

# State and Federal Employment Data Sets Issues, Concerns, and Questions

Colorado-based Business and Economic Research

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# State and Federal Employment Data Sets

## Overview

This brief document addresses issues, concerns, and questions about three state and federal employment data sets. The need for this analysis follows:

- The media, private and public leaders, and other researchers have raised questions regarding the quality and interpretation of employment data produced by state and federal agencies.
- Colorado Department of Labor and Employment (CDLE) officials have been quoted in the media suggesting they are not comfortable with some of the data they produce and distribute.
- While the various data sets measure different aspects of the labor market, they should all tell a similar story. As will be seen, there are instances where that is not the case.

Hopefully, this discussion will help data users understand the limitations of the various data sets, issues that affect the credibility of the data, and how the data sets should be used to explain changes in the Colorado economy.

# State and Federal Employment Data Sets

## It Okay to Raise Questions About Data Sets

No data set is perfect! While that may sound distressing, the good news is that U.S. public and private leaders have made it a priority to have employment, population, business, and other data that can be used to inform the public debate about critical issues.

Annually, there are numerous national, regional, state, and local conferences that include sessions dedicated to issues, concerns, and questions about state and federal data. A sampling of topics discussed at these events include the credibility of the data, flaws in methodology, limitations of the data, uses and misuses of the data, rumors about how officials manipulate the data for political gain, how to make the data more meaningful, how to make the data more accurate, and how to produce data in a more timely and efficient manner.

An important part of understanding and using the data is being aware of issues associated with it – hence this document. Additional information can be found at the Bureau of Labor Statistics (BLS) website or <http://www.bls.gov/audience/economists.htm>.

# State and Federal Employment Data Sets

## Outline of Discussion

This analysis evaluates three data series produced and distributed by BLS and CDLE that measure different aspects of employment. The series are discussed below:

- Local Area Unemployment Statistics (LAUS) - LAUS includes the size of the labor force, number of unemployed and unemployed workers, and the unemployment rate. A survey of households is used to collect the data. As a result it includes wage and salary workers, self employed, and others.
- The Current Employment Statistics (CES) data is collected by a survey and measures only the number of wage and salary, or non-farm, jobs.
  - The base CES data is expressed as Not Seasonally Adjusted (NSA). Changes to the economy and seasonality cause employment to increase or decrease.
  - Seasonal adjustment factors are applied to the NSA data to create the seasonally adjusted (SA) data series. SA data attempts to eliminate changes caused by seasonality, thus measuring only changes in the economy.

The LAUS and CES SA data sets are the foundation of monthly CDLE press releases describing changes in employment and unemployment.



# LAUS Labor Force

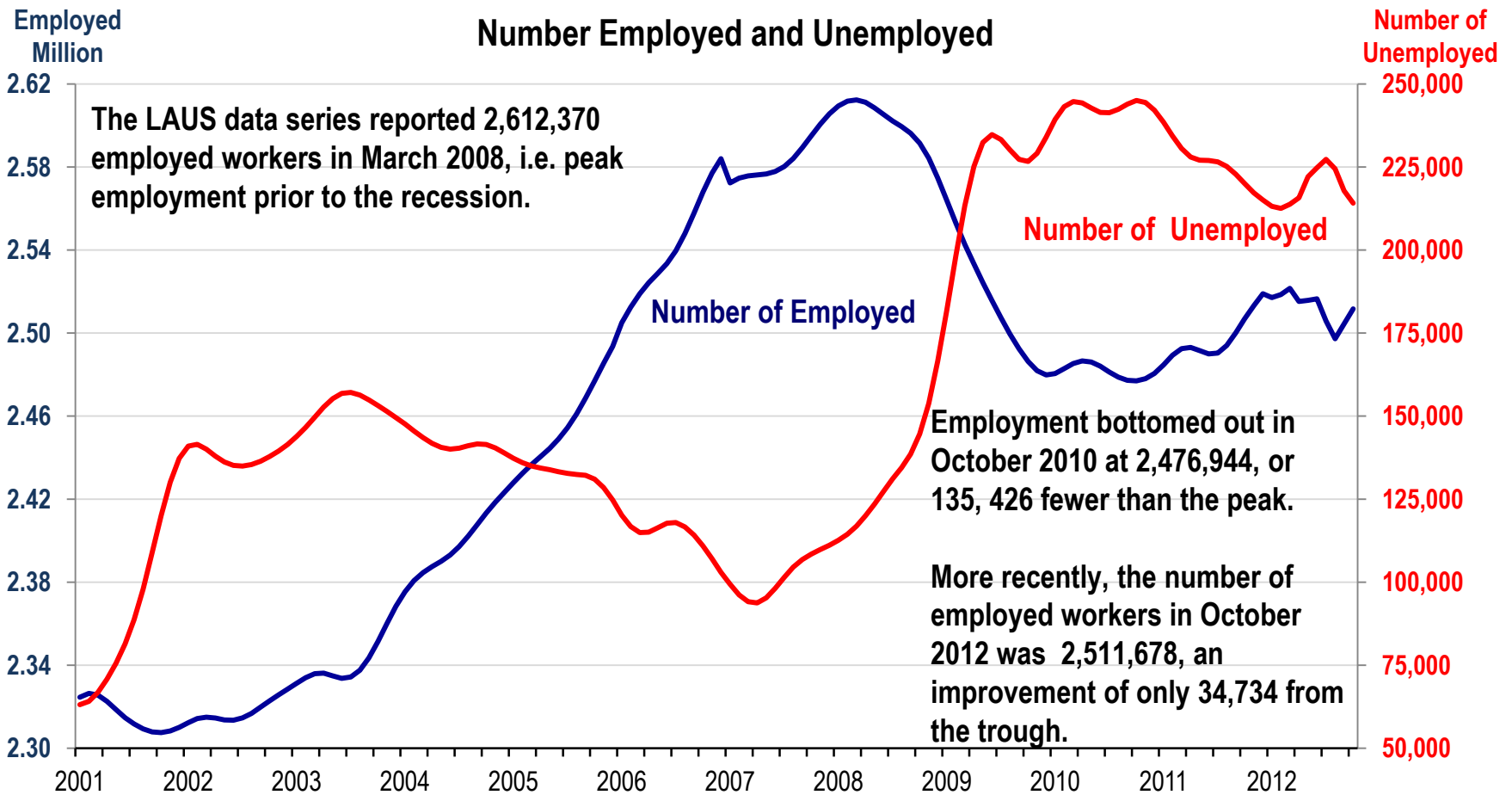
# Local Area Unemployment Statistics

## Labor Force

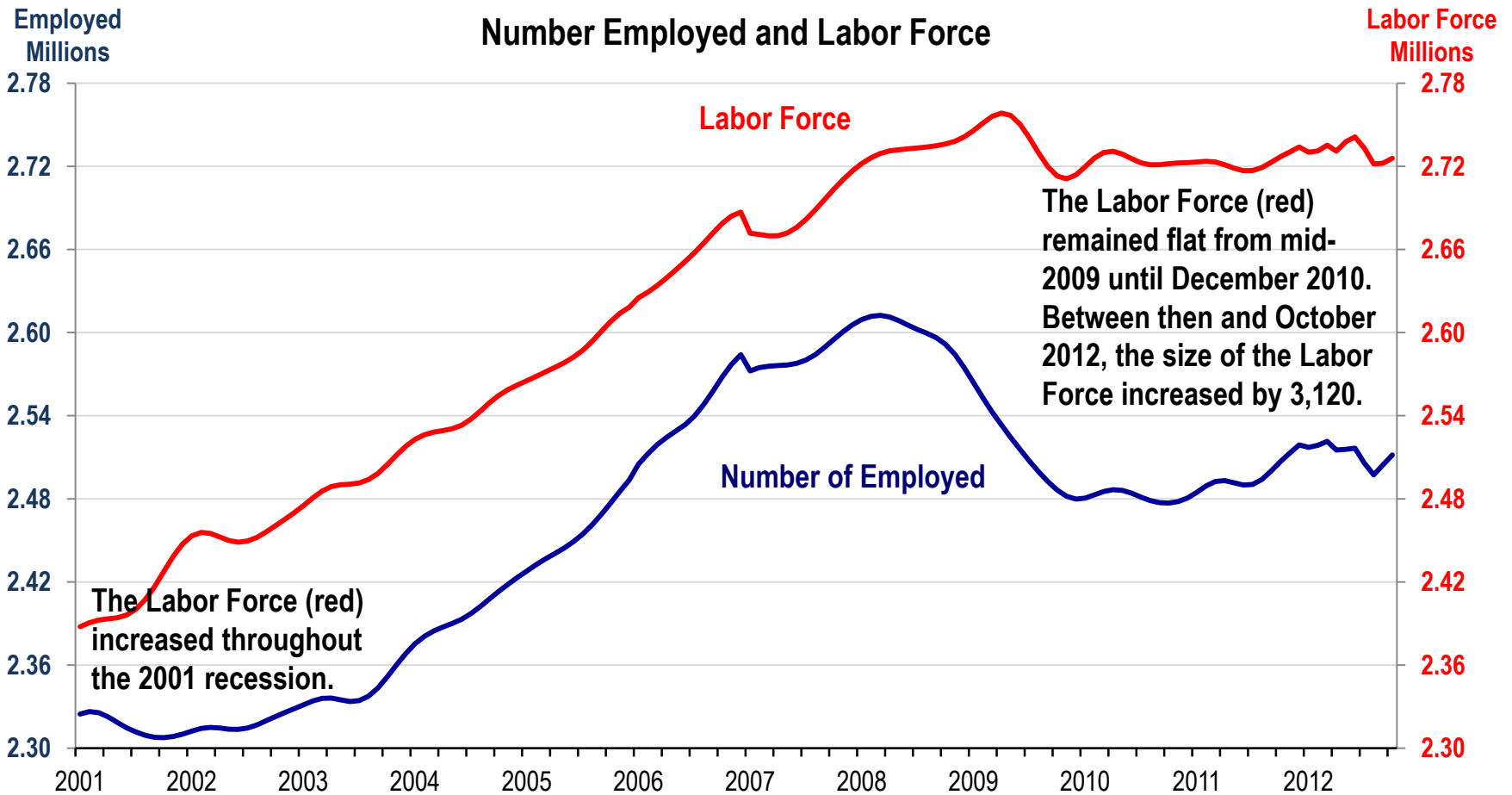
The following three charts focus on the relationship between the size of the labor force and the number of employed and unemployed. They show the following:

- As expected, there is an inverse relationship between the number of employed and unemployed workers. During good economic conditions, the number of employed workers increases and the number of unemployed workers decreases. The opposite happens during bad economic times.
- The size of the Colorado Labor Force (# of employed + # of unemployed) was essentially the same in January 2008 as it was in October 2012. During this period, the state population increased by about 375,000 and about one-third of that increase included people of working age (16-65). The population increased by about 6,500 people each month, while the number of working age people increased by about 2,200.
- Between December 2010 and October 2012, the size of the U.S. Labor Force increased by 2,028,000. During that same period, the size of the Colorado Labor Force increased by only 3,120, i.e. it was flat. The Colorado Labor Force increased by about 140 workers per month.

