

Presentation

By

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To

Texas Municipal Retirement System

May 25, 2018

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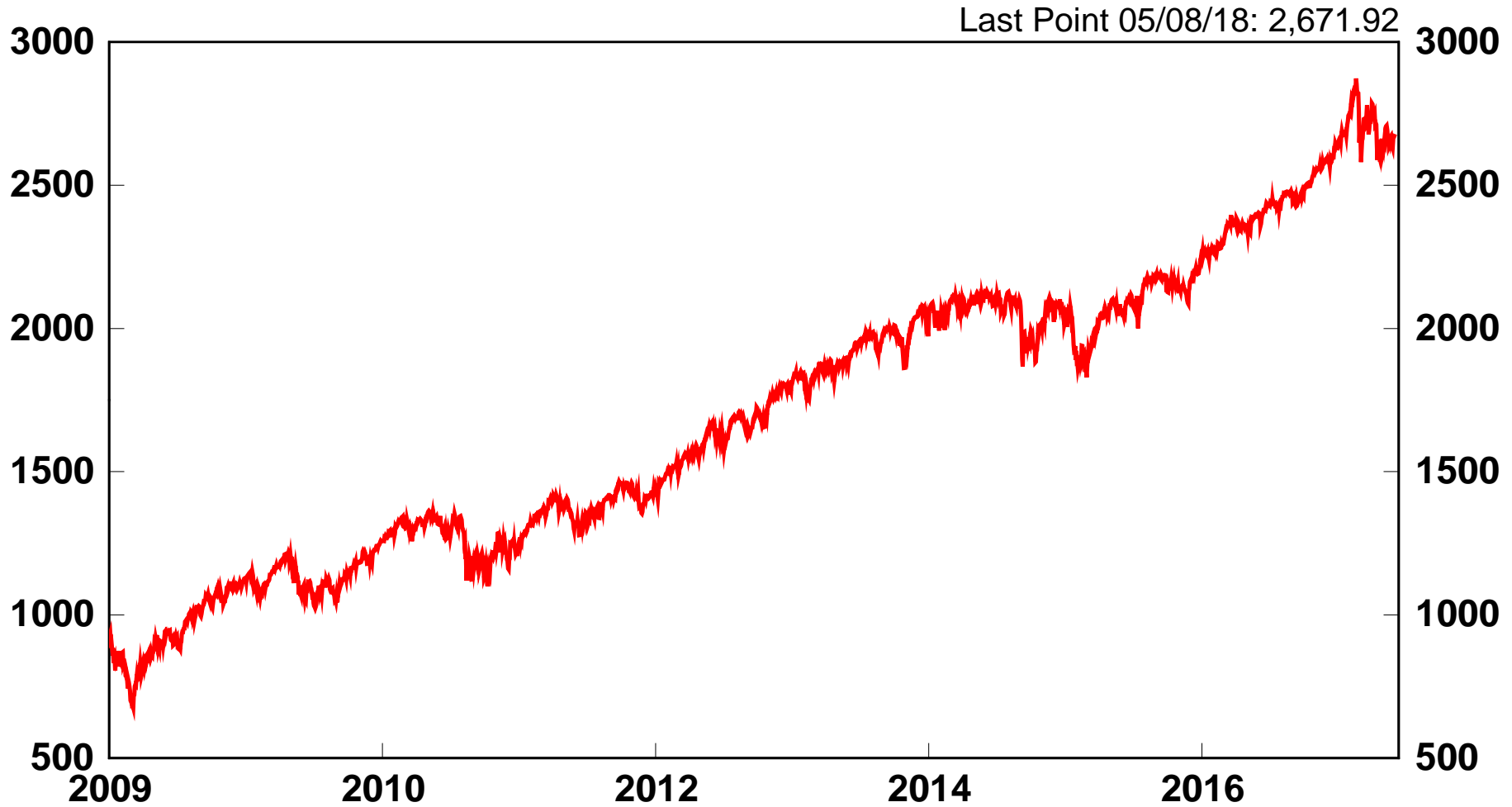
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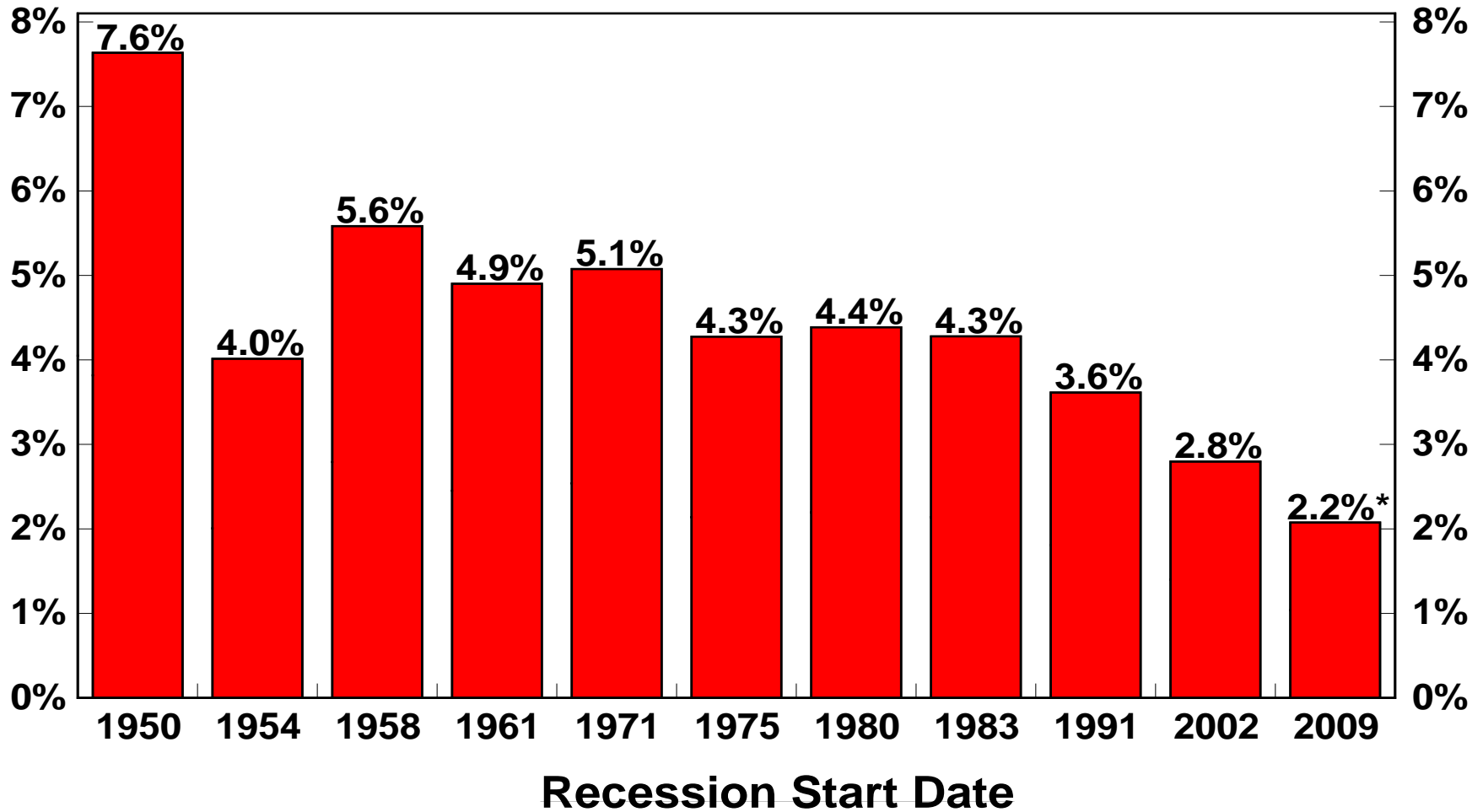
Chart 2

S&P 500 Index



Source: Thomson Reuters

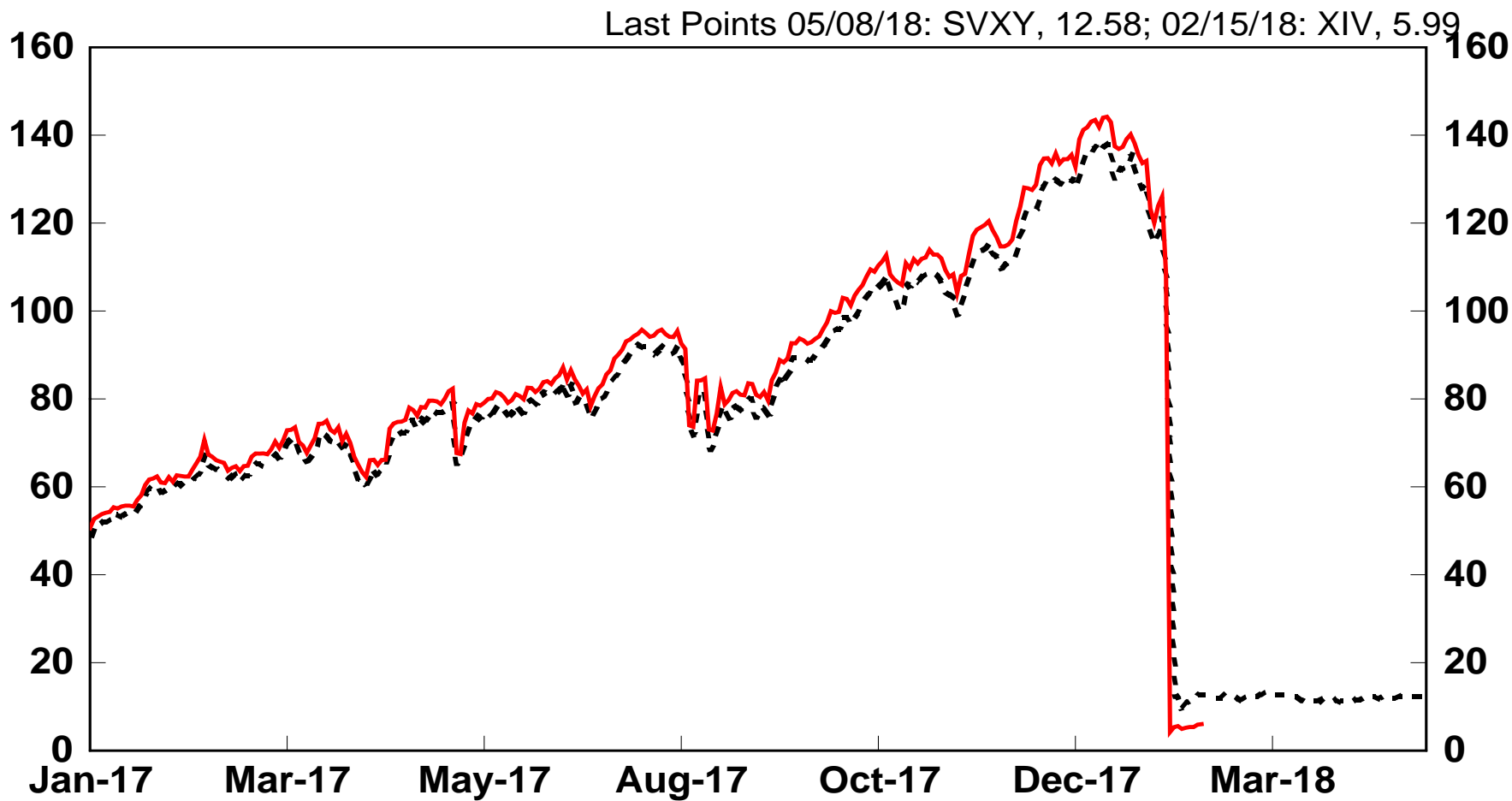
Chart 3
Real GDP Growth During Expansions
annualized rates of expansion from NBER trough-to-peak



