cber.co
Review of Revised 2016
Colorado Employment Data
and 2017 Employment Forecast

Colorado-based Business and Economic Research
Prepared
March 15, 2017

Overview of Economic Review

This chartbook provides a series of charts, graphs, and discussions that review the March 2017 benchmark revisions to the Colorado Wage and Salary employment data published by the Bureau of Labor Statistics. Employment for 2015 was revised upwards to 77,000, while the 2016 employment was lowered to 56,400.

This information is divided into the sections listed below.

U.S. Economy
- The United States Economy
  - Real GDP and Employment
  - Inflation, Equities, Equity Volatility, Corporate Profits, and the Price of Oil.
  - Non-Manufacturing, Manufacturing, Construction, and Retail
  - Summary

The Colorado Economy
- Population, Unemployment, and Employment
- Benchmark Revisions
- Colorado Employment Forecast
- Putting the Forecast in Perspective
- Summary

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

The United States Economy
## Real GDP and Employment

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

Real GDP will grow at a rate between 2.1% to 2.5% in 2017.

- As is usually the case, personal consumption will drive real GDP growth. It will increase at a rate slightly greater than the rate of growth for the 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.

- The trade deficit will increase as a result of the lack of demand caused by a strong dollar.

GDP = Consumption + Private Investment + Government Spending + Net Exports

U.S. Real GDP Growth

Percent

Annualized Real GDP Growth = 2.1% 2010 to 2016

Annualized Real GDP Growth = 1.8% the 2000s
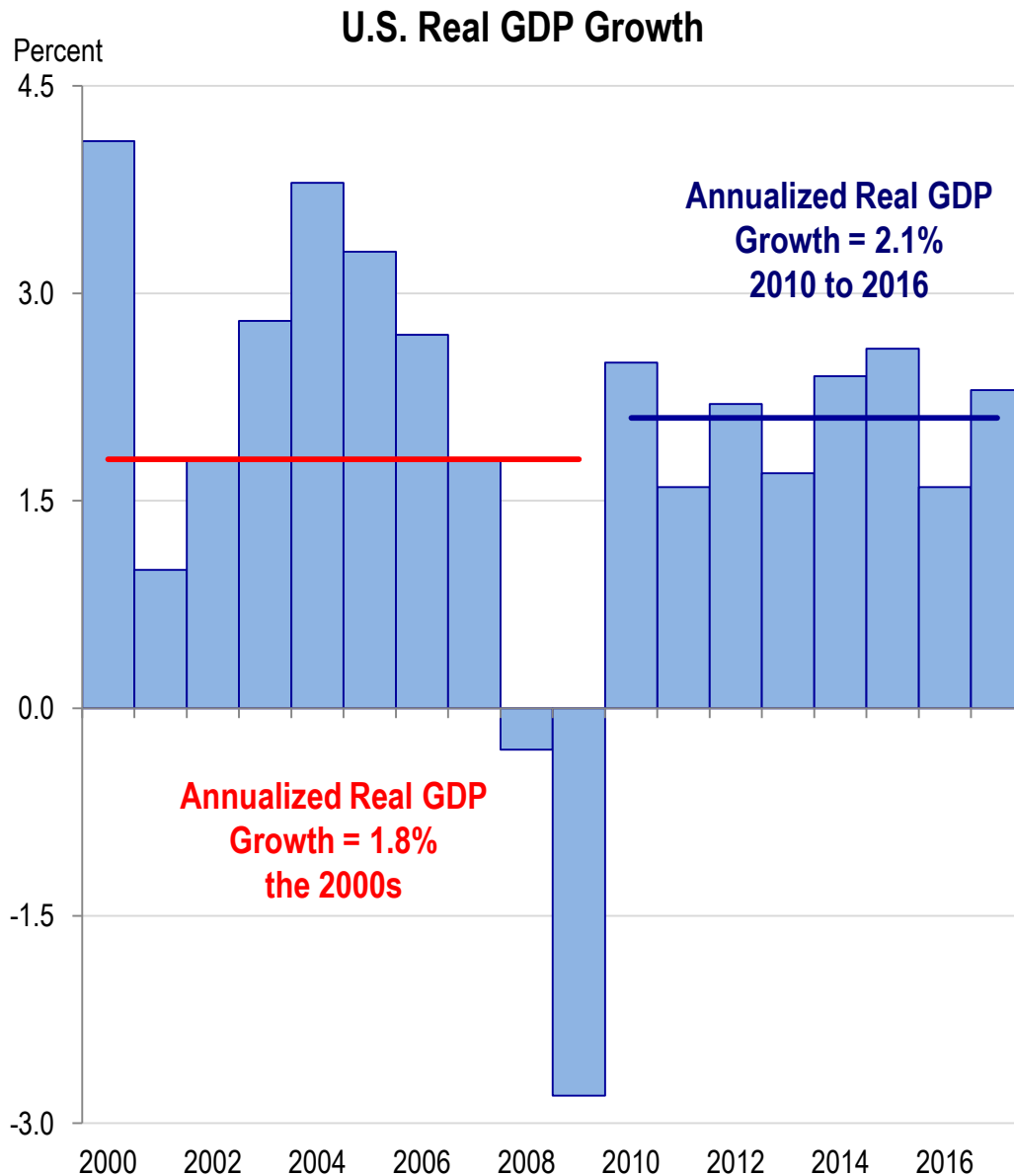
Source: Bureau of Economic Analysis, cber.co, chained in 2009 dollars.

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Change in United States Employment Year-Over-Year

Change in United States Employment

(000s)

Monthly data is shown with the blue line. Average annual data is shown with the red line.

+2.885 million

+2.243 million

+2.206 million

+2.577 million

+2.463 million

+1.571 million

Since the end of the Great Recession, the strongest job growth occurred between October 2014 and July 2015. Monthly job growth has trended downward since early 2015. Average annual job growth for 2017 will be 1.9 to 2.1 million. On a monthly basis that is an average of 158,000 to 175,000 jobs.

2011 2012 2013 2014 2015 2016

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

United States Unemployment Rate
Unemployment Rate vs. Natural Rate of Unemployment

United States Unemployment Rate

Percent

The natural rate of unemployment is an academic concept. It is reached when the labor market is in equilibrium. In most cases the natural rate of unemployment varies between 4.5% and 5.5%. At rates above and below this level, the economy operates inefficiently – for different reasons.

The rate of U.S. unemployment has been between 4.5% and 5.5% since February 2015.

The total number of unemployed was 7.5 million at the end of 2016. This is 7.9 million below the peak in the Great Recession. Great news!

Natural Rate of Unemployment

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

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The United States Economy

Inflation, Equities, Equity Volatility, Corporate Profits, and the Price of Oil

Consumer Price Index (CPI)

The Denver-Boulder-Greeley CPI (red bars) is sometimes used as a proxy for Colorado inflation.

It has been greater than the U.S. CPI 12 of 18 times between 2000 and 2017. Five of the six years that Colorado inflation was lower were between 2003 and 2009.
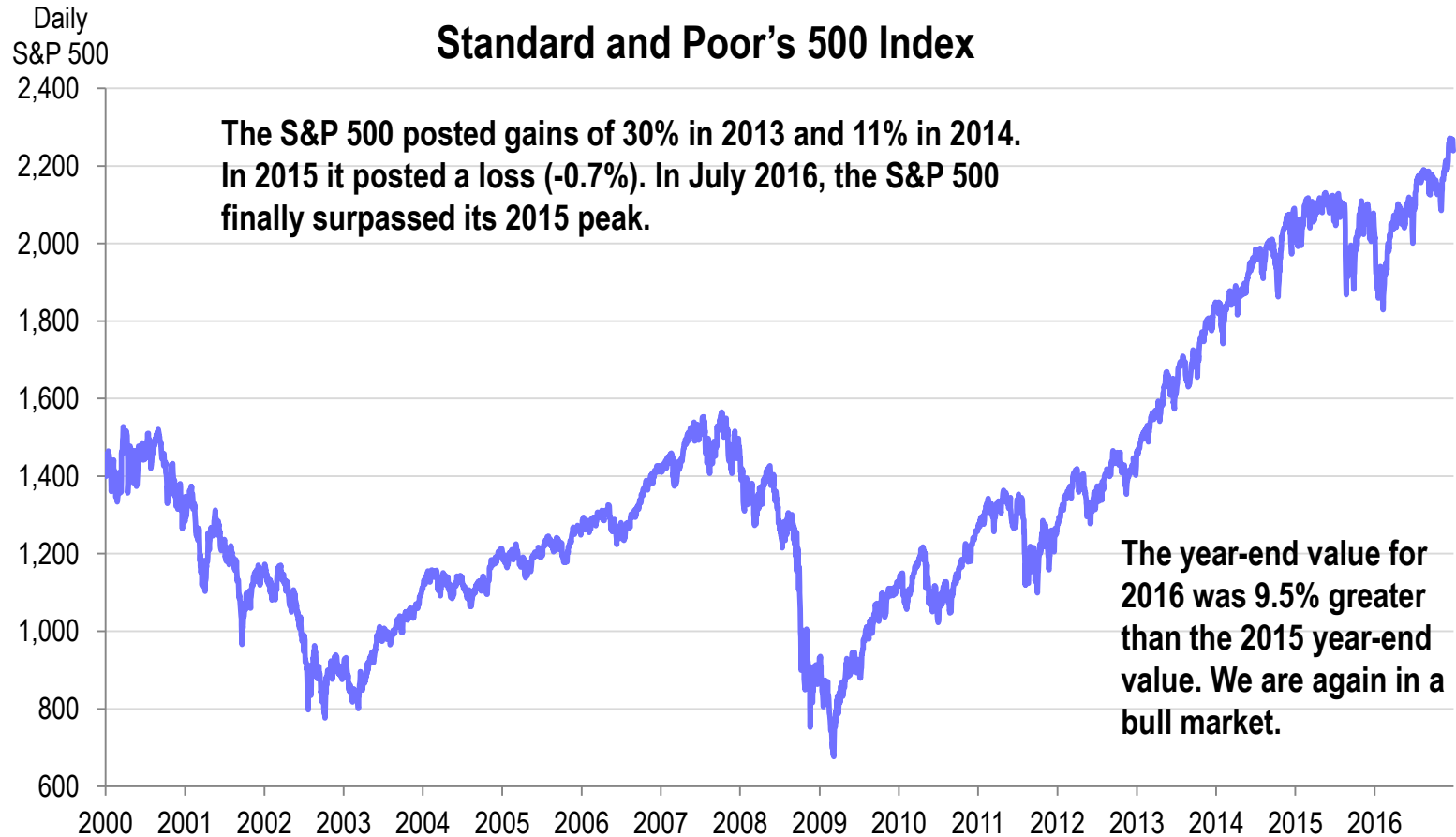
Recently, higher housing prices and medical costs have increased Colorado inflation significantly.

The Denver-Boulder-Greeley CPI (red lines) is expected to rise by 3.0% in 2017. The U.S. rate will rise by 2.5% in 2017.

Colorado vs. U.S. Consumer Price Index

1982-84=100

Legend: U.S., Colorado

Source: Bureau of Labor Statistics, cber.co.
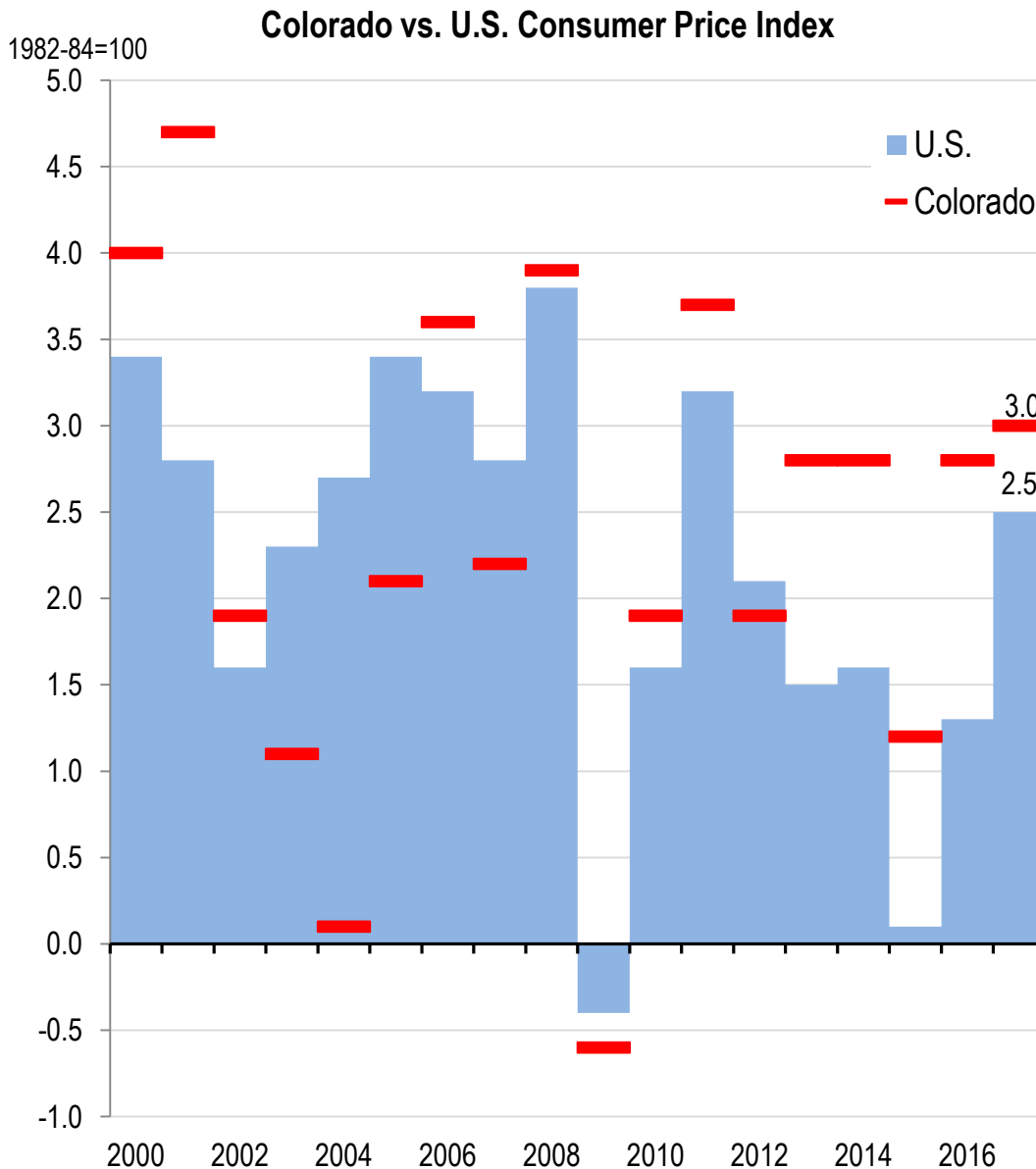
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Standard and Poor's 500 Index