# Colorado Number of Employed and Unemployed

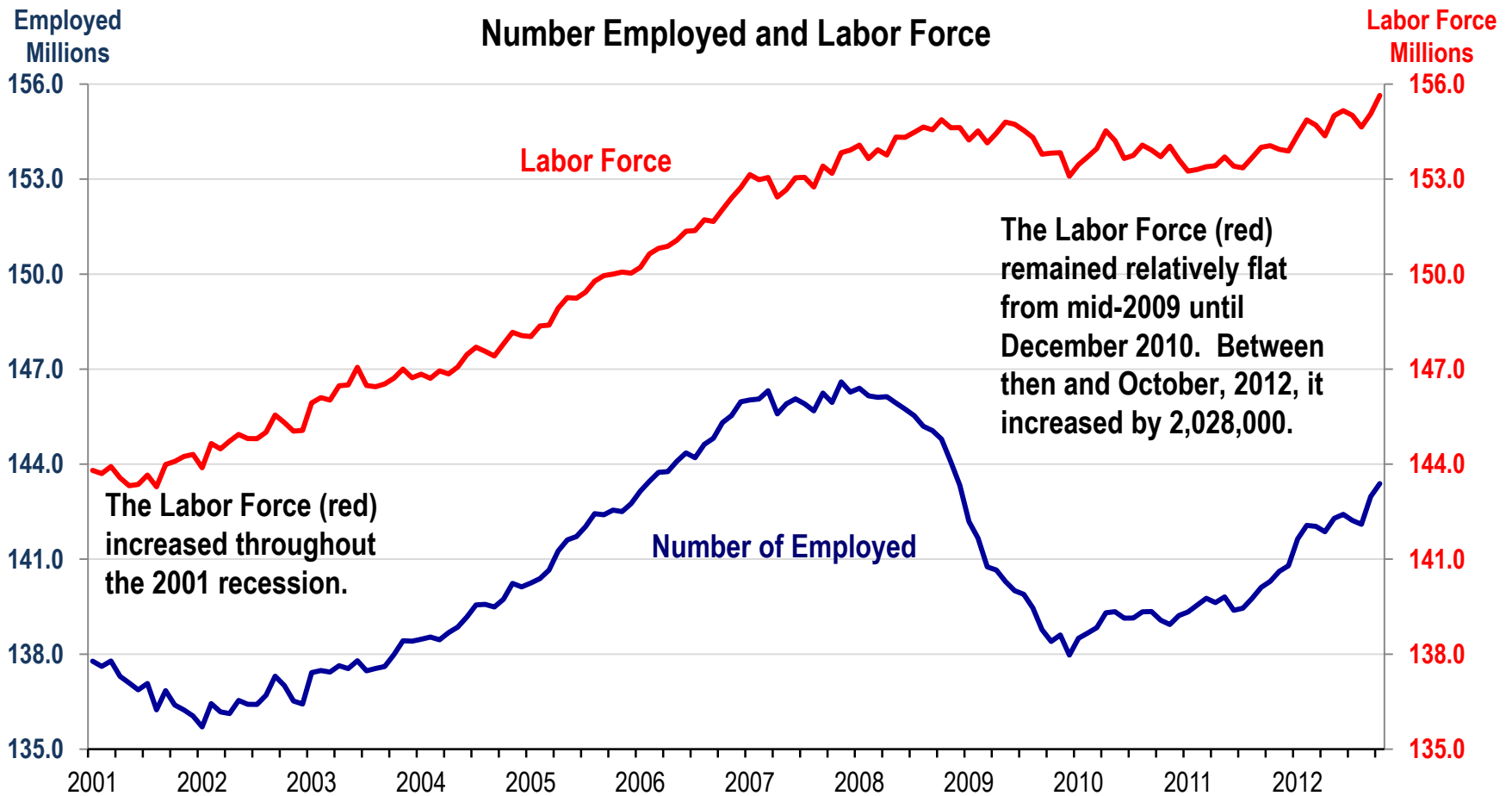


# Colorado Labor Force and Number of Employed Workers





# U.S. Labor Force and Number of Employed Workers



# Questions Related to Labor Force Data

The following questions/comments relate to the following charts:

- Why did the U.S. and Colorado Labor Force increase during the 2001 recession, but remain flat during the Great Recession?
- Why didn't the size of the Colorado Labor Force increase over the past 22 months, yet the size of the U.S. Labor Force increased dramatically during the period?
- Why didn't the increase in working-age population, about 125,000 people over the past five years, cause an increase in either the total of unemployed workers, the total of employed workers, and ultimately the size of the Labor Force?
- This analysis produces results that suggest that LAUS data may not accurately measure the unemployment rate in Colorado.