*Through 1Q 2018
Source: BEA; NBER

Chart 4

Inverse Volatility Exchange Traded Products



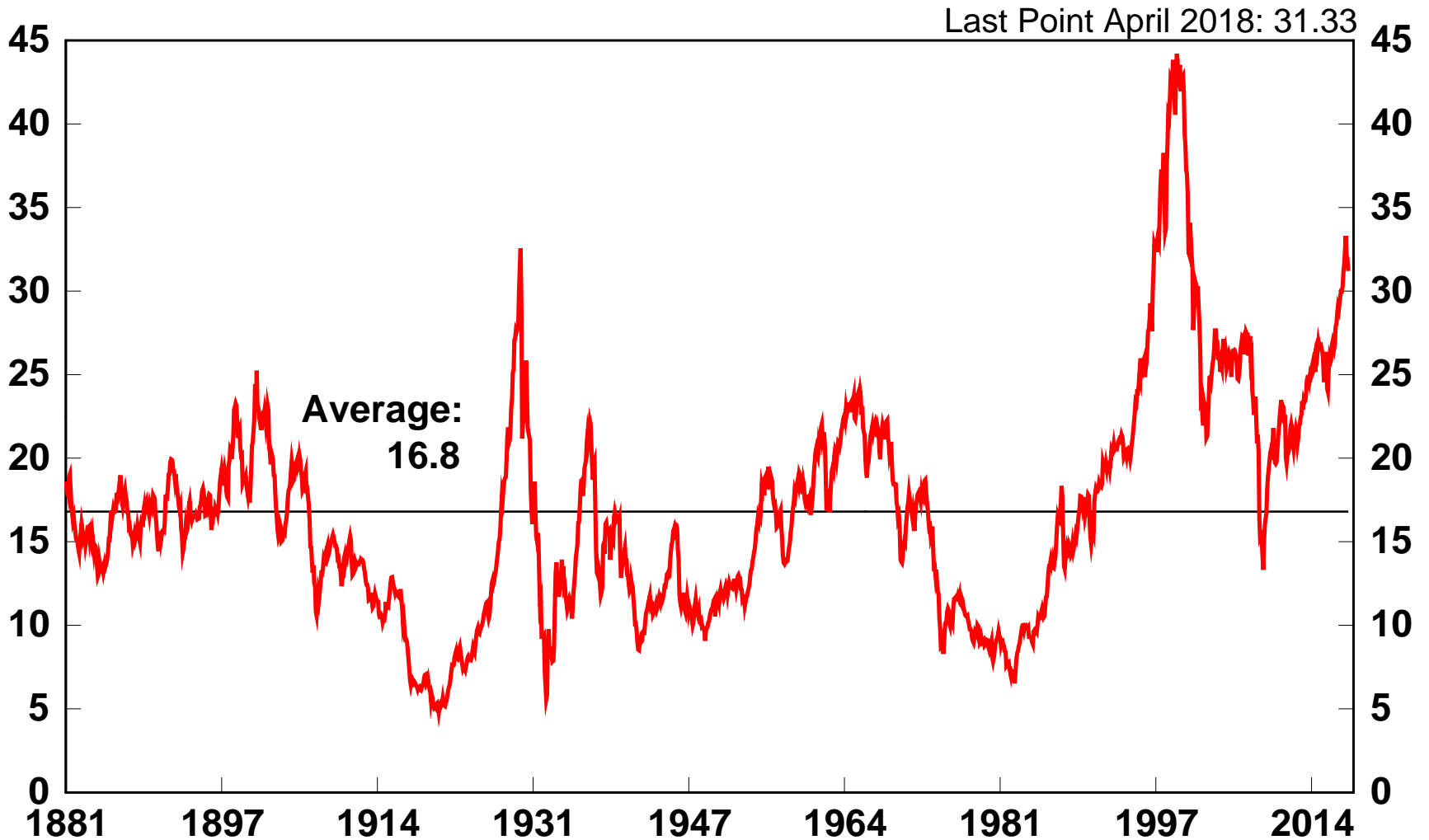
— VelocityShares Daily Inverse VIX Short-Term ETN (XIV)
- - - ProShares Short VIX Short-Term Futures ETF (SVXY)

Source: Bloomberg

Chart 5

Cyclically Adjusted Stock Price to Earnings Ratio

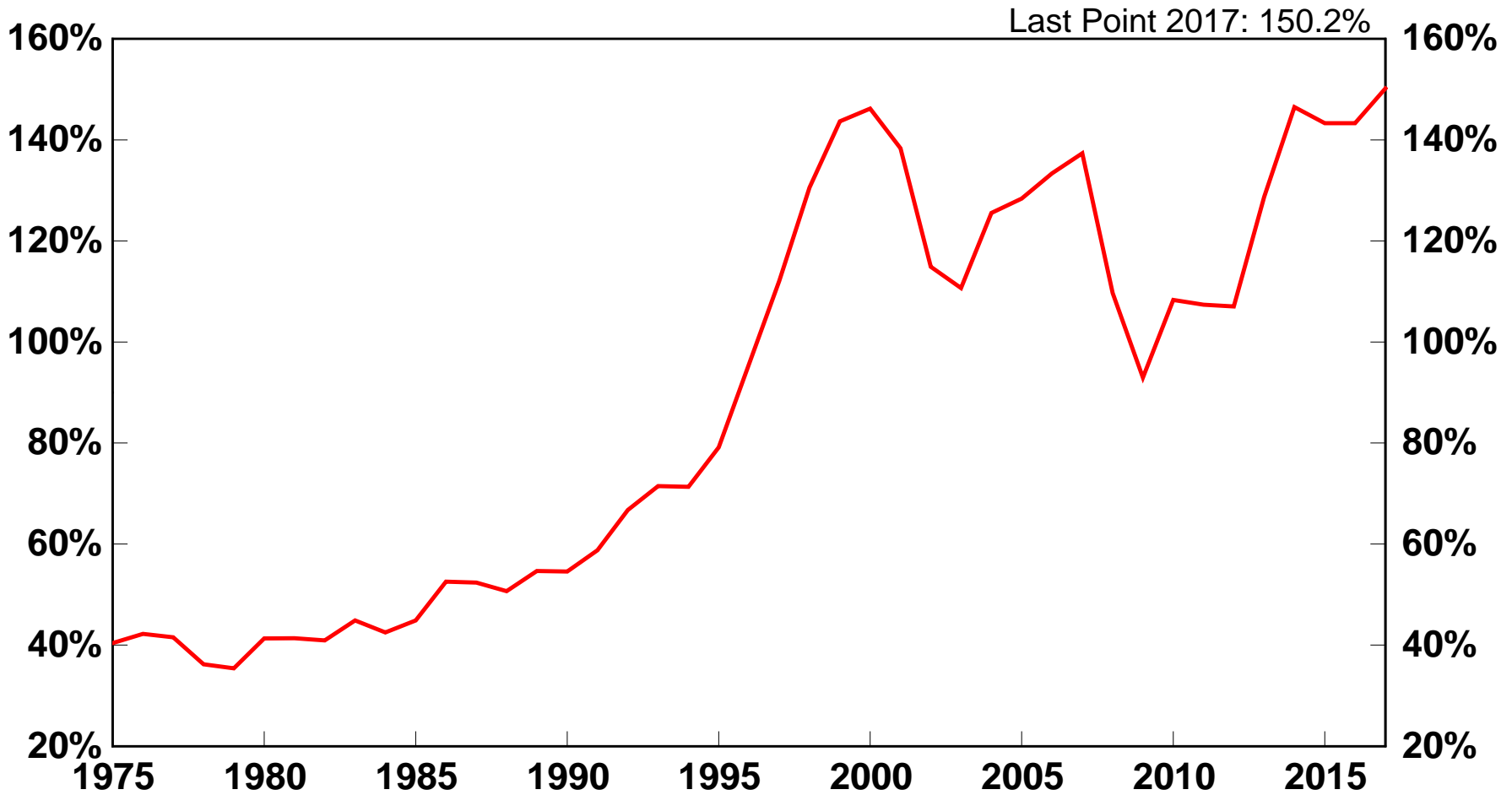
S&P 500 price / avg. earnings from previous 10 years



