

Taking FRED into the Classroom

Ryan W. Herzog, Ph.D.
Gonzaga University



How I use FRED

- As a teacher
 - Lecture notes
 - Classroom assignments
- As a researcher
 - Stata and FREDUSE
- As a textbook developer
 - Countless hours are spent updating data in macro/money and banking textbooks.

FRED in the Classroom

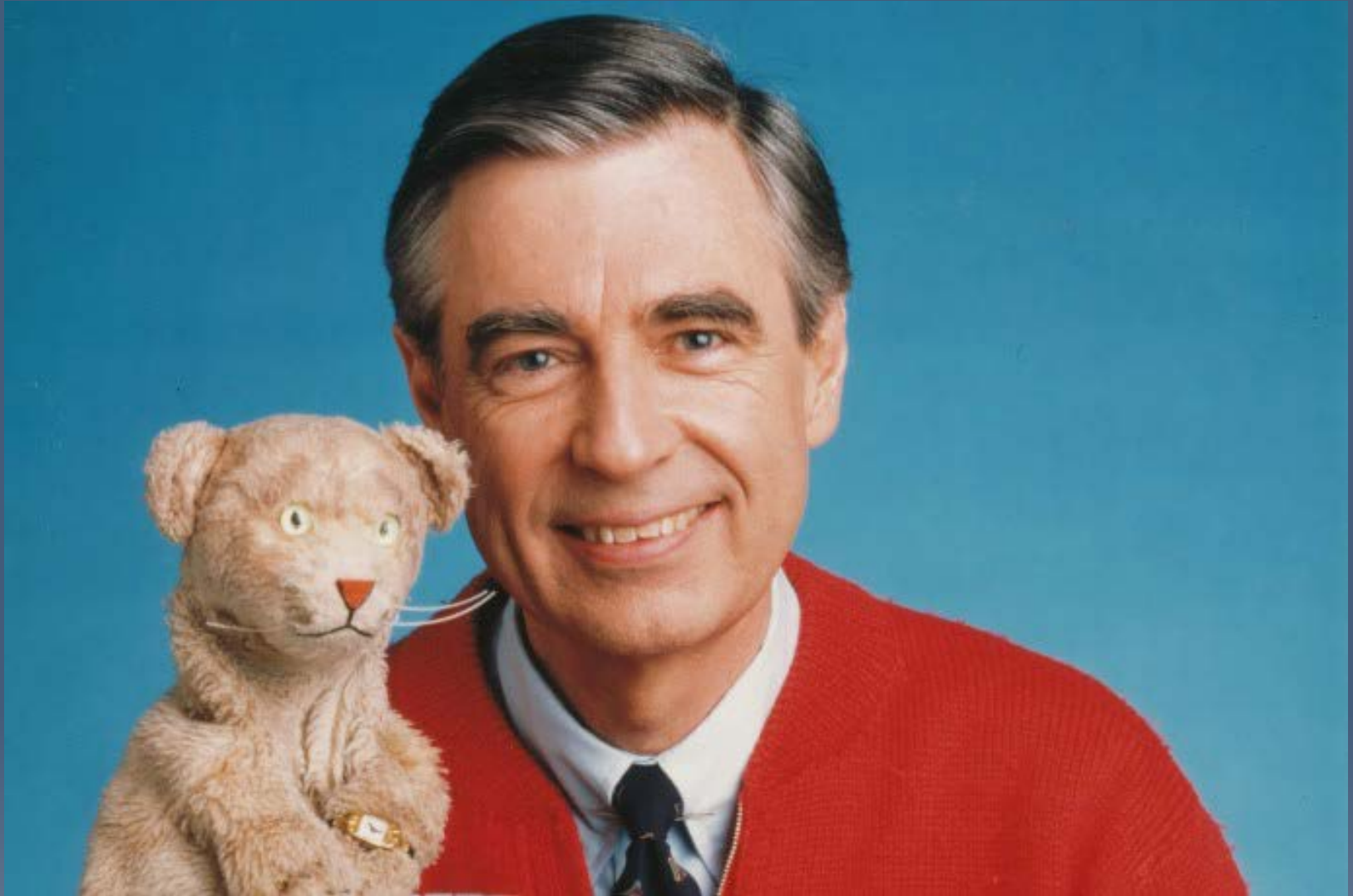
- FRED has lot of data....
- So?
- How can faculty and students engage with FRED to enhance learning?

“Let’s start by googling FRED”









Herzog, Ph.D. - Beyond the Numbers



Download, graph, and track **397,000** US and international time series from **79** sources.

Search FRED data e.g., gdp, inflation, unemployment



Browse data by **Tag**, **Category**, **Release**, **Source**, **Release Calendar** or **Get Help**

FRED News

Changes to Interest Rate Series in FRED

FRED-MD Has Been Updated

FRED Blog

Engel's law is still good food for thought

Research News

Working, but Not at Capacity

GEOFRED

Build your own U.S. data map.

Show FRED data at state, county, and metropolitan statistical area levels.

GEOGRAPHICAL ECONOMIC DATA | ST. LOUIS FED

AT A GLANCE

POPULAR SERIES

LATEST RELEASES

TOOLS

NEED HELP?

CPI

+1.1 % Chg. from Yr. Ago on Aug 2016



Real GDP

1.4 % Chg. from Preceding Period on Q2 2016



IP

-0.4 % Chg. on Aug 2016



US/Euro FX Rate

1.1238 U.S. \$ to 1 Euro on 2016-09-30



Civ. Unemploy. Rate

5.0 % on Sep 2016



Payroll Employment

+156 Chg., Thous. of Persons



Send feedback

Overview

- Some general observations...

Micro = FUN!

Macro = No FUN!

- The value of macroeconomics is not realized until after college.
 - Is this their fault?

Learning Outcomes

“Expected Proficiencies for Undergraduate Economics Majors,” by W. Lee Hansen.

The Journal of Economic Education, Vol. 32, No. 3, The Scholarship of Teaching Economics (Summer, 2001), pp. 231-242

1. Access existing knowledge
2. Display command of existing knowledge
3. Interpret existing knowledge
4. Interpret and manipulate economic data
5. Apply existing knowledge
6. Create new knowledge

Teaching Macroeconomics

- Who is our audience?
- What do students need to know for upper level courses?
- How can we make macroeconomics relevant and of interest to students across disciplines

Teaching Macroeconomics

- Traditional economics courses emphasize theoretical models with old data.
- Data allows students to...
 - learn how variables compare across countries
 - learn how variables have changed over time

Why FRED?

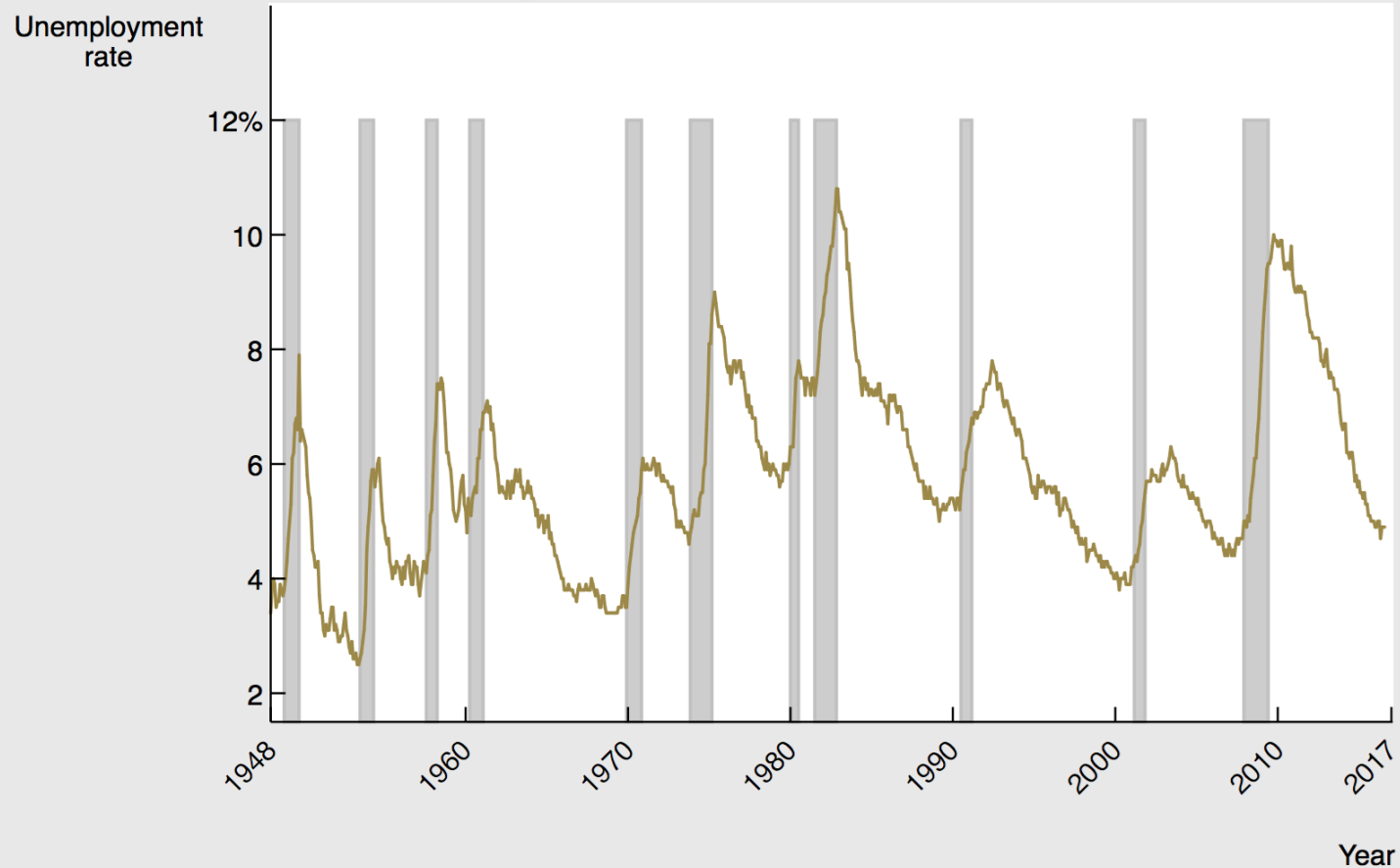
- Has nearly all macroeconomic series that are covered in many courses:
 - Principles of Macroeconomics
 - Intermediate Macroeconomics
 - Money, Banking, and Financial Markets
- Can also be useful for teaching:
 - Econometrics
 - International Finance
 - Economic Growth

Why FRED?

- Data are easy to find and visualize
- Graphs are user friendly
- Provides links to original data sources
- One stop shop

What is more informative?

Figure 8-1: The U.S. Unemployment Rate, 1948-2017



Data from Bureau of Labor Statistics;
National Bureau of Economic Research;
Federal Reserve Bank of St. Louis.

Home > Categories > Population, Employment, & Labor Markets > Current Population Survey (Household Survey) > Unemployment Rate

Civilian Unemployment Rate (UNRATE)

DOWNLOAD 

Observation:

Sep 2016: **5.0** (+ more)

Updated: 8:16 AM CDT

Units:

Percent,

Seasonally Adjusted

Frequency:

