Bianco Research L.L.C.

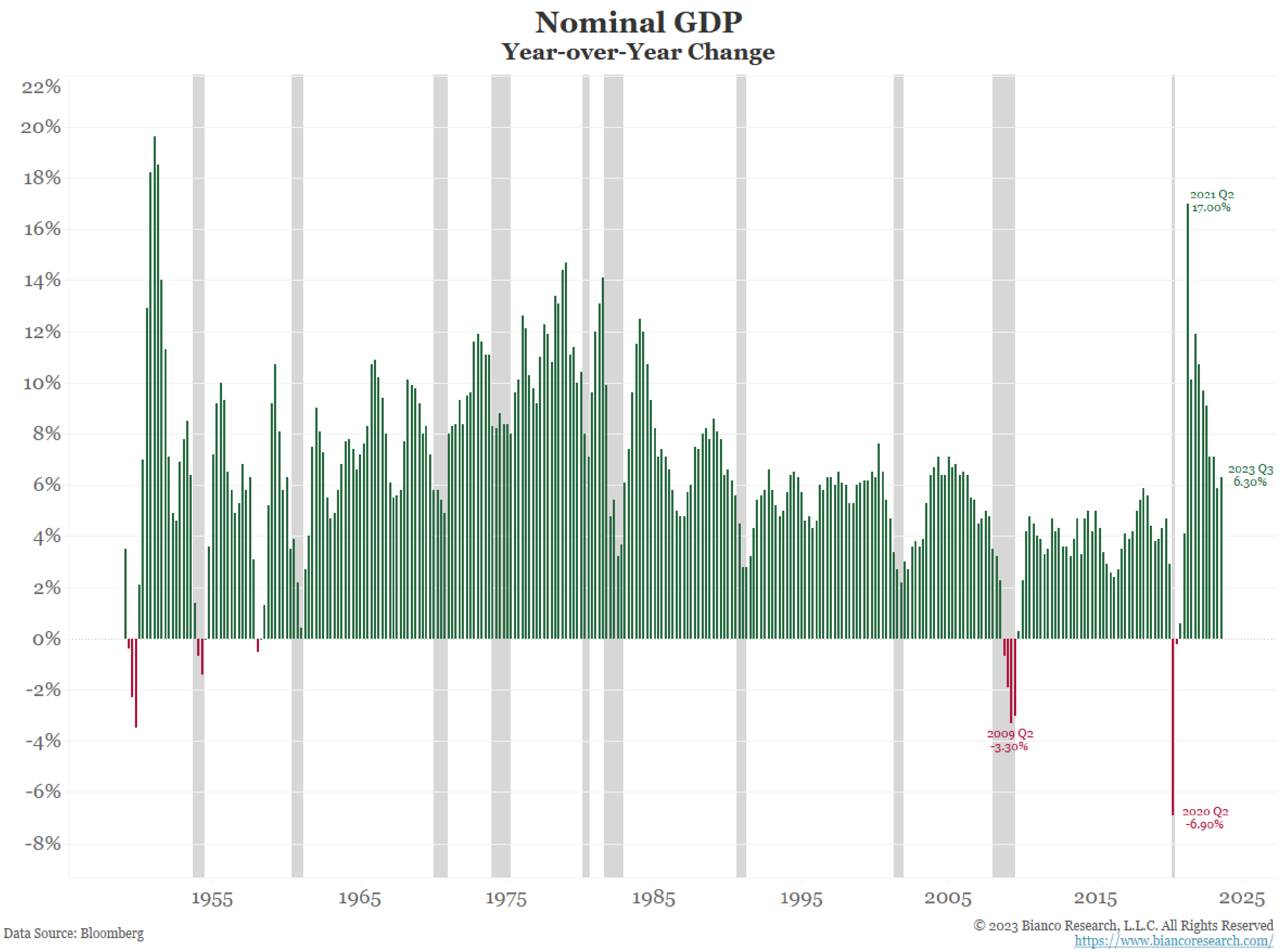
An Arbor Research & Trading Affiliated Company

Independent · Objective · Original

James Bianco

Introducing Our Index & Our 2024 Outlook

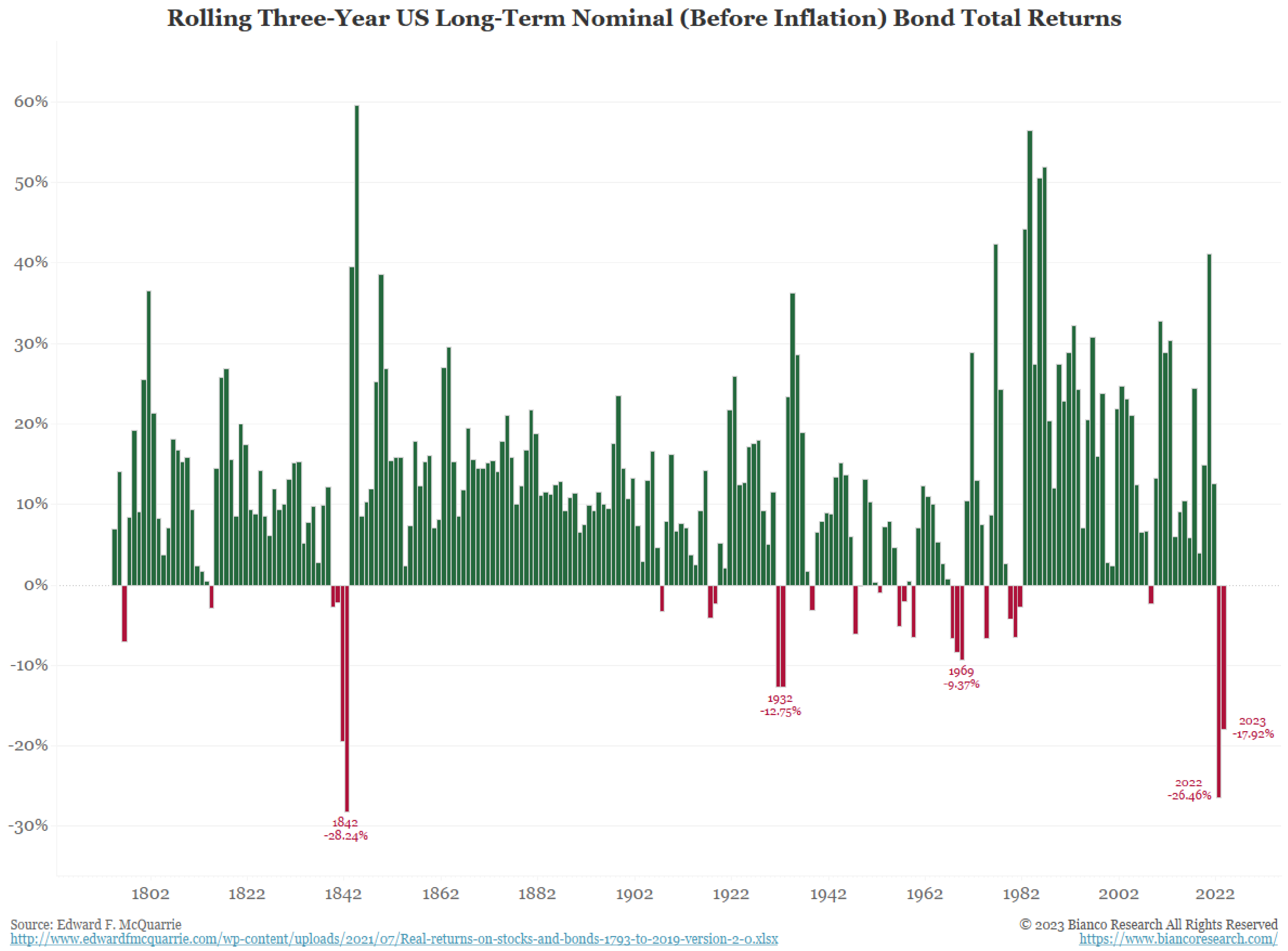
December 21, 2023



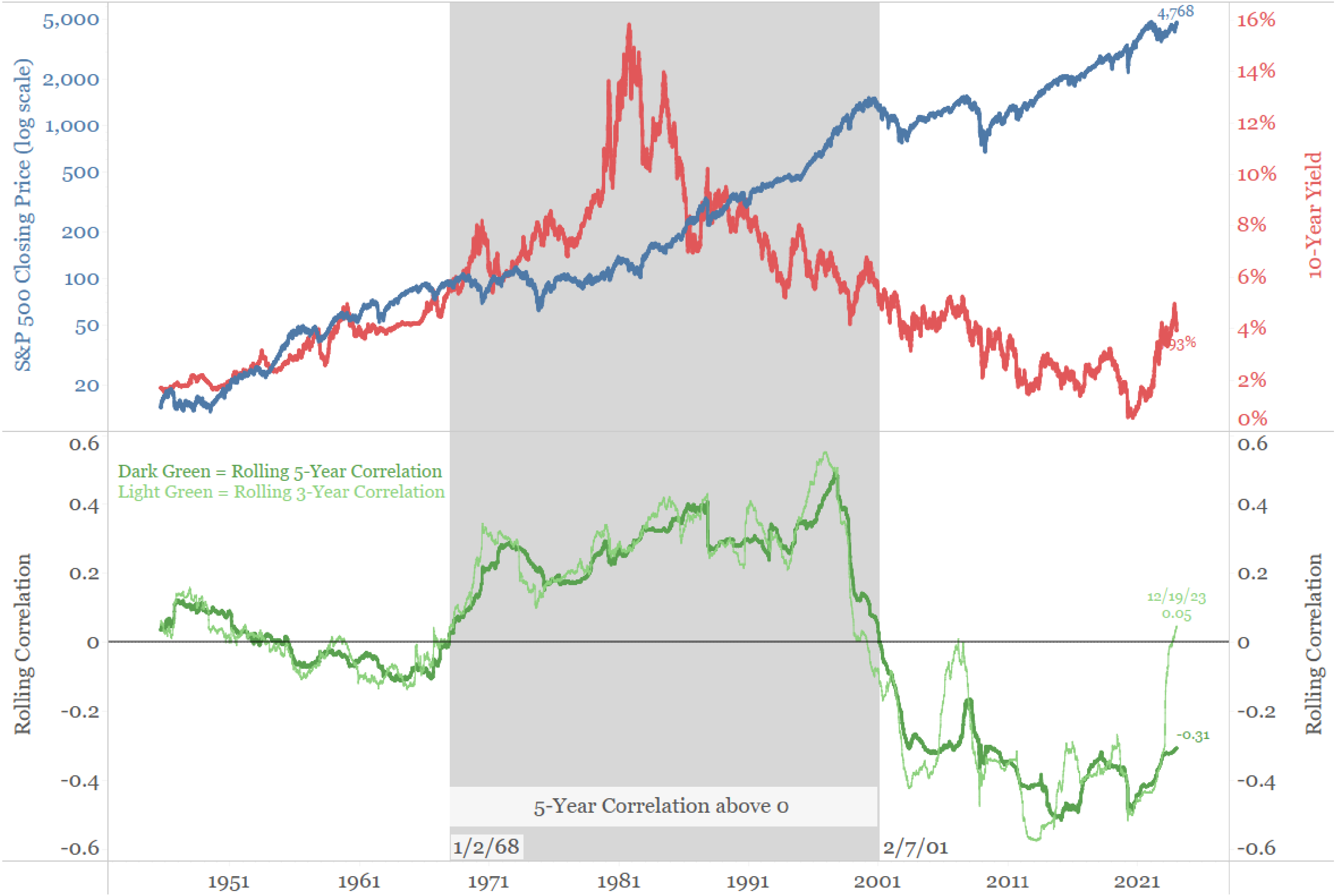
Nominal GDP
Year-over-Year Change
22%
20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
-2%
-4%
-6%
-8%
1955
1965
1975
1985
1995
2005
2015
2025
2021 Q2
17.00%
2023 Q3
6.30%
2009 Q2
-3.30%
2020 Q2
-6.90%
Data Source: Bloomberg
© 2023 Bianco Research, L.L.C. All Rights Reserved
https://www.biancoresearch.com/

