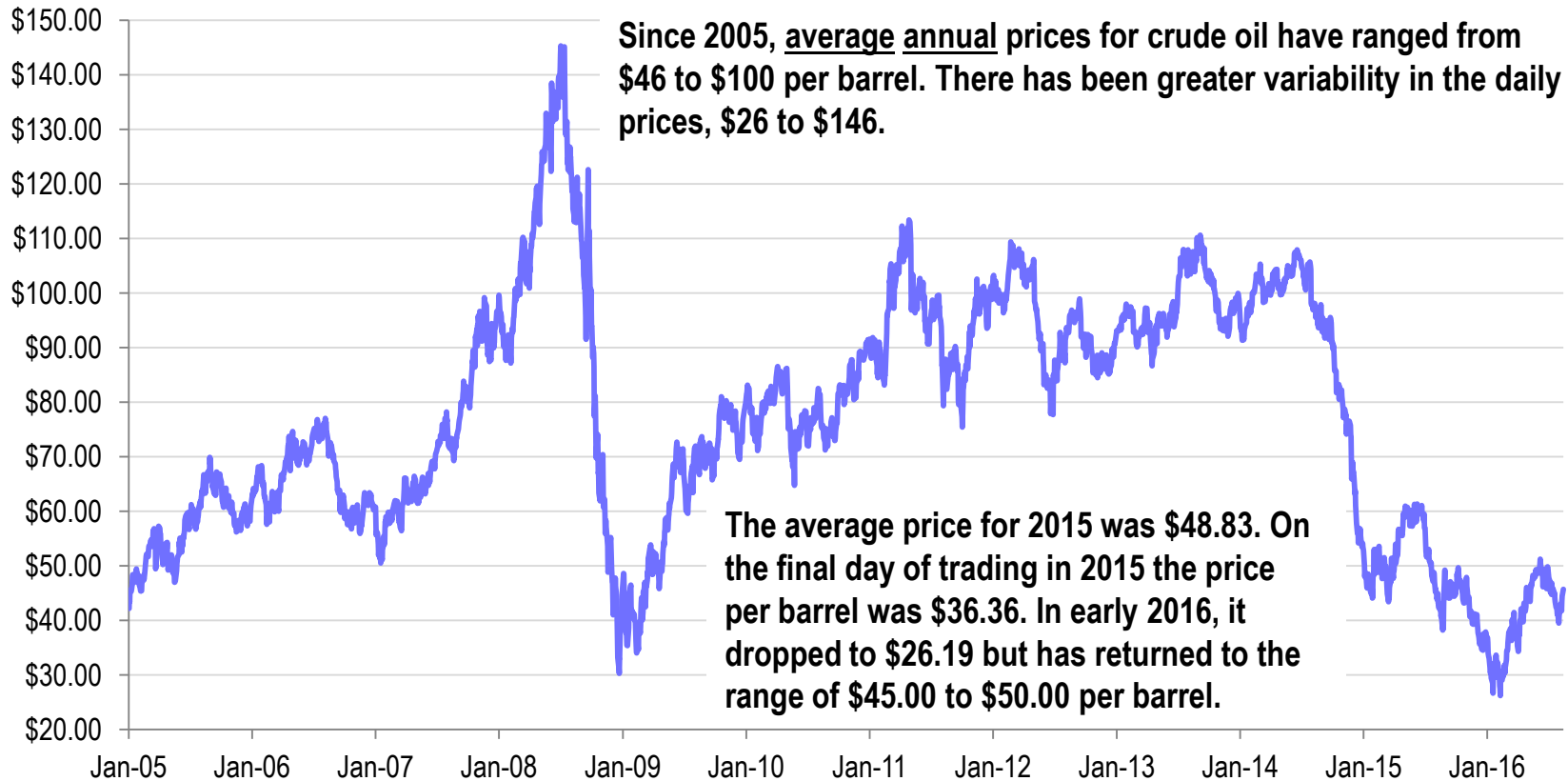
Source: FRED, S&P 500, cber.co.

Crude Oil Prices

West Texas Intermediate

Dollars
per Barrel

Crude Oil Prices: West Texas Intermediate, Cushing, Oklahoma



Source: FRED, EIA, cber.co.

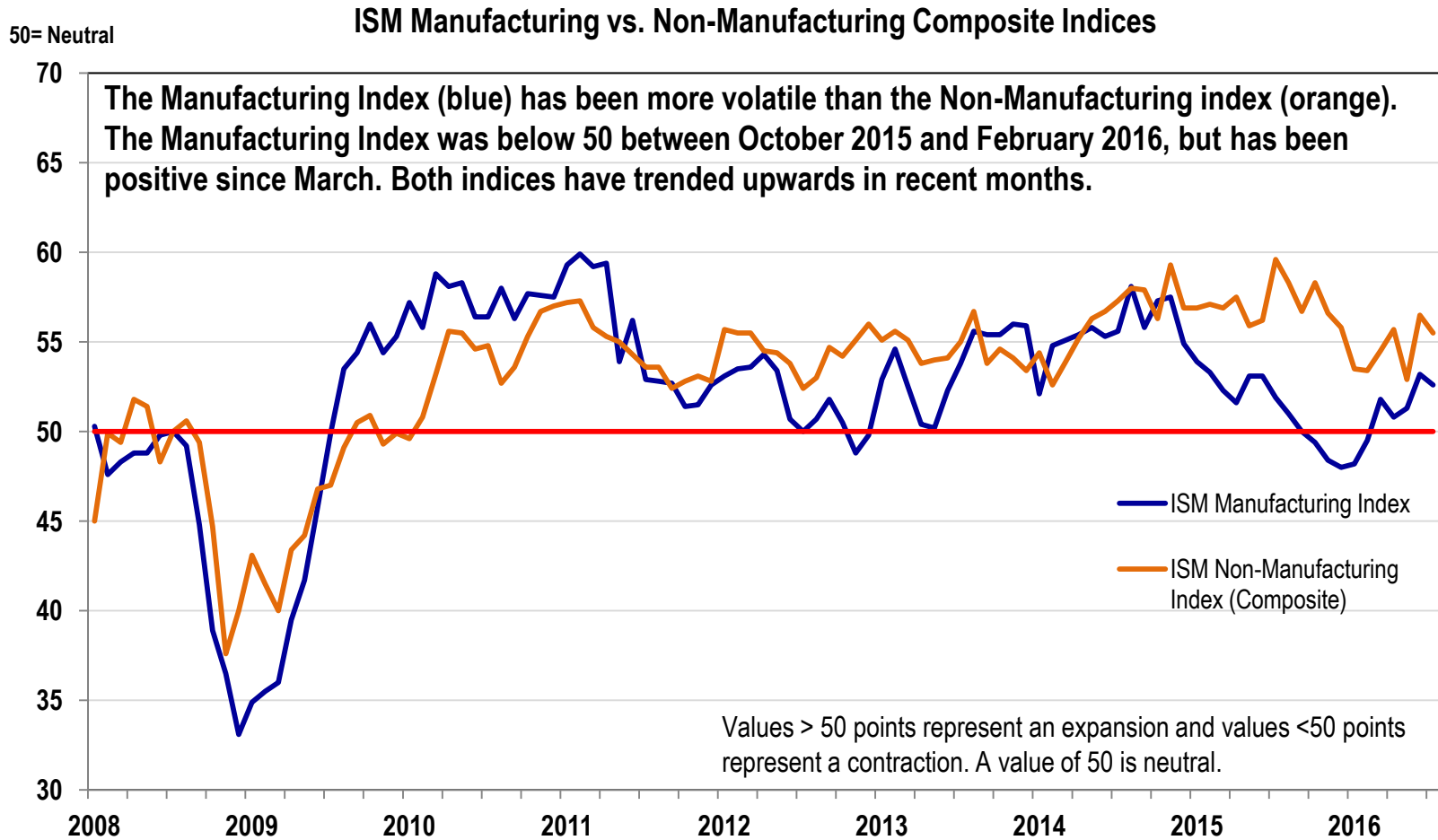


United States Economy

Non-Manufacturing, Manufacturing, and Retail

ISM PMI Composite Indices

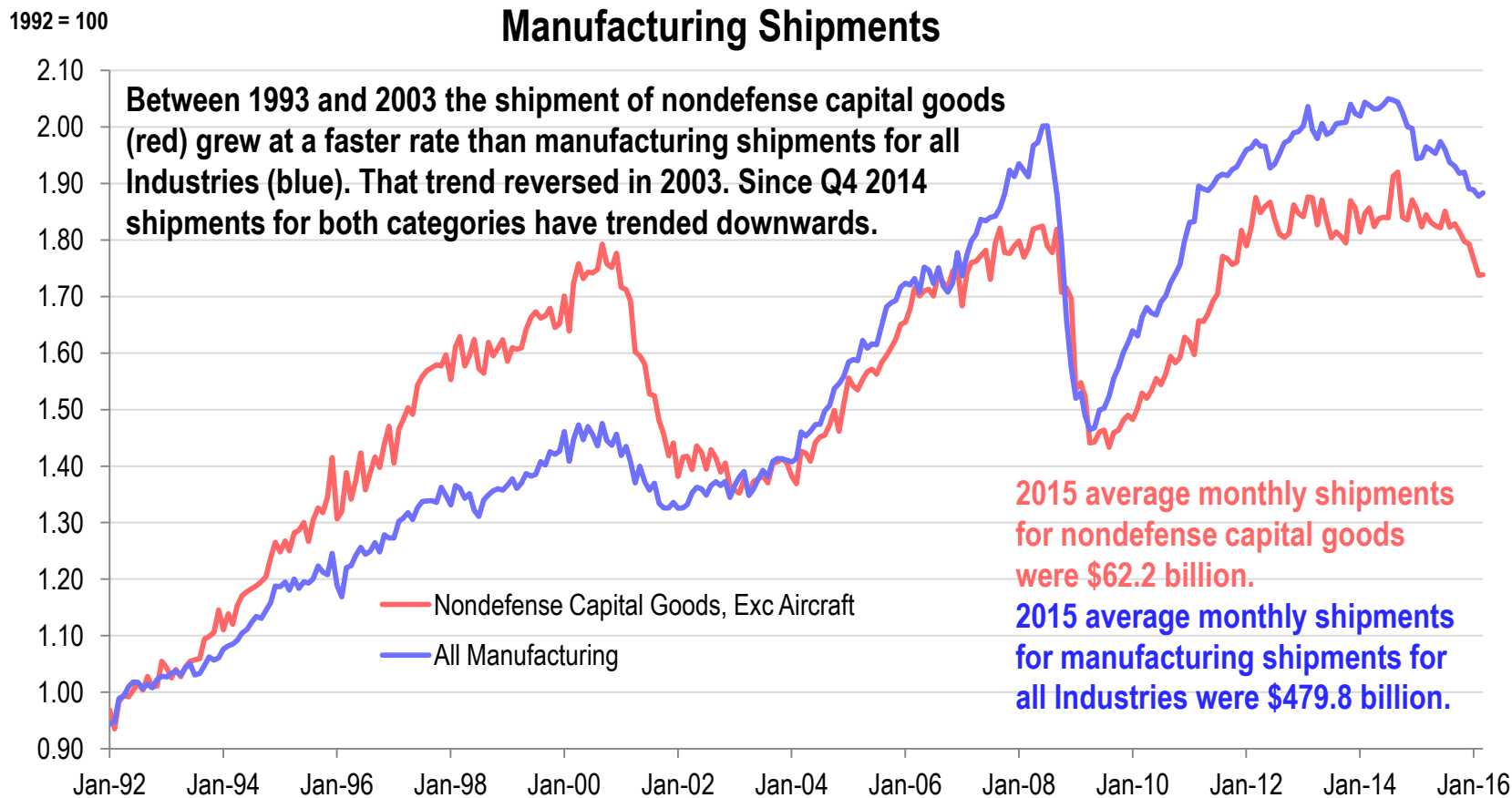
Manufacturing vs. Non-manufacturing



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

United States Manufacturing Shipments

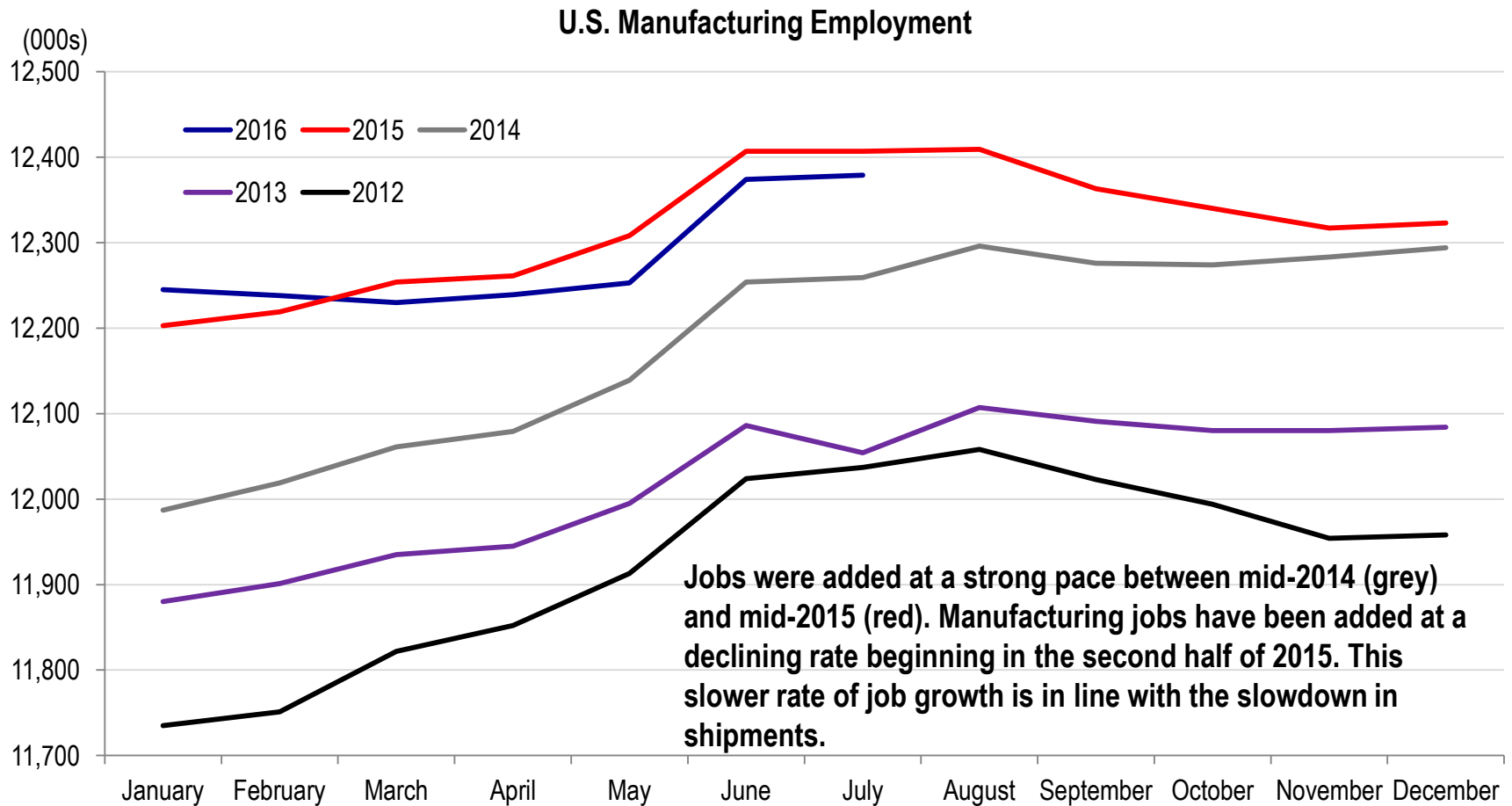
All Industries vs. Nondefense Capital, Excluding Aircraft