Monthly

1Y | 5Y | 10Y |
Max

1948-01-01

to

2016-09-01

EDIT GRAPH 

FRED 


— Civilian Unemployment Rate



Shaded areas indicate US recessions

Source: US. Bureau of Labor Statistics

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Share Links 

Account Tools 



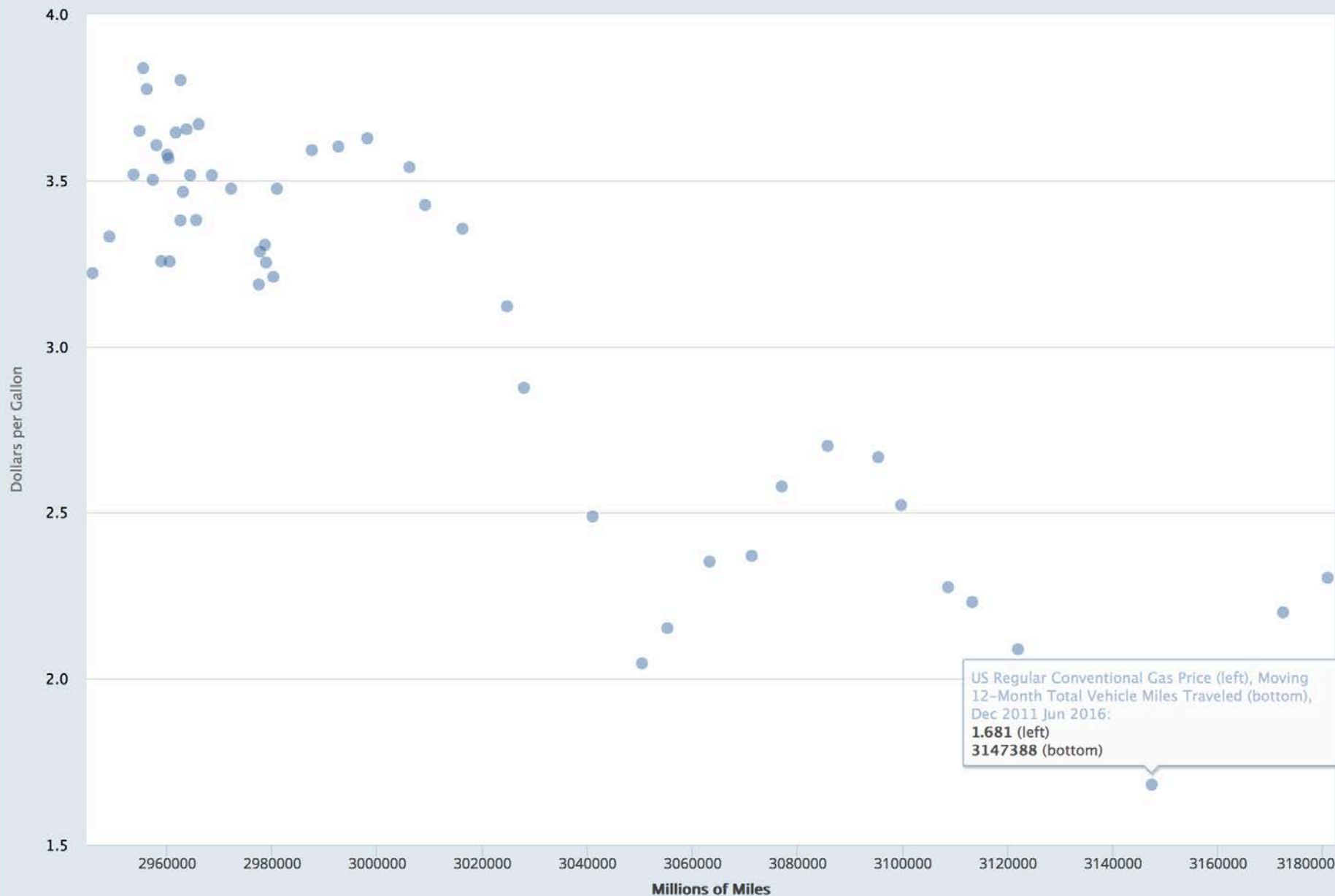
NOTES

Send feedback

Basic Economic Concepts

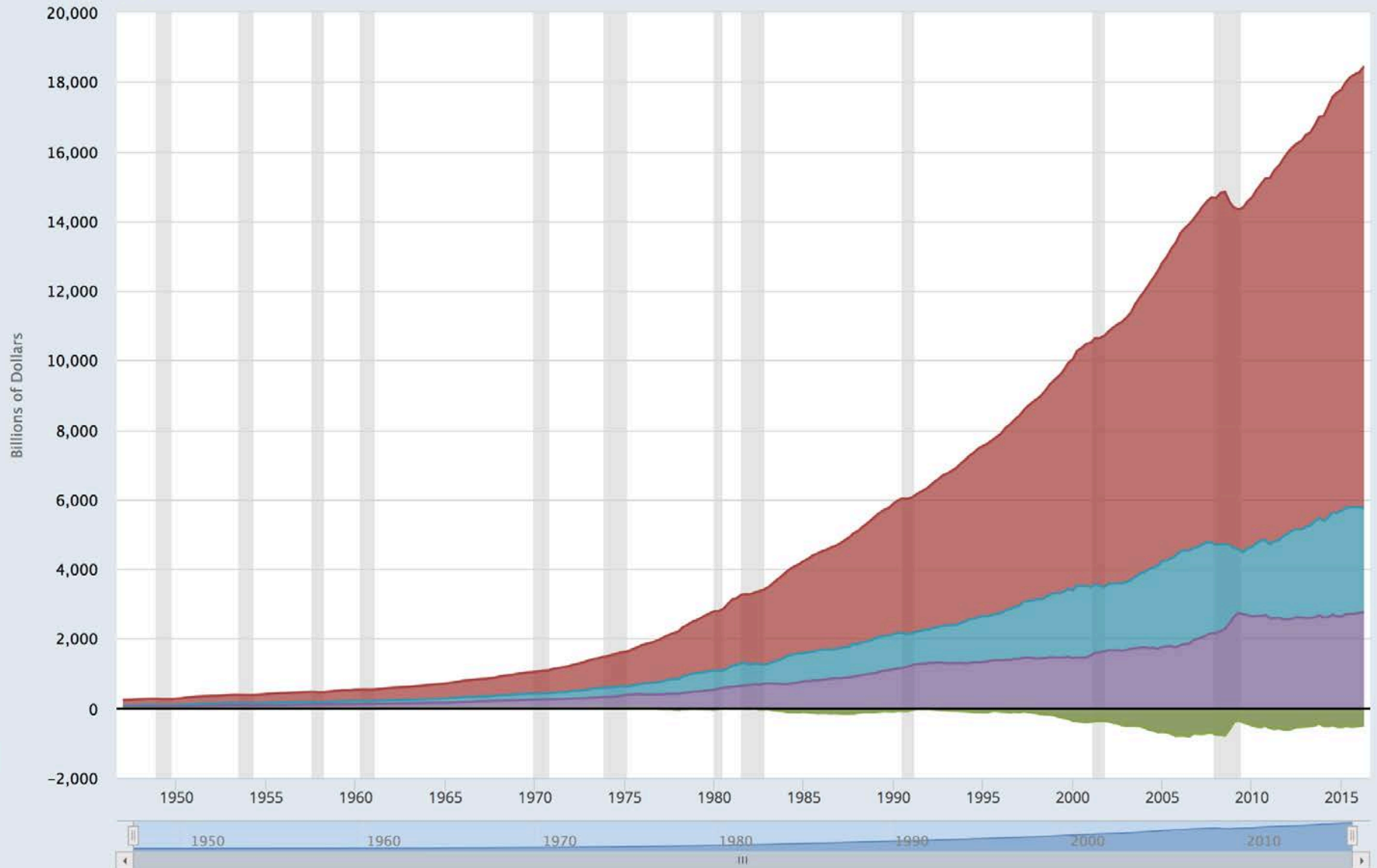
- Supply and Demand
- GDP
- Inflation
- Unemployment
- Growth

Supply and Demand



Gross Domestic Product

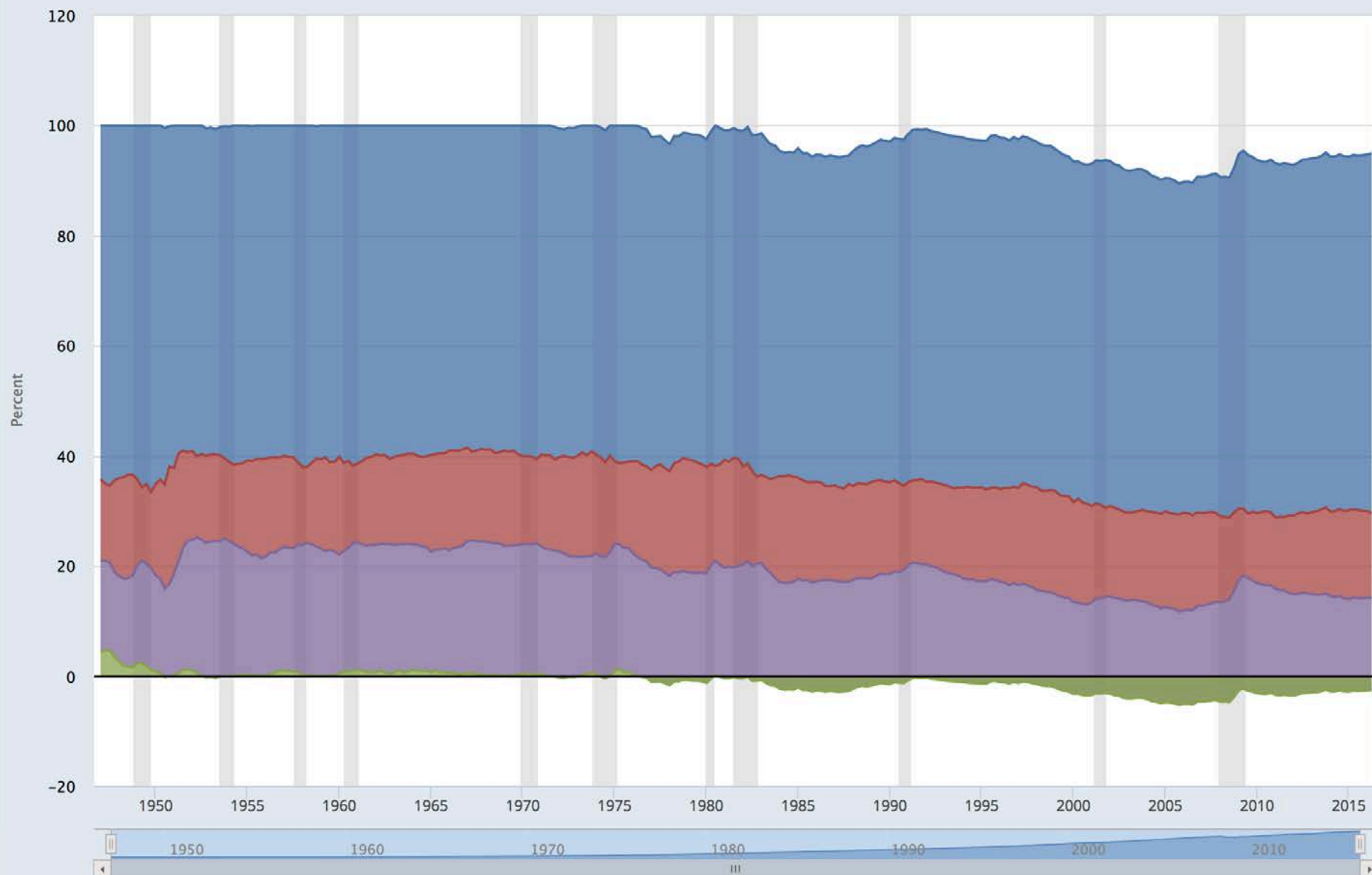
- Personal Consumption Expenditures
- Gross Private Domestic Investment
- Government Consumption Expenditures and Gross Investment
- Net Exports of Goods and Services



Shaded areas indicate US recessions

2016 fred.stlouisfed.org

- Personal Consumption Expenditures
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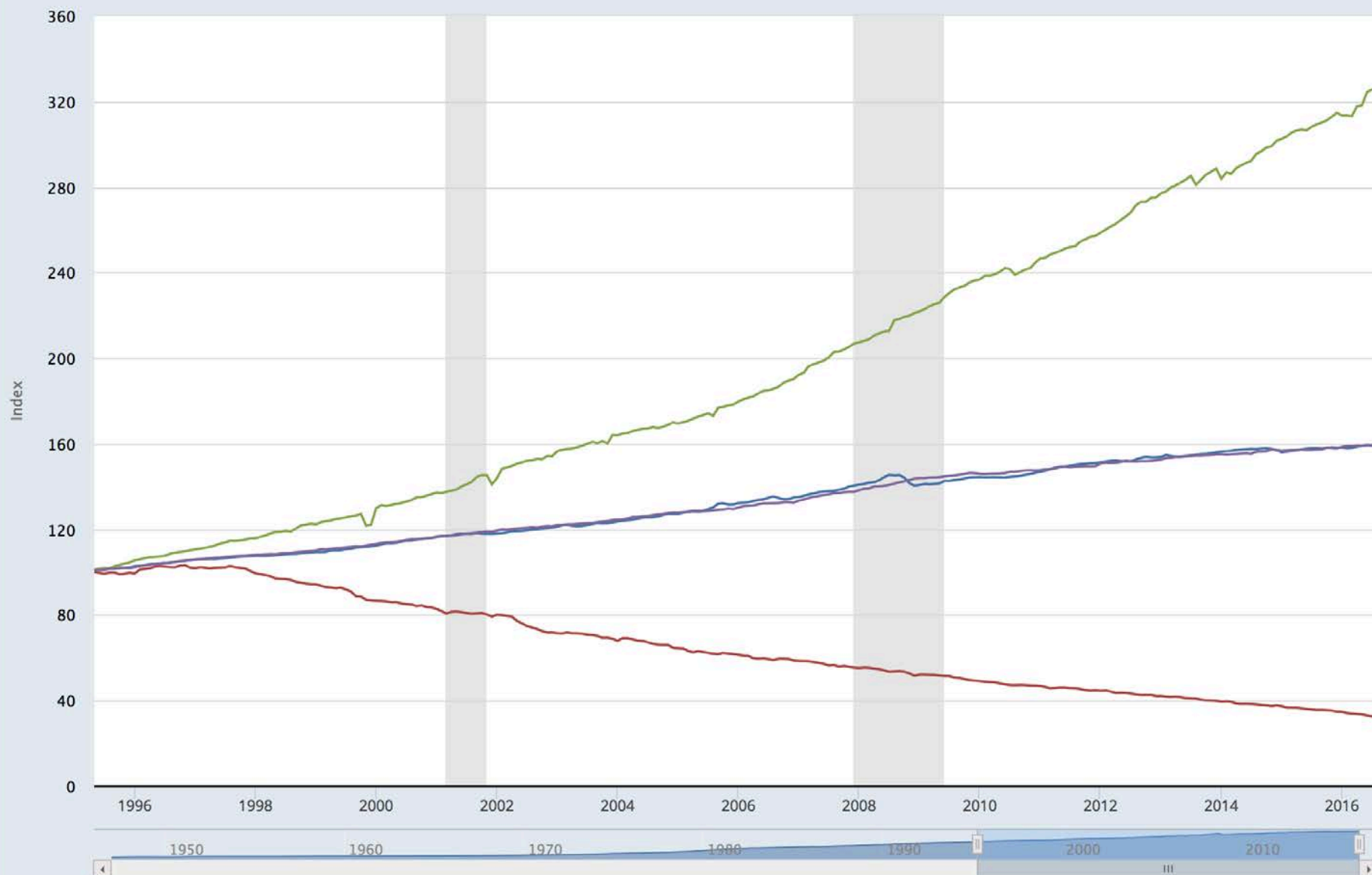


Shaded areas indicate US recessions

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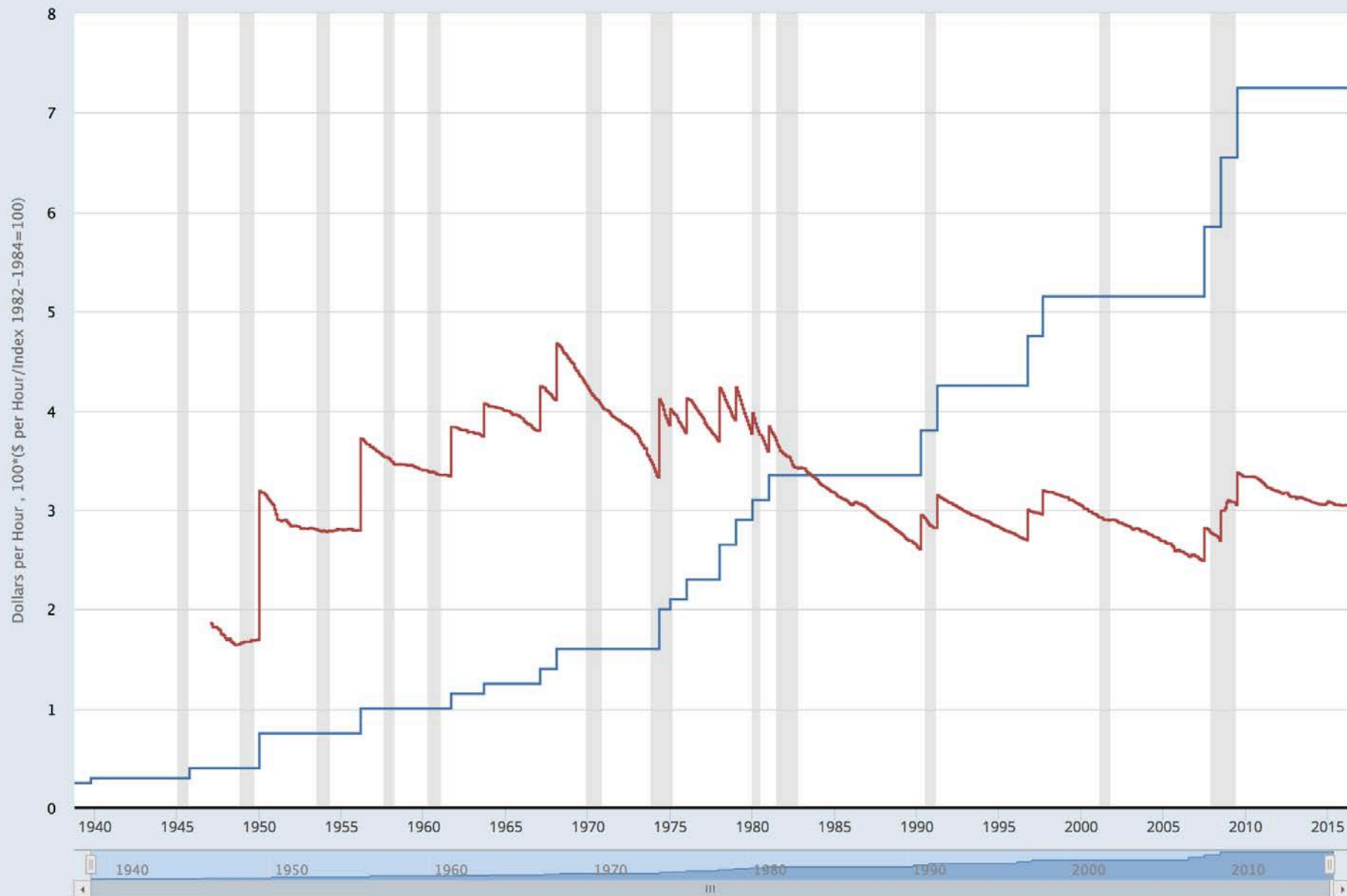
Inflation and Real Values

