cber.co Colorado Economy and Employment Data Through April 2017

Colorado-based Business and Economic Research Prepared May 22, 2017

Overview of Economic Review

This chartbook provides a series of charts, graphs, and discussions that review the Colorado wage and salary employment data published by the Bureau of Labor Statistics for the first 4 months of 2017. On average, Colorado employment through April indicates the state is on track to add 47,900 jobs this year, a number that appears to be understated. In addition, the Bureau of Economic Analysis released 2016 Colorado real GDP data by industry showing Colorado outperformed the U.S. in 2016, 2.0% vs. 1.6%.

U.S. Economy

- The United States Economy
 - Leading Index, Real GDP, Personal Consumption,
 Domestic Private Investment, Government
 Expenditures
 - Employment, ECI, Productivity
 - Equities, Equity Volatility, Corporate Profits
 - Manufacturing, Non-manufacturing, Trade Weighted Dollar, CPI, Retail, Auto Sales
 - Summary

The Colorado Economy

- Population, Unemployment, Employment
- Employment in Strong Growth, Solid Growth, Volatile Categories
- Additional Data
- U.S. vs. Colorado Real GDP 2009 Through 2016
- Summary

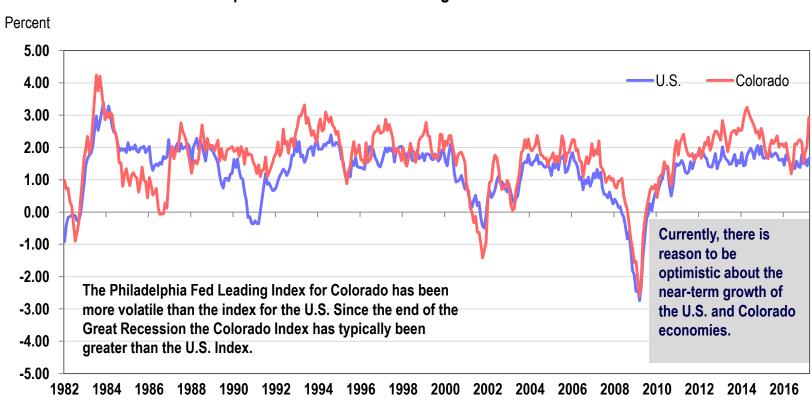
The complete 2017 cber.co forecast can be found at http://cber.co/economic-forecasts/

The U.S. Economy

Leading Index, Real GDP, Personal Consumption, Domestic Private Investment, Government Expenditures

Leading Index Colorado vs. United States

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



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

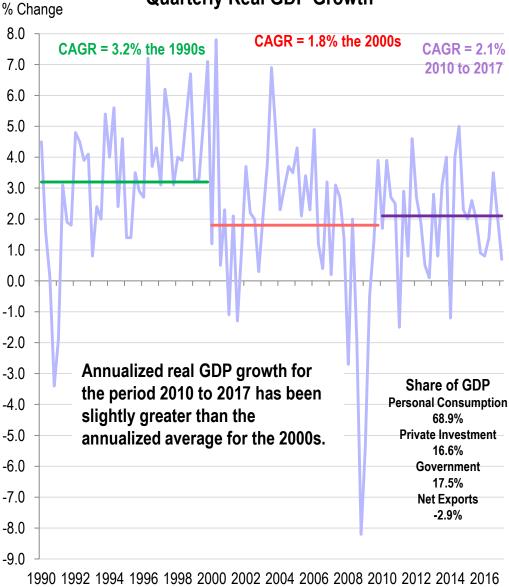
Annualized real GDP growth for the 1990s was 3.2% (green line). It was 1.8% for the 2000s (red line) and 2.1% from 2010 to 2015 (purple line).

Real GDP growth for Q1 2017 was 0.7%.

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%
- 2016 1.6%
- 2017 2.1% to 2.5% projected

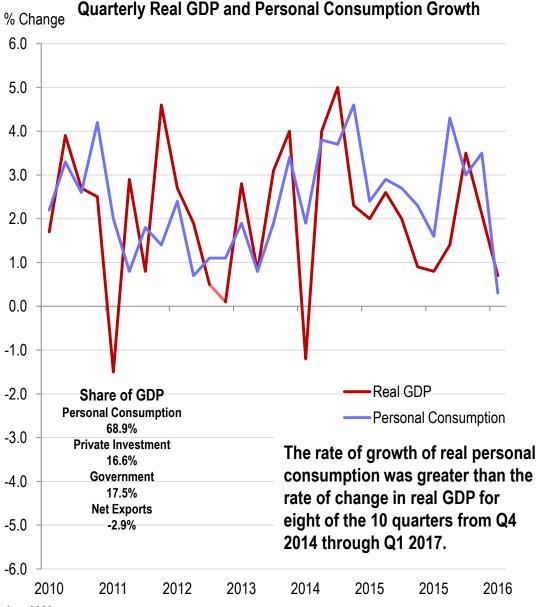




Real GDP growth for Q1 2017 was 0.7%. Real personal consumption increased at a rate of 0.3%. Although, consumption came in below expectations, this is thought to be an anomaly and stronger growth is expected in Q2 and the remainder of the year.

Real personal consumption growth for recent years was:

- 2010 1.9%
- 2011 2.3%
- 2012 1.5%
- 2013 1.5%
- 2014 2.9%
- 2015 3.2%
- 2016 2.7%

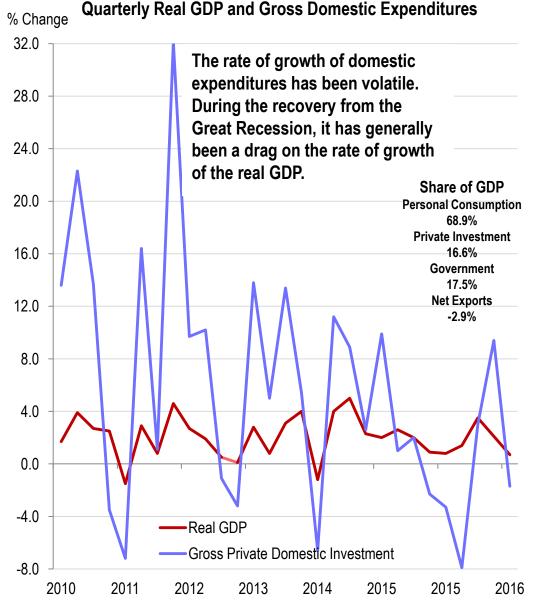


Source: Bureau of Economic Analysis, cber.co, Note GDP chained on 2009.

Real GDP growth for Q1 2017 was 0.7%. Gross private domestic investment changed at a rate of -1.7% in Q1 2017.

Gross private domestic investment for recent years was:

- •2010 12.9%
- 2011 5.2%
- 2012 10.6%
- 2013 6.1%
- 2014 4.5%
- 2015 0.5%
- 2016 -1.6%

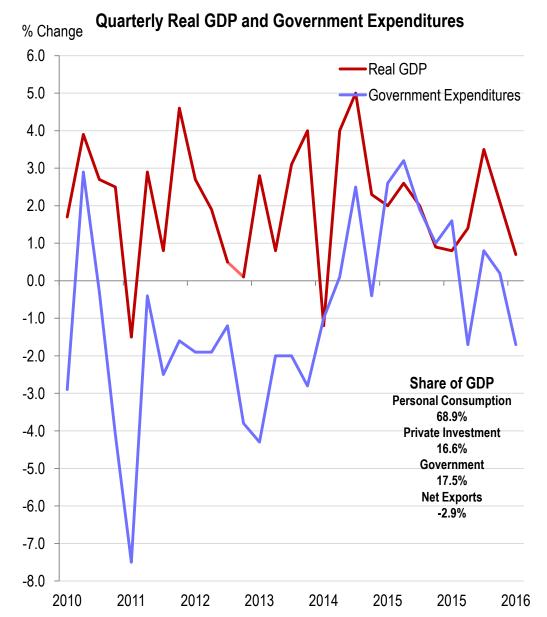


Source: Bureau of Economic Analysis, cber.co, Note GDP chained on 2009.

Real GDP growth for Q1 2017 was 0.7%. Government expenditures changed at a rate of -1.7%. The rate of growth of real government spending has been a drag on the GDP since 2010.

Real government spending for recent years was:

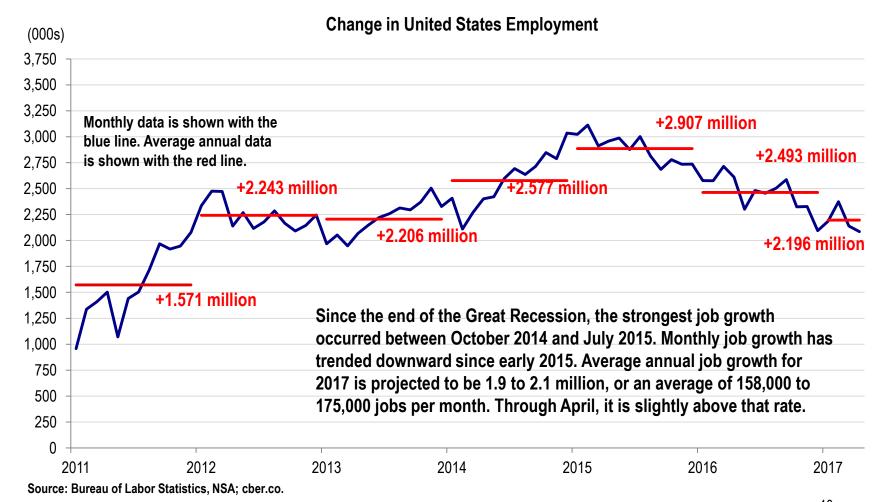
- 2010 0.1%
- 2011 -3.0%
- 2012 -1.9%
- 2013 -2.9%
- 2014 -0.9%
- 2015 1.8%
- 2016 0.8%



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

The U.S. Economy Employment, ECI, Productivity

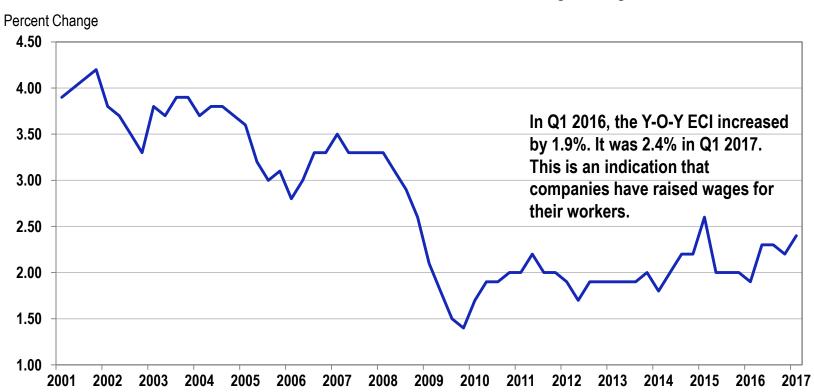
Change in United States Employment Year-Over-Year



Employment Cost Index (ECI)

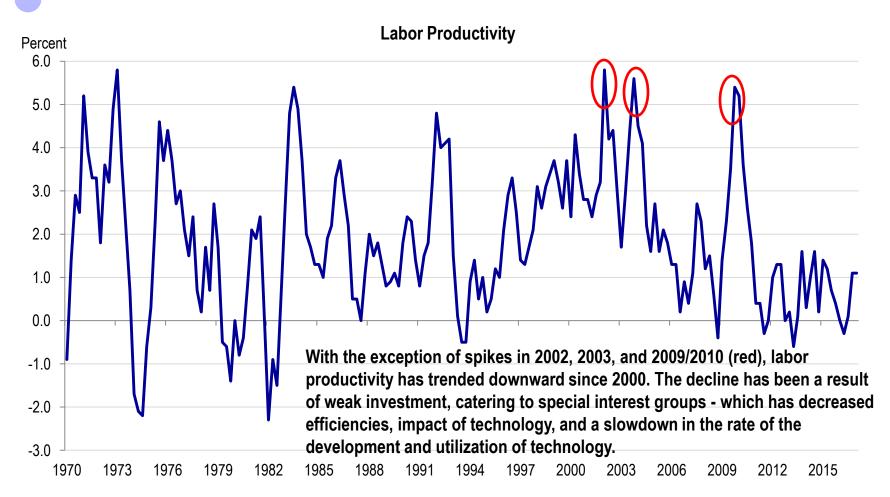
Total Compensation for All Civilian Workers in All Industries, 12-month Percent Change