Standard and Poor's 500 Index

Daily S&P 500

The S&P 500 posted gains of 30% in 2013 and 11% in 2014. In 2015 it posted a loss (-0.7%). In July 2016, the S&P 500 finally surpassed its 2015 peak.

The year-end value for 2016 was 9.5% greater than the 2015 year-end value. We are again in a bull market.

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

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CBOE Volatility Index
VIX (VIXCLS)

CBOE Volatility Index - VIX

VIX Percent

Lower oil prices, a change in U.S. monetary policy, and the slowdown in the Chinese economy caused significant heartburn in the equities markets during late 2015 and early 2016. The Brexit vote and a weak jobs report in May 2016 caused a small spike in the VIX. The spikes in 2010, 2012, and 2015 (red) were painful, but mild compared to the volatility in 2009. The spike associated with the election was minimal and short-lived (black).

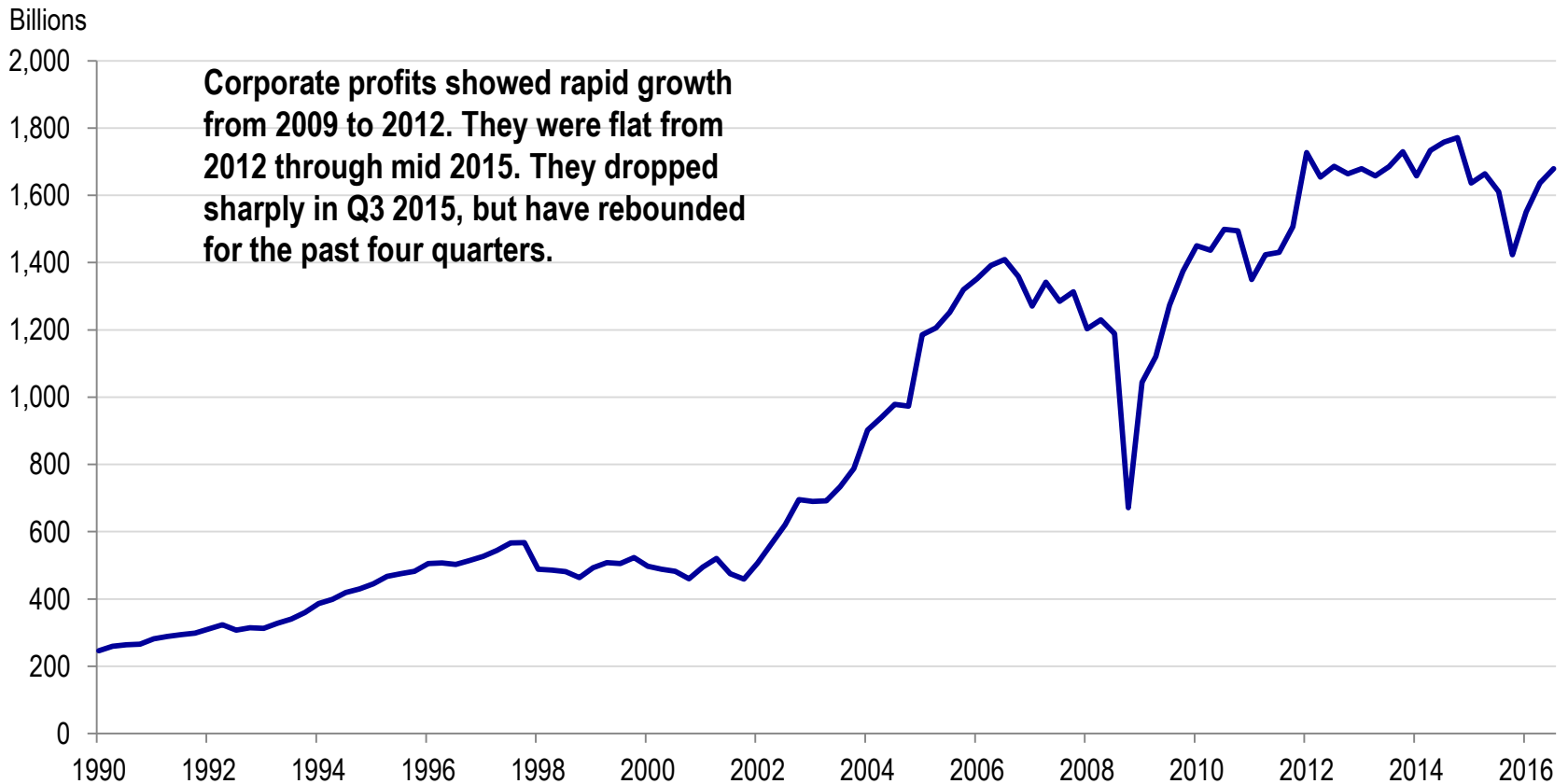VIX measures market expectations of near term volatility conveyed by stock index option prices (S&P 500).

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

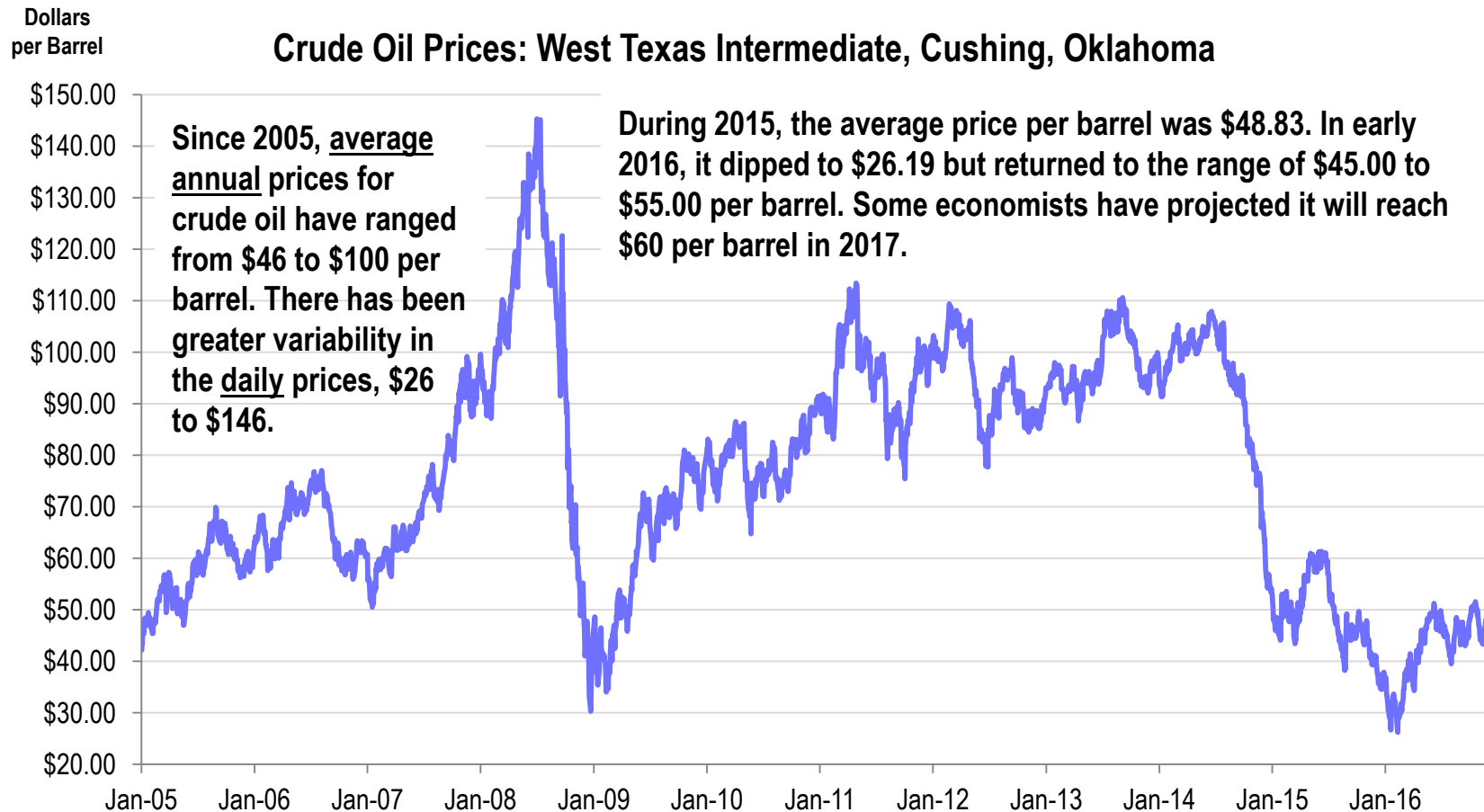# Corporate Profits After Tax (without IVA and CCAdj)

Corporate Profits After Tax

Billions

Corporate profits showed rapid growth
from 2009 to 2012. They were flat from
2012 through mid 2015. They dropped
sharply in Q3 2015, but have rebounded
for the past four quarters.

Source: FRED, BEA, cber.co.

Crude Oil Prices
West Texas Intermediate

Crude Oil Prices: West Texas Intermediate, Cushing, Oklahoma

Dollars per Barrel

Since 2005, <u>average annual</u> prices for crude oil have ranged from $46 to $100 per barrel. There has been greater variability in the <u>daily</u> prices, $26 to $146.

During 2015, the average price per barrel was $48.83. In early 2016, it dipped to $26.19 but returned to the range of $45.00 to $55.00 per barrel. Some economists have projected it will reach $60 per barrel in 2017.

Source: FRED, EIA, cber.co.