Source: Robert Shiller

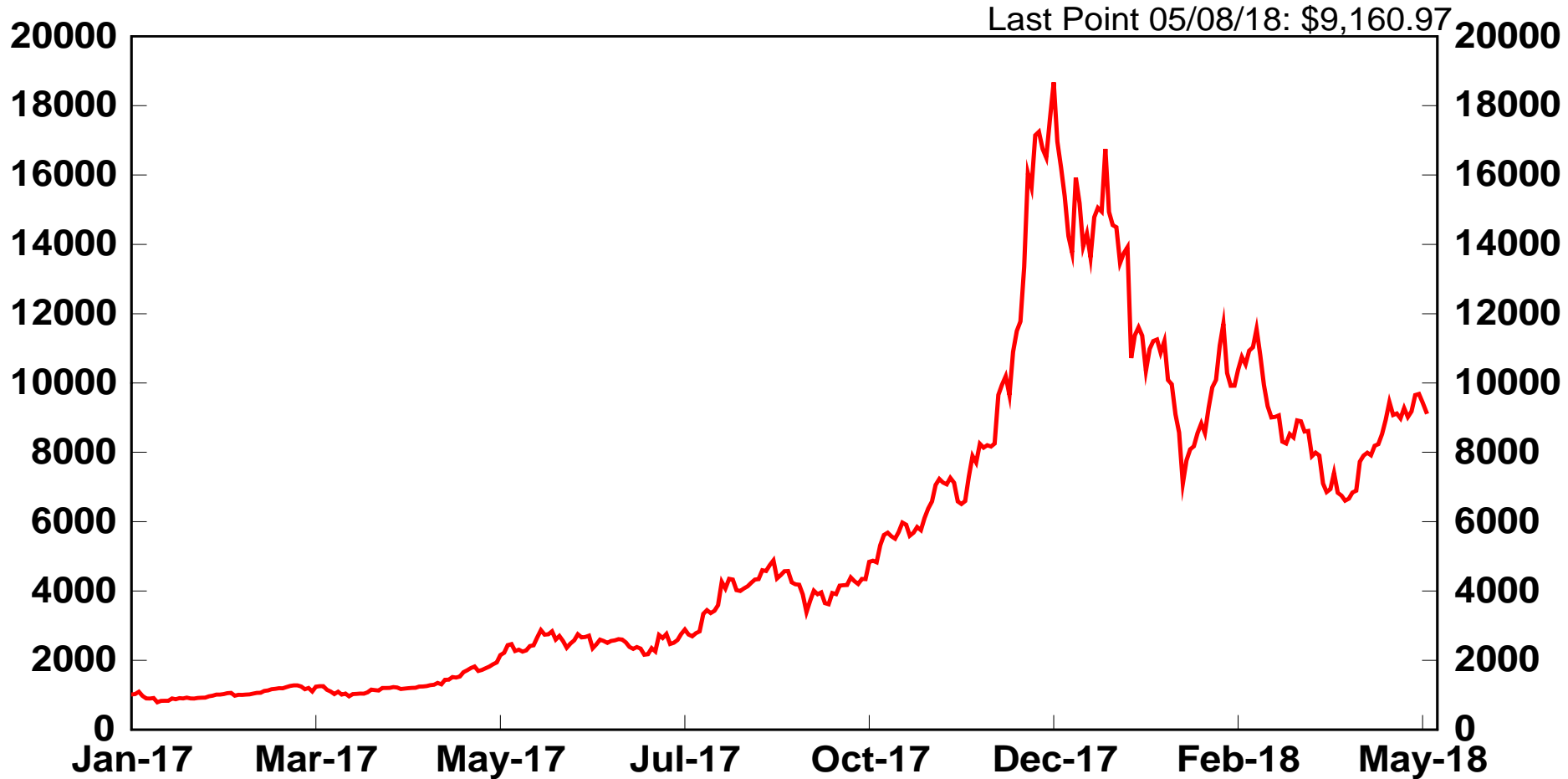
Chart 6

United States Stock Market Capitalization as percent of GDP



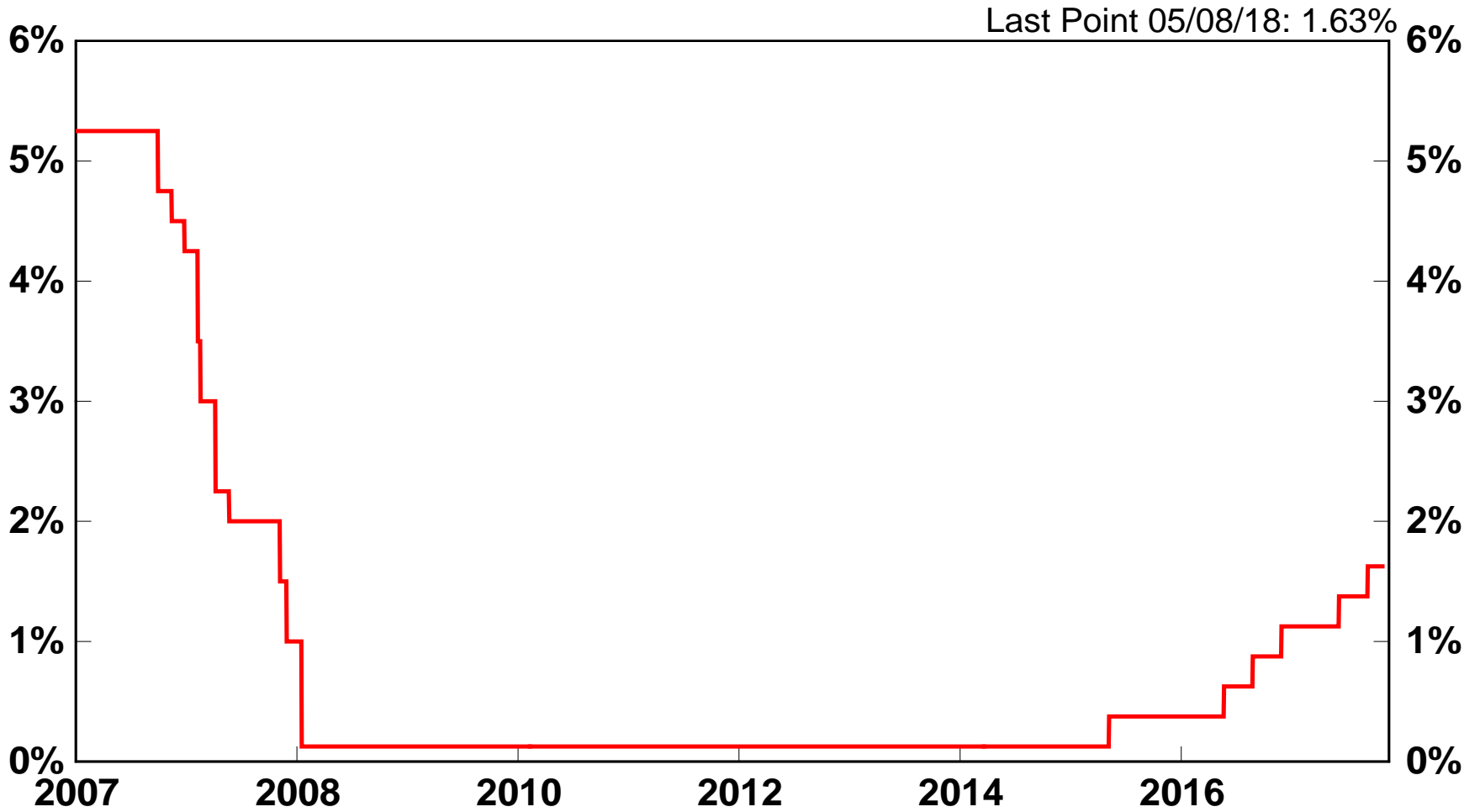
Source: The World Bank;
Bloomberg

Chart 7 Bitcoin USD per Bitcoin



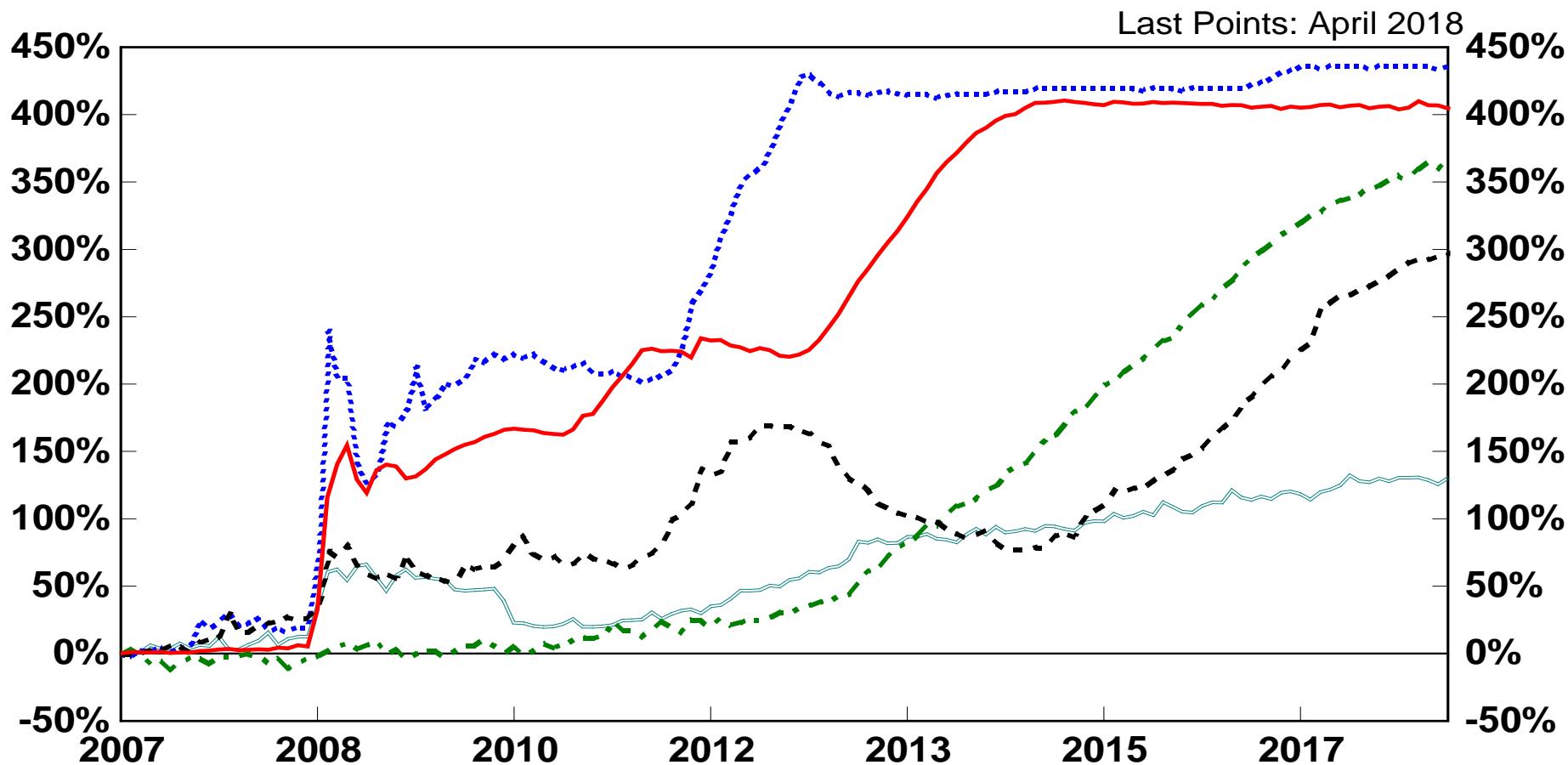
Source: Bloomberg

Chart 8 Federal Funds Target Rate midpoint of range



Source: Federal Reserve

Chart 9 Central Bank Assets change since January 2007

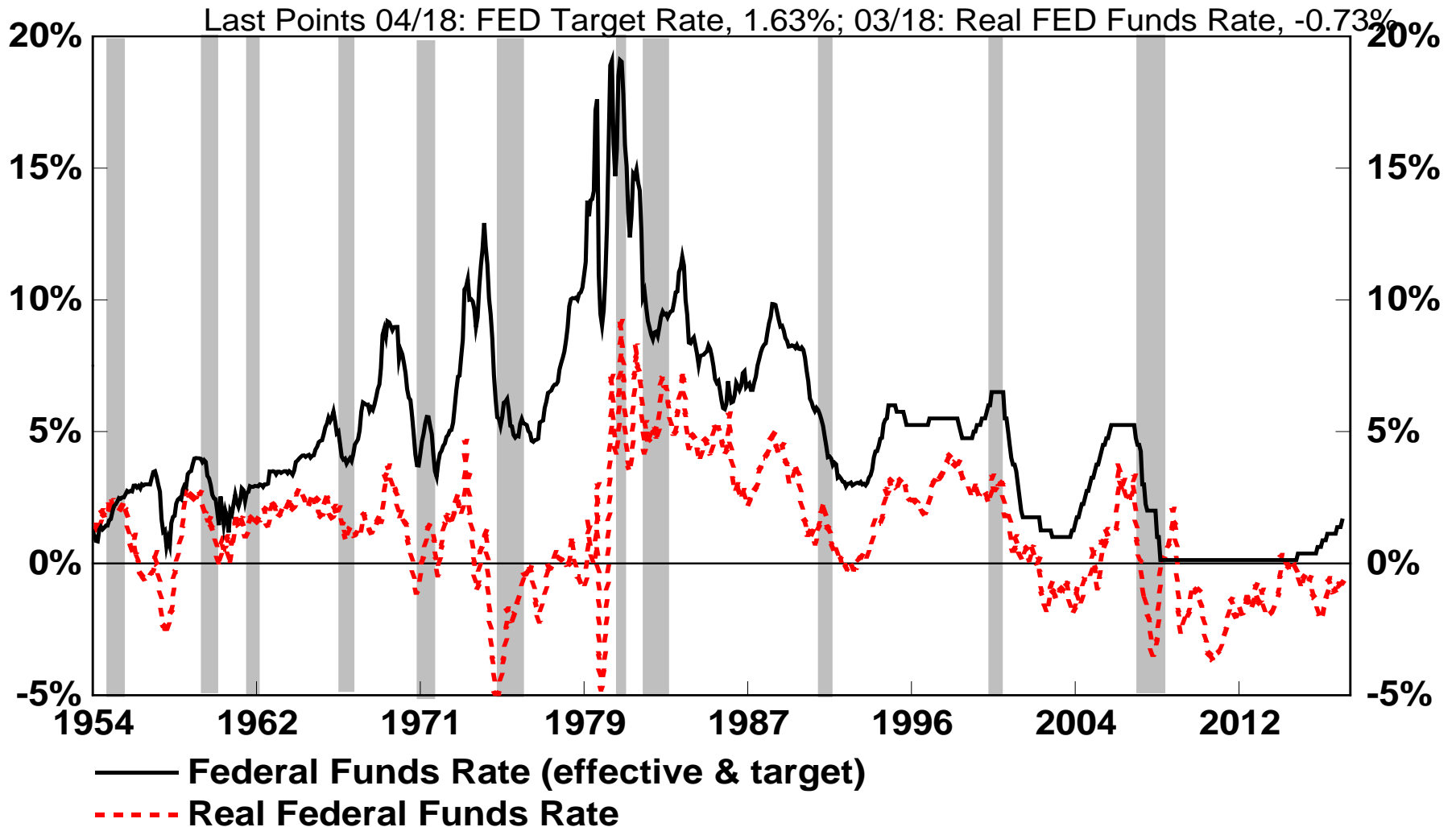


- **Federal Reserve**
- - - **European Central Bank**
- ⋯ **Bank of England**
- · - · **Bank of Japan**
- **Bank of Canada**

Note: Growth in Gilt purchases used after Q3 2014 for BOE due to lack of data.