- Consumer Price Index for All Urban Consumers: All Items, Jan 1995=100
- Consumer Price Index for All Urban Consumers: Educational books and supplies, Jan 1995=100
- Consumer Price Index for All Urban Consumers: Toys, Jan 1995=100
- Consumer Price Index for All Urban Consumers: Alcoholic beverages, Jan 1995=100



Shaded areas indicate US recessions

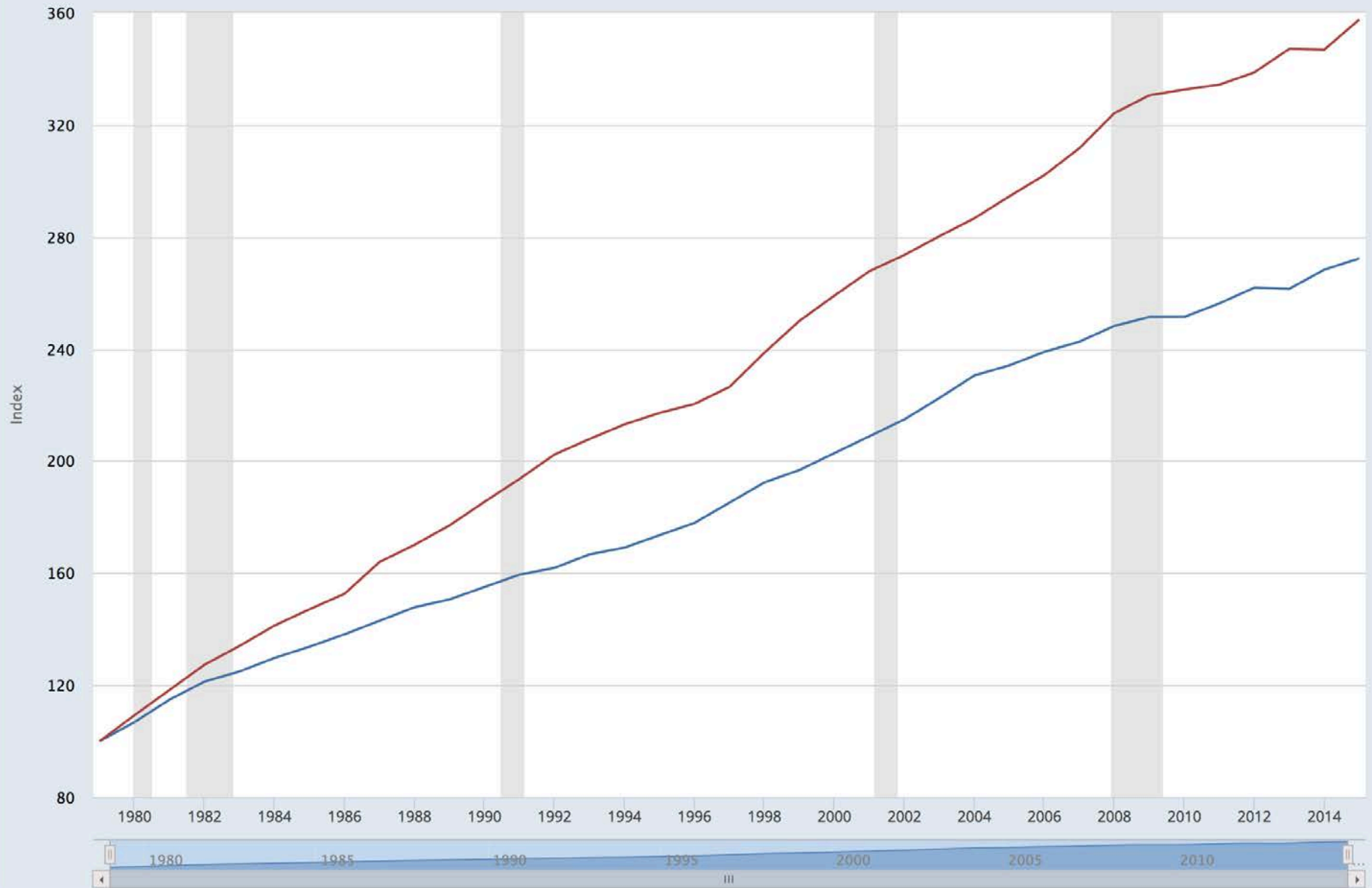
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Shaded areas indicate US recessions

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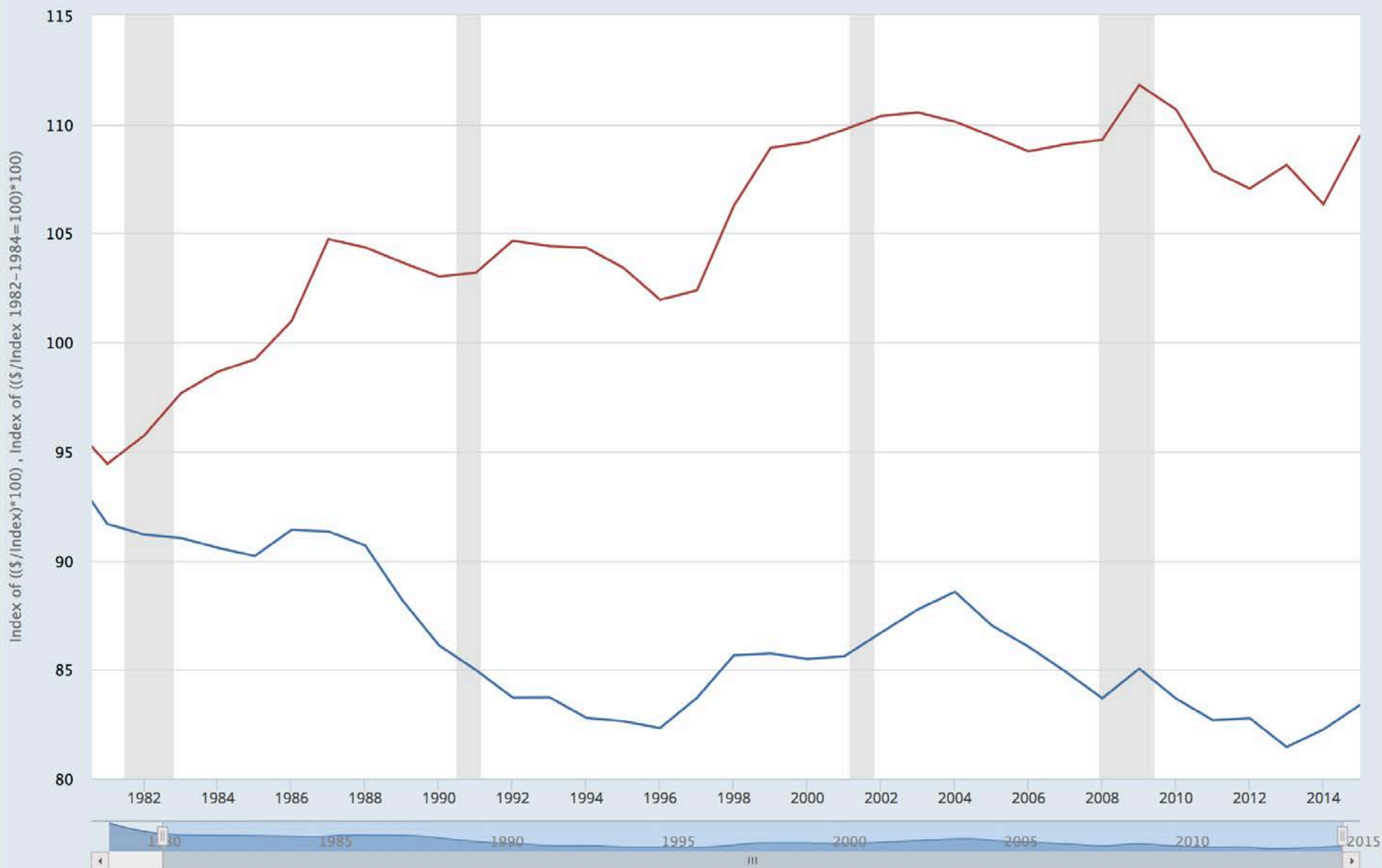
- Employed full time: Median usual weekly nominal earnings (second quartile): Wage and salary workers: High School graduates, no college: 25 years and over, 1979=100
- Employed full time: Median usual weekly nominal earnings (second quartile): Wage and salary workers: Bachelor's degree and higher: 25 years and over, 1979=100



Shaded areas indicate US recessions

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— ((Employed full time: Median usual weekly nominal earnings (second quartile): Wage and salary workers: High School graduates, no college: 25 years and over/Consumer Price Index for All Urban Consumers: All Items, 1979=100)*100), 1979=100
 — ((Employed full time: Median usual weekly nominal earnings (second quartile): Wage and salary workers: Bachelor's degree and higher: 25 years and over/Consumer Price Index for All Urban Consumers: All Items)*100), 1979=100

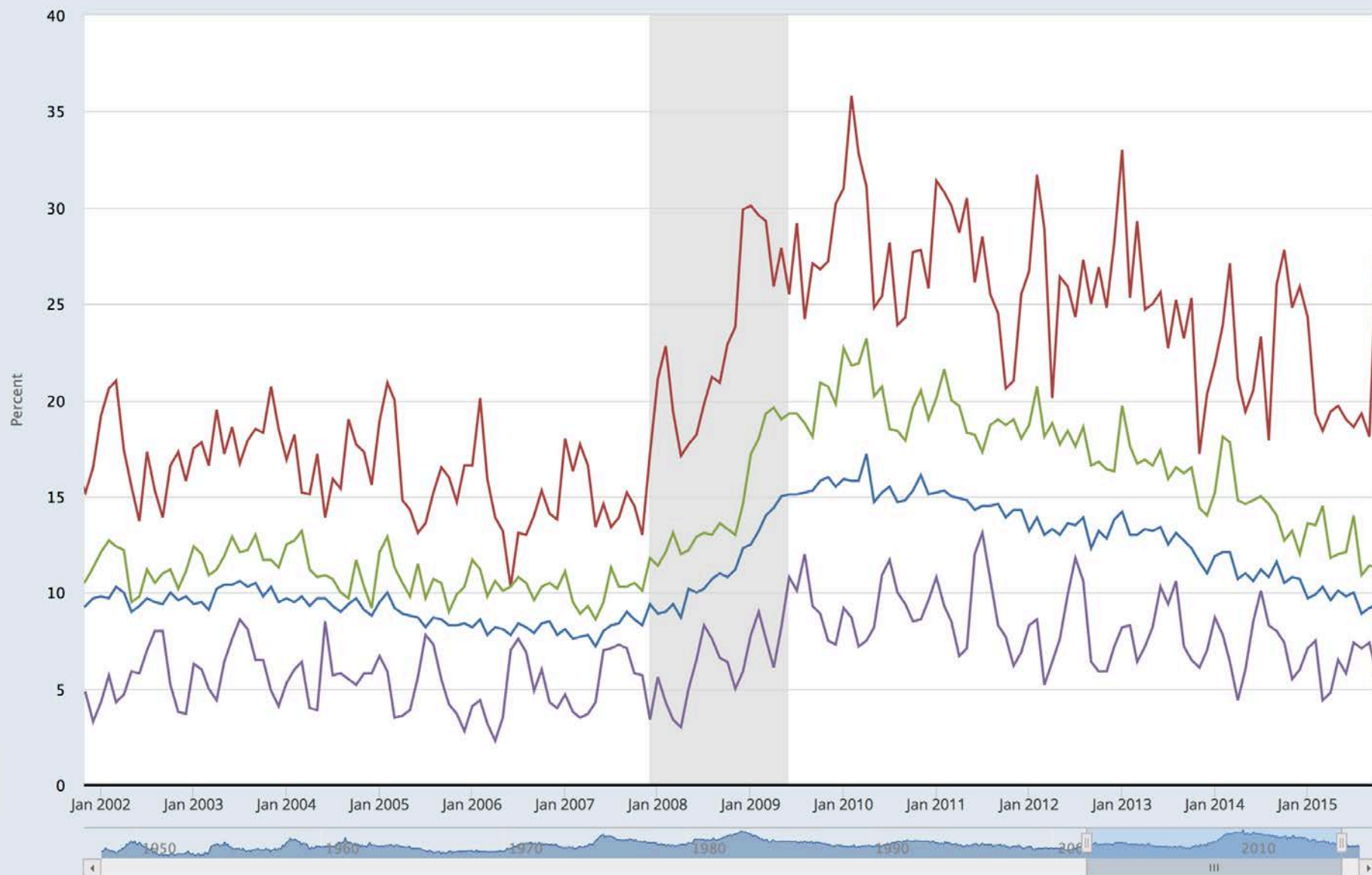


Shaded areas indicate US recessions

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Unemployment and Labor Market