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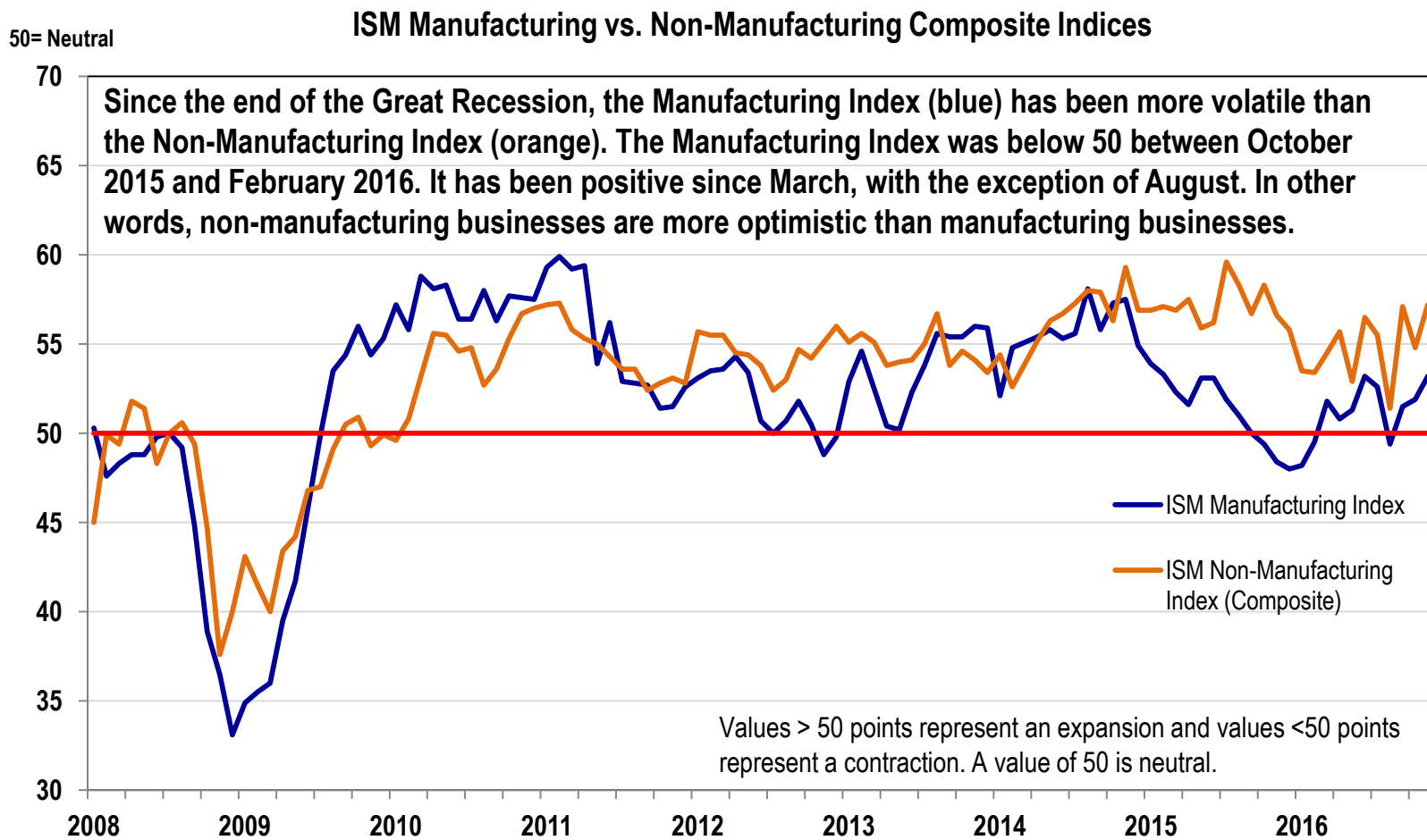Colorado-based Business and Economic Research http://cber.co

United States Economy
Non-Manufacturing, Manufacturing, Construction, and Retail

ISM PMI Composite Indices Manufacturing vs. Non-manufacturing

ISM Manufacturing vs. Non-Manufacturing Composite Indices

50= Neutral

> Since the end of the Great Recession, the Manufacturing Index (blue) has been more volatile than the Non-Manufacturing Index (orange). The Manufacturing Index was below 50 between October 2015 and February 2016. It has been positive since March, with the exception of August. In other words, non-manufacturing businesses are more optimistic than manufacturing businesses.

— ISM Manufacturing Index

— ISM Non-Manufacturing Index (Composite)

Values > 50 points represent an expansion and values <50 points represent a contraction. A value of 50 is neutral.

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

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United States Manufacturing Shipments
All Industries vs. Nondefense Capital, Excluding Aircraft

1992 = 100

Manufacturing Shipments

Between 1993 and 2003 the shipment of nondefense capital goods (red) grew at a faster rate than manufacturing shipments for all Industries (blue). That trend reversed in 2003. Since Q4 2014 shipments for both categories have trended downwards.

Nondefense Capital Goods, Exc Aircraft

All Manufacturing

2015 average monthly shipments for nondefense capital goods were $62.2 billion.

2015 average monthly shipments for manufacturing shipments for all Industries were $479.8 billion.

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

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U.S. Weekly Auto and Light Truck Sales

United States Number of Auto and Light Trucks Sold

Annualized Rate Millions

Auto and light truck sales bottomed out in early 2009. Sales trended upward and hit the mark of 18 million in October, 2015. Since then sales have fluctuated between 16.5 million and 18.3 million.
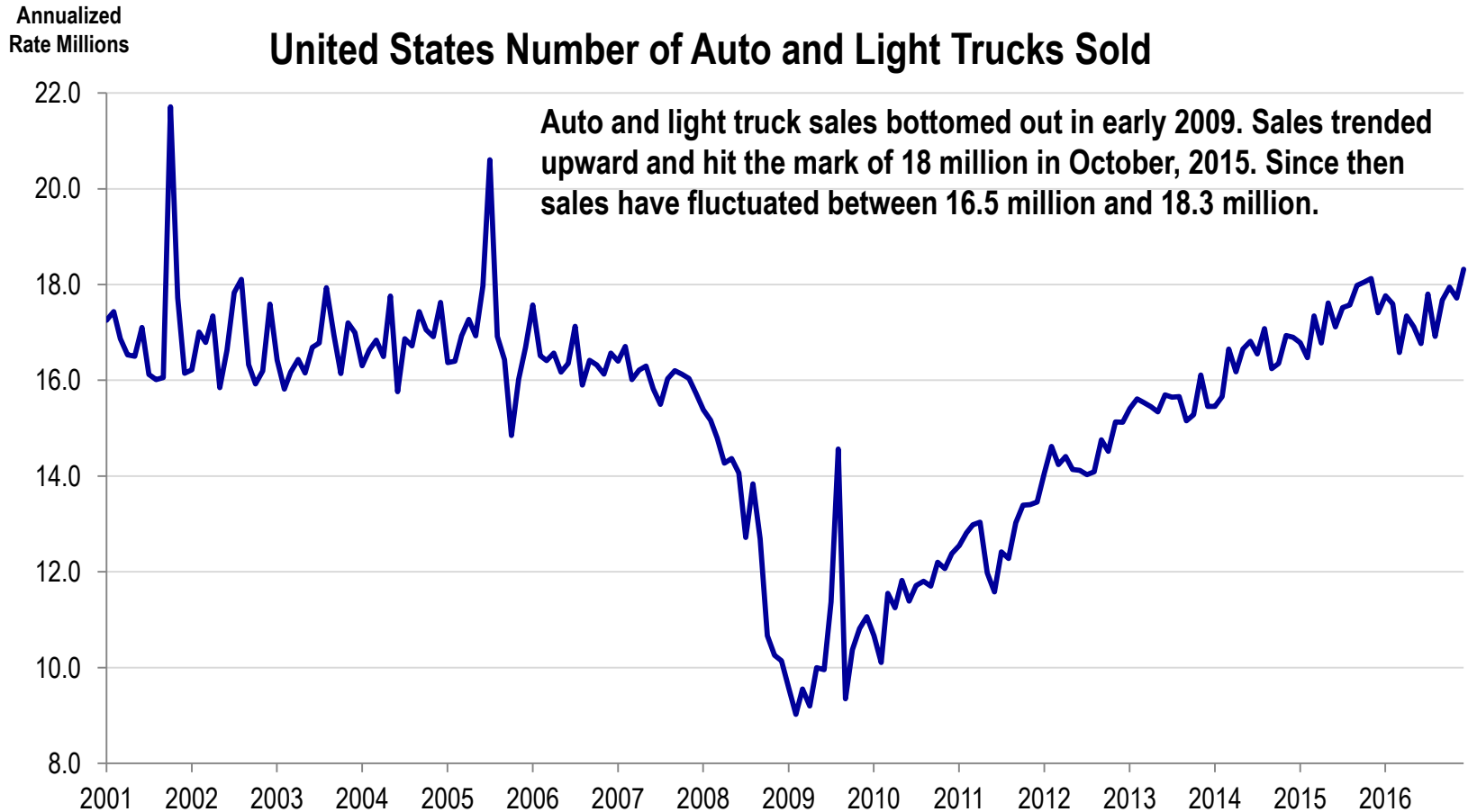
Source: FRED, BEA, cber.co.
Note: Seasonally Adjusted Annualized Rate.
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Total United States Construction Spending

Total Construction Spending

$ Millions

Between mid-2015 and mid-2016 construction spending was flat (red circle). Spending in 2016 was about 4.9% greater than 2015.
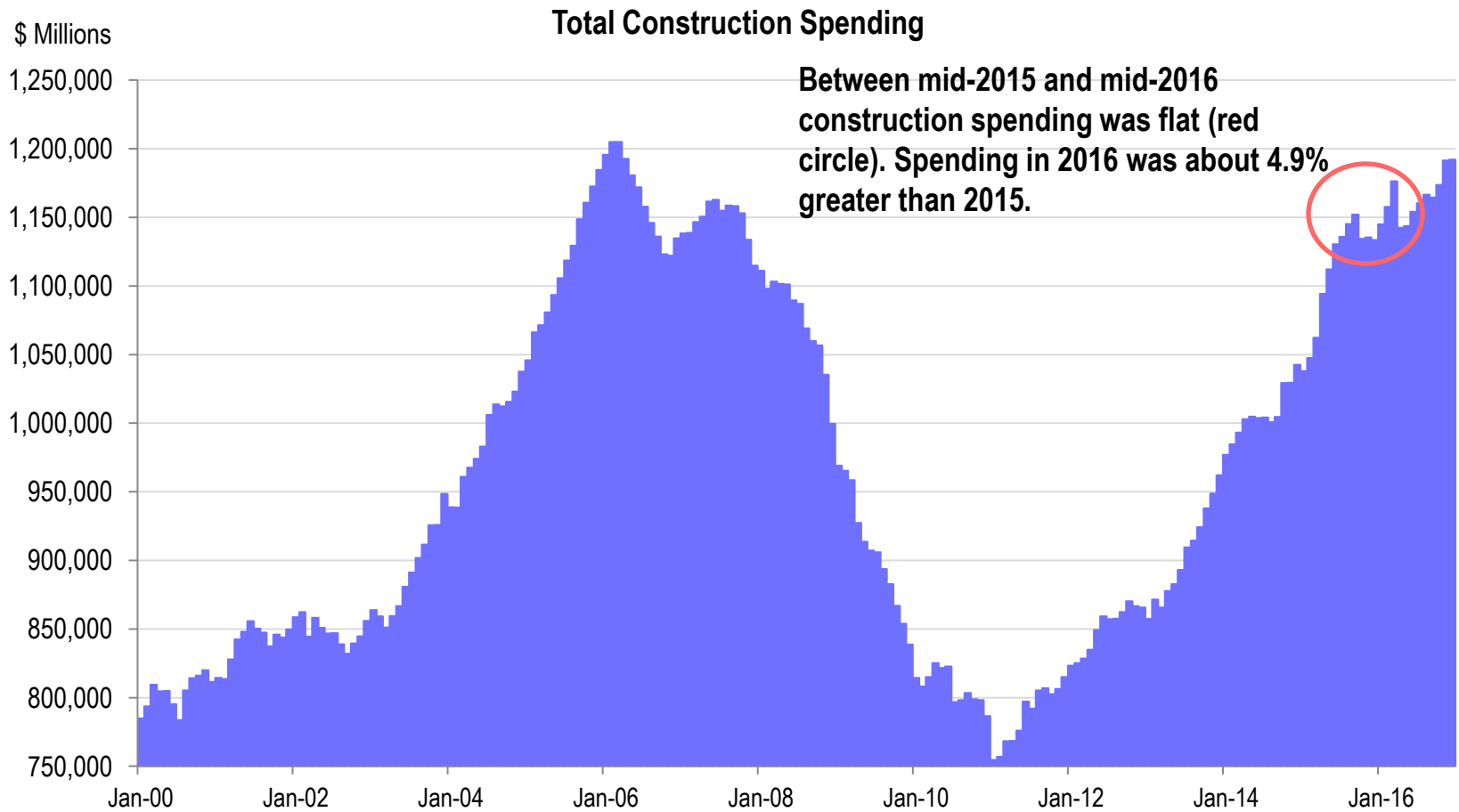
Source: FRED, Census Bureau, SAAR, cber.co. Data is not adjusted for inflation.