ECI for Civilian Workers – 12 Month Percentage Change



U.S. Labor Productivity (Output per Hour)

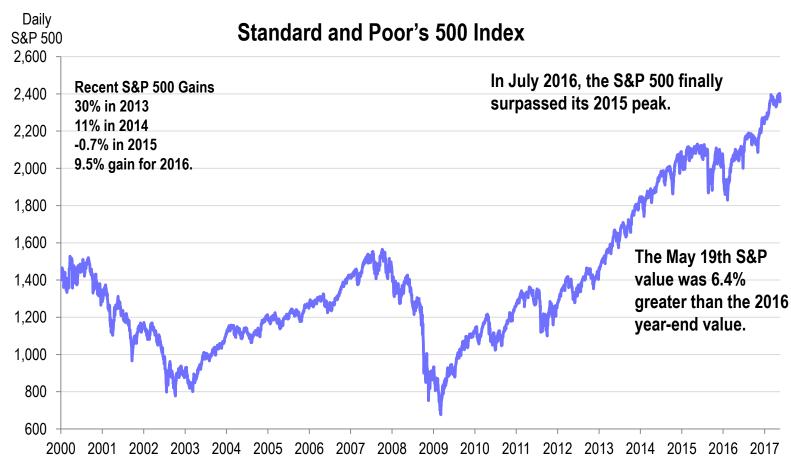
Percent Change Same Quarter Prior Year Nonfarm Business



The U.S. Economy

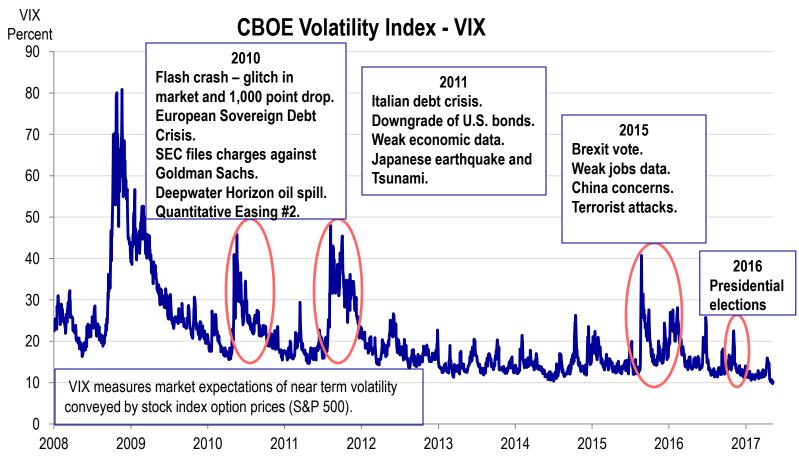
Equities, Equity Volatility, Corporate Profits

Standard and Poor's 500 Index



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

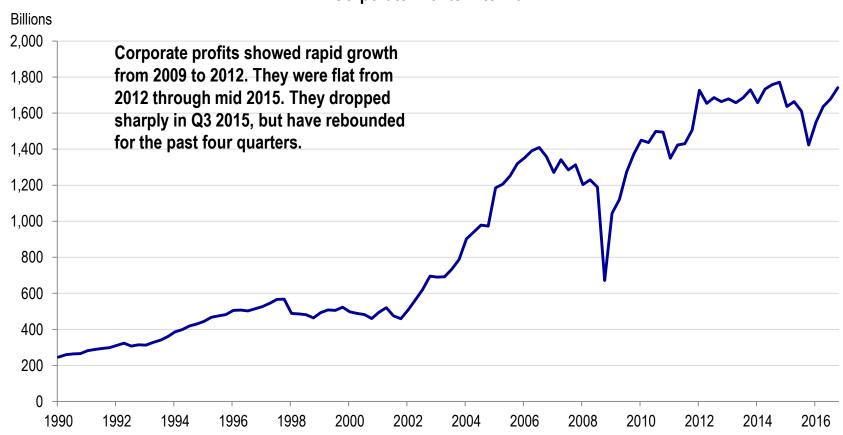
CBOE Volatility Index VIX (VIXCLS)



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

Corporate Profits After Tax (without IVA and CCAdj)

Corporate Profits After Tax

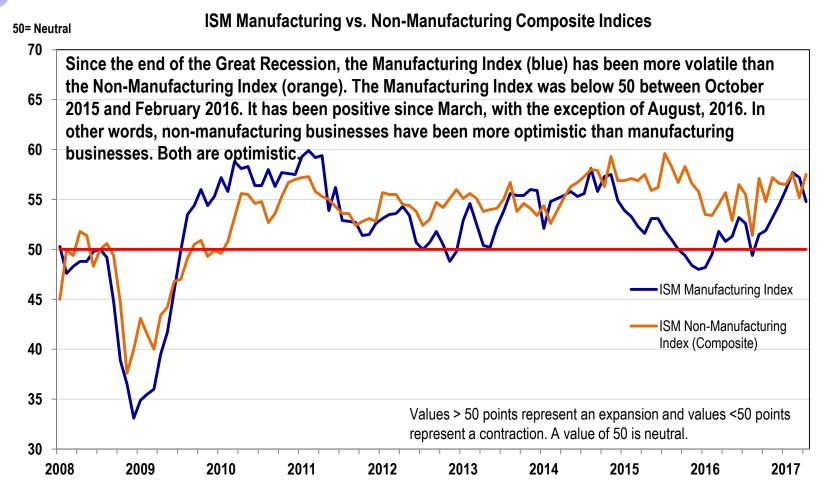


Source: FRED, BEA.

The U.S. Economy

Manufacturing, Non-Manufacturing, Trade Weighted Dollar, CPI, Retail, Auto Sales

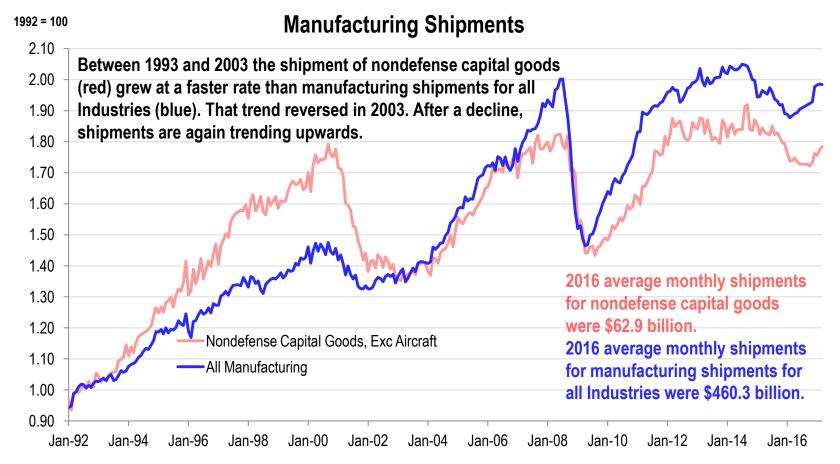
ISM PMI Composite Indices Manufacturing vs. Non-manufacturing



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

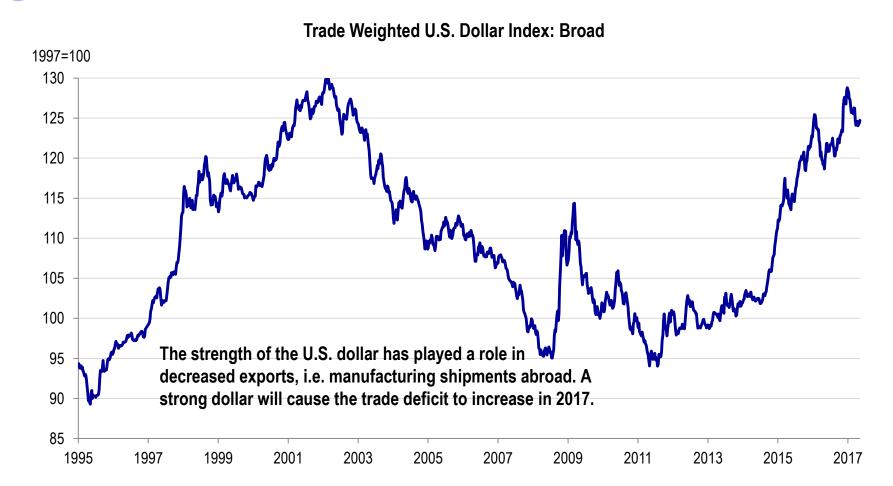
United States Manufacturing Shipments

All Industries vs. Nondefense Capital, Excluding Aircraft



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

Trade Weighted U.S. Dollar Index: Broad



Source: FRED, The Federal Reserve, cber.co.

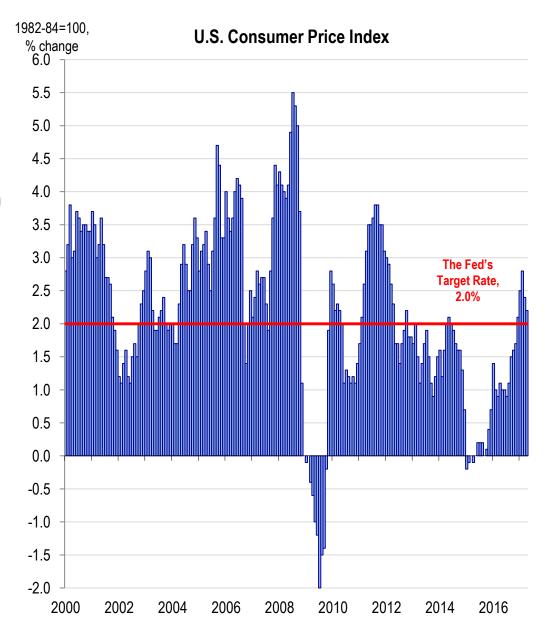
Consumer Price Index (CPI)

In 2015, U.S. inflation, as measured by the seasonally adjusted CPI, dropped precipitously because of lower fuel costs. In the second half of 2016 it began to increase again.

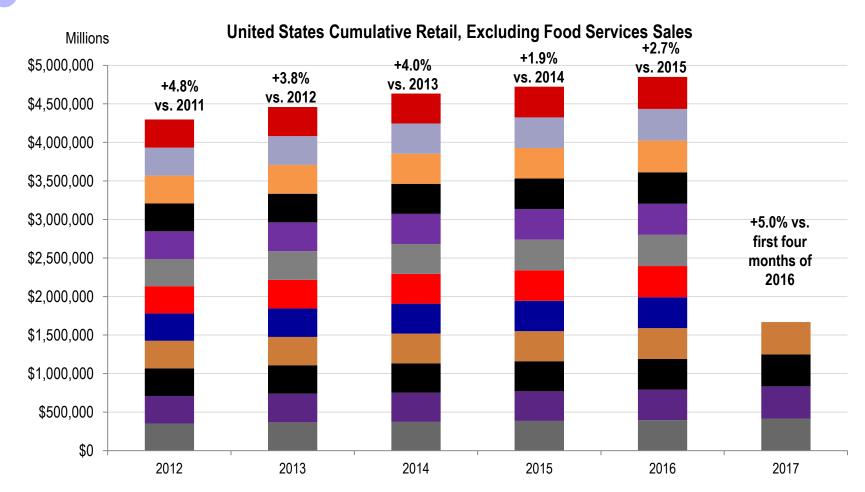
Annual rates for recent years are:

- 2010 1.6%
- 2011 3.2%
- 2012 2.1%
- 2013 1.5%
- 2014 1.6%
- 2015 0.1%
- 2016 1.3%

In 2017 inflation will increase as a result of higher interest rates, housing costs, health care costs, gasoline prices, and wages. Inflation is currently about 2.5%.



