

The 2020 Maxwell Fry Global Finance Memorial Lecture

# Central Banking in Interesting Times and the Demand for Base Money

**Richard G. Anderson**

University of Missouri – Kansas City, Missouri

Lindenwood University, St Charles, Missouri

Federal Reserve Bank of St. Louis

“May you live in interesting times.”

-- author unknown. Attributed to Joseph Chamberlain or Austin Chamberlain circa 1898.

“ ‘May you live in interesting times’ is more a curse than a blessing.”

-- author unknown

Central bankers seem always to live in interesting times...

It's one thing after another

## Sayers and Capie on Central Banking

“It was, he [Sayers] maintained, ‘...the very essence of central banking that it should be fluid and should adapt its way to the needs of the time’.”


-- Richard Sayers, *Central Banking After Bagehot*. Oxford: Clarendon Press, 1957, p. 33. Quoted in Forrest Capie, *The Bank of England 1950s to 1979*. Cambridge University Press, 2010, p. 57

‘it is probably fair to say that there has never been a time when there were so many unsettled questions of central banking as there are today’.

-- Sayers, *Modern Banking*, 1958, p. 304. Quoted by Capie, 2010, p. 57

A word regarding our namesake...

Professor Maxwell Fry

Hi Caroline -- 

## Professor Maxwell Fry February 1944 – February 2000

- Tokai Bank Professor of International Finance at University of Birmingham (1990-2000) and Director of the Bank of England Centre for Central Banking Studies (1997-99)
- BsC LSE 1962-1966. Classmate of Stanley Fischer (professor, MIT 1973-1988). MsC, UCLA, 1966. Ph.D. LSE 1970.
- City University of London 1970-74. University of Hawaii-Manoa 1974-81. UC-Irvine 1980-1989.

*“The Bank of England benefited greatly from his presence as an Adviser in 1990 and Senior Houblon-Norman Fellow in 1997....*

*Under his direction and thanks to his vision, the Centre for Central Banking Studies [developed into] a forum in which central bankers from all over the world can meet and exchange ideas on the latest developments in central banking.*

*This is an achievement for which all central bankers can be profoundly grateful.”*

-- Eddie George, Governor, Bank of England, in the 2002 festschrift volume edited by David Dickinson and William Allen, *Monetary Policy, Capital Flows and Exchange rates: Essays in honour of Maxwell Fry*

## **Maxwell "Max" Fry, Professor, UH-Manoa Economics, 1974 - 1981**

After receiving his PhD in economics at the London School of Economics in 1970, Max taught at The City University of London for 4 years. In 1974 he joined the Department of Economics at the University of Hawaii-Manoa as Associate Professor and immediately took on the job of running the Department's graduate program.

Max brought an enormous amount of energy to the Department and especially the graduate program where his expertise in monetary and financial economics and economic development bolstered the core strengths of the Department.

His own research on the role of money in economic development put him in an elite circle of scholars working in the area.

Who can forget this Brit, with his British accent and infectious laugh, who came to work in rubber slippers (zoris)--he bought a new pair every year--yet, was much sought after as a consultant by the OECD, the USAID, the UN, and the Central Banks of many countries.

Max enjoyed being with people. He (violin) and wife Celia (cello) were also accomplished musicians.

Max left for UC-Irvine in 1980 and shortly after [1989] accepted an endowed chair at the University of Birmingham (UK). He passed away in 2000 from a brain tumor.

Those of us who worked and played with him miss him very much.

-- James Mak, Honolulu, Hawaii, March 2006

## Professor Maxwell Fry (con't)

- Fry's research focused on monetary policy in developing countries
  - A viable financial system was essential to a market-oriented, capitalist economy
  - Interaction/coordination/competition between fiscal authorities and the central bank
  - Deficit spending and pressure on central bank to finance the spending
- Seminal text *Money, Interest and Banking in Economic Development* (second edition, 1995, still in print) + a large number of published papers (I discuss Fry and Sinclair, 2002, more below)

- My theme today:
  - The problems of today developed-countries' fiscal and monetary policymakers, following recent large adverse macroeconomic shocks, closely resemble the problems of developing-countries' central banks.

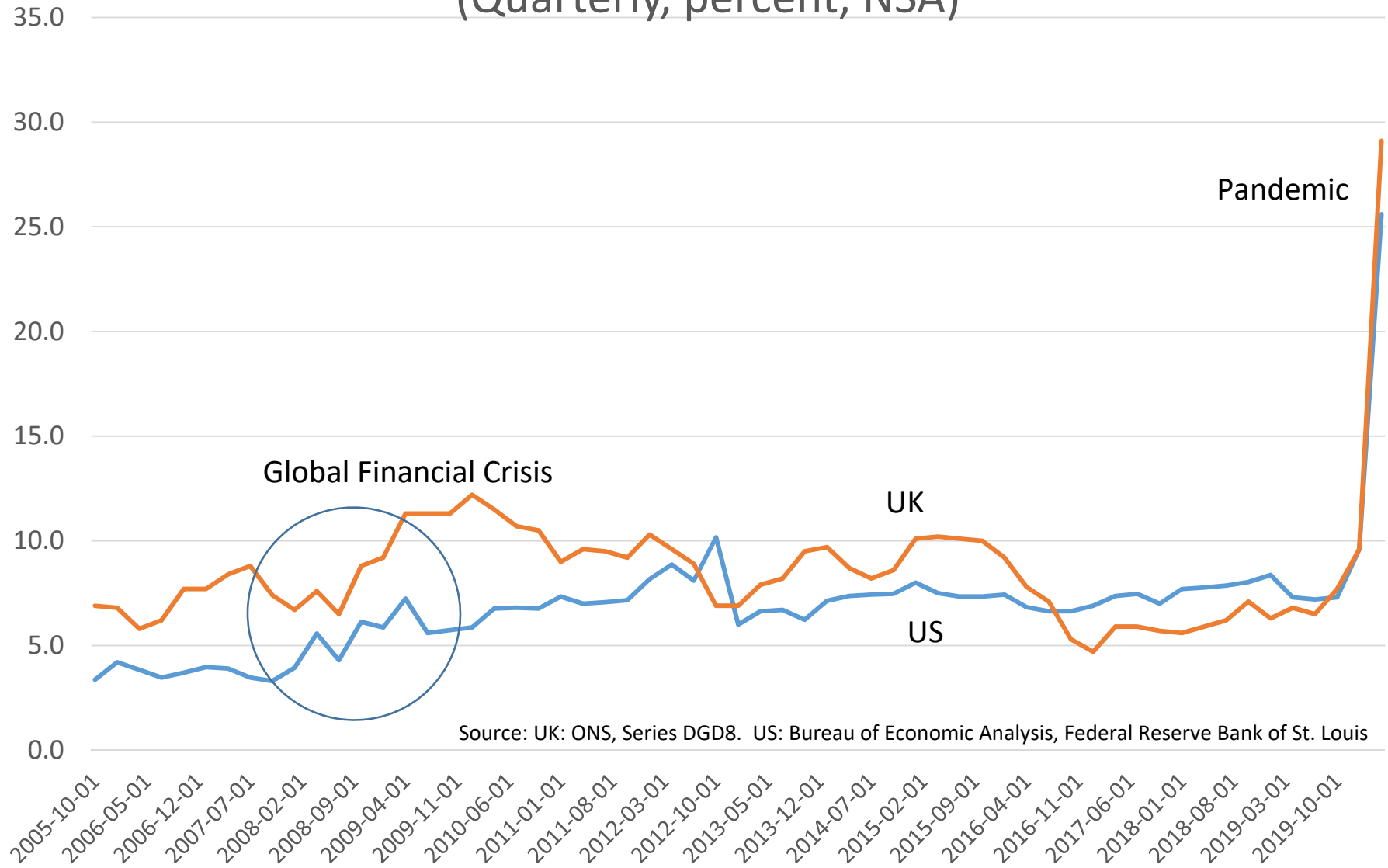
## Applying a Theme of Fry's Research

- Fry was interested in the “government budget constraint.” Today, the analysis is known as the “Fiscal Theory of the Price Level (FTPL)”
- “fiscal policy matters for inflation—prudence, consistency, and clear articulation of future policy intentions—have an important role to play in achieving the goal of price stability” (Fry and Sinclair)
- FTPL models suggest that low inflation rates can accompany large budget deficits and large expansion of the central bank balance sheet *IF in the future there are primary surpluses to reduce the debt*
  - “Primary surplus” occurs when revenue equals or exceeds expenditure (excluding interest on existing debt)
  - *If primary surplus < 0, you are borrowing to pay the interest on past borrowing*
- Can these models explain the absence of an acceleration of inflation in the U.S. during the last 10 years, even with a doubling or tripling of the monetary base (the monetary liabilities of the central bank)?



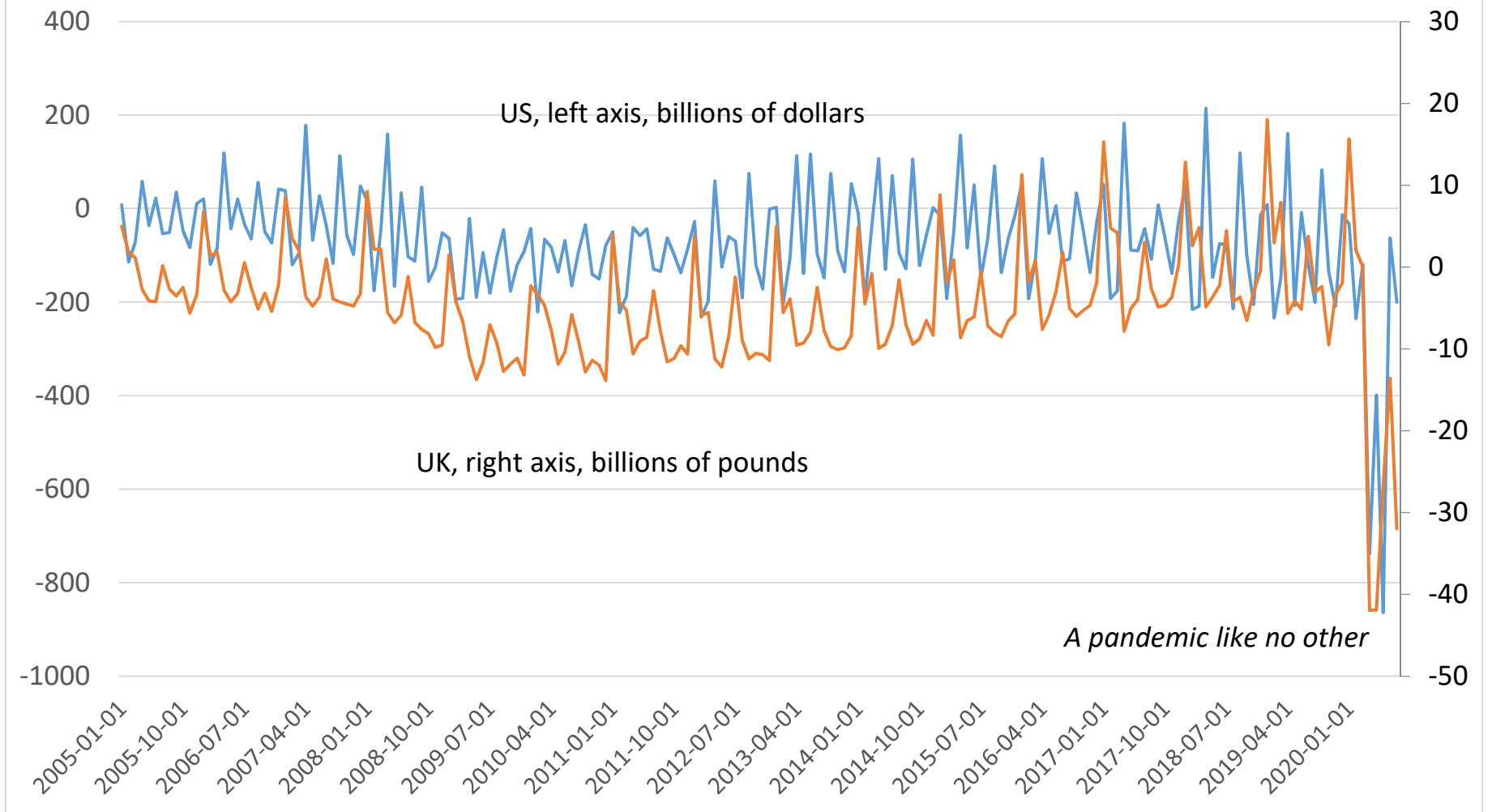
## A Quick View of Recent Events

# US, UK Saving Rates 2005:Q4 - 2020:Q2 (Quarterly, percent, NSA)



Source: UK: ONS, Series DGD8. US: Bureau of Economic Analysis, Federal Reserve Bank of St. Louis

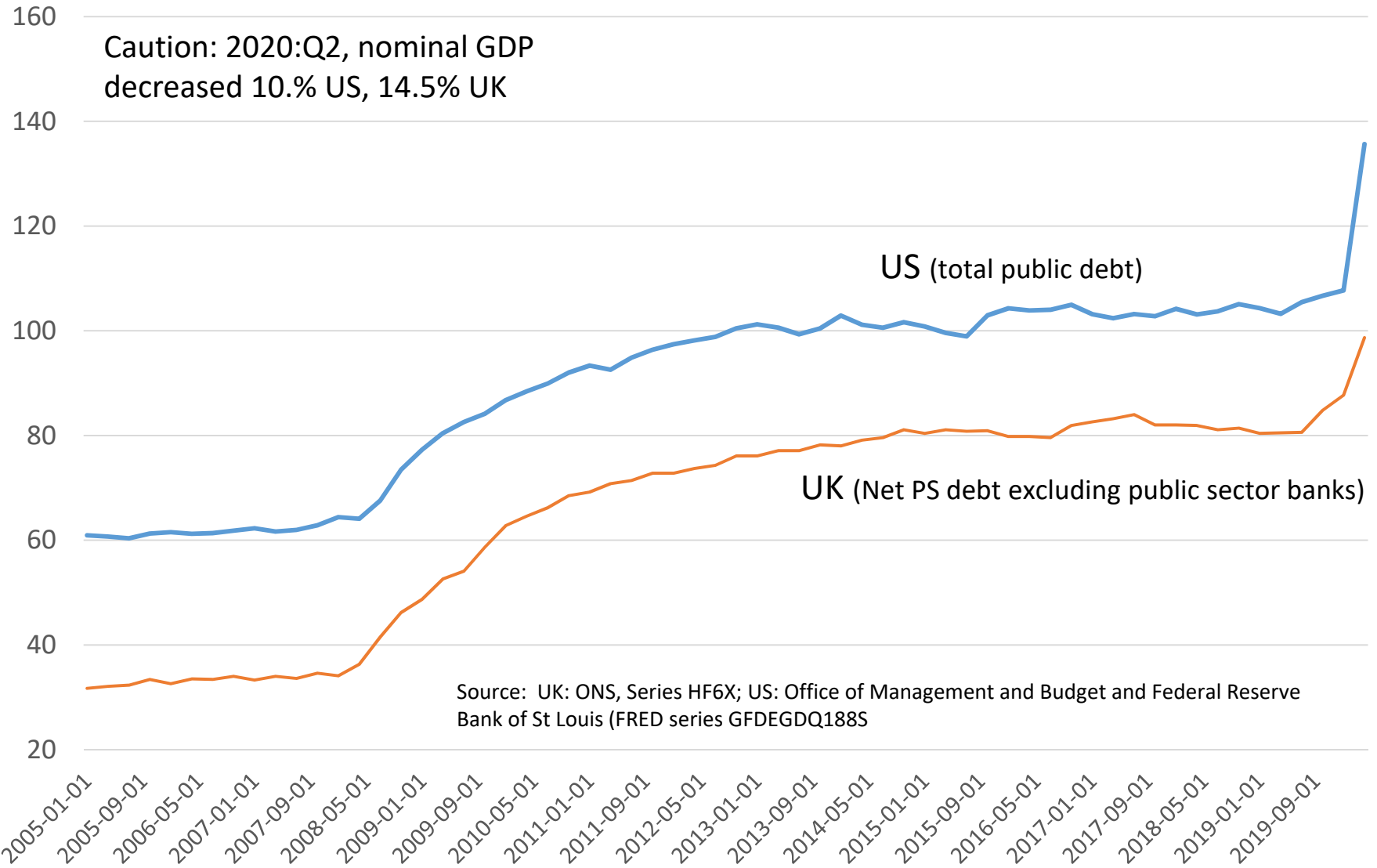
# US, UK Budget Surplus/Deficit Jan 2005-Aug 2020 (monthly, billions of dollars and pounds, NSA)



Source: US Department of the Treasury; UK Office of National Statistics, series JW2T