US 10-Year Yield

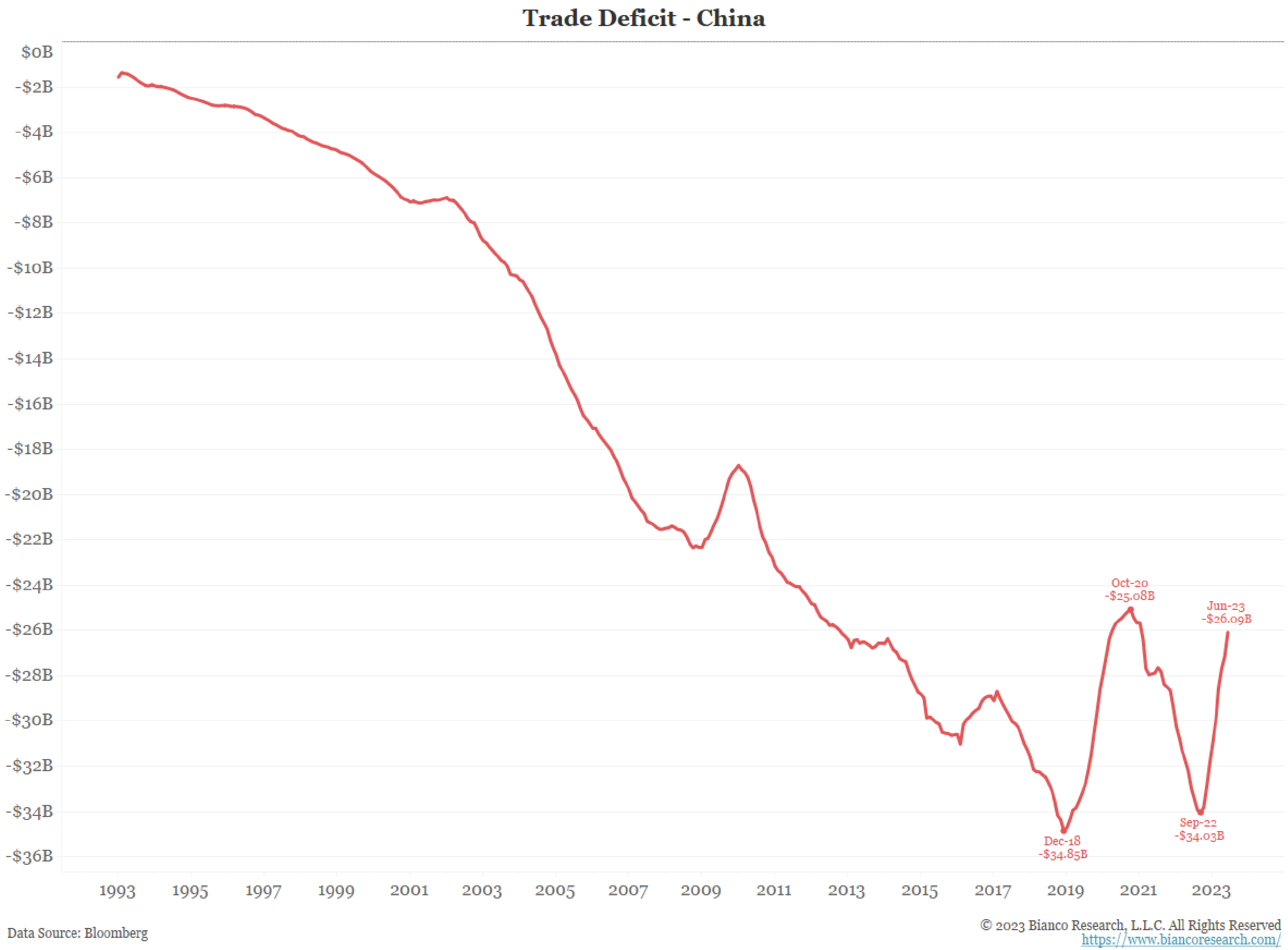
Source: Bloomberg

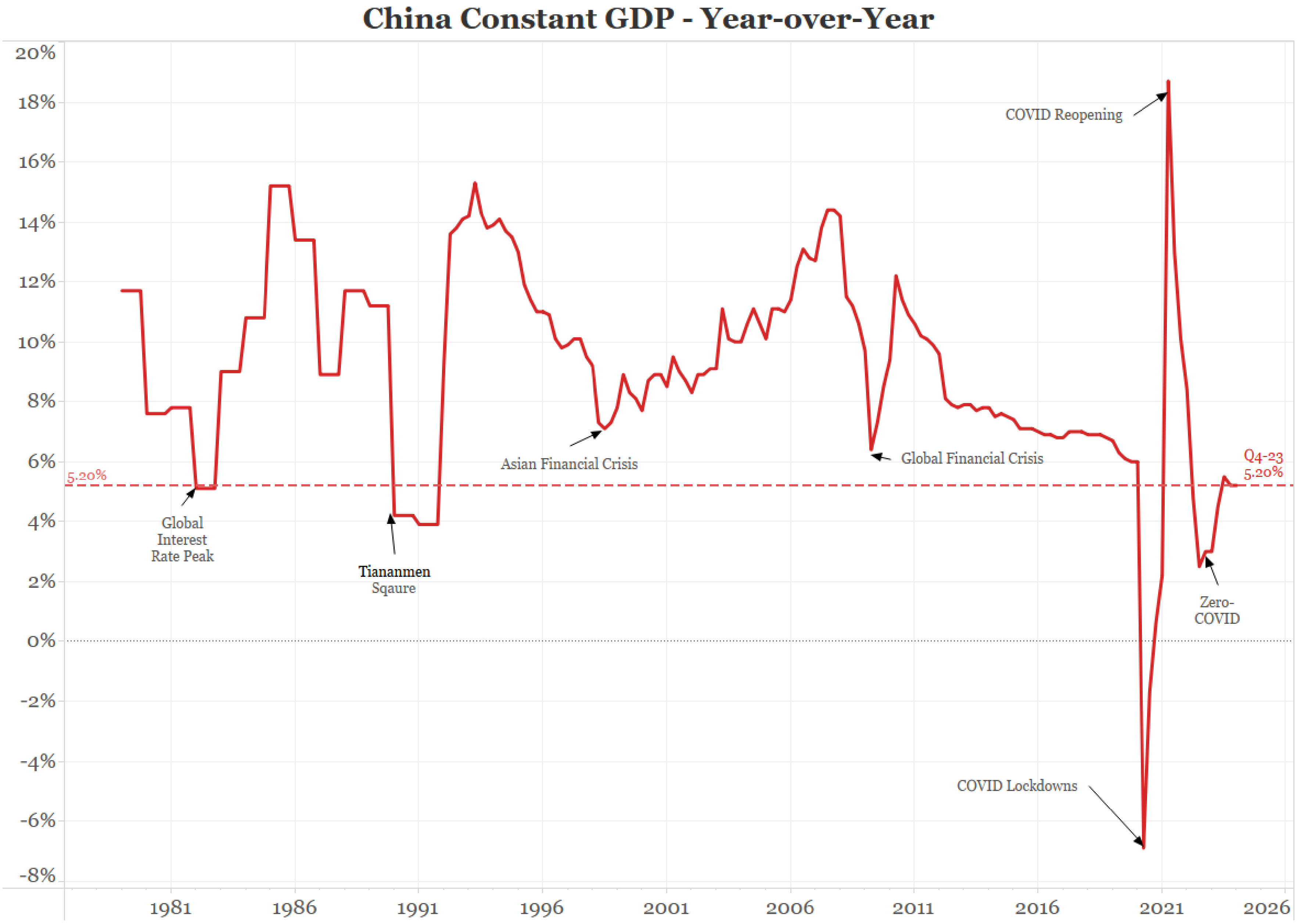

Rolling Three-Year US Long-Term Nominal (Before Inflation) Bond Total Returns
60%
50%
40%
30%
20%
10%
0%
-10%
-20%
-30%
1842
-28.24%
1932
-12.75%
1969
-9.37%
2022
-26.46%
2023
-17.92%
1802
1822
1842
1862
1882
1902
1922
1942
1962
1982
2002
2022
Source: Edward F. McQuarrie
http://www.edwardfmcquarrie.com/wp-content/uploads/2021/07/Real-returns-on-stocks-and-bonds-1793-to-2019-version-2-0.xlsx
© 2023 Bianco Research All Rights Reserved
https://www.biancoresearch.com/

Stock/Bond Correlation



Source: U.S. Treasury & The Federal Reserve


Trade Deficit - China
$0B
-$2B
-$4B
-$6B
-$8B
-$10B
-$12B
-$14B
-$16B
-$18B
-$20B
-$22B
-$24B
-$26B
-$28B
-$30B
-$32B
-$34B
-$36B
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
Oct-20
-$25.08B
Jun-23
-$26.09B
Dec-18
-$34.85B
Sep-22
-$34.03B
Data Source: Bloomberg
© 2023 Bianco Research, L.L.C. All Rights Reserved
https://www.biancoresearch.com/



Data Source: Bloomberg, China National Bureau of Statistics

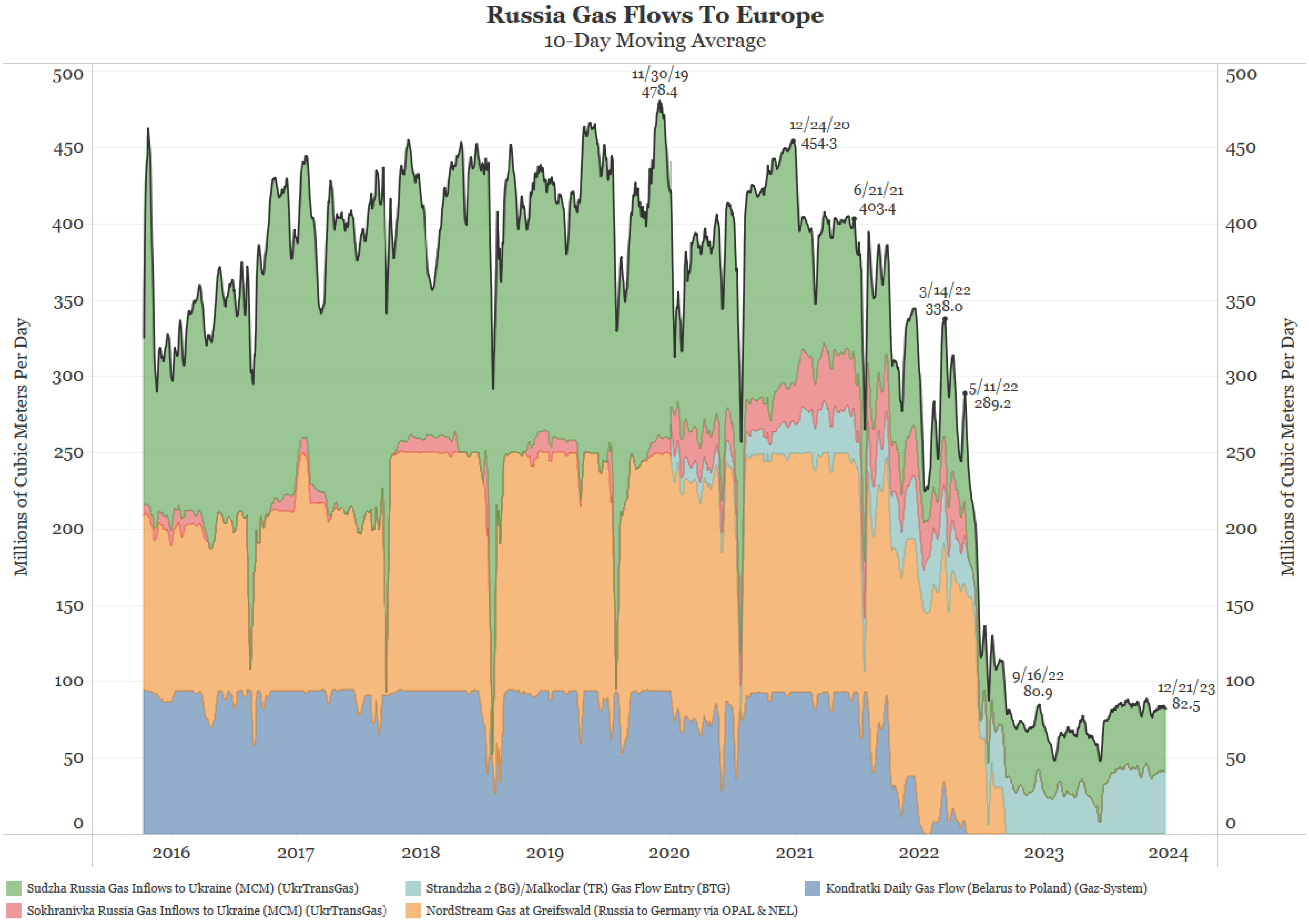
***Bloomberg* – (*November 29, 2023*) [*China Investment Bank Bans Displays of Wealth*]**

CICC asks analysts to avoid negative macro, market commentary

Bankers also discouraged from showing off their wealth: memo

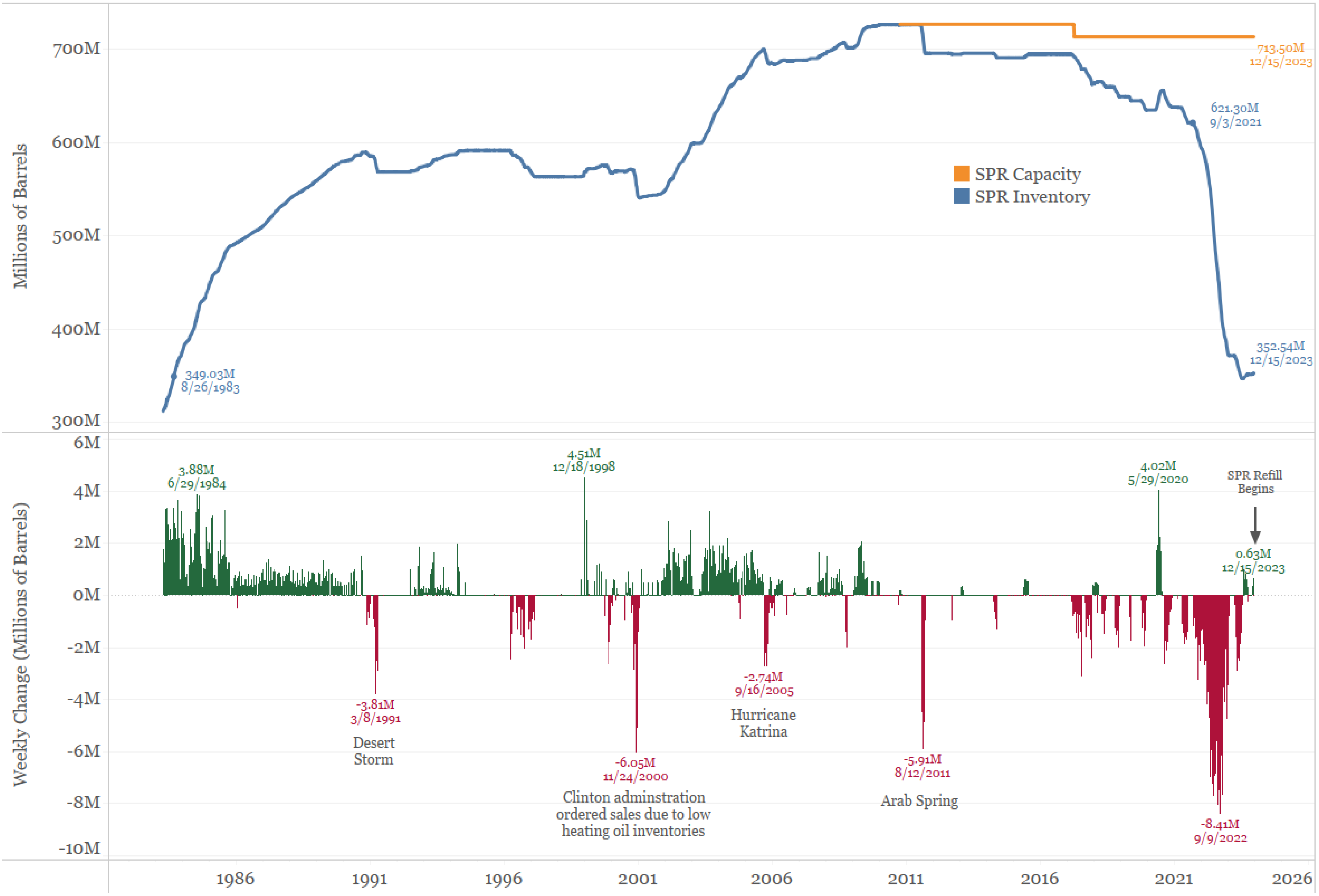
Analysts at China International Capital Corp. are barred from sharing negative comments about the economy or markets in both public and private discussions, according to an internal memo sent to the research department this month and seen by Bloomberg News. Employees should also avoid wearing luxury brands or revealing their compensation to third parties, the memo said.