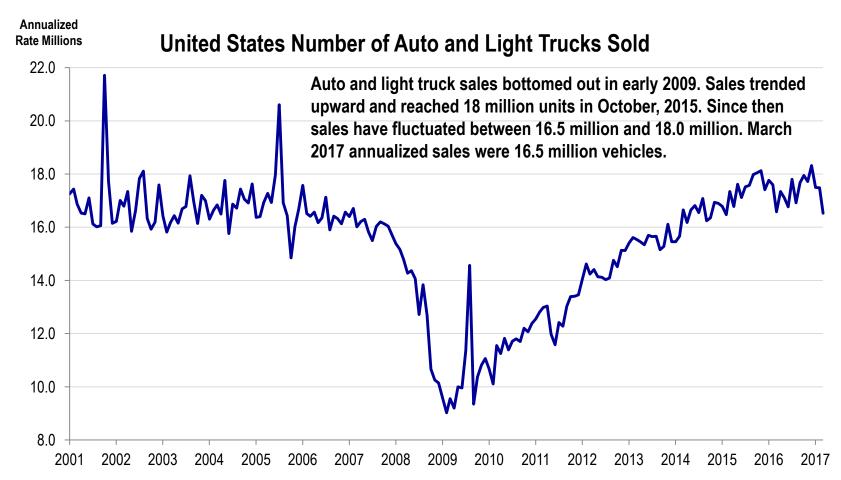
Cumulative Retail, Excluding Food Services Sales



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.

U.S. Weekly Auto and Light Truck Sales



Source: FRED, BEA, cber.co.

Note: Seasonally Adjusted Annualized Rate.

The U.S. Economy Summary

The Global and U.S. Economies in 2017

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

There are always headwinds, but the foundation for the U.S. economy remains solid. At present, the biggest headwinds are the small pool of potential workers and uncertainty caused by the political climate. At the moment, the rhetoric about new legislation has been greater than actual legislation.

- The IMF is more optimistic! The title of their April forecast is "Gaining Momentum?" Their forecast for 2017real GDP global growth has risen to 3.5%, with 3.6% for 2018.
- Stronger real GDP growth is expected for the U.S., 2.1% to 2.5% (2017) vs. 1.6% (2016). Personal consumption will remain solid. Business investment will improve.
- The Philadelphia Federal Reserve Leading Index points to continued growth for the U.S through 2017.
- Purchasing managers (manufacturing and nonmanufacturing) are optimistic about the future.
- Good news the Fed is optimistic about the economy.
 Bad news (for some) the Fed is optimistic about the economy interest rates will be raised.

- Inflation is near the Fed's target of 2.0 to 2.5%.
- Nationally, the U.S. is projected to add 1.9 million to 2.1 million jobs in 2016; currently we are slightly above that range.
- The price of oil is just under \$50 per barrel.
- The dollar with continue to be strong, which will be bad for exports.
- Debt will continue to increase. Depending on your perspective, that will be a concern.

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The Colorado Economy

Population, Unemployment, Employment

Colorado Population Components of Change

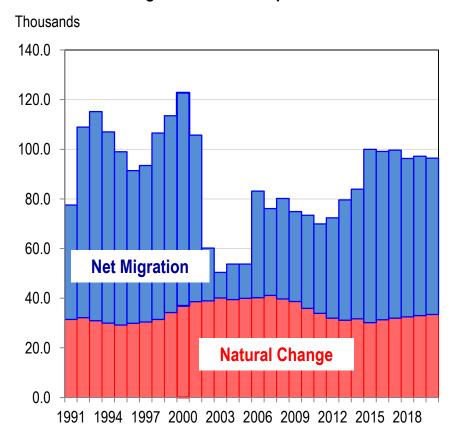
The population increases and decreases are a result of the natural rate of change (births minus deaths) and the change in net migration (people moving into the state minus people moving out of the state).

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. In both cases, it was difficult for people to move anywhere to escape the downturn.

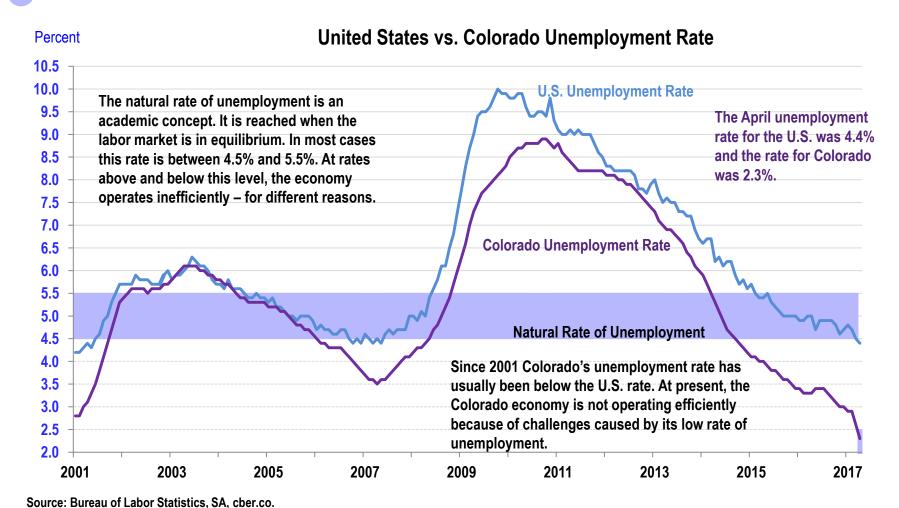
The Colorado population will increase by about 100,000 in through 2020. In 2017 the state's population will increase by 1.8% to 5.655,405.

Change in Colorado Population 1991 - 2020



Unemployment Rate

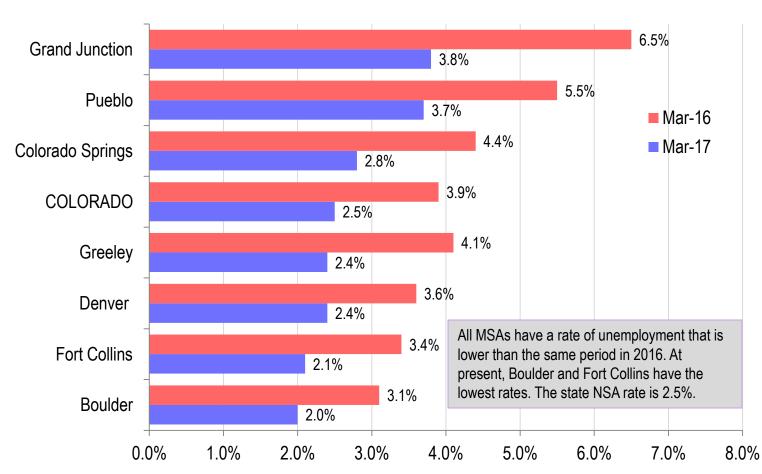
United States vs. Colorado



Unemployment by MSA

2016 vs. 2017

Unemployment by MSA

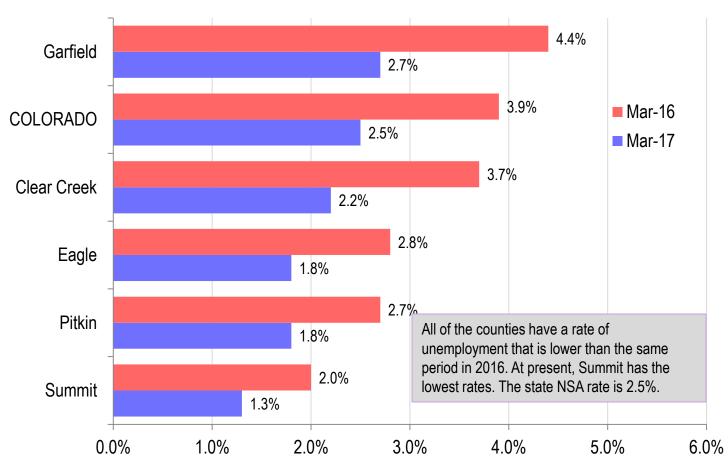


Source: Bureau of Labor Statistics, NSA, cber.co. Note: MSA unemployment lags by two months and is reported only on a non-seasonally adjusted basis.

Unemployment by County (I-70)

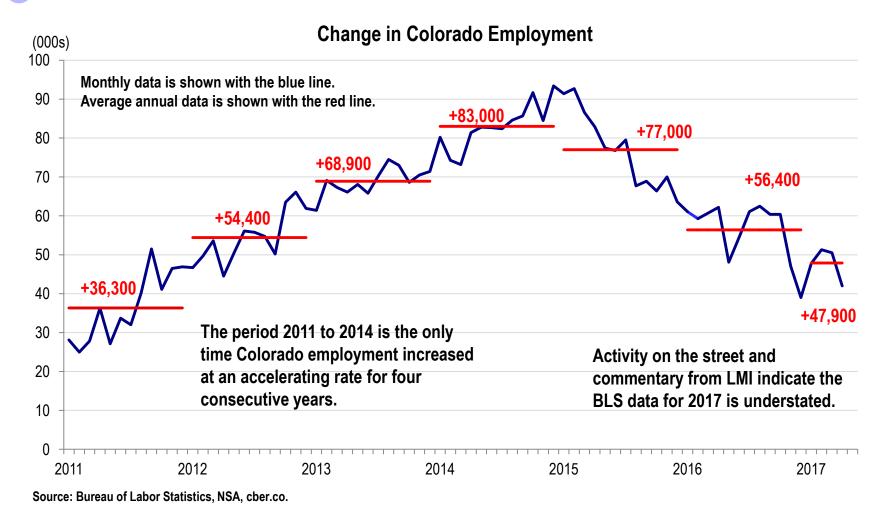
2016 vs. 2017

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.

Change in Colorado Employment Year-Over-Year



Colorado Economy

Employment in Strong Growth, Solid Growth, Volatile Categories

Change in Employment
Summary of Strong, Solid,
and Volatile Growth
Categories

Strong Growth Category – 21,900 jobs added, 2.6% growth rate.

Health care and professional, business, and personal services are the major sectors.

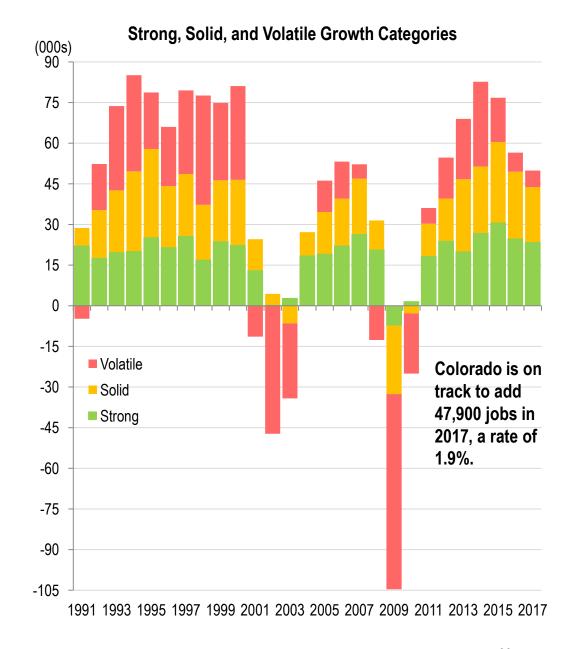
Solid Growth Category – 20,400 jobs added, 2.0% growth rate.

Accommodations and food services, trade, and state and local government are the major sectors.

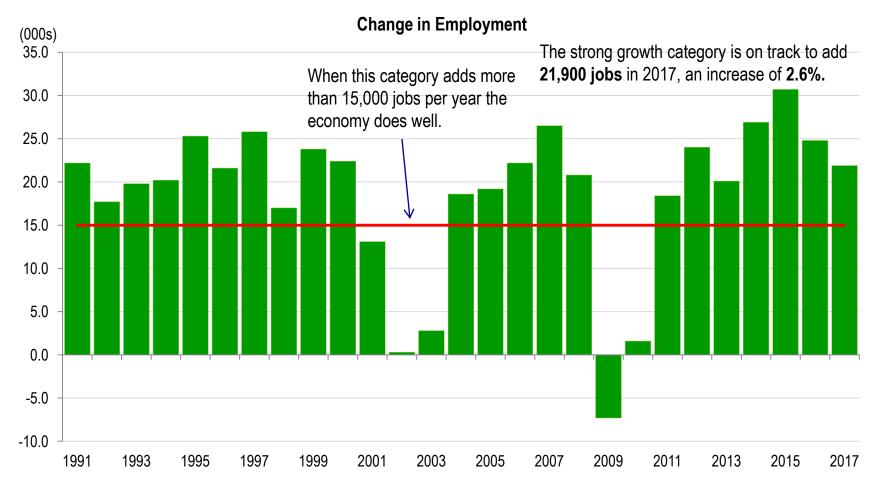
Volatile Growth Category – 5,600 jobs added 0.8% growth rate.