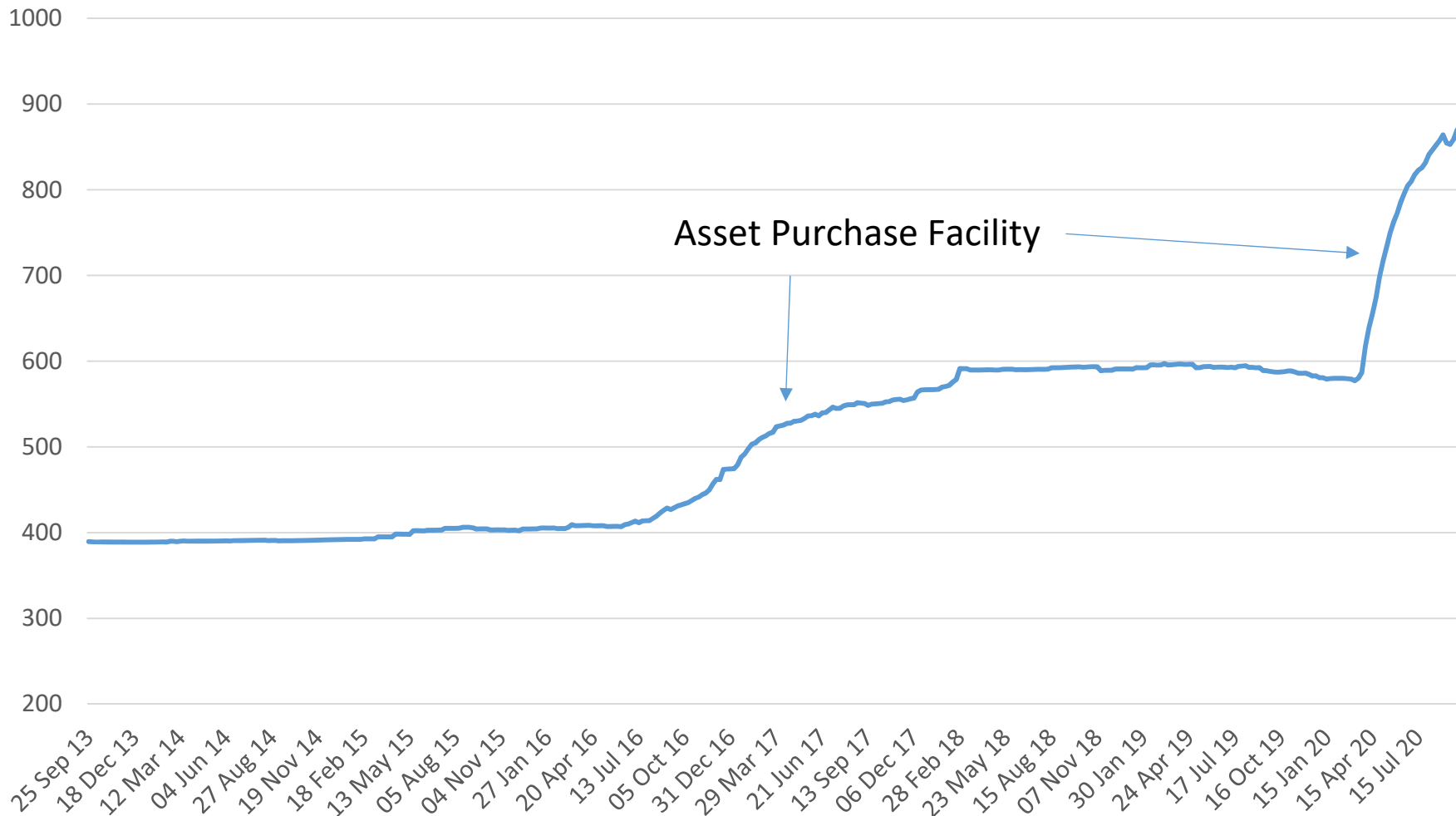
# US, UK Public Debt as Share of GDP 2005:Q1-2020:Q2 (quarterly, percent)

Caution: 2020:Q2, nominal GDP  
decreased 10.% US, 14.5% UK



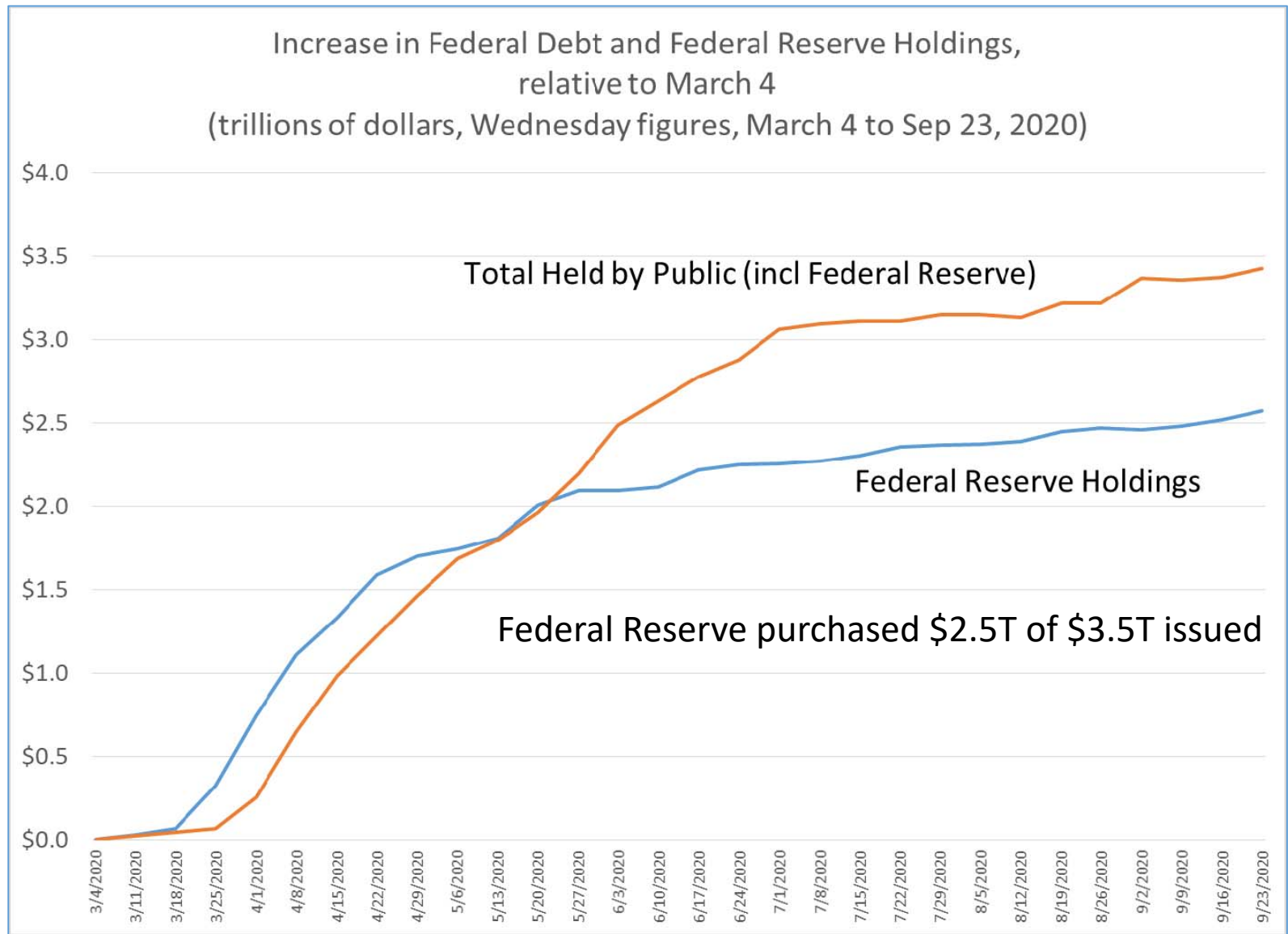
Source: UK: ONS, Series HF6X; US: Office of Management and Budget and Federal Reserve Bank of St Louis (FRED series GFDEGDQ188S)

# Bank of England, Total Assets Sep 2013 - Sep 2020 (weekly, billions of pounds, NSA)



Source: Bank of England

# 2020: Federal Reserve Finance of Deficit Spending



## Fry and Sinclair (2002)

Maxwell Fry and Peter Sinclair, "Inflation, Debt, Fiscal Policy and Ambiguity," *International Journal of Finance and Economics*. 7:157-163

- One of the last published papers to analytically explore the government budget constraint
  - Later papers generally have used computer simulation models (example to come)
- Maxwell Fry's last published paper (posthumous), 2002.
- Co-authored with the late Peter Sinclair.

*Working with Max was a fascinating and very stimulating experience. I had the privilege of knowing him for ten years before joining his university, Birmingham, in 1994. Our 1996 paper was written there, and the present paper is the outcome of later work we did on this subject. It is a great honour for me to be able to offer this tribute to the memory of an outstanding economist, and excellent friend.*

*-- Peter Sinclair (Sept 1946 - Mar 2020)*

## Pause for a Look Back: Fry (1993)

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INTERNATIONAL MONETARY FUND

Fiscal Affairs Department

The Fiscal Abuse of Central Banks

Prepared by Maxwell J. Fry 1/  
Tokai Bank Professor of International Finance  
International Finance Group, University of Birmingham, England

Authorized for Distribution by Vito Tanzi

July 1993

This paper reviews the fiscal activities that governments in a sample of 26 developing countries have obliged their central banks to undertake. In the main, these activities fall under five categories: (1) collecting seigniorage; (2) imposing financial restriction; (3) implementing selective credit policies; (4) undertaking foreign exchange operations at nonmarket-clearing prices; and (5) providing implicit or explicit deposit insurance at subsidized rates and recapitalizing insolvent financial institutions. Not all central banks engage in all these activities, but some central banks perform additional fiscal activities such as collecting taxes and running food procurement programs.



## Pause for A Look Back: Fry (1993) (con't)

Since their invention, central banks have served as a source of government revenue. Indeed, the central bank is the goose that lays the golden eggs. The free-range goose, conducting conservative monetary policy with a fair degree of independence, produces golden eggs worth less than 1 percent of GNP (most OECD countries). The battery-farm goose, bred specially for intensive egg-laying, can produce golden eggs in the form of an inflation tax yielding 5 to 10 percent of GNP (Mexico, Peru, and Yugoslavia in the 1980s). The force-fed goose can produce revenue of up to 25 percent of GNP for a limited period before the inevitable demise of the goose and collapse of the economy (Chile in the early 1970s). All three forms of central bank geese have been sighted since the 1920s.

“developing countries undermine ... the banks’ independence [and] monetary policy objectives”

## Fry and Sinclair (2002) (con't)

- “We explore the idea that the rate at which the nominal monetary base—currency—expands over time depends on the public authorities’ budget deficit.”
- How [are] inflation and the ratio of interest-bearing debt to national income determined in the long-run and during the passage to that long-run equilibrium.
- [We find that] *ambiguity* surrounding future fiscal policy... is inflationary in its own right.

Two equation model, in the rate of inflation  $\pi$  and bond/GDP ratio  $b$ . Long-run equilibrium requires  $\dot{\pi} = 0$  and  $\dot{b} = 0$  where the laws of motion are

$$v' \dot{\pi} / v = \pi + g - \dot{M} / M$$

$$\dot{b} / b = (1 - \alpha)(1 - n / b) - (\pi + g)$$

and where  $M$  is base money,  $v(r + \pi)$  is the income velocity of  $M$ ,  $g$  is the growth rate of real GDP,  $n$  is the budget surplus/real GDP, and  $r$  is the real interest rate, and  $\alpha$  is the share of the of the budget deficit financed via  $M$ .



## The Fiscal Theory of the Price Level: Sims (2013)

Princeton University's Christopher Sims (Nobel prize, 2011) in his 2013 AEA presidential address:

*“Recent expansions of central bank balance sheets and of the levels of rich-country sovereign debt, as well as the evolving political economy of the European Monetary Union, have made it clear that fiscal policy and monetary policy are intertwined.”*

- The real value of a country's debt = the present discounted value of future primary surpluses
- Neil Wallace's Modigliani-Miller theorem for macroeconomics: real value of the firm equals the present discounted value of the firm's future profits.
- An adverse macroeconomic shock that increases real debt (GFC, pandemic) requires larger future primary surpluses

## The Fiscal Theory of the Price Level: Sims (2013) (con't)

Central bank balance sheets matter because they connect monetary and fiscal policy

- Fiscal policy affects income, interest rates, and asset prices – and hence the central bank balance sheet
- Monetary policy affects fiscal receipts and expenditures
- If fiscal policymakers act to offset all induced changes, then monetary policy will have no affect.

## The Interaction of Fiscal and Monetary Policy: Financial Repression and “Fiscal Dominance”: Dufrenot, Jawadi, and Khayat (2018)

G. Dufrenot, F. Jawadi, and G. Khayat, “A model of fiscal dominance under the ‘Reinhart Conjecture’ “ (Journal Economic Dynamics and Control, 2018).

How do fiscal and monetary authorities deal jointly with problems of high debt ratios and potentially unsustainable public debt growth?

Might the fiscal authority, trapped in insolvency after responding to an adverse shock, seek to have the monetary authority “bail it out” via either higher inflation or lower interest rates?

*“A major consequence of the 2008 financial crisis was the sharp rise in public debt ratios in the industrialized countries.*

*Given the strong Keynesian effects of fiscal consolidation during economic downturns ... [governments have been unable] to rapidly lower the high levels of sovereign debt.*

*In this context, economic policy debates brought back to the agenda the idea that monetary policy could come to the rescue of fiscal policy..”*

## The Interaction of Fiscal and Monetary Policy (con't)

Financial repression' or 'fiscal dominance' [Carmen Reinhart, Harvard] is said to occur when the central bank comes under pressure from the fiscal authority to keep interest rates lower and inflation higher than the monetary authority would judge optimal in the absence of fiscal pressure.

Another theme from Fry's work. Survey paper written while a faculty member at UC-Irvine visiting FRB San Francisco:



World Development  
Volume 10, Issue 9, September 1982, Pages 731-750



### Models of financially repressed developing economies

Maxwell J. Fry \*

## The Interaction of Fiscal and Monetary Policy (con't)

Dufrenot, Jawadi, and Khayat, A model of fiscal dominance under the “Reinhart Conjecture” (JEDC, 2018).

The government’s budget constraint in real per-capita terms, to be satisfied for all periods  $t$ , is:

$$\Delta d_t + \Delta m_t + \pi_t m_t = R_t d_{t-1} + g_t - \tau_t y_t$$

where  $d_t = b_t / y_t$  is the sovereign debt ratio,  $\Delta m_t$  is money creation (base money),  $\pi_t m_t$  is seignorage,  $g_t - \tau_t y_t$  is the primary deficit/surplus, and  $R_t$  is a function of the interest rate/GDP growth rate differential.

Classic analysis: Sargent and Wallace (“Unpleasant Monetarist Arithmetic”, FRB Minneapolis, 1981).

- Let the fiscal authority act first, setting current and future primary deficits and surpluses and, hence, current and future debt ratios  $d_t$ . The balance must be bond sales or seignorage. Can the monetary authority assure solvency of the fiscal authority without hyperinflation?

DJK:

- Monetary authority affects  $R_t$ , real interest rate and real GDP growth rate. Can it thereby assure solvency of the fiscal authority? ZLB + QE as policy environment
- Is the monetary authority under pressure to keep interest rates low and allow inflation to drift upward? Do they vary their inflation target inversely with  $d_t$ ?
- An announced upper bound on inflation is important to avoid uncontrolled inflation.



## The Interaction of Fiscal and Monetary Policy (con't)

Dufrenot, Jawadi, and Khayat, A model of fiscal dominance under the “Reinhart Conjecture” (JEDC, 2018).

**Table 1**

Primary balance adjustment needed to stabilize the debt ratio at the pre-crisis level (% GDP). Corrected

	2008	2010	2012	2015
Euro area	0.13	3.6	0.3	2.5
Japan	3.8	8.6	7.9	4.9
United Kingdom	4.3	7.0	5.2	3.2
United States	5.8	9.0	5.5	2.4

Source: World Economic Outlook 2016 and authors' calculation.

**Table 1**

Primary balance adjustment needed to stabilize the debt ratio at the pre-crisis level (% GDP).

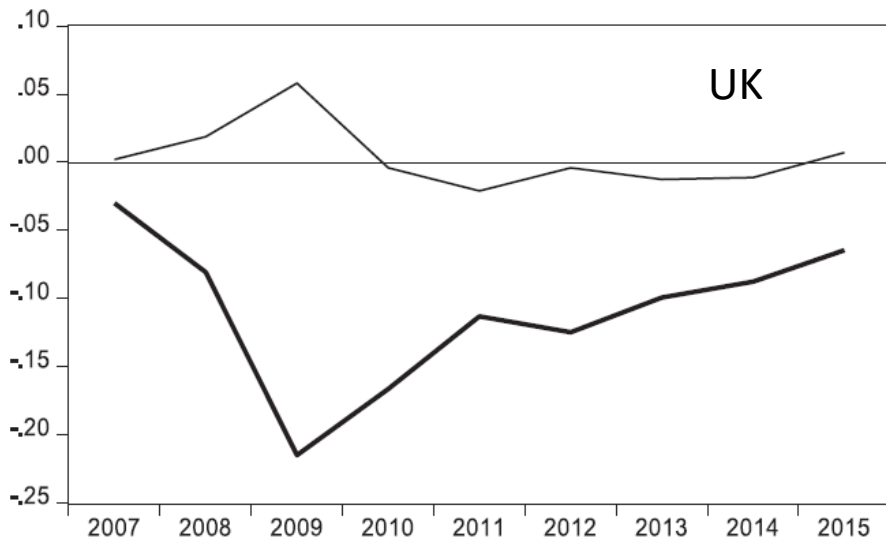
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Source: World Economic Outlook 2016 and authors' calculation.

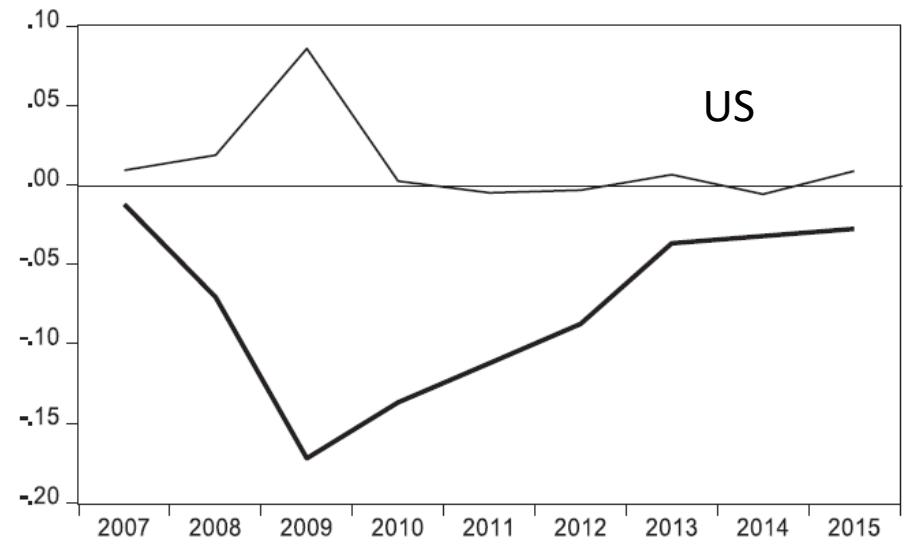
## The Interaction of Fiscal and Monetary Policy (con't)

Dufrenot, Jawadi, and Khayat, A model of fiscal dominance under the “Reinhart Conjecture” (JEDC, 2018).