Cumulative Retail, Excluding Food Services Sales
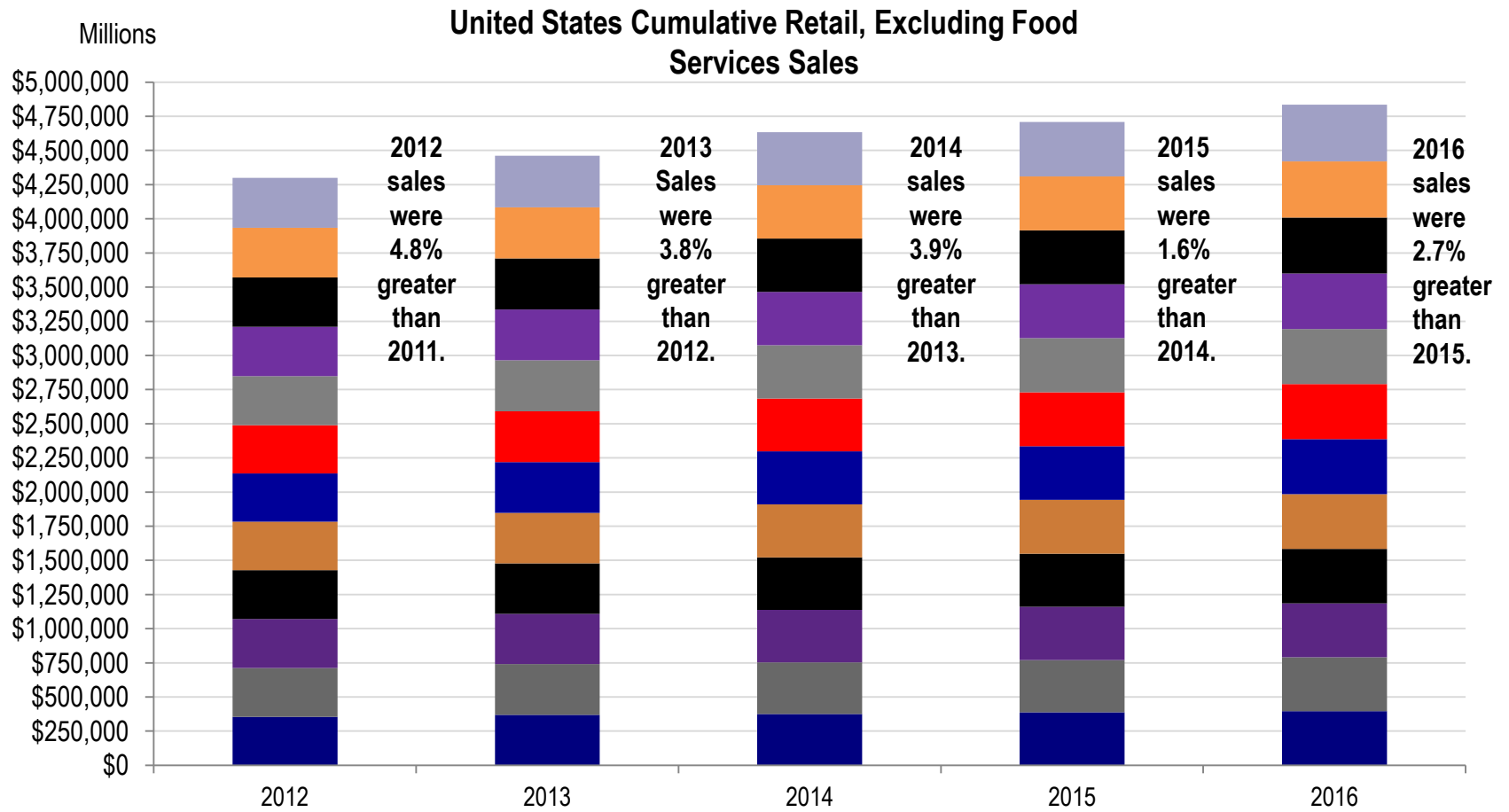
United States Cumulative Retail, Excluding Food Services Sales

2012 sales were 4.8% greater than 2011.

2013 Sales were 3.8% greater than 2012.

2014 sales were 3.9% greater than 2013.

2015 sales were 1.6% greater than 2014.

2016 sales were 2.7% greater than 2015.

Millions

United States Economy
Summary

The Global and U.S. in 2017
Factors that Will Affect the U.S. and Colorado

1. Improved global economy (real GDP growth), 2.9%.

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. The good news is the Fed is optimistic about the economy. For many people the bad news is interest rates will continue to rise 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. Strong surge in optimism from the purchasing managers.

8. The price of oil is expected to increase.

9. The dollar with continue to be strong.

10. Debt will continue to be a concern.

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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!

The Colorado Economy

The Colorado Economy
Population, Unemployment, and Employment

Colorado Population
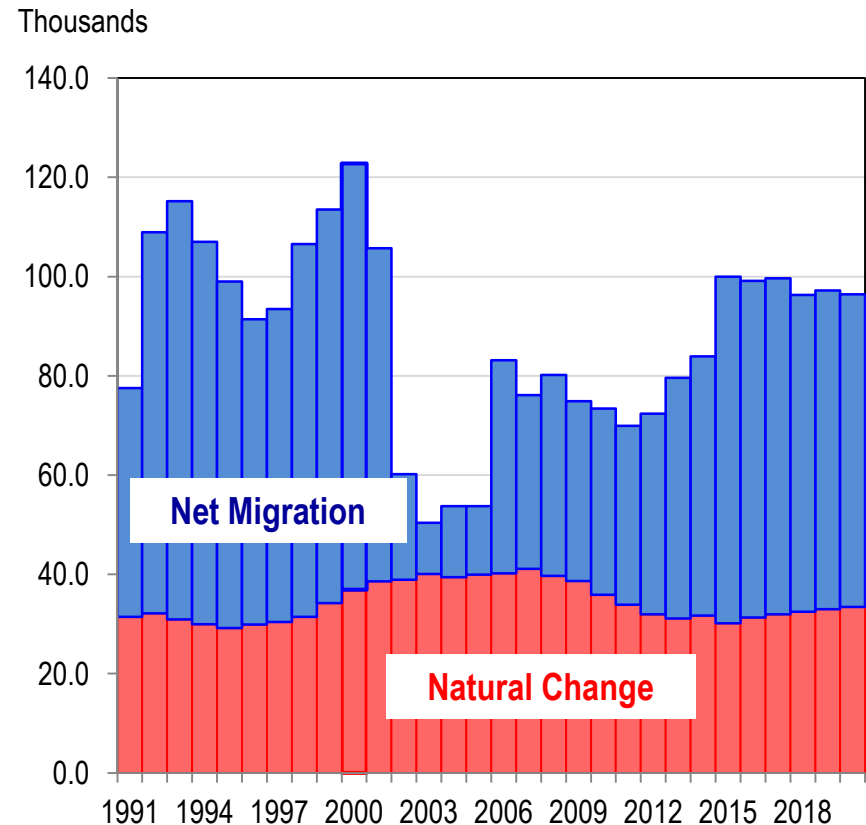## Components of Change

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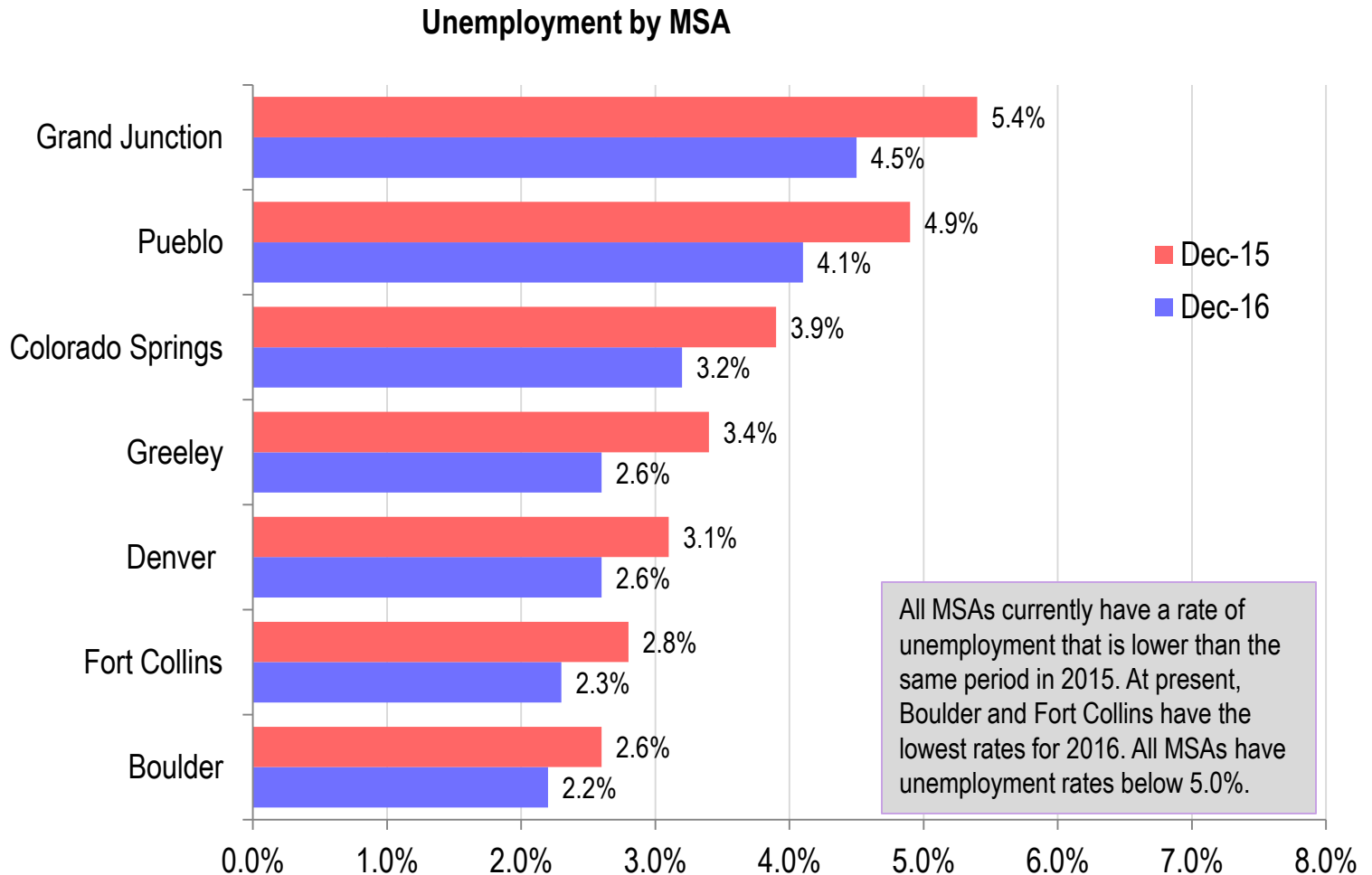
Changes resulting from net migration (blue bars) are closely tied to the strength of the economy and the change in state employment. For example, there were five years, from 1986 to 1990, when net migration was negative (not shown on this chart). More people moved out of state than moved into the state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

The Colorado population will increase by about 100,000 in 2015, 2016, and 2017. In 2017 the state's population will increase by 1.8% to 5.655,405.

Change in Colorado Population 1991 - 2020

Sources: Colorado State Demography Office and cber.co.
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Unemployment by MSA 2015 vs. 2016

Unemployment by MSA

MSA	Dec-15	Dec-16
Grand Junction	5.4%	4.5%
Pueblo	4.9%	4.1%
Colorado Springs	3.9%	3.2%
Greeley	3.4%	2.6%
Denver	3.1%	2.6%
Fort Collins	2.8%	2.3%
Boulder	2.6%	2.2%

All MSAs currently have a rate of unemployment that is lower than the same period in 2015. At present, Boulder and Fort Collins have the lowest rates for 2016. All MSAs have unemployment rates below 5.0%.
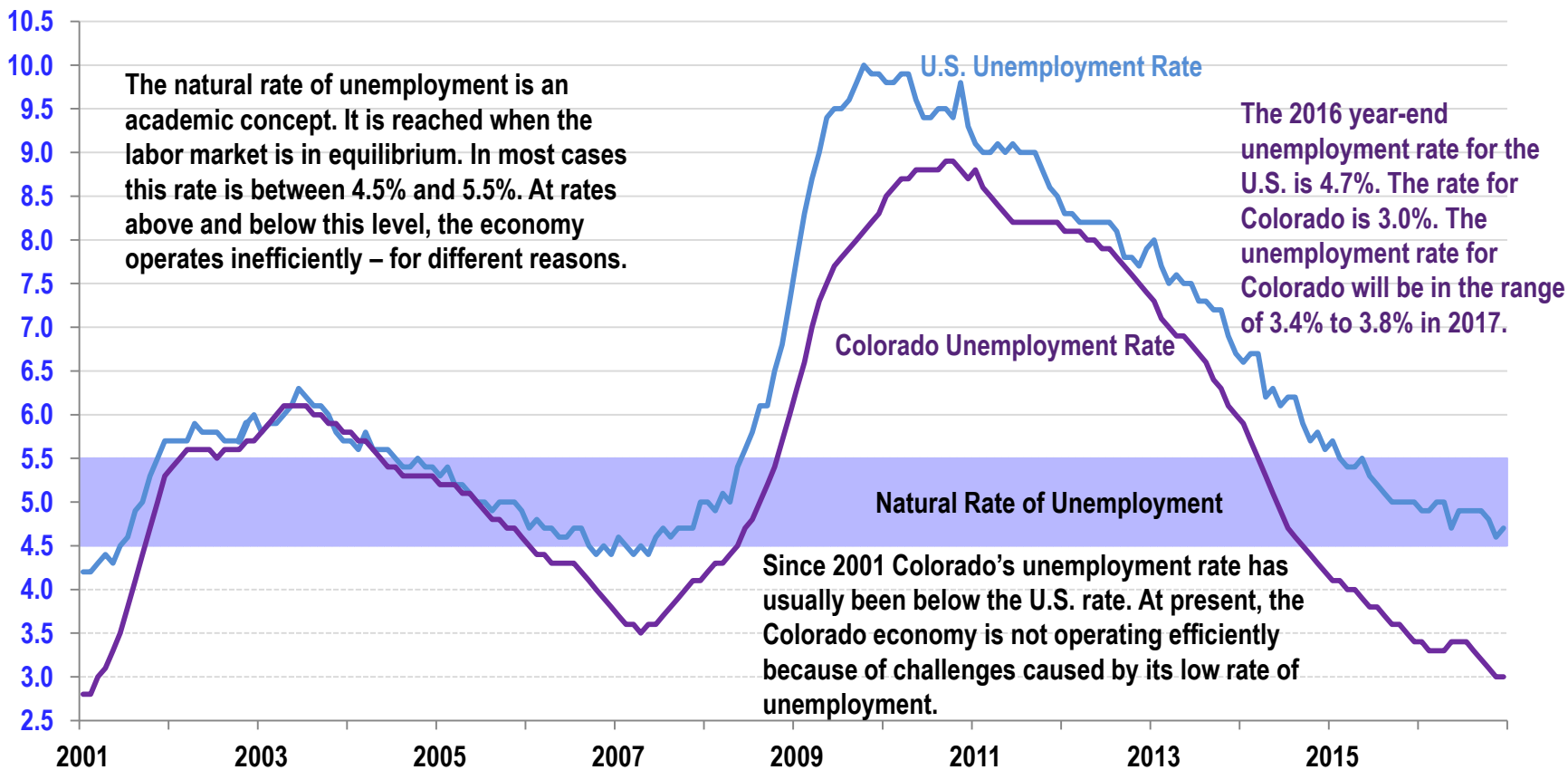
Source: Bureau of Labor Statistics, NSA, cber.co. Note: MSA unemployment lags by two months and is reported only on a non-seasonally adjusted basis.