Boom or bust industries – such as the extractive industries, manufacturing, information.

Colorado is on track to add **47,900 jobs** in 2017, a rate of **1.9%**, based on employment data through April.

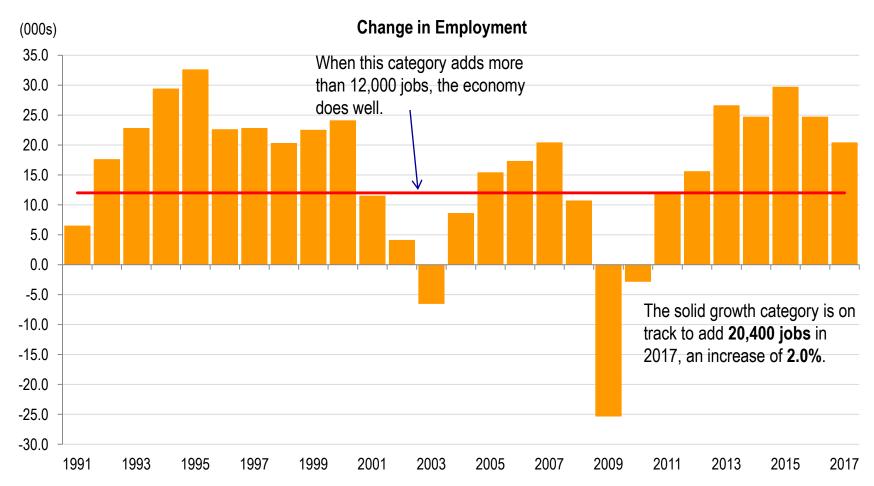


Change in Employment Strong Growth Category



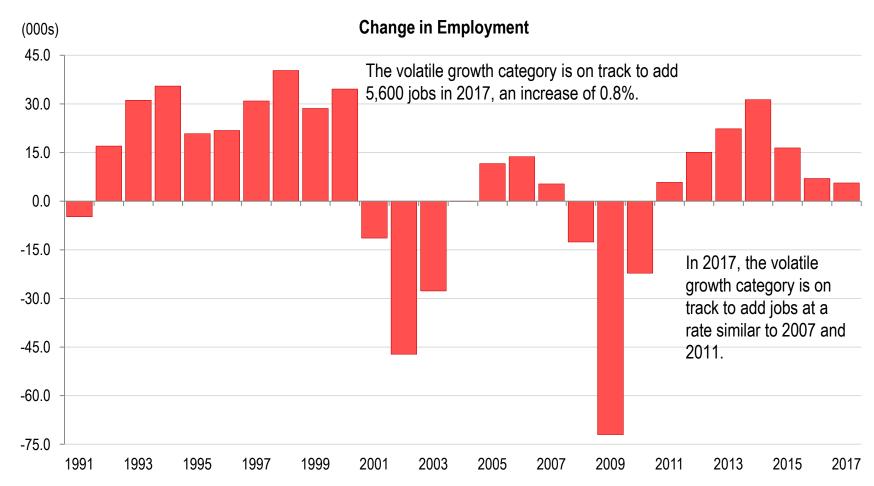
Change in Employment

Solid Growth Category



Change in Employment

Volatile Growth Category



Six Industries That Are Important for Different Reasons

Strong Growth Category

Health care 18.0% of jobs added

PST 11.5% of jobs added

Total 29.5% of jobs added, or 14,100 jobs

Solid Growth

AFS 22.7% of jobs added

Retail
 11.0% of jobs added

Total 33.7% of jobs added, or 16,400 jobs

Volatile Growth

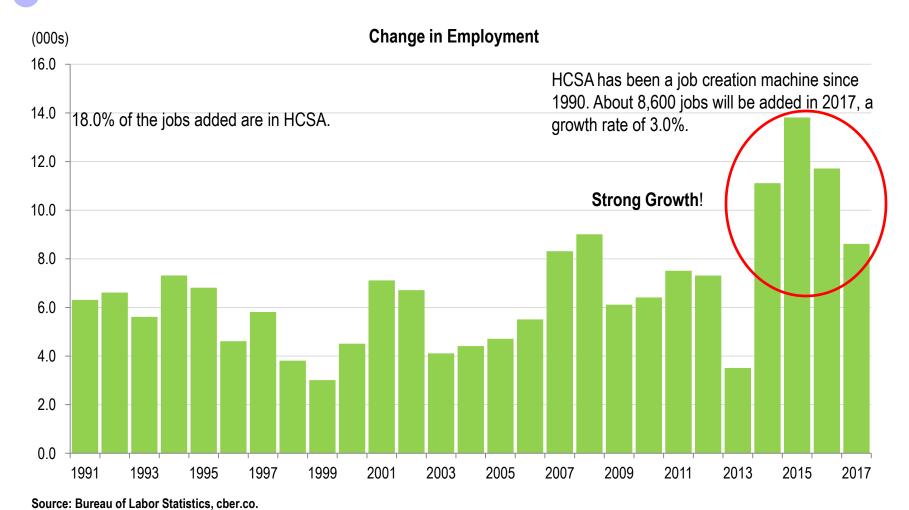
Financial activities
 7.5% of jobs added

Construction
 5.4% of jobs added

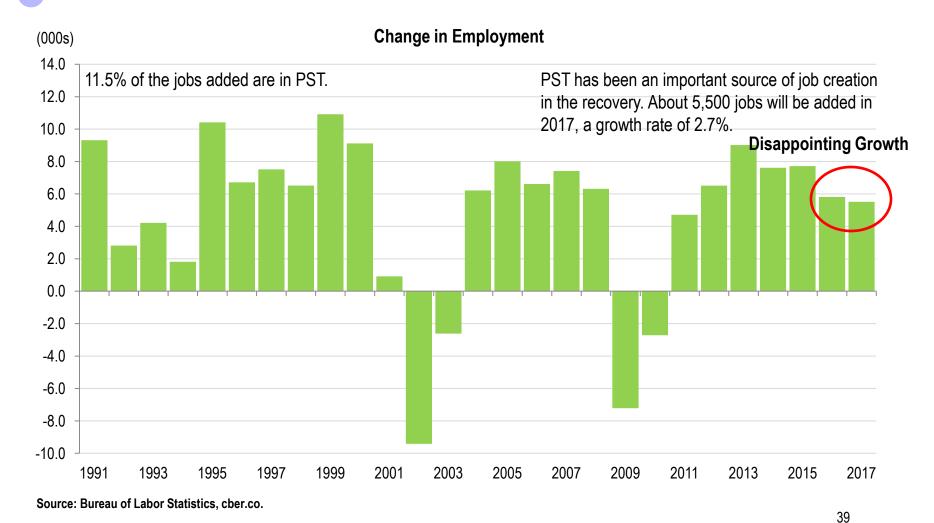
Total 12.8% of jobs added, or 6,200 jobs added

76.0% of jobs added in 2017

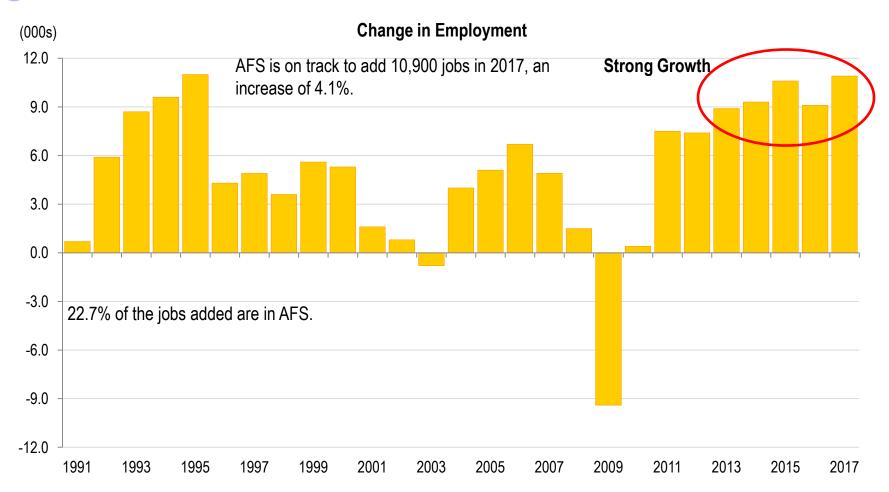
Health Care and Social Assistance



Professional, Scientific, and Technical Services

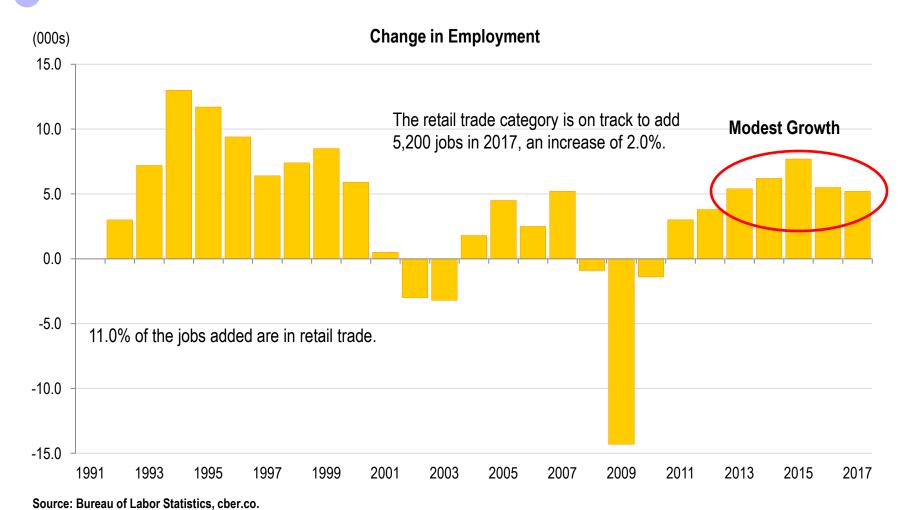


Accommodations and Food Services

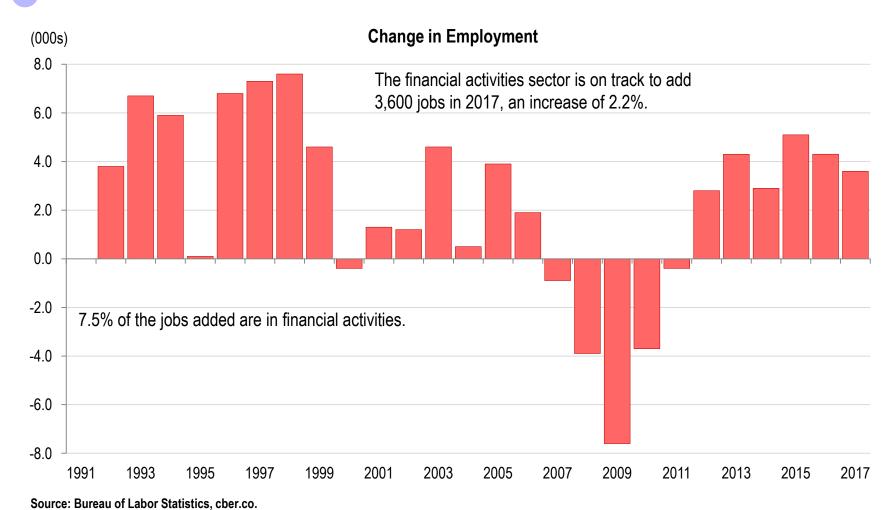


Source: Bureau of Labor Statistics, cber.co.