Simulate the spread between interest on debt and GDP growth necessary to stabilize debt/GDP ratio



— Interest rate-growth differential (UK)  
— Debt stabilizing interest rate-growth differential



— Interest rate-growth differential (USA)  
— Debt stabilizing interest rate-growth differential

How Did We Get Into This Mess?

The Global Financial Crisis

# Unconventional and Conventional Monetary Policy

## “Unconventional” policy includes

- Zero overnight interest rates
- Large-scale asset purchase programs (aka Quantitative Easing)
- *The essence of “quantitative easing” policies is the purchase of assets from the private sector with newly created central bank deposits; such exchanges promise to reduce both risk and term premia in longer-term interest rates. (Bernanke)*
- Targeted credit programs
- Forward guidance
  - promises by policymakers to not increase interest rate targets when models suggest doing so
- Operating day-to-day with large reserve deposits

## “Conventional” policy includes

- Selecting and sustaining a desired short-term (overnight ) interest rate
  - Keep the banking system slightly short of desired liquidity at the target rate => sell deposits at the Fed to banks via market auctions
- Buying/selling government bonds
- Modern schemes use a “tunnel” with remuneration and lending rates
  - Pay interest on deposits at the central bank (remuneration rate)
  - Lend to depository institutions against good collateral

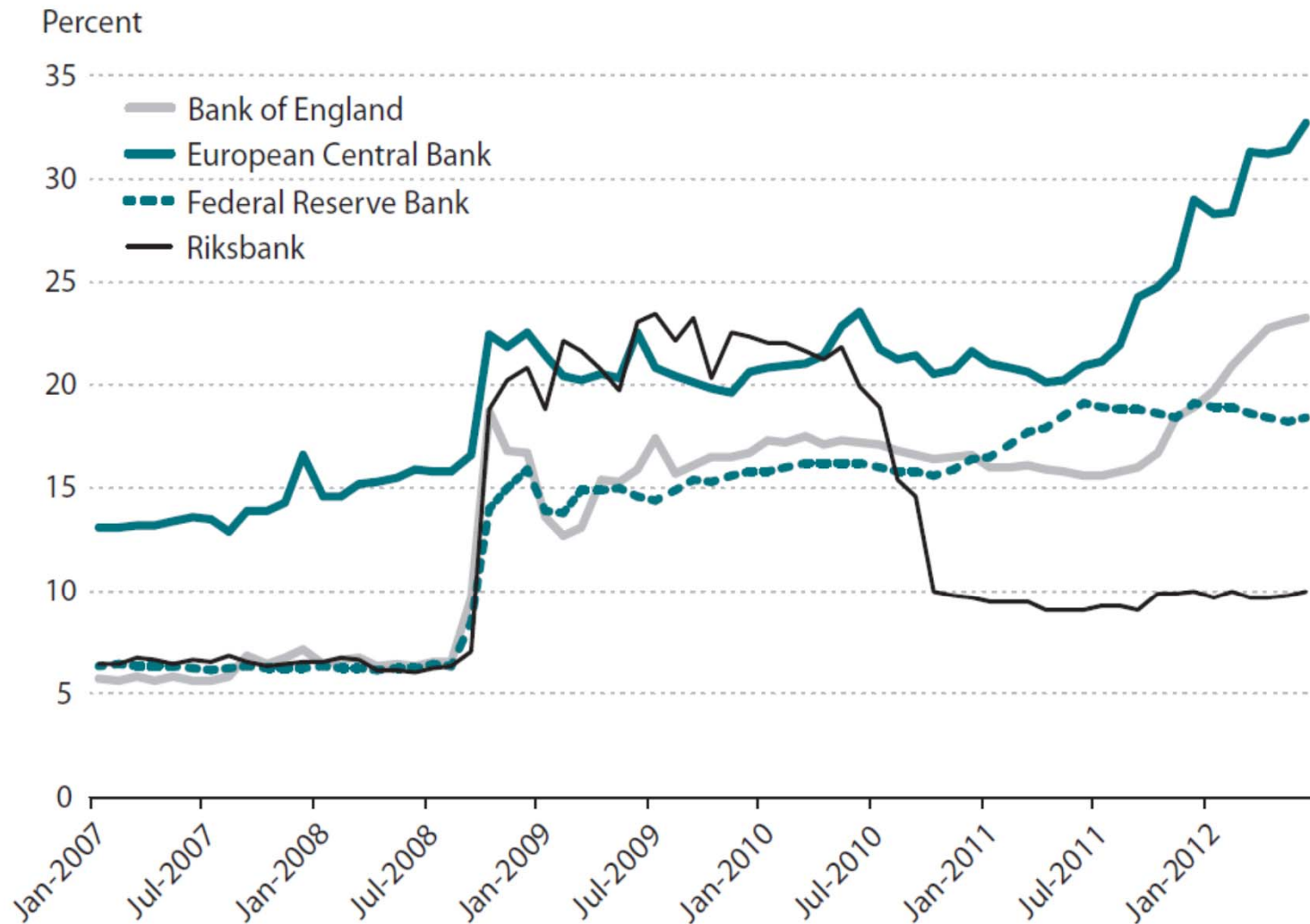
# Quantitative Easing and Large Scale Asset Purchases

- Global Financial Crisis and 2020 Pandemic
  - Policy Rates at Zero Lower Bound
  - Fiscal programs, pandemic assistance, credit assistance (sometimes forgiven)
  - Central bank balance sheets increase sharply
  - Little or no Increase in Inflation or inflation expectations
- Fry's writing was famous for its cross-country focus
  - Here, examine several countries
  - Canada, Japan, England, Euro Area, Federal Reserve, Riksbank, Switzerland
  - Pictures also show a few earlier episodes

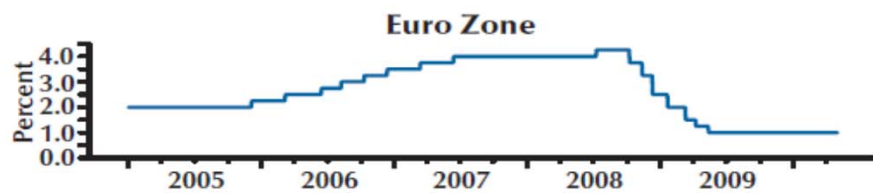
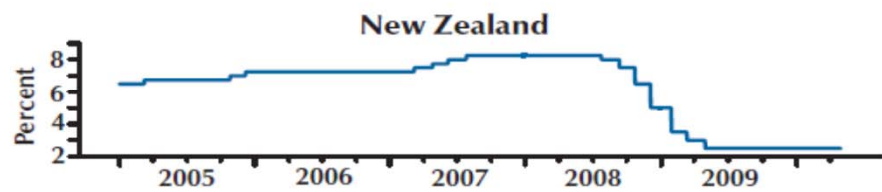
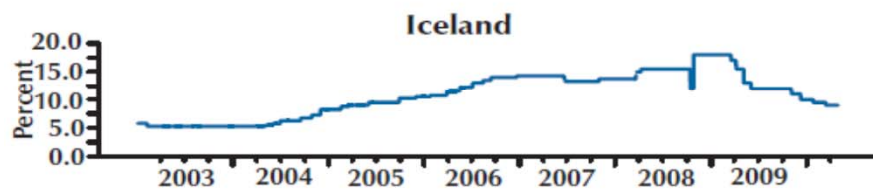
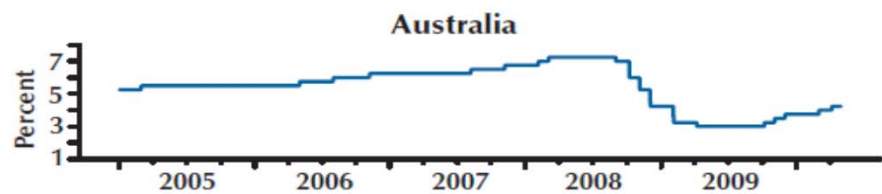
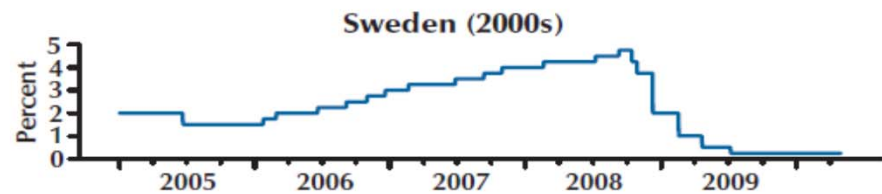
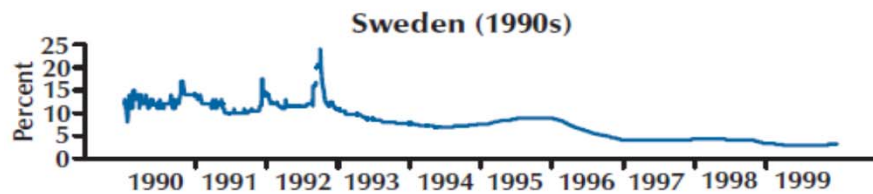
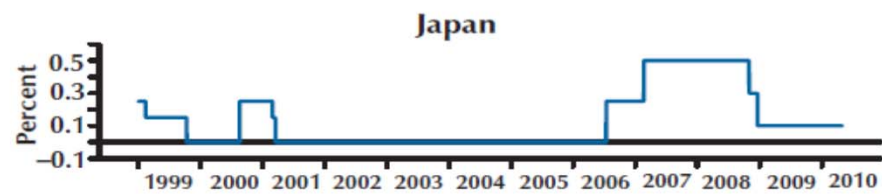
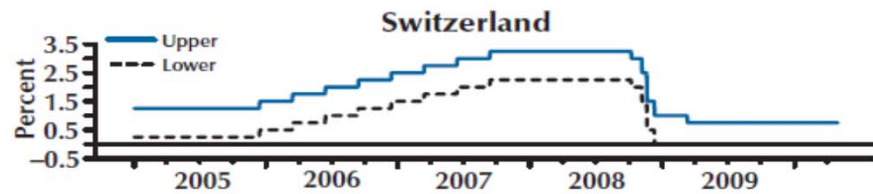
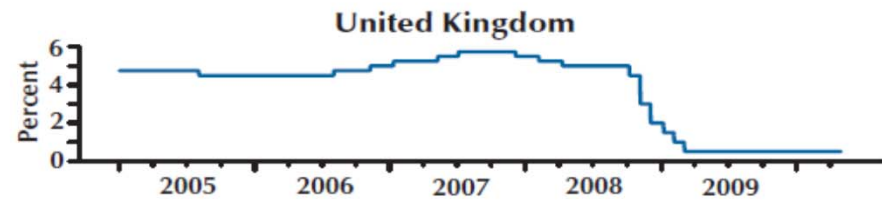
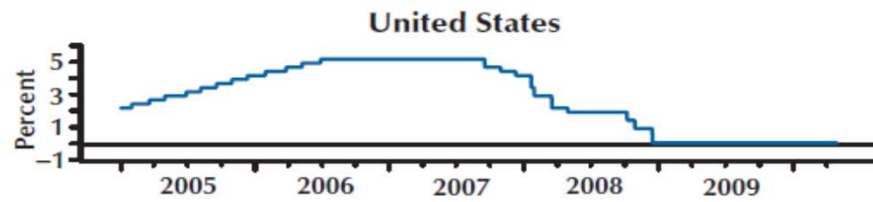
Source: Richard Anderson, Charles Gascon and Yang Liu, "Doubling Your Monetary Base and Surviving: Some International Experience." Federal Reserve Bank of St Louis Review, November/December 2010.

# Panic 2007-2009: Central Banks Response

## Central Banks' Total Assets as a Percent of Nominal GDP

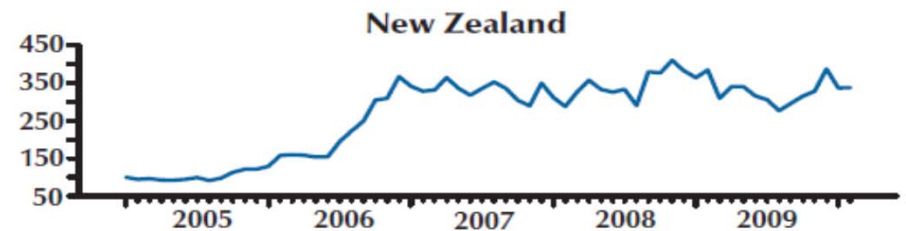
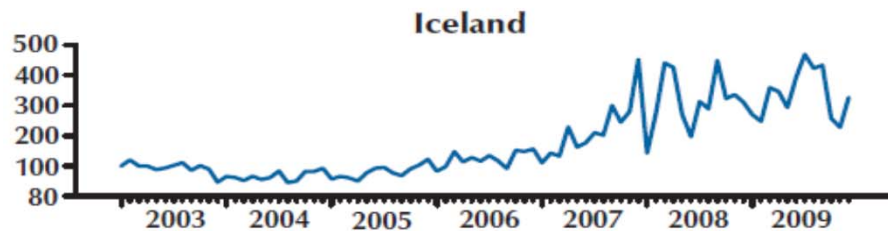
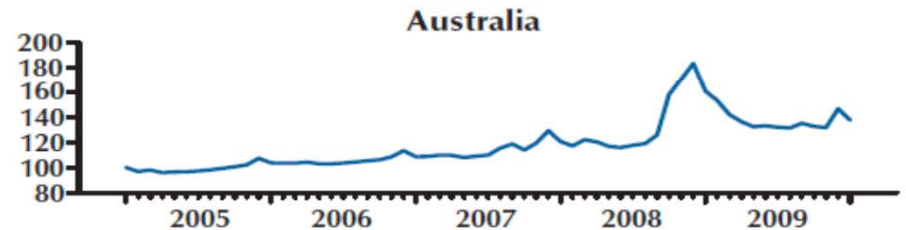
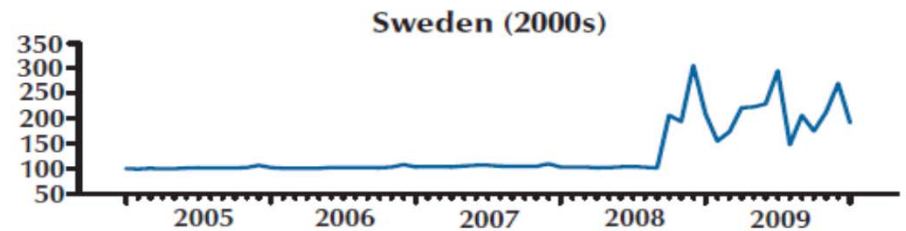
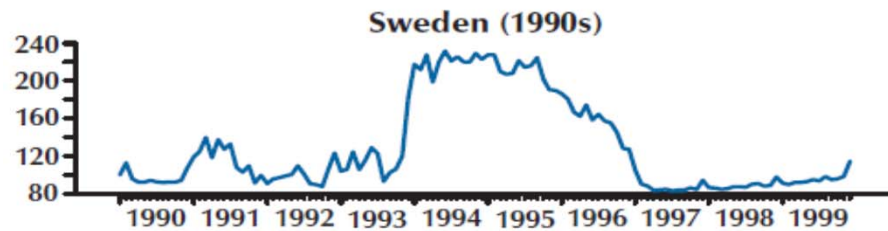
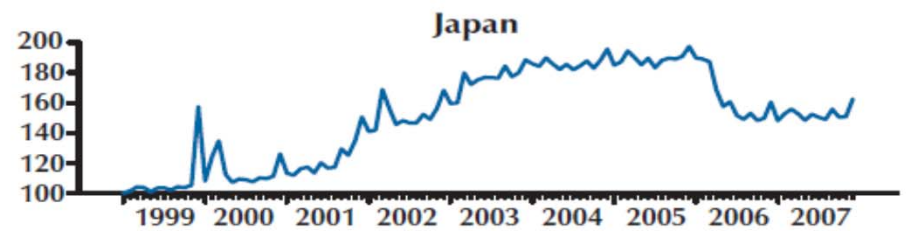
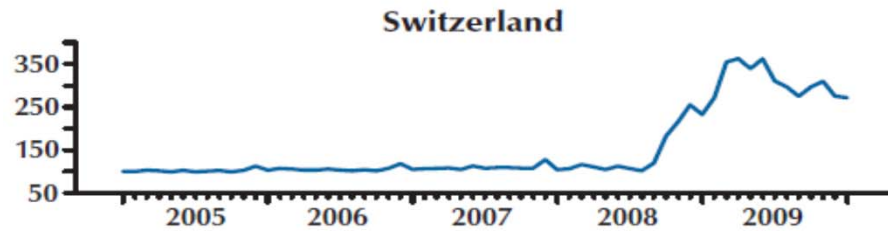
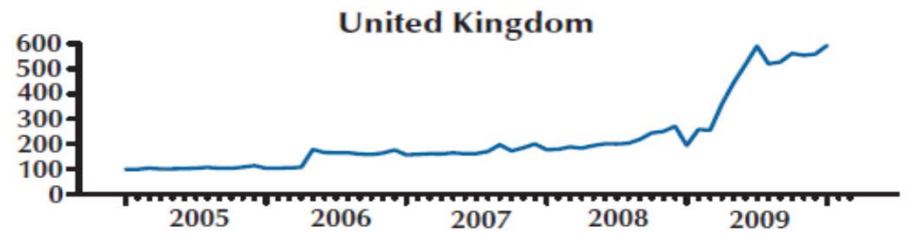
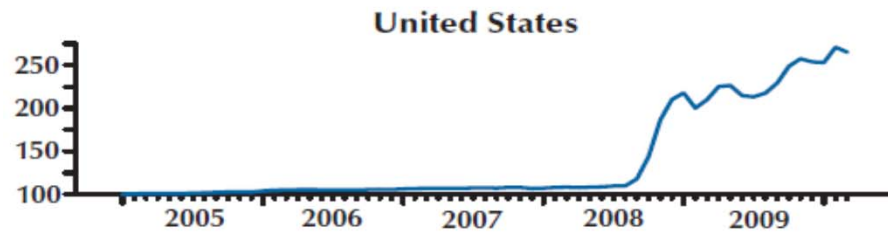