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

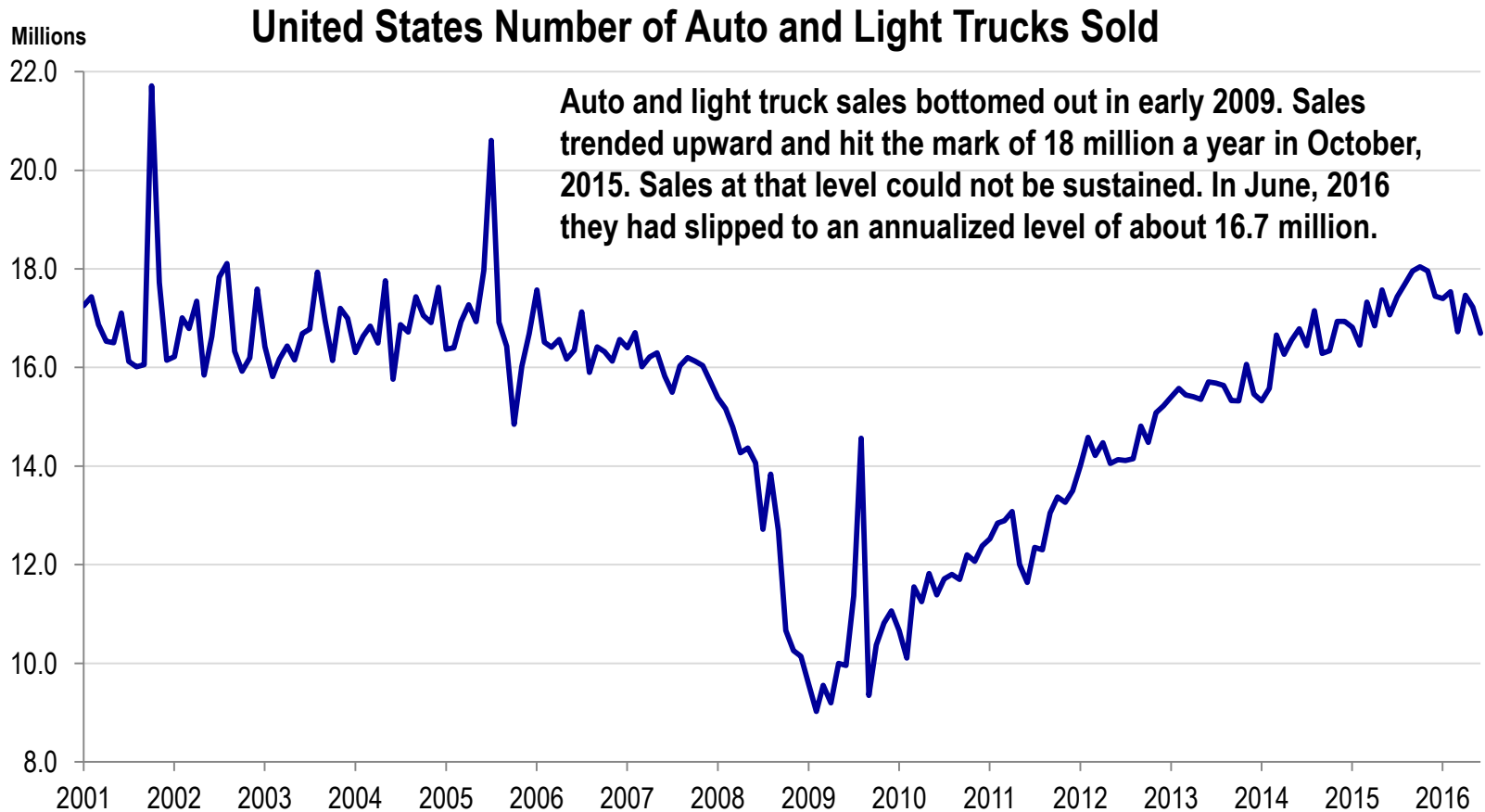
United States Manufacturing Employment

2012 to Current



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

U.S. Weekly Auto and Light Truck Sales

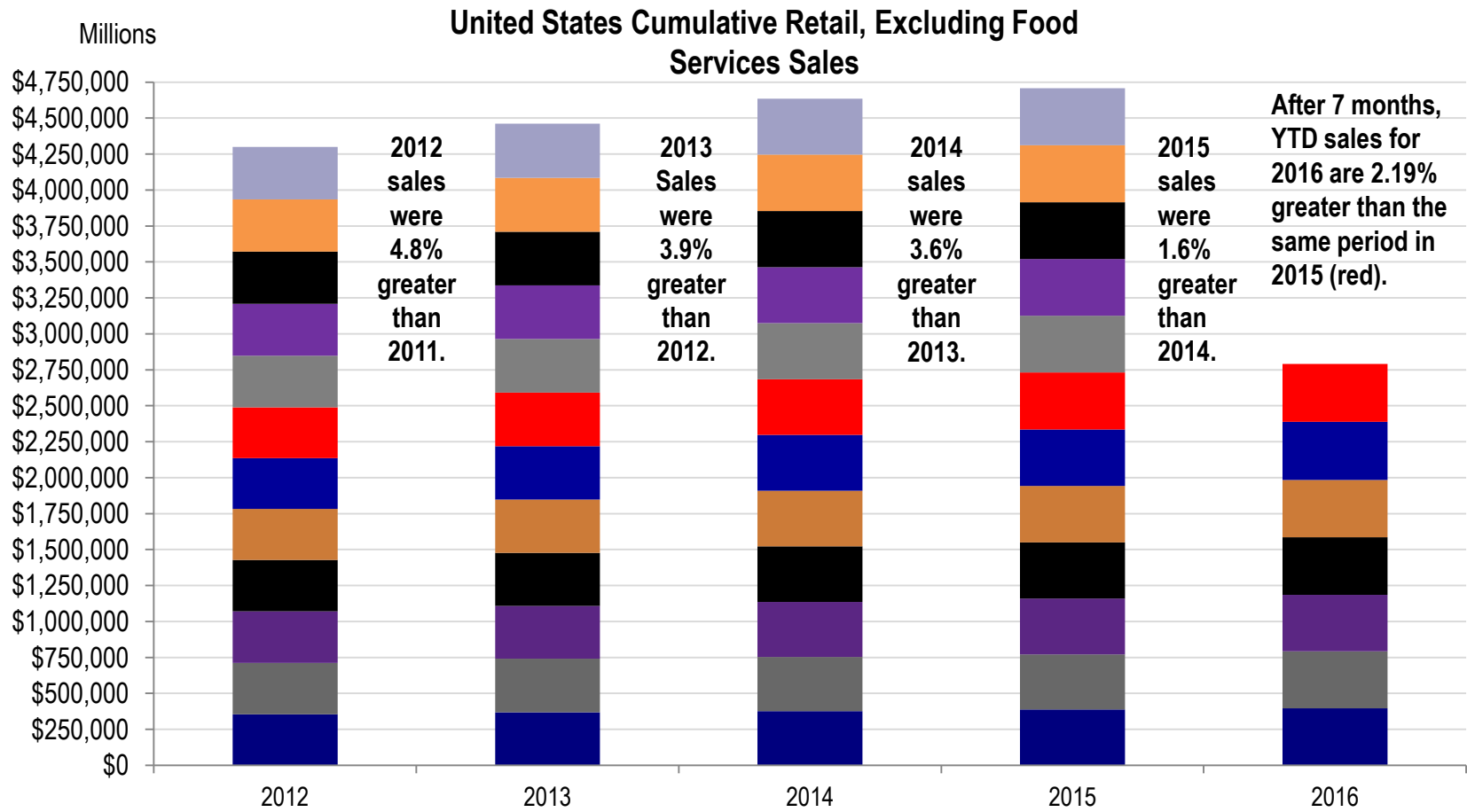


Source: FRED, BEA, cber.co.

Note: Seasonally Adjusted Annualized Rate.

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Cumulative Retail, Excluding Food Services Sales



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

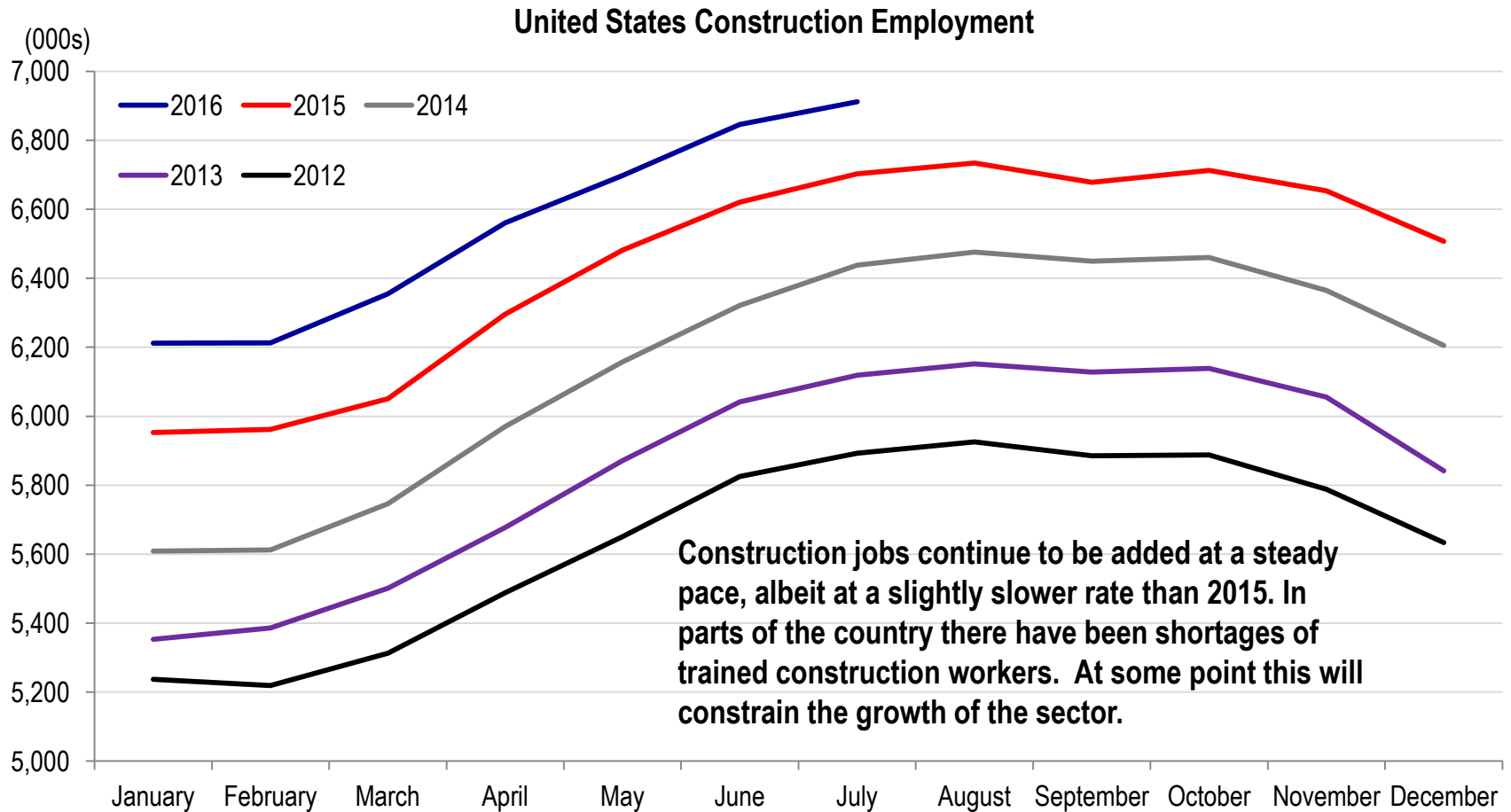
Note: Data is in descending order with December at the top and January at the bottom, not adjusted for inflation.