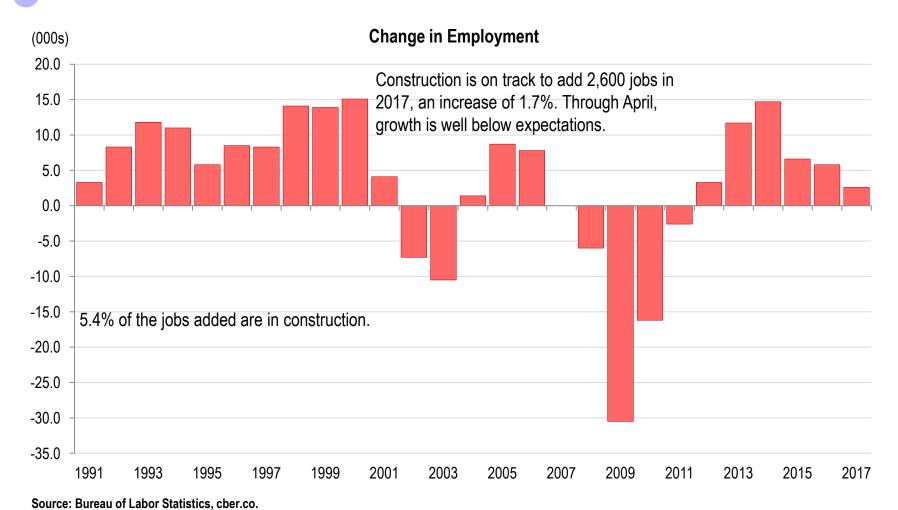
Retail Trade Category



Financial Activities



Construction Category



Colorado Economy Additional Data

Additional Data

Key Industries

Housing Prices

 The Case Shiller Index shows that Denver housing prices have appreciated at a faster rate than Phoenix, Las Vegas, and the U.S., although Denver did not experience as much of a bubble as Phoenix, Las Vegas, and the U.S.

Building Permits - Units

 The number of single family and multi family permits has increased since the end of the Great Recession although the total is significantly lower than the peak in 2001 and 2002. In addition, the mix of single family and multi-family permits is much different.

Building Permits – Valuation

• The YTD valuation of permits is less than the same period in 2016.

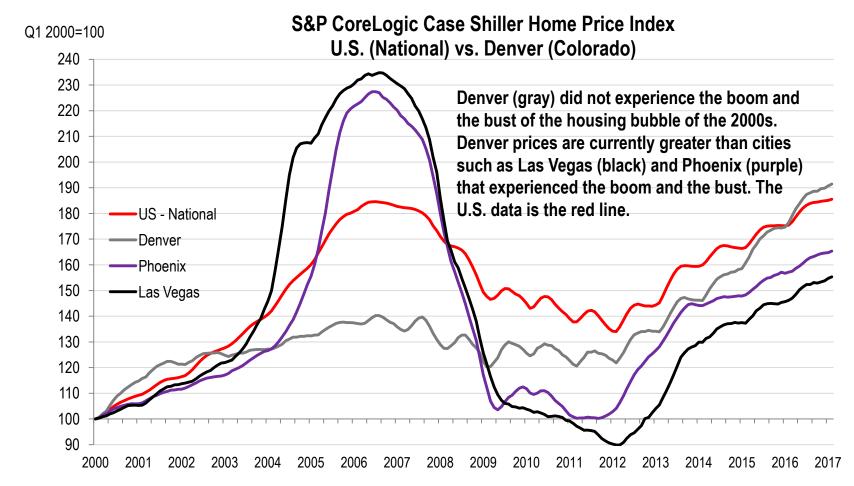
WTI Crude Oil Prices

After dropping to \$26 per barrel, the price for a barrel of oil reached \$45 in April 2016. It has topped \$50 per barrel and dropped back into the \$30, but has been closer to \$50 per barrel for much of that time. As a result, the number of rigs in operations has increased.

New and Use Car Registrations

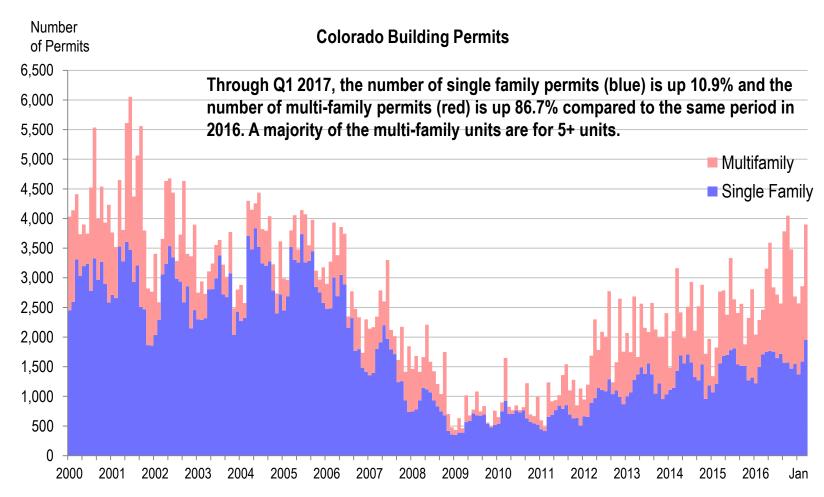
 Nationally, auto sales have been flat; they actually decreased in March. In Colorado, there is a different story. New auto sales for the first quarter are up 3.8%, while used auto sales are up 7.2%.

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



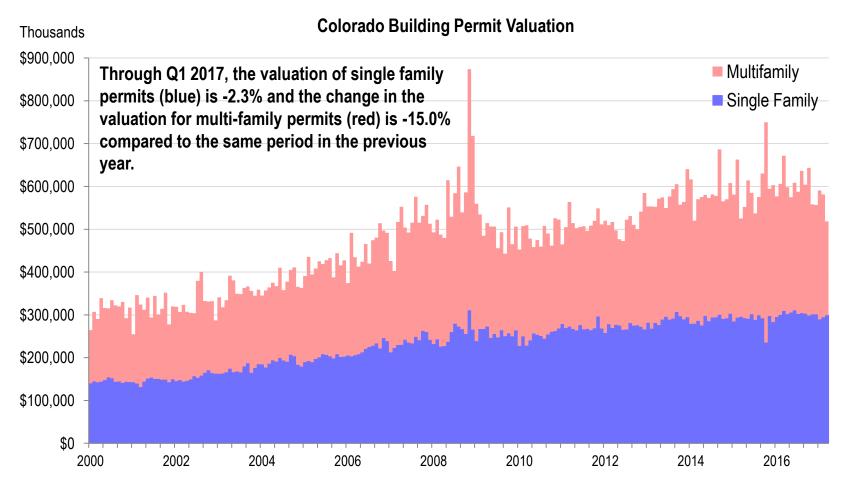
Source: S&P Core-Logic Case-Shiller, cber.co.

Colorado Residential Building Permits - Units



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

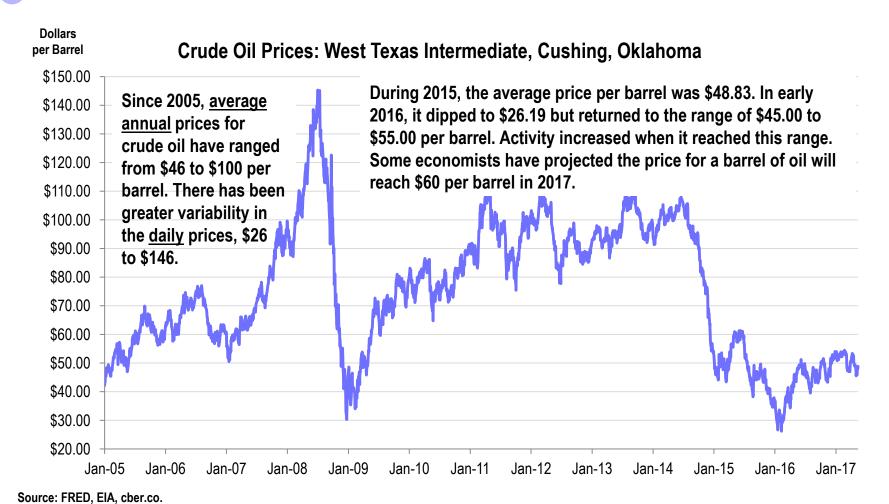
Colorado Residential Building Permits - Valuation



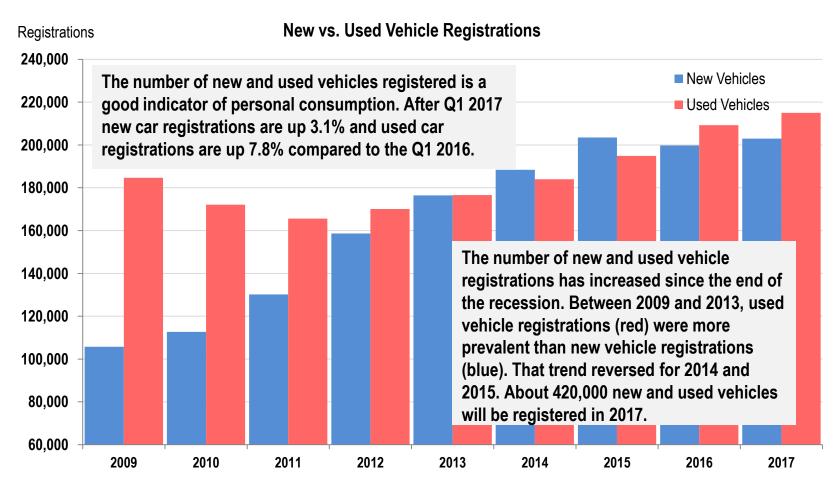
Source: TAMU Real Estate Center, U.S. Census Bureau, cber.co. Note: Not adjusted for inflation.

Crude Oil Prices

West Texas Intermediate



Colorado New and Used Vehicle Registrations



Source: Colorado Auto Dealers Association, cber.co.

The Colorado Economy U.S. vs. Colorado Real GDP 2009 Through 2016

2016 Real GDP Growth Colorado

Reasons for Evaluating real GDP

Most economic forecasts focus on employment. This is done because employment is a concept the public understands and employment forecasts are produced on a monthly basis.

It is also important to look at the various industries based on their real Gross Domestic Product. This is important because some industries make small contributions to employment, but significant contributions to real GDP. The opposite is also true. In other words, all sectors contribute to the economy in important, but different ways.

What to Look for in this Analysis

The analysis in this section looks at the rate of change in the real GDP by sector for Colorado and the U.S for 2015 vs. 2016. It also looks at the annualized rate of change in the real GDP for the years 2009 to 2016.

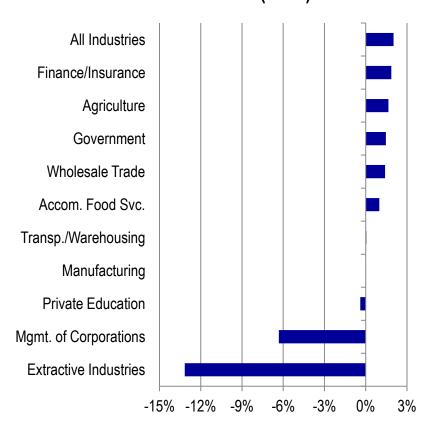
The analysis lists the sectors where the change in real GDP (2015 vs. 2016) is less than the state average (2.0%). Second, it lists the sectors where the change in real GDP (2015 vs. 2016) is greater than or equal to the state average.

It can be seen that Colorado outperforms the U.S. in some sectors and it underperforms in other areas. In addition, the data shows that some sectors are more volatile and the change in real GDP for 2015 vs. 2016 varies from the change in real GDP for 2009 to 2016.