# LAUS Employed Workers

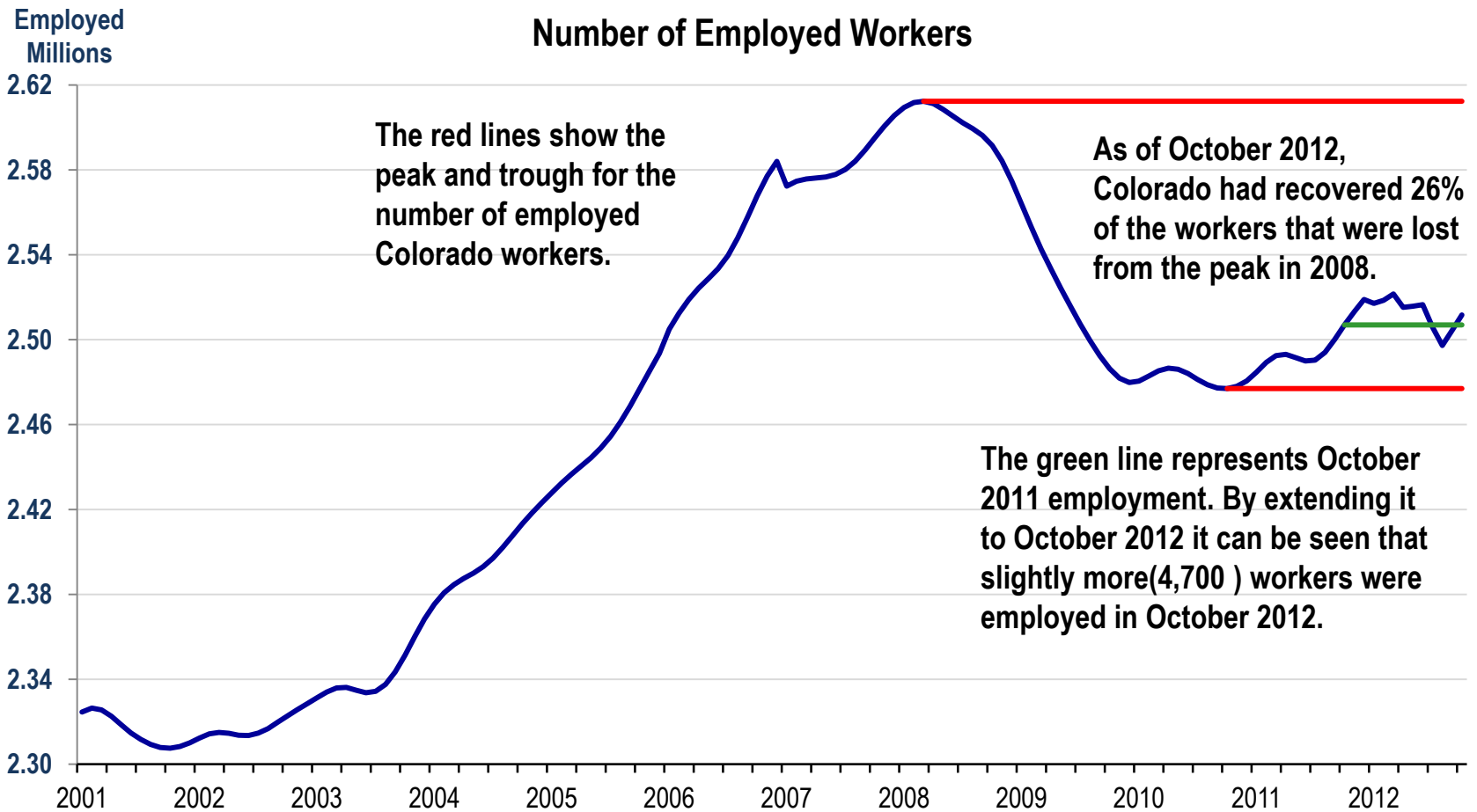
# Local Area Unemployment Statistics

## Employed Workers

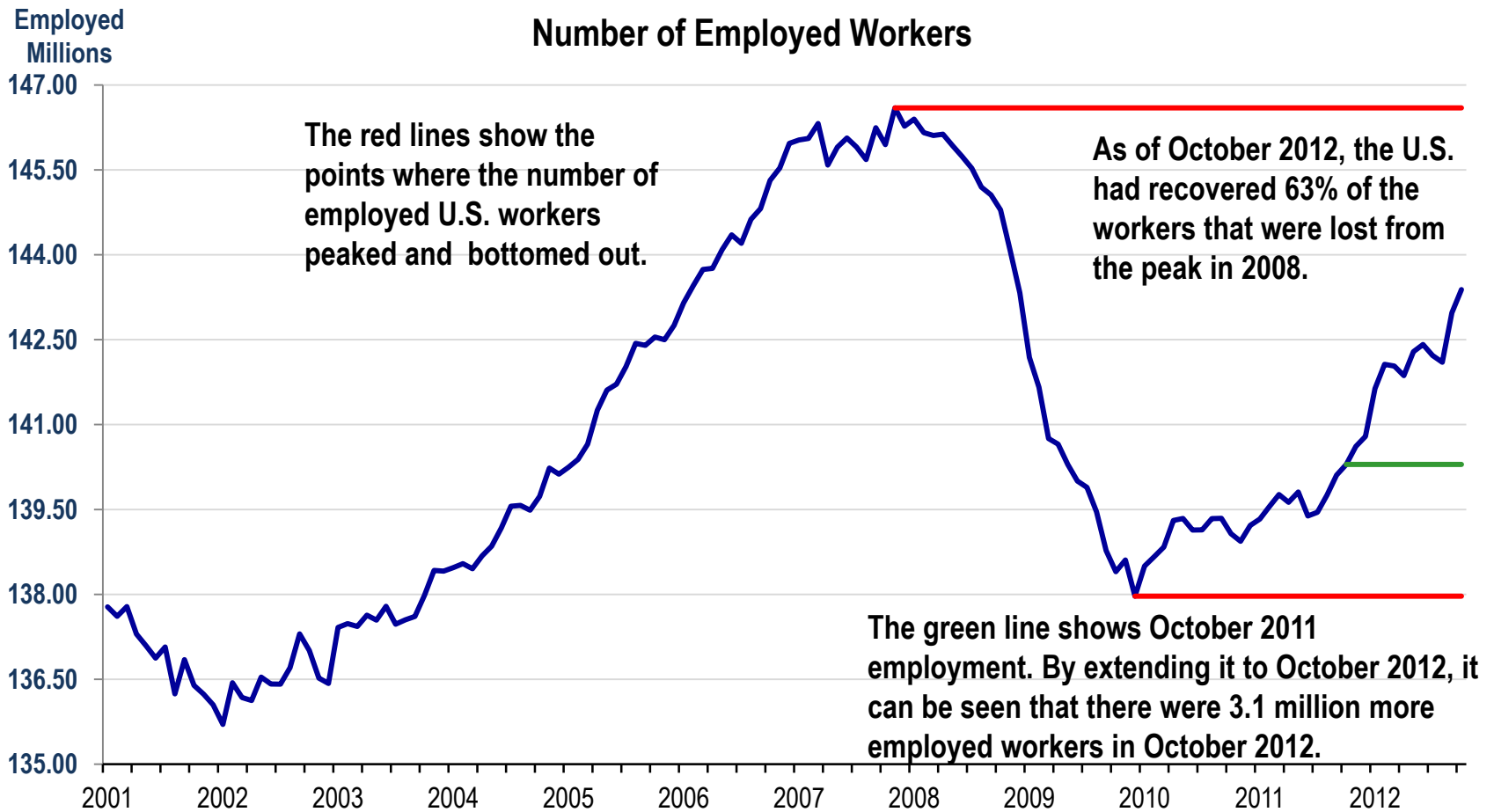
The following three charts focus on the number of employed workers. The first two focus on LAUS data and the third shows a comparison between LAUS and CES data. The charts show the following:

- :
- Colorado LAUS Data
  - Between the 2008 peak and the trough in 2010, Colorado lost more than 135,000 jobs. As of October 2012, the state had recovered only 26% of the jobs lost during the Great Recession.
  - From October 2011 to October 2012, the LAUS data reports that the number of employed in Colorado has increased by 4,700.
  - Over the past year, state CES employment has increased by 41,600 (NSA) or 42,100 (SA).
- U.S. LAUS Data
  - Between the 2008 peak and the trough in 2010, the U.S. lost more than seven million jobs. It has recovered 67% of the jobs lost during the Great Recession.
  - From October 2011 to October 2012, the LAUS data reports that the number of employed in the U.S. has increased by 3.1 million.
  - Over the past year, U.S.CES employment has increased by more than 1.922 million (NSA) or 1.949 million (SA).
- LAUS vs. CES Data
  - The LAUS data shows that Colorado has recovered 26% of the jobs lost during the Great Recession compared to 67% for the U.S.
  - The CES SA data shows that Colorado has recovered about 67% of jobs compared to 51% for the U.S.

# Colorado Number of Employed - LAUS



# U.S. Number of Employed - LAUS



Source: Bureau of Labor Statistics, LAUS, SA.; note: January data affected by population controls.

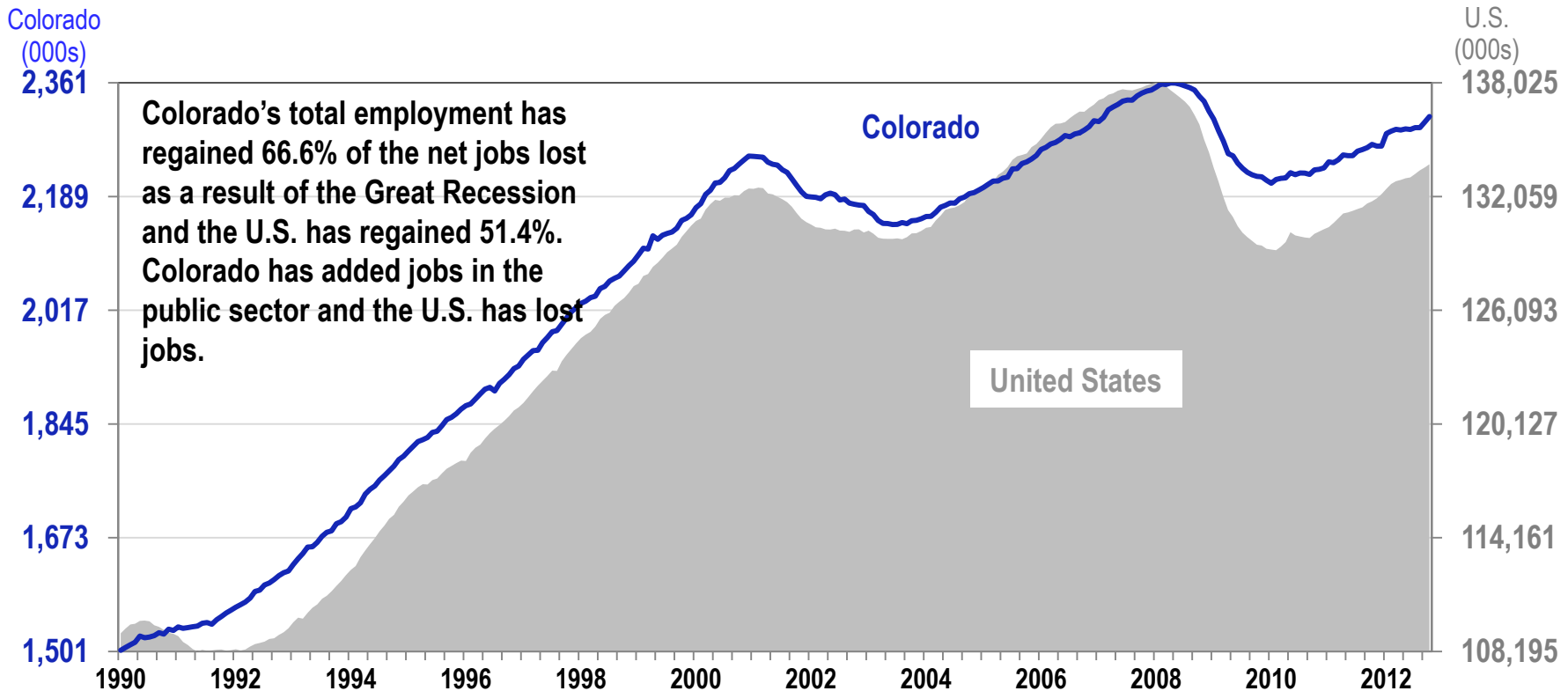
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# ● CES SA United States vs. Colorado Total Employment



U.S. vs. Colorado Total Employment



Source: Bureau of Labor Statistics, SA.

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# Questions About the Number of Employed Workers

The following comments/questions relate to the previous charts:

- Why does the LAUS series show an increase in employment for Colorado of 4,700 for the past year, while the CES data shows a gain of about 42,000? Does this mean significant deterioration has occurred in the number of Colorado sole proprietors or entrepreneurs over the past year?
- The LAUS data reports that Colorado has recovered only about 26% of jobs lost as a result of the Great Recession while the U.S. has recovered 67%. The CES data shows that Colorado has recovered 67% of jobs lost as a result of the Great Recession compared to 51% for the U.S. Why are the recovery rates so different for the LAUS and CES data series?
- This analysis produces results that suggest that LAUS data may not be accurately measuring the unemployment rate in Colorado.