United States Economy Construction and Housing

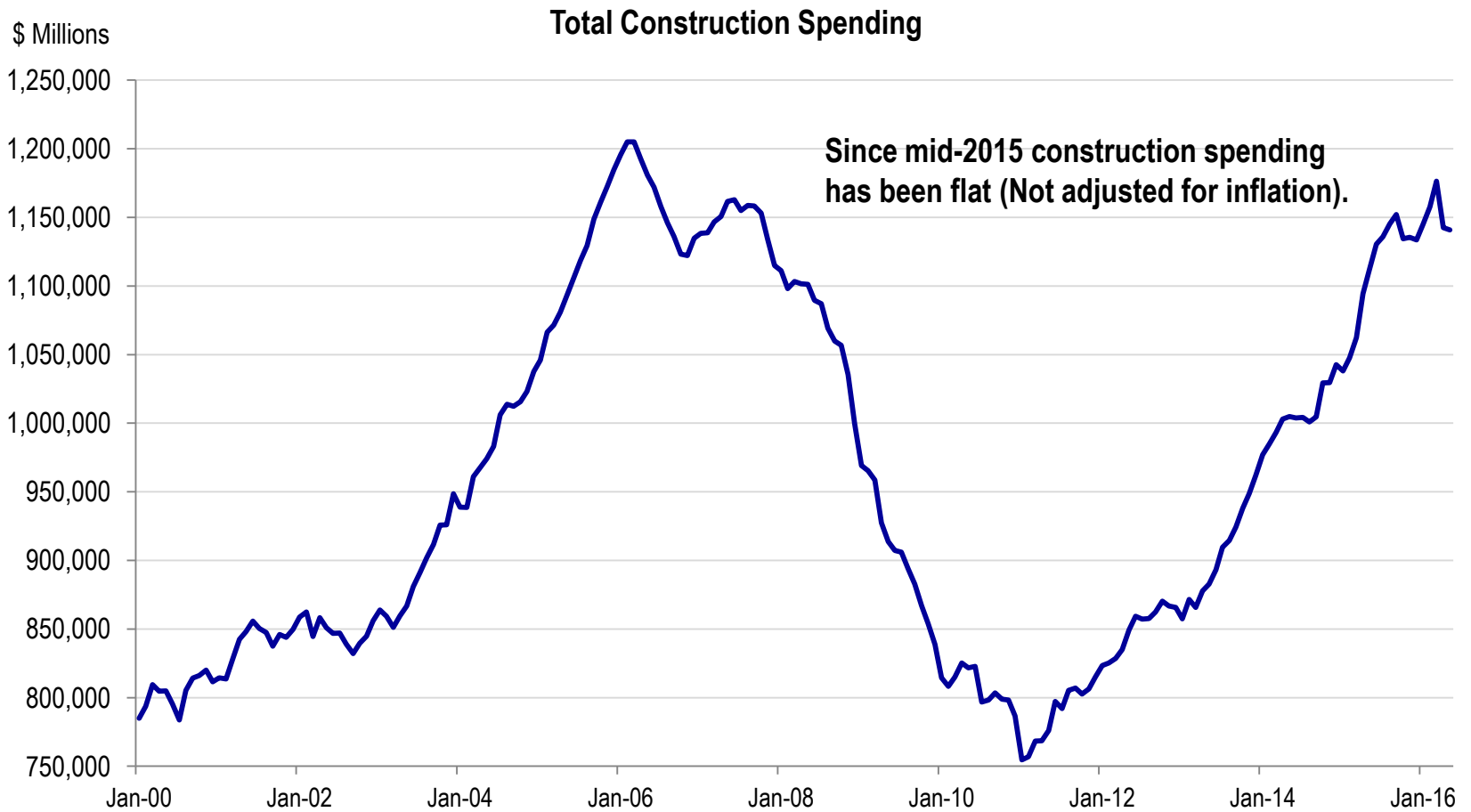
United States Construction Employment

2012 to 2015



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

Total United States Construction Spending

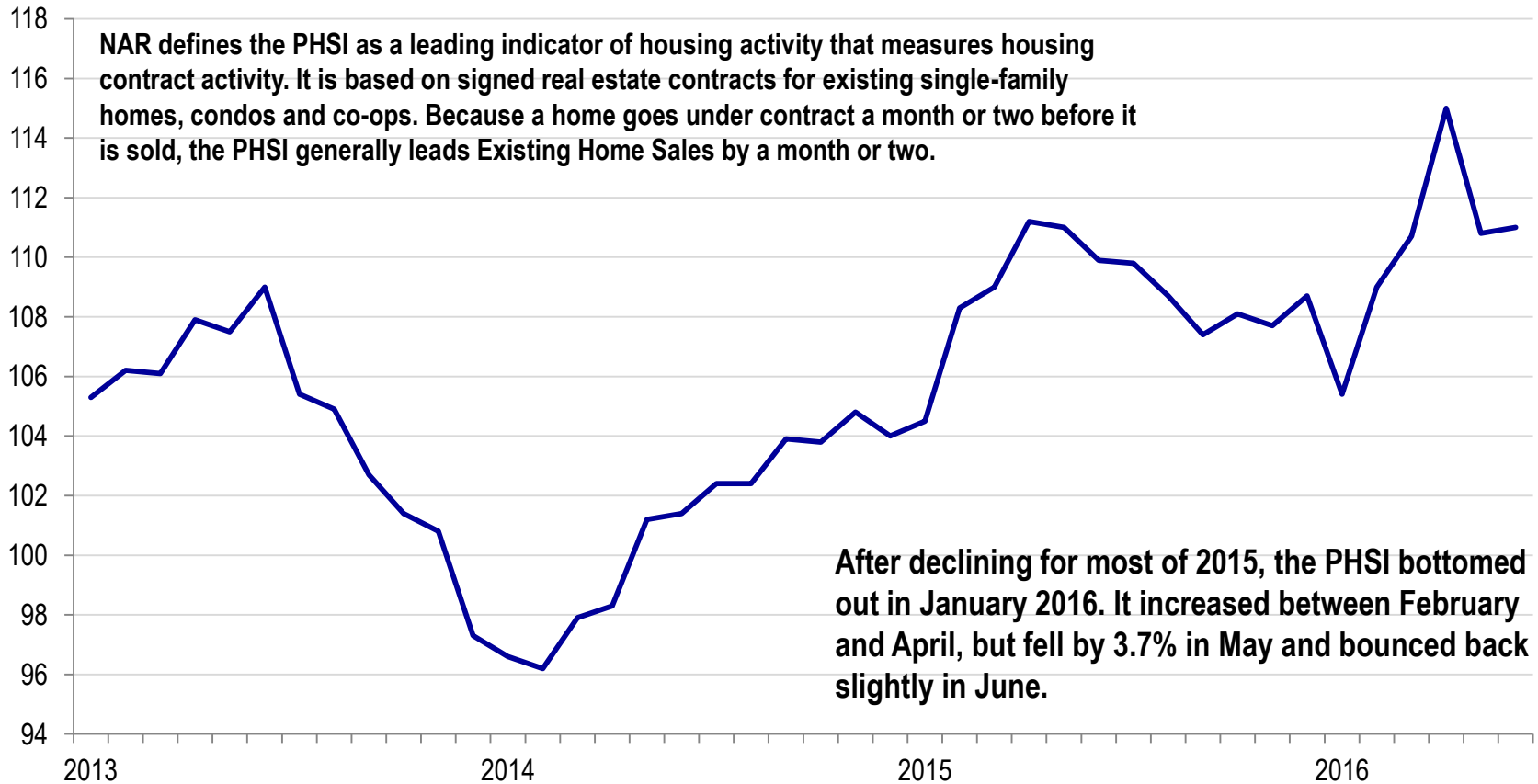


Source: FRED, Census Bureau, cber.co.

Pending Home Sales Index

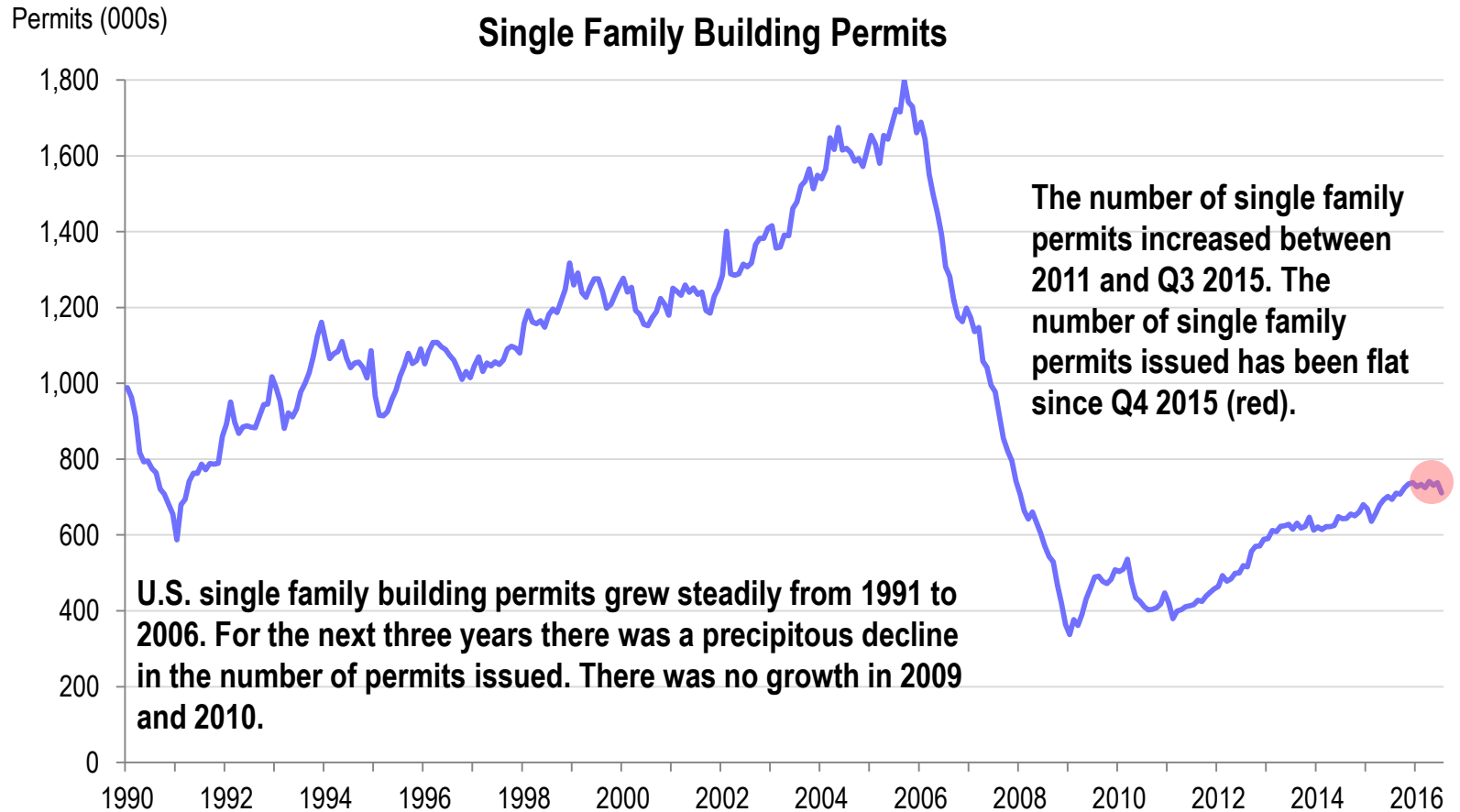
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Pending Home Sales Index



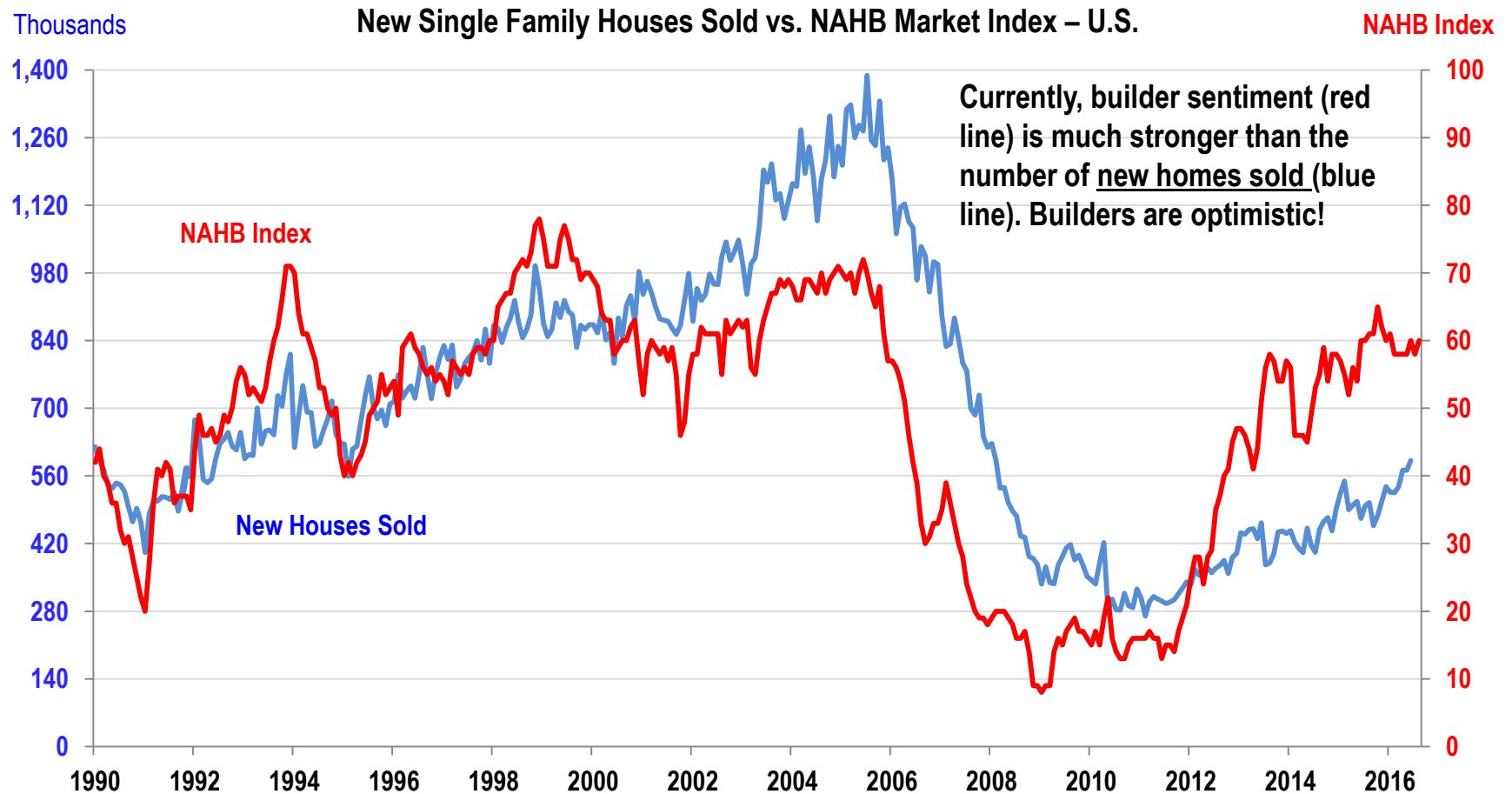
Source: National Association of Realtors, SA; cber.co.

New Single Family Building Permits – U.S.



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

New Single-Family Houses Sold vs. NAHB Market Index



Source: FRED, Census Bureau SA., NAHB; cber.co.

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United States Economy Summary

Summary of the Global and United States Economy

The United States economy should continue to post solid job growth for the remainder of the year. Even if real GDP growth for Q3 is greater than 2.5%, the rate of growth for the year will be well be in the range of 1.5% to 2.0%.

Areas of Concern

IMF economic update - The global rate of growth for real GDP will be lower than originally projected in 2016. It will be 3.1% in 2016 and 3.4% in 2017.

Philly Fed Q3 economic update

- The number of U.S. jobs will increase by 2.4 to 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 been reduced significantly.

Prices at the pump – Expect prices at the pump to increase in the near-term.

Manufacturing - Manufacturing shipments remain sluggish. Auto sales have dropped off. Job growth in the sector is weak.

Reasons to be Optimistic

Earnings - Wage increases have been across most industries and have generally exceeded the rate of inflation.

Housing - Overall, prices in the U.S. housing market are appreciating at about 5%.

CPI - Inflation is near 1.0%, well below the Fed's target rate of 2.0%. It is expected to increase in 2017.

Consumer spending - Consumers are spending and saving. Personal consumption is solid.

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.