Source: Bloomberg; The Central Banks

Chart 10 Federal Funds Rates



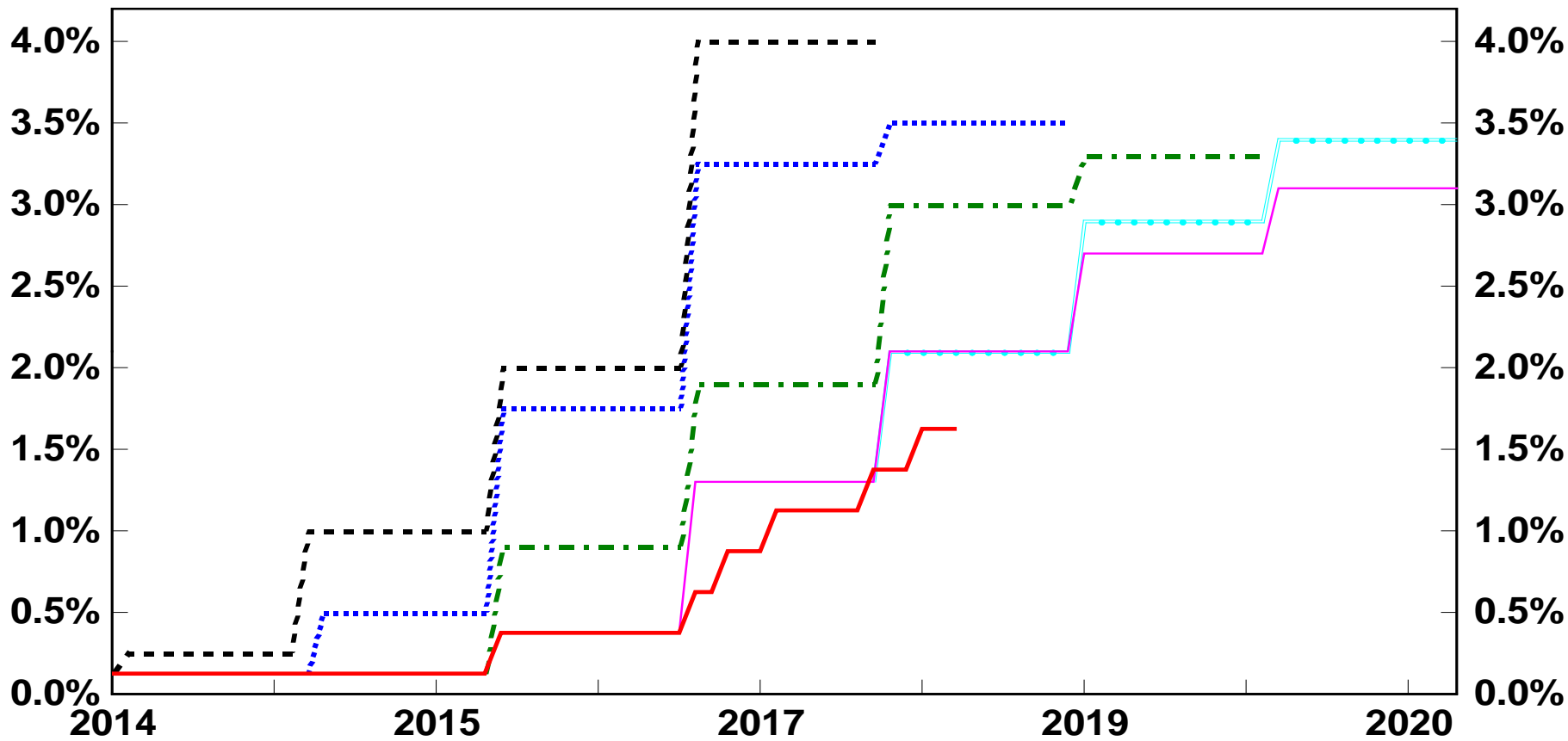
Note: FED Target Rate (midpoint) used after 1995 reflecting FED's change to monetary policy announcement after FOMC meeting.

Source: Federal Reserve;
Bureau of Labor Statistics

Chart 11

Historical FOMC FED Funds Rate Projections

midpoint target rate projection at year's end; median of survey

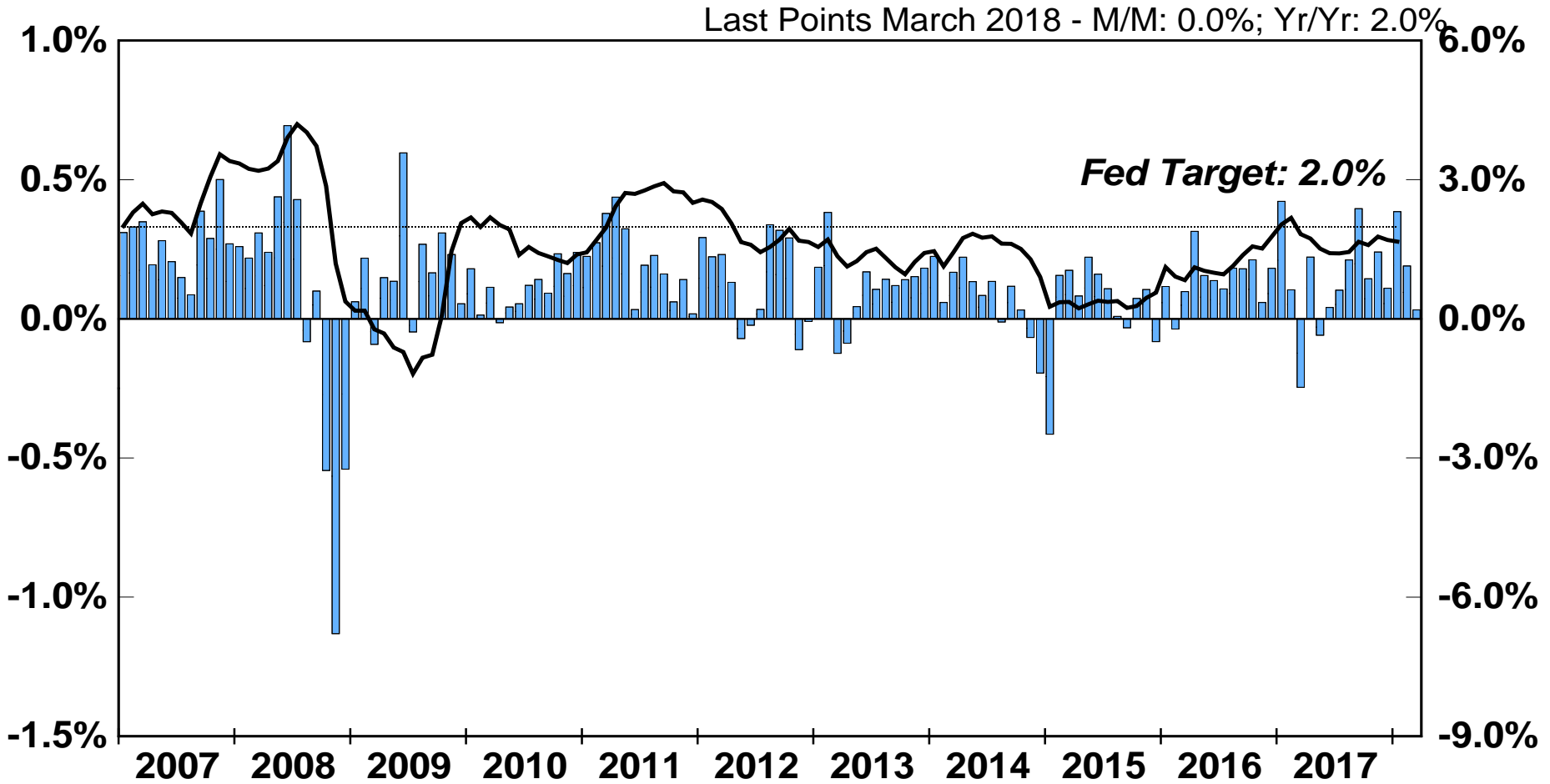


- Actual FED Funds Rate
- - - 2014
- · · 2015
- · - 2016
- 2017
- 2018*

Note: Projections based on first FED meeting of each year. *2018 updated for latest FED meeting.

Source: Federal Reserve

Chart 12 PCE Deflator seasonally-adjusted



■ **Month/Month % Change - left axis**

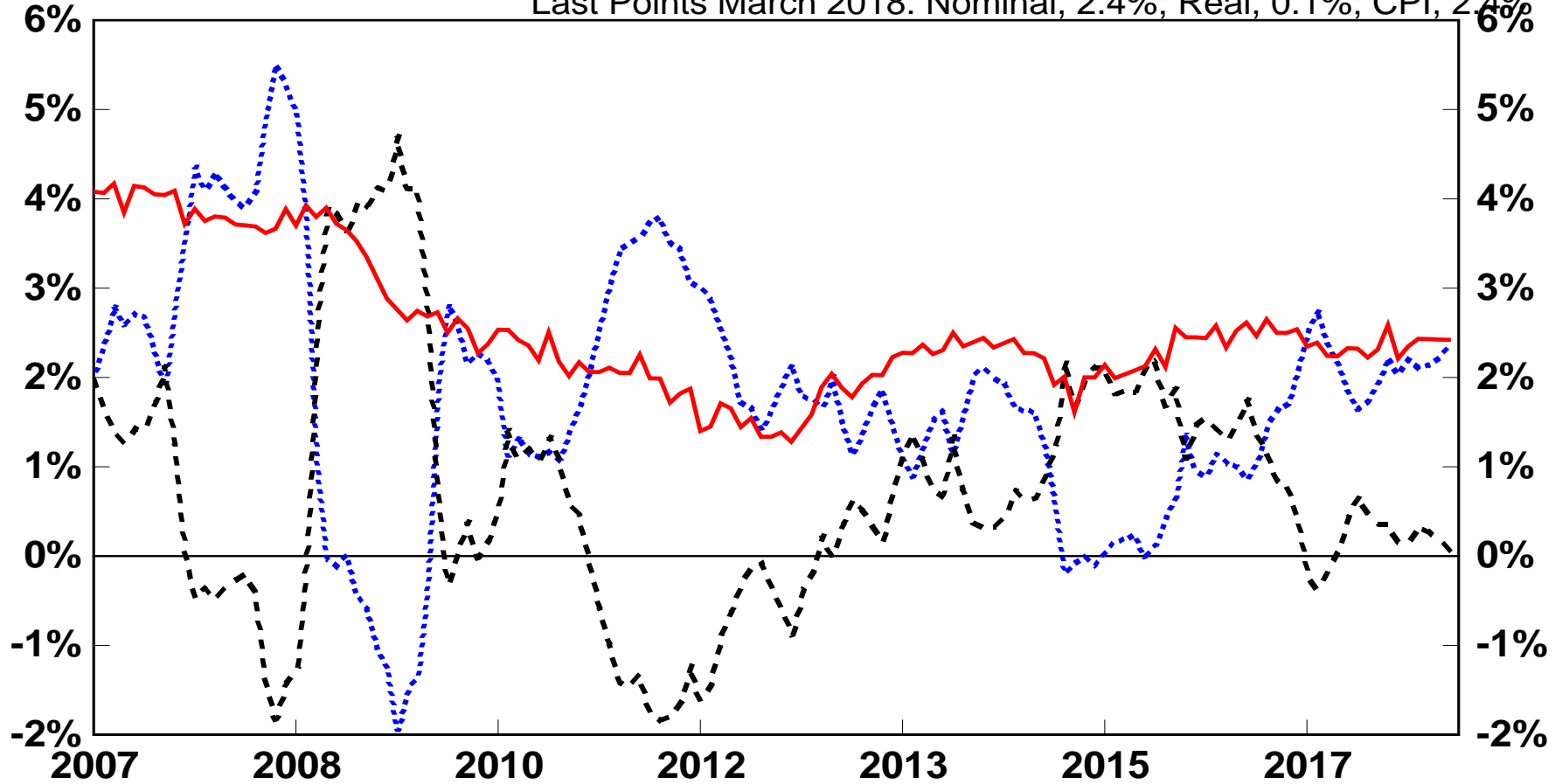
— **Year/Year % Change - right axis**

Source: Bureau of Economic Analysis

Chart 13 Nominal and Real Wages

Production and Non-Supervisory Employees; year/year percent change

Last Points March 2018: Nominal, 2.4%; Real, 0.1%; CPI, 2.4%



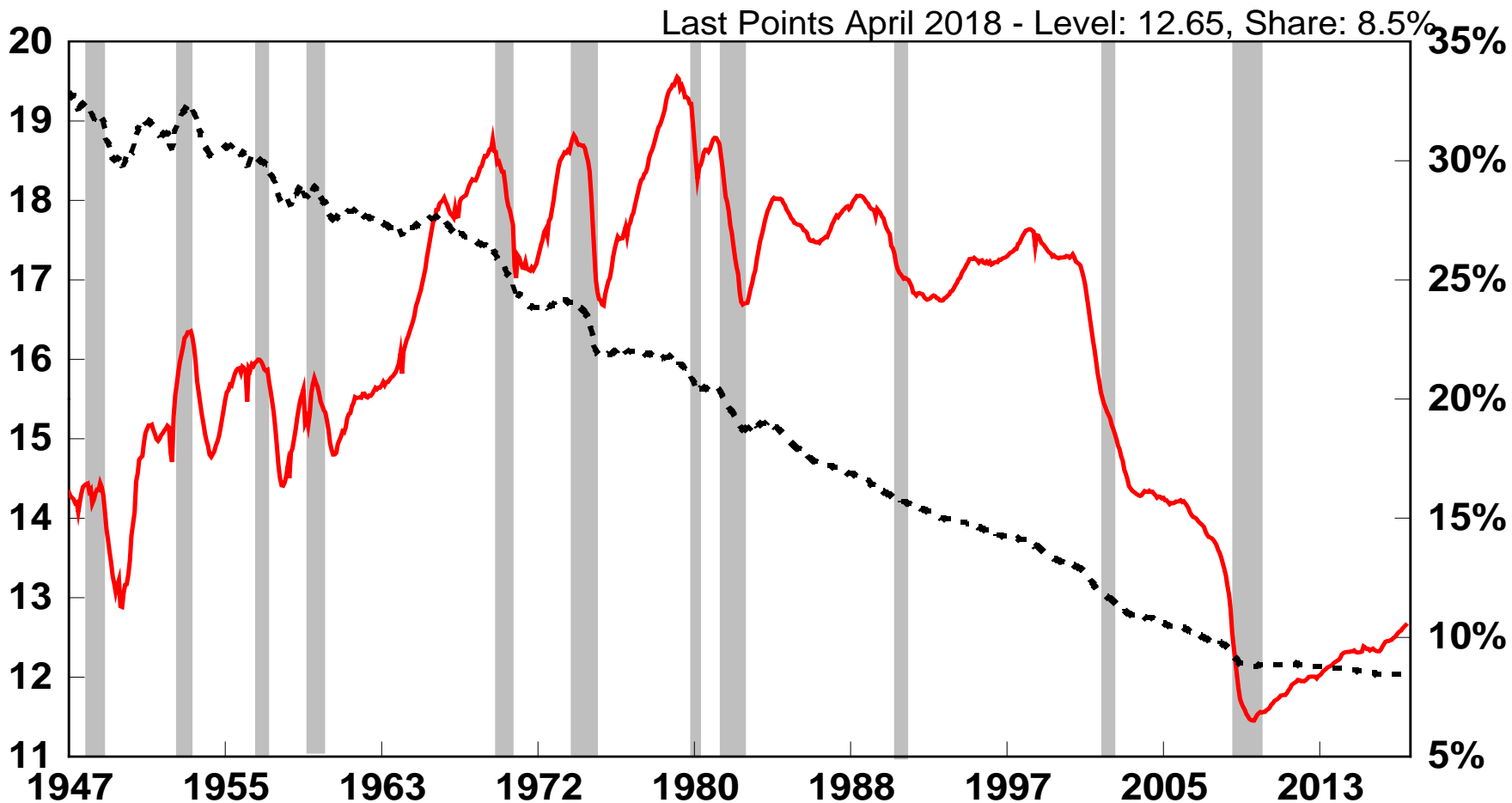
- Nominal Wages
- - - Real Wages
- Consumer Price Index