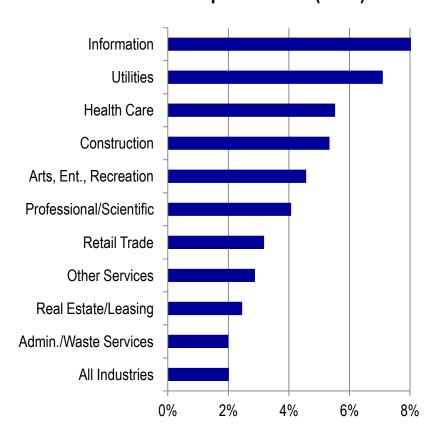
2016 Real GDP Growth Colorado

Major Sectors

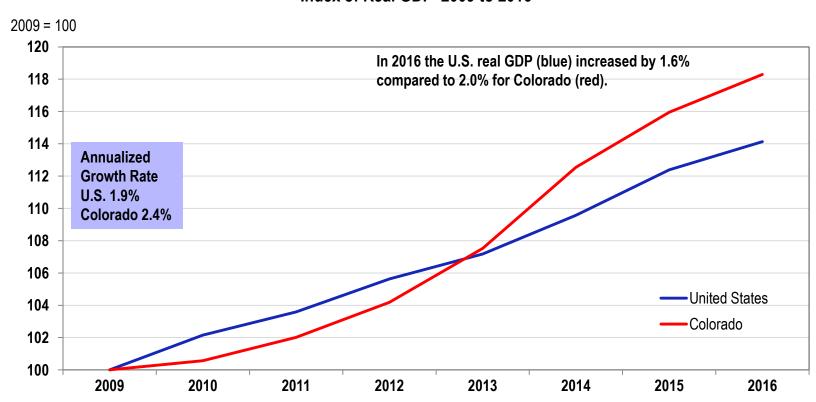
Sectors with 2016 Real GDP Less than State (2.0%)



Sectors with 2016 Real GDP Greater than or Equal to State (2.0%)



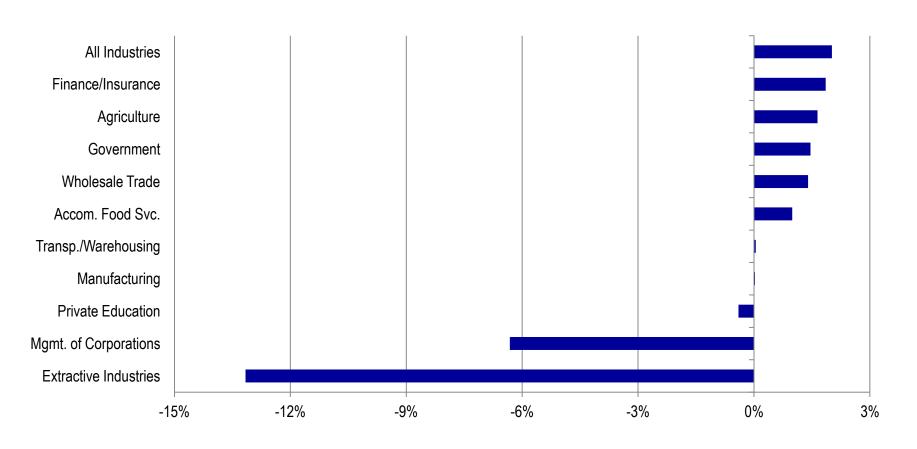
- Index of Real GDP
- Colorado vs. U.S.



2016 Real GDP Growth Colorado

Major Sectors

Sectors with 2016 Real GDP Less than State (2.0%)



Real GDP Growth

Sectors with Below Average real GDP Growth for Colorado (2.0%) in 2016

The following sectors all have real GDP growth rates below the state average, 2.0%, for 2015 vs. 2016. The sectors on the left were above the annualized rate of 2.4% for 2009 to 2016 for Colorado. The sectors on the right were below the annualized rate of 2.4% for 2009 to 2016 for Colorado.

Since 2009, these sectors have had <u>above</u> average growth rates.

Since 2009, these sectors have had <u>below</u> average growth rates.

Extractive industries

Management of corporations and enterprises

Manufacturing - durable goods

Transportation and warehousing

Accommodations and food services

Wholesale trade

Private education

Manufacturing - total

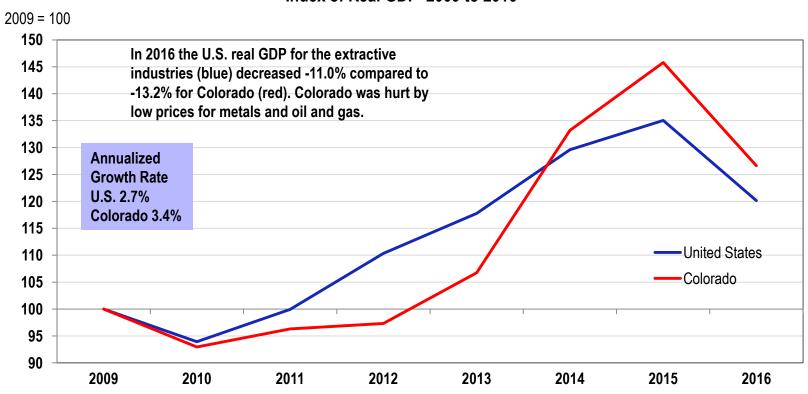
Manufacturing – non durable goods

Government

Agriculture

Finance/insurance

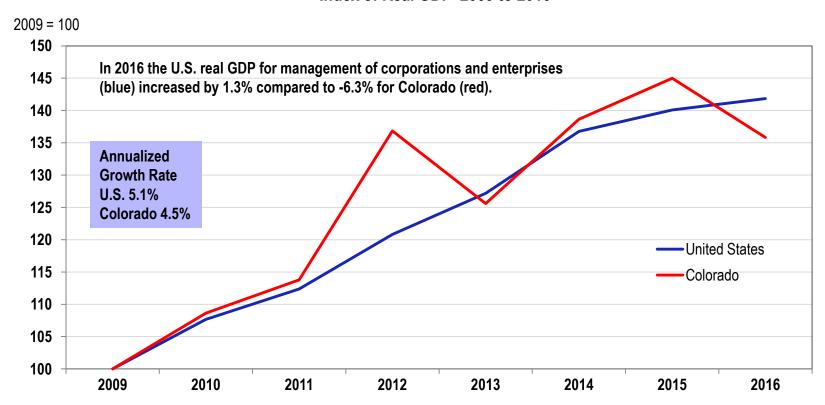
- Index of Real GDP
- Colorado vs. U.S. Extractive Industries



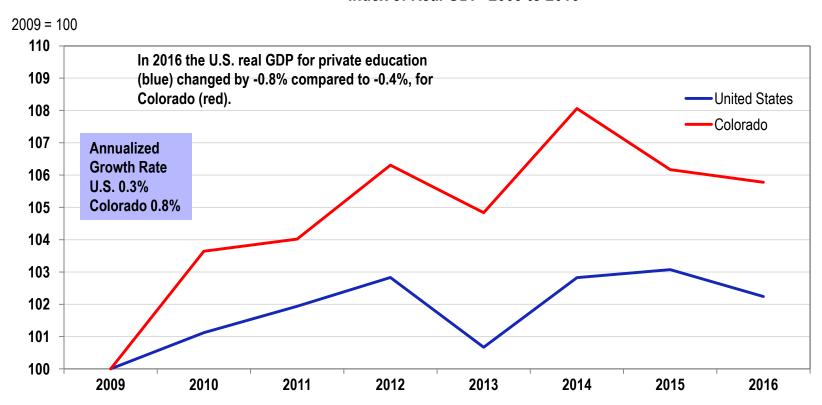
Index of Real GDP

Colorado vs. U.S. Management of Corporations and Enterprises

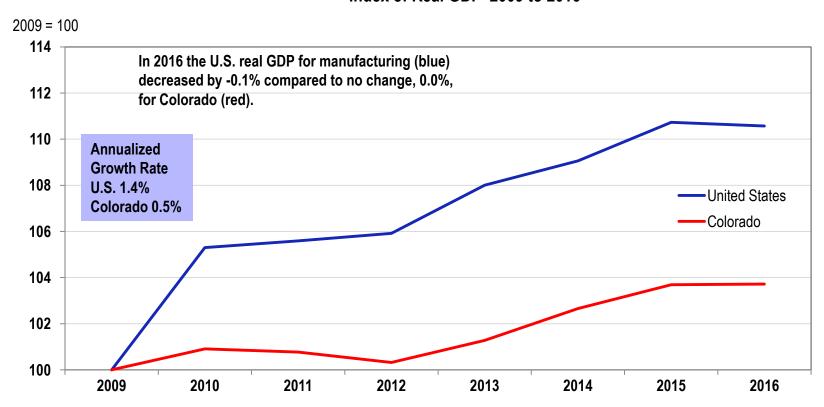
Index of Real GDP 2009 to 2016



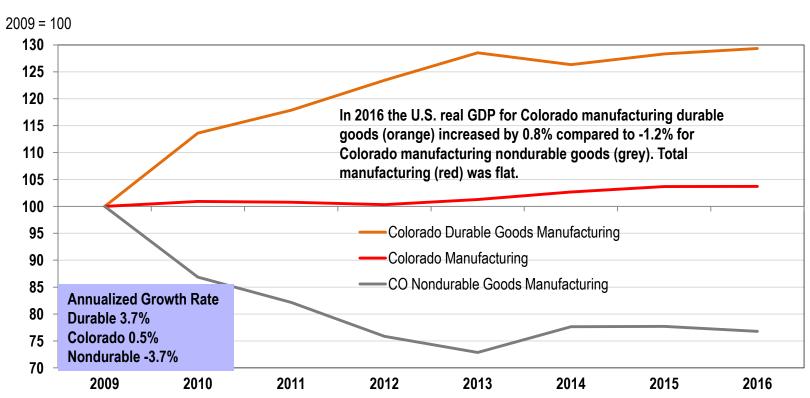
- Index of Real GDP
- Colorado vs. U.S. Private Education



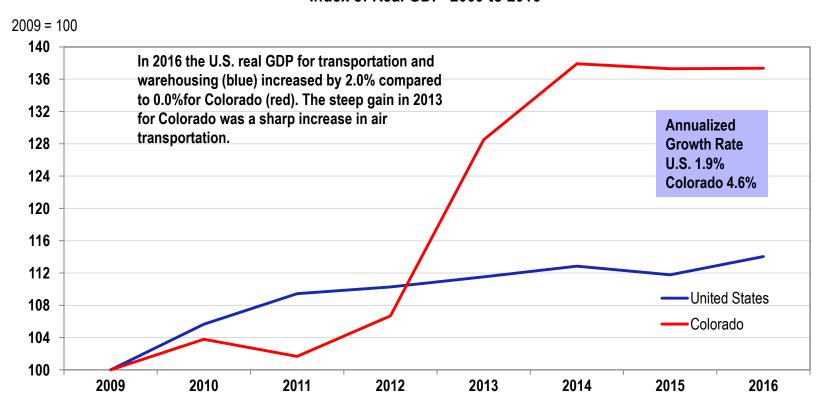
- Index of Real GDP
- Colorado vs. U.S. Manufacturing



- Index of Real GDP
- Colorado Durable vs. Nondurable Manufacturing



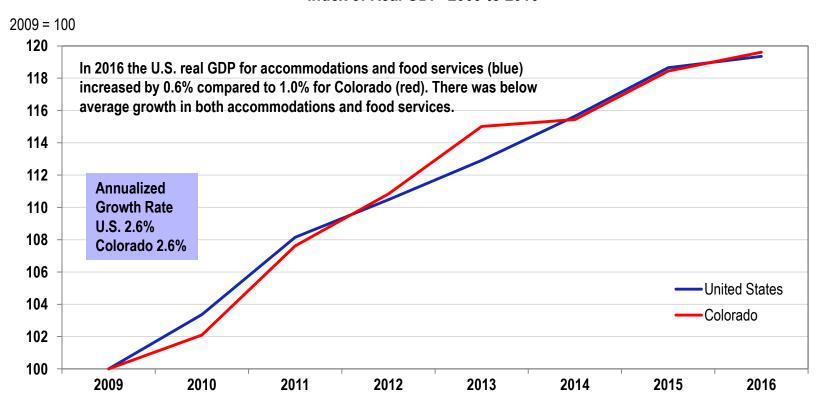
- Index of Real GDP
- Colorado vs. U.S. Transportation and Warehousing