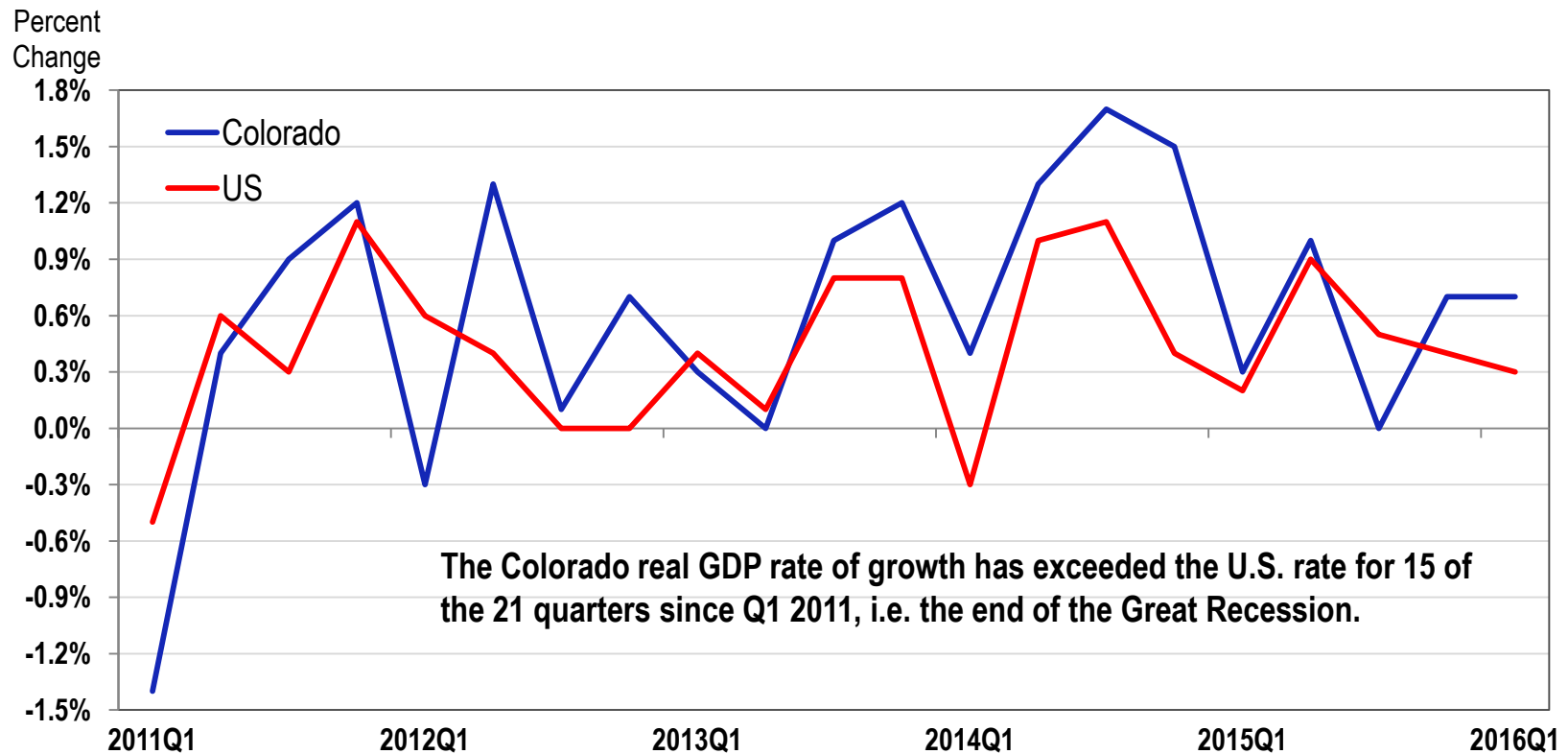


The Colorado Economy

Gross Domestic Product and Labor

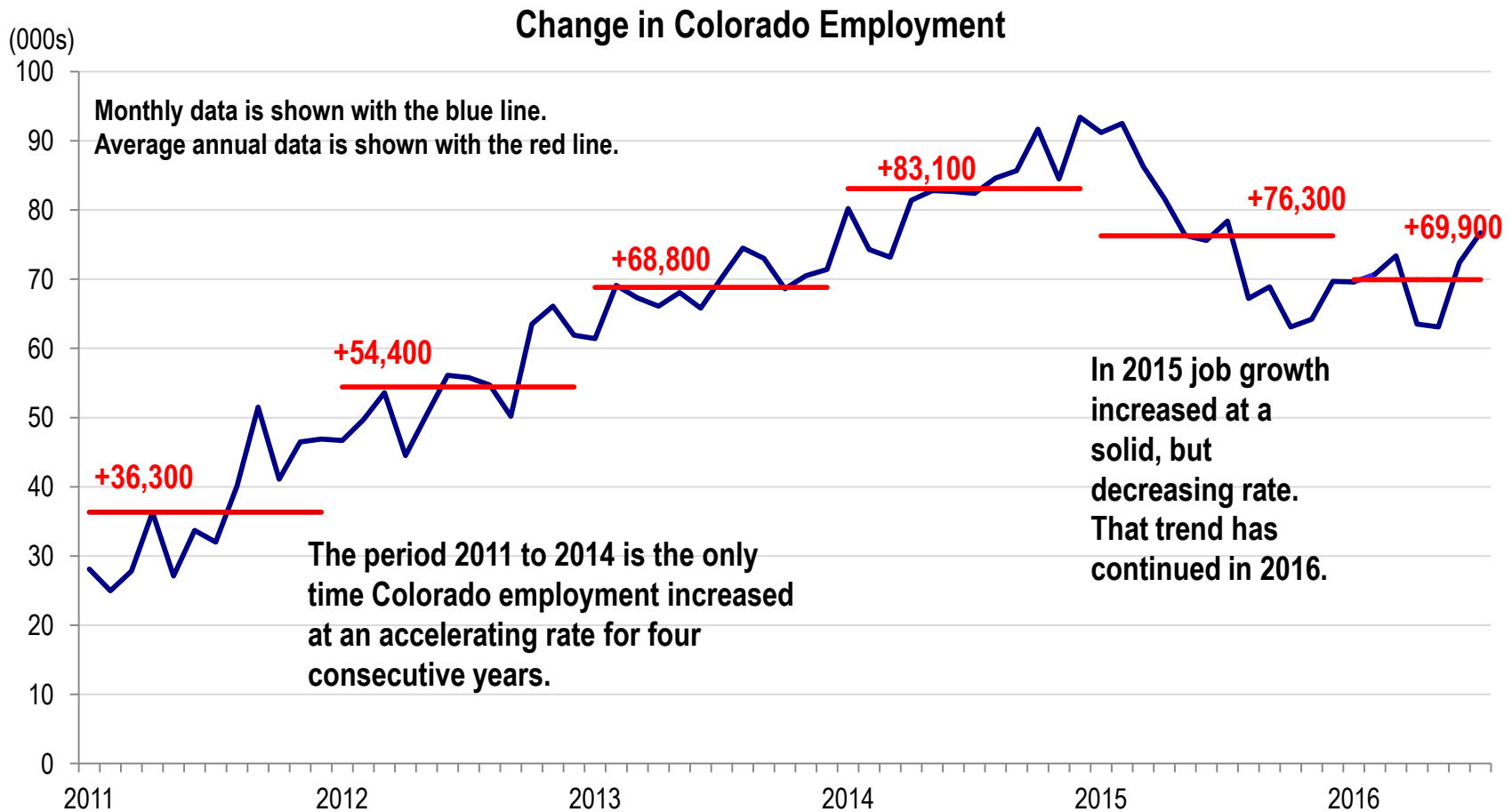
- Change in Quarterly Real GDP
- Over Previous Month
- Colorado vs. United States

Percentage Change in Real GDP Colorado vs. United States



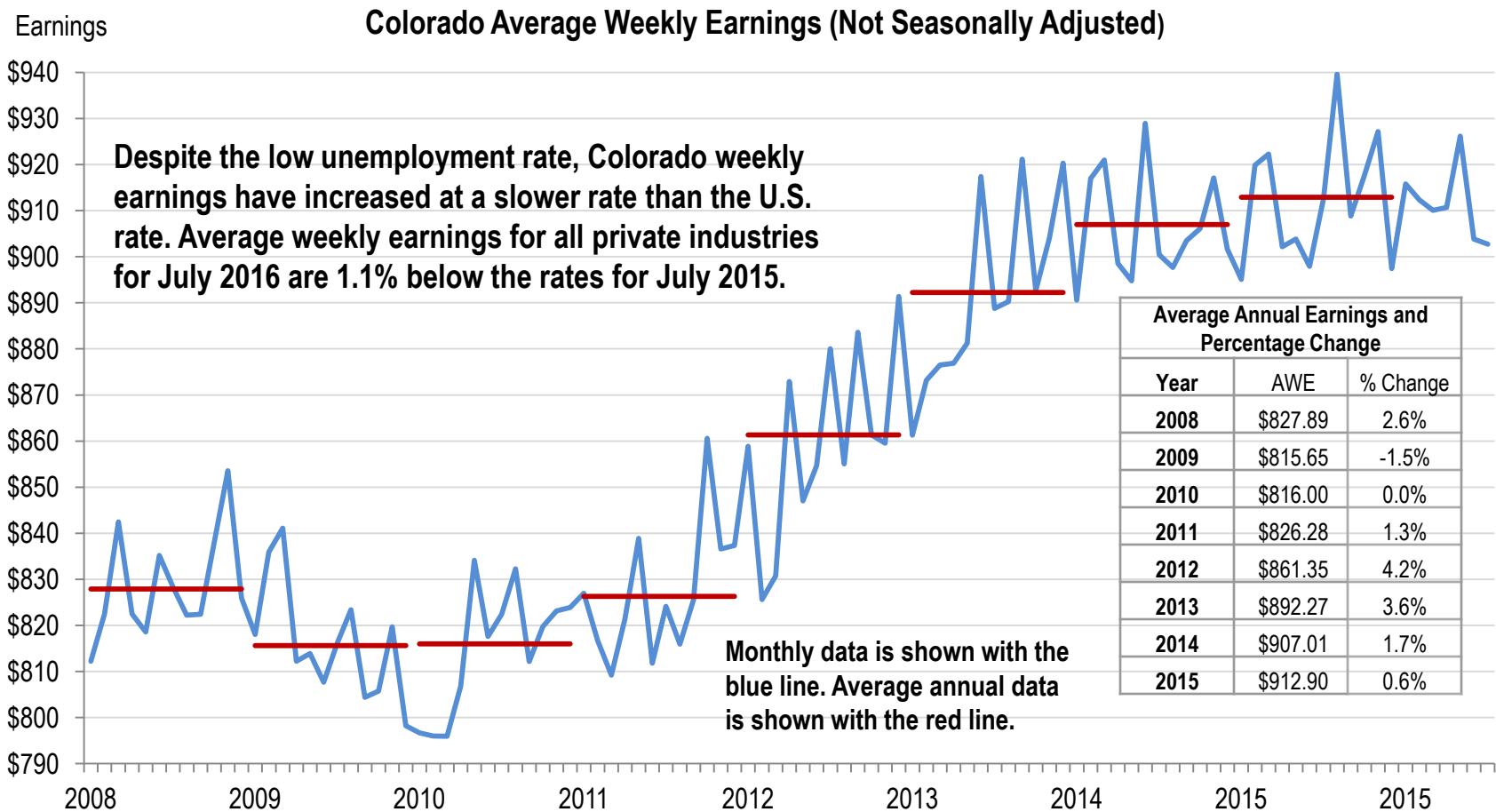
Source: Bureau of Economic Analysis. Note: U.S. GDP is summary of states GDP. Note: Real GDP growth rates are not annualized.

Change in Colorado Employment Year-Over-Year



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

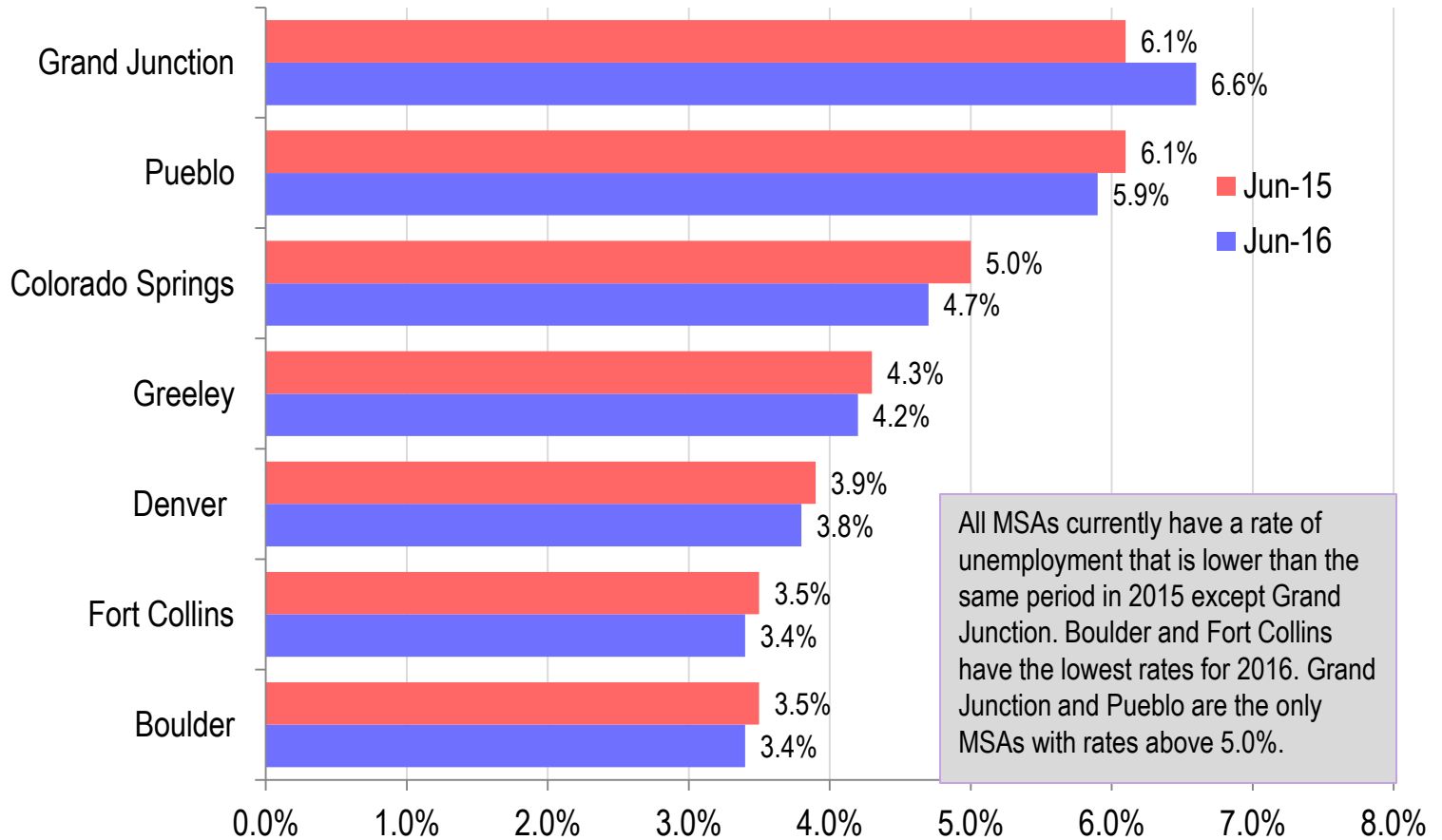
Colorado Average Weekly Earnings of All Employees (Private Sector)



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

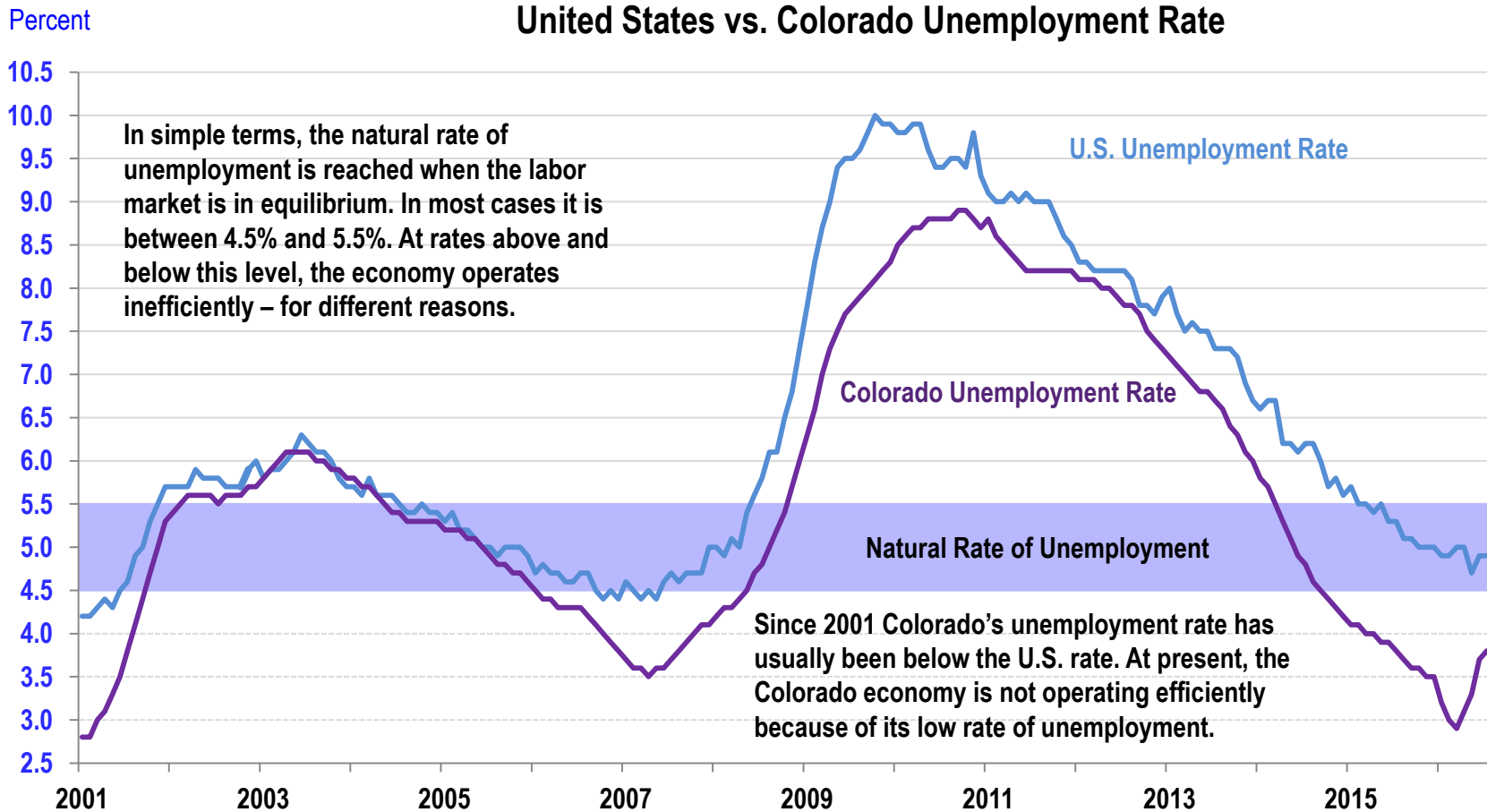
Unemployment by MSA 2015 vs. 2016

Unemployment by MSA



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.