The directive underscores the increasing level of self-scrutiny at Chinese financial institutions after authorities lashed out this year at bankers' "hedonistic" lifestyles, and ordered them to comply with President Xi Jinping's "common prosperity" drive. It also highlights concern among international investors that China is increasingly restricting access to transparent data and research in the world's second-largest economy.

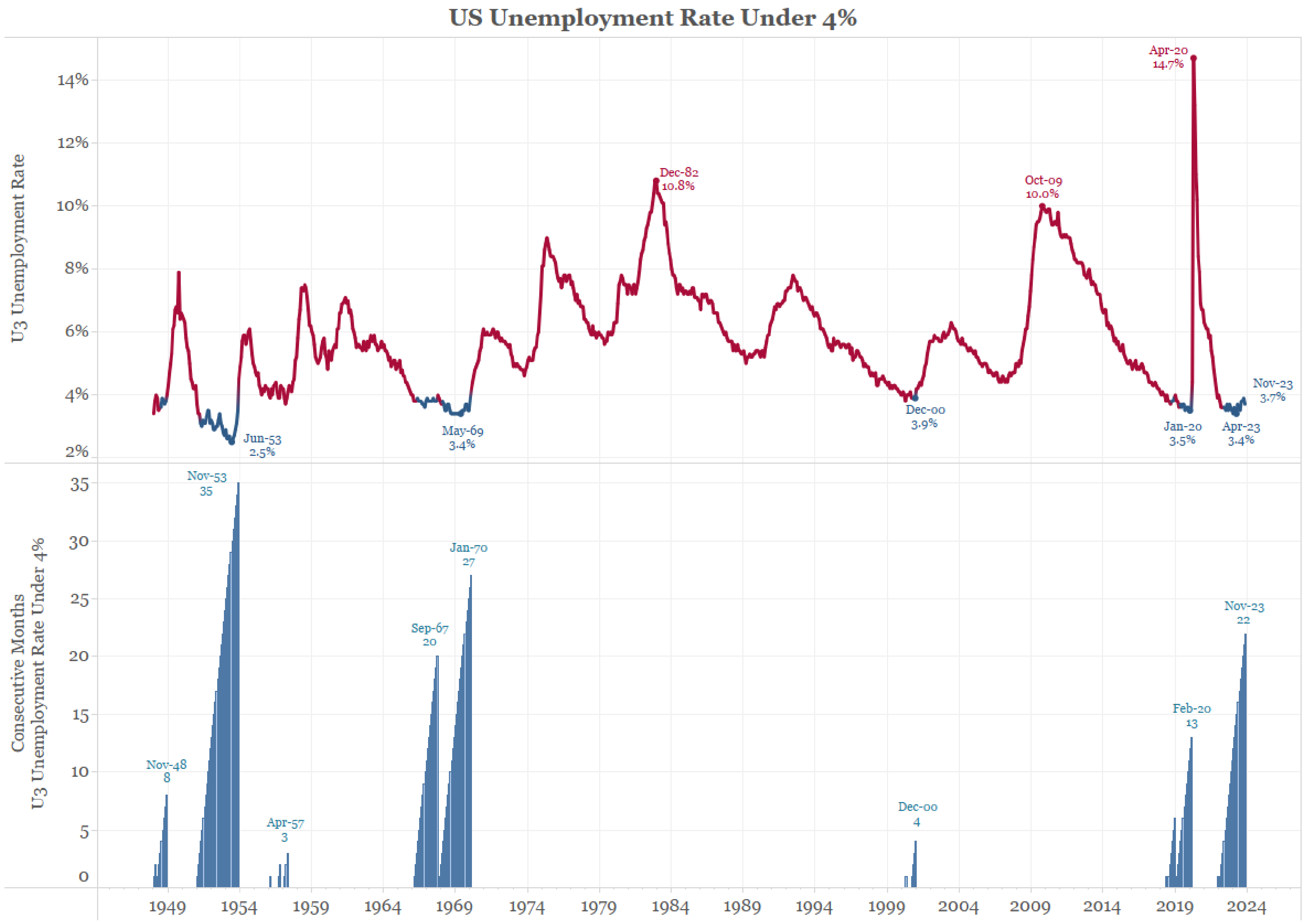


Source: Gascade

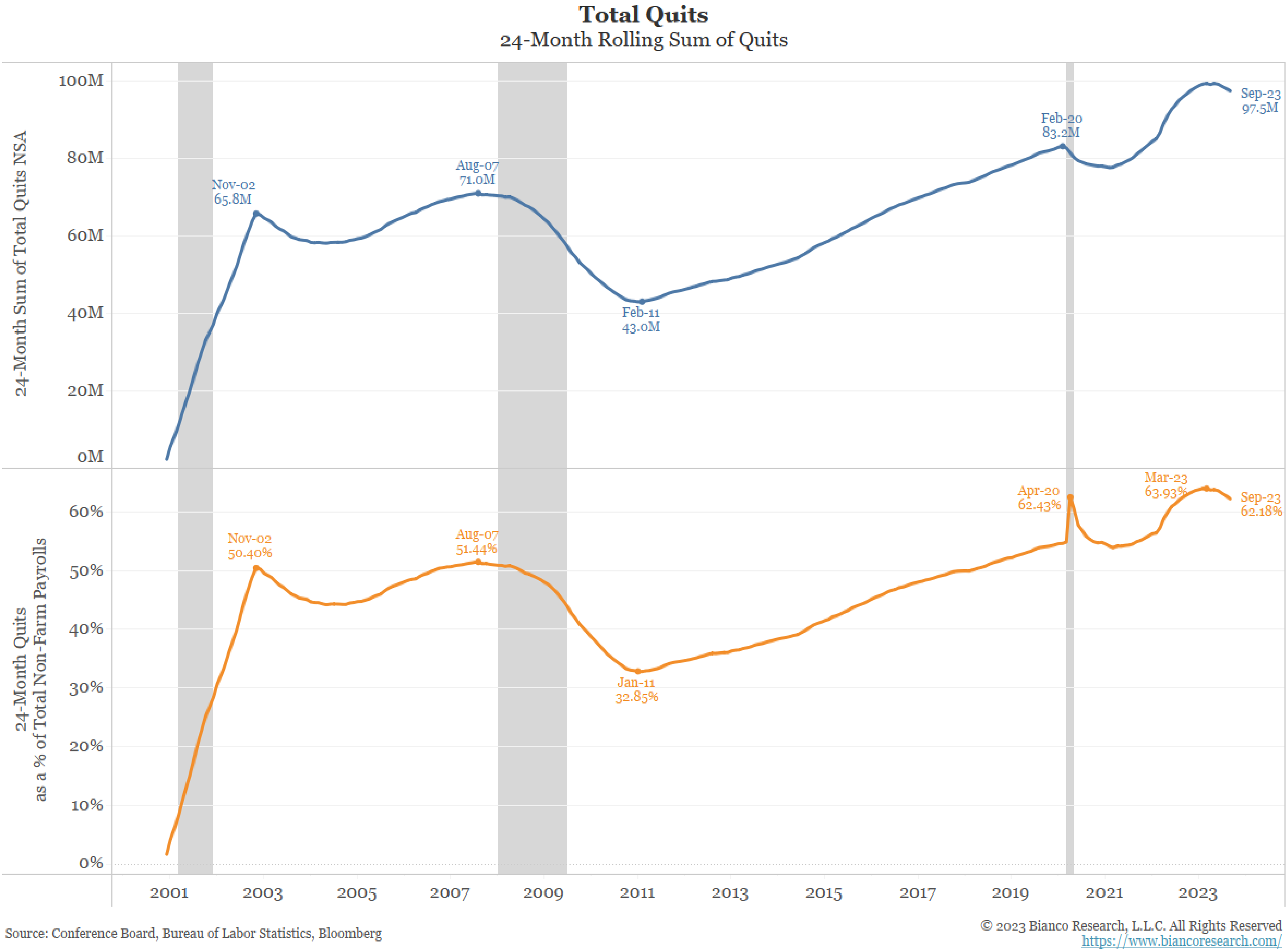
SPR Inventory

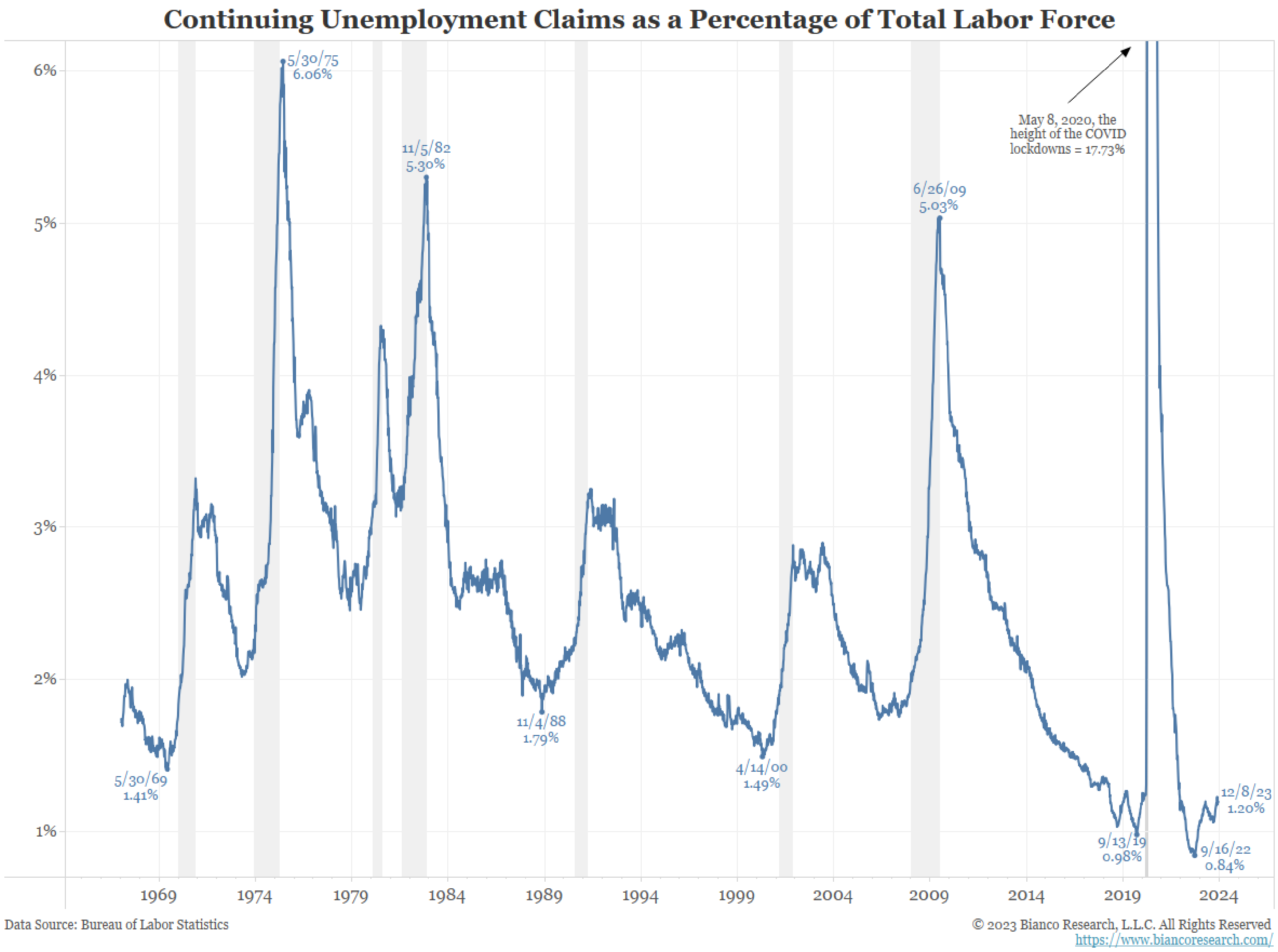


Source: Department of Energy, Bloomberg

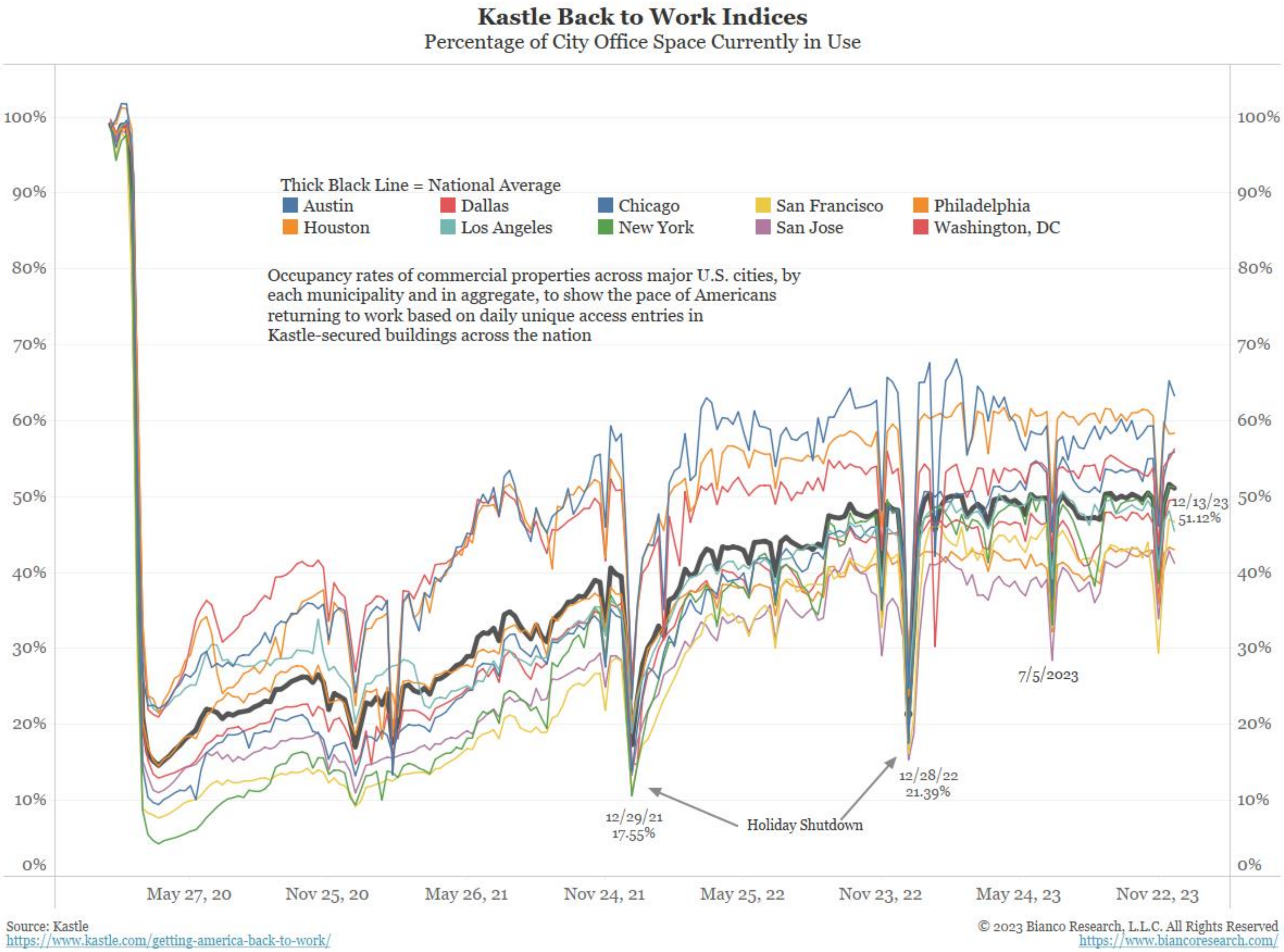


Source: Bureau of Labor Statistics


Total Quits
24-Month Rolling Sum of Quits
24-Month Sum of Total Quits NSA
100M
80M
60M
40M
20M
0M
Nov-02
65.8M
Aug-07
71.0M
Feb-11
43.0M
Feb-20
83.2M
Sep-23
97.5M
24-Month Quits
as a % of Total Non-Farm Payrolls
60%
50%
40%
30%
20%
10%
0%
Nov-02
50.40%
Aug-07
51.44%
Jan-11
32.85%
Apr-20
62.43%
Mar-23
63.93%
Sep-23
62.18%
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
Source: Conference Board, Bureau of Labor Statistics, Bloomberg
© 2023 Bianco Research, L.L.C. All Rights Reserved
https://www.biancoresearch.com/


Continuing Unemployment Claims as a Percentage of Total Labor Force
6%
5%
4%
3%
2%
1%
1969
1974
1979
1984
1989
1994
1999
2004
2009
2014
2019
2024
5/30/75
6.06%
11/5/82
5.30%
6/26/09
5.03%
May 8, 2020, the height of the COVID lockdowns = 17.73%
5/30/69
1.41%
11/4/88
1.79%
4/14/00
1.49%
9/13/19
0.98%
9/16/22
0.84%
12/8/23
1.20%
Data Source: Bureau of Labor Statistics
© 2023 Bianco Research, L.L.C. All Rights Reserved
https://www.biancoresearch.com/

Fortune – (December 1, 2023) [Even the U.S. president's return-to-office push is being ignored by workers: 'They aren't coming back']



McKinsey & Company – (May 8, 2023)