Source: Bureau of Labor Statistics

Chart 14

Manufacturing Payroll Employment

level and share of total



— Level (millions of employees) - left axis
 - - - - Share of Total Nonfarm Payrolls - right axis

Source: Bureau of Labor Statistics

Chart 15 Union Membership % of workforce

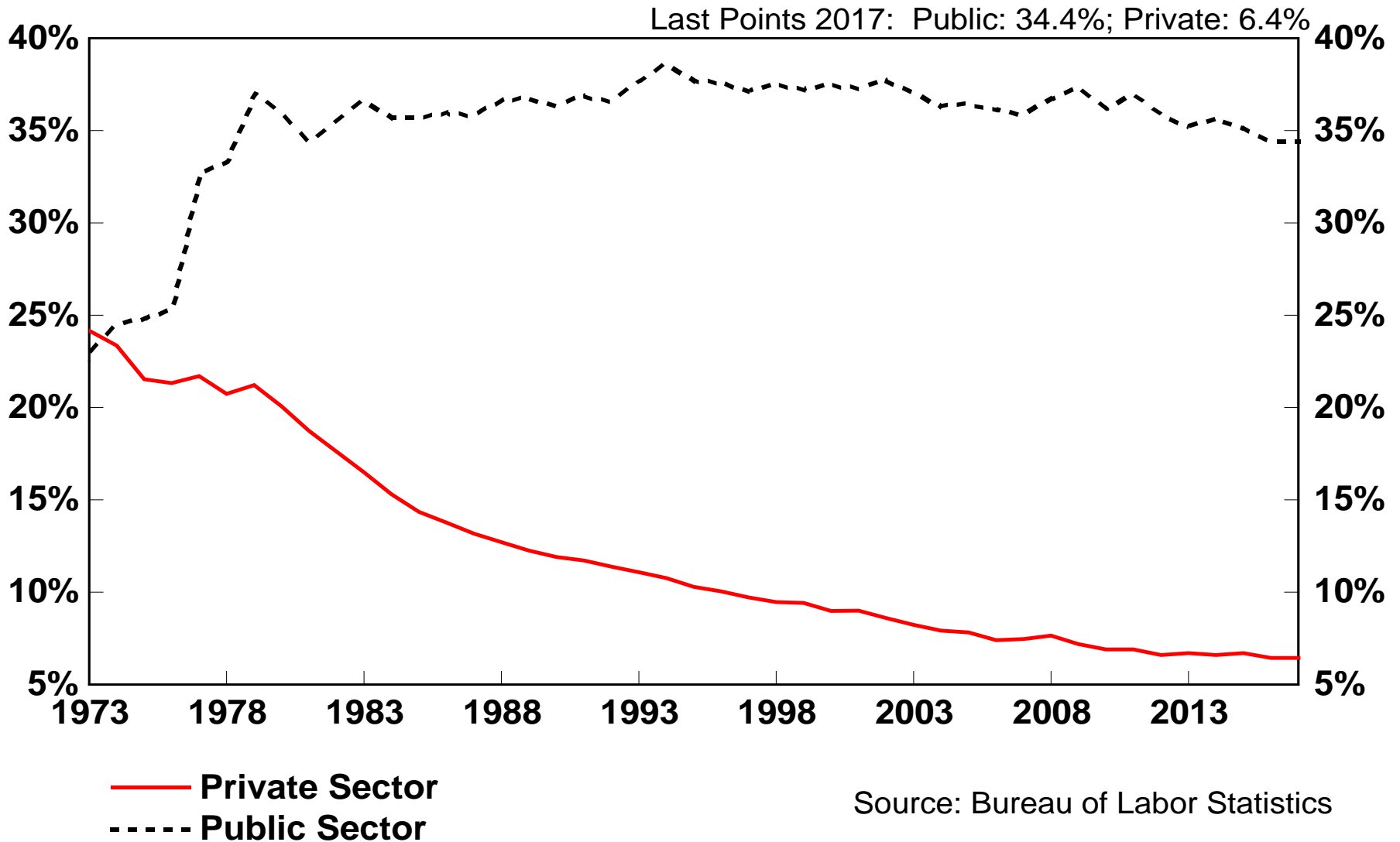
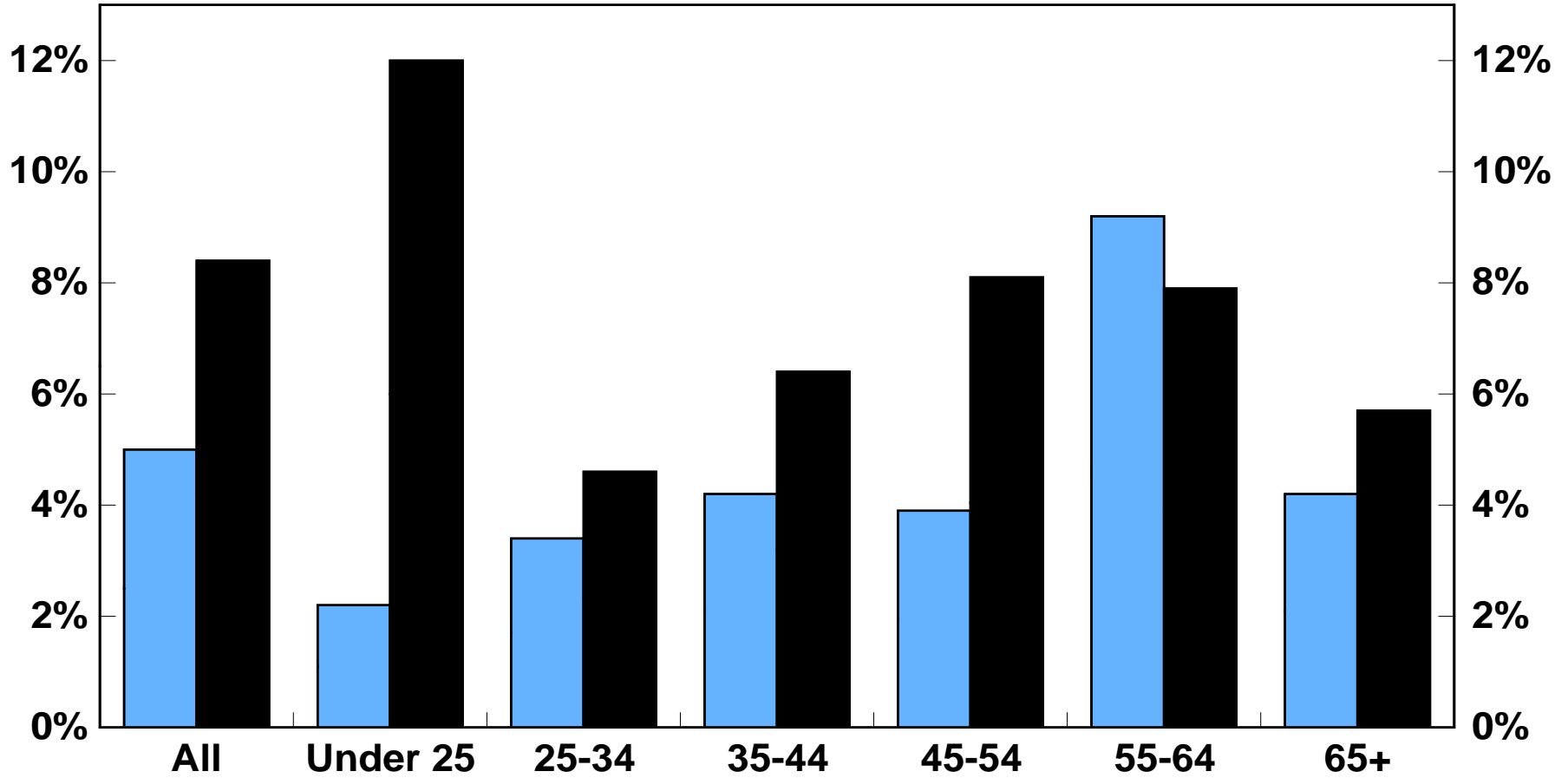