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:

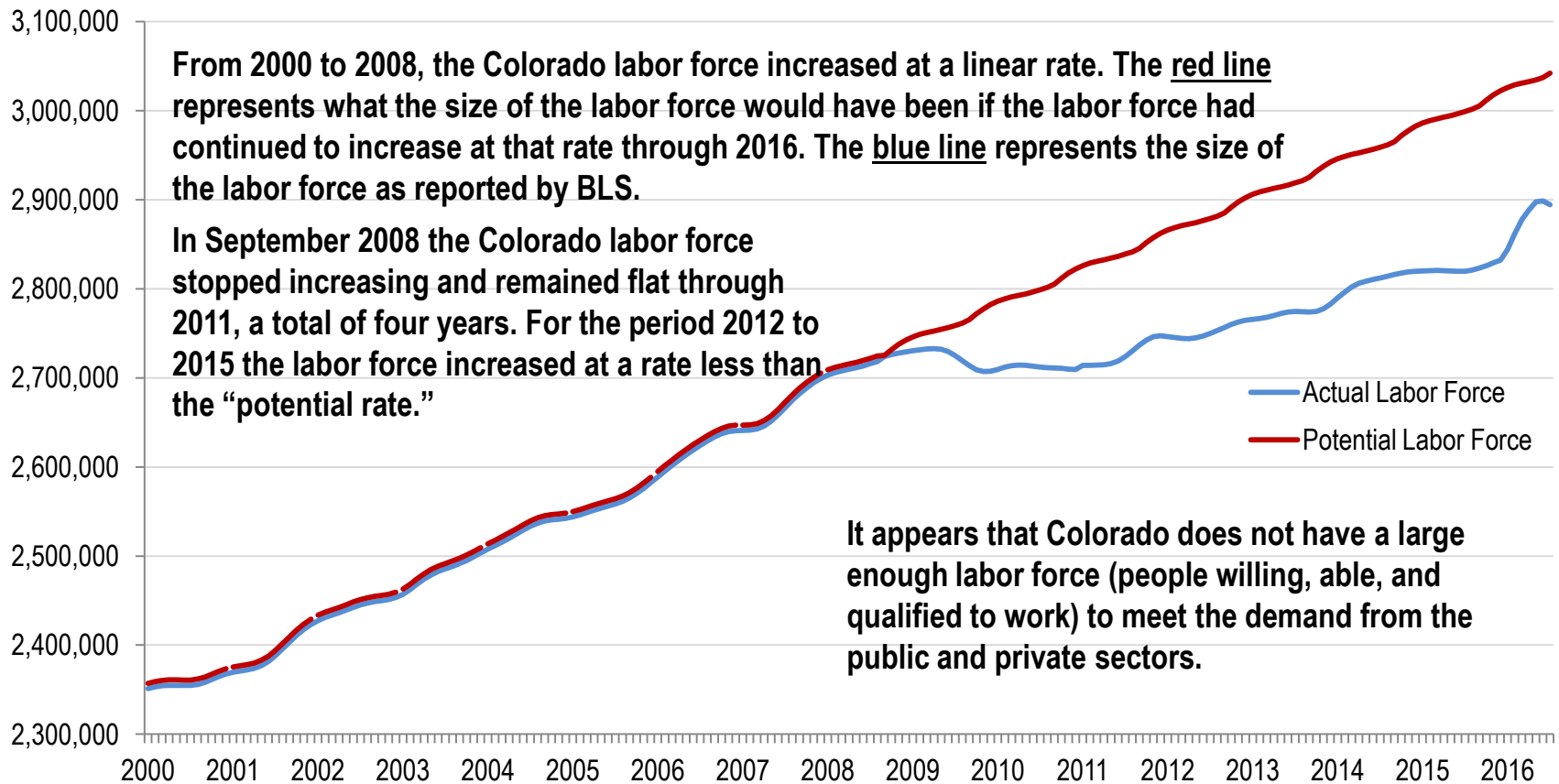
- The rate of unemployment is too high, as it was during the Great Recession.
- The rate of unemployment is too low. The current rate of unemployment in Colorado is too low.

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.

Colorado Labor Force

Colorado Labor Force



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

- Lack of Qualified Labor is a Potential Risk to the
- Colorado Economy
-

The lack of a qualified labor force is a potential near-term risk to the growth of the Colorado economy. The state can address this challenge by strengthening efforts to train the workforce through Colorado's education and government-funded training programs. In addition, it will be necessary for the public and private sector to take responsibility for training within their industry and aggressively attract workers from outside the state for key positions.



Colorado Employment

2016 Colorado Employment by Performance Category
Average Employment 1st Seven 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.

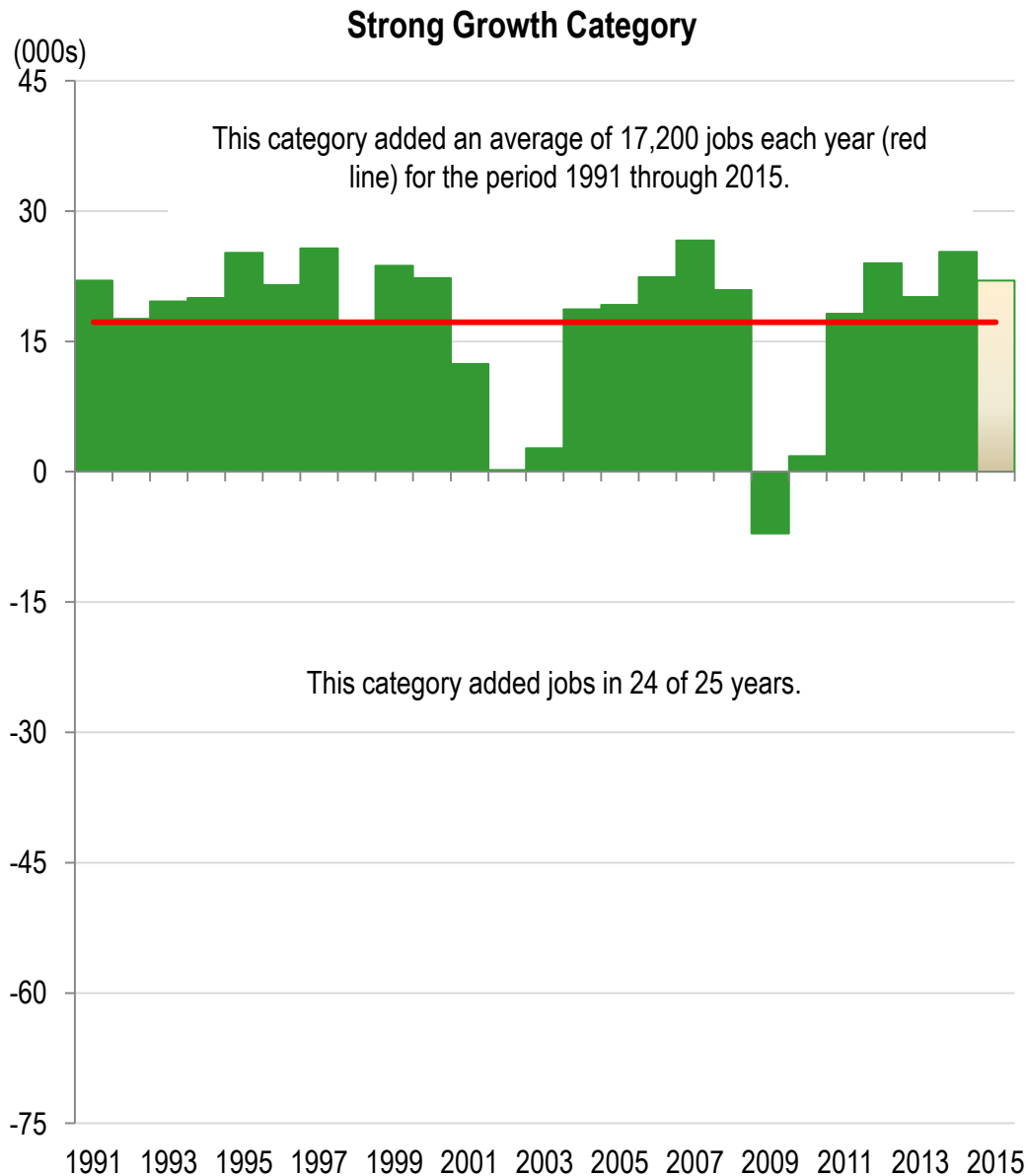
- Professional, Scientific, and Technical Services
- Management of Companies and Enterprises
- Administrative - Business to Business (Not Employment Services)
- Private Education
- Health Care
- Arts, Entertainment, and Recreation
- Other Services.

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



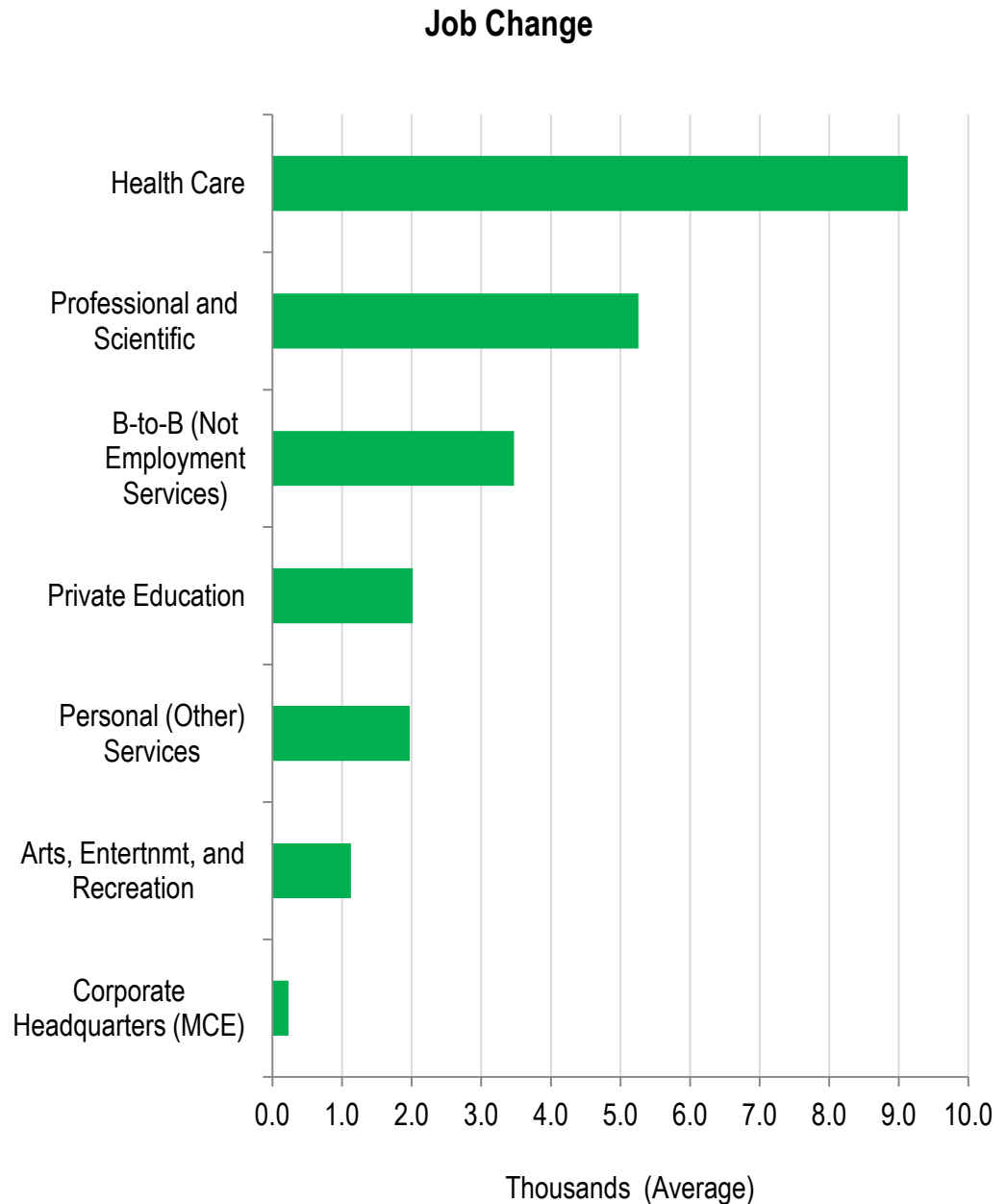
Source: Bureau of Labor Statistics, cber.co.

Solid Growth Sectors

- Average employment for the first 7 months shows this category of sectors added 23,200 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.

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.

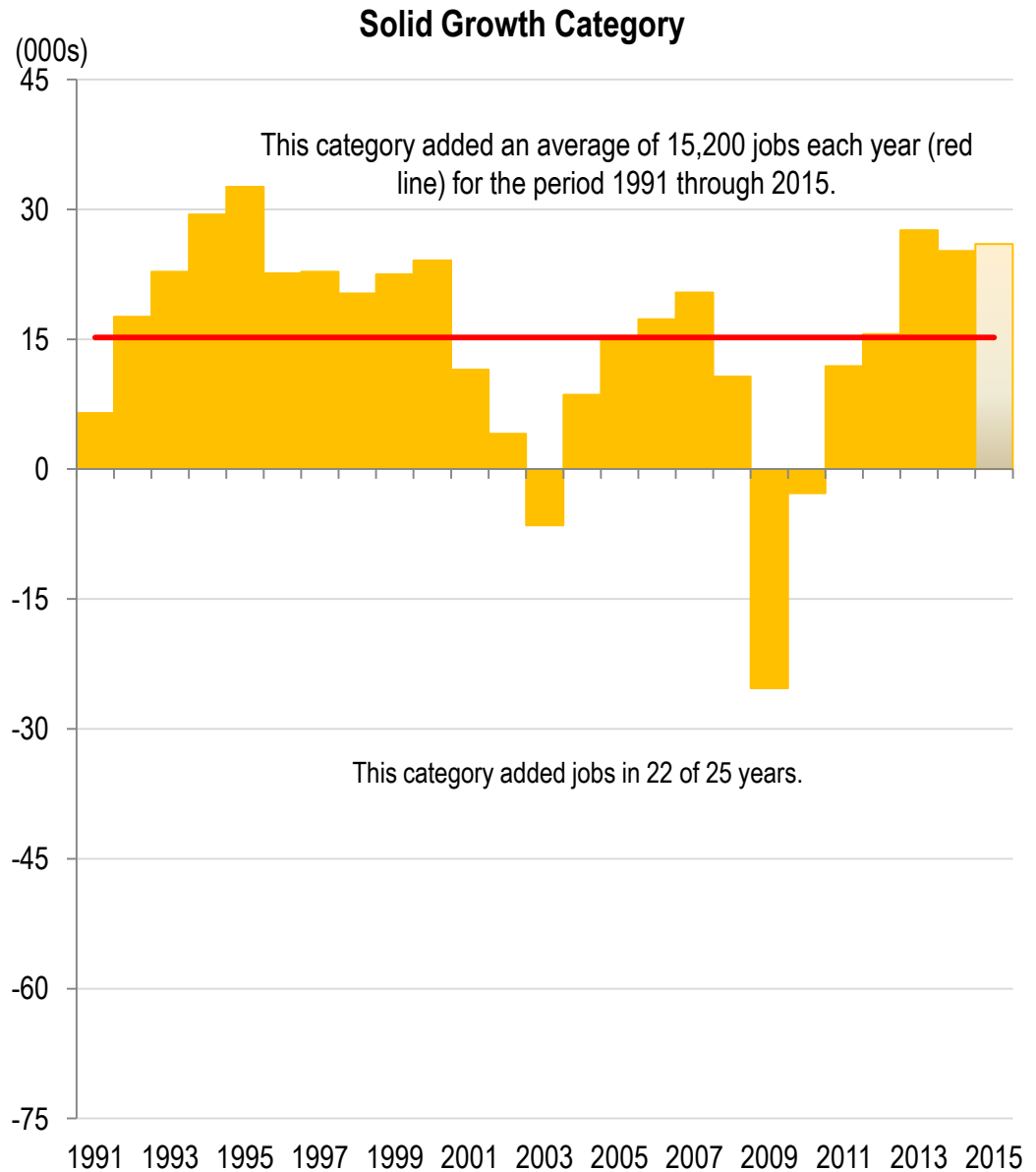
- Wholesale Trade
- Retail Trade
- State (Not Higher Education)
- Higher Education
- Local (Not K-12 Education)
- K-12 Education
- Accommodations and Food Services

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.