# LAUS and CES Unemployment Rate and Change in Number of Employed Workers

# ● Colorado Unemployment Rate, ● Unemployed Workers, and Change in Employed Workers

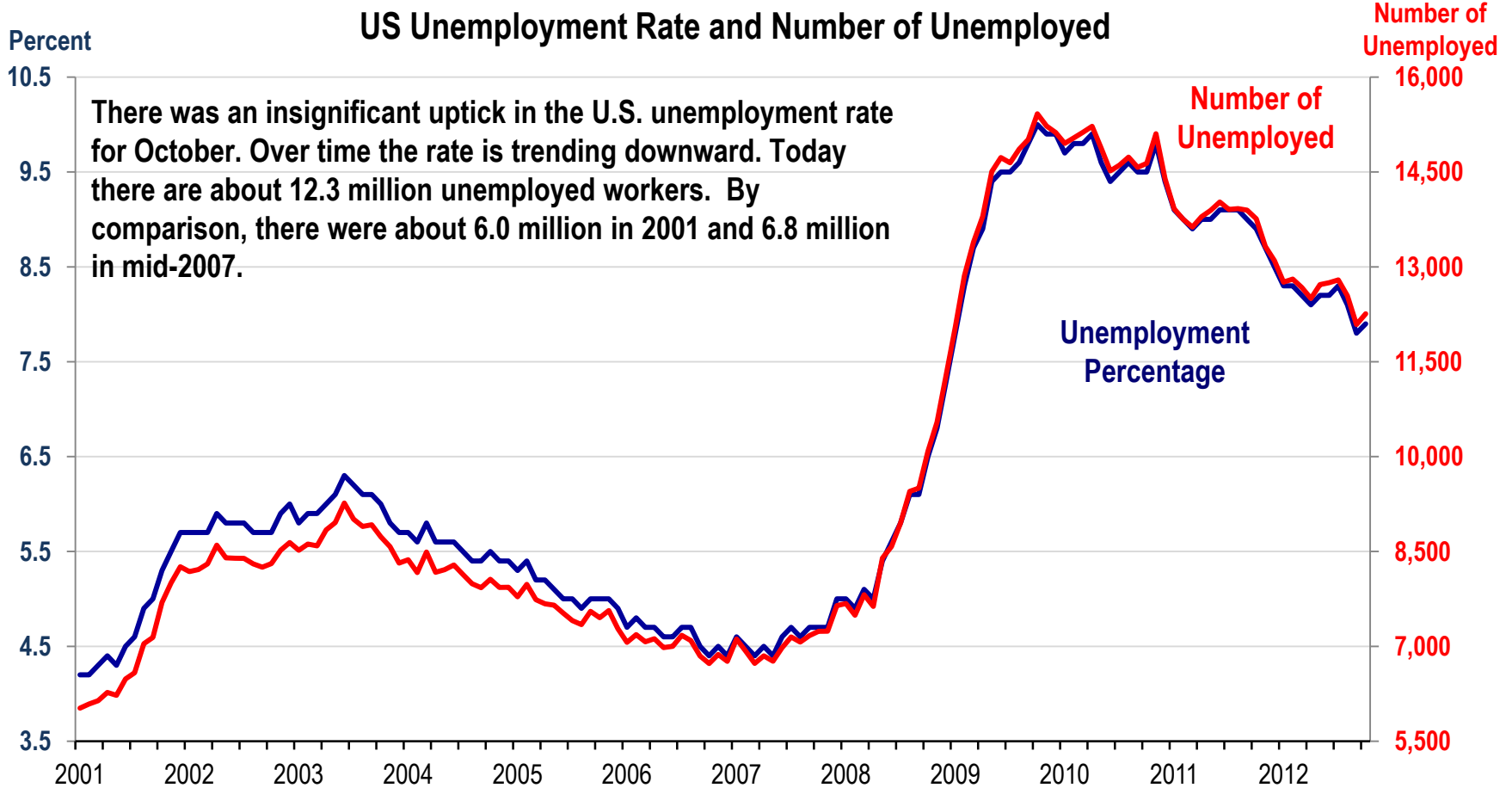
●  
The following three charts focus on the Colorado unemployment rate.

The first two charts look at the relationship between the unemployment rate and the number of unemployed workers (LAUS). They show that there is a strong relationship between these two variables; U.S. ( $r=99.8$ ) and Colorado ( $r=99.5$ ) since the end of the Great Recession.

The third chart compares the unemployment rate to the CES SA employment situation data. It shows the following:

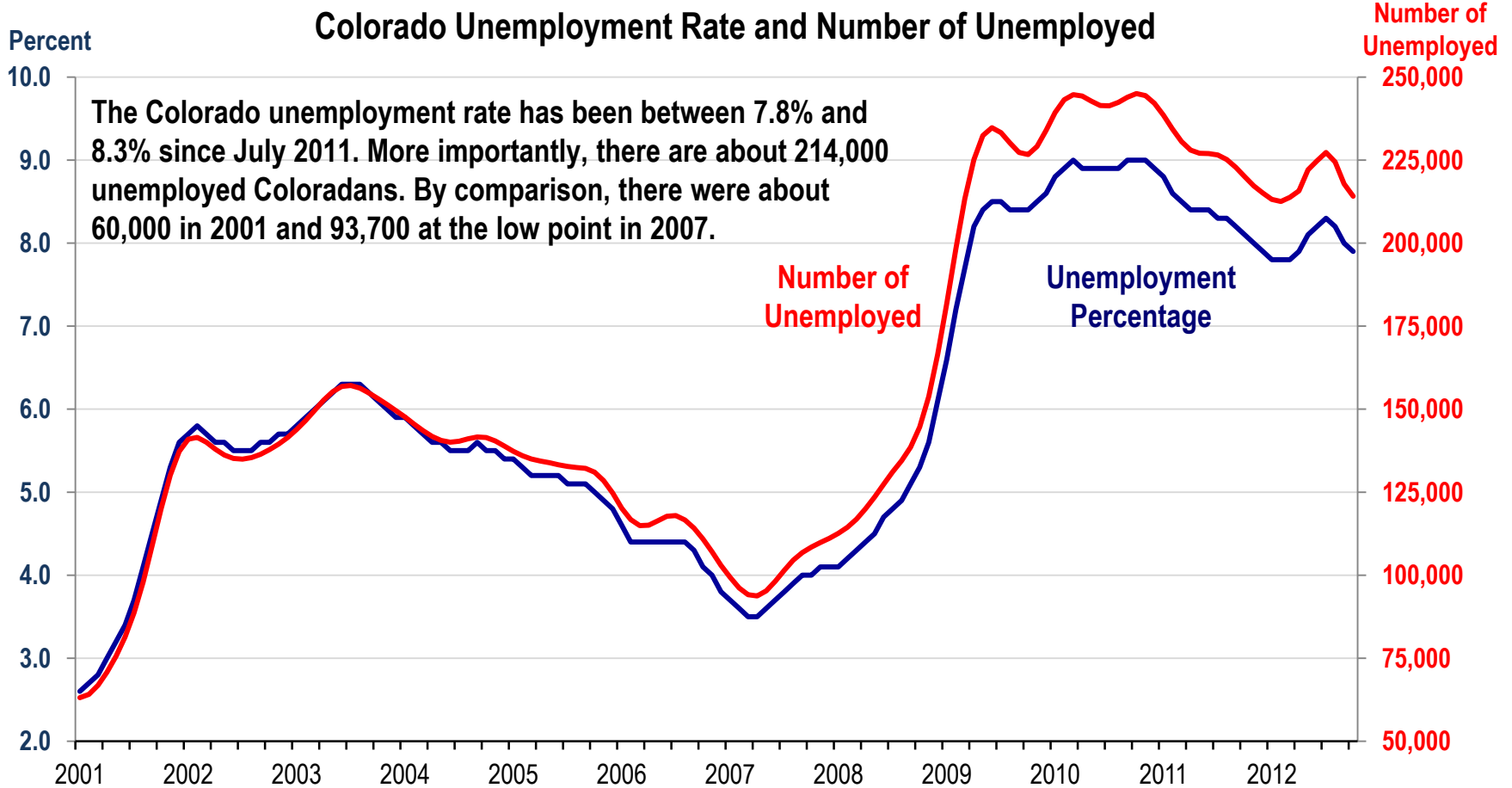
- Since the end of the recession, there is a weak negative relationship between changes in wage and salary employment and the unemployment rate ( $r=-.2$ )
- Since August 2011 the unemployment rate has bounced around between 7.8% and 8.3%. During that period, about 59,300 CES jobs have been added, or a monthly average of 3,700 jobs.