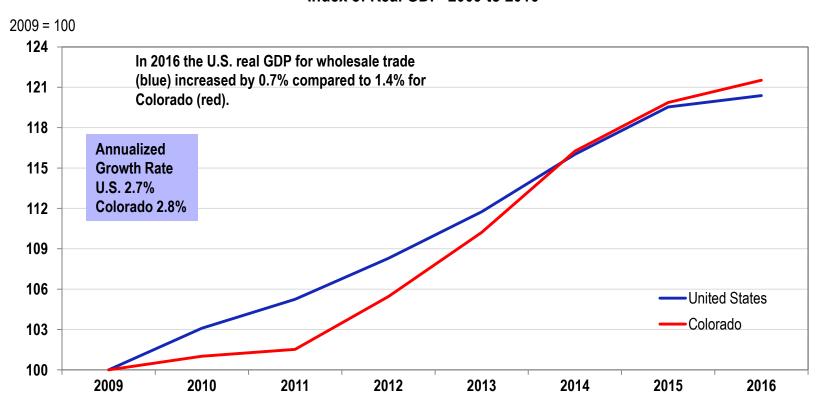
Index of Real GDP

Colorado vs. U.S. Accommodations and Food Services

Index of Real GDP 2009 to 2016



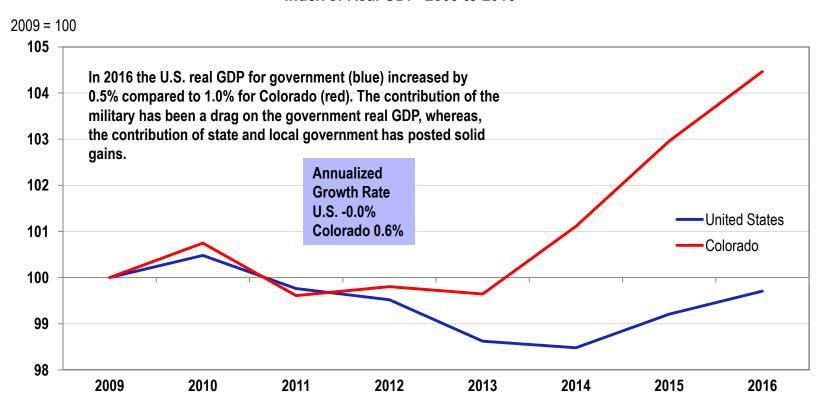
- Index of Real GDP
 - Colorado vs. U.S. Wholesale Trade



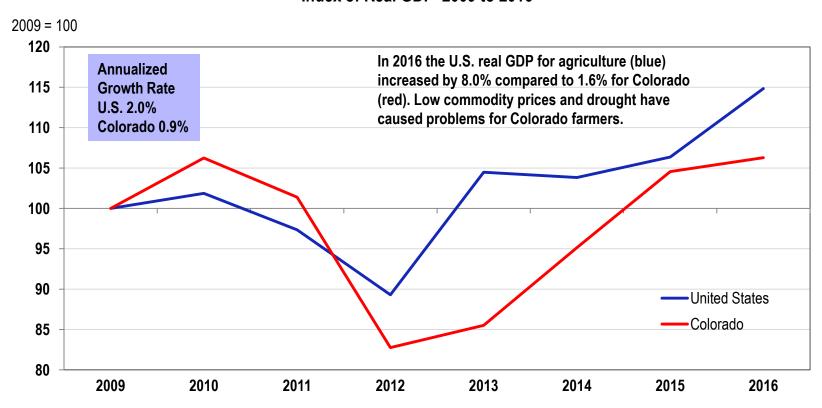
Index of Real GDP

Colorado vs. U.S. Government

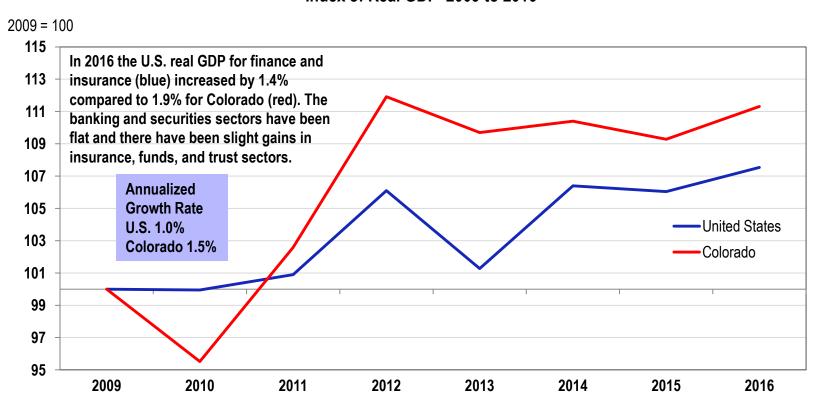
Index of Real GDP 2009 to 2016



- Index of Real GDP
 - Colorado vs. U.S. Agriculture



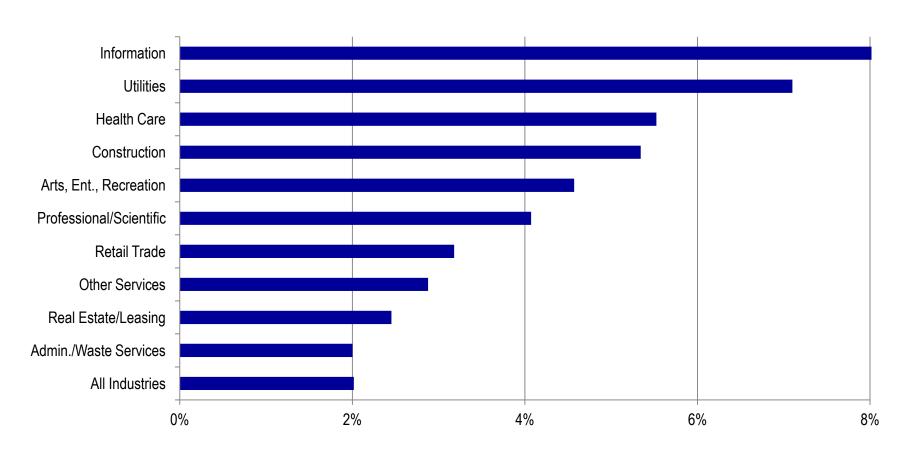
- Index of Real GDP
- Colorado vs. U.S. Finance and Insurance



2016 Real GDP Growth Colorado

Major Sectors

Sectors with 2016 Real GDP Greater than or Equal to State (2.0%)



Real GDP Growth

Sectors with Average Real GDP Growth for Colorado Equal to or Greater than 2.0% in 2016

The following sectors all have real GDP growth rates equal to or above the state average, 2.0% for 2016. The sectors on the left were above the annualized rate of 2.4% for 2009 to 2016 for Colorado. The sectors on the left were above the annualized rate of 2.4% for 2009 to 2016 for Colorado.

Since 2009, these sectors have had <u>above</u> average growth rates.

Since 2009, these sectors have had <u>below</u> average growth rates.

Administrative and waste management services Real estate, rental, and leasing

Retail trade

Professional, scientific, and technical services

Construction

Health care

Arts, entertainment, and recreation

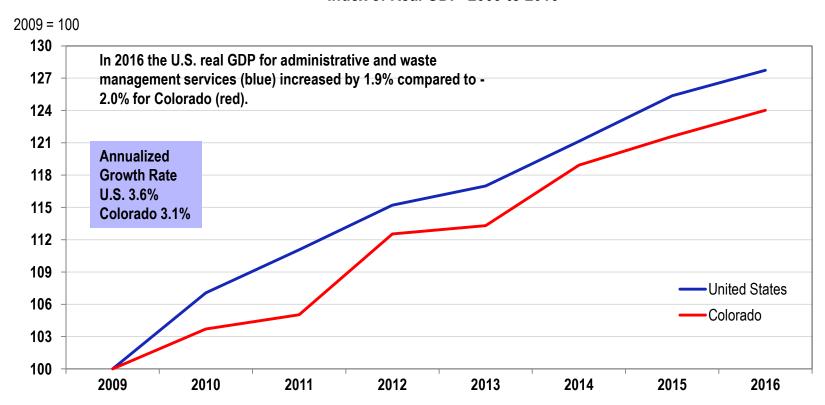
Utilities

Other services Information

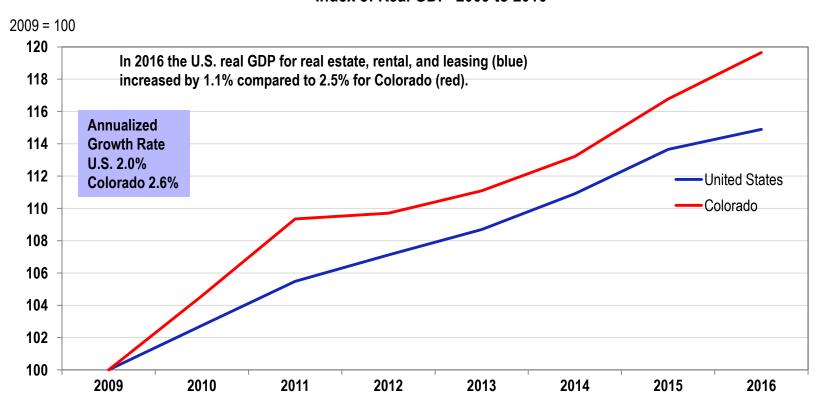
Index of Real GDP

Colorado vs. U.S. Administrative and Waste Management Services

Index of Real GDP 2009 to 2016



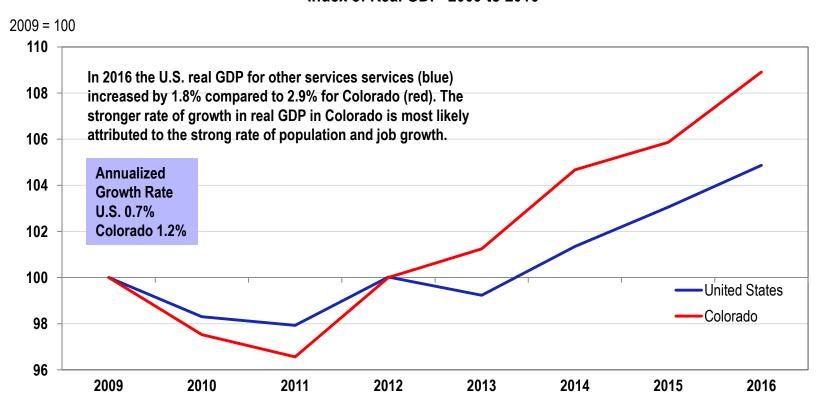
- Index of Real GDP
- Colorado vs. U.S. Real Estate, Rental, and Leasing



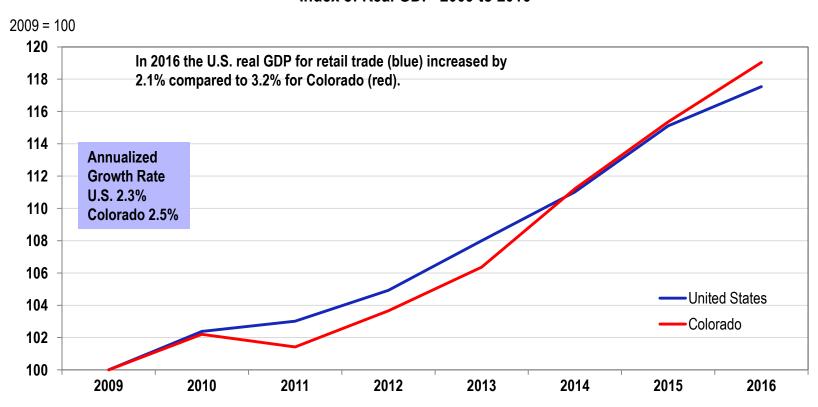
Index of Real GDP

Colorado vs. U.S. Other Services

Index of Real GDP 2009 to 2016



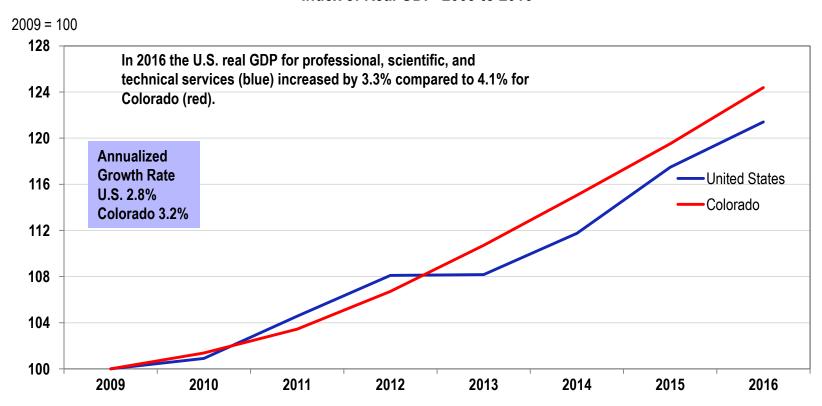
- Index of Real GDP
- Colorado vs. U.S. Retail Trade