# With Central Bank Policy Rates near zero...



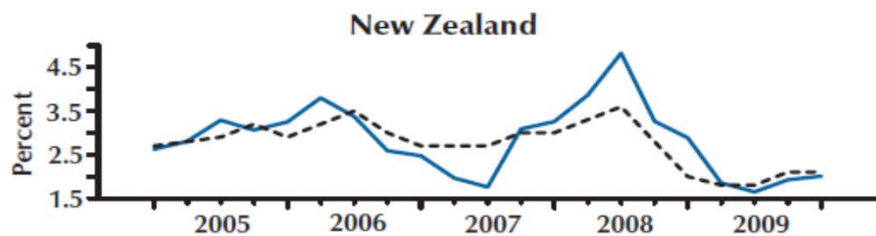
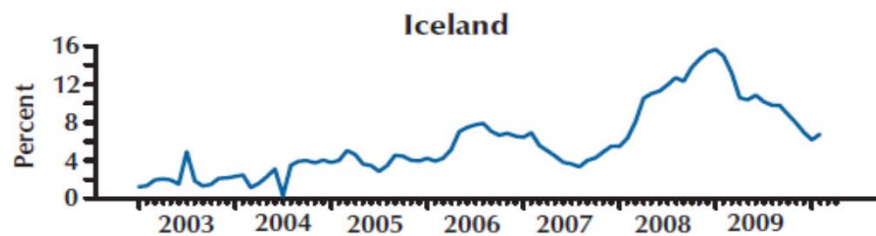
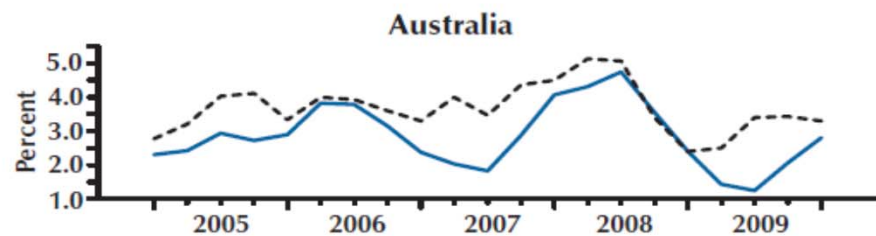
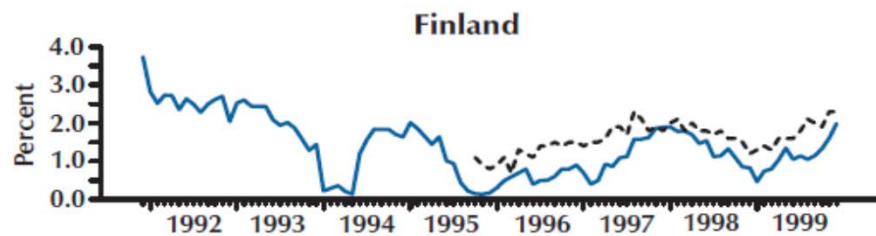
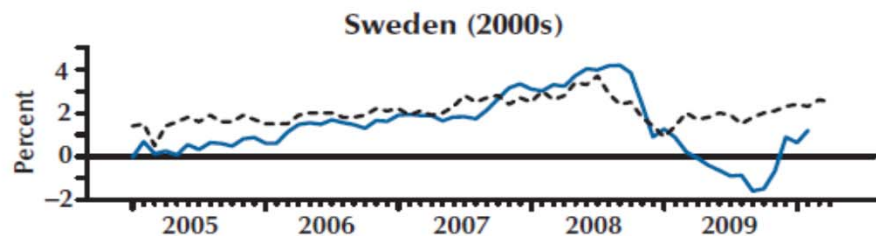
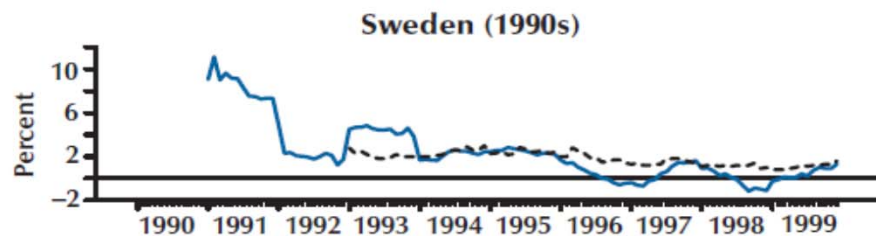
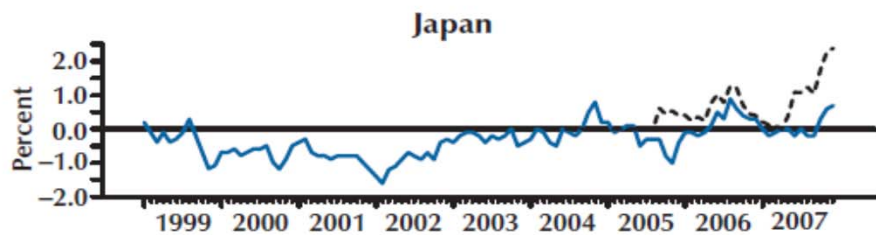
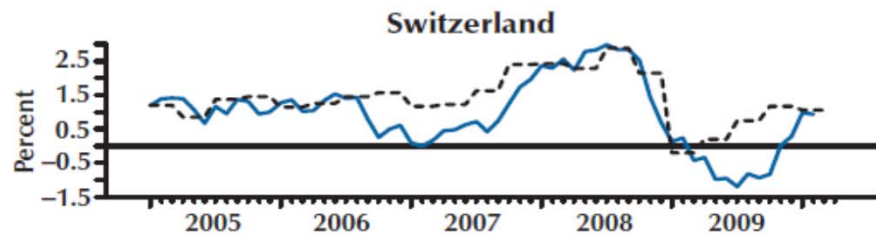
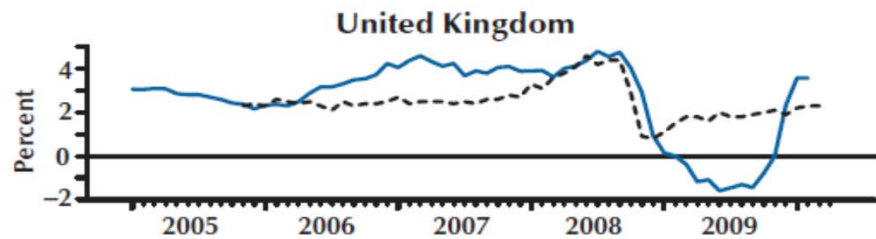
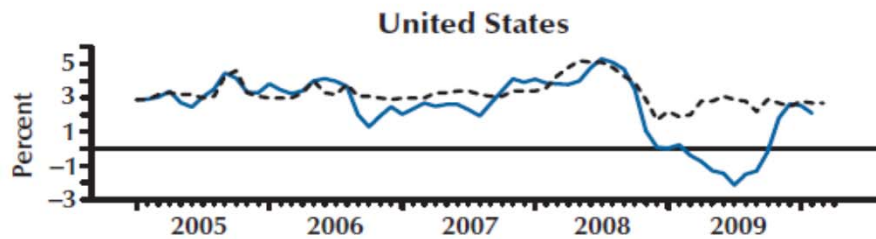


# There are large increases in their balance sheet liabilities



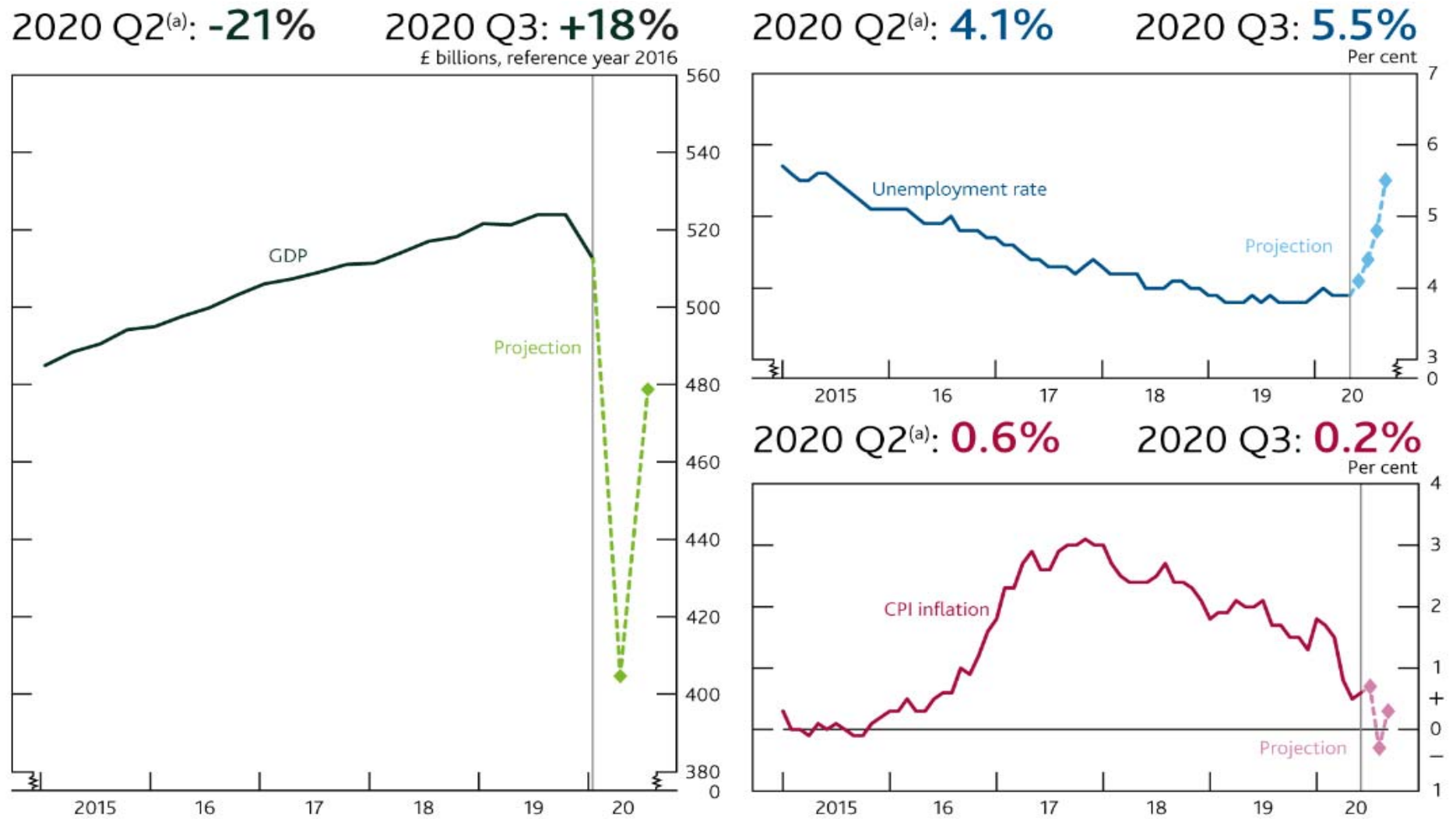


# With little change in inflation (How can that be?)



UK

# Pandemic and the U.K.

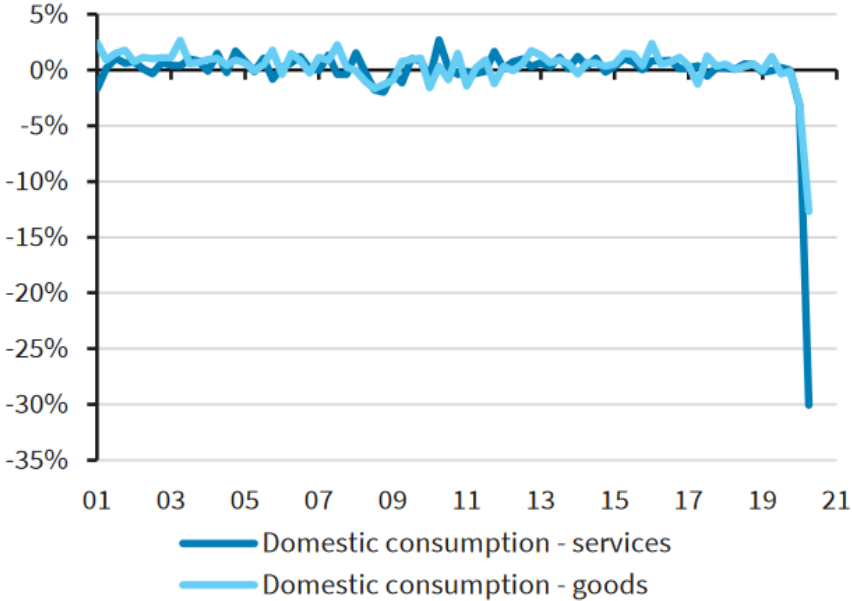


Source: Bank of England. Monetary Policy Report. August 2020

# Pandemic: UK

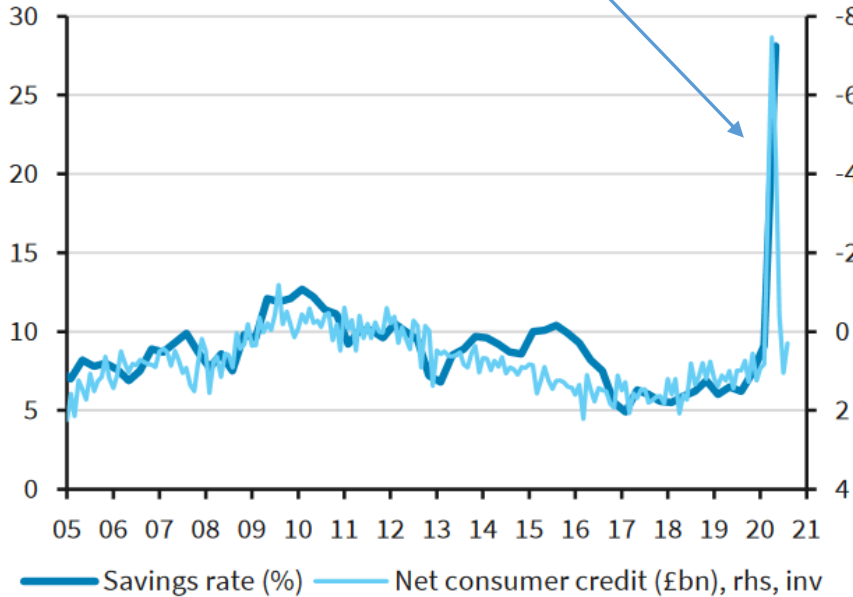
High savings rate => government borrowing and spending

Domestic consumption growth (% q/q), services vs goods



Source: ONS, Haver Analytics, Barclays Research

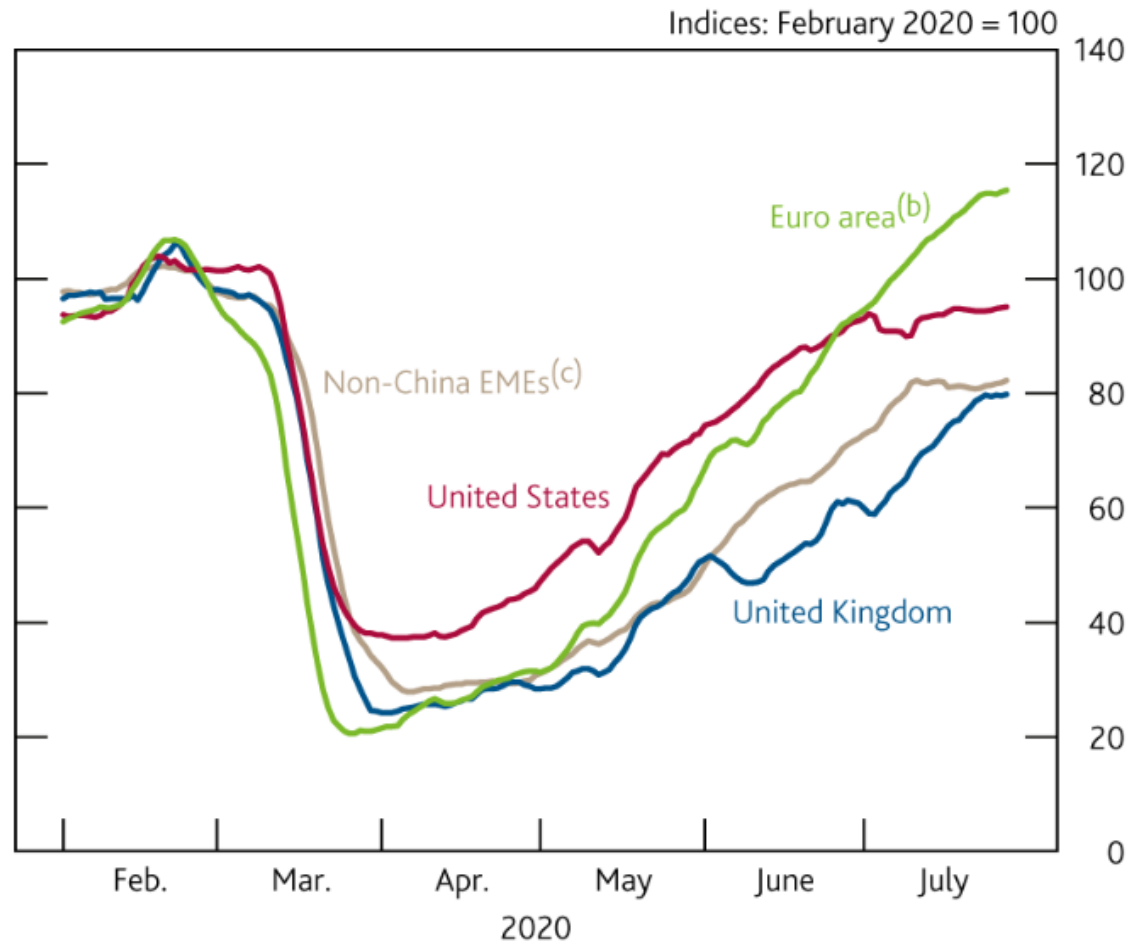
Record savings rate in Q2, followed by weak consumer credit in August