[Thinking beyond markdowns to tackle retail's inventory glut]

In the United States alone, retailers are sitting on $740 billion in unsold goods. Clearing inventory and building more resilient and agile supply chains require action across five dimensions.

Over the past 18 months, retail supply chains have experienced unprecedented demand and supply shifts. Pandemic-related disruptions from the end of 2021 to the start of 2022 led to goods arriving late—or, in some cases, after the season. As retailers sought to overbuy inventory to mitigate potential shortages, softening demand and a sudden shift in consumer spending in the middle of last year left them with an inventory glut needing to be marked down or warehoused.

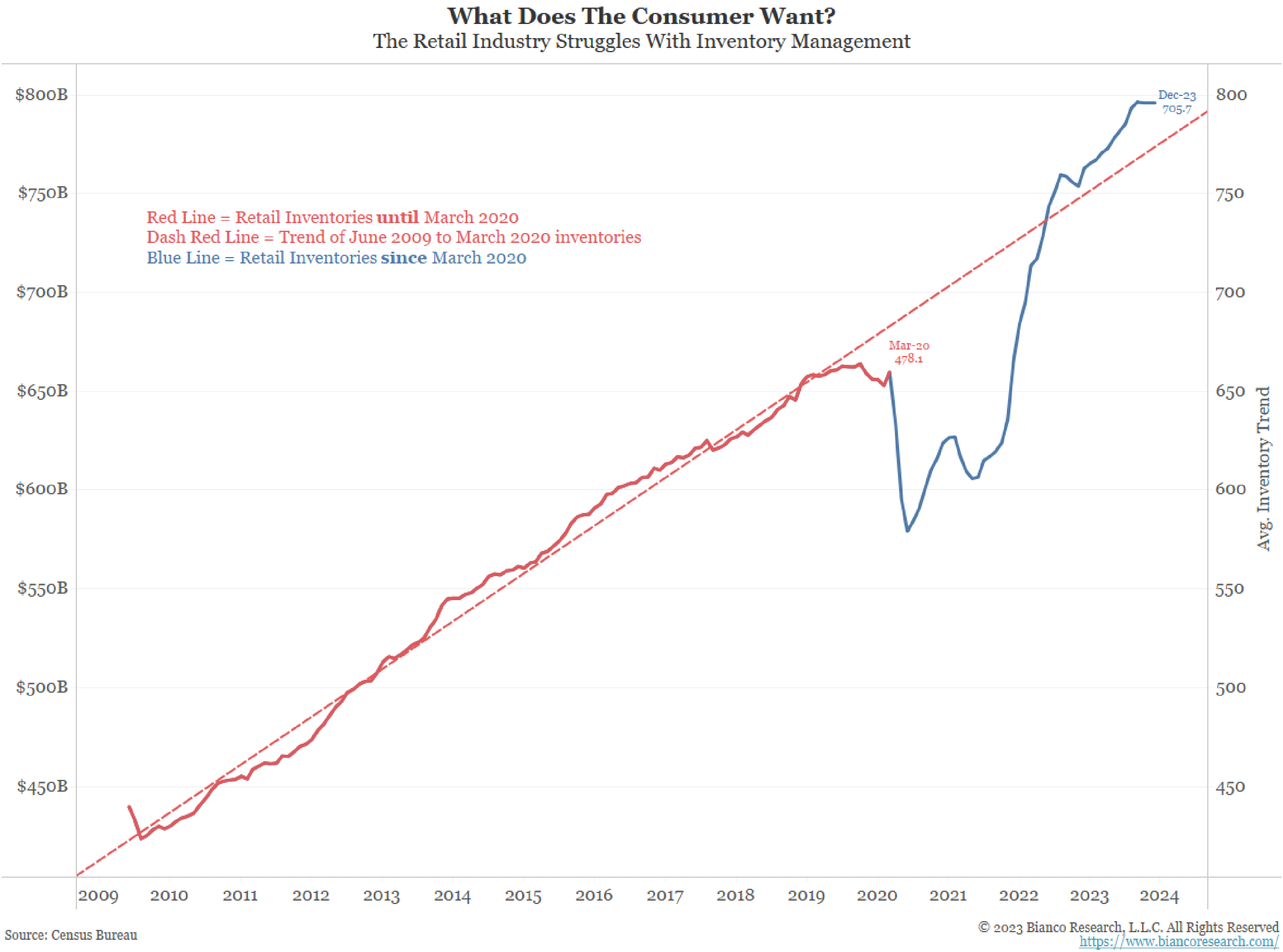
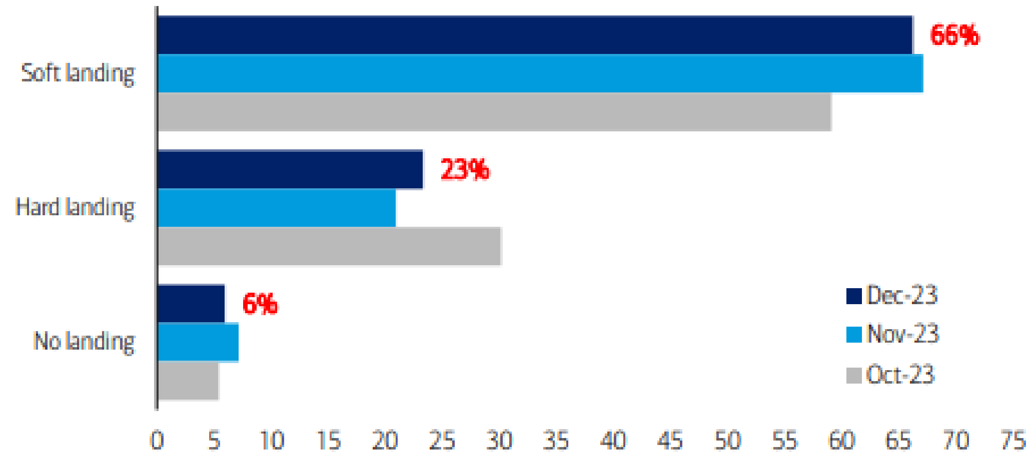


Chart 6: "Soft landing" the consensus for 2024
What is the most likely outcome for the global economy in the next 12 months?



Source: BofA Global Fund Manager Survey

BofA GLOBAL RESEARCH

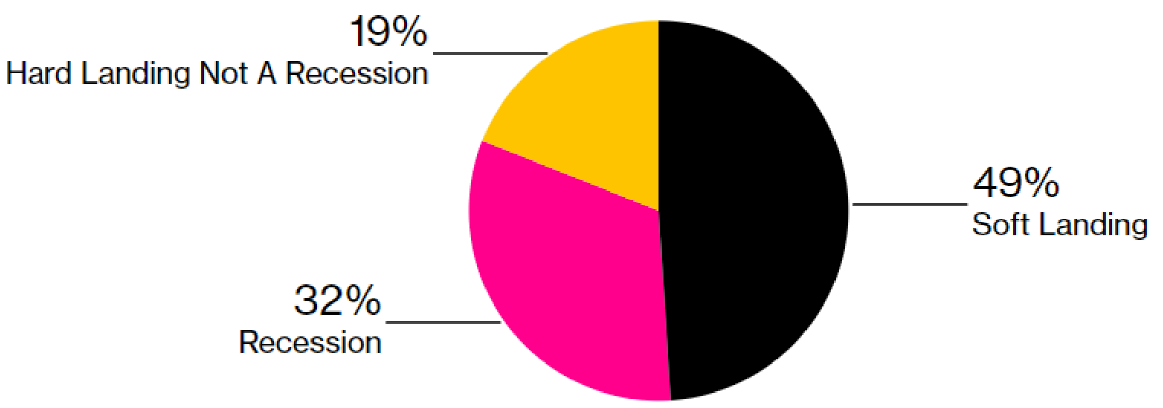
66% of FMS investors expect a "soft landing" for the global economy in the next 12 months.

Expectations for "hard landing" 23%.

When asked about the timing of recession for the US economy, 36% said they expect no recession at all in the next 12 months while 32% expect the US to fall into recession in Q2'24.

Most Economists Don't Expect Recession Within 12 Months

Fewer than one third of economists forecast a recession



Source: Bloomberg News survey of economists Dec. 1-6
Economists were asked if US would have a recession in the next 12 months.

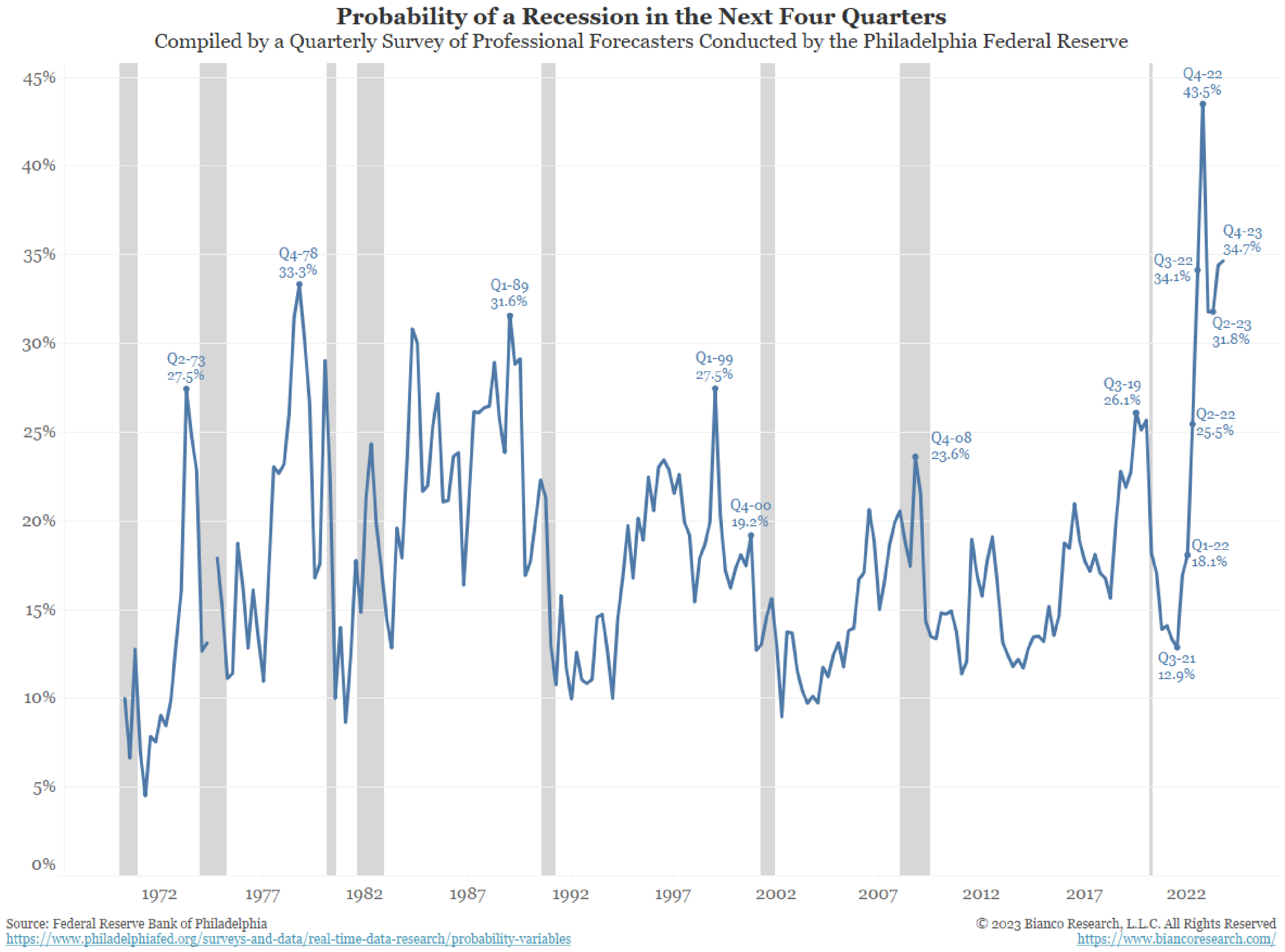
CNN – (November 29, 2023) [Jamie Dimon says to be prepared for recession]

JPMorgan Chase CEO Jamie Dimon issued a stark warning to Wall Street on Wednesday: Inflation could rise further and recession is not off the table.