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Unemployment Rate
United States vs. Colorado

United States vs. Colorado Unemployment Rate

Percent

The natural rate of unemployment is an academic concept. It is reached when the labor market is in equilibrium. In most cases this rate is between 4.5% and 5.5%. At rates above and below this level, the economy operates inefficiently – for different reasons.

U.S. Unemployment Rate

Colorado Unemployment Rate

The 2016 year-end unemployment rate for the U.S. is 4.7%. The rate for Colorado is 3.0%. The unemployment rate for Colorado will be in the range of 3.4% to 3.8% in 2017.

Natural Rate of Unemployment

Since 2001 Colorado's unemployment rate has usually been below the U.S. rate. At present, the Colorado economy is not operating efficiently because of challenges caused by its low rate of unemployment.

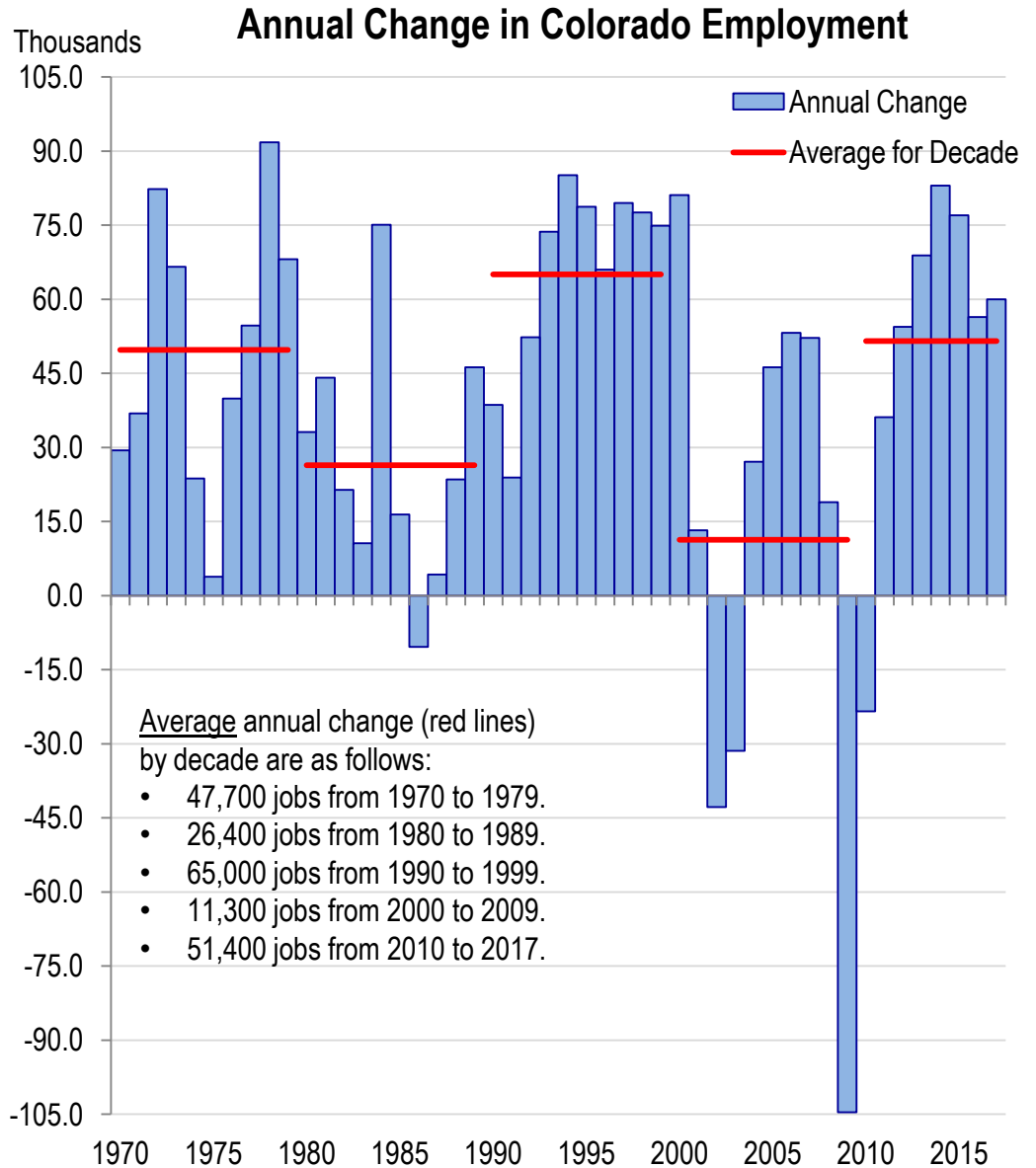Source: Bureau of Labor Statistics, SA, cber.co.

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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%.

Annual Change in Colorado Employment

Thousands

Legend:
- Annual Change
- Average for Decade

Average annual change (red lines) by decade are as follows:
- 47,700 jobs from 1970 to 1979.
- 26,400 jobs from 1980 to 1989.
- 65,000 jobs from 1990 to 1999.
- 11,300 jobs from 2000 to 2009.
- 51,400 jobs from 2010 to 2017.

The Colorado Economy
Benchmark Revisions

Bureau of Labor Statistics
Benchmark Data Revision Process

BLS and LMI Data Projections

The Bureau of Labor Statistics has a process for revising their employment data each March that is often referred to as the benchmark revisions. This section briefly describes that process and what recent updates mean to Colorado.

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

BLS and LMI Data Revision Process

The CES projection process is outlined below:

1. Around the 20th of a month, preliminary data for the prior month will be published and the month prior to that will be updated (For example, around June 20th preliminary data for May will be produced and April will be updated.) These revisions are usually minor. Most short-term forecasts use this data.

2. In March of the following year, the previous two years will be revised. (For example, the 2014 employment data will be revised in March 2015 and finalized in March 2016).

3. The initial March update is usually the most significant revision, and the two-year update is often minor (In the case of 2014, some of the monthly totals will see significant upward revisions when revised in March 2015.)

4. Periodically, BLS updates the entire data series back to 1990. This usually occurs when they recalibrate their projection models or redefine NAICS codes.

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Overview of the Benchmark Revisions
2015 and 2016

There is good news and there is bad news in the March 2017 revisions.

Good News

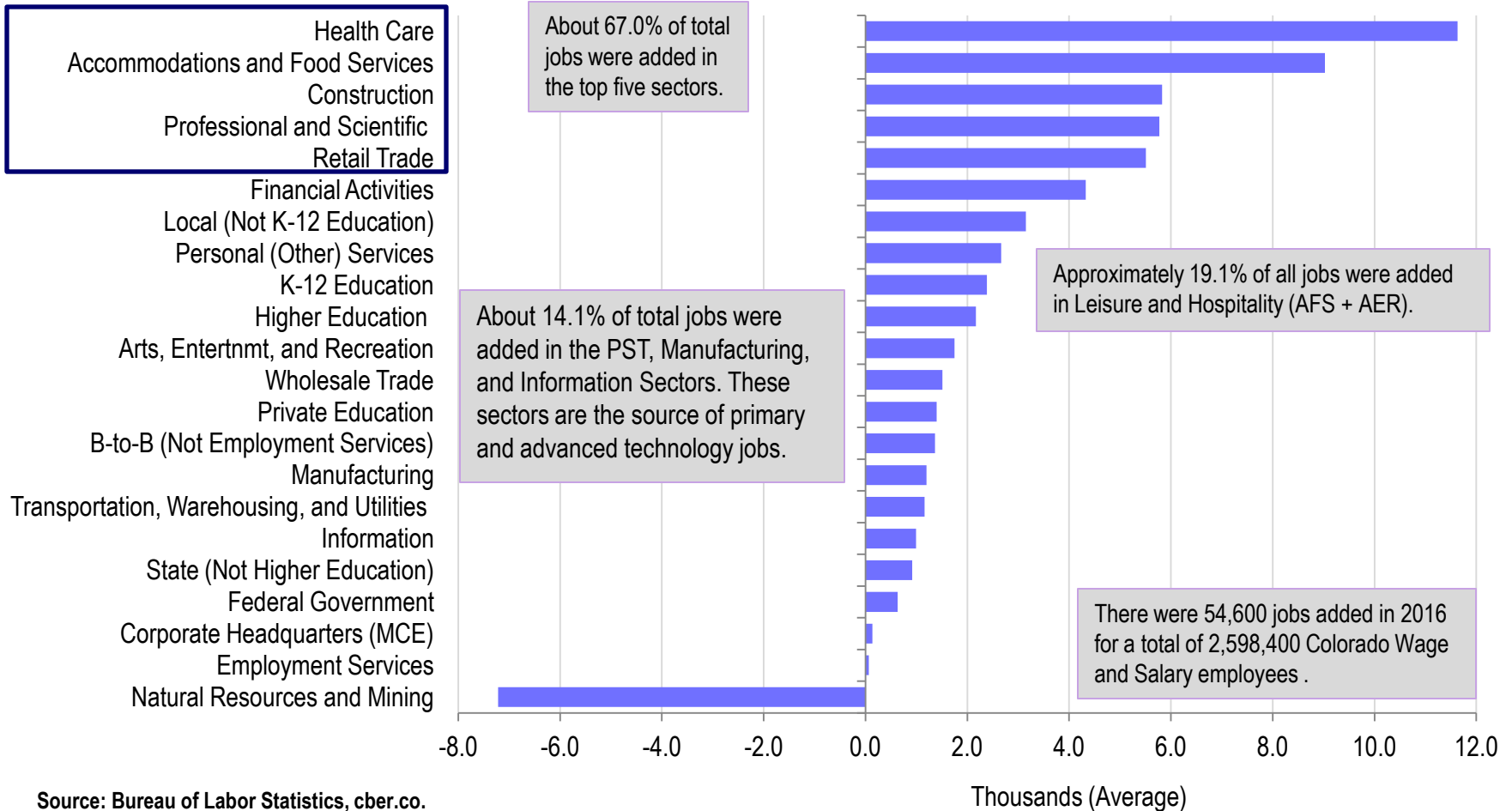Employment for 2015 was revised upwards to 77,000.

Bad News

Throughout 2016 the BLS data indicated the state would add about 70,000 jobs in 2016. Unfortunately, that was revised significantly downwards to 56,400.