Source: ONS, BoE, Haver Analytics, Barclays Research

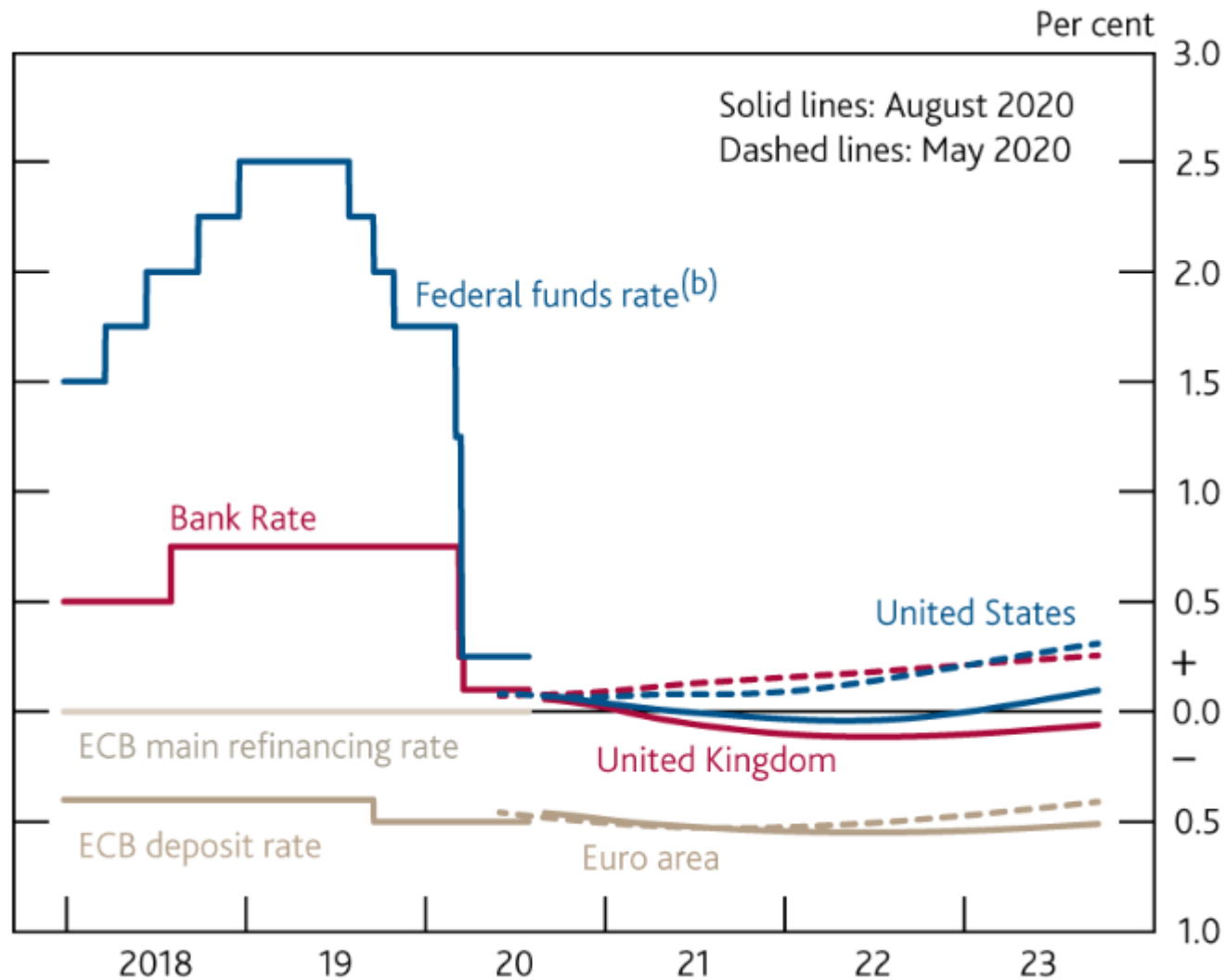
## Pandemic and the U.K.

**Chart 2.2** Activity was restricted by lockdown measures  
Apple mobility indices<sup>(a)</sup>



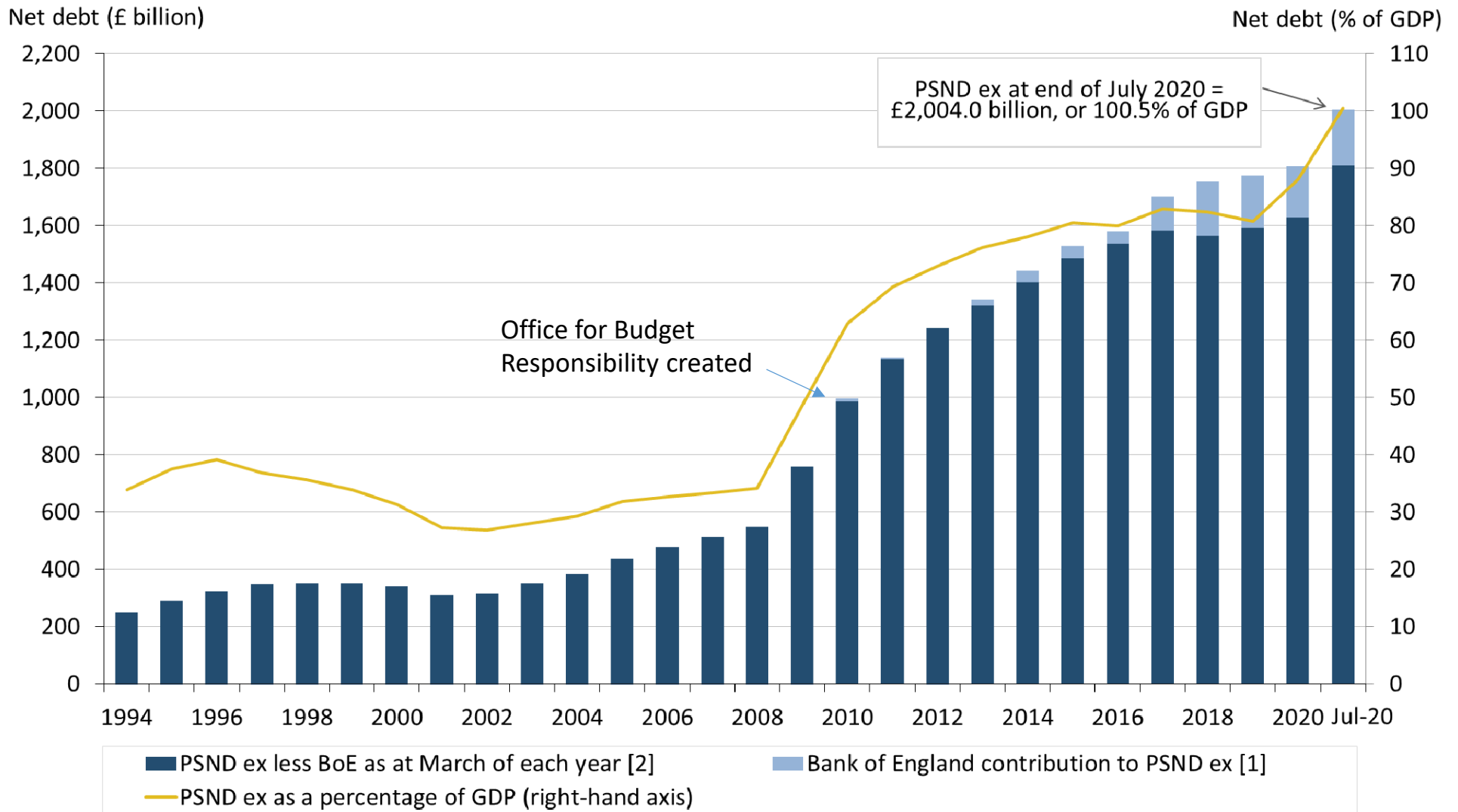
Source: Bank of England. Monetary Policy Report. August 2020

# Pandemic and the U.K.



Source: Bank of England. Monetary Policy Report. August 2020

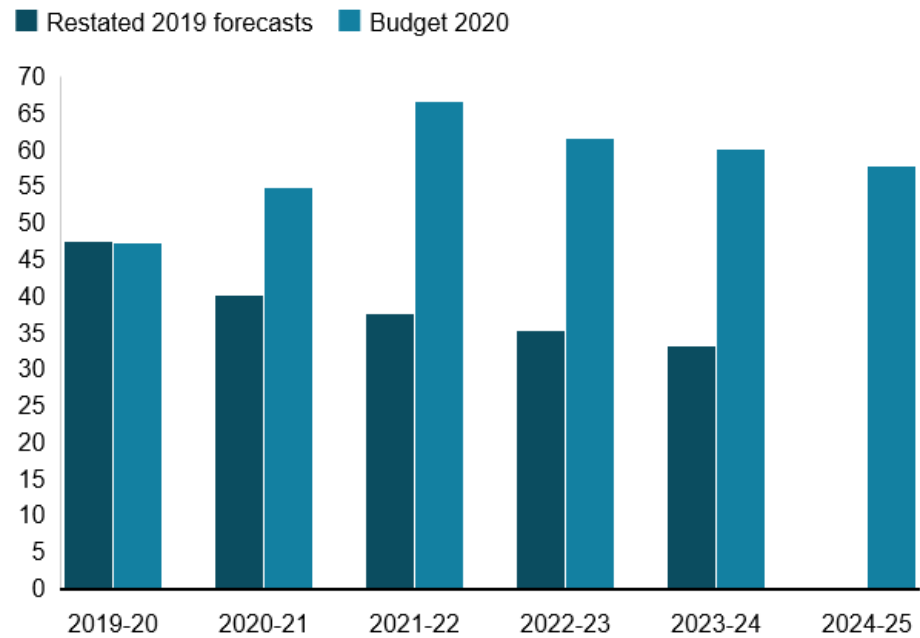
## UK Public Sector Net Debt (PSND) March 1993- July 2020



Source: Office of National Statistics

## Pre-Covid Borrowing in Budget of 11 March 2020

### Big increases in borrowing



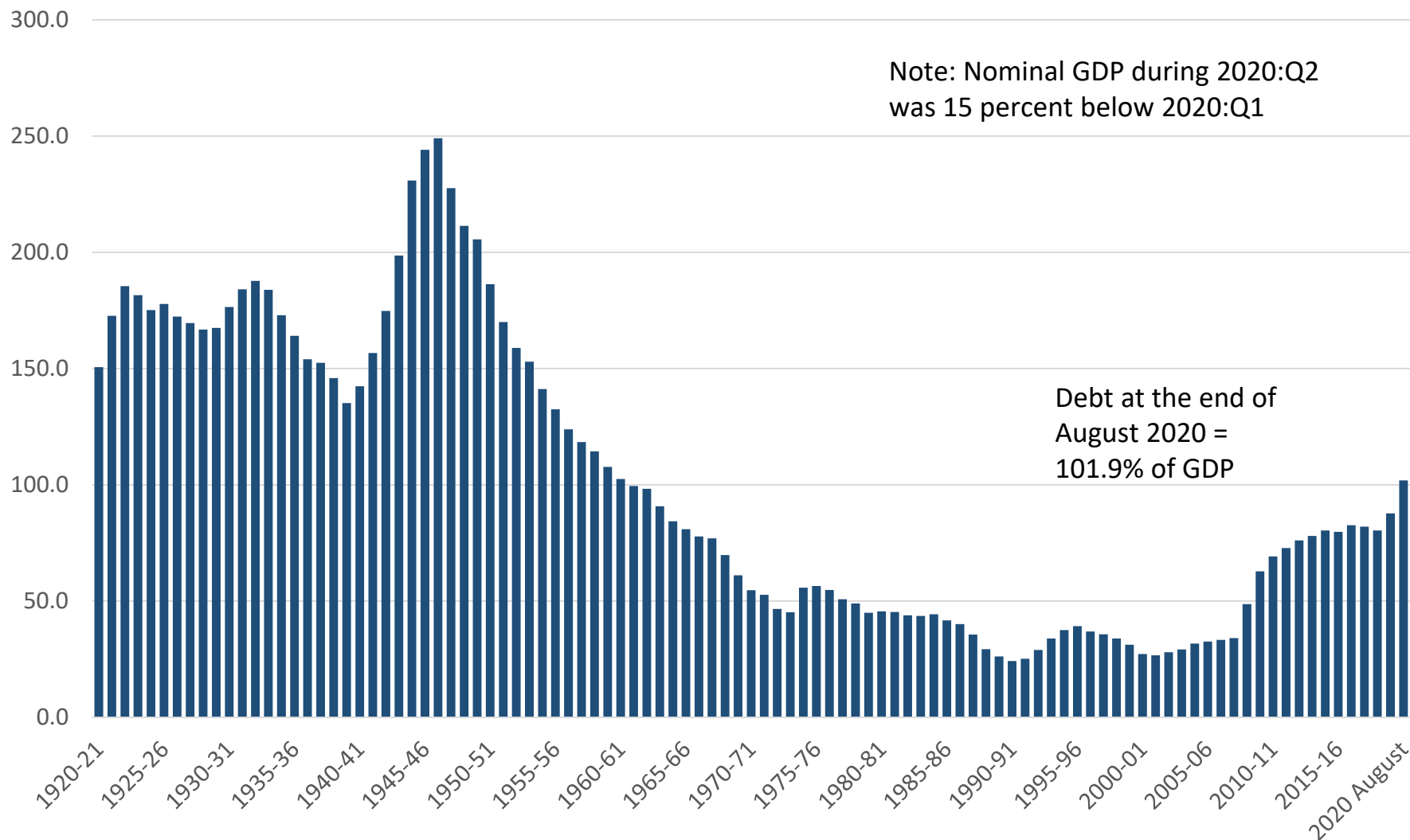
Source: OBR

BBC

Source: BBC. "Budget 2020: Chancellor pumps billions into economy to combat coronavirus" 11 March 2020



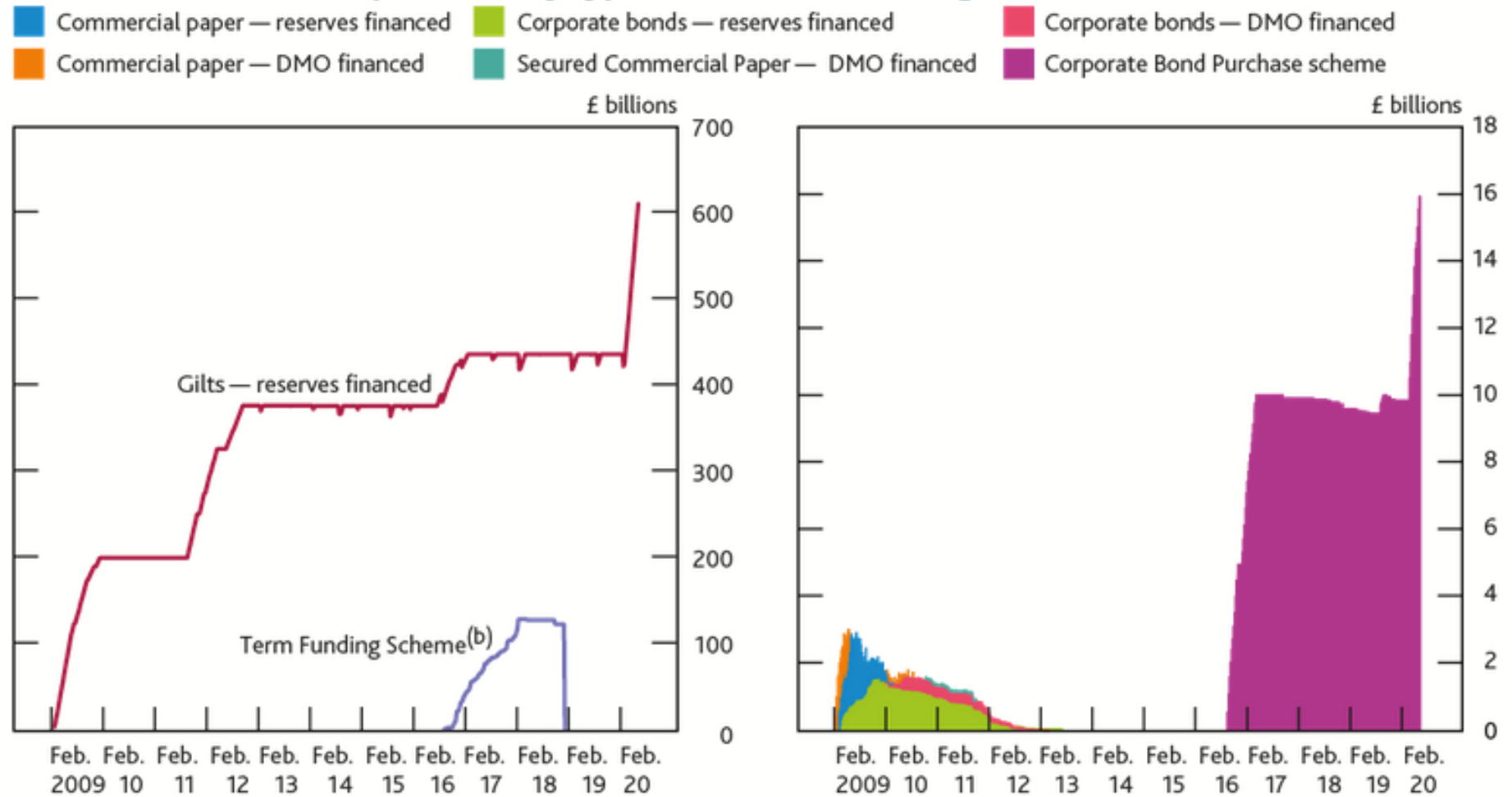
## UK Public Sector net debt excluding public sector banks, percent of GDP (financial year ending March 1921 to August 2020)