# US Unemployment Rate and Unemployed



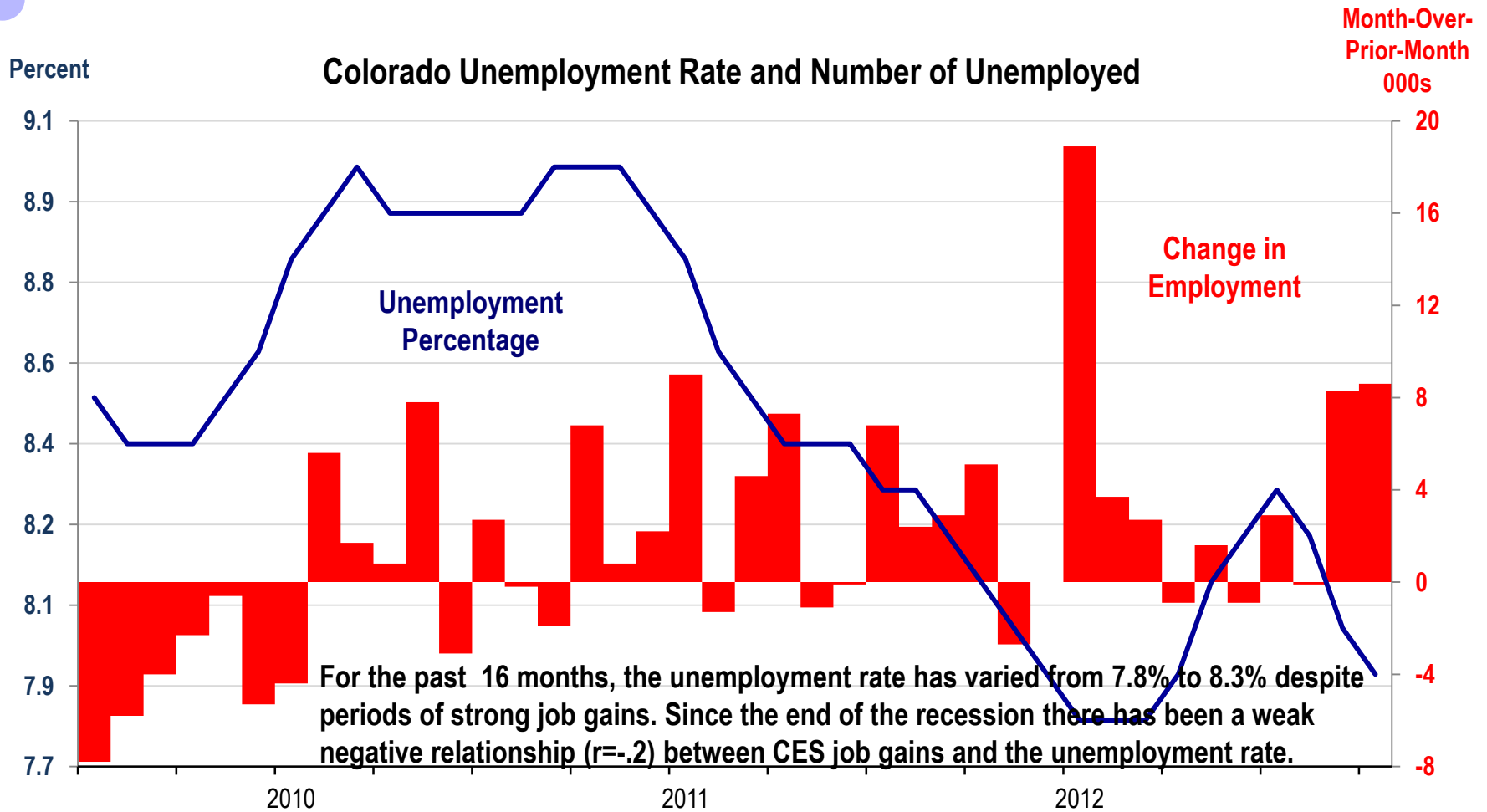
There was an insignificant uptick in the U.S. unemployment rate for October. Over time the rate is trending downward. Today there are about 12.3 million unemployed workers. By comparison, there were about 6.0 million in 2001 and 6.8 million in mid-2007.

# Colorado Unemployment Rate and Number of Unemployed



Source: Bureau of Labor Statistics, SA.  
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# Colorado Unemployment Rate and Number of Employed (CES SA) Since End of Great Recession



# Questions Related to Colorado CES Employment and Unemployment Rate

Over the past 16 months the unemployment rate has varied from 7.8 to 8.3%. During this period, CES employment increased by a monthly average of 3,700 jobs and LAUS employment increased by a monthly average of 1,300 jobs.

The following comments/questions relate to the previous charts:

- If this level of CES employment (3,700 per month) is not causing LAUS employment to increase or the unemployment rate to decrease, what does that say about the health of sole proprietors and startup activity in Colorado? (LAUS employment includes sole proprietors and startups).
- What level of CES employment is necessary to significantly lower the unemployment rate?
- How big is the margin of error for the unemployment rate?
- This analysis produces results that suggest that LAUS data may not accurately measure the unemployment rate in Colorado.



# CES

## NSA and SA Employment

# ● Current Employment Survey Data

## ● Seasonally and Not Seasonally Adjusted

### ●

BLS produces seasonally adjusted data to “eliminate” the effects of seasonality on job changes. The key to producing meaningful SA data is to develop seasonal adjustment factors that accurately reflect changes related to seasonality. This is particularly challenging given the volatility of the economy for the past decade.

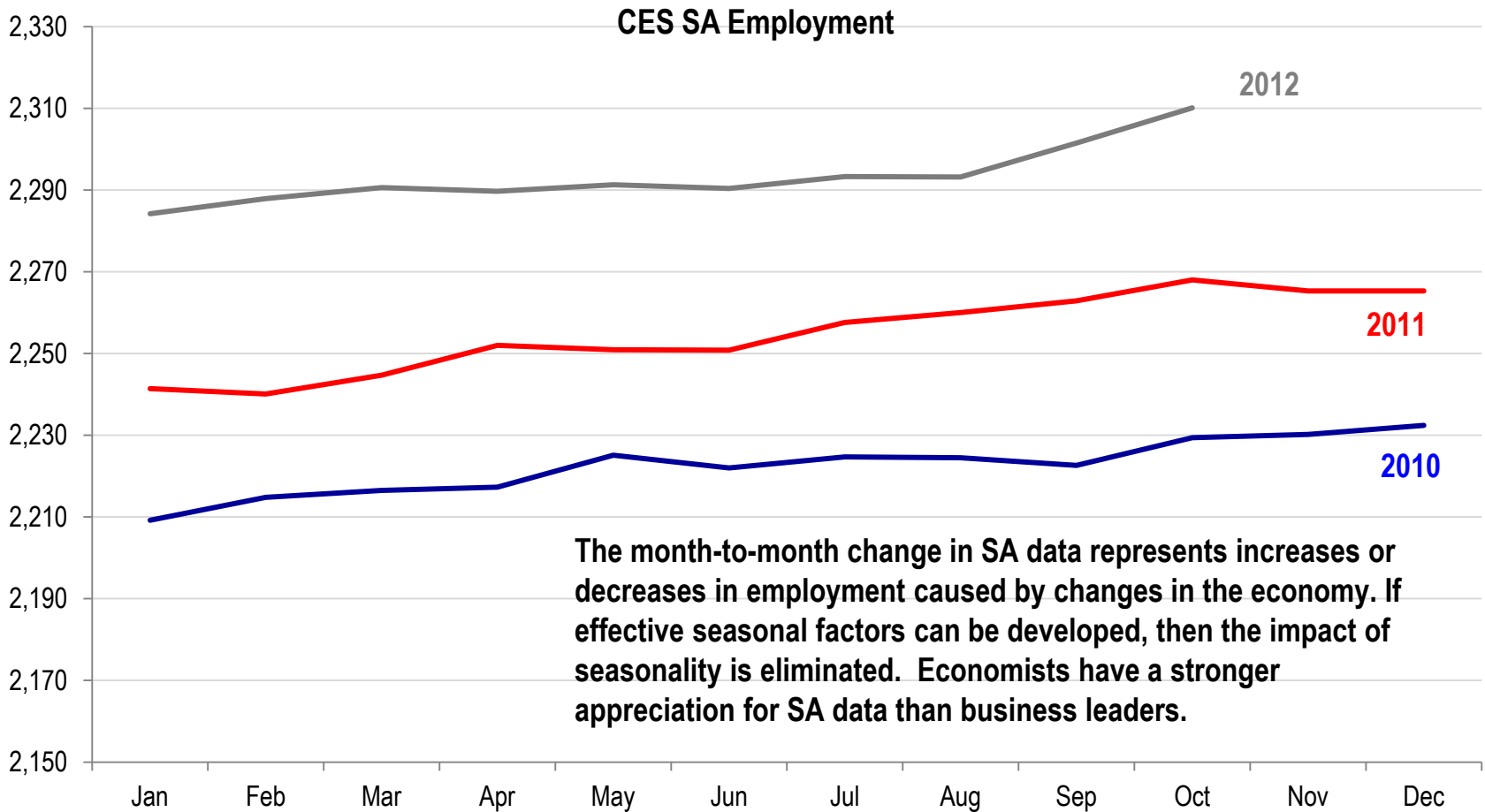
The following charts illustrate differences between the CES (SA and NSA) data. They show the following:

- SA data.
- NSA data.
- Month-Over-Same-Month-Prior-Year Change.
- Month-Over-Previous-Month Change.
- Comparison of NSA and SA data.