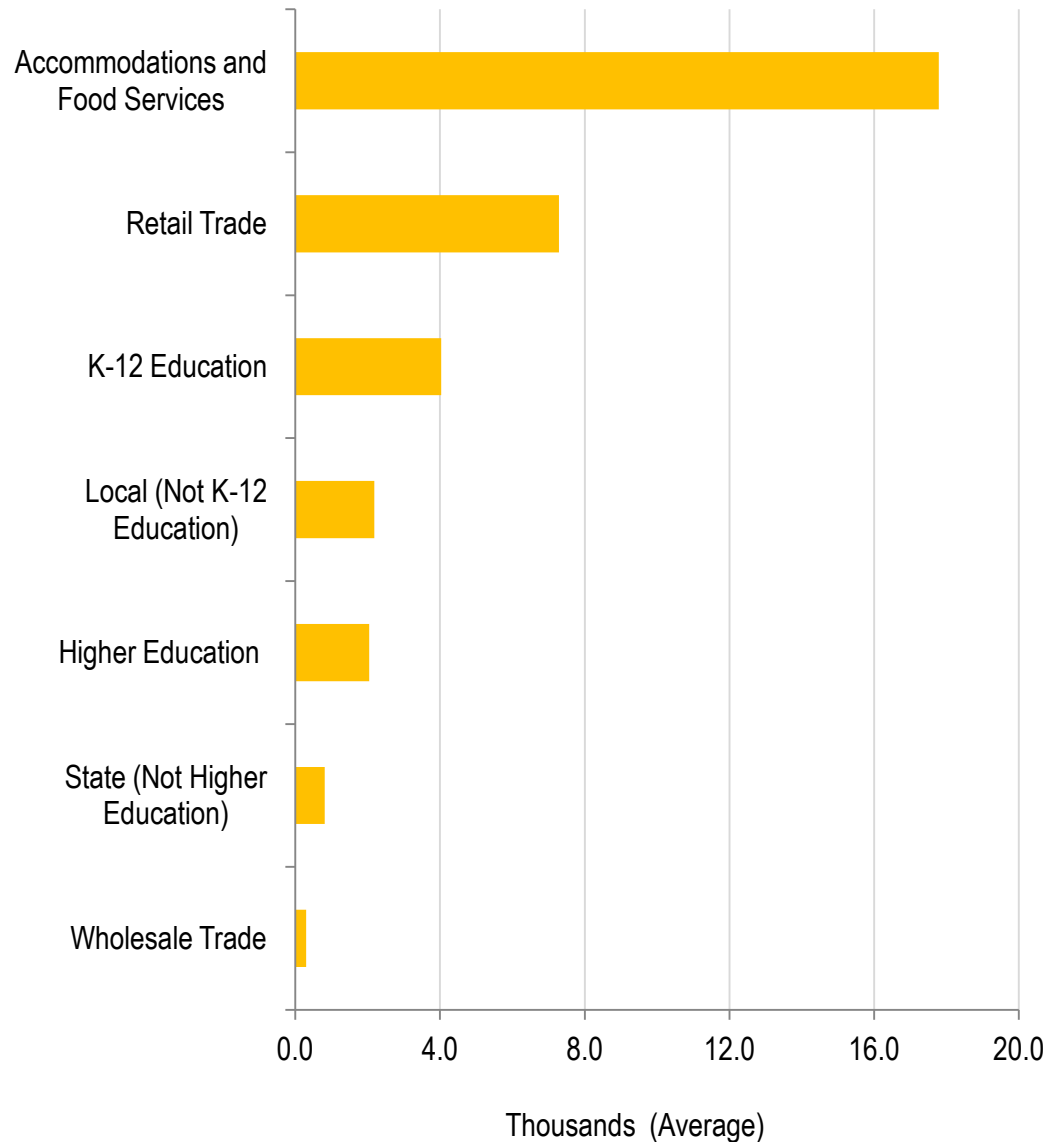
Limited Growth Sectors

- Average employment for the first 7 months shows this category of sectors added 34,400 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.

Job Change



Source: Bureau of Labor Statistics.

Annual Employment Situation for the Volatile Category

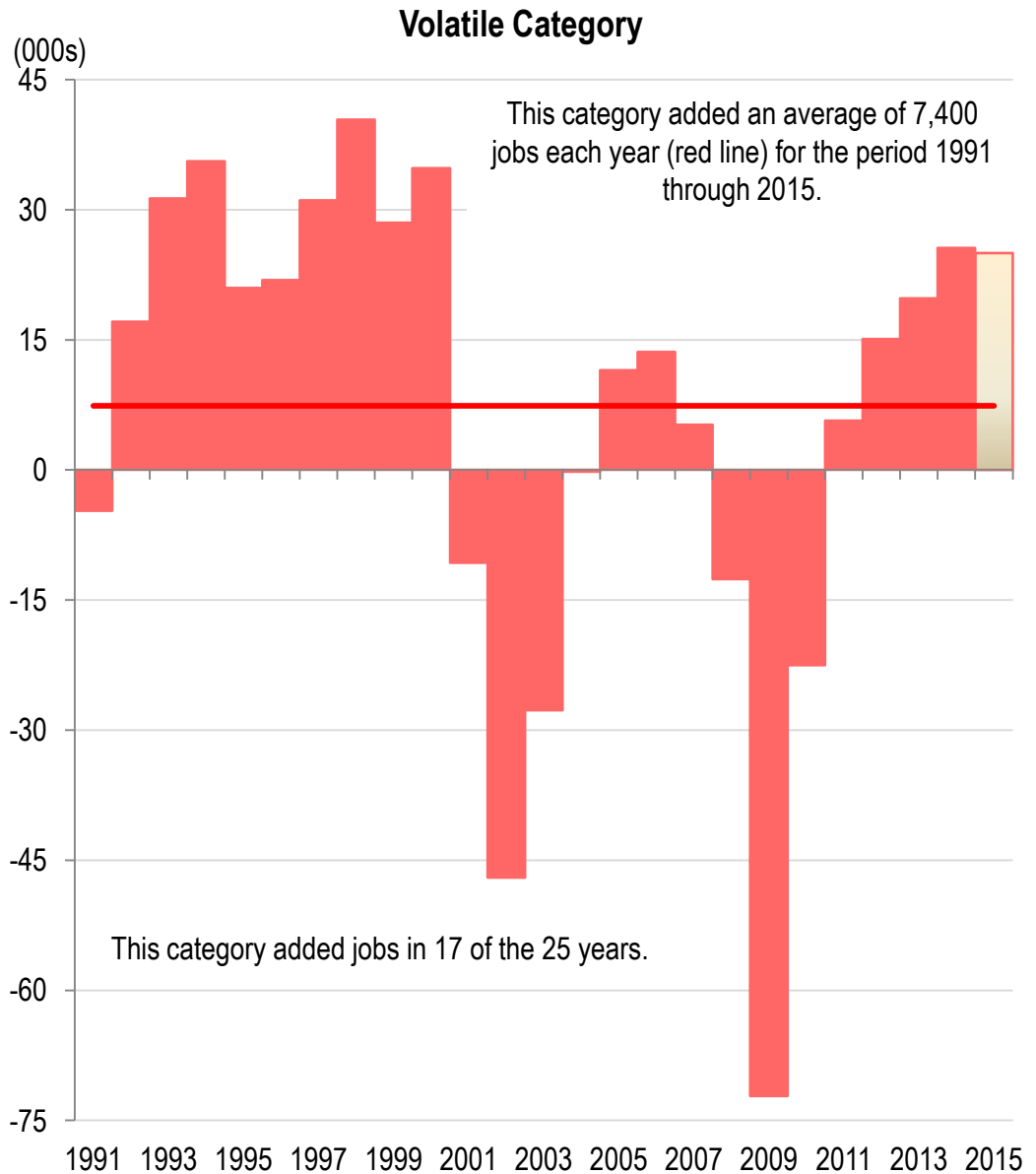
Over the past two decades the sectors listed below were the primary source of volatility in total employment.

The sectors are:

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

Total employment for this category was:

1994 625,400 workers, 35.6% of total employment
 2004 716,000 workers, 32.8% of total employment
 2014 714,300 workers, 29.0% of total employment



● Volatile Sectors

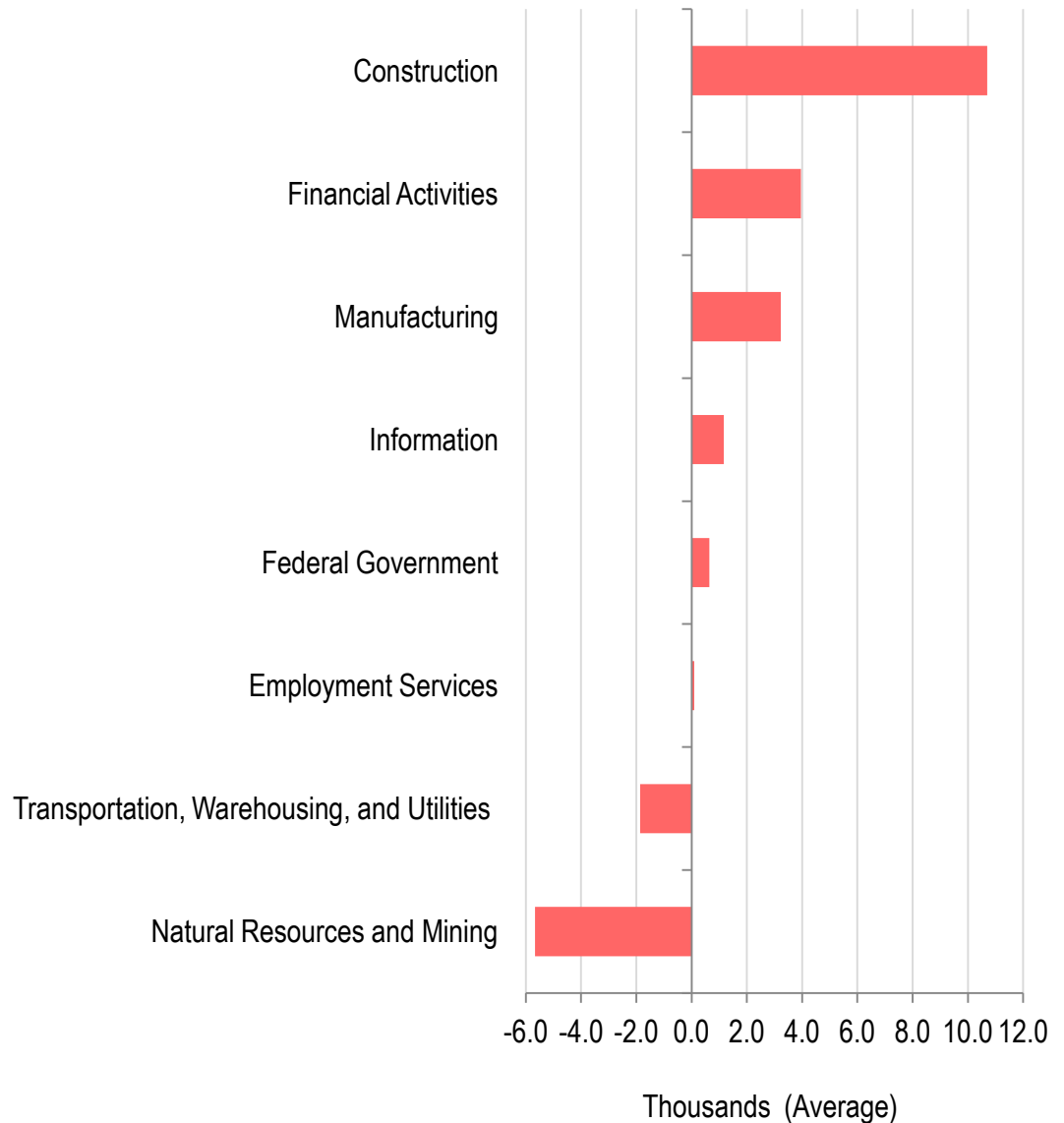
● Average employment for the first 7 months of 2016 shows this category of sectors added 12,300 jobs in 2016 compared to the same period last year.

● 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.

Job Change



Source: Bureau of Labor Statistics.

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 7 months of 2016.

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

Average employment for the first 7 months of 2016 is 69,900 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 four industries that are responsible for the unpredictable nature of the Volatile category. It is obvious there are factors other than a standard business cycle that drive change in their employment.