Source: Office of National Statistics

# Financial Assistance often Calls for Expansion of Bank of England balance sheet

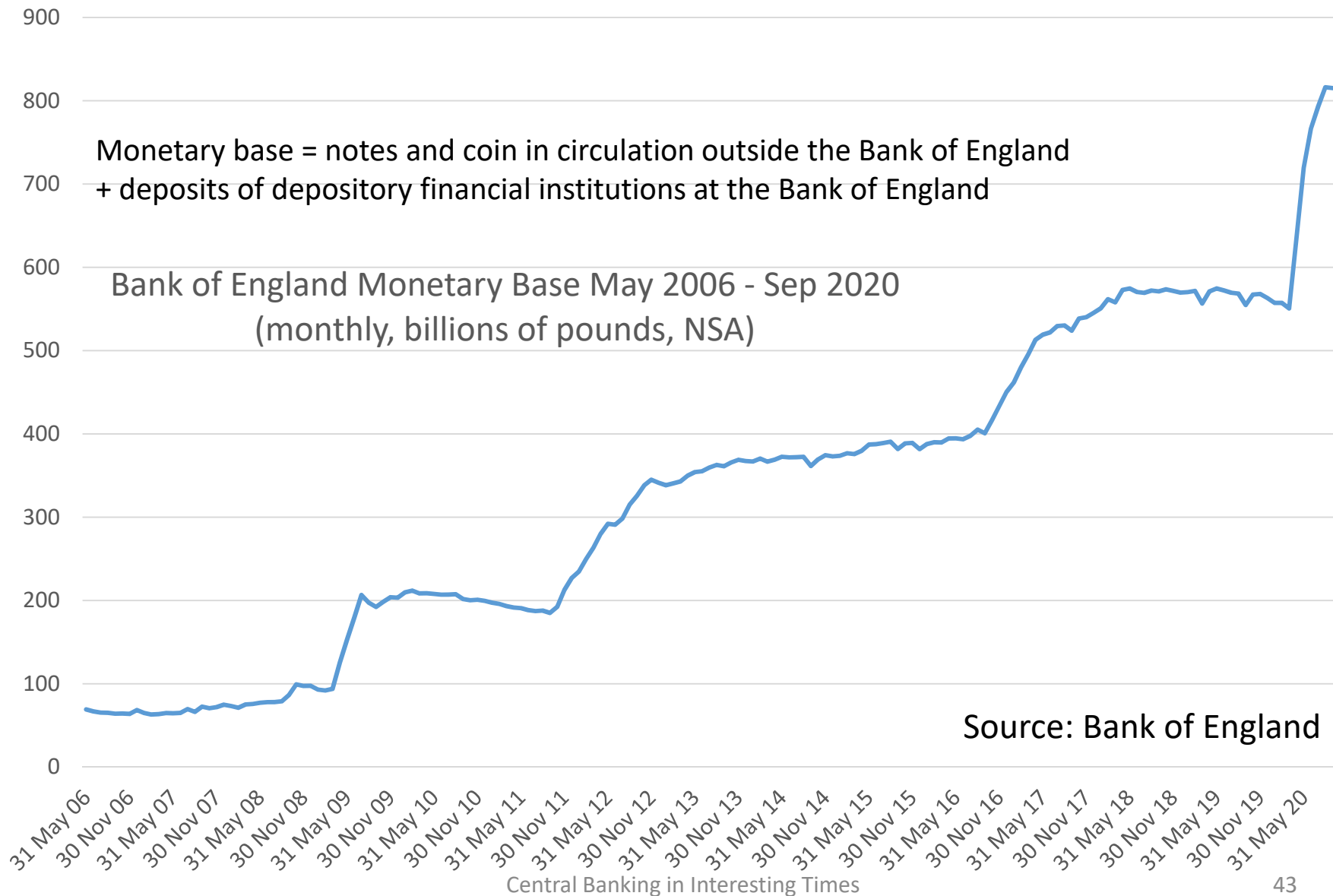
**Chart 1 Cumulative APF purchases by type: amounts outstanding (a)**



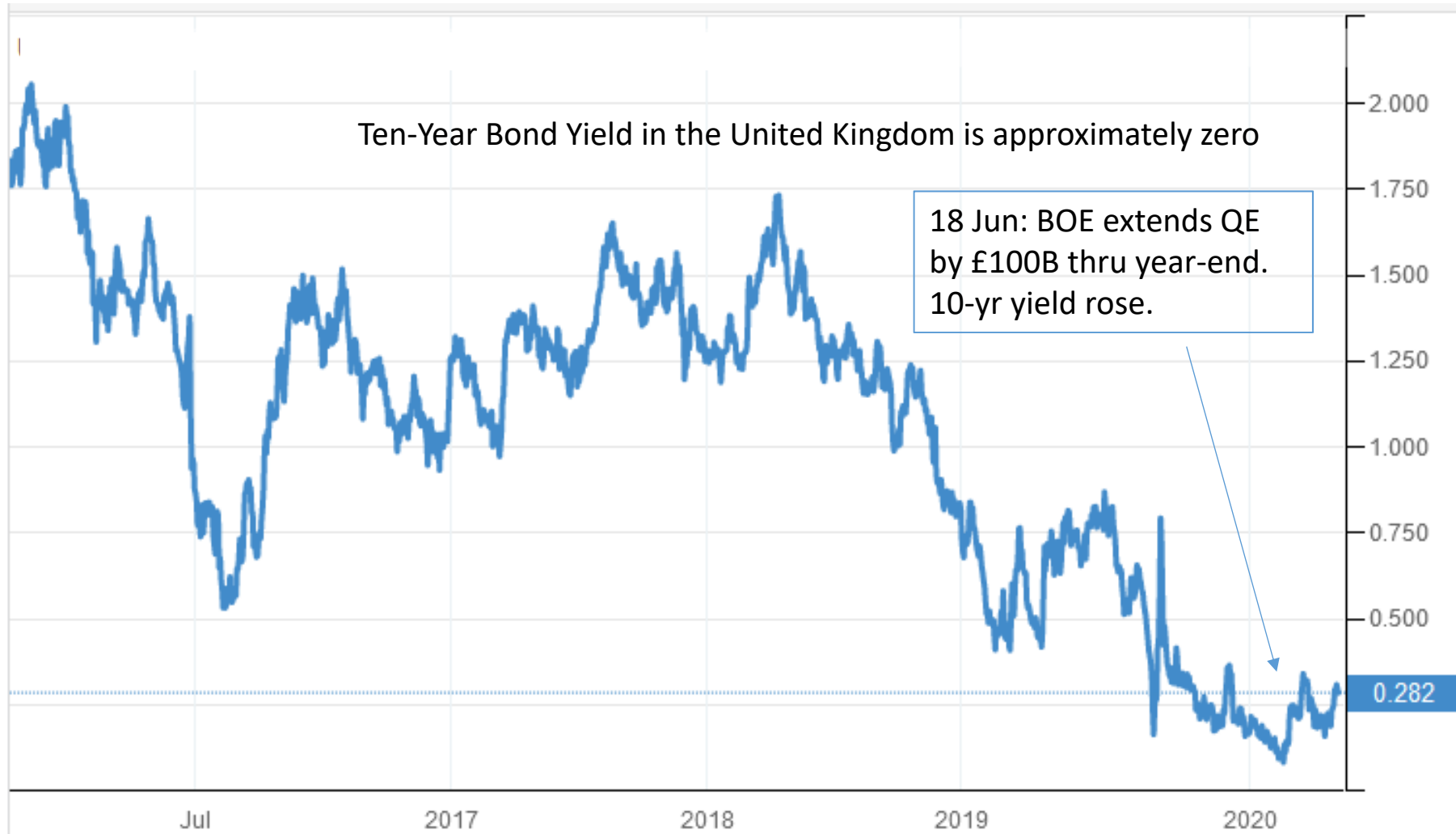
Source: Bank of England.

Source: “Asset Purchase Facility Quarterly Report – 2020 Q2”. Bank of England. 27 July 2020.

# Bank of England has financed a great deal of the assistance



## Markets Do Not Appear to be Expecting Higher Inflation



## Markets Do Not Appear to be Expecting Higher Inflation

UK: Expected Inflation

**Chart 14:** Financial-market measures of inflation expectations have been stable



Sources: Bloomberg Finance L.P., TradeWeb and Bank calculations.

Source: Ben Broadbent. Government Debt and Inflation (2 September 2020)

## Someone at the Bank of England seems concerned...

### The U.K.: Two Recent Speeches

(1) Gertjan Vlieghe. Monetary Policy and the Bank of England's Balance Sheet (23 April 2020)

(2) Ben Broadbent. Government Debt and Inflation (2 September 2020)

#### Vlieghe on monetary finance:

- *We carried out several rounds of QE operations after the financial crisis, expecting them to be unwound some years later as the economy improved sufficiently. But the economy did not improve sufficiently, the neutral rate of interest fell more persistently than we expected, with the result that the amount of gilts we own has so far not been reduced.*
- *Before the crisis, central bank money (notes and reserves) in the UK was about 12% of government debt. Now it is 26% of government debt.*
- *There is no clear threshold beyond which monetary financing is 'too much', as long as investors believe government finances are sustainable without resorting to inflation.*
- *The low levels of government bond yields and break-even inflation rates in the UK [suggest that], investors clearly do believe that government finances are sustainable without resorting to inflation.*

## Broadbent on monetary finance...

- *Aggressive monetary easing by central banks, occurring as it has alongside very large government deficits, has raised fears in some quarters about ‘monetary finance.’ These are misplaced.*
  - *“coincidence in time of easier monetary policy and a higher government deficit”*
  - *“monetary finance” is not occurring if agents expect the debt increase to be limited in size and eventually reversed*
  - *The rapid inflation of the 1970s and early 1980s occurred when public-sector debt was much lower than during those two episodes but when there was no stable anchor for monetary policy*
  - *For policy to be effective that regime has to be credible. Indeed, without such credibility – without confidence that fiscal outcomes are a matter for fiscal policy, with monetary policy assigned to controlling a nominal objective – it’s not clear that QE would even work in the first place.*
- Then what of the economics that says “mobilizing savings” should be reversed via large primary surpluses?

## Summary

Office for Budget Responsibility (11 March 2020)

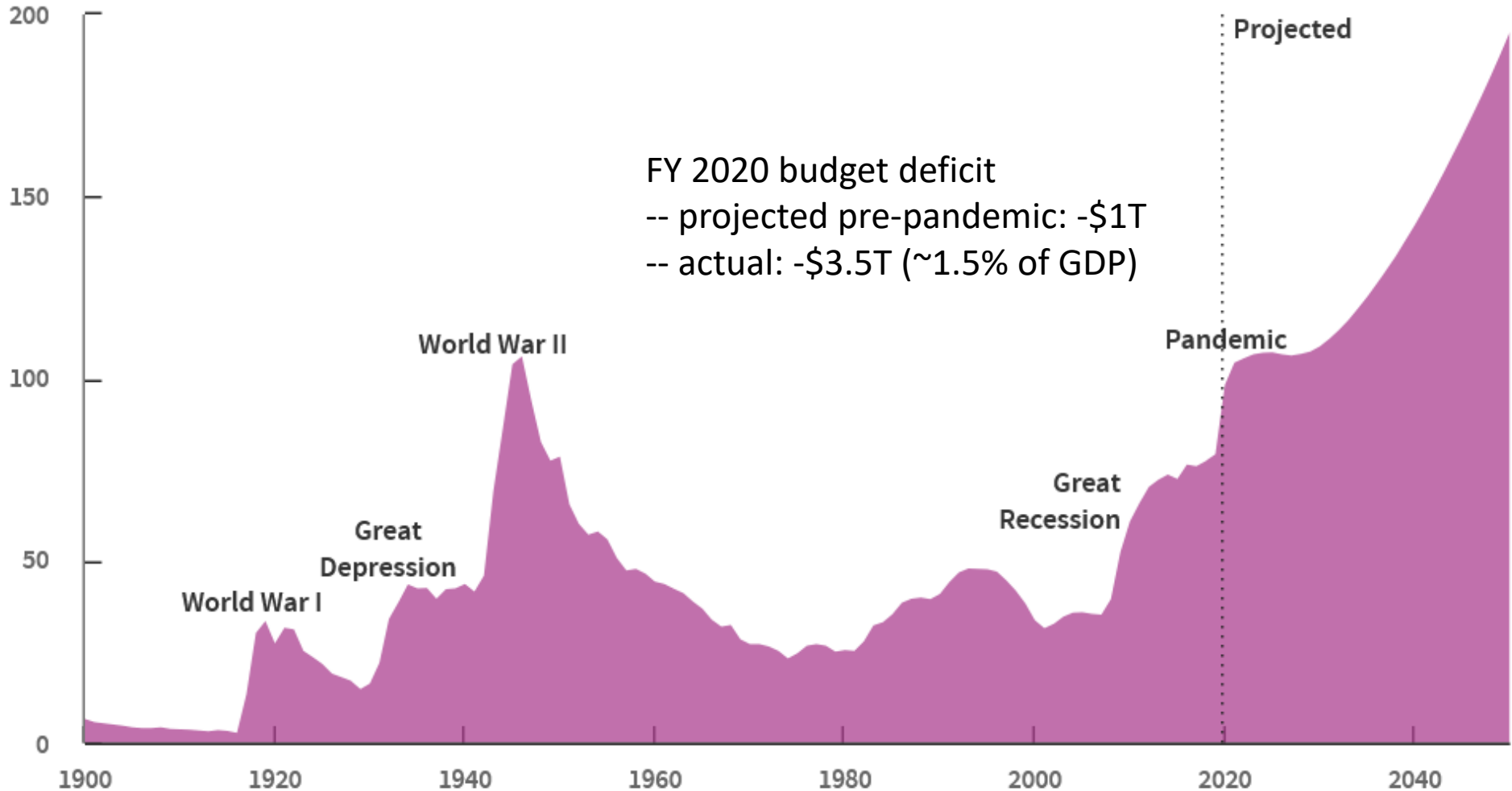
- *The debt-to-GDP ratio is twice as high as in the pre-crisis [GFC] period, the stock of index-linked gilts is much larger and the Bank of England's asset purchases have shortened the effective maturity of the public debt.*
- *Taking both fresh borrowing and the need to roll over existing debt into account, the government's gross financing requirement averages around £150 billion a year over the next five years, around half as much again as a share of GDP as in the five years prior to the financial crisis even though the budget deficit is around a fifth smaller.*
- Rather than aim for budget balance and a clear decline in the debt-to-GDP ratio, ... the new administration is content to borrow significant sums on an ongoing basis and merely to stabilize the debt-to-GDP ratio.
- This looks sustainable over the medium term on current interest rate and growth forecasts.
- => *This fragile assessment was prior to the pandemic...*



US

# Federal Debt Held by the Public 1900-2050

Percentage of Gross Domestic Product



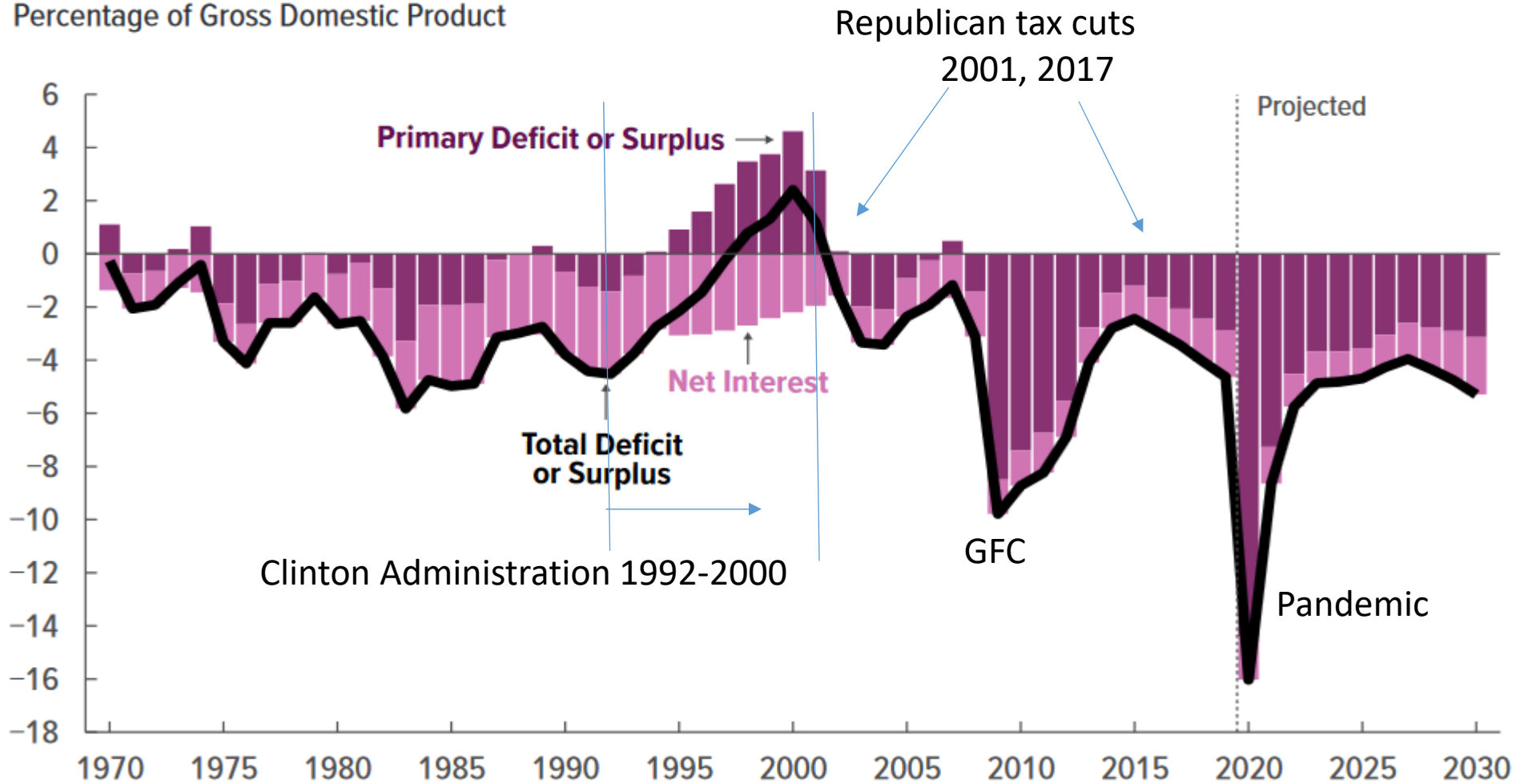
Source: Congressional Budget Office

# United States: An Unsustainable Fiscal Path

Figure 2.