Chart 16
Self Employment Income as Percent of Total
by age group



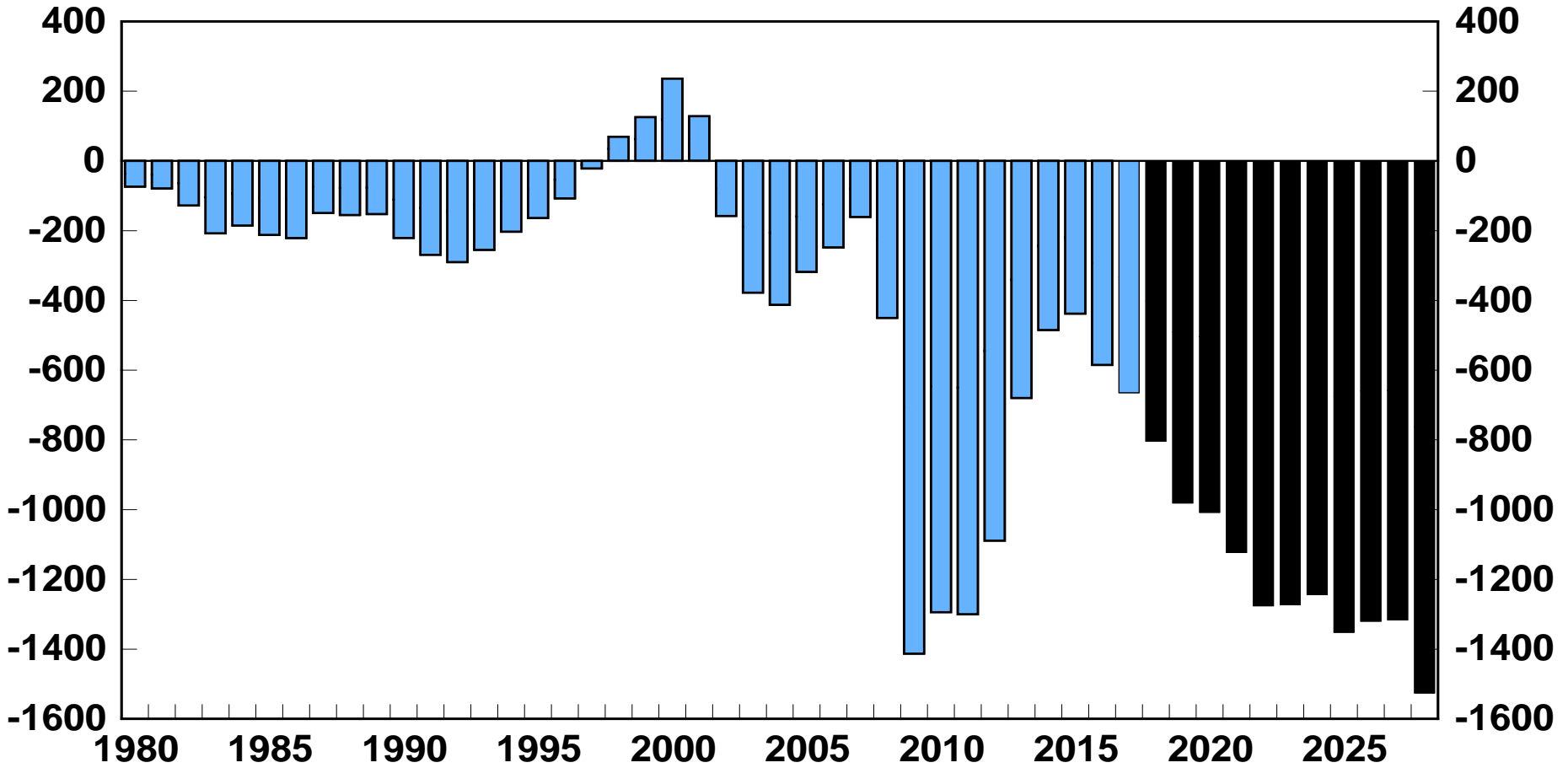
■ 2008
■ 2016

Source: Economic Analysis Associates; Bureau of Labor Statistics

Chart 17

Federal Budget Balance

billion USD

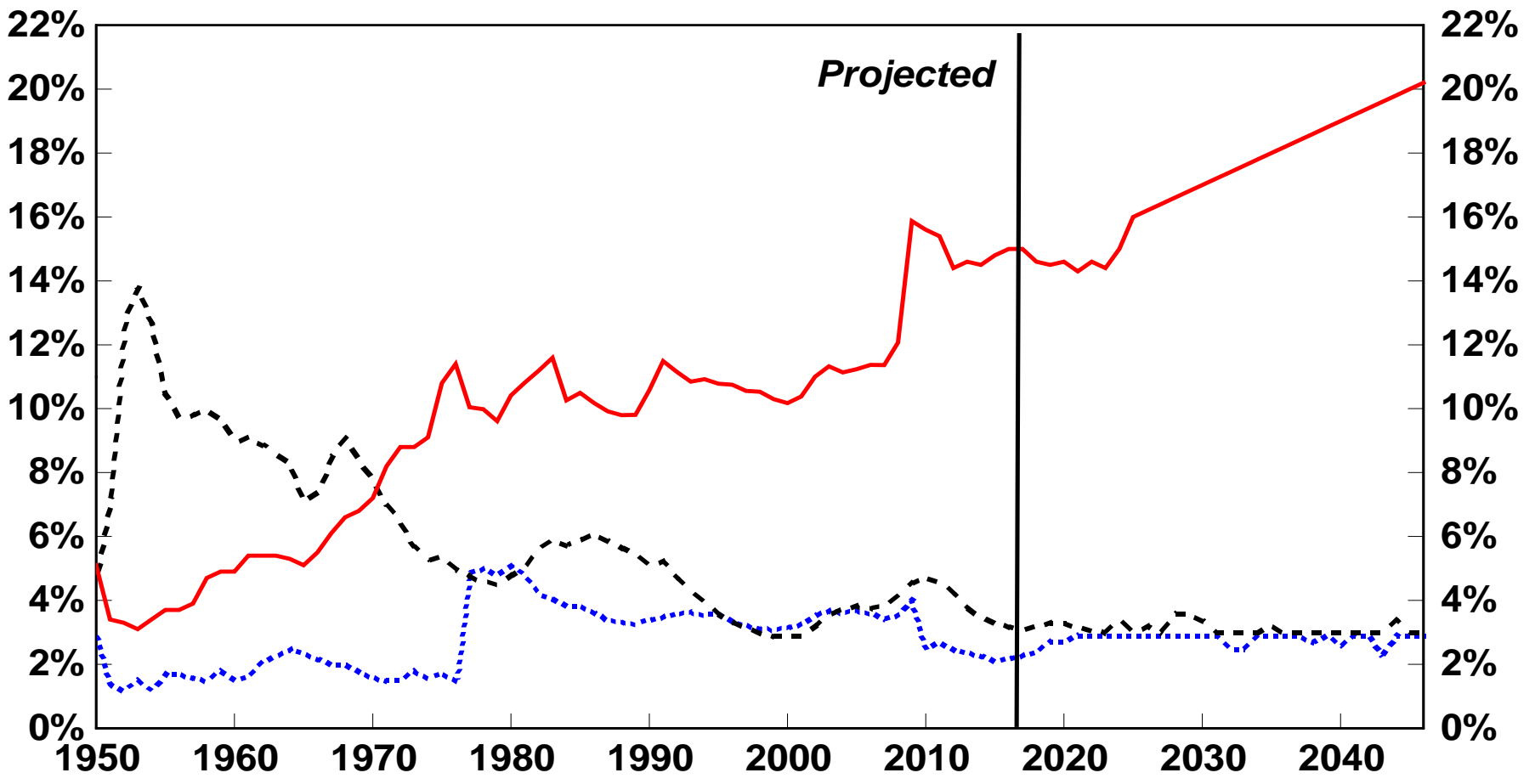


■ Historical
■ CBO Projections

Source: Congressional Budget Office

Chart 18

Federal Spending as percent share of GDP

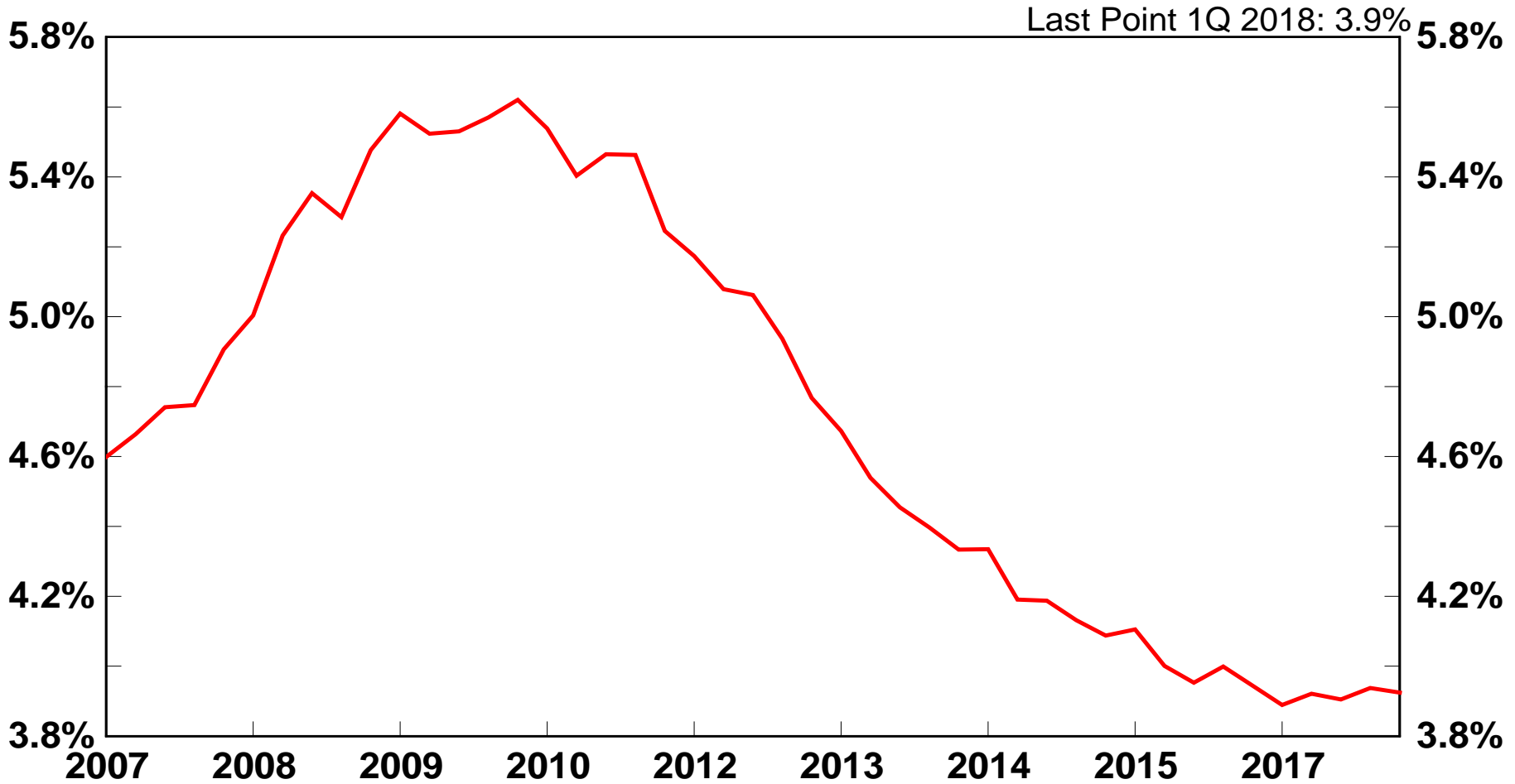


- Major Entitlements
- - - National Defense
- ⋯ Others

Source: Congressional Budget Office; The Wall Street Journal

Chart 19

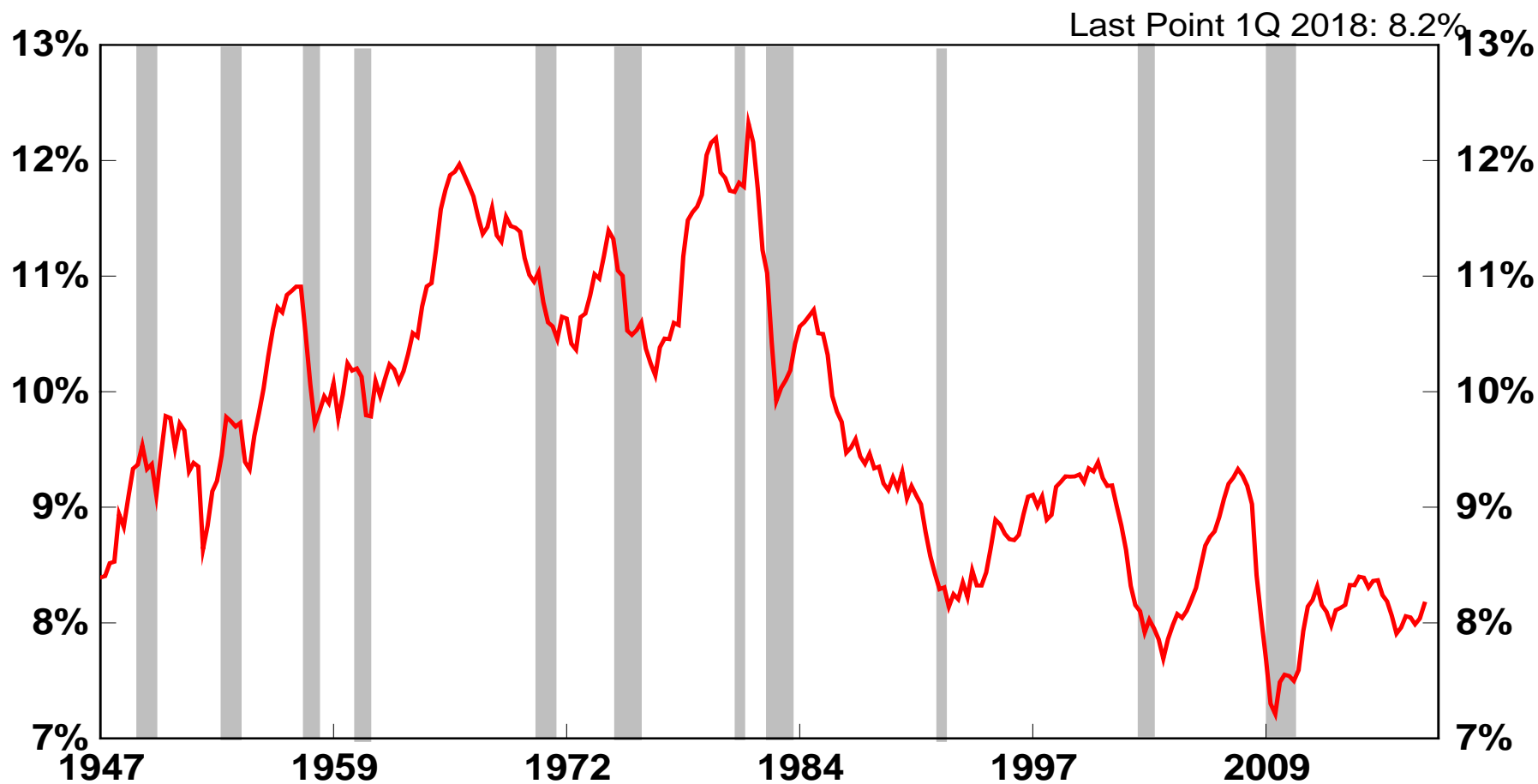
United States National Defense Spending as percent share of GDP