"A lot of things out there are dangerous and inflationary. Be prepared," he said at the 2023 New York Times DealBook Summit in New York. "Interest rates may go up and that might lead to recession."

I don't think that expansions just die of old age. Two things usually end them. One is financial imbalances and the other is the Fed, and usually, when the Fed ends an expansion, it's because inflation has gotten out of control and the Fed needs to tighten to bring it down.
– Janet Yellen, January 4, 2019

But as Janet says, expansions don't die of old age. I'd like to say they get murdered, instead.
– Ben Bernanke, January 4, 2019

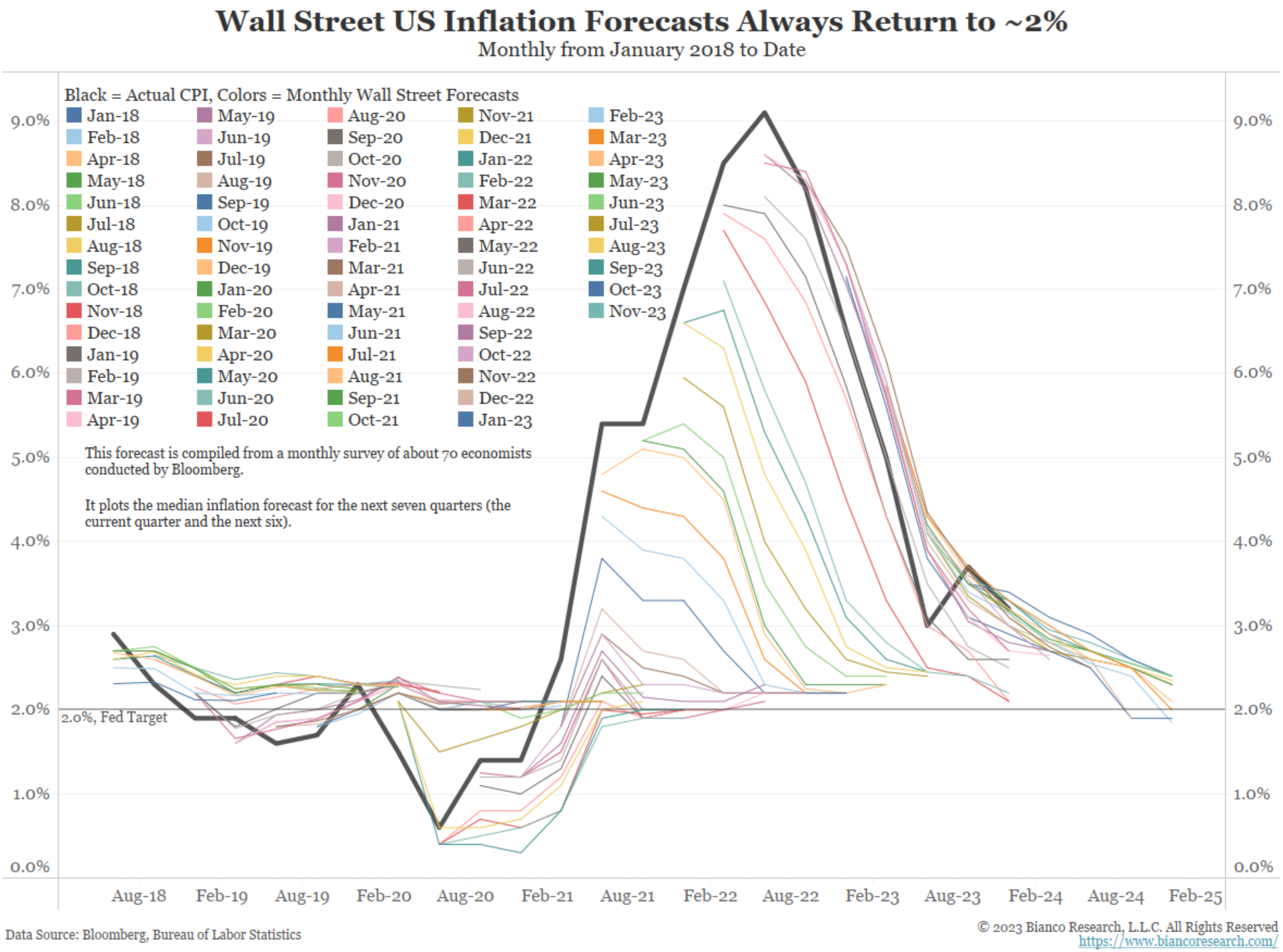


US 10-Year Yield

Source: Bloomberg

•***Financial Times* – (October 2017)** ***[Fed has no reliable theory of inflation, says Tarullo]***

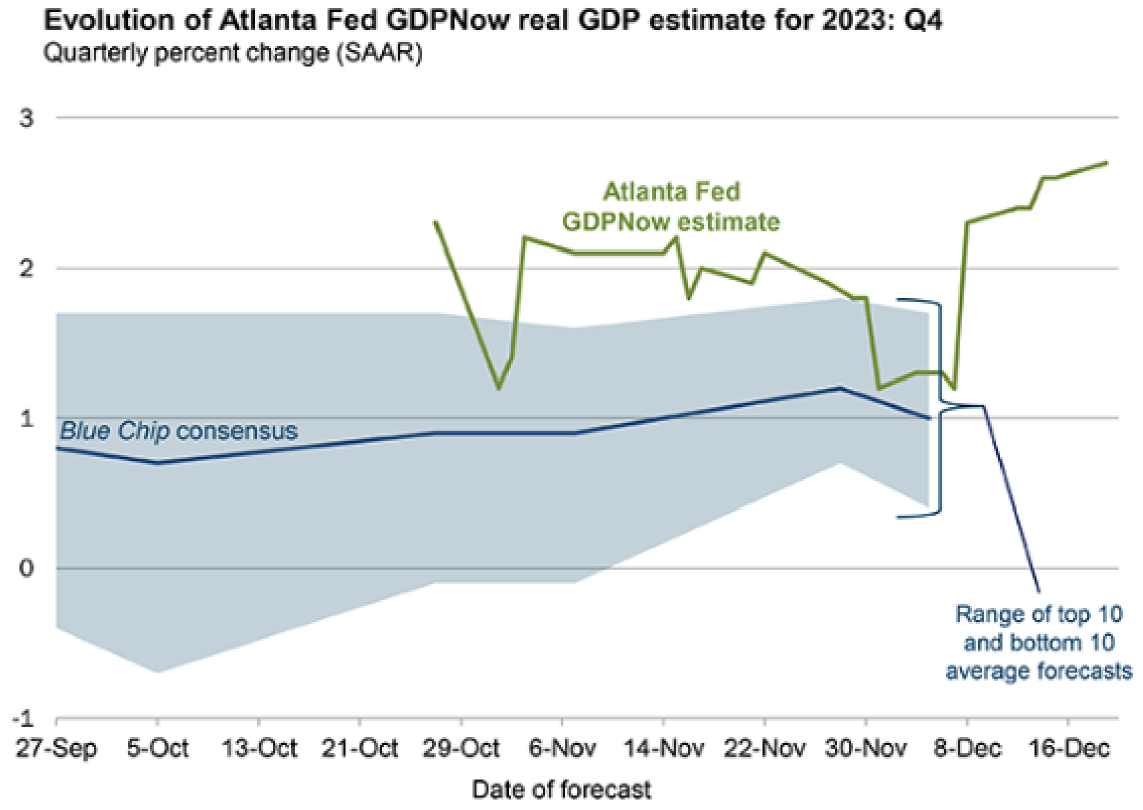
He was particularly doubtful about the weight inflation expectations play in rate-setting policy, given the "range and depth of unanswered questions" about how they are formed and measured. "The substantive point is that we do not, at present, have a theory of inflation dynamics that works sufficiently well to be of use for the business of real-time monetary policymaking," said Mr Tarullo in a speech at the Brookings think-tank in Washington.



Latest estimate: 2.7 percent -- December 19, 2023

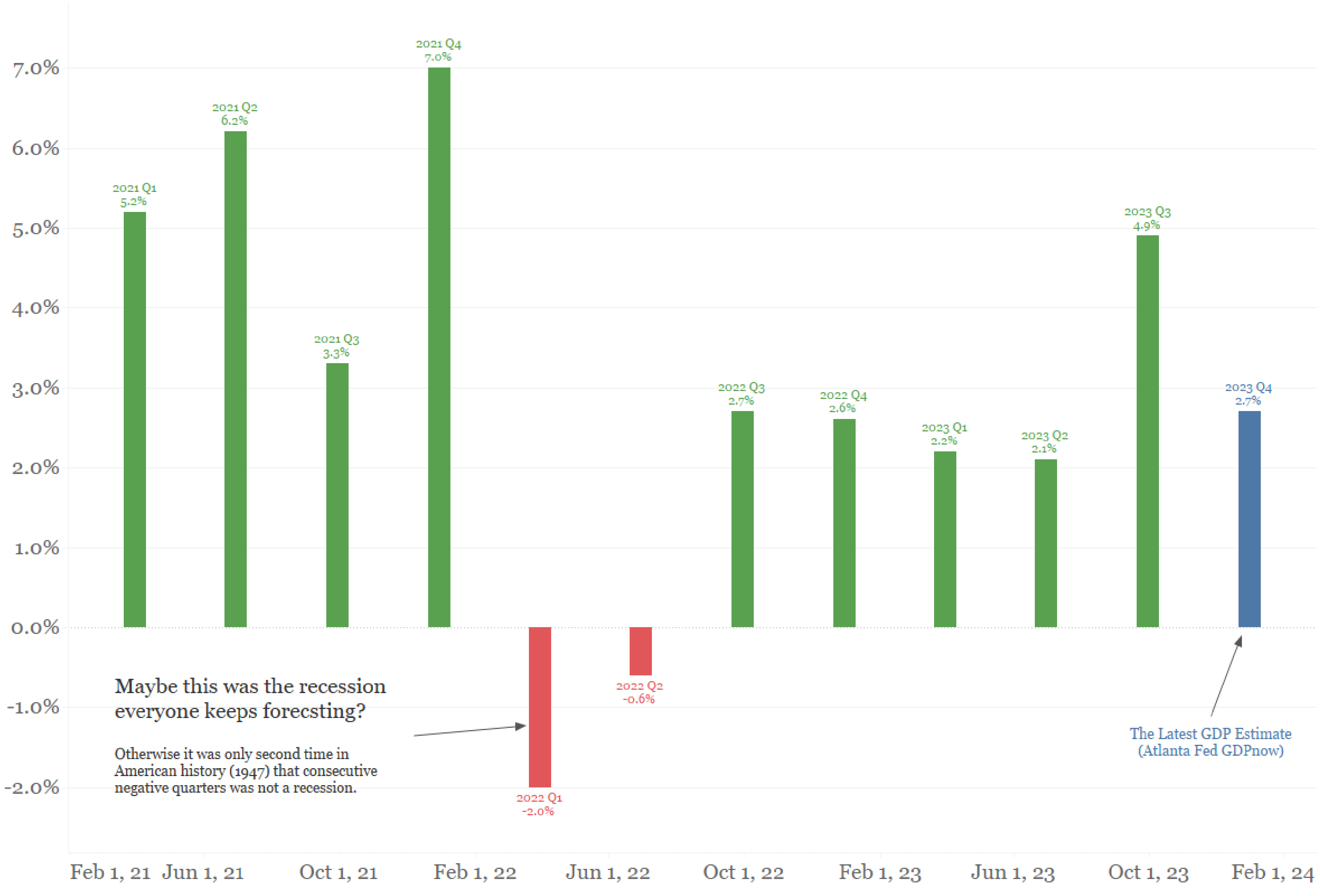
The GDPNow model estimate for real GDP growth (seasonally adjusted annual rate) in the fourth quarter of 2023 is **2.7 percent** on December 19, up from 2.6 percent on December 14. After recent releases from the US Census Bureau and the Federal Reserve Board of Governors, the nowcast of fourth-quarter real gross private domestic investment growth increased from 0.5 percent to 0.8 percent.