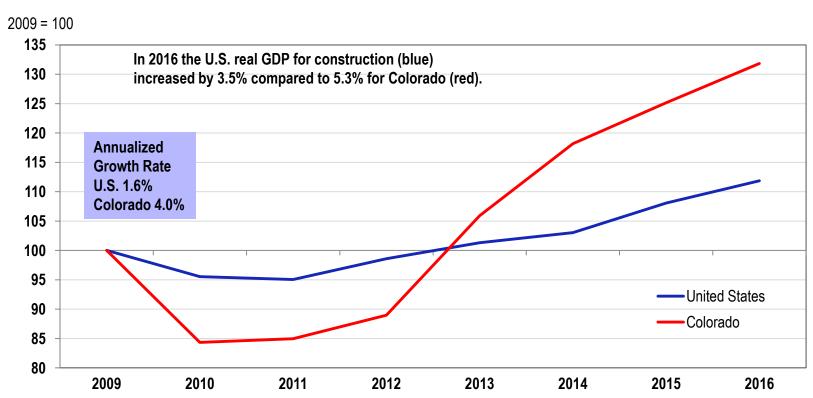
Index of Real GDP

Colorado vs. U.S. Professional, Scientific, and Technical Services





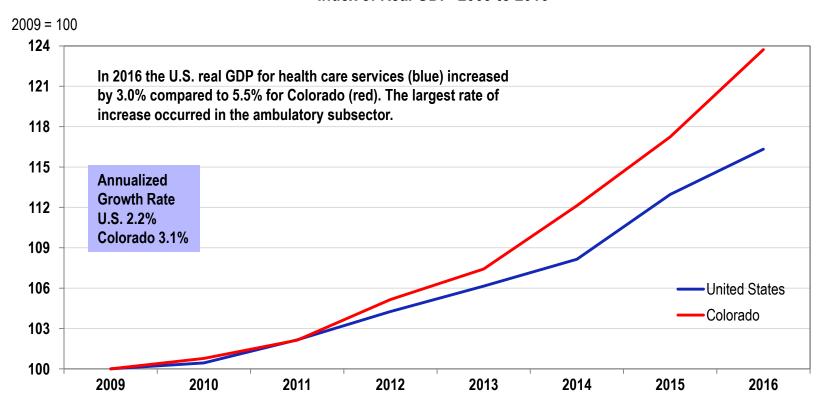
- Index of Real GDP
- Colorado vs. U.S. Construction



Index of Real GDP

Colorado vs. U.S. Health Care

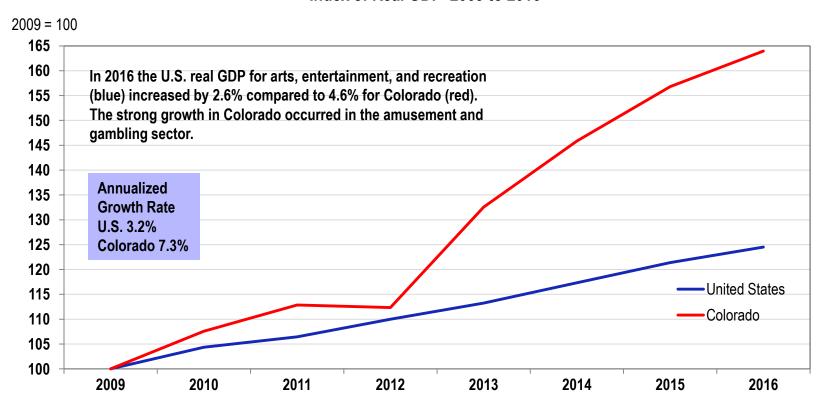
Index of Real GDP 2009 to 2016



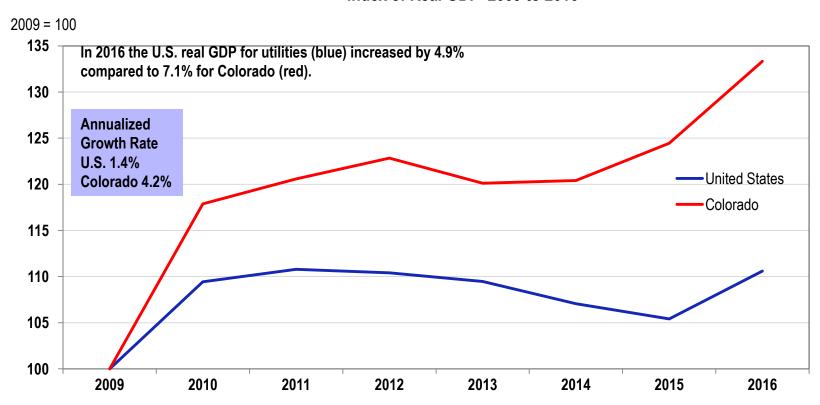
Index of Real GDP

Colorado vs. U.S. Arts, Entertainment, and Recreation

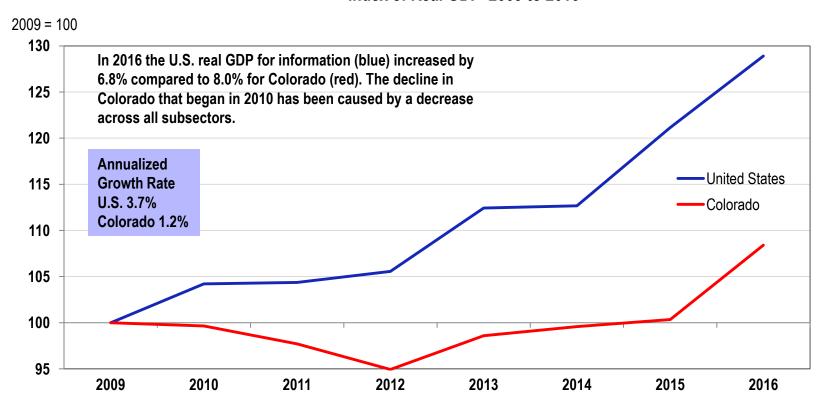
Index of Real GDP 2009 to 2016



- Index of Real GDP
 - Colorado vs. U.S. Utilities



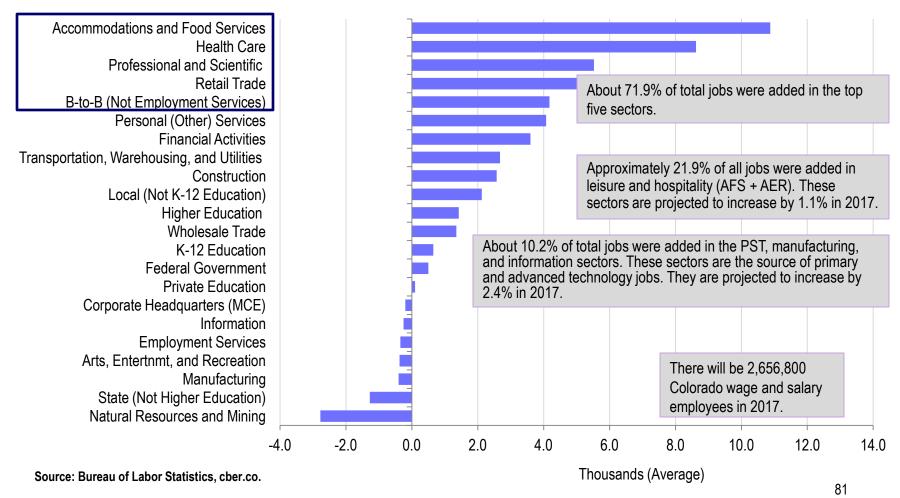
- Index of Real GDP
 - Colorado vs. U.S. Information



The Colorado Economy Summary

Job Changes 2017 YTD Through April

Job Change All Sectors



Annual EmploymentChange in ColoradoEmployment

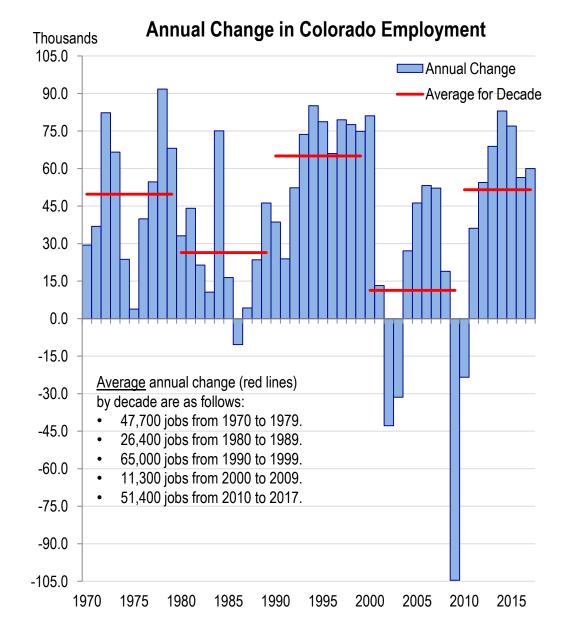
Colorado added 77,000 jobs in 2015 and 56,400 jobs in 2016.

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

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

Through Q1 2017, the state is on track to add 47,900 jobs, an increase of 1.9%.

Based on "activity on the streets" and commentary from the Colorado Labor Market Information group, the BLS employment data for Colorado appears to be understated.



Source: Bureau of Labor Statistics, cber.co.

- The Colorado Economy in 2017
 - Factors that Will Affect the Colorado Economy

Overview of Colorado Economy

There are always headwinds, but the foundation for the Colorado economy continues to be solid. Currently, the biggest headwinds are the small pool of potential workers and funding issues with the state budget, particularly for transportation infrastructure. The small pool of workers is a much bigger issue for Colorado than the U.S. At the moment, the state is somewhat insulated from the uncertainty caused by the U.S. political climate. At the state level, this discord can best be defined as frustration, rather than the outrage that is coming out of D.C. To date, job growth for 2017 is weaker than expected. It is likely the BLS data is understating growth.

- Real GDP growth for Colorado was 2.0% in 2016 compared to 1.6% for the U.S. Colorado will experience stronger real GDP growth than the U.S. in 2017.
- The Philadelphia Federal Reserve Leading Index points to continued growth for Colorado and the U.S.
- The state will continue to enjoy strong population growth.
- There will be modest establishment and job growth.
- The health care industry will continue to be a leader in employment and real GDP growth.
- Construction employment should be greater given the level of construction activity.

- Employment in the extractive industries has stopped its free fall and will stabilize around 22,000 workers.
- Home owners are excited to see the value of their homes appreciate at a strong pace - they are happy until they receive their property tax bill. It will continue to be difficult to find attainable and affordable housing.
- Through the first quarter of 2017, Colorado new car and used car registrations were stronger than 2016. Strong sales are expected to continue in 2017.
- DIA passenger activity has had y-o-y increases for the past 18 months. This is reflected in the strong real GDP growth in transportation over the past couple of years.

Review of Colorado Economy and Employment Data Through April 2017

This analysis is for informational purposes only. Any opinions or interpretations of data are those of the presenter. As such, they do not represent the viewpoints of any group or particular organization.

For further information contact Colorado-based Business and Economic Research (cber.co).

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For additional information contact cber.co at cber@cber.co.

ABOUT THE AUTHOR

Gary Horvath has produce annual employment forecasts of the state economy for over 25 years. They have been supplemented by monthly economic updates and indices that track economic performance over the short term. In addition he has directed three statewide analyses that included reviews of all 64 county economies.

In addition, Horvath was the principal investigator for a state and federally funded project to prepare a nanotechnology roadmap for Colorado. As well, he was a co-founder of the Colorado Photonics Industry Association, a trade group for Colorado's Photonics cluster. Horvath has been an active board member of the group since its inception.

Horvath has also served on the Board of Directors for the Economic Development Council of Colorado, Northwest Denver Business Partnership, Adams County Economic Development, and Broomfield Economic Development Corporation. Horvath has also been the lead for the photonics/electronics cluster, which is part of OEDIT's early stage and proof of concept programs.