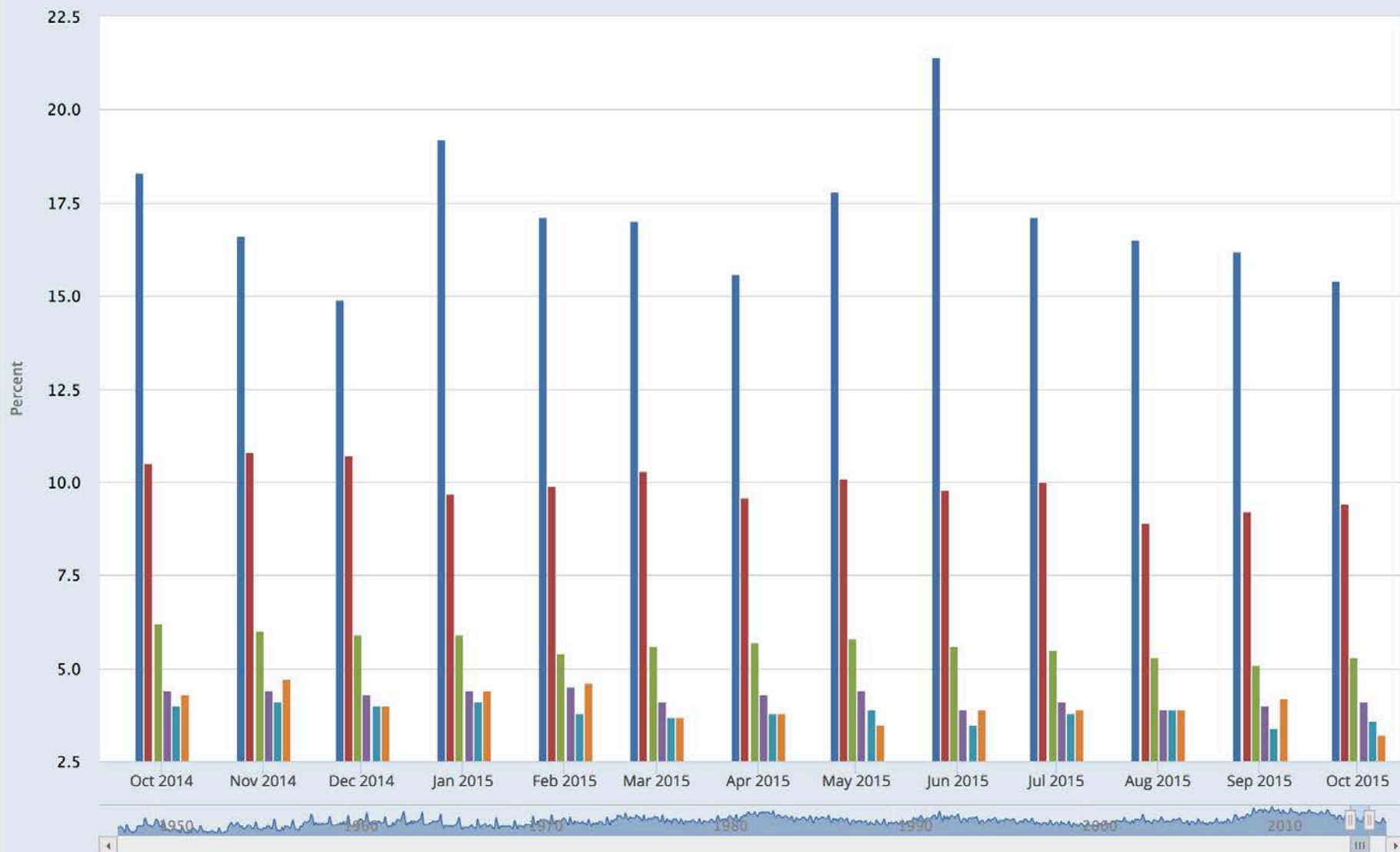
- Unemployment Rate: 20 to 24 years
- Unemployment Rate - Less than a High School Diploma, 20 to 24 years
- Unemployment Rate - High School Graduates, No College, 20 to 24 years
- Unemployment Rate - College Graduates - Bachelor's Degree, 20 to 24 years



Shaded areas indicate US recessions

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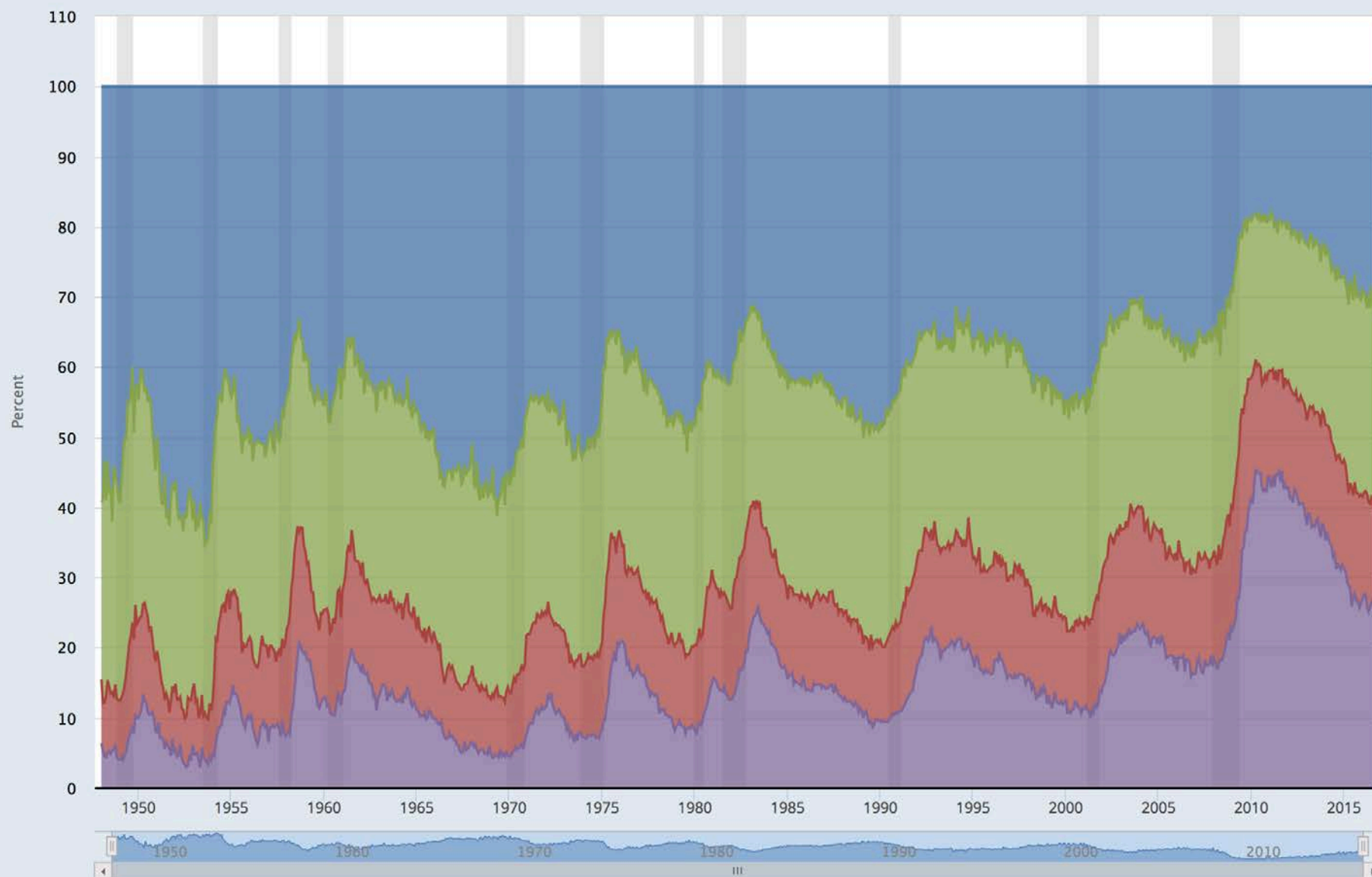
- Unemployment Rate: 16 to 19 years
- Unemployment Rate: 20 to 24 years
- Unemployment Rate: 25 to 34 years
- Unemployment Rate: 35 to 44 years
- Unemployment Rate: 45 to 54 years
- Unemployment Rate: 65 years and over



Shaded areas indicate US recessions

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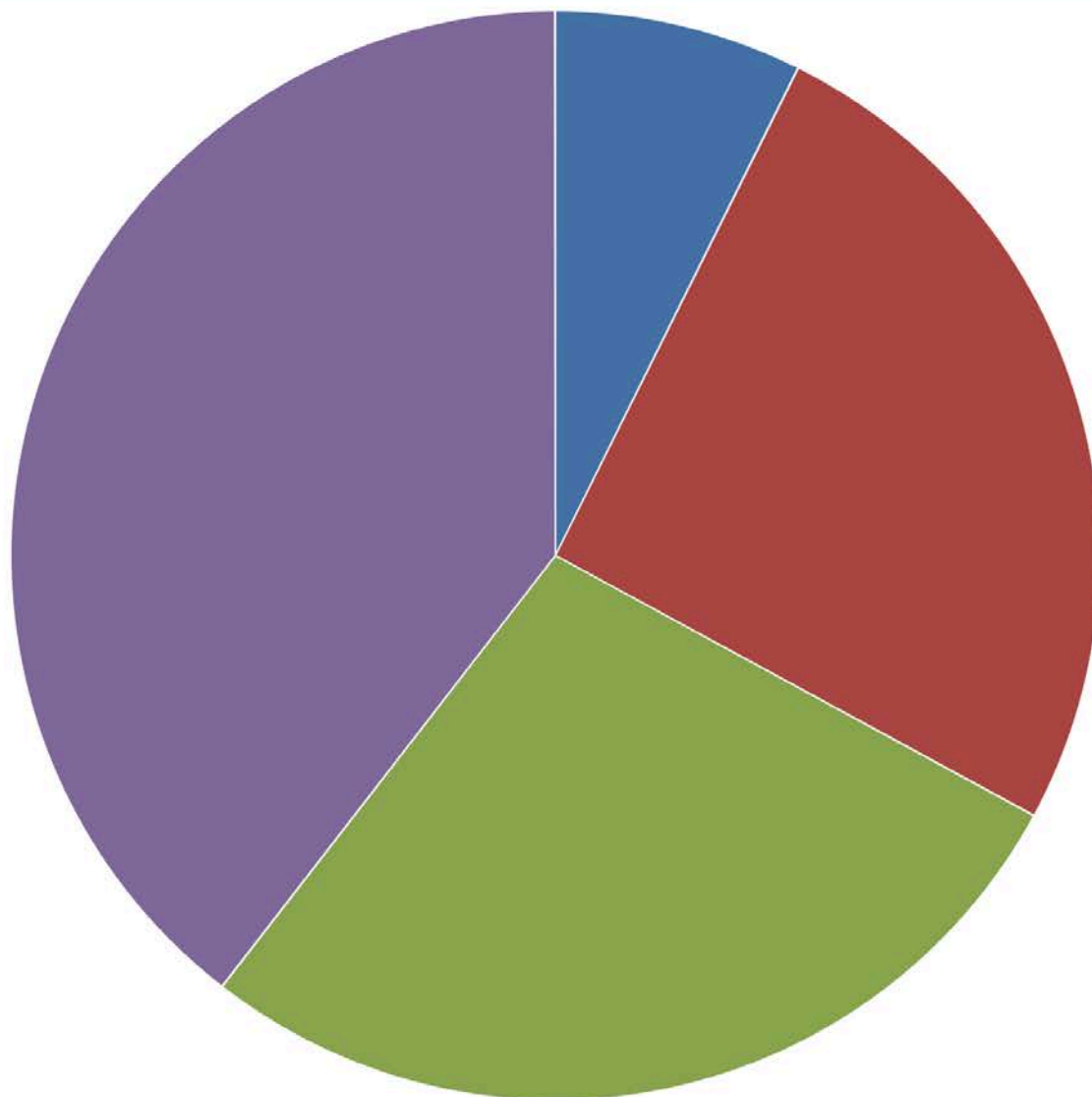
- Of Total Unemployed, Percent Unemployed Less than 5 Weeks
- Of Total Unemployed, Percent Unemployed 5 to 14 Weeks
- Of Total Unemployed, Percent Unemployed 15 to 26 Weeks
- Of Total Unemployed, Percent Unemployed 27 Weeks and over



Shaded areas indicate US recessions

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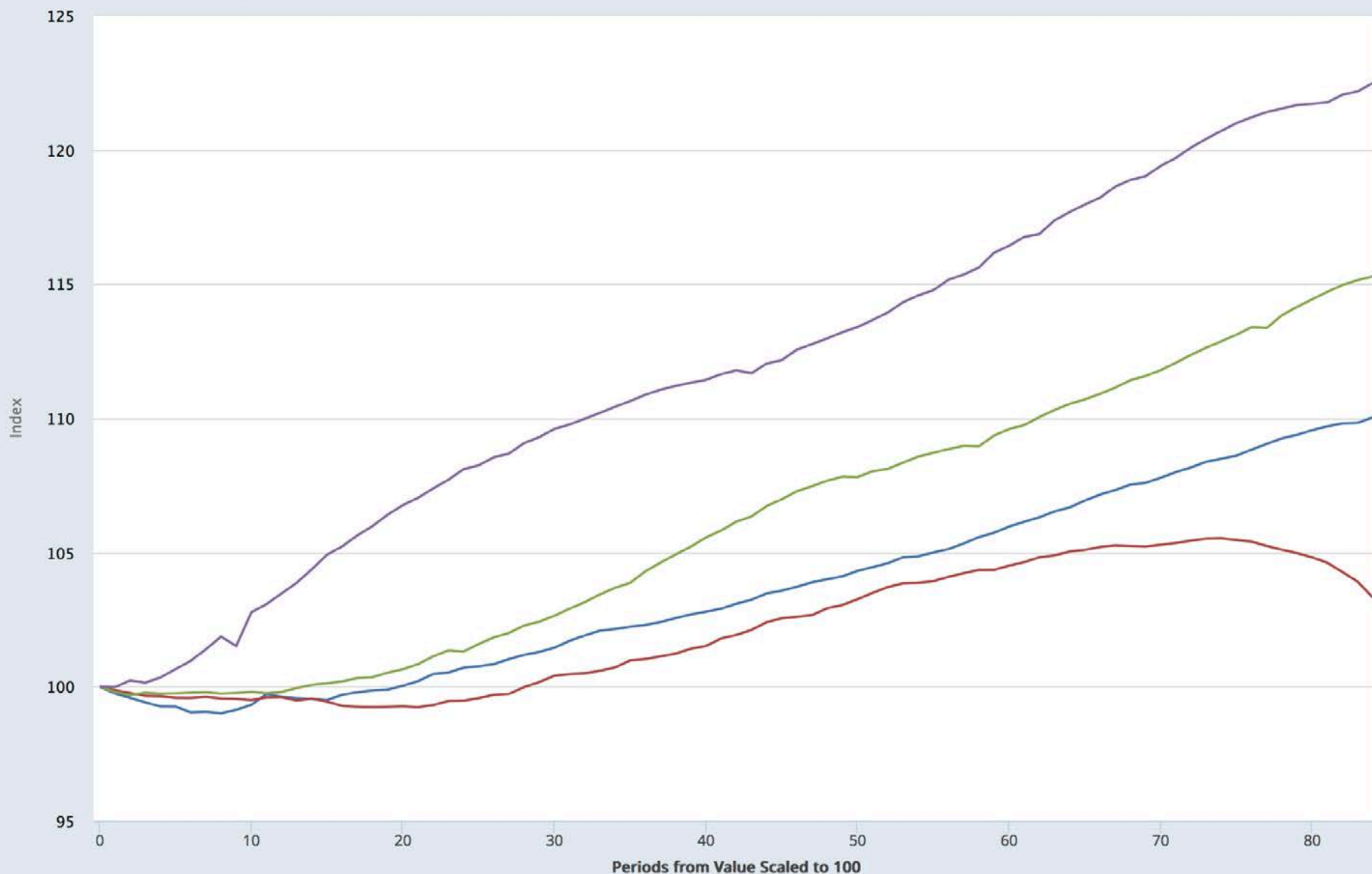
- Employment Level: Less than a High School Diploma, 25 years and over
- Employment Level: High School Graduates, No College, 25 years and over
- Employment Level: Some College or Associate Degree, 25 years and over
- Employment Level: Bachelor's Degree and Higher, 25 years and over