# Colorado CES Employment Seasonally Adjusted

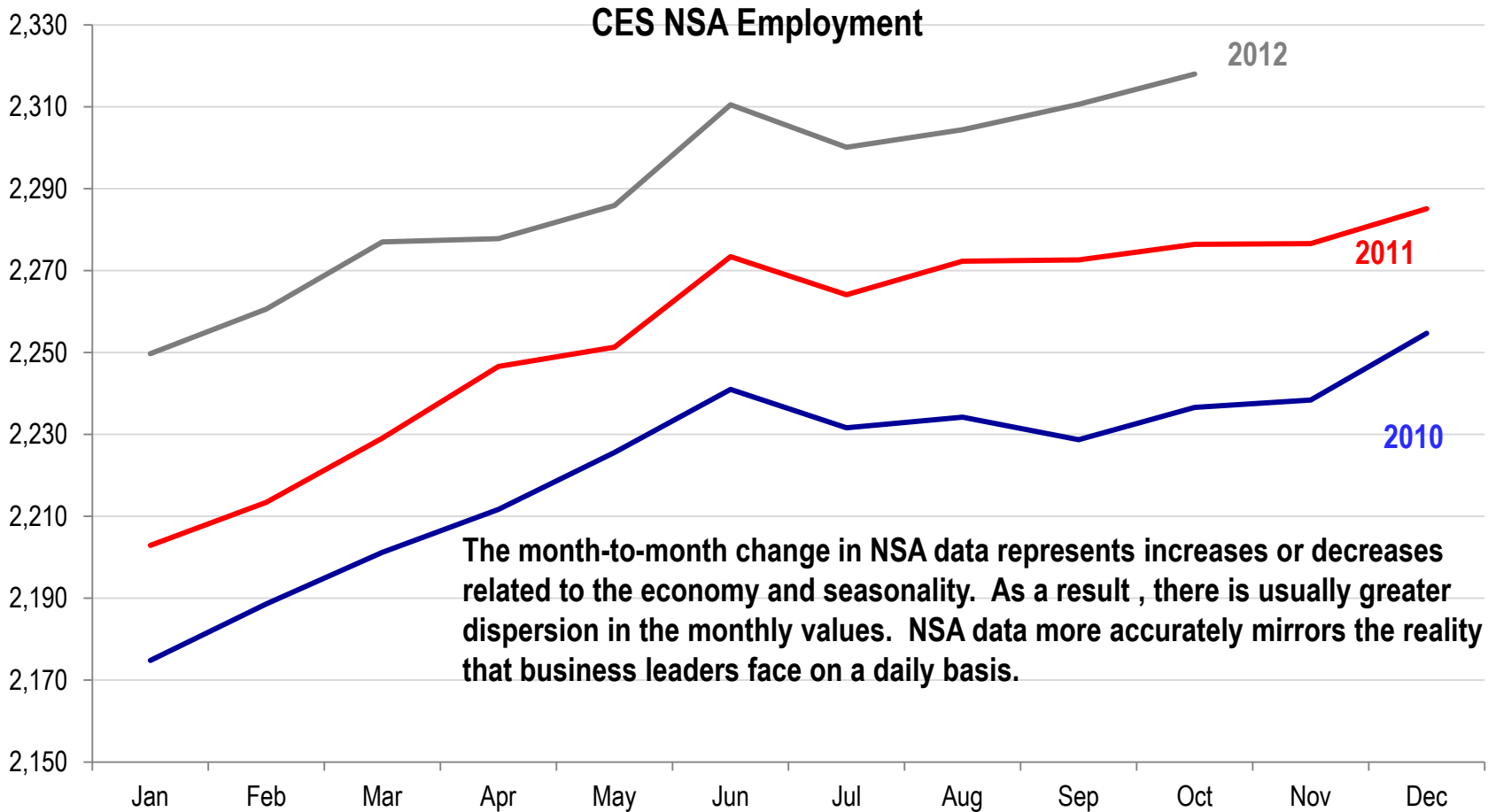
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Source: Bureau of Labor Statistics, SA.  
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# Colorado CES Employment Not Seasonally Adjusted

(000s)

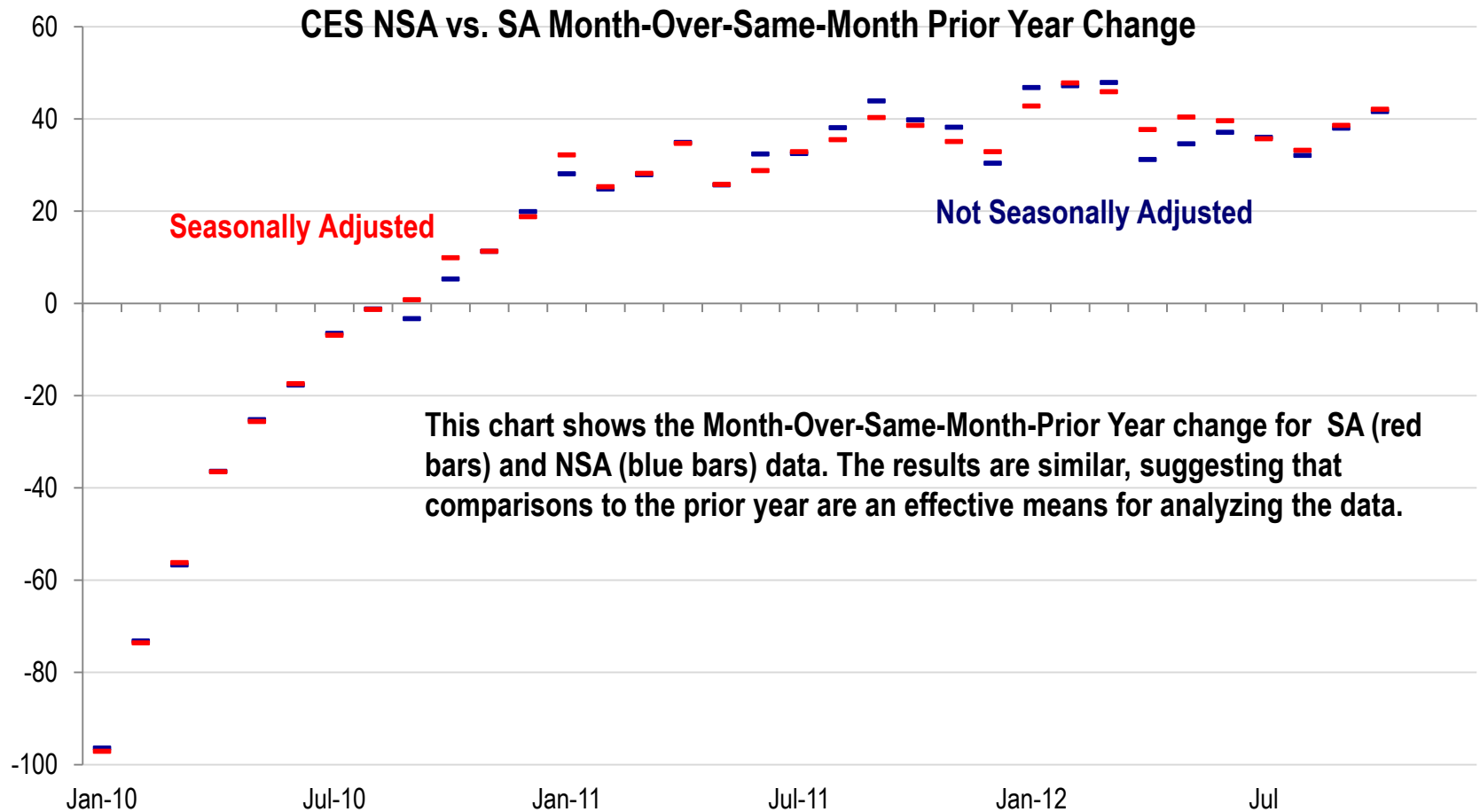


The month-to-month change in NSA data represents increases or decreases related to the economy and seasonality. As a result, there is usually greater dispersion in the monthly values. NSA data more accurately mirrors the reality that business leaders face on a daily basis.

# ● CES Employment (NSA and SA Data)

## ● Month-Over-Same-Month-Prior-Year Change

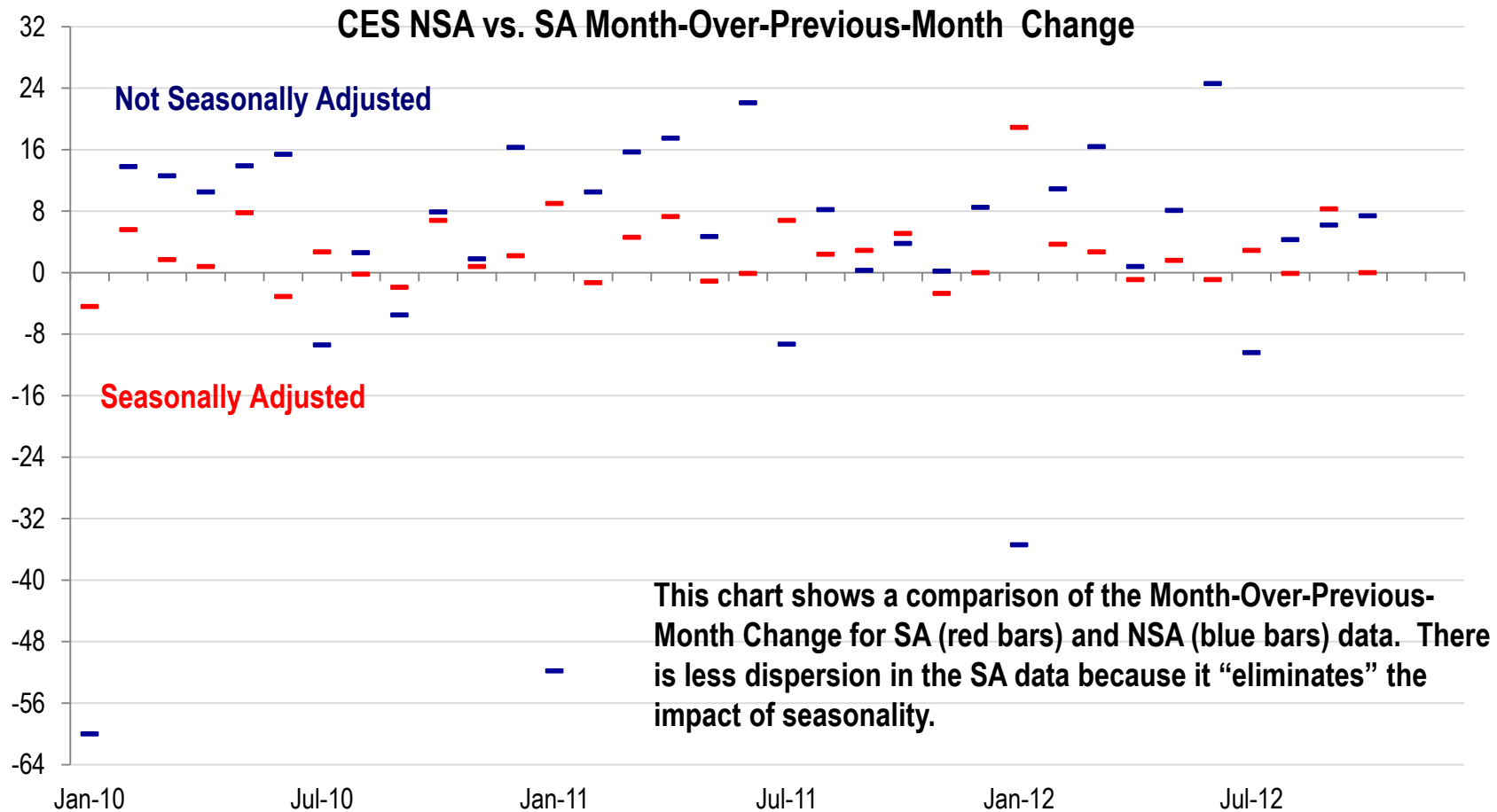
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# ● CES Employment (NSA and SA )