*The next GDPNow update is **Friday, December 22**. Please see the "Release Dates" tab below for a list of upcoming releases.*

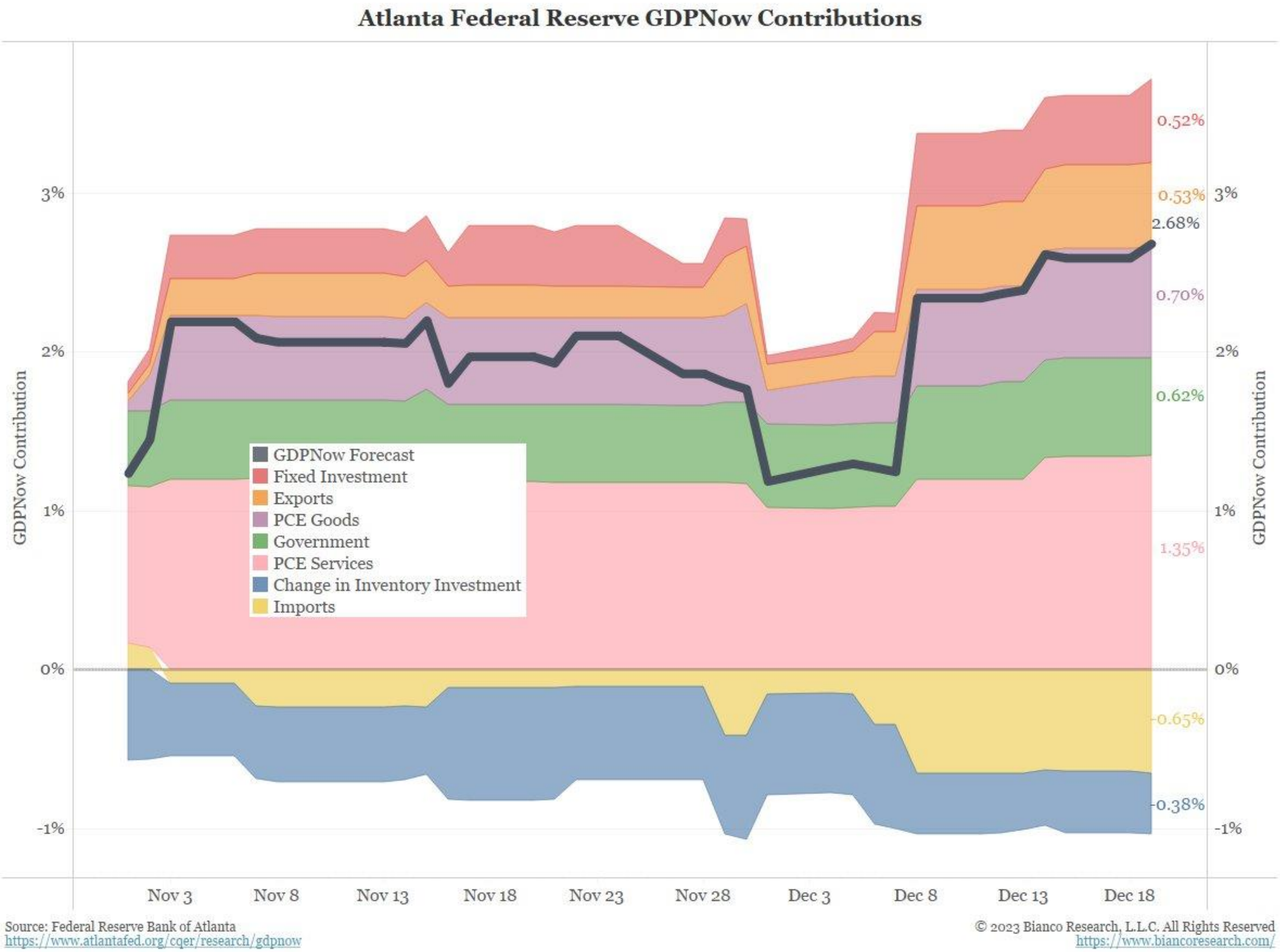


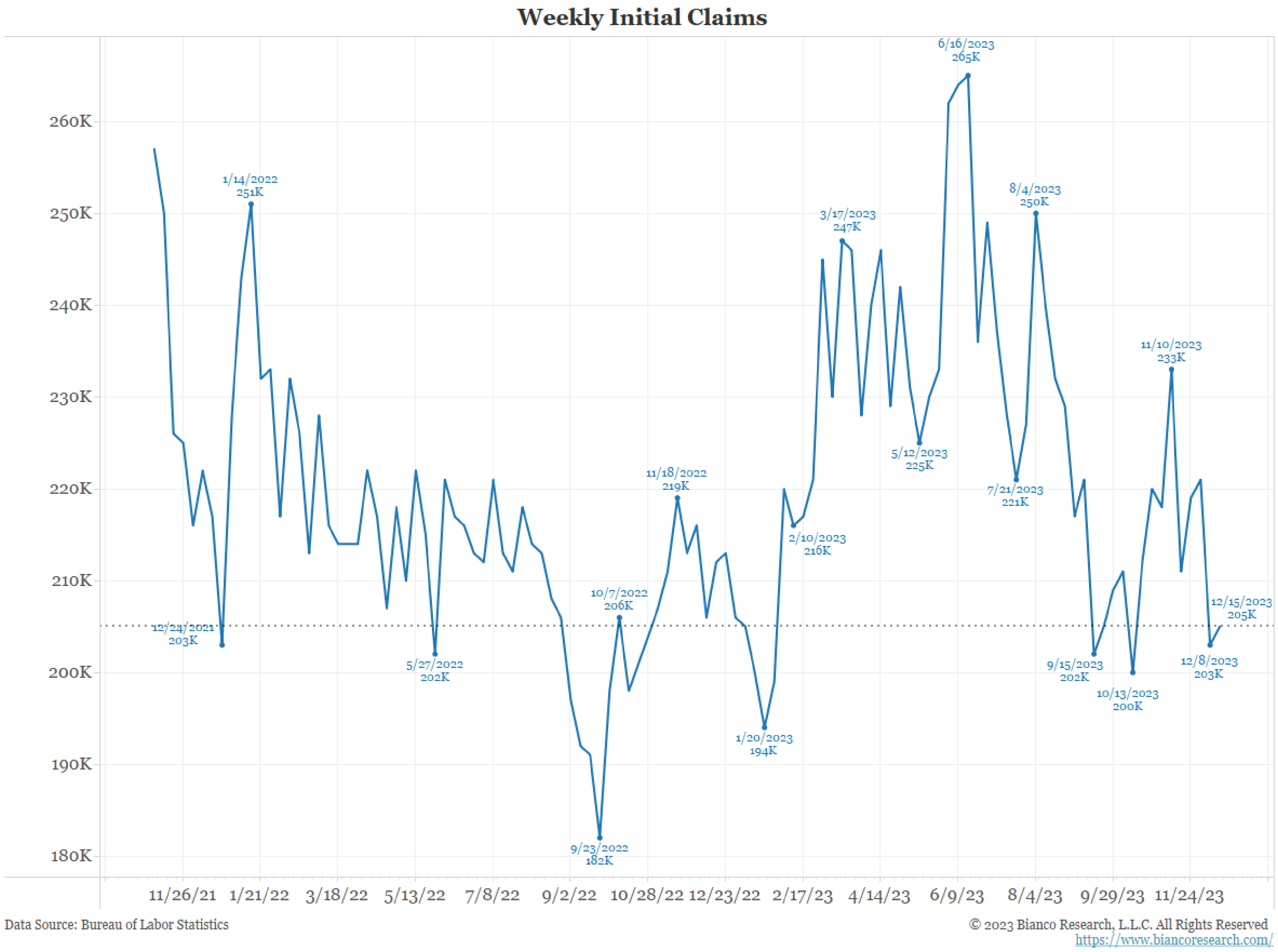
Sources: *Blue Chip Economic Indicators* and *Blue Chip Financial Forecasts*
Note: The top (bottom) 10 average forecast is an average of the highest (lowest) 10 forecasts in the *Blue Chip* survey.

US Quarterly GDP



Data Source: Bloomberg

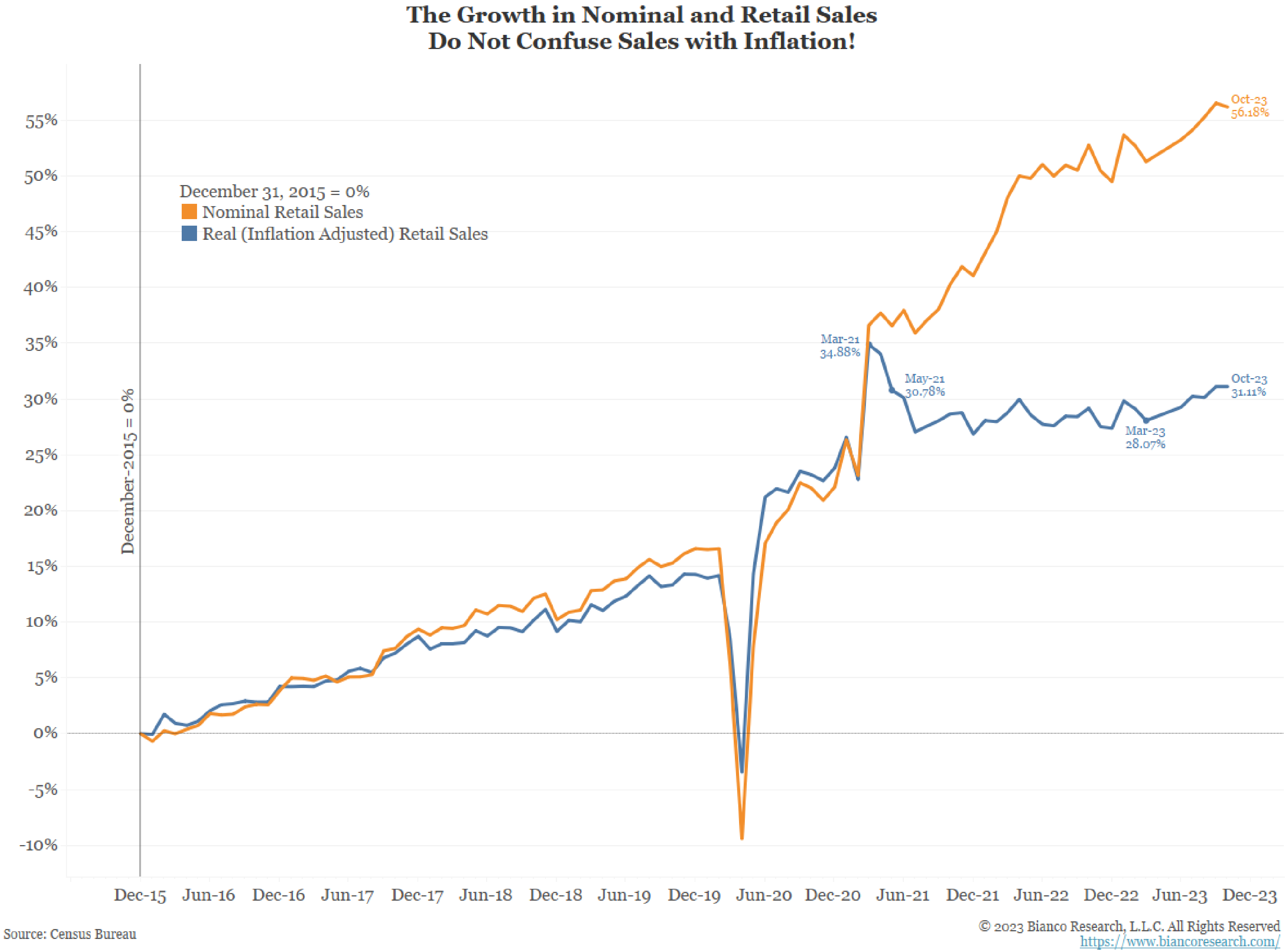

Atlanta Federal Reserve GDPNow Contributions
GDPNow Contribution
3%
2%
1%
0%
-1%
GDPNow Forecast
Fixed Investment
Exports
PCE Goods
Government
PCE Services
Change in Inventory Investment
Imports
0.52%
0.53%
2.68%
0.70%
0.62%
1.35%
-0.65%
-0.38%
Nov 3
Nov 8
Nov 13
Nov 18
Nov 23
Nov 28
Dec 3
Dec 8
Dec 13
Dec 18
Source: Federal Reserve Bank of Atlanta
https://www.atlantafed.org/cqer/research/gdpnow
© 2023 Bianco Research, L.L.C. All Rights Reserved
https://www.biancoresearch.com/

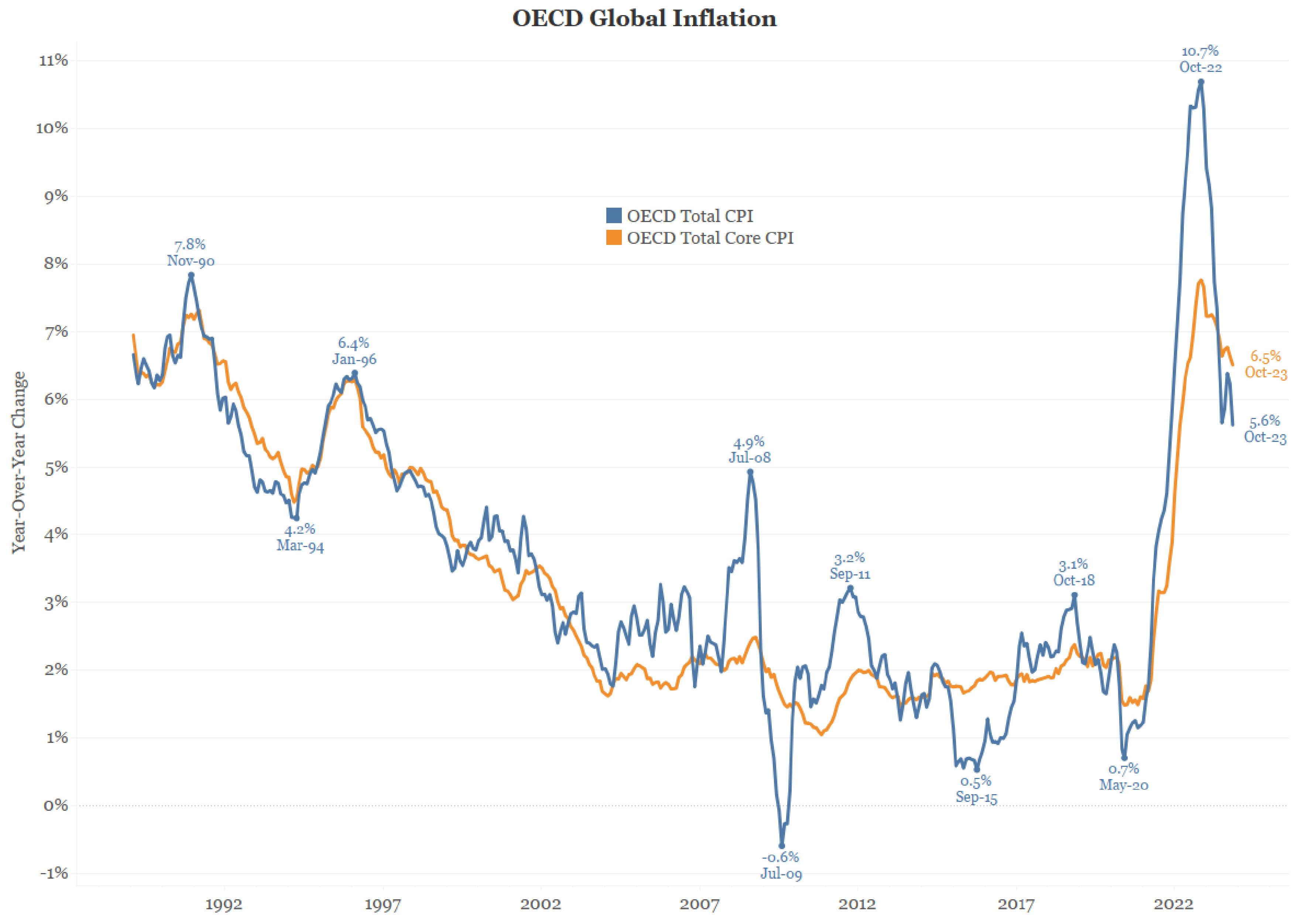


Weekly Initial Claims
260K
250K
240K
230K
220K
210K
200K
190K
180K
11/26/21
1/21/22
3/18/22
5/13/22
7/8/22
9/2/22
10/28/22
12/23/22
2/17/23
4/14/23
6/9/23
8/4/23
9/29/23
11/24/23
1/14/2022
251K
12/24/2021
203K
5/27/2022
202K
9/23/2022
182K
10/7/2022
206K
11/18/2022
219K
1/20/2023
194K
2/10/2023
216K
3/17/2023
247K
5/12/2023
225K
6/16/2023
265K
7/21/2023
221K
8/4/2023
250K
9/15/2023
202K
10/13/2023
200K
11/10/2023
233K
12/8/2023
203K
12/15/2023
205K
Data Source: Bureau of Labor Statistics
© 2023 Bianco Research, L.L.C. All Rights Reserved
https://www.biancoresearch.com/