May 2016

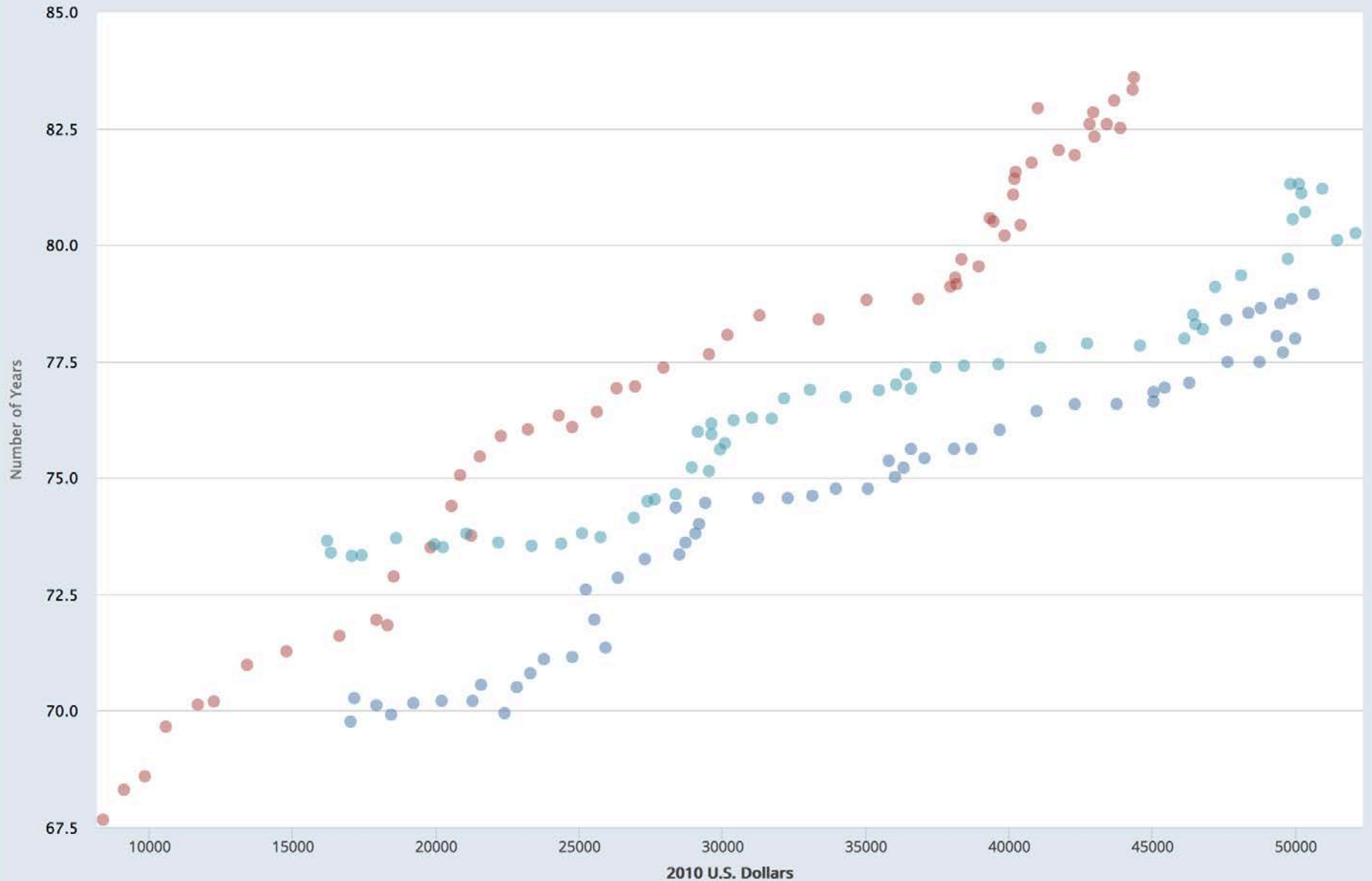
2016 fred.stlouisfed.org

- All Employees: Total Nonfarm Payrolls, Jun 2009=100
- All Employees: Total Nonfarm Payrolls, Nov 2001=100
- All Employees: Total Nonfarm Payrolls, Mar 1991=100
- All Employees: Total Nonfarm Payrolls, Nov 1982=100

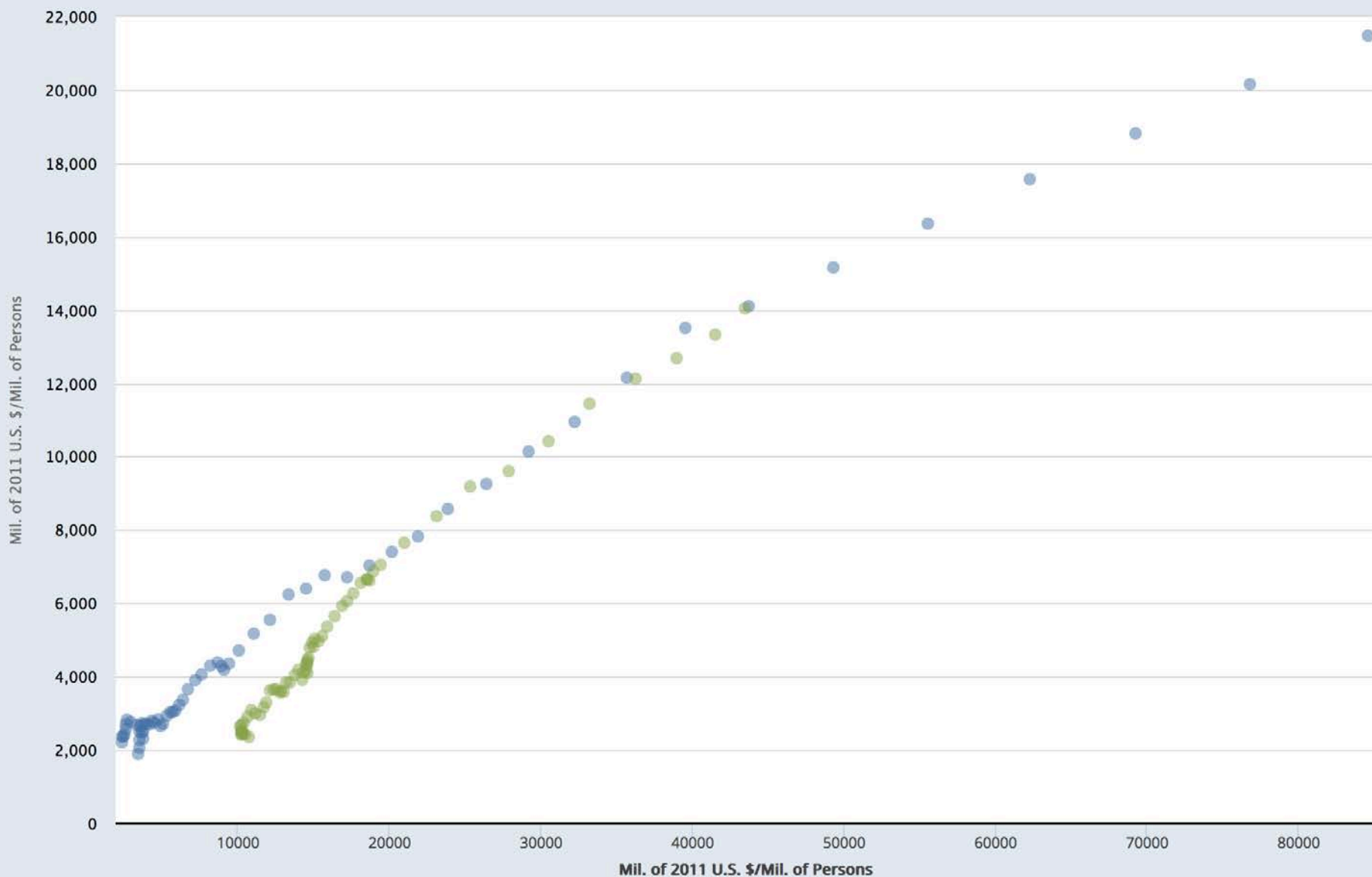


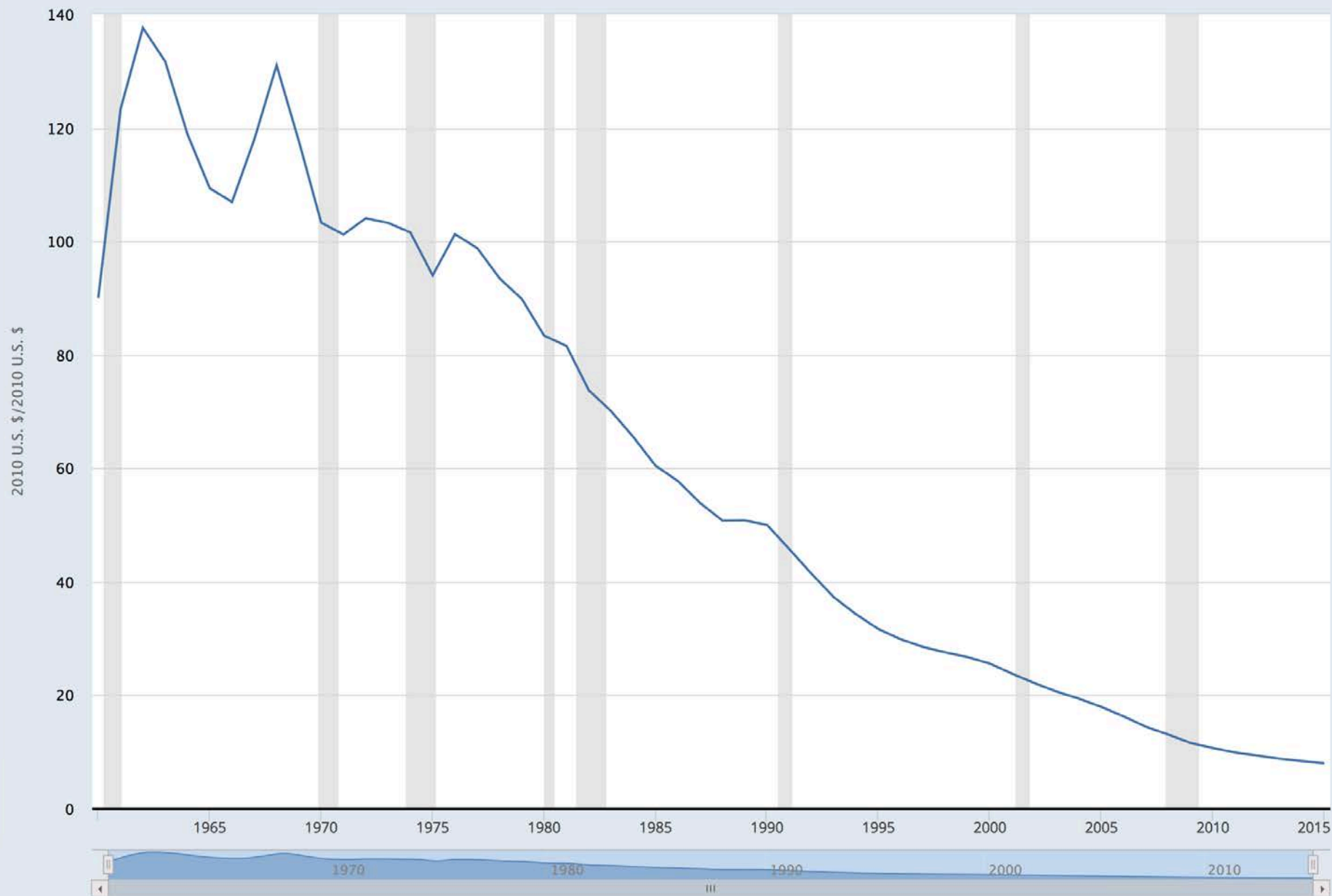
Economic Growth

- Life Expectancy at Birth, Total for the United States (left), Constant GDP per capita for the United States (bottom), 1960 2014
- Life Expectancy at Birth, Total for Japan (left), Constant GDP per capita for Japan (bottom), 1960 2014
- Life Expectancy at Birth, Total for the Netherlands (left), Constant GDP per capita for the Netherlands (bottom), 1960 2014



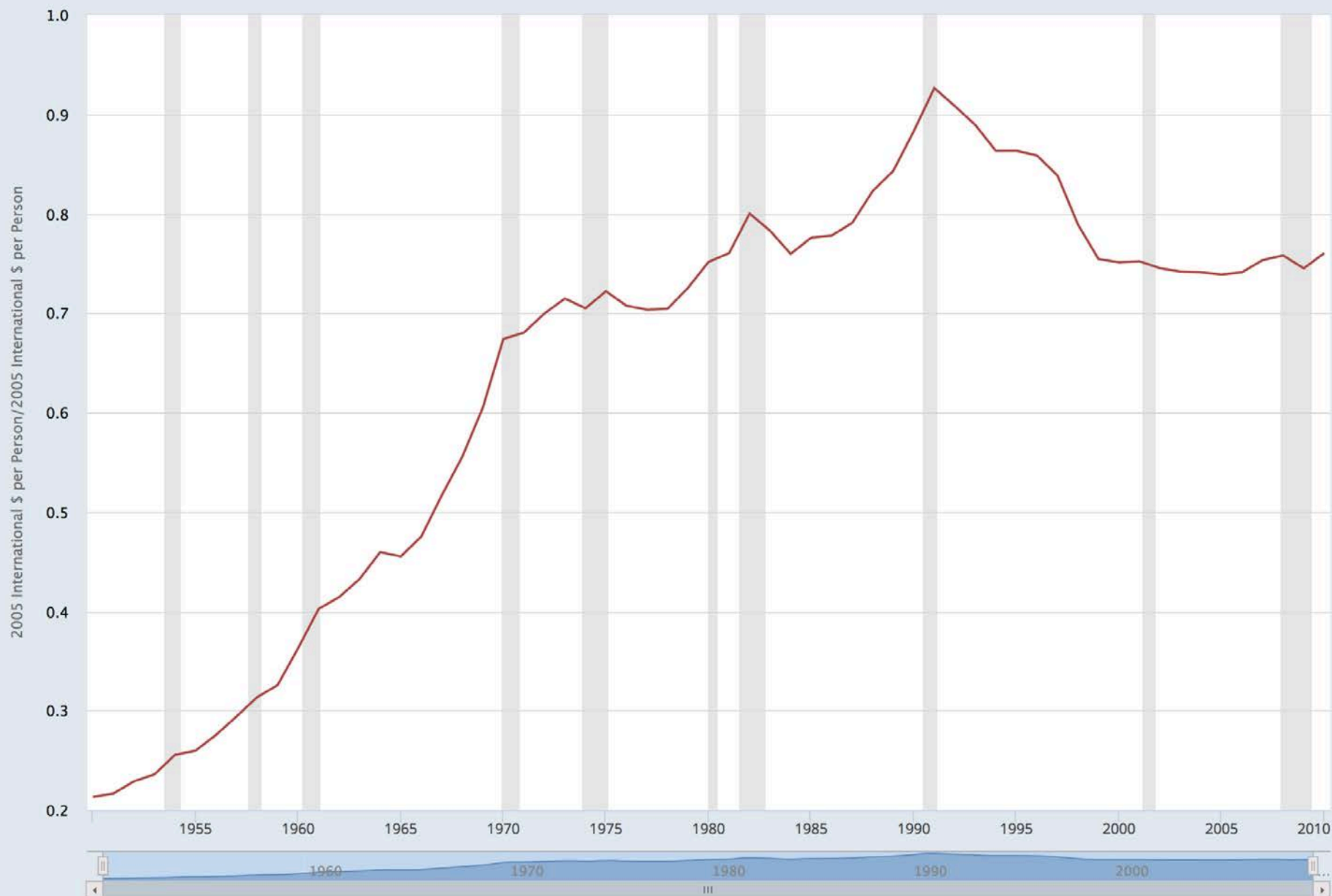
- Real GDP at Constant National Prices for China/Number of Persons Engaged for China (left), Capital Stock at Constant National Prices for China/Number of Persons Engaged for China (bottom), 1952-2014
- Real GDP at Constant National Prices for India/Number of Persons Engaged for India (left), Capital Stock at Constant National Prices for India/Number of Persons Engaged for India (bottom), 1952-2014