The following two charts show the total change by sector and total employment by sector.
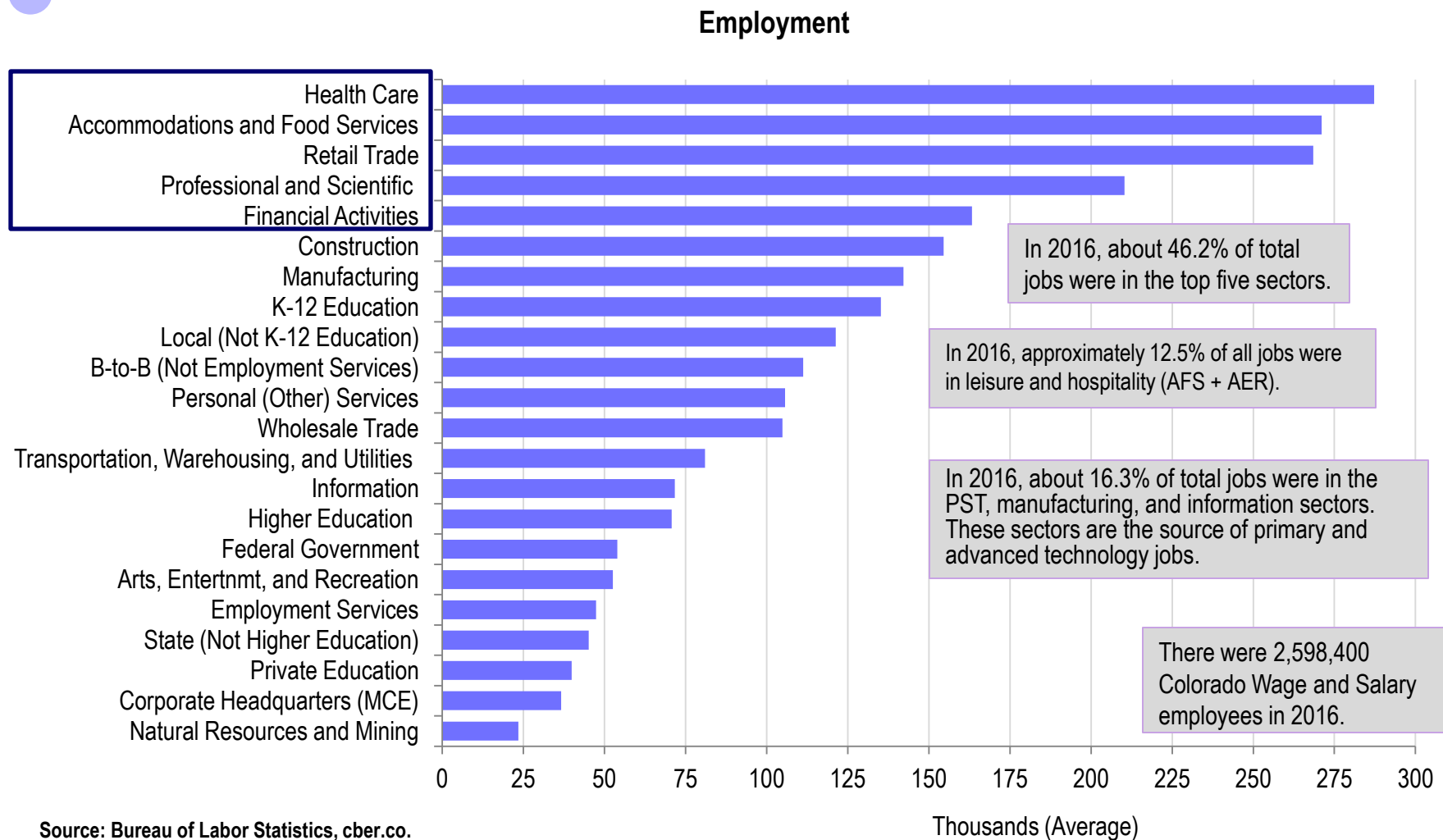
2016 Colorado Employment Changes by Sector

Job Change All Sectors

About 67.0% of total jobs were added in the top five sectors.

About 14.1% of total jobs were added in the PST, Manufacturing, and Information Sectors. These sectors are the source of primary and advanced technology jobs.

Approximately 19.1% of all jobs were added in Leisure and Hospitality (AFS + AER).

There were 54,600 jobs added in 2016 for a total of 2,598,400 Colorado Wage and Salary employees .

Health Care
Accommodations and Food Services
Construction
Professional and Scientific
Retail Trade
Financial Activities
Local (Not K-12 Education)
Personal (Other) Services
K-12 Education
Higher Education
Arts, Entertnmt, and Recreation
Wholesale Trade
Private Education
B-to-B (Not Employment Services)
Manufacturing
Transportation, Warehousing, and Utilities
Information
State (Not Higher Education)
Federal Government
Corporate Headquarters (MCE)
Employment Services
Natural Resources and Mining

Thousands (Average)

-8.0   -6.0   -4.0   -2.0   0.0   2.0   4.0   6.0   8.0   10.0   12.0

Source: Bureau of Labor Statistics, cber.co.

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

Total 2016 Colorado
Wage and Salary Employment by Sector

Employment

Sector	Employment (Thousands Average)
Health Care	~287
Accommodations and Food Services	~270
Retail Trade	~268
Professional and Scientific	~210
Financial Activities	~163
Construction	~153
Manufacturing	~142
K-12 Education	~135
Local (Not K-12 Education)	~121
B-to-B (Not Employment Services)	~111
Personal (Other) Services	~105
Wholesale Trade	~104
Transportation, Warehousing, and Utilities	~82
Information	~71
Higher Education	~70
Federal Government	~54
Arts, Entertnmt, and Recreation	~53
Employment Services	~47
State (Not Higher Education)	~45
Private Education	~40
Corporate Headquarters (MCE)	~36
Natural Resources and Mining	~23

In 2016, about 46.2% of total jobs were in the top five sectors.

In 2016, approximately 12.5% of all jobs were in leisure and hospitality (AFS + AER).

In 2016, about 16.3% of total jobs were in the PST, manufacturing, and information sectors. These sectors are the source of primary and advanced technology jobs.

There were 2,598,400 Colorado Wage and Salary employees in 2016.

Source: Bureau of Labor Statistics, cber.co.

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Five-Year Rolling Average Absolute Job Growth

Five-Year Rolling Average Colorado Jobs Added

(000s)

Given the benchmark revisions, it is appropriate to compare the average number of jobs added for the past five years to previous five year periods, i.e. the five year rolling average.

For the five-year period ending in 2016, Colorado added an average of 67,900 jobs. Only 5 other five-year periods had stronger job growth (years ending in 1996 to 2000).

67,900 jobs added

Source: Bureau of Labor Statistics, cber.co.

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Colorado Employment Forecast
Strong Growth, Solid Growth, Volatile Categories

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. The data used for classifying the sectors is available in the appendix. 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.

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
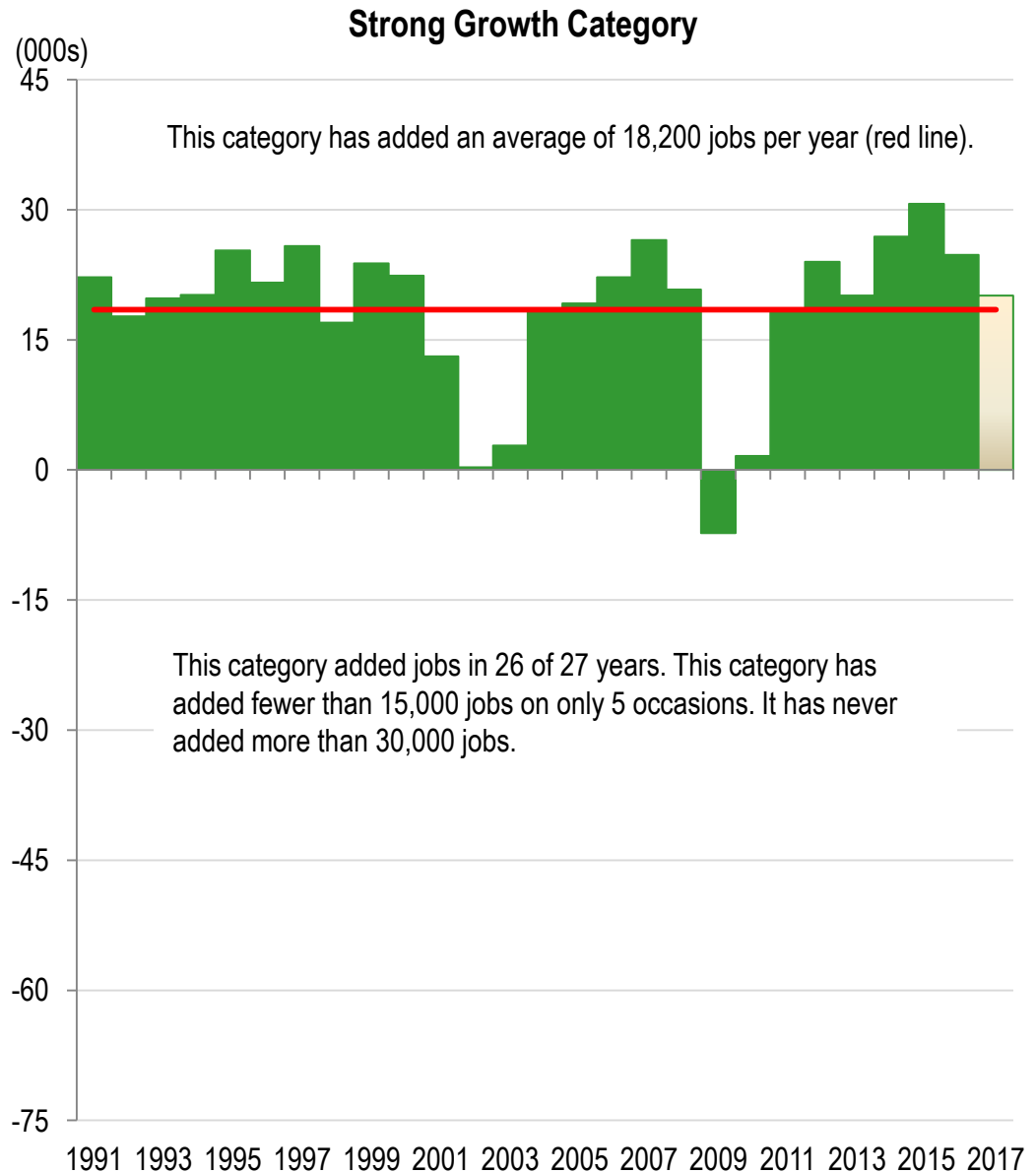- Arts, Entertainment, and Recreation
- Other Services.

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.

Strong Growth Category

(000s)

This category has added an average of 18,200 jobs per year (red line).

This category added jobs in 26 of 27 years. This category has added fewer than 15,000 jobs on only 5 occasions. It has never added more than 30,000 jobs.

Source: Bureau of Labor Statistics, cber.co.

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Three Things to Look for in 2017
Strong Growth Category

Strong Growth Category

(Business and Services)

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

Three Things to Look For

- In 2017, jobs will be added at a rate slightly above the long-term average for the category.
- The health care sector will lead job growth. It is likely the Affordable Care Act will be revised by Congress; however, it is unlikely the changes will have an impact on employment in 2017.
- The PST sector will continue to be a source of high wage jobs. Many of the jobs will be added in the advanced technology clusters with a small number of jobs being added in industries that support the extractive industries.

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.

Solid Growth Category

(000s)

This category added an average of 16,100 jobs each year (red line).

This category added jobs in 24 of 27 years. This category has added fewer than 15,000 jobs on 7 occasions. It has only added above 30,000 jobs once.

Source: Bureau of Labor Statistics, cber.co.

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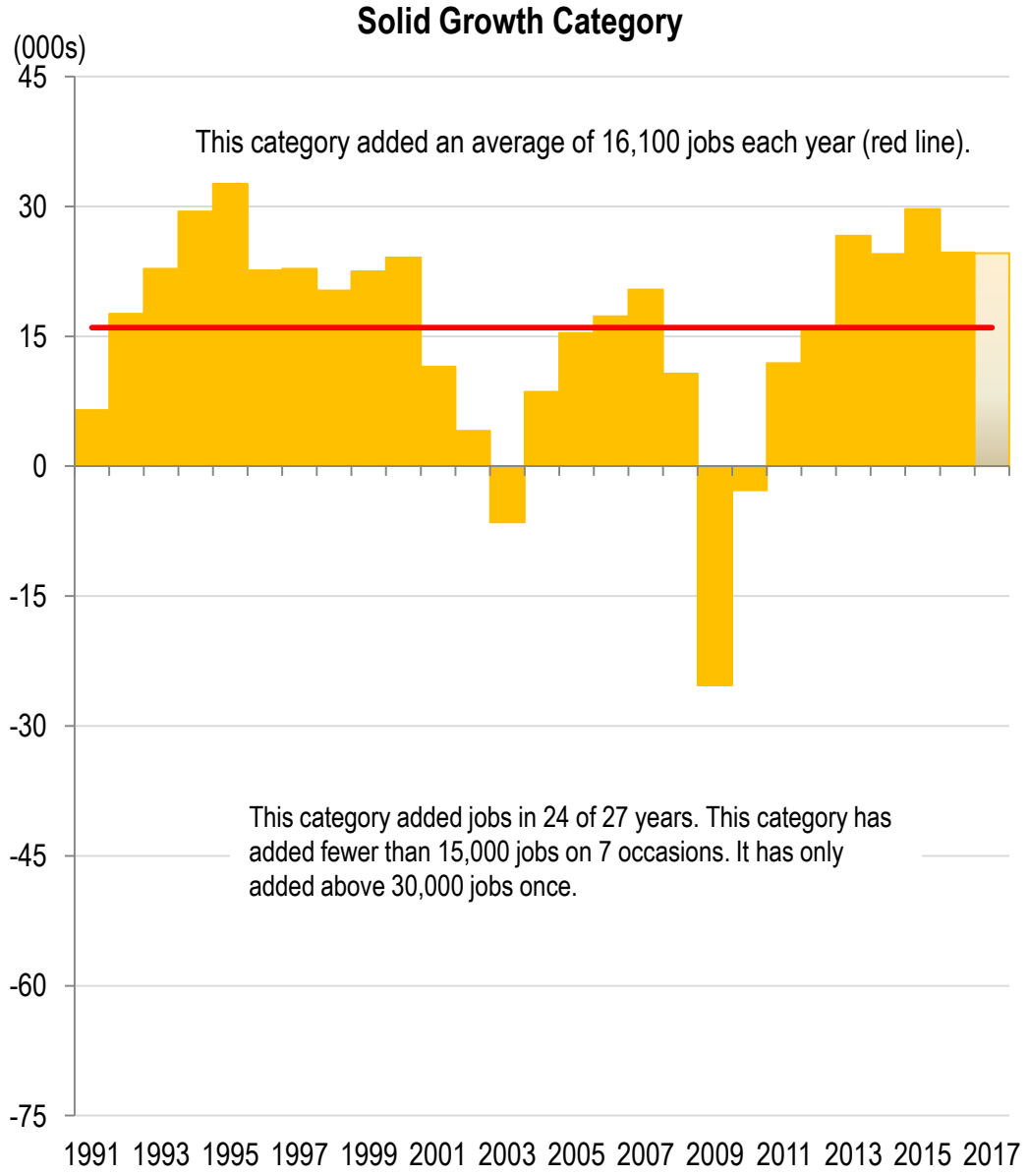
Three Things to Look for in 2017
Solid Growth Category

Solid Growth Category

(Consumption and Government)

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

Three Things to Look For

- Job growth in this category will be solid, but about the same as 2016. It will be well above the long-term average for the category.
- State and local government coffers will benefit from increased sales and income taxes. This will occur because of increases in the population, employment, and wages.
- Demand for food service operations (AFS) will continue to increase because of the strong tourism industry and a larger population.