## ● Month-Over-Previous-Month Change

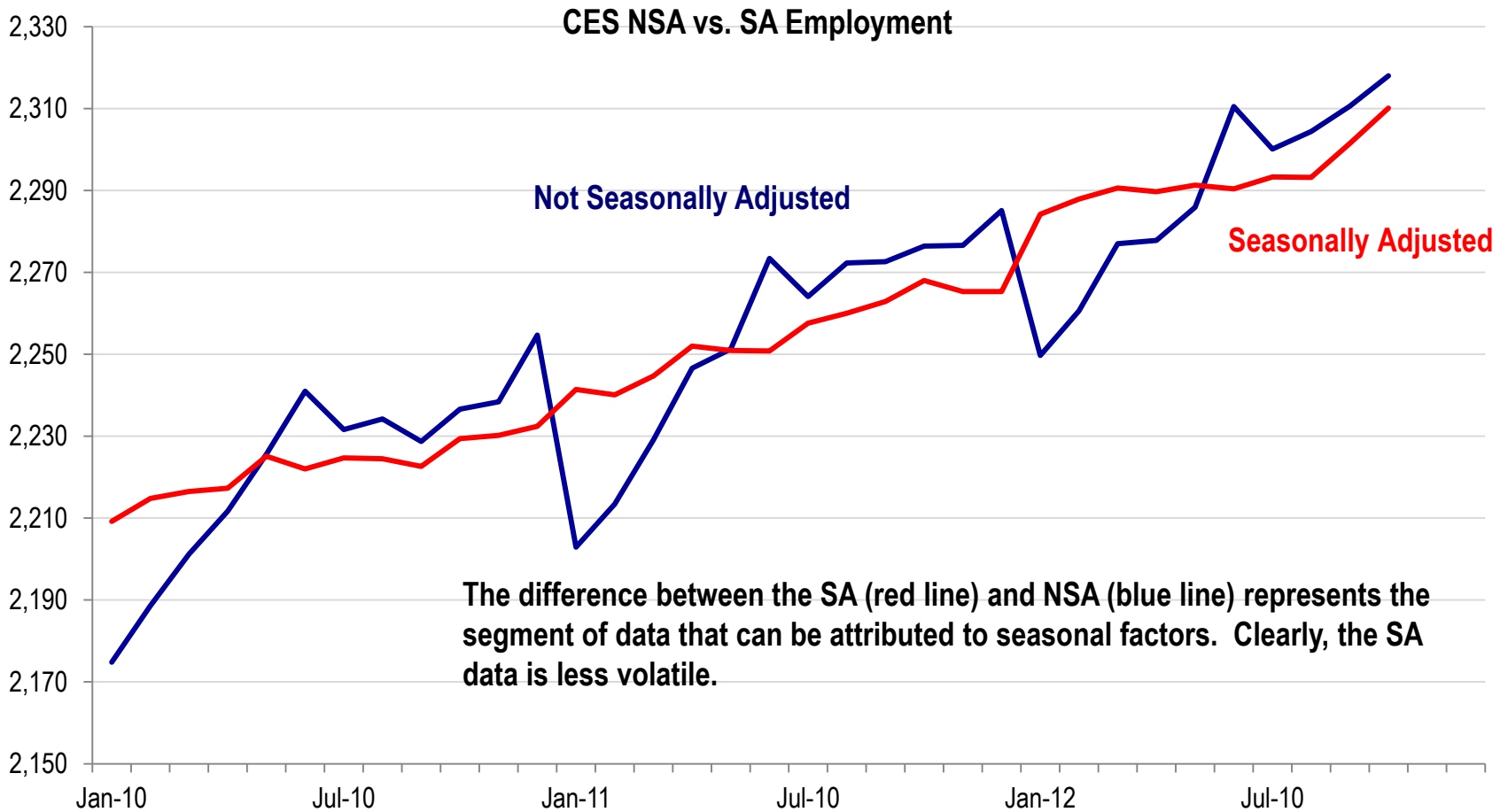
(000s)



This chart shows a comparison of the Month-Over-Previous-Month Change for SA (red bars) and NSA (blue bars) data. There is less dispersion in the SA data because it “eliminates” the impact of seasonality.

# CES Employment NSA and SA

(000s)



# Questions/Comments Related to Colorado CES NA and NSA Data

The following comments relate to the previous charts:

- It is more appropriate to use SA data than NSA data to compare changes in employment between consecutive months.
- If accurate seasonal adjustment factors cannot be calculated, then SA data should be used with caution for comparing employment changes in consecutive months.
- NSA data most accurately reflects “real-world” changes in employment. The data reflect both shifts in seasonality and the economy.
- Both SA and NSA provide comparable changes when comparing Month-Over-Same-Month-Prior-Year data.



# CES SA Employment Colorado vs. U.S.

# ● Current Employment Survey Data

## ● Seasonally and Not Seasonally Adjusted

### ●

The following charts illustrate the Employment Situation for the U.S. and Colorado since the end of the Great Recession. The Employment Situation looks at the month-over-prior month change using CES SA data.

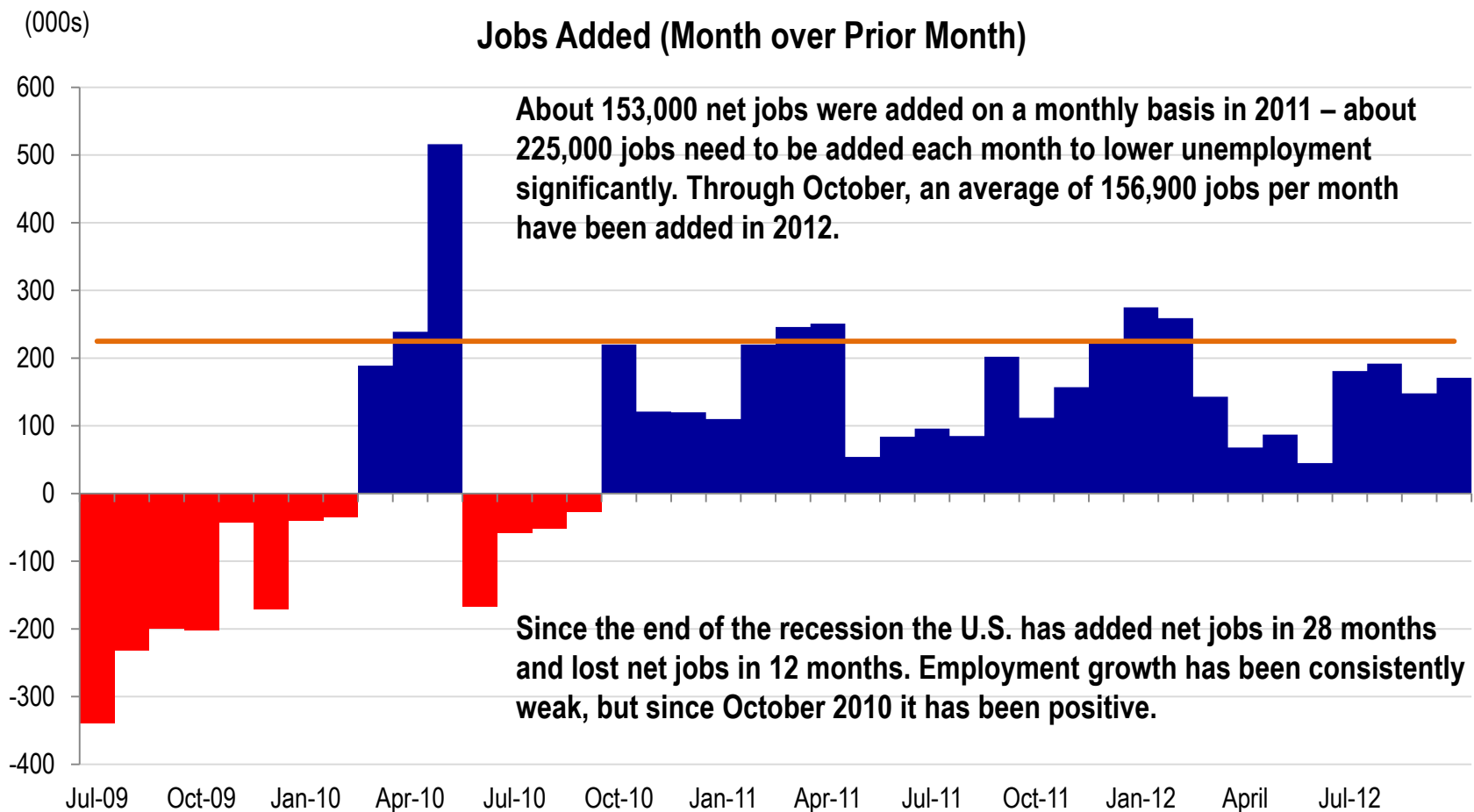
The charts show that:

- The U.S. has added net jobs in 28 months and lost net jobs in 12 months. Employment growth has occurred in each of the most recent 25 months.
- Colorado has added net jobs in only 22 of 40 months and 17 of the past 25 months. The Colorado recovery is more “erratic” than the U.S. recovery.
- Colorado is recovering more quickly from the Great Recession than the U.S.