Shaded areas indicate US recessions

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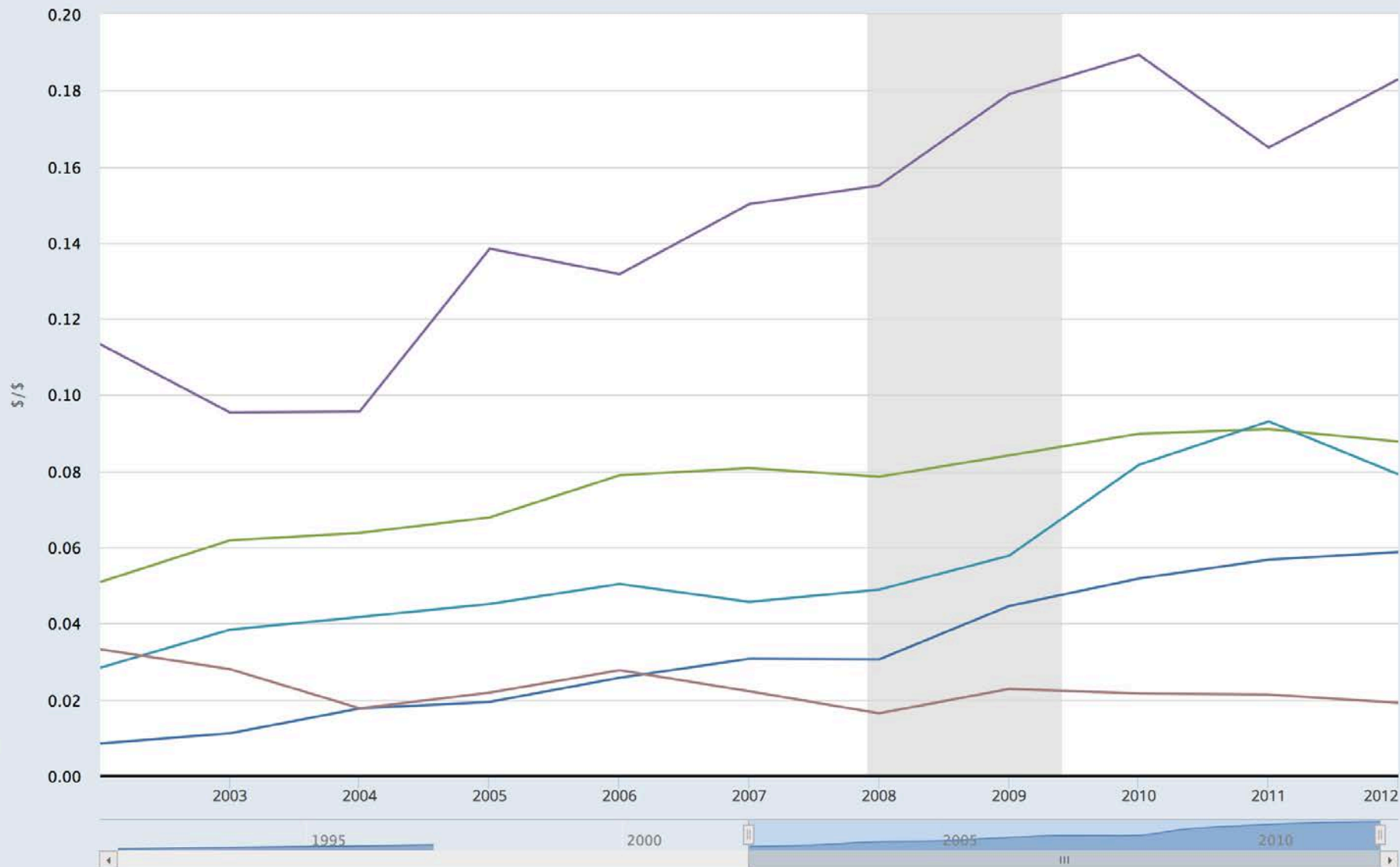


Shaded areas indicate US recessions

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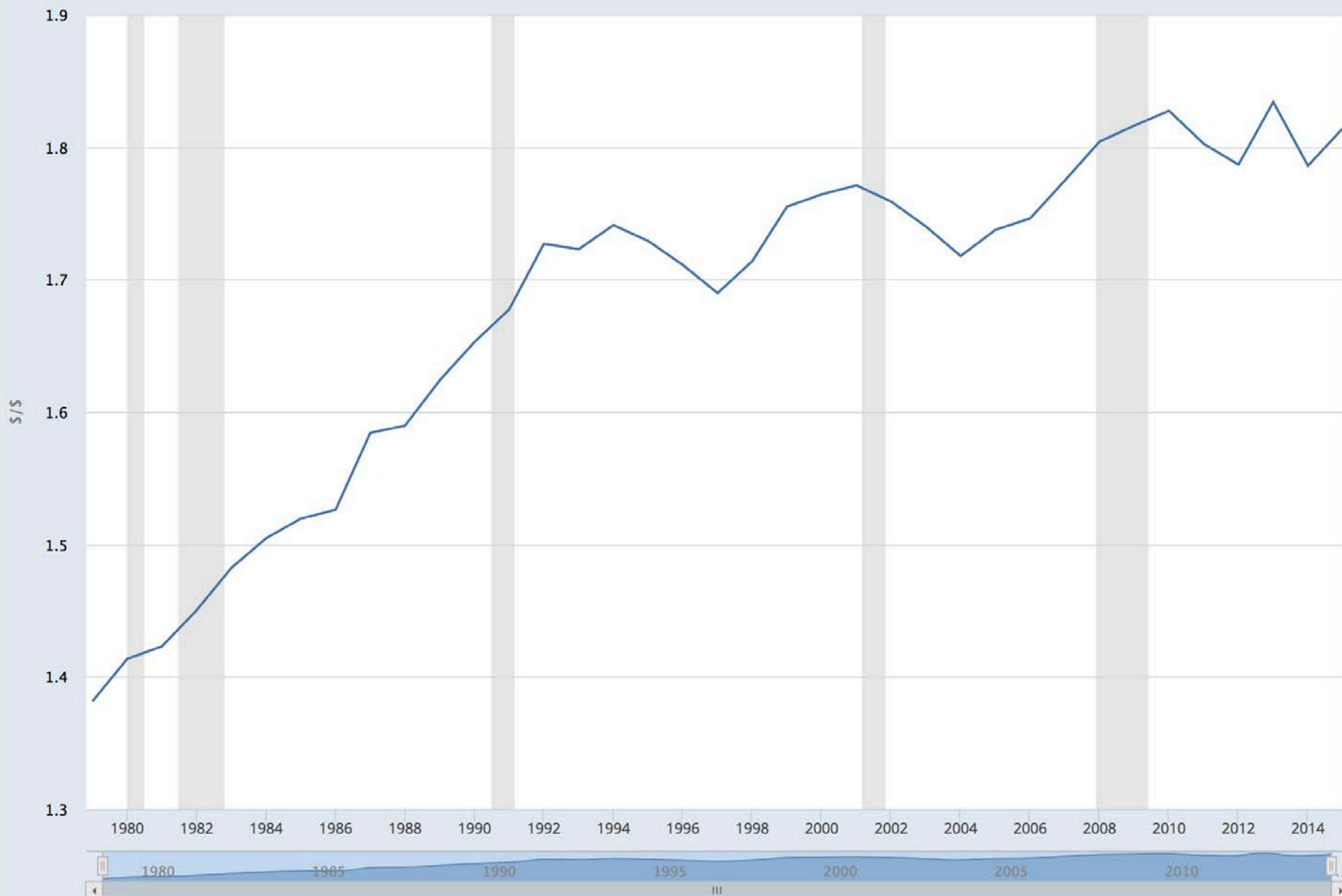
Other Fun Graphs

- Value of Exports to China from Michigan/Value of Exports to All Countries from Michigan
- Value of Exports to China from California/Value of Exports to All Countries from California
- Value of Exports to China from Washington/Value of Exports to All Countries from Washington
- Value of Exports to China from Pennsylvania/Value of Exports to All Countries from Pennsylvania
- Value of Exports to China from Florida/Value of Exports to All Countries from Florida



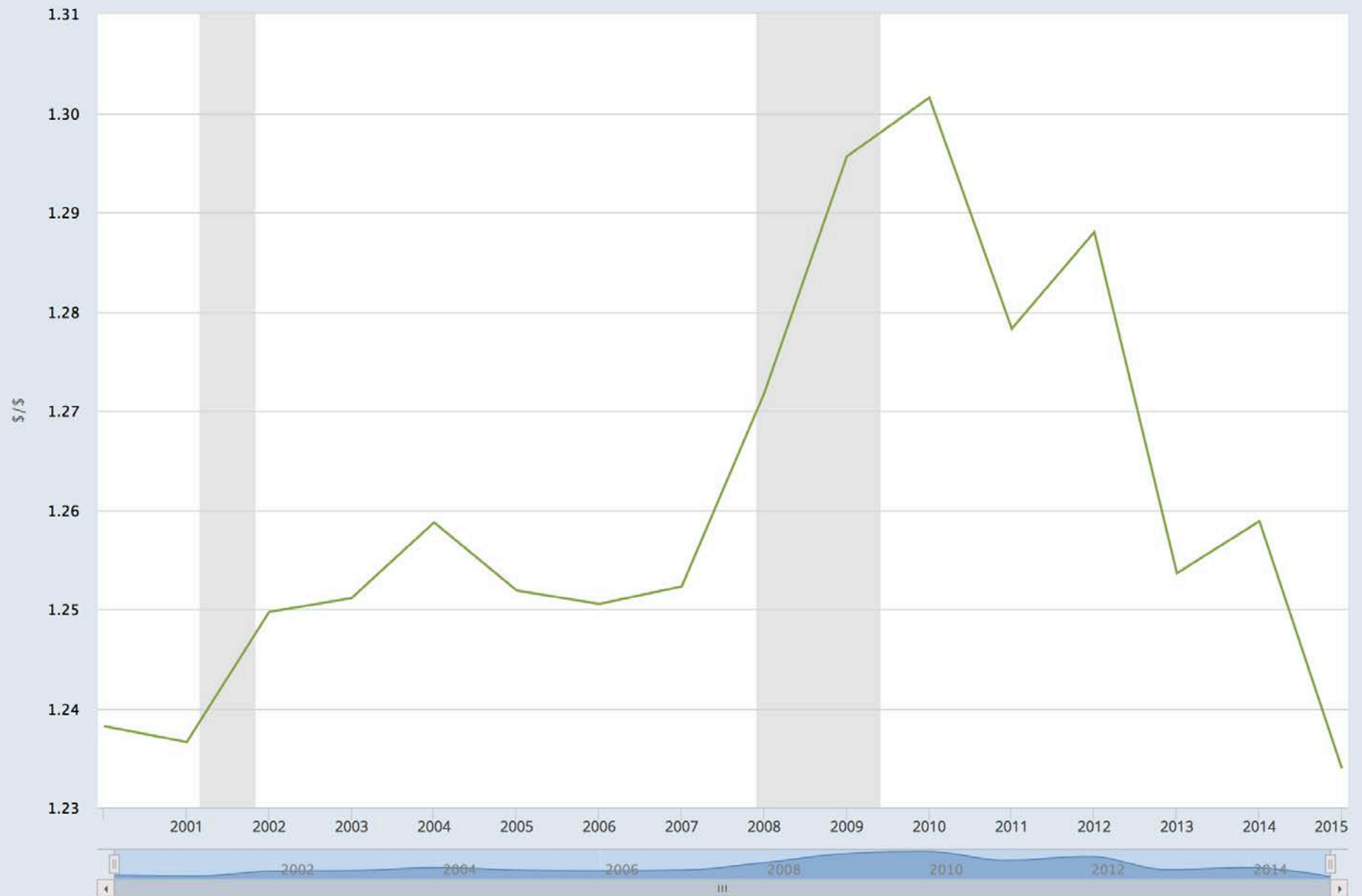
Shaded areas indicate US recessions

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Shaded areas indicate US recessions

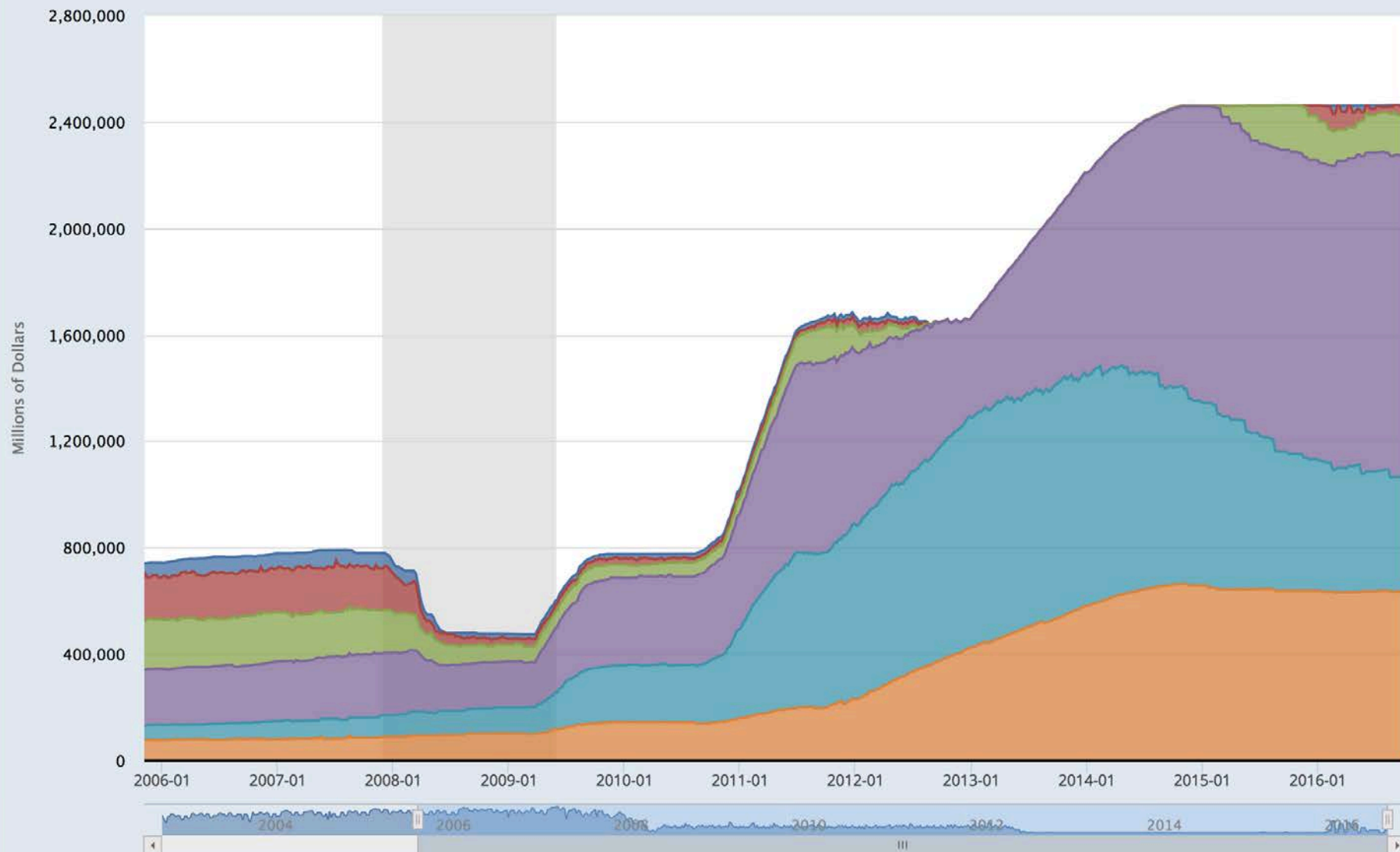
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Shaded areas indicate US recessions