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
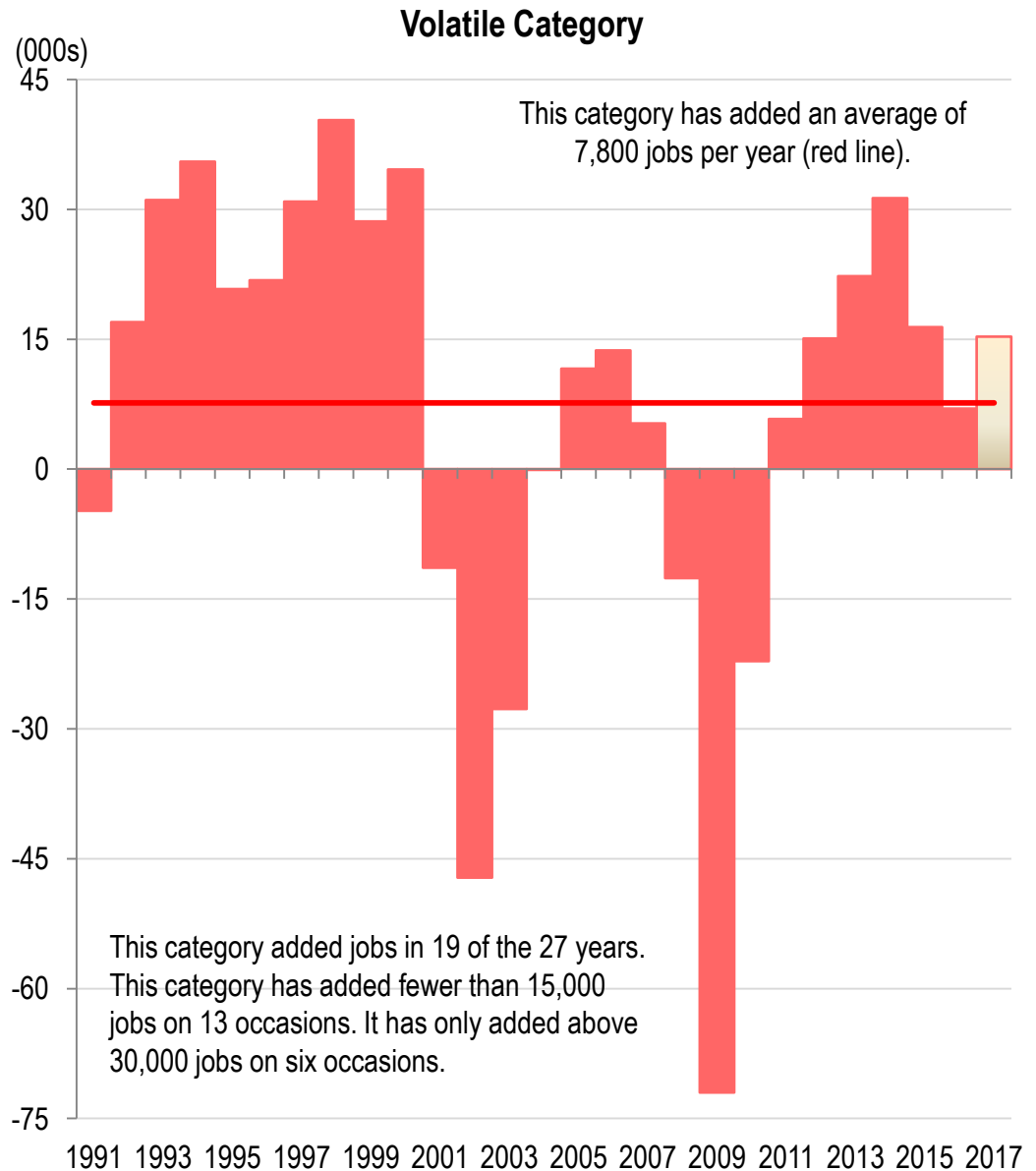- Information
- Federal Government

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.

Volatile Category

(000s)

This category has added an average of 7,800 jobs per year (red line).

This category added jobs in 19 of the 27 years. This category has added fewer than 15,000 jobs on 13 occasions. It has only added above 30,000 jobs on six occasions.

Source: Bureau of Labor Statistics, cber.co.

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

Three Things to Look for in 2017
Volatile Category

Volatile Category

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

Three Things to Look For

- Construction will have a <u>solid to strong</u> year in 2017. The greatest concern will be finding a sufficient number of qualified workers to fill job openings.
- The price for a barrel of oil is again in the $45 to $55 range and projected to move higher in 2017. The rig count is again trending upward and production will be similar to the last two years.
- The number of manufacturing jobs flattened out in 2016 and is expected to show minimal growth in 2017. The growth in financial activities will increase at a slower rate. Higher interest rates may cause reduced demand for financial industry workers.

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 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.

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 that 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.

Source: cber.co.

2017 Employment Forecast
Most Likely Scenario

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.

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

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

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

Source: cber.co.

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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 2.2% in 2016 and 2.1% to 2.5% in 2017.

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.

Note: This data reflects projected changes to the 2015 and 2016 data when BLS makes its revisions in March 2017.
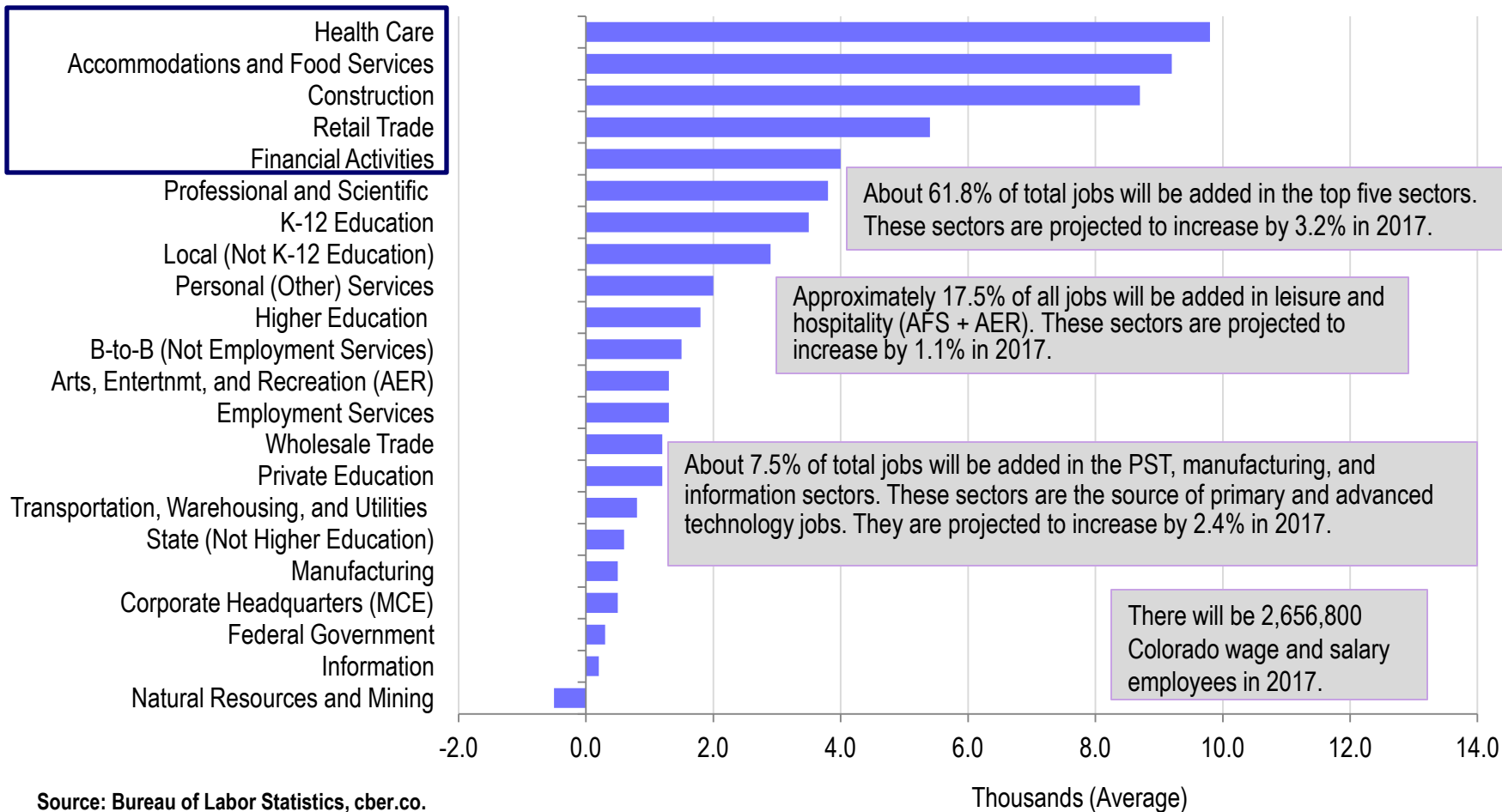
Strong, Solid, and Volatile Growth Categories

Source: Bureau of Labor Statistics, cber.co.

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

Projected Job Changes
2017 Forecast

Job Change All Sectors

Sector	
Health Care	
Accommodations and Food Services	
Construction	
Retail Trade	
Financial Activities	
Professional and Scientific	
K-12 Education	
Local (Not K-12 Education)	
Personal (Other) Services	
Higher Education	
B-to-B (Not Employment Services)	
Arts, Entertnmt, and Recreation (AER)	
Employment Services	
Wholesale Trade	
Private Education	
Transportation, Warehousing, and Utilities	
State (Not Higher Education)	
Manufacturing	
Corporate Headquarters (MCE)	
Federal Government	
Information	
Natural Resources and Mining	

About 61.8% of total jobs will be added in the top five sectors. These sectors are projected to increase by 3.2% in 2017.

Approximately 17.5% of all jobs will be added in leisure and hospitality (AFS + AER). These sectors are projected to increase by 1.1% in 2017.

About 7.5% of total jobs will be added in the PST, manufacturing, and information sectors. These sectors are the source of primary and advanced technology jobs. They are projected to increase by 2.4% in 2017.