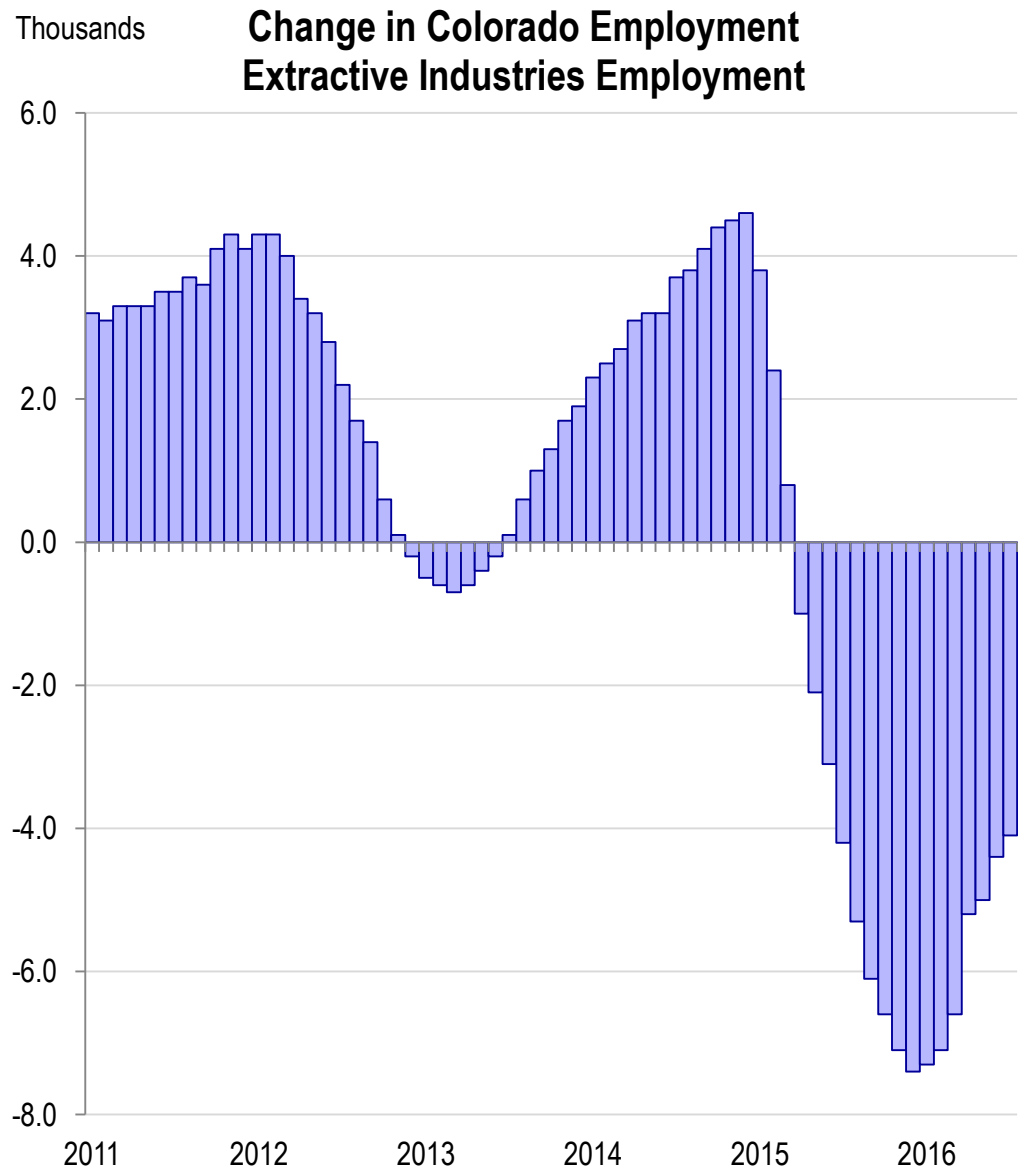
Y-O-Y Monthly Employment Change in Colorado Employment – Extractive Industries

The monthly year-over-year 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 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.

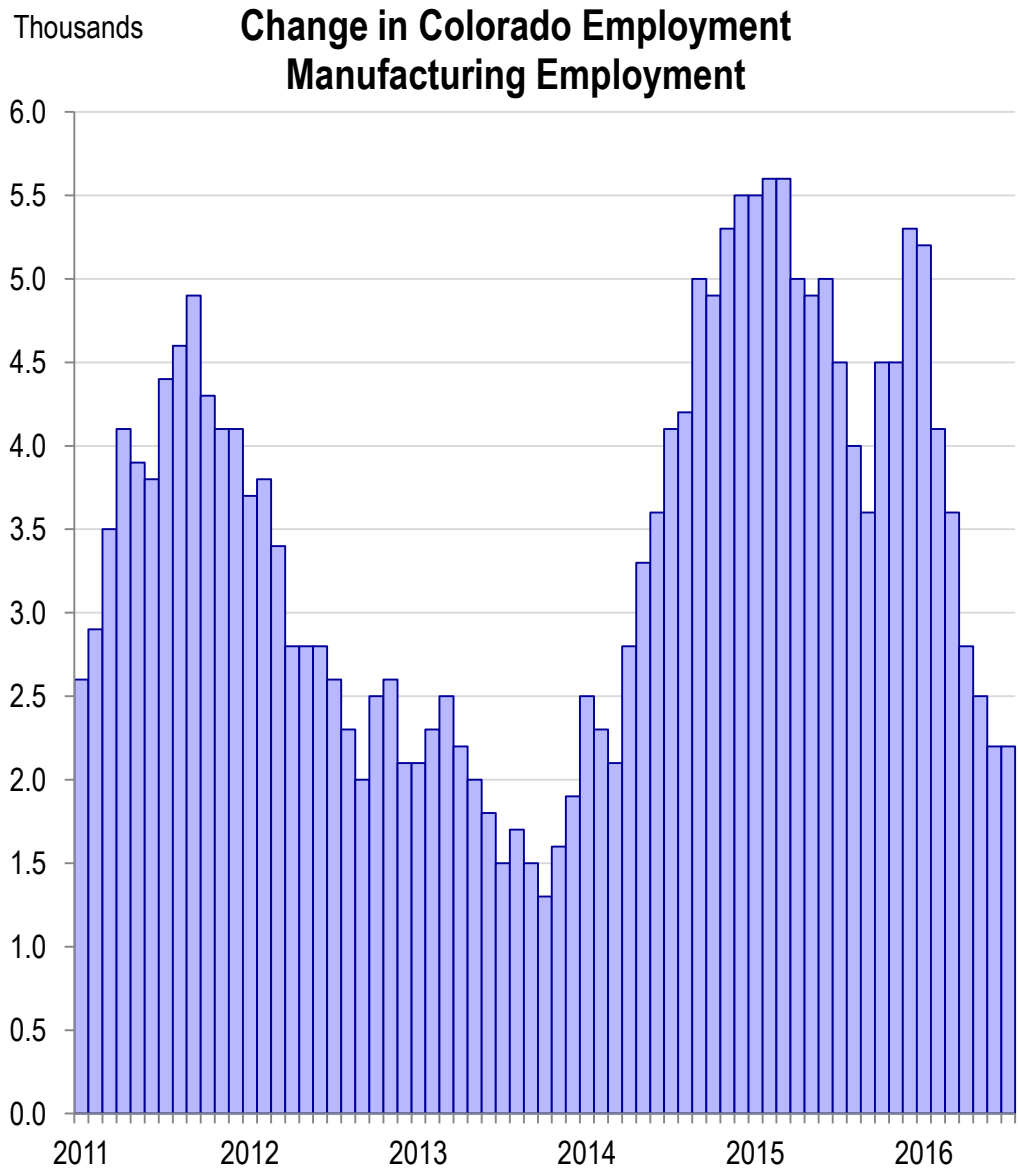


● Y-O-Y Monthly Employment
● Change in Colorado
● Employment -
● Manufacturing

Since Q4 2010 the monthly year-over-year 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 July 2016, there were 2,200 more manufacturing jobs than the same period in 2015.



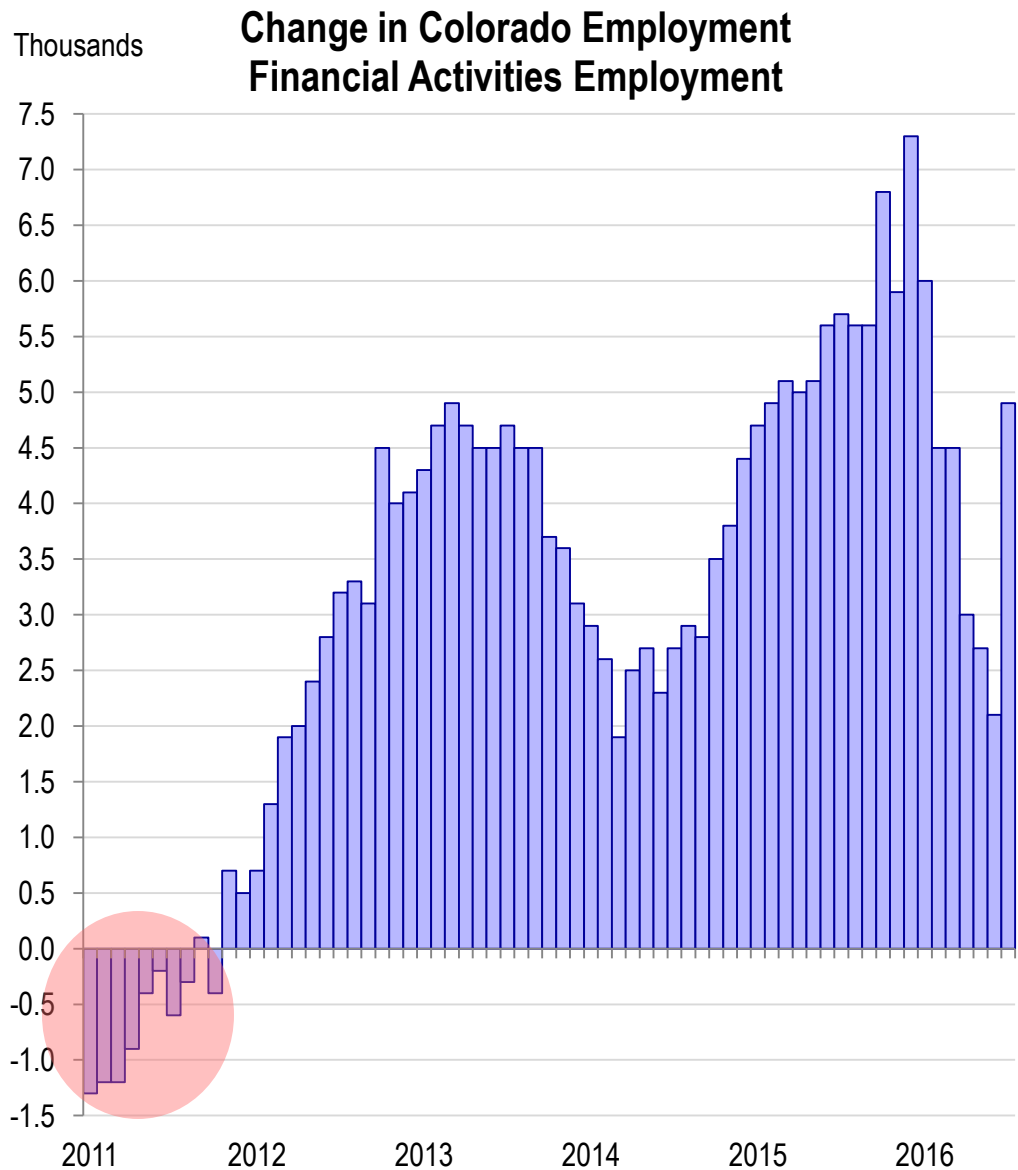
Source: Bureau of Labor Statistics, cber.co.

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 July 2016, there were 4,900 more financial activities jobs than the same period in 2015.



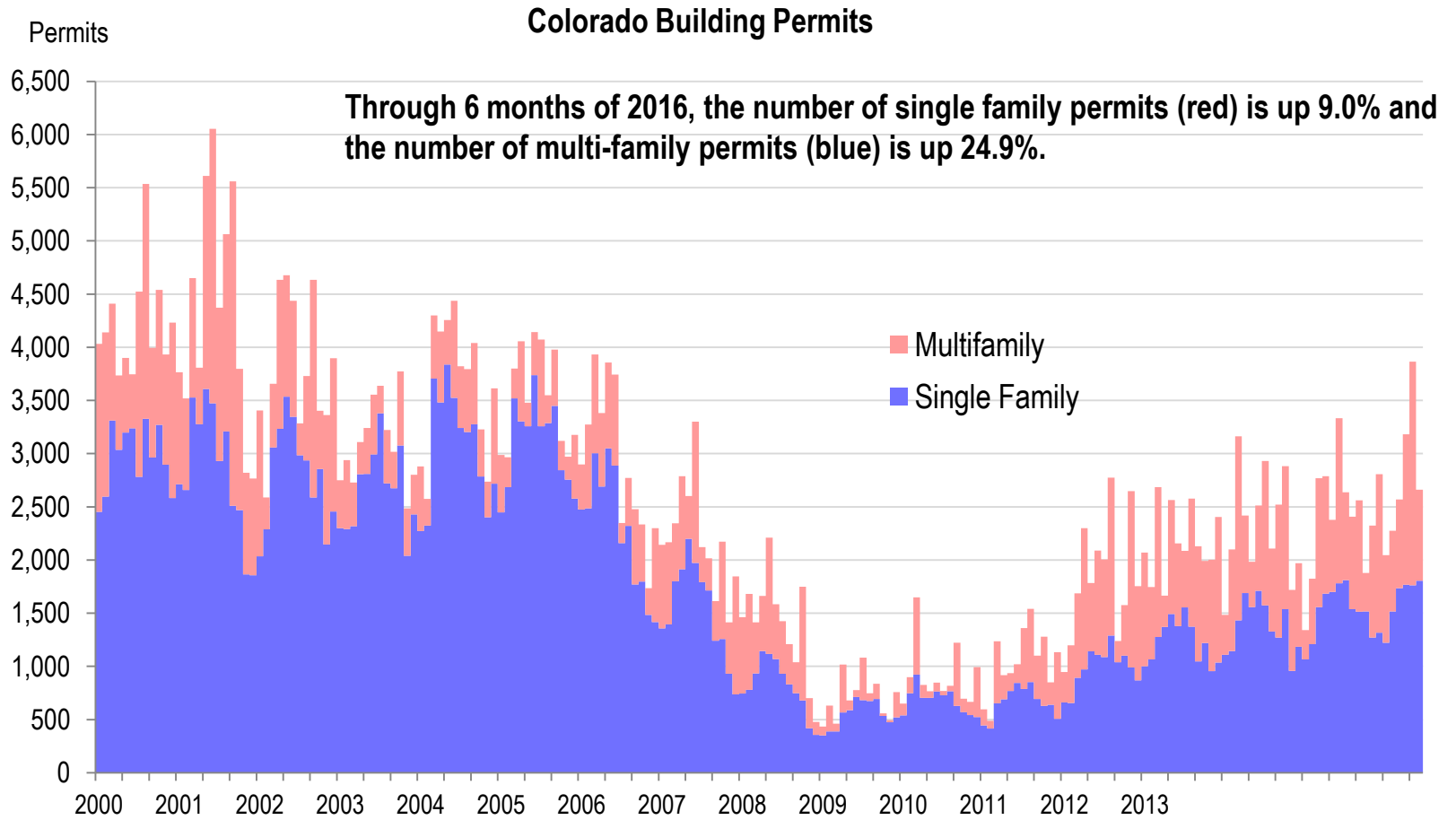
Source: Bureau of Labor Statistics, cber.co.