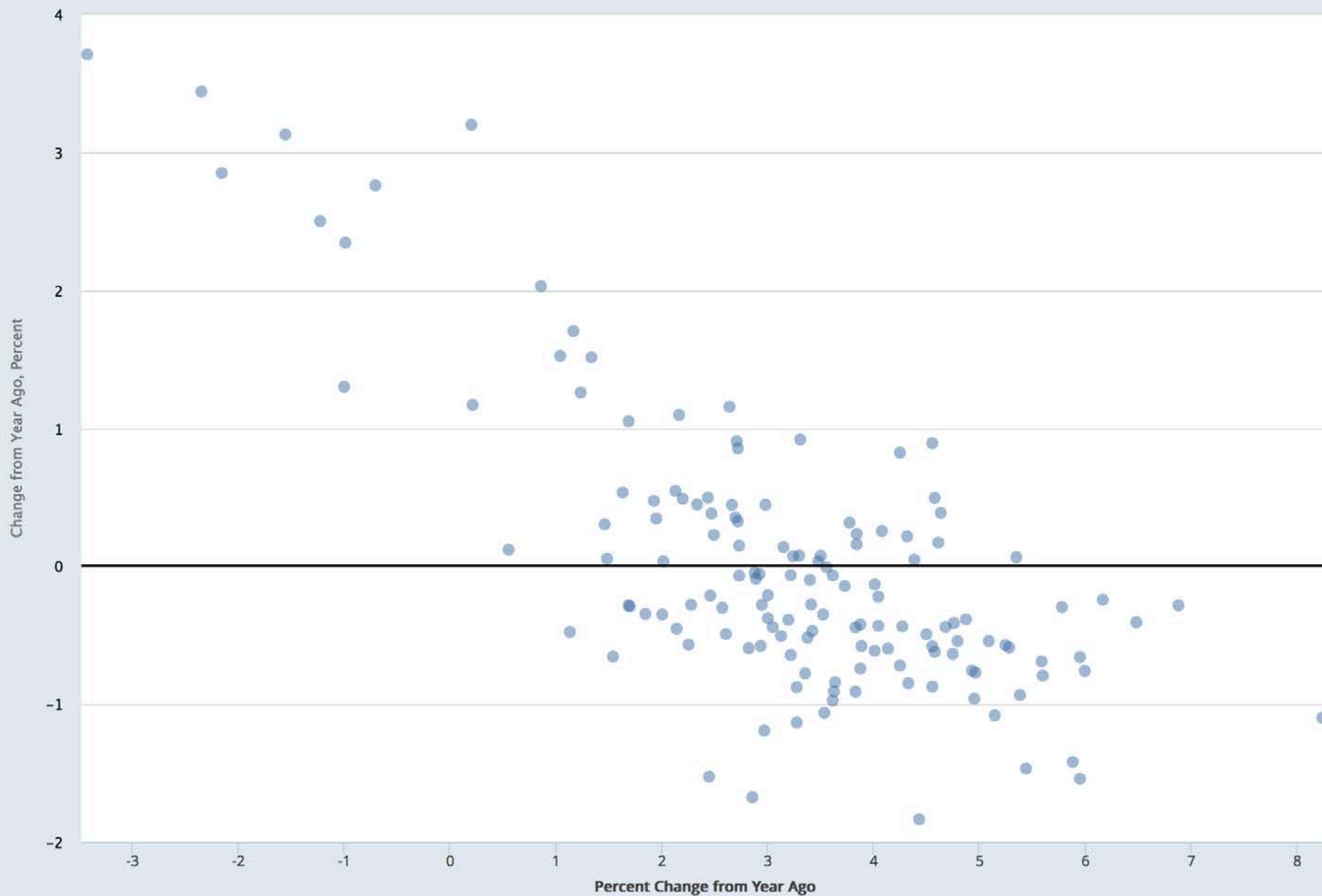
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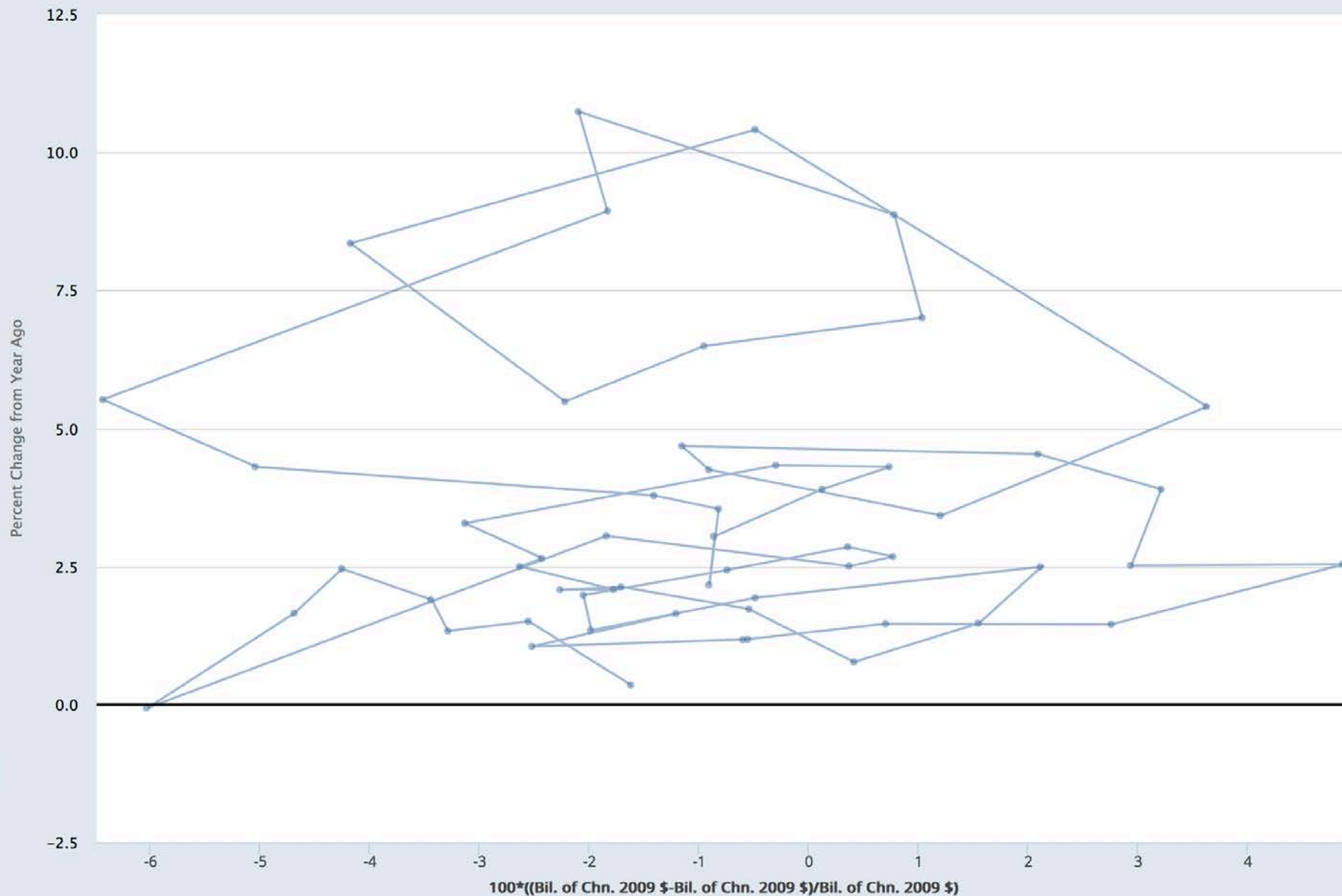
- U.S. Treasury securities held by the Federal Reserve: Maturing within 15 days
- U.S. Treasury securities held by the Federal Reserve: Maturing in 16 days to 90 days
- U.S. Treasury securities held by the Federal Reserve: Maturing in 91 days to 1 year
- U.S. Treasury securities held by the Federal Reserve: Maturing in over 1 year to 5 years
- U.S. Treasury securities held by the Federal Reserve: Maturing in over 5 years to 10 years
- U.S. Treasury securities held by the Federal Reserve: Maturing in over 10 years