Source: Bureau of Economic Analysis

Chart 20

United States Infrastructure Spending as percent share of GDP



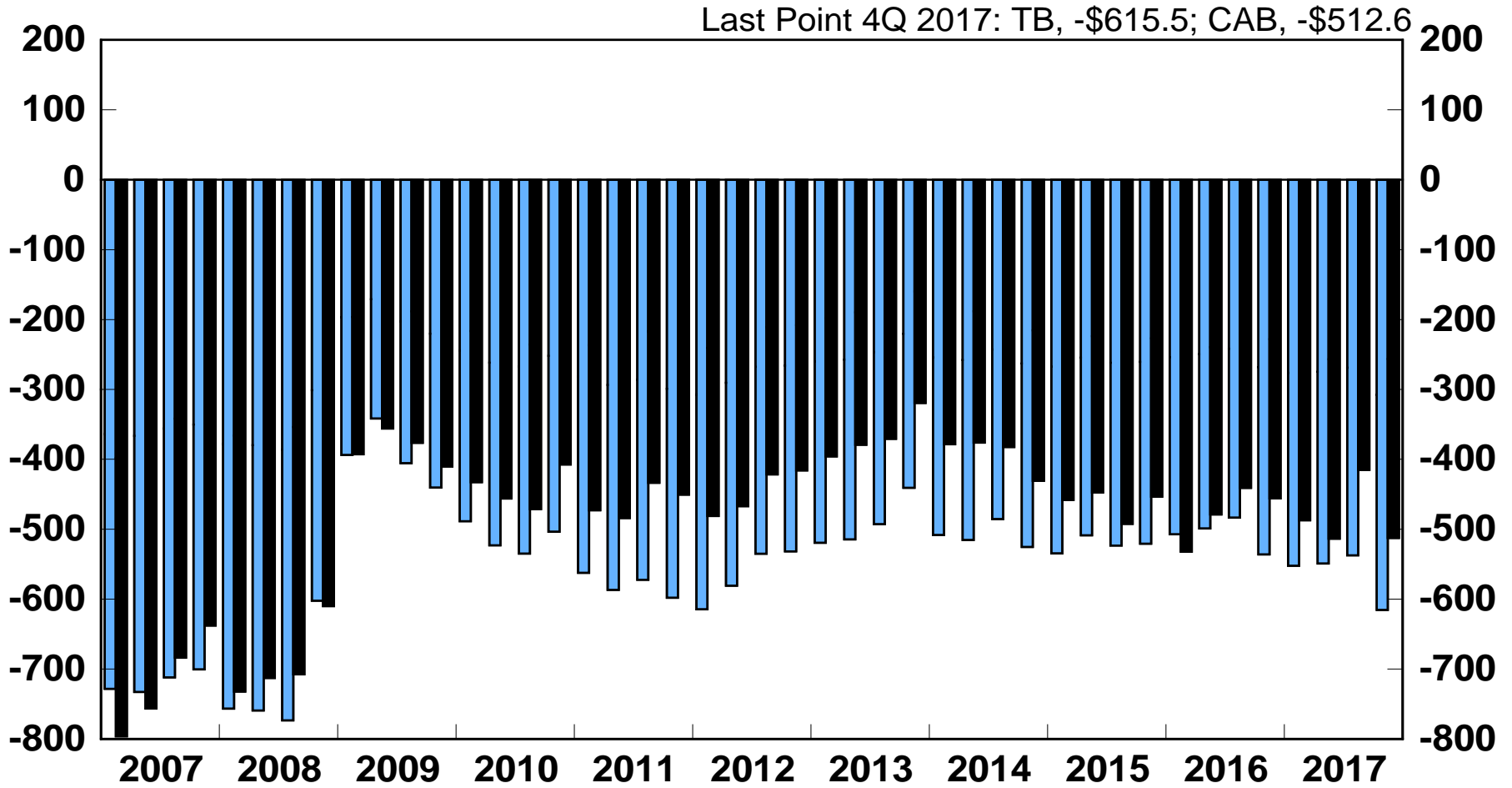
Note: Includes private fixed investment in structures, industrial equipment and transportation equipment. Includes federal nondefense gross investment and state & local gross investment.

Source: Bureau of Economic Analysis

Chart 21

United States International Trade

seasonally-adjusted annual rate; billion USD



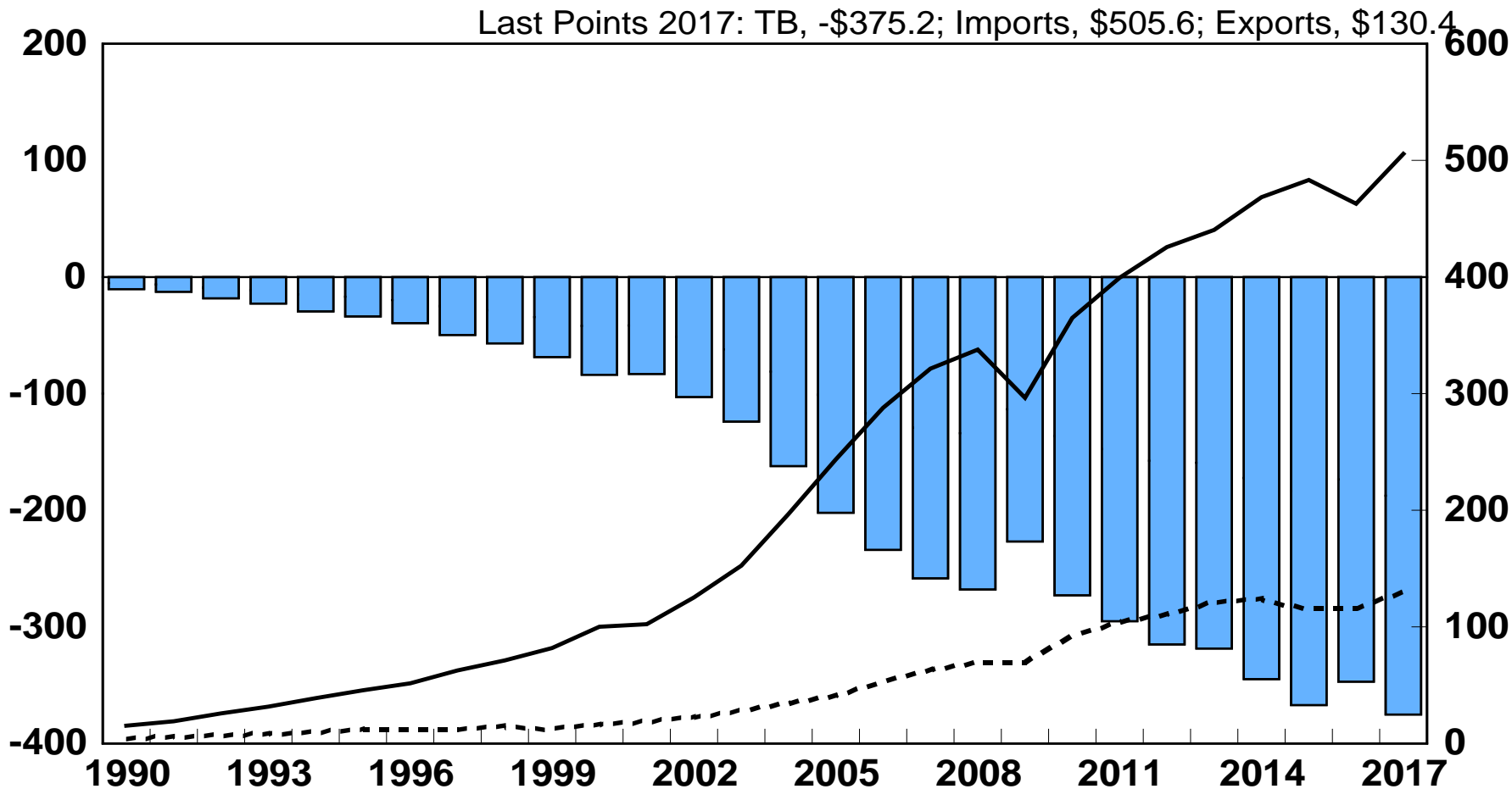
Trade Balance
Current Account Balance

Source: Bureau of Economic Analysis

Chart 22

Chinese and United States International Trade

billion USD



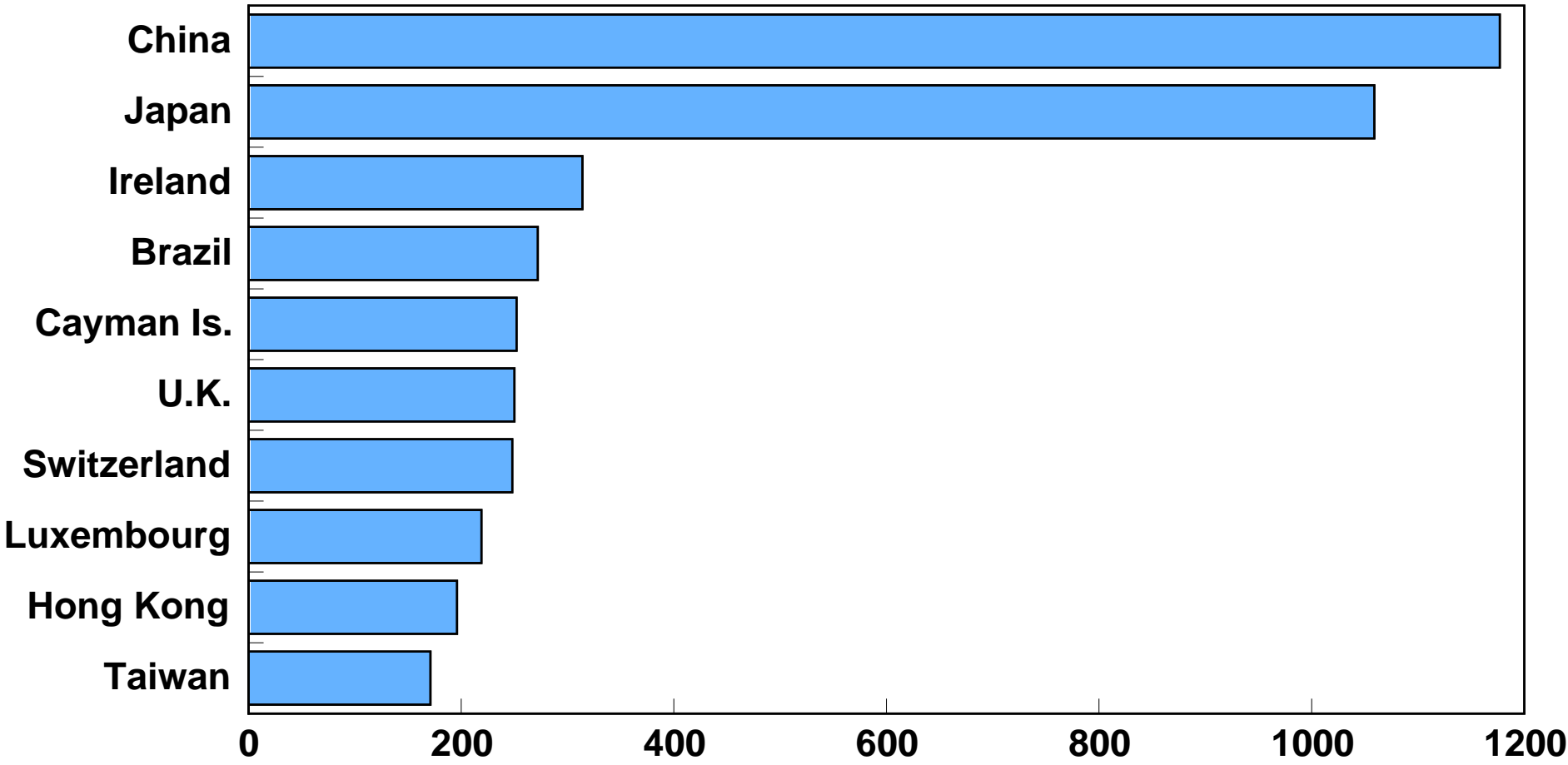
- Trade Balance - left axis
- Imports - right axis
- - - Exports - right axis