The Colorado Economy

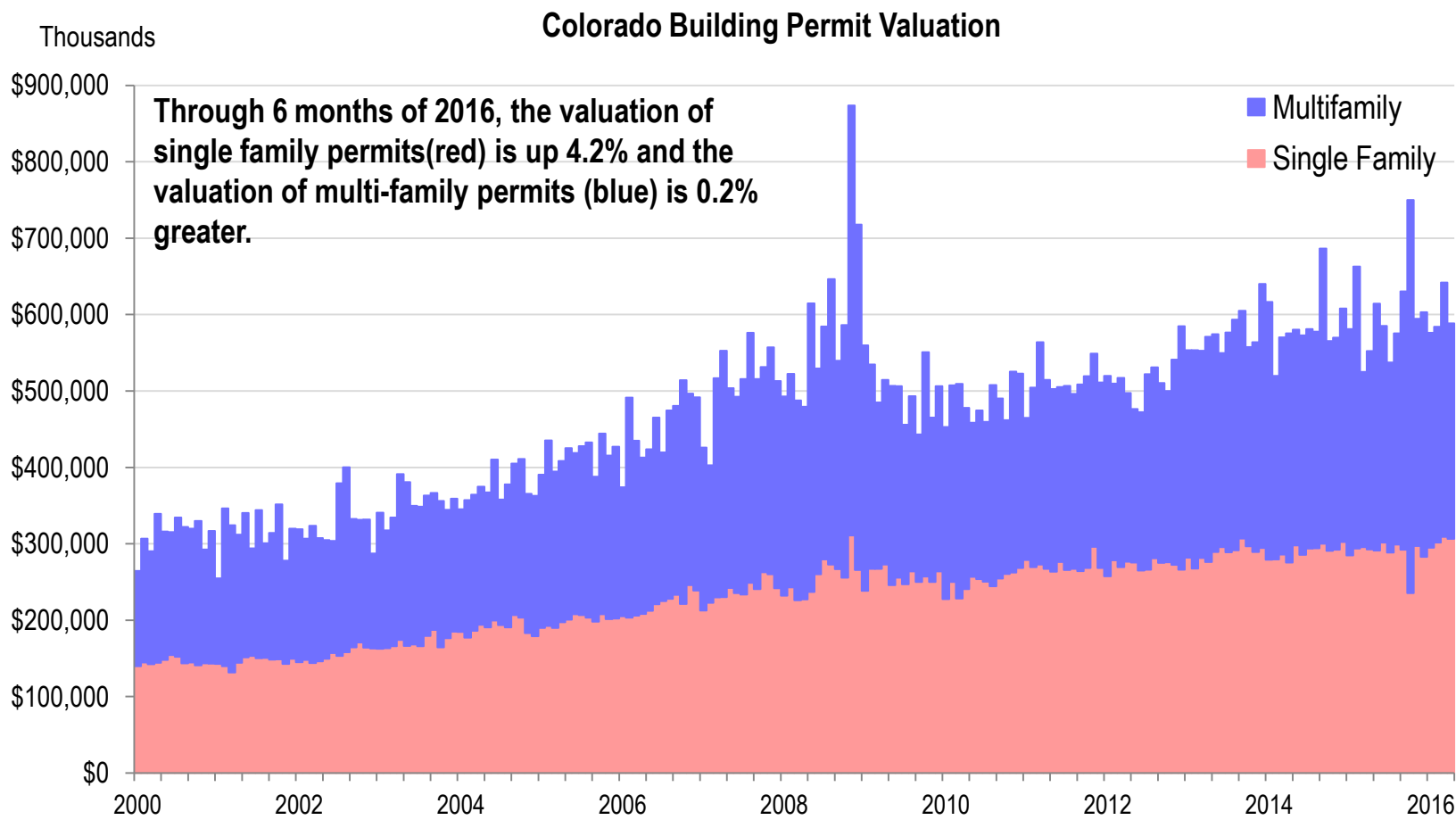
Construction and Housing

Colorado Residential Building Permits - Units



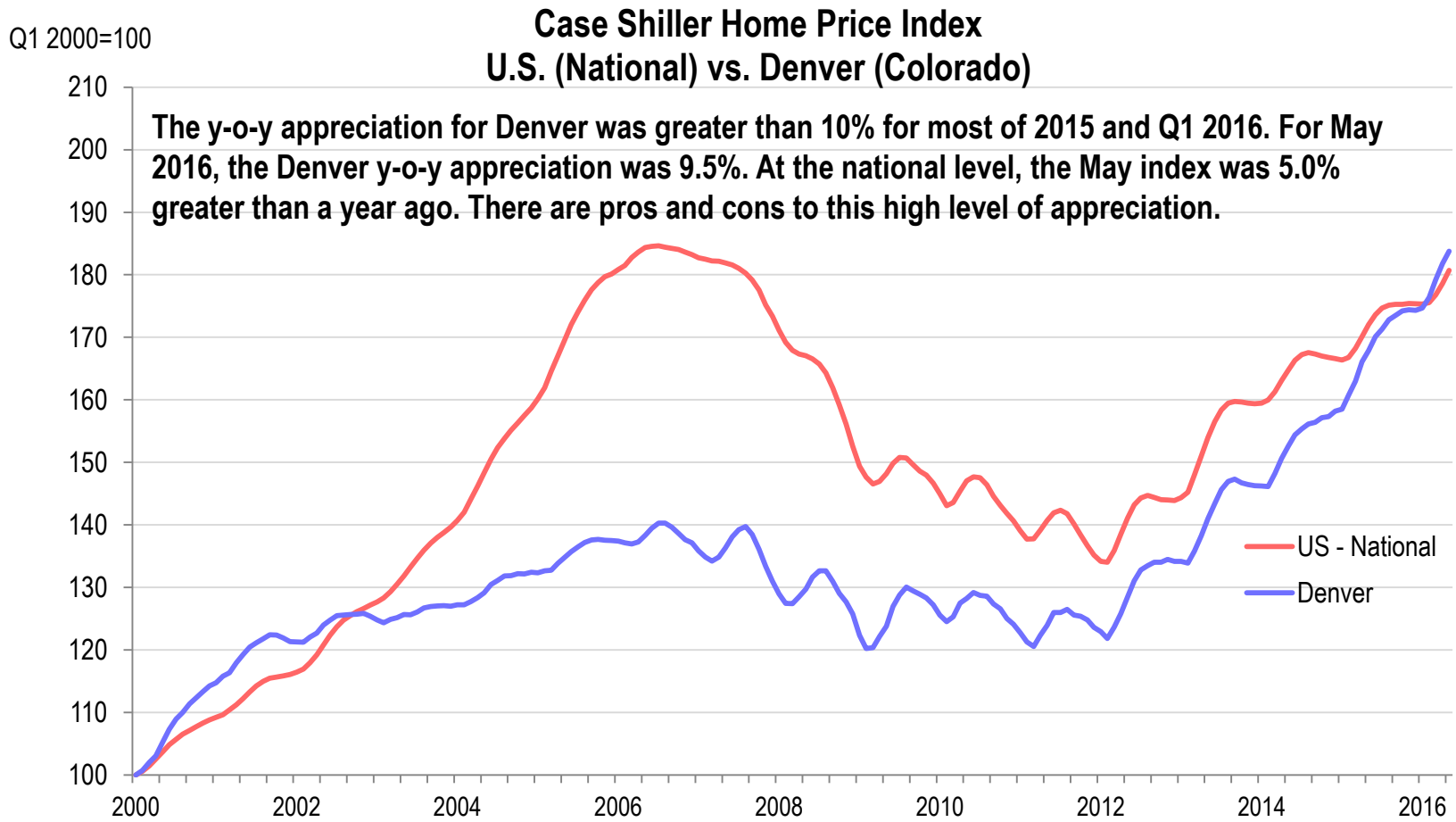
Source: TAMU Real Estate Center, U.S. Census Bureau, cber.co.

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.



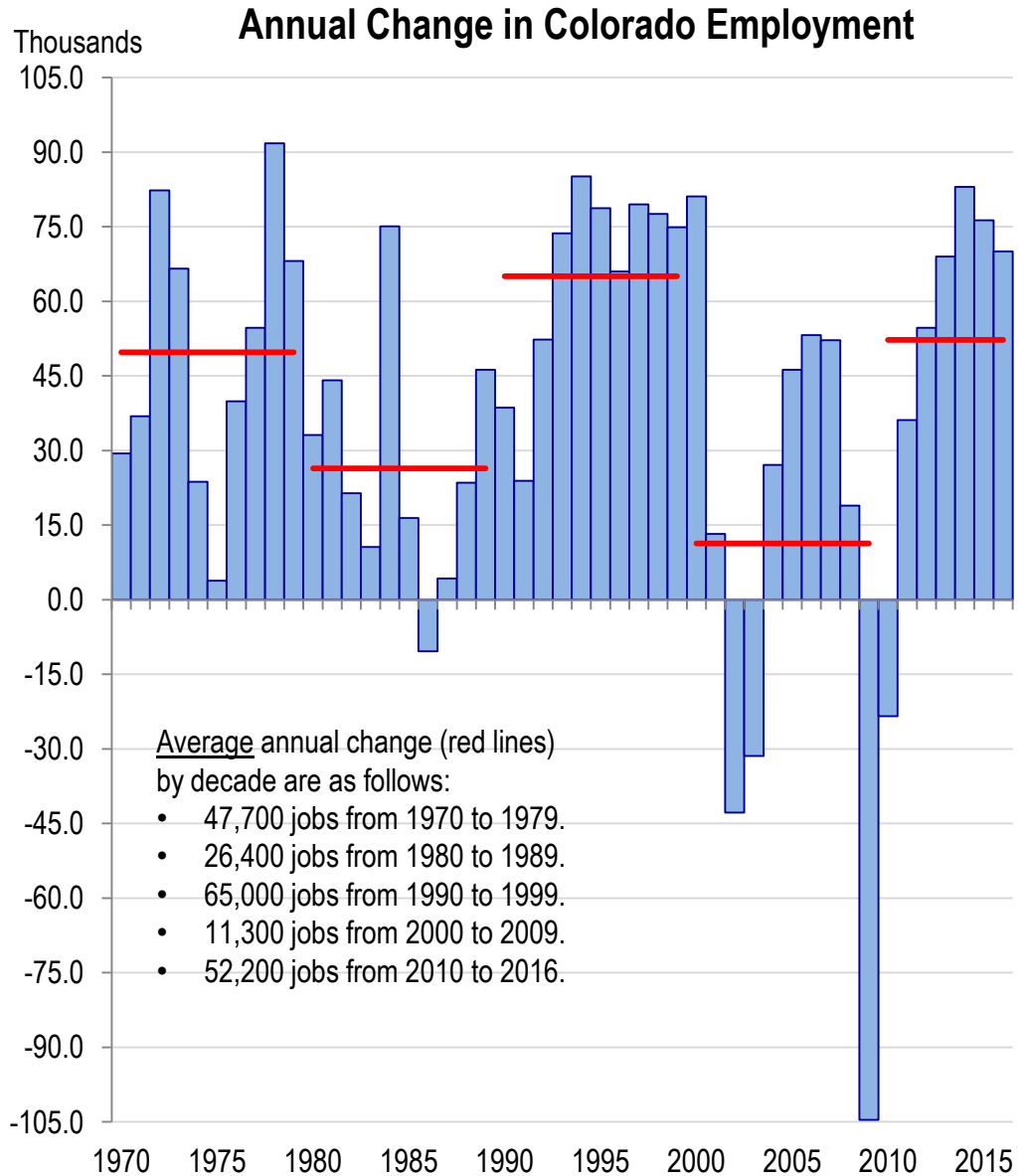
The Colorado Economy Summary

● 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%.

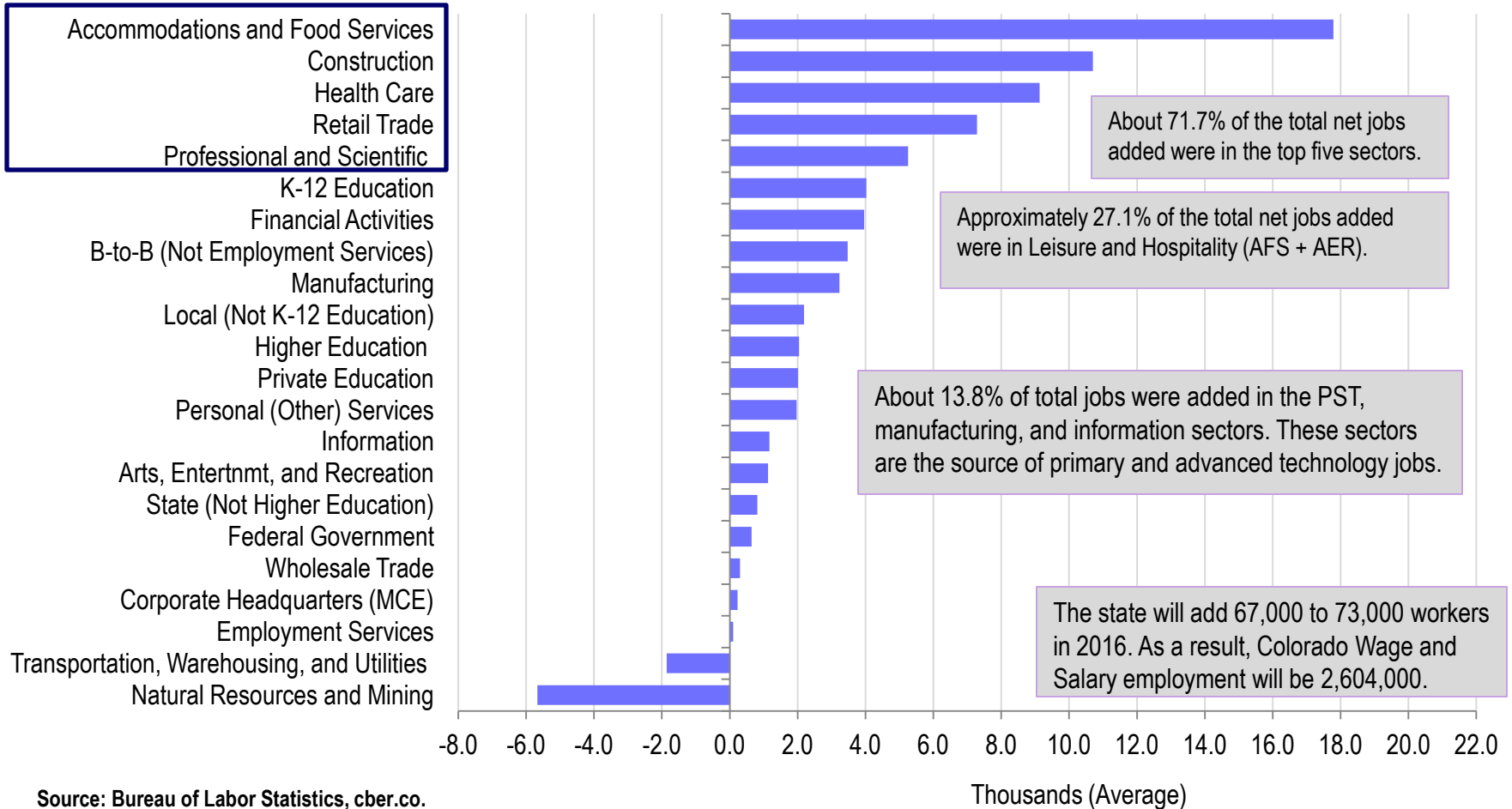
After 7 months, the state is on track to add 69,900 jobs this year, prior to the BLS benchmark revisions.

The Colorado Department of Labor and Employment has indicated that the Q1 2016 jobs data may be slightly overstated.



Job Changes First 7 Months of 2016 vs. Same Period in 2015

Job Change All Sectors



Source: Bureau of Labor Statistics, cber.co.

Thousands (Average)



Summary of the Colorado Economy

Reasons to Feel Good About the Colorado Economy


The best things the Colorado economy has going for it are potential, momentum and consistent and diversified growth. Other factors include:

- Strong construction is on tap for 2016 and 2017.
- Tourism is coming off a record year in 2015 and is strong in 2016.
- State real GDP growth continues to outpace U.S. real GDP growth. Colorado real GDP growth is broad-based.
- Strong growth in the number of business establishments in 2015 – although most of the growth is along the Front Range.
- Record passenger traffic at DIA.
- Manufacturing continues to show growth, albeit at a declining rate.
- Colorado job growth is broad-based and includes most sectors.
- Job losses in the oil and gas industry appear to have bottomed out.
- Agriculture prices are expected to improve in the months ahead.

Potential Risks to Strong Economic Growth

The following factors could cause the Colorado economy to grow at a pace that is slower than the current rate:

- Lack of qualified workers to fill key positions. The quality of service at some businesses has declined since the state unemployment rate dropped below 4.5%.
- Construction is directly and indirectly responsible for the expansion of the local economy. An abrupt slowdown in construction could cause a concurrent slowdown in a number of industries.
- Lack of affordable housing. This is a problem that is relevant to most parts of the state. To date it has not been proven to be a deterrent to job growth.



cber.co Colorado Economic Review Through First Seven Months of 2016

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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.