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

-2.0   0.0   2.0   4.0   6.0   8.0   10.0   12.0   14.0

Thousands (Average)

44

Colorado Wage and Salary Employment
2017 Forecast

Employment

Sector	Thousands (Average)
Health Care	~295
Accommodations and Food Services	~282
Retail Trade	~273
Professional and Scientific	~210
Financial Activities	~167
Construction	~166
Manufacturing	~142
K-12 Education	~140
Local (Not K-12 Education)	~122
B-to-B (Not Employment Services)	~113
Personal (Other) Services	~106
Wholesale Trade	~105
Transportation, Warehousing, and Utilities	~81
Higher Education	~72
Information	~71
Federal Government	~54
Arts, Entertnmt, and Recreation	~53
Employment Services	~50
State (Not Higher Education)	~45
Private Education	~41
Corporate Headquarters (MCE)	~37
Natural Resources and Mining	~22

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

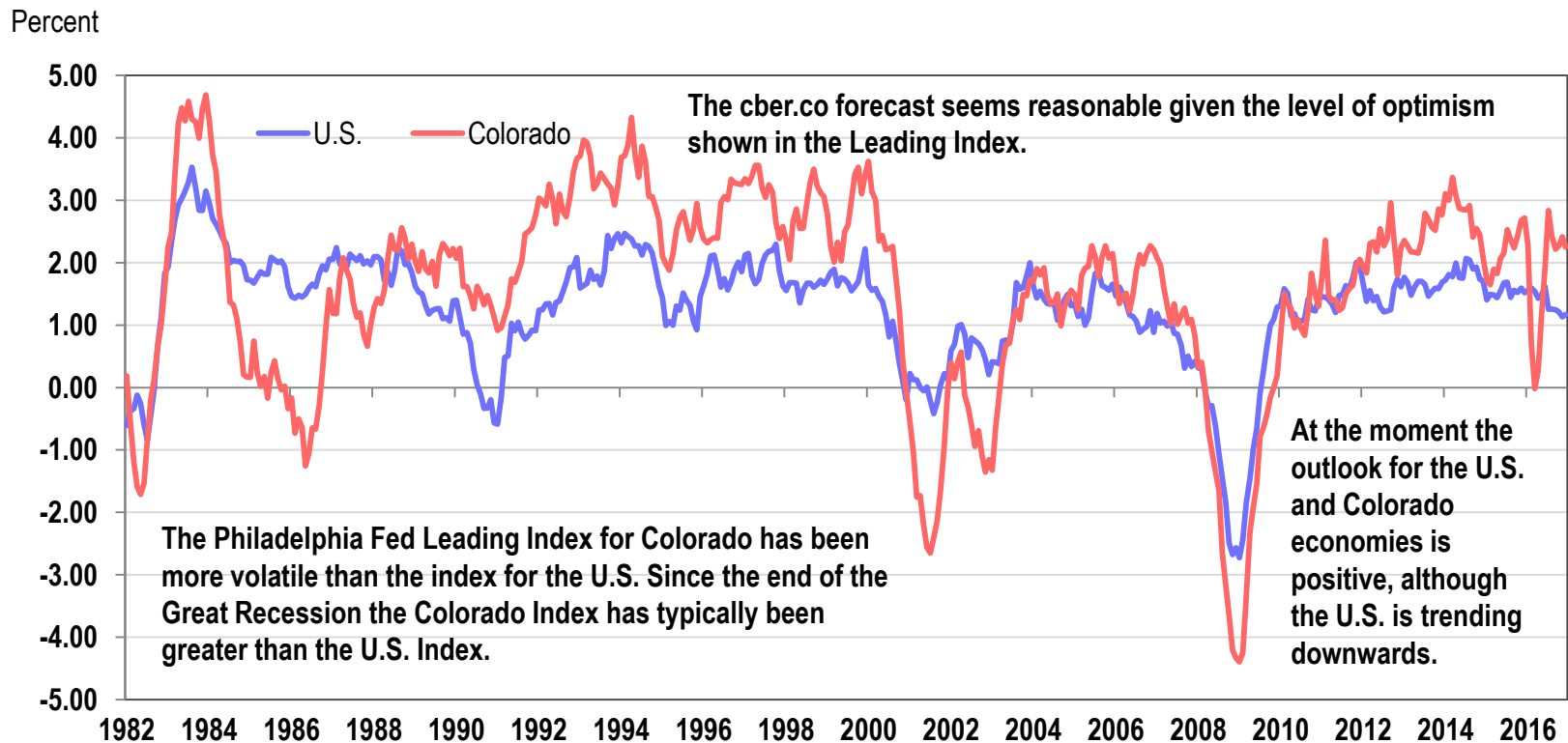Approximately 12.6% of all jobs are in leisure and hospitality (AFS + AER).

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.

Source: Bureau of Labor Statistics, cber.co.

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Leading Index
Colorado vs. United States

Leading Index Colorado vs. U.S.

Percent

The cber.co forecast seems reasonable given the level of optimism shown in the Leading Index.

The Philadelphia Fed Leading Index for Colorado has been more volatile than the index for the U.S. Since the end of the Great Recession the Colorado Index has typically been greater than the U.S. Index.

At the moment the outlook for the U.S. and Colorado economies is positive, although the U.S. is trending downwards.

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

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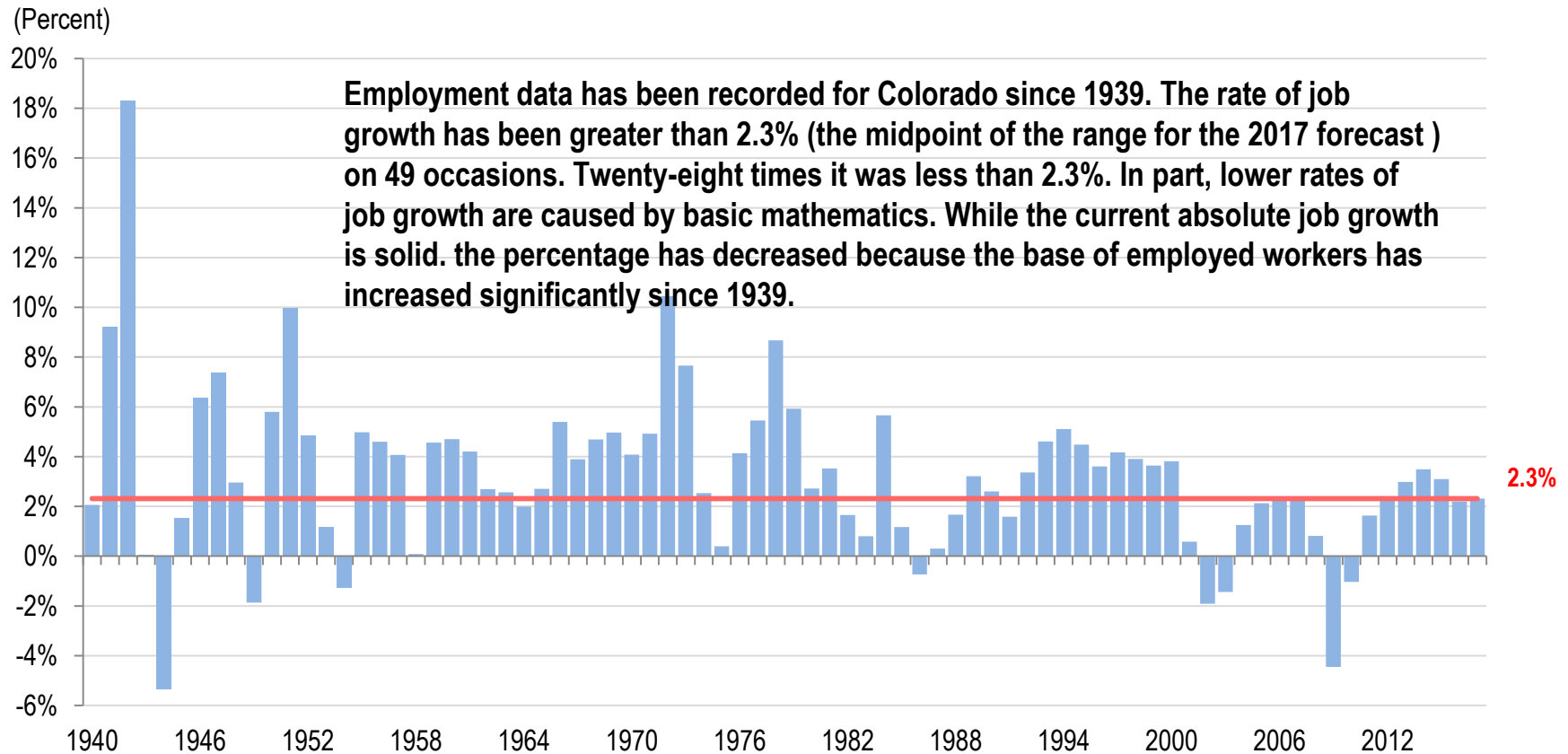
The Projected Absolute Job Growth for 2017 (Total Jobs Added) will be the 17th Strongest since 1939.

Colorado Jobs Added

(000s)

Employment data has been recorded for Colorado since 1939 (78 years), including the 2017 projection. The change in employment has been greater than 60,000 workers (the midpoint of the range for the 2017 forecast) on 16 occasions. The first time the change in employment was greater than 60,000 workers was in 1972. Colorado employment has been greater than 60,000 employees 4 times during the 1970s, 1 time during the 1980s, 7 times during the 1990s, 1 time during the 2000s, and 3 times during the 2010s.

60,000 jobs added

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

Percentage of Jobs Added

(Percent)

Employment data has been recorded for Colorado since 1939. The rate of job growth has been greater than 2.3% (the midpoint of the range for the 2017 forecast) on 49 occasions. Twenty-eight times it was less than 2.3%. In part, lower rates of job growth are caused by basic mathematics. While the current absolute job growth is solid. the percentage has decreased because the base of employed workers has increased significantly since 1939.

2.3%

50

Colorado Employment as a Percent of U.S. Employment

Colorado Employment as a Percent of U.S. Employment
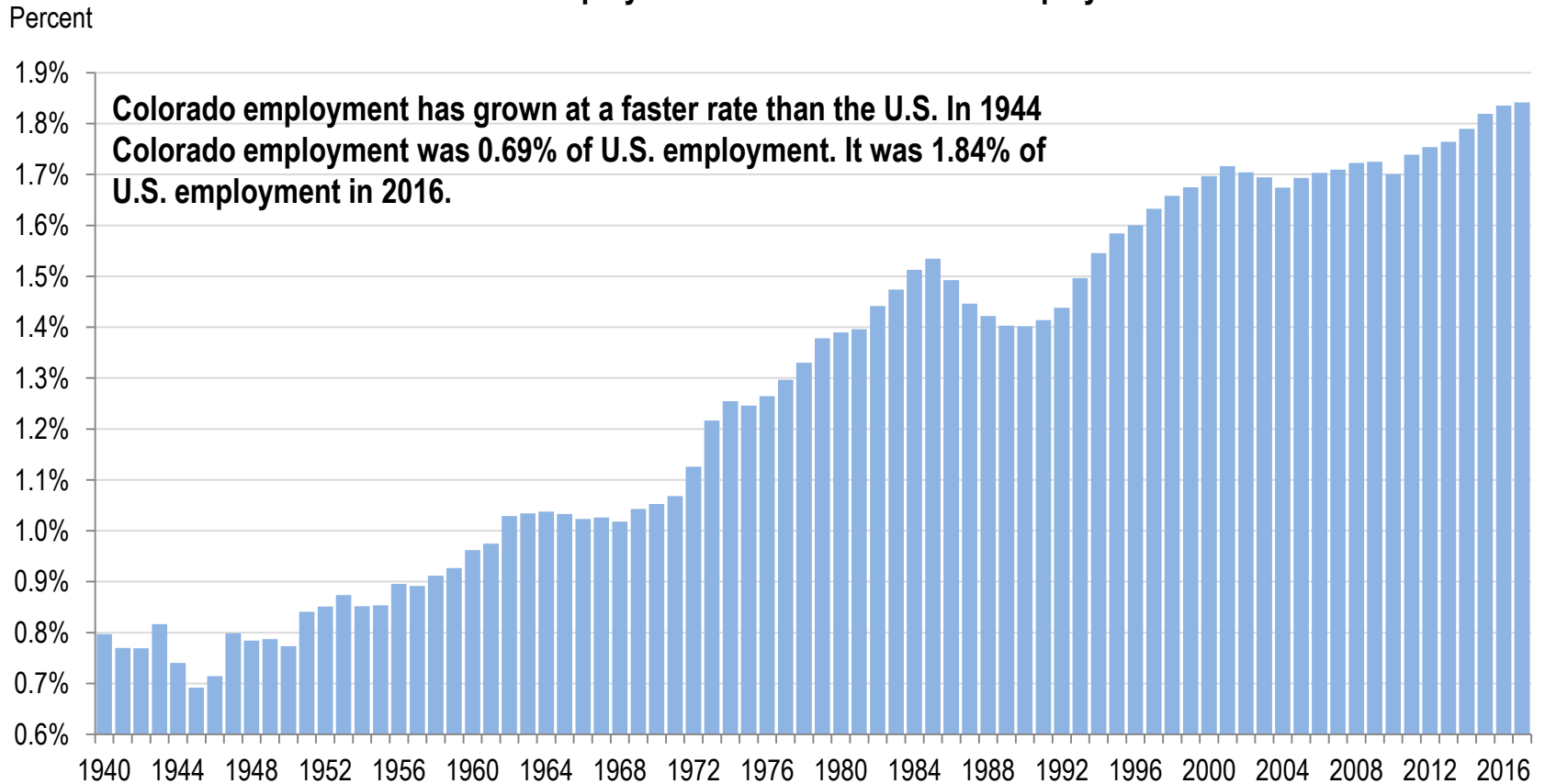
Percent

Colorado employment has grown at a faster rate than the U.S. In 1944 Colorado employment was 0.69% of U.S. employment. It was 1.84% of U.S. employment in 2016.

The Colorado Economy
Summary

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 is positive for Colorado.

3. Modest, but diverse establishment and job growth.

4. Construction will be solid.

5. Extractive industries are on solid ground again.

6. 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. Attainable and affordable housing will be more difficult to find.

The state will likely see positive and negative changes resulting from the new administration.

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

Review of Revised 2016 Colorado Employment Data and 2017 Employment Forecast

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 programs.

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