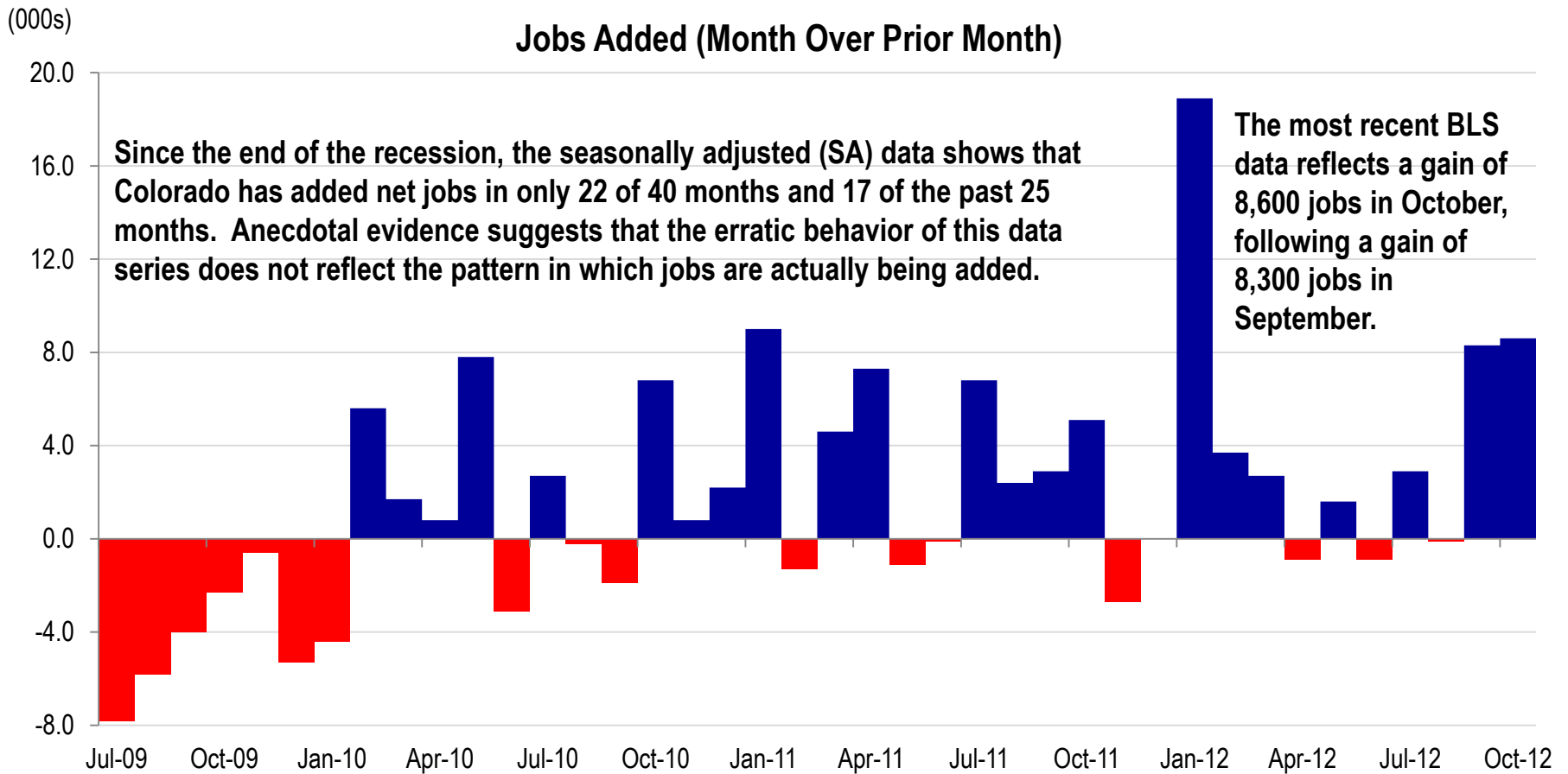
# U.S. Employment Situation

## From End of Recession to Current



# Colorado Employment Situation

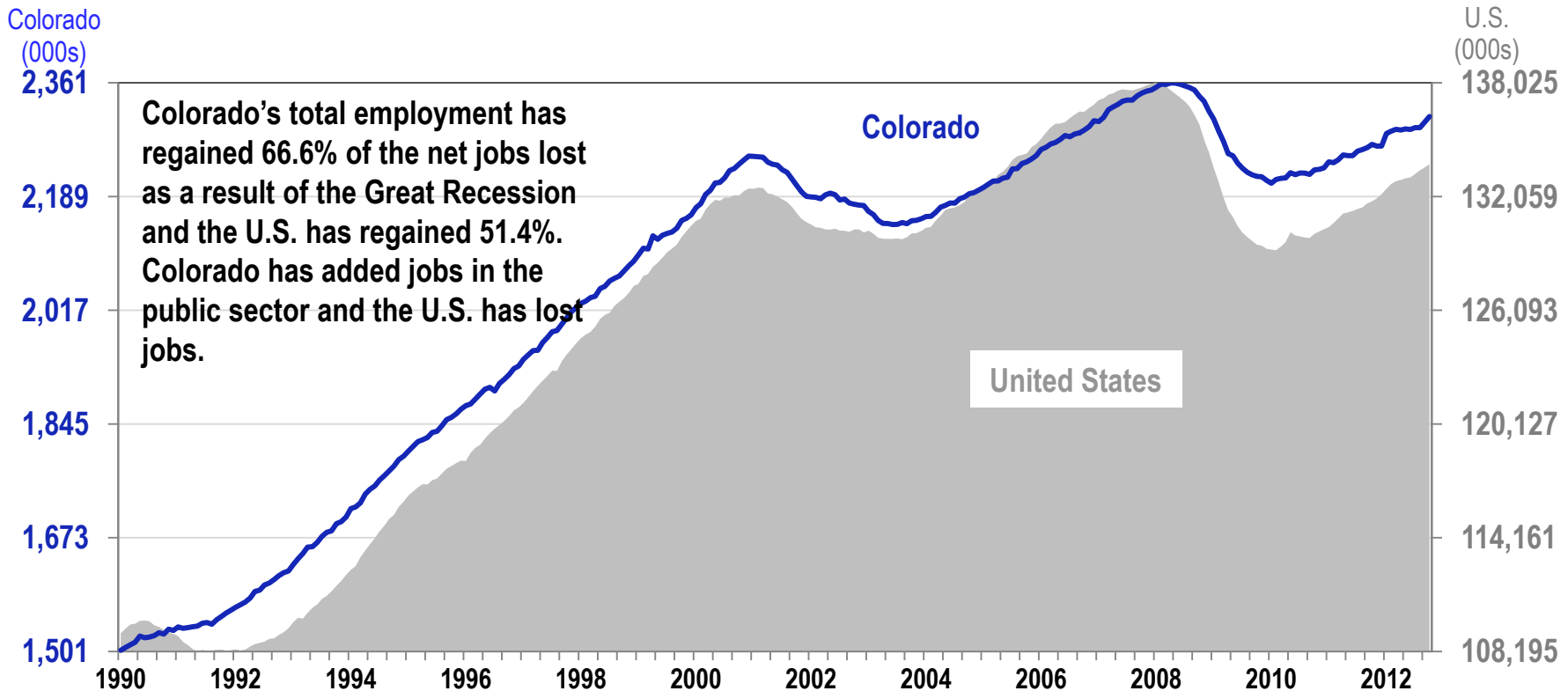
## From End of Recession to Current



# ● CES SA United States vs. Colorado Total Employment



U.S. vs. Colorado Total Employment



Source: Bureau of Labor Statistics, SA.

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# Questions Related to Colorado CES SA

The following questions/comments arise from a review of the previous charts:

- Do month-to-month changes in the Colorado CES SA data provide a reasonable representation of actual employment activity on the street?
- Are there better ways to communicate monthly changes in employment than by calculating the Employment Situation using the CES SA data?
- Economic activity on the street suggests the recovery is steady for both the U.S. and Colorado. It seems unlikely that the Colorado recovery from the Great Recession is both faster and more erratic than the U.S., as illustrated by the CES SA data.



# Summary

# There is No Perfect Set of Data

There are clearly challenges with producing sets of data. That is simply part of the business.

In most cases, those challenges are caused by the methodology used to produce data, imperfect forecasting models, cost to gather and compile data, and time allowed to collect data. Very seldom are errors made in the compilation of the data.

Within the past six weeks, the state's Chief Labor Economist stated, in the media, that the unemployment rate should not be taken at face value. On another occasion the economist stated that people should not get excited about the addition of 7,000 jobs in one month, i.e. the monthly employment change in the CES SA data did not reflect reality. These comments appear to be a public confession that CDLE is not comfortable with some of the state-level LAUS or CES-SA data sets they produce and distribute.

The point is that all data sets have limitations, particularly the LAUS and CES SA data. They should be used with caution.

# Guidelines for Use of LAUS and CES Data

Guidelines for use of the LAUS and CES data sets are provided below.

- The CES NSA data is the most solid of the three data series. Month-over-previous-month comparisons using NSA data capture changes caused by seasonality and the economy. They may provide valuable information to business or industry leaders. The use of rolling averages makes it possible to quickly evaluate trends from NSA data.
- The CES SA data is derived from the NSA data. Seasonal factors are applied to “eliminate” changes caused by seasonality, i.e. they report changes caused only by the economy. As a result, annual totals cannot be calculated for SA data. Month-over-previous-month comparisons, also referred to as the Employment Situation, are used frequently, but they may produce results that do not reflect “real-world” employment activity.
- Month-over-same-month-previous-year comparisons provide results that are consistent between NSA and SA data. This is an effective means of evaluating changes in employment.
- Month-over-previous-month comparisons using NSA data may be appropriate when performing employment analyses for specific industries.
- The LAUS data should be used with extreme caution. It is an extremely popular data series, but a case can be made that it currently does not accurately represent employment activity in Colorado. The data should be used very broadly; for example, it is more meaningful to evaluate a trend of six months or longer than to focus on a monthly unemployment rate. As well, trends in LAUS data are most valuable when they are used to support other information or analysis.

While there are issues with these data sets, the good news is that we have data to work with.



## State and Federal Employment Data Sets Issues, Concerns, and Questions

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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