Source: U.S. Census Bureau

Chart 23

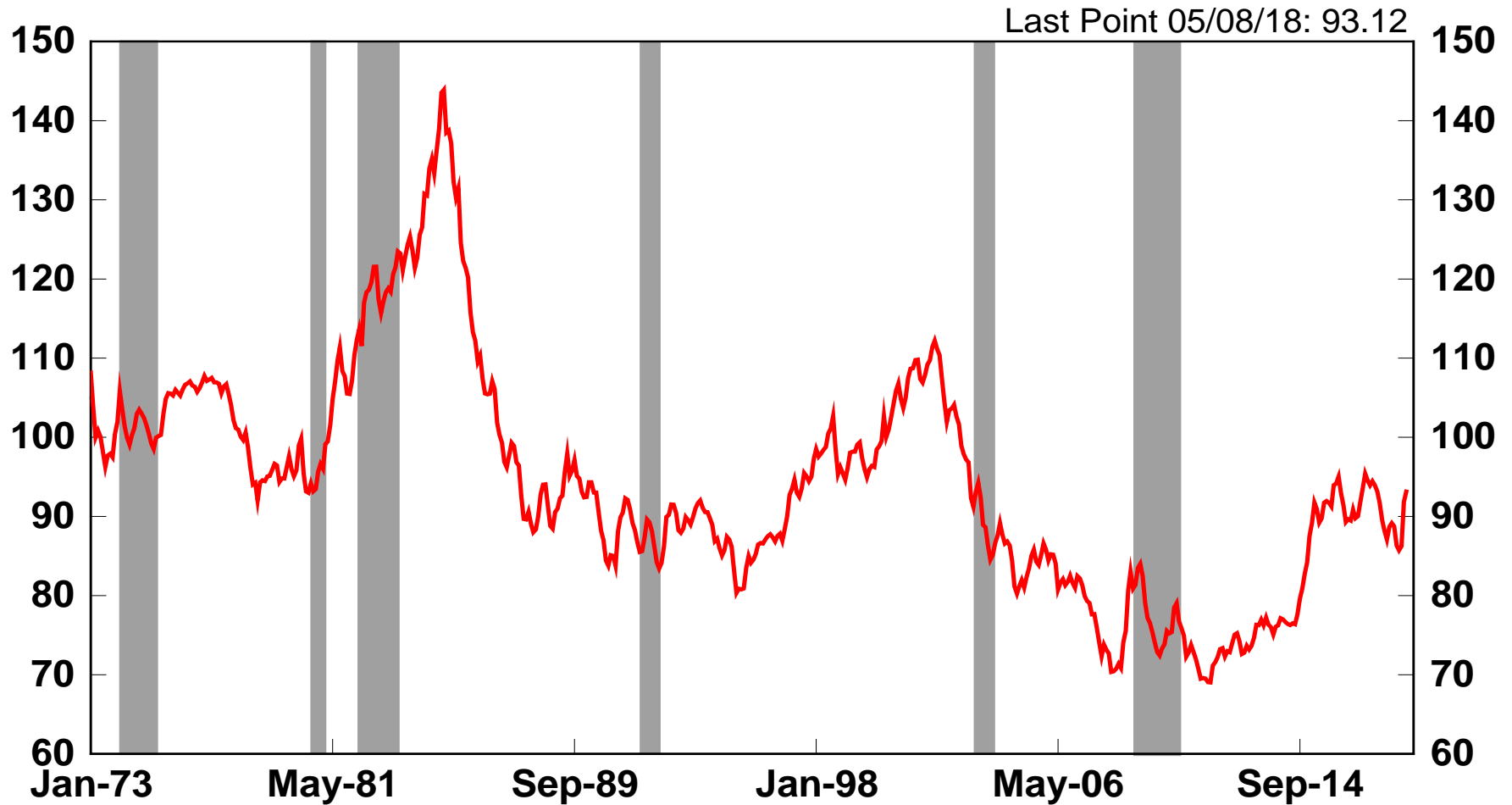
Top Foreign Holders of U.S. Treasuries

billion USD; as of February 2018



Source: U.S. Department of the Treasury

Chart 24 Dollar Index vs. Major Currencies



Source: Federal Reserve

Chart 25

Most Traded Currencies by Value

United States dollar	87.6%
Euro	31.4%
Japanese yen	21.6%
Pound sterling	12.8%
Australian dollar	6.9%
Canadian dollar	5.1%
Swiss franc	4.8%
Renminbi	4.0%
Swedish krona	2.2%
New Zealand dollar	2.1%
Mexican peso	1.9%
Singapore dollar	1.8%
Hong Kong dollar	1.7%
Norwegian krone	1.7%
South Korean won	1.7%
Turkish lira	1.4%
Russian ruble	1.1%
Indian rupee	1.1%
Brazilian real	1.0%
South African rand	1.0%

Source: Wikipedia

Chart 26

Net Futures Positions in the U.S. Dollar

billion USD

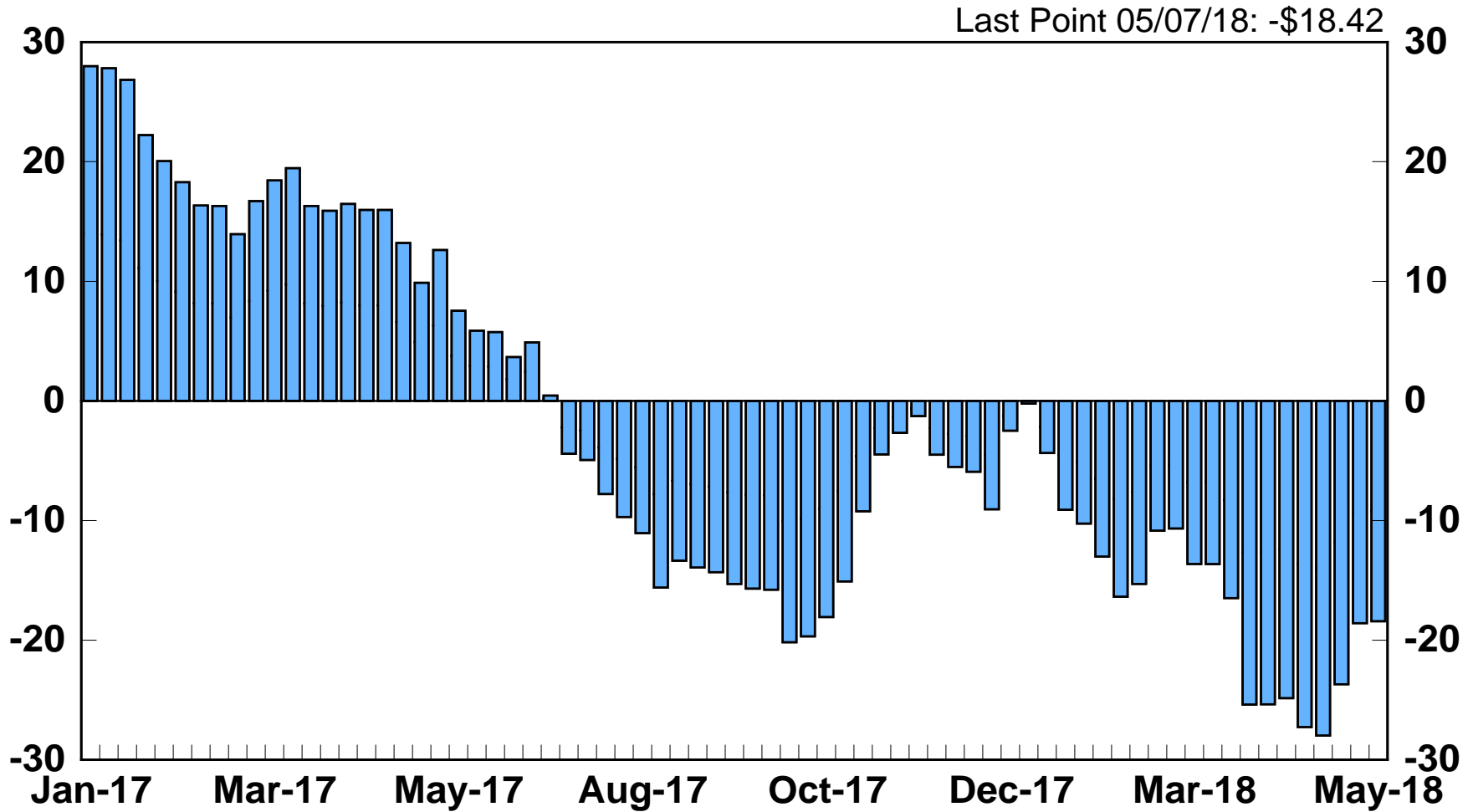
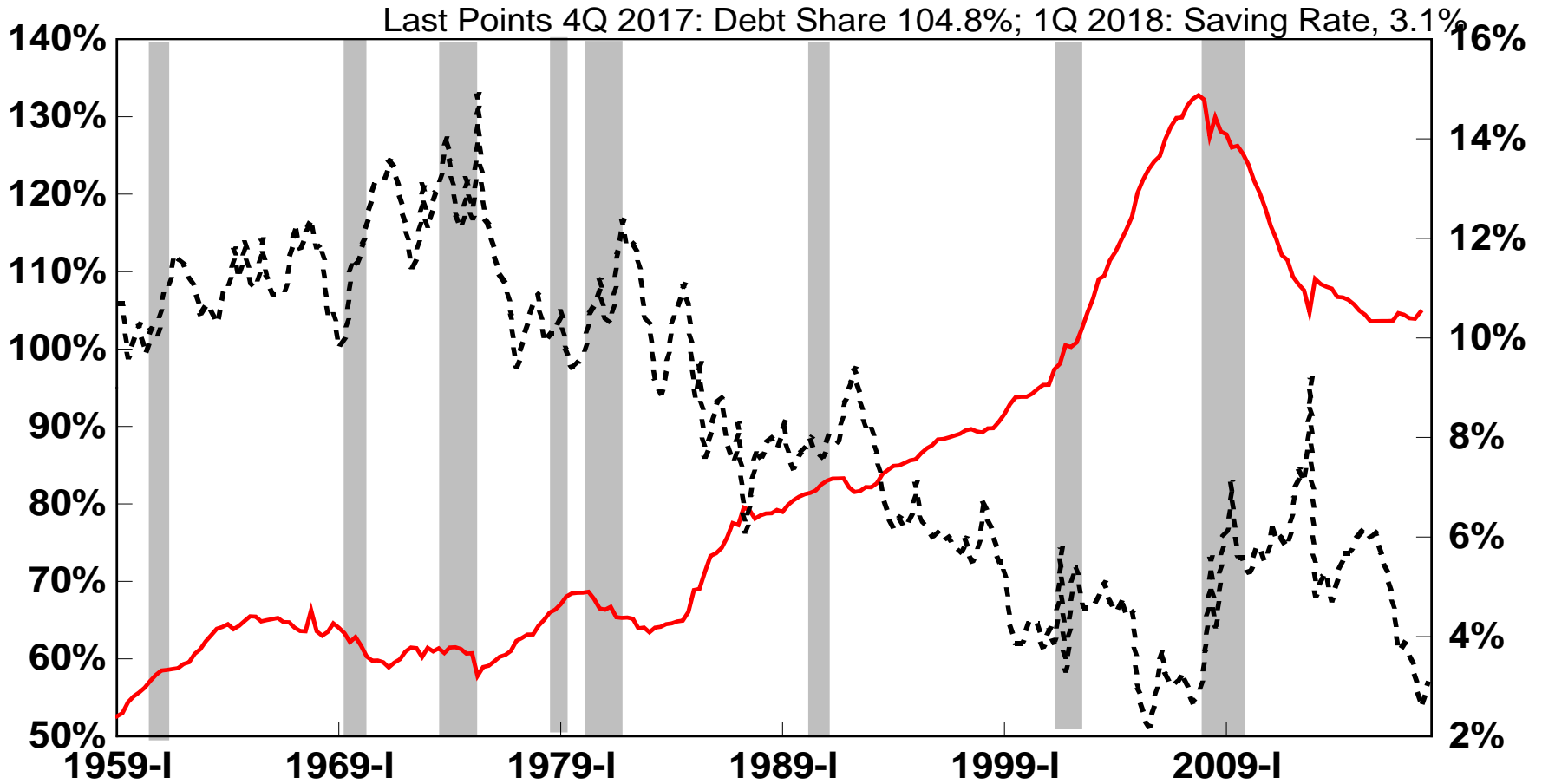


Chart 27

Household Consumer Debt and Personal Saving Rate

seasonally-adjusted



— Household Debt (as % of disposable personal income) - left axis
 - - - - Personal Saving Rate - right axis

Source: Federal Reserve; Bureau of Economic Analysis

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