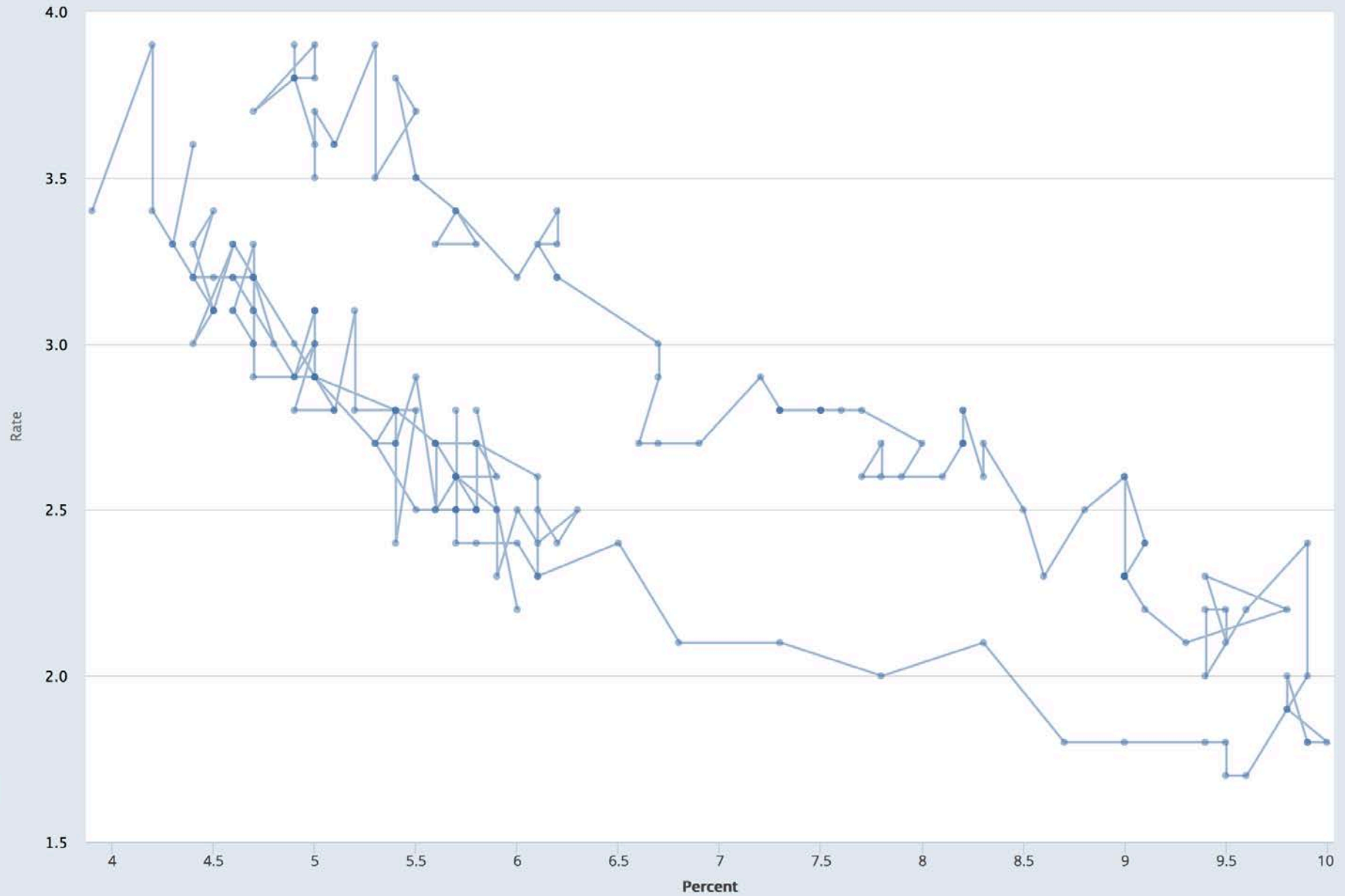


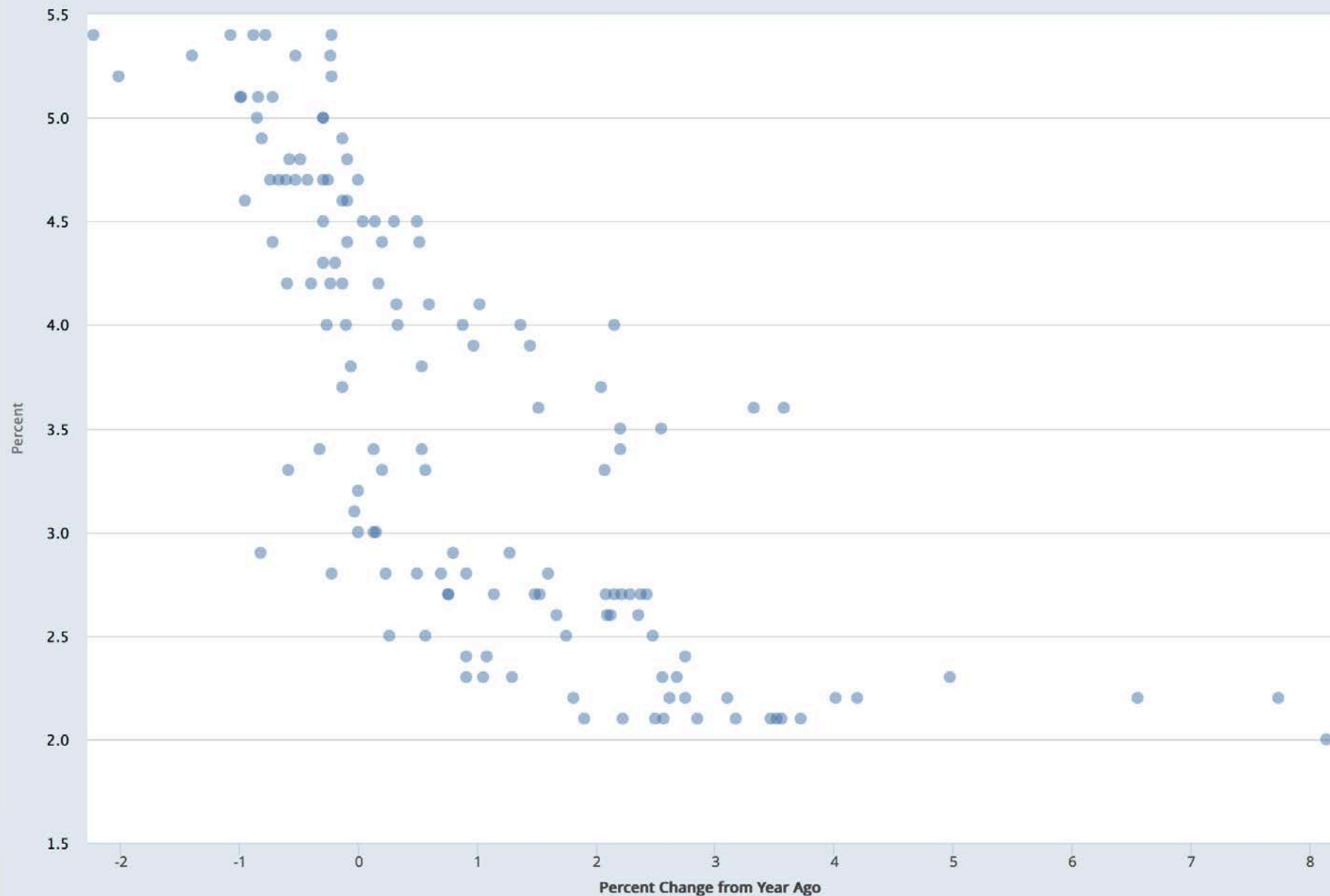
Shaded areas indicate US recessions

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Benefits

Student learning is improved

Students learn the basic principles of data analytics and visualization

Students begin to develop the tools for future research

Fun way of learning



Home



Moments

Search Twitter



Have an account? Log in

**Justin Wolfers**

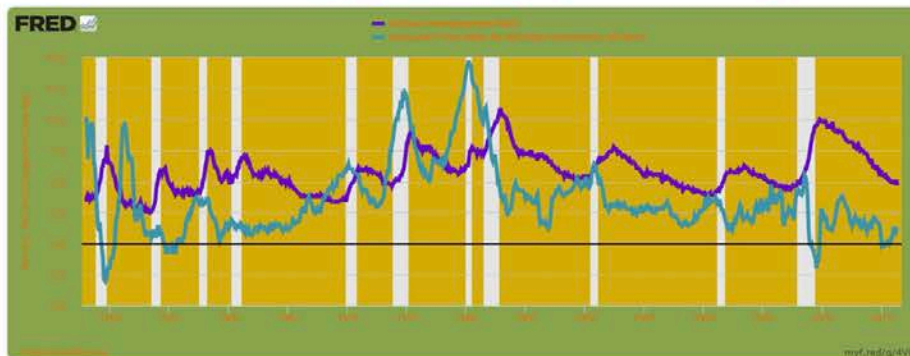
@JustinWolfers

Follow

Here's my attempt to create the ugliest FRED chart ever:

Can you make it uglier?

fred.stlouisfed.org/graph/?graph_i... #UglyChart



RETWEETS

7

LIKES

22



9:02 AM - 23 Jun 2016



7



22

**Matt Phillips** @MatthewPhillips · Jun 23

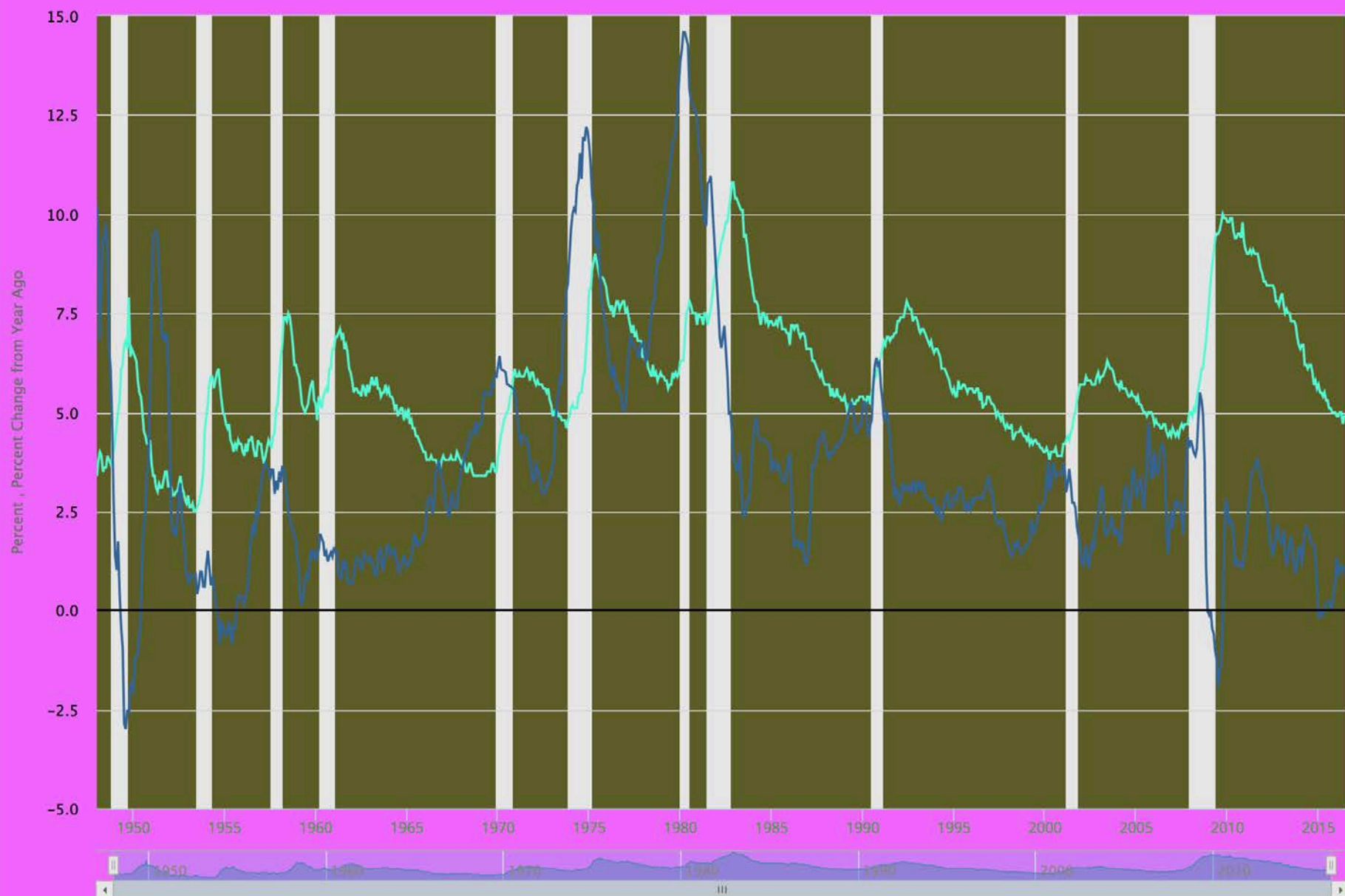
@JustinWolfers You've done it!



1

**Alton BH Worthington** @abhworthington · Jun 23

@JustinWolfers Can you Comic Sans the text?



Shaded areas indicate US recessions

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Engaging Students

- It starts with the faculty member using data in the classroom
- But the learning happens through well developed student assignments.

Data 3 - Inflation

* Required

Name (Last, First) *

Your answer

Email *

Your answer

Student ID *

Your answer

Comparing Prices over Time

The graph below compares the CPI for all items with the CPI for tuition, educational books, and kid's toys. On the FRED homepage under "Browse data by" select category. Under the category "Prices" select "Consumer Price Indexes (CPI and PCE)". Start with the series



Download All Data Save to My Account Share Export as PowerPoint Print Report an issue

Account ▾

Data 3 - Quinn Anderson

Data Assignment 3: Inflation and CPI

Comparing Prices – Anderson

FRED

- Consumer Price Index for All Urban Consumers: All Items, Jan 1999=100
- Consumer Price Index for All Urban Consumers: Admission to movies, theaters, and concerts, Jan 1999=100
- Consumer Price Index for All Urban Consumers: Gasoline (all types), Jan 1999=100
- Consumer Price Index for All Urban Consumers: Communication, Jan 1999=100



fred.stlouisfed.org

myf.red/g/7tr

View on FRED • Download Data

Personal CPI Index – Anderson

FRED

- Consumer Price Index for All Urban Consumers: Rent of primary residence, H1 1998=100*0.5 + Consumer Price Index for All Urban Consumers: Alcoholic beverages, H1 1998=100*0.05 + Consumer Price Index for All Urban Consumers: Recreational books, H1 1998=100*0.05 + Consumer Price Index for All Urban Consumers: Gasoline (all types), H1 1998=100*0.15 + Consumer Price Index for All Urban Consumers: Food, H1 1998=100*0.25 + Consumer Price Index for All Urban Consumers: All Items, Jan 1998=100



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myf.red/g/7rts

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Personal Inflation Rate – Anderson

FRED

- Consumer Price Index for All Urban Consumers: Rent of primary residence, H1 1998=100*0.5 + Consumer Price Index for All Urban Consumers: Alcoholic beverages, H1 1998=100*0.05 + Consumer Price Index for All Urban Consumers: Recreational books, H1 1998=100*0.05 + Consumer Price Index for All Urban Consumers: Gasoline (all types), H1 1998=100*0.15 + Consumer Price Index for All Urban Consumers: Food, H1 1998=100*0.25 + Consumer Price Index for All Urban Consumers: All Items, Jan 1998=100

Inflation Across Countries – Anderson

FRED

- Inflation, consumer prices for Italy
- Inflation, consumer prices for Germany
- Inflation, consumer prices for France

7

6

Data Assignment 4 - Bond Market

* Required

Name (Last, First) *

Your answer

Student ID *

Your answer

Email *

Your answer

Comparing Financial Stress and Interest Rates

The Federal Reserve Bank of St. Louis publishes a weekly index of financial stress (FRED code: STLFSI) that summarizes strains in financial markets, including liquidity problems. For the period beginning in 1994, plot this index and, as a second line, the difference between the 3-month Treasury bill (FRED code: TB3MR) and the 10-year Treasury note (FRED code: T10Y).

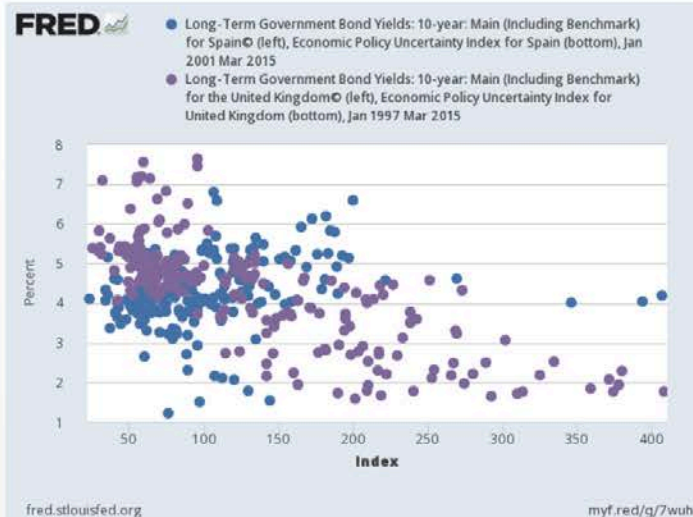


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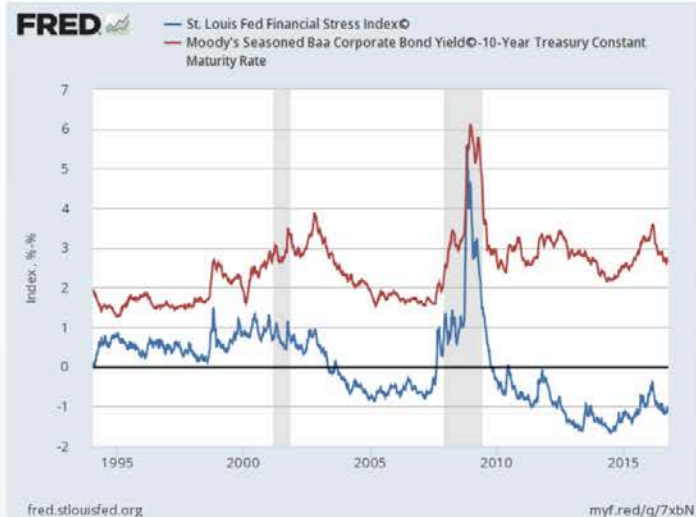
Data Assignment 4-Fall 2016 Zalesky

Economic Uncertainty Spain versus UK



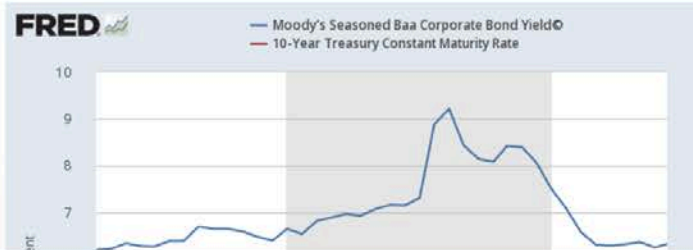
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Financial Stress and Interest Rates

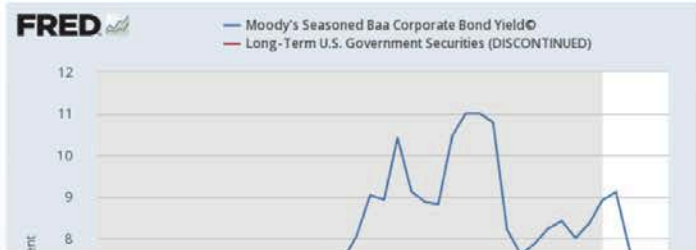


View on FRED • Download Data

Great Recession Spread



Great Depression Spread



Presentation

- Until recently most presentation software were unable to show iframes
 - You can embed FRED graphs in webpages
 - During presentations you were forced to use static, PNG image files.
- Liveslides and Web Viewer allow you to embed iframes.
 - Liveslides is free from Poll Everywhere and more robust
 - Web Viewer is free through the Microsoft store

Wish List

- The ability to add a graph to a dashboard from the graph page
- More data
 - Historical data – Maddison
- Identifying a single point in a scatter plot
- Create custom title and axis labels

Conclusion

- Macroeconomics is evolving, we need to evolving in our teachings.
- FRED provides an easy, user friendly interface to help students learn macroeconomics and data analytics and visualization
- Can be used as a springboard for learning other statistical packages (Excel, R, Stata)