Reuters - [US Thanksgiving weekend sales hit record on big discounts, online boost]

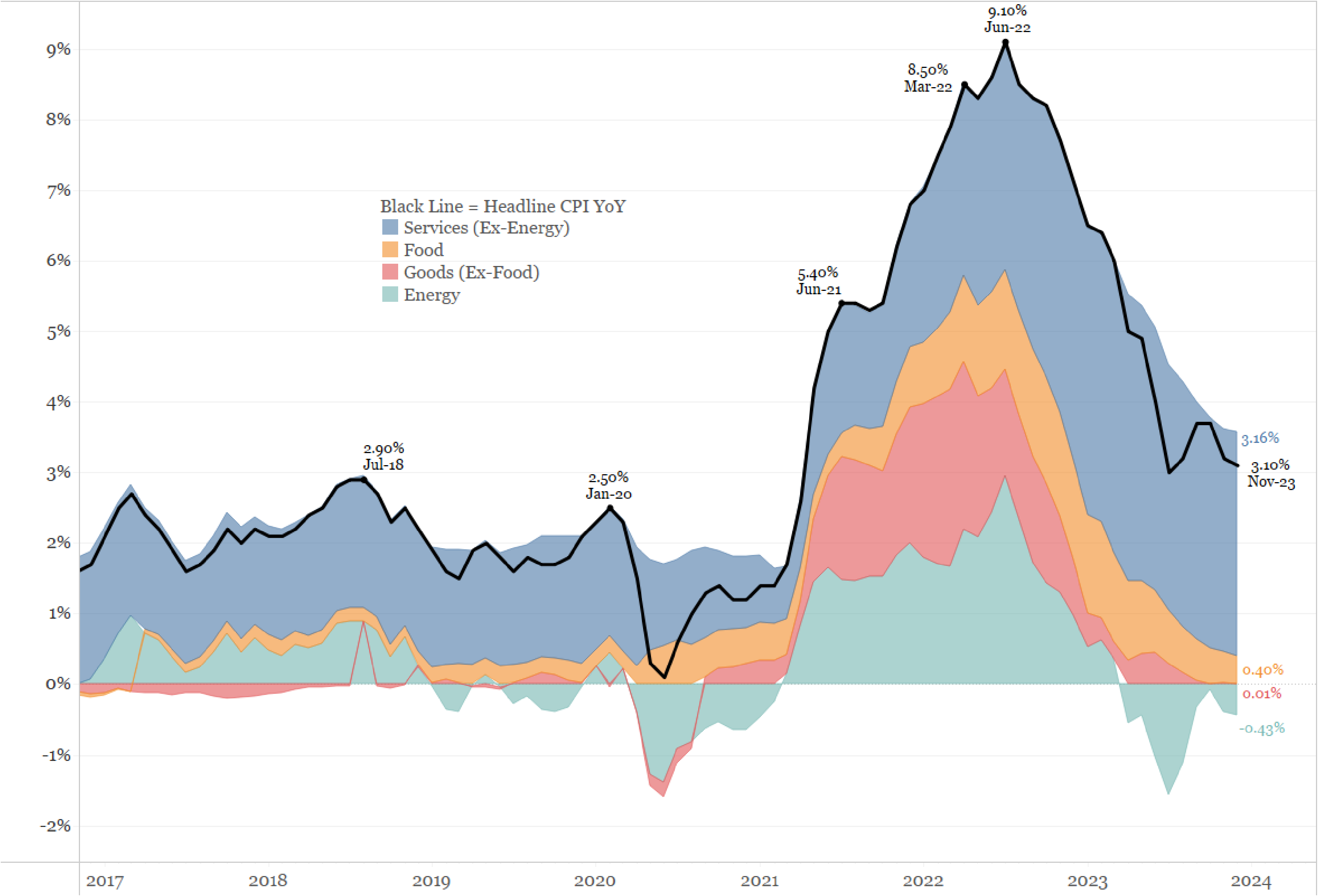
Deep discounts on everything from beauty products and toys to electronics during the Thanksgiving weekend enticed U.S. shoppers to splurge about $38 billion online, signaling a strong holiday shopping season even as economic uncertainty swirled.



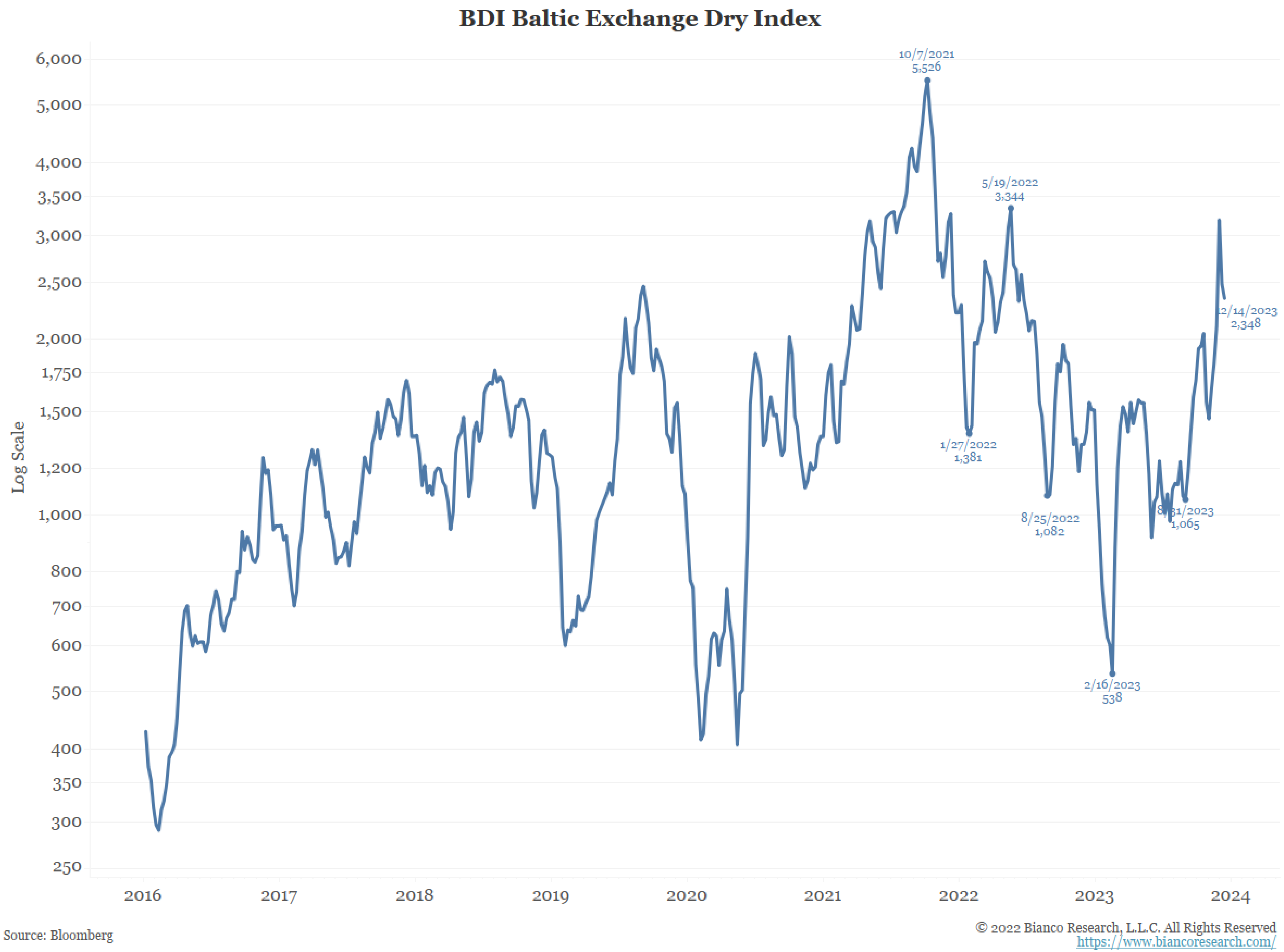

OECD Global Inflation
OECD Total CPI
OECD Total Core CPI
Year-Over-Year Change
11%
10%
9%
8%
7%
6%
5%
4%
3%
2%
1%
0%
-1%
1992
1997
2002
2007
2012
2017
2022
7.8% Nov-90
6.4% Jan-96
4.2% Mar-94
4.9% Jul-08
-0.6% Jul-09
3.2% Sep-11
0.5% Sep-15
3.1% Oct-18
0.7% May-20
10.7% Oct-22
6.5% Oct-23
5.6% Oct-23

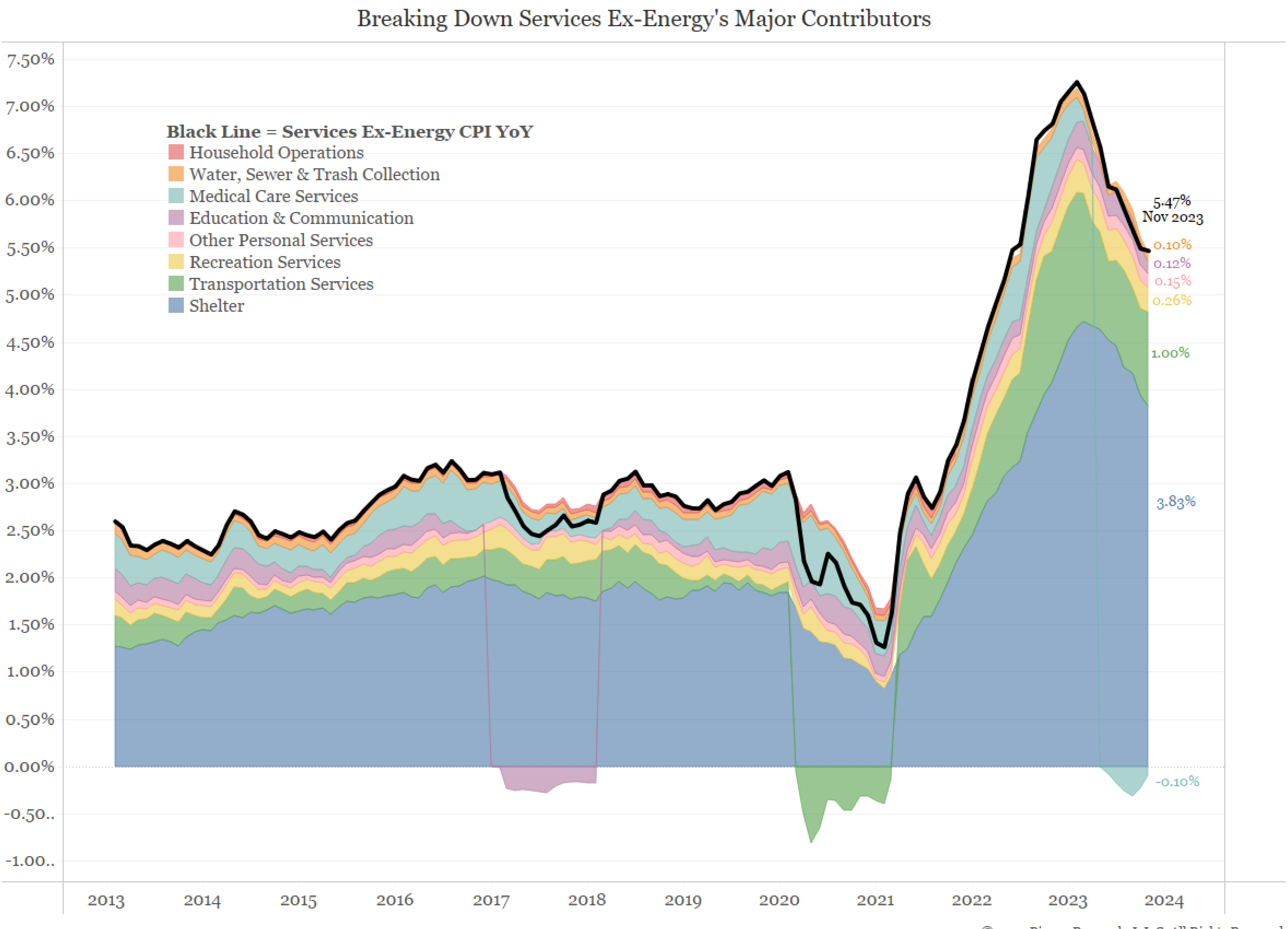
Source: OECD

Breaking Down CPI's Major Contributors



Source: Bloomberg


BDI Baltic Exchange Dry Index
Log Scale
6,000
5,000
4,000
3,500
3,000
2,500
2,000
1,750
1,500
1,200
1,000
800
700
600
500
400
350
300
250
2016
2017
2018
2019
2020
2021
2022
2023
2024
10/7/2021
5,526
5/19/2022
3,344
1/27/2022
1,381
8/25/2022
1,082
2/16/2023
538
8/31/2023
1,065
12/14/2023
2,348
Source: Bloomberg
© 2022 Bianco Research, L.L.C. All Rights Reserved
https://www.biancoresearch.com/