## Total Deficit, Primary Deficit, and Net Interest

Percentage of Gross Domestic Product

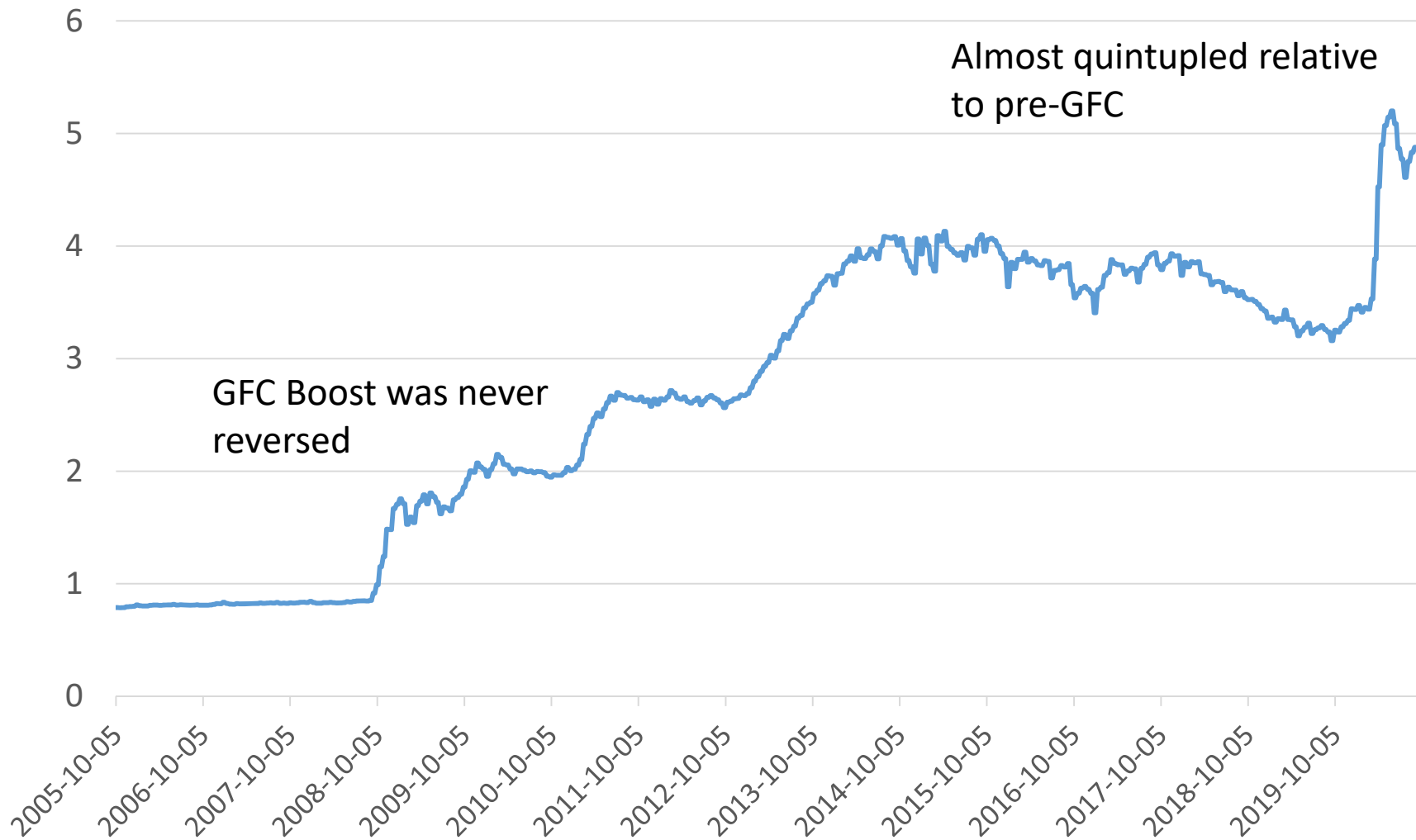


Source: Congressional Budget Office September 2020

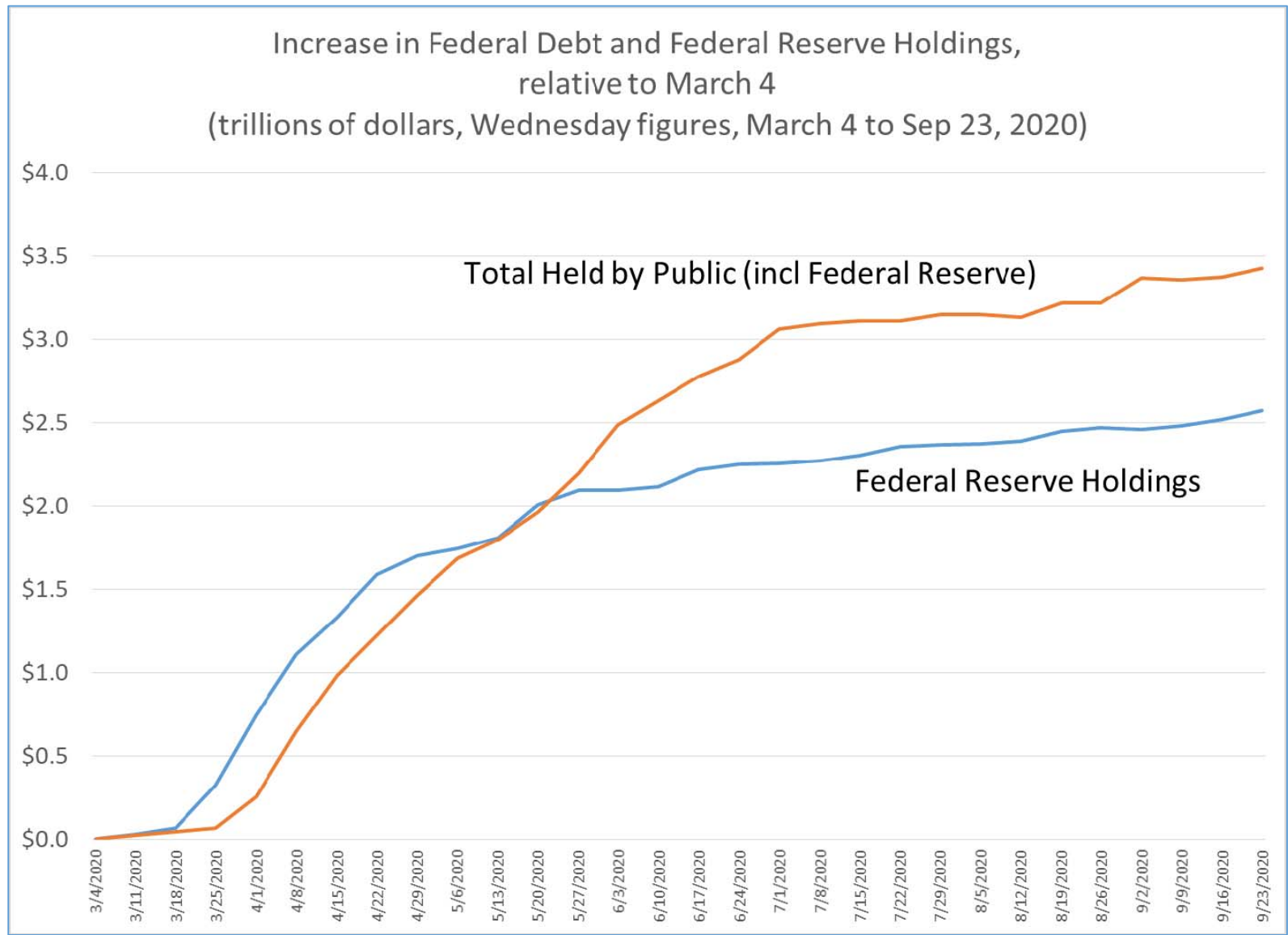
Primary deficits or surpluses exclude net outlays for interest.

# Federal Reserve Monetary Liabilities

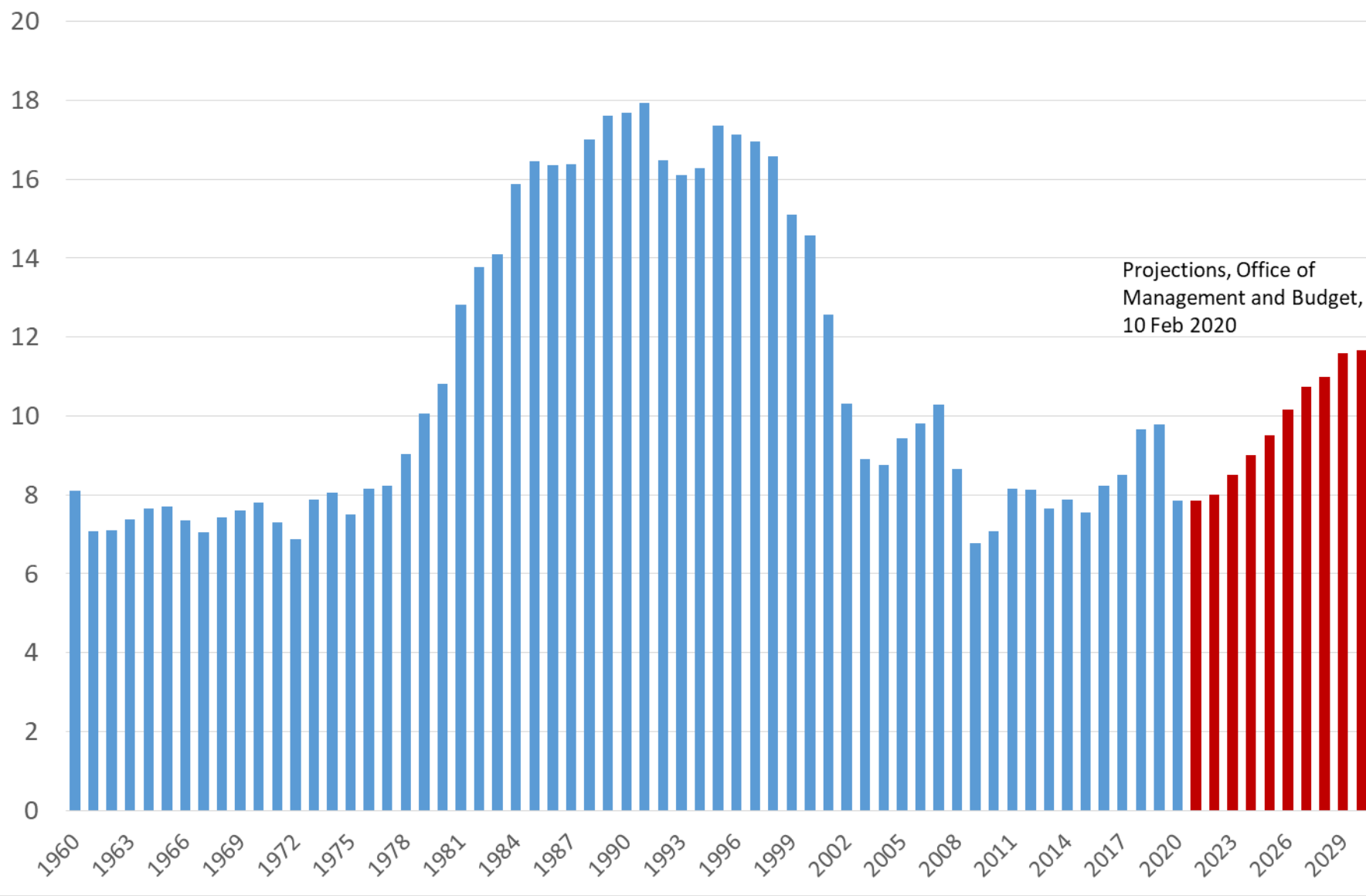
Federal Reserve Monetary (source) Base  
(trillions of dollars, weekly, Oct 2005-Sep 2020)



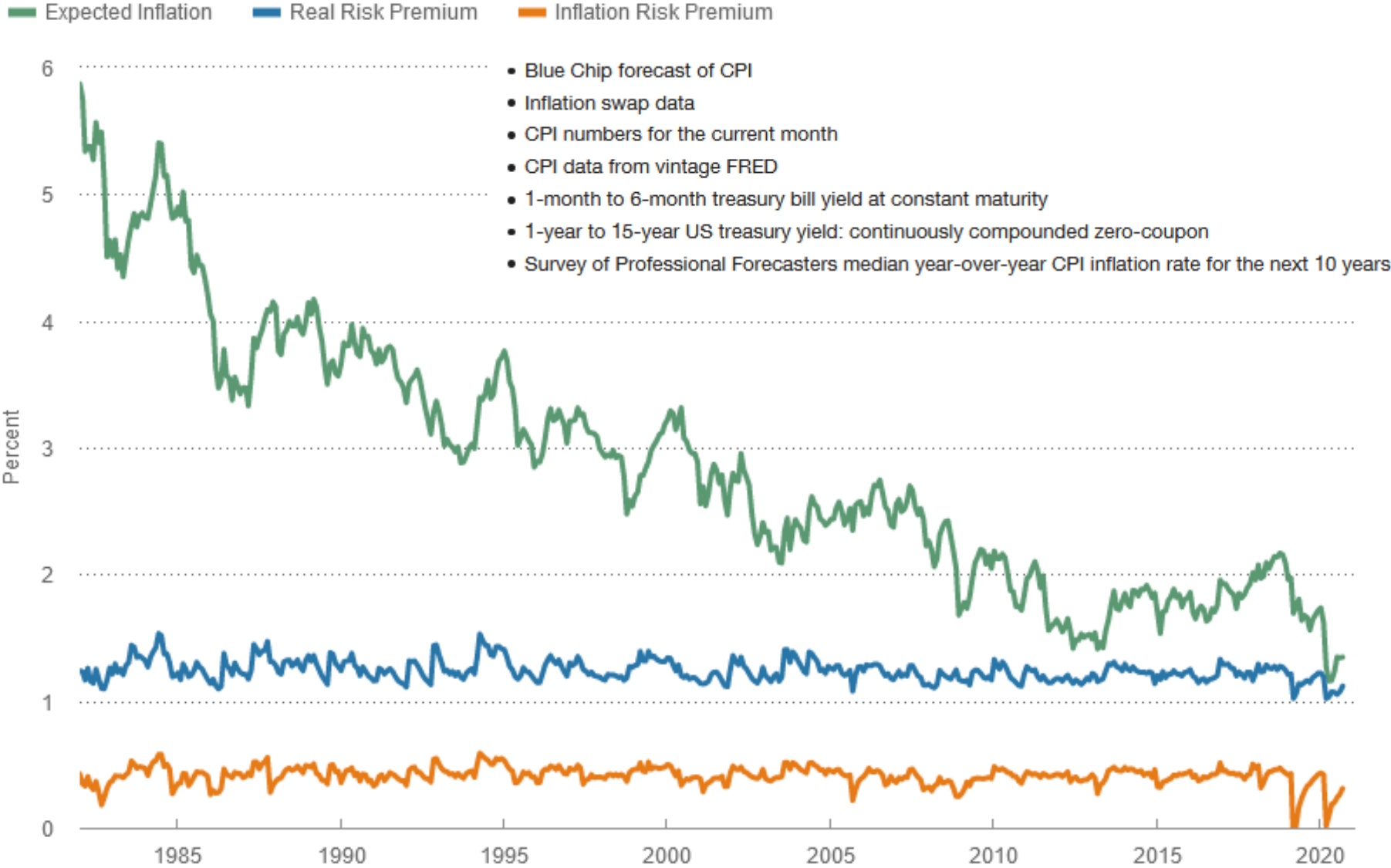
# 2020: Federal Reserve Finance of Deficit Spending



# US Federal Government: Interest as Percent of Total Expenditures (percent, annual, NSA)

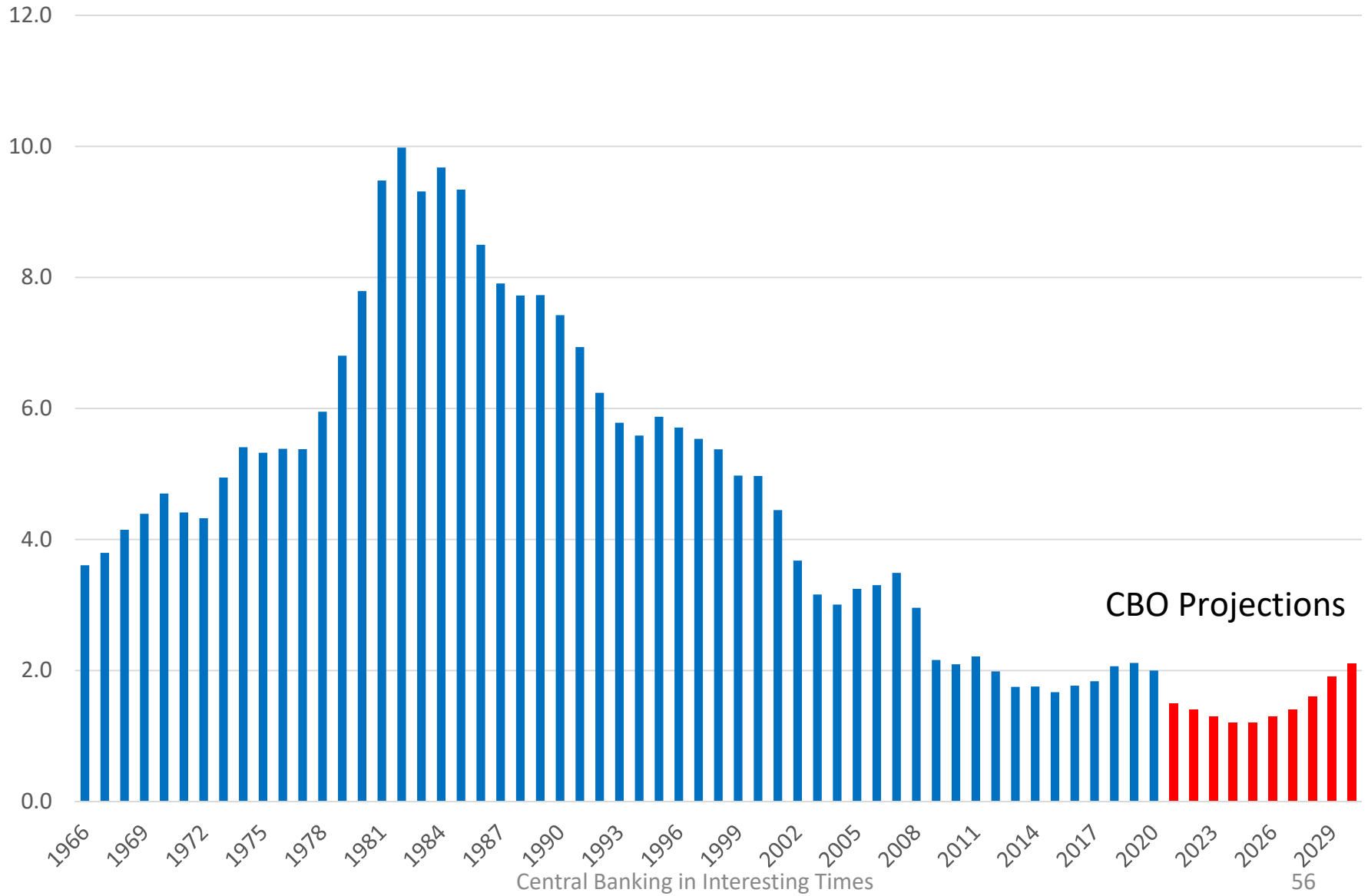


# Ten-Year Expected Inflation and Real and Inflation Risk Premia



Source: Federal Reserve Bank of Cleveland

# Average interest rate paid on US federal debt (annual, percent)





# Federal Reserve: a Laundry List of Fiscal-Like Programs

## Global Financial Crisis

- Term Auction Facility
- Primary Dealer Credit Facility
- Term Securities Lending Facility
- Commercial Paper Funding Facility
- Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility
- Money Market Investor Funding Facility
- Term Asset-Backed Securities Loan Facility
- LSAP
  - Sept 2012: buy agency-backed mortgage backed securities (\$40/mo)
  - Jan 2013: buy long-dated Treasuries \$45b/mo
  - Jan 2014: begin tapering off purchases

## Pandemic

- Primary Dealer Credit Facility
- Commercial Paper Funding Facility (launched July 6)
- Money Market Mutual Fund Liquidity Funding Facility (launched Mar 23)
- Term Asset-Backed Securities Loan Facility (launched May 20)

# The Federal Reserve's Fiscal Role: Pandemic

- Fry emphasized that Central Banks, in extraordinary times, may be pressed into a fiscal role

## Example: 2020 Federal Reserve Response to Pandemic

- Combination of non-targeted credit (asset purchases) and targeted credit

### 1. *The Municipal Liquidity Facility*

- Backstop private investors in the municipal securities market by purchasing short-term securities
- SPV at FRBNY.
- Up to \$500 bil of short-term notes (include all U.S. states, counties with a population of at least 500,000 residents, cities with a population of at least 250,000 residents, certain multistate entities, and revenue-bond issuers designated as eligible issuers by their state governors)
- Penalty above-market interest rates
- \$35 bil Treasury equity investment
- As of September 18, two issues, \$1.7 bil.
- Successful: municipal securities rates are now at or near historic lows
- Mirrors GFC success of commercial paper funding facility (CPFF)
- => Creation sufficient... little usage

## The Federal Reserve's Fiscal Role: Pandemic (con't)

### 2. *Main Street Lending Program* (launched July 6)

- SPV at FRB Boston, up to \$600B, with 5 credit facilities: the Main Street New Loan Facility (MSNLF), the Main Street Priority Loan Facility (MSPLF), the Main Street Expanded Loan Facility (MSELF), the Nonprofit Organization New Loan Facility (NONLF), and the Nonprofit Organization Expanded Loan Facility (NOELF).
- “Small and medium-sized businesses and nonprofit organizations that were in sound financial condition before the onset of the COVID-19 pandemic and that have good longer-term prospects but which have encountered temporary cash flow problems due to the pandemic, and are not able to get credit on reasonable terms as a result.”
- Businesses with less than 15,000 employees or 2019 revenues of less than \$5 billion
- Loan sizes from \$250,000 to \$300 million across the facilities. 5 year maturity. No principal payments in the first two years. No interest payments in the first year.
- Lenders retain participation. Loans may not be forgiven.
- \$75 billion Treasury equity
- As of September 18, nearly 600 lenders representing more than half of U.S. banking assets have registered to participate in the program and the program has purchased over \$1 billion in participations.

## The Federal Reserve's Fiscal Role: Pandemic (con't)

### 3. Primary Market Corporate Credit Facility; Secondary Market Corporate Credit Facility (launched March 23)

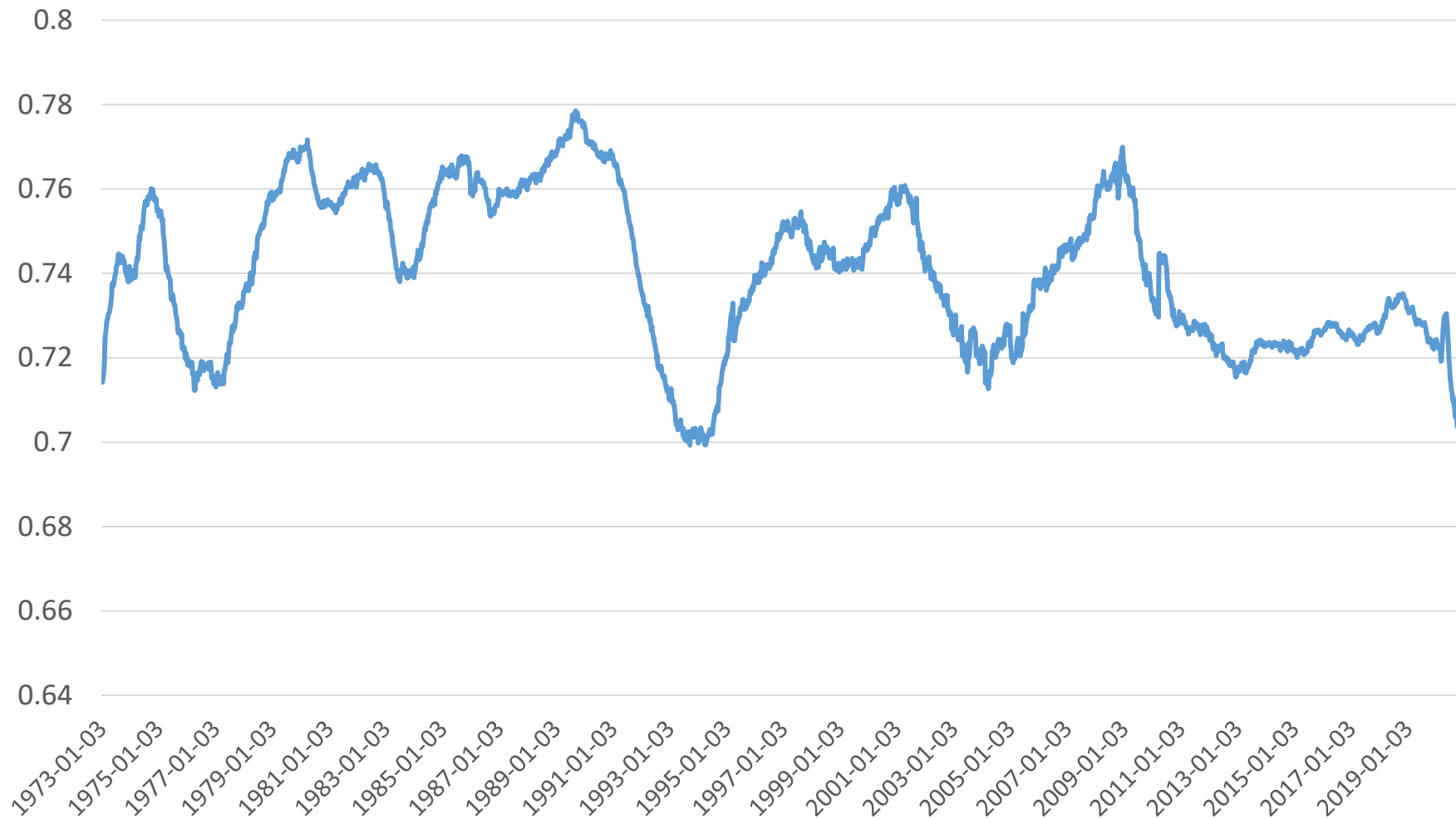
- SMCCF SPV purchases corporate bonds issued by investment-grade U.S. companies, U.S. companies that were investment grade before the onset of the pandemic and remain near-investment-grade, and U.S.-listed exchange-traded funds (ETFs) whose investment objective is to provide broad exposure to the market for U.S. corporate bonds.
- PMCCF SPV purchases qualifying bonds and syndicated loans with maturities up to four years either as the sole investor in a bond issuance or as a participant in a loan or bond syndication at issuance, where the facility may purchase a maximum of 25 percent of the syndication.
- SPVs at Federal Reserve Bank of New York.
- Between March 23 and April 6, credit spreads for investment-grade bonds declined substantially.
- \$75 bil equity participation by Treasury (one-third SMCCF)
- As of September 18, SMCCF outstanding value \$12.8 billion, PMCCF \$0
- While the PMCCF has not purchased any bonds since it opened, it serves as a backstop should markets enter another period of stress.

## 2020 Federal Reserve Response to Pandemic (con't)

### 4. *Term Asset-Backed Securities Loan Facility* (launched May 20)

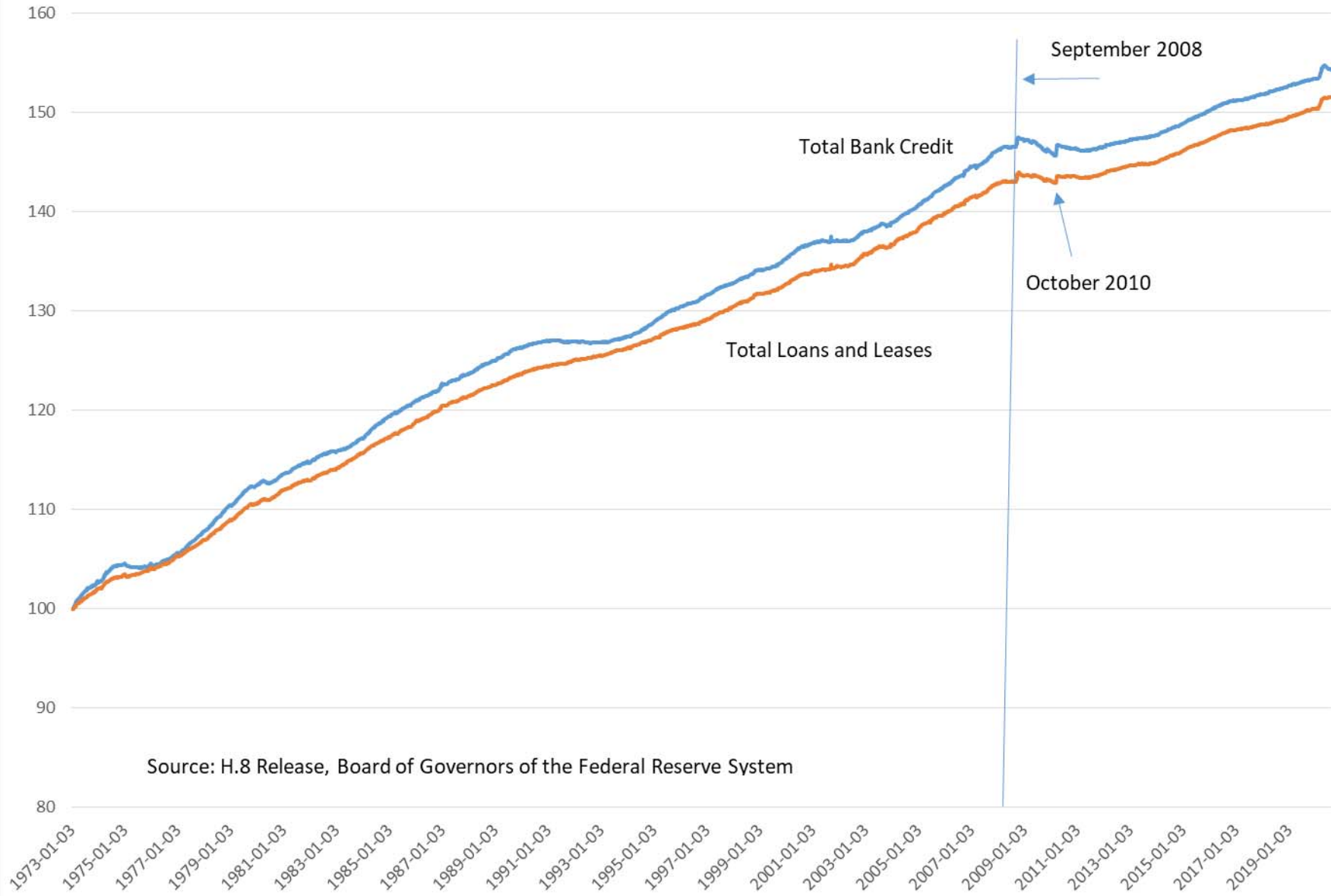
- Support the issuance and improve liquidity of asset-backed securities (ABS) guaranteed by newly and recently originated consumer and business loans.
- Penalty rates. Attractive to borrowers when market conditions are stressed, but not in normal conditions.
- SPV at Federal Reserve Bank of New York. Up to \$100 bil of three-year term loans available to holders of certain triple A-rated ABS backed by student loans, auto loans, credit card loans, loans guaranteed by the Small Business Administration (SBA), SBA-guaranteed ABS, commercial mortgage-backed securities (CMBS), and premium-finance and student-loan ABS.
- \$10 bil equity investment by Treasury
- As of September 18, the TALF had extended \$2.9 bil in loans
- TALF has improved liquidity in the ABS markets, including those for CMBS and collateralized loan obligations. Spreads in some ABS sectors have returned close to normal levels.

# Loans and Leases as a Share of Total Bank Assets (1973-2020, weekly, NSA)



Source: Federal Reserve Board H.8 Release

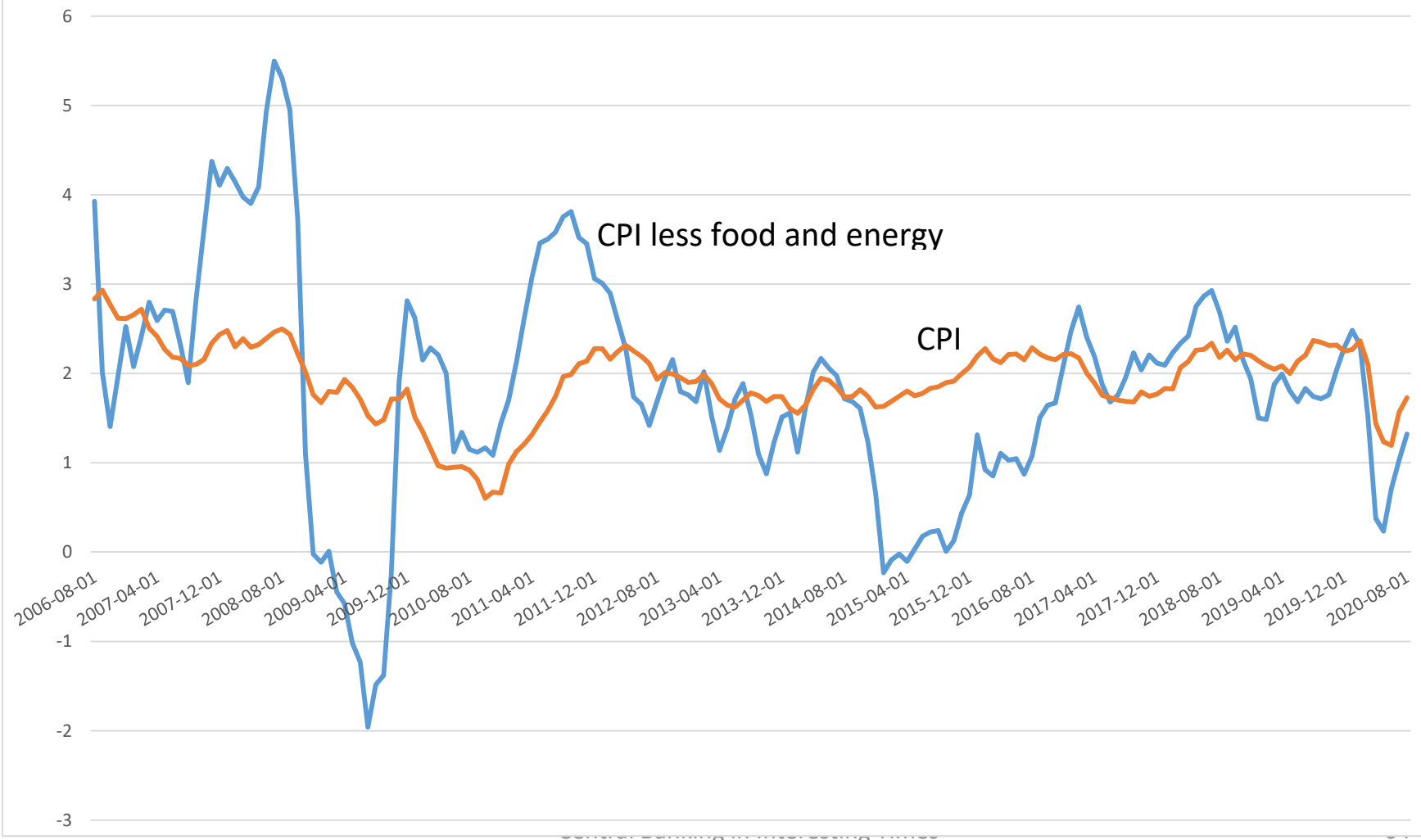
# Total Bank Credit and Loans & Leases, US Commercial Banks (weekly, 1973-2020, log scale, 1973=100)



Source: H.8 Release, Board of Governors of the Federal Reserve System

# Consumer Price Inflation

## U.S. CPI Inflation (year-over-year percent change, monthly, 2006-2020)





Last Slide

Thank you for Listening

The 2020 Maxwell Fry Global Finance Memorial Lecture

# Central Banking in Interesting Times and the Demand for Base Money

Richard G. Anderson

University of Missouri – Kansas City, Missouri

Lindenwood University, St Charles, Missouri

Federal Reserve Bank of St. Louis