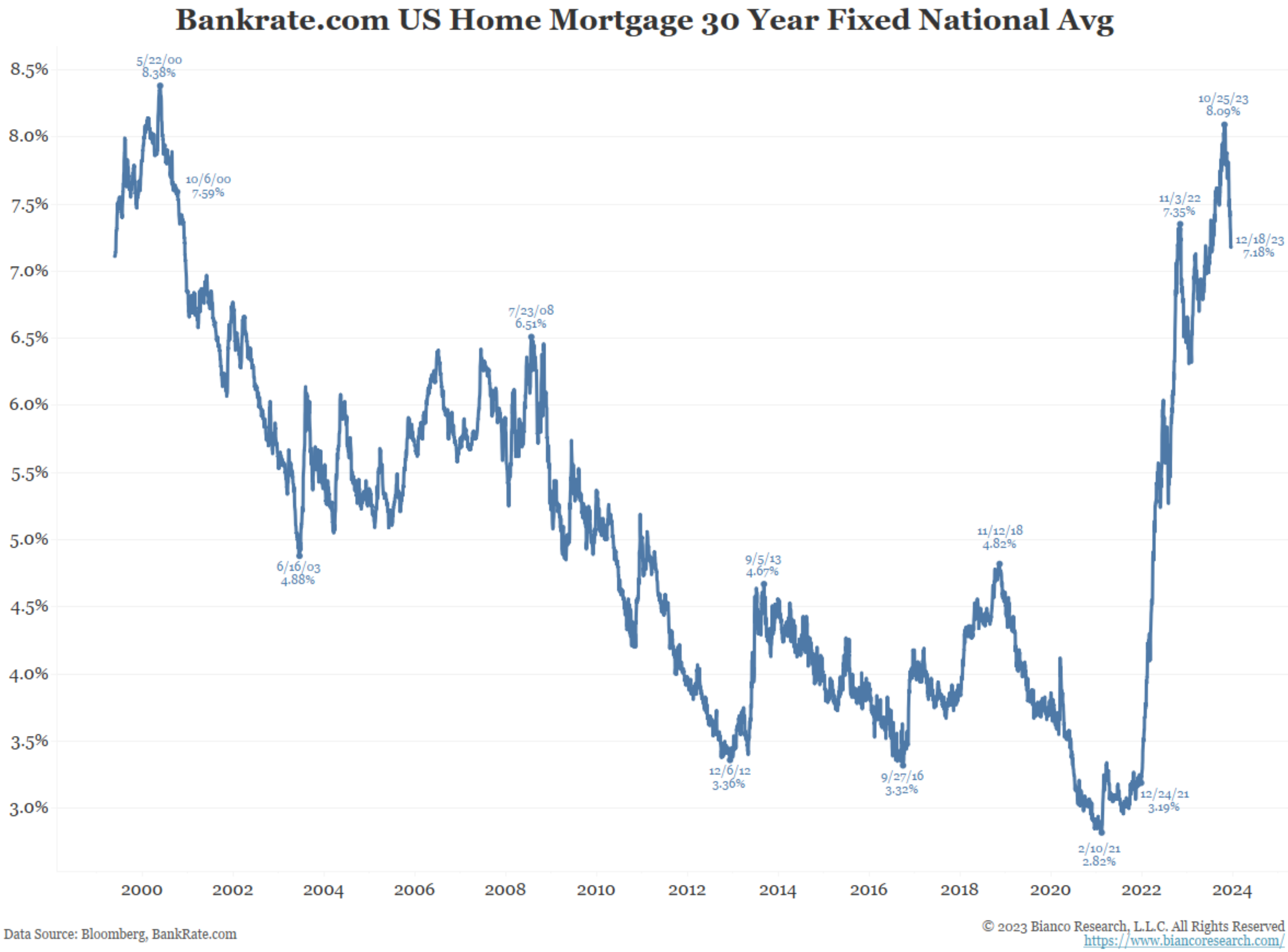


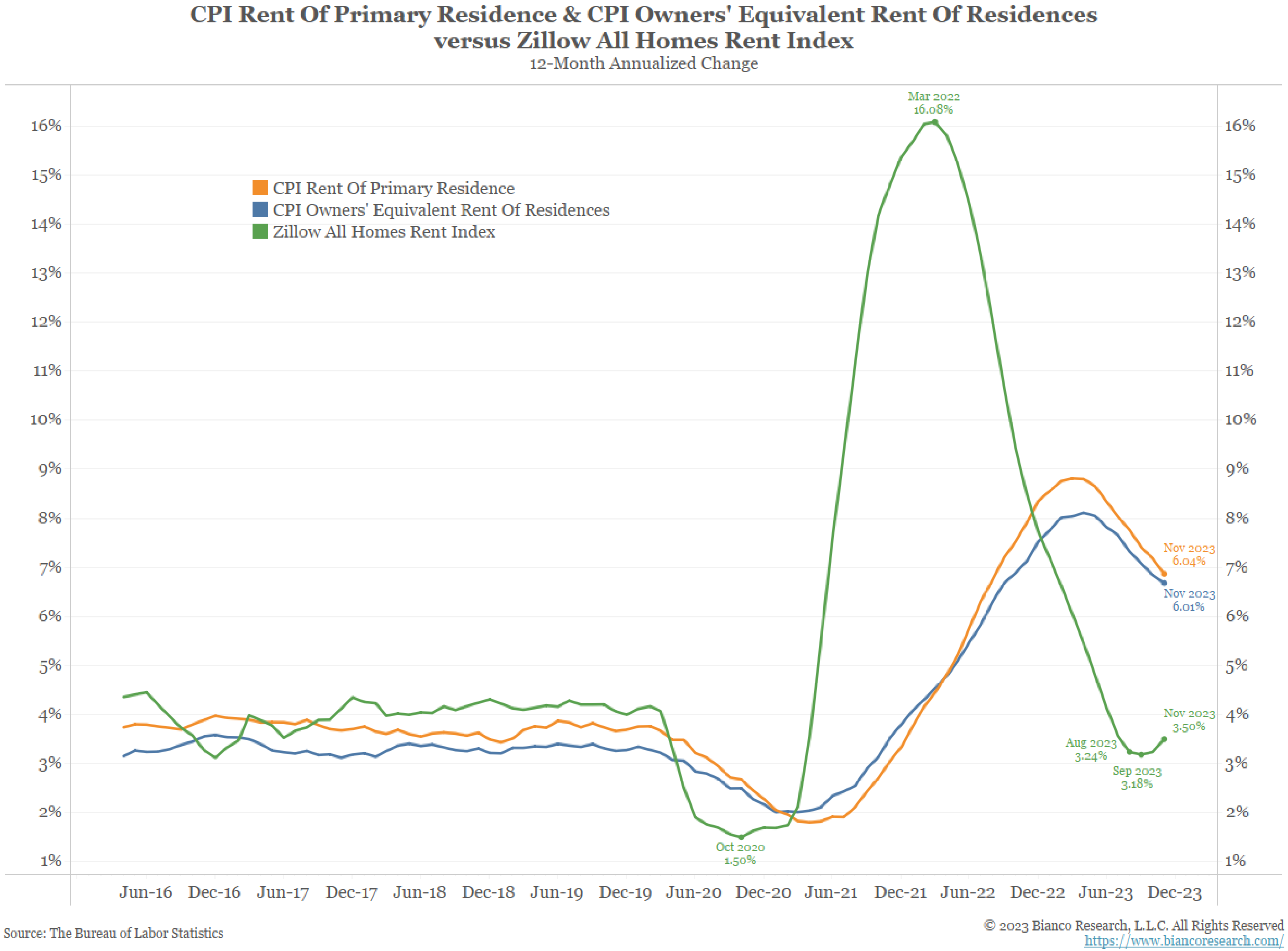
Breaking Down Services Ex-Energy's Major Contributors
Black Line = Services Ex-Energy CPI YoY
Household Operations
Water, Sewer & Trash Collection
Medical Care Services
Education & Communication
Other Personal Services
Recreation Services
Transportation Services
Shelter
5.47%
Nov 2023
0.10%
0.12%
0.15%
0.26%
1.00%
3.83%
-0.10%
7.50%
7.00%
6.50%
6.00%
5.50%
5.00%
4.50%
4.00%
3.50%
3.00%
2.50%
2.00%
1.50%
1.00%
0.50%
0.00%
-0.50..
-1.00..
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Source: Bloomberg

The Financial Times* – (*October 19, 2023*) *[Blackstone warns of looming hit to consumers from surge in bond yields]

‘When 30-year mortgages and car loans cost you 8% it will impact consumer behaviour,’ says president

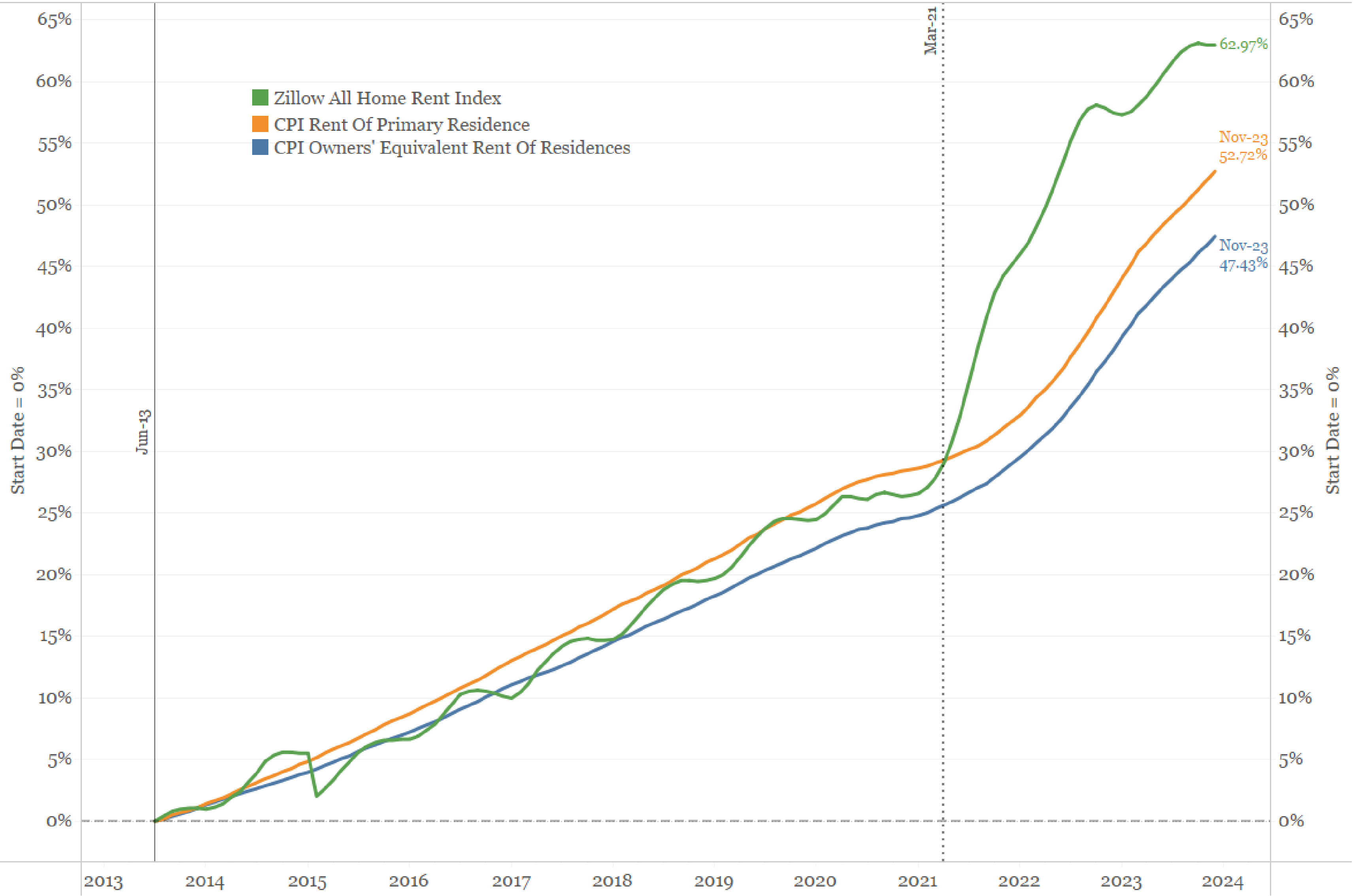
Jonathan Gray, president of Blackstone, said in an interview with the Financial Times that the jump in 10-year Treasury yields would force consumers to tighten their belts. “When 30-year mortgages and car loans cost you 8 percent it will impact consumer behaviour,”




CPI Rent Of Primary Residence & CPI Owners' Equivalent Rent Of Residences
versus Zillow All Homes Rent Index
12-Month Annualized Change
CPI Rent Of Primary Residence
CPI Owners' Equivalent Rent Of Residences
Zillow All Homes Rent Index
Mar 2022
16.08%
Oct 2020
1.50%
Nov 2023
6.04%
Nov 2023
6.01%
Nov 2023
3.50%
Aug 2023
3.24%
Sep 2023
3.18%
16%
15%
14%
13%
12%
11%
10%
9%
8%
7%
6%
5%
4%
3%
2%
1%
Jun-16
Dec-16
Jun-17
Dec-17
Jun-18
Dec-18
Jun-19
Dec-19
Jun-20
Dec-20
Jun-21
Dec-21
Jun-22
Dec-22
Jun-23
Dec-23
Source: The Bureau of Labor Statistics
© 2023 Bianco Research, L.L.C. All Rights Reserved
https://www.biancoresearch.com/

Does CPI Owners' Equivalent Rent Have More Catch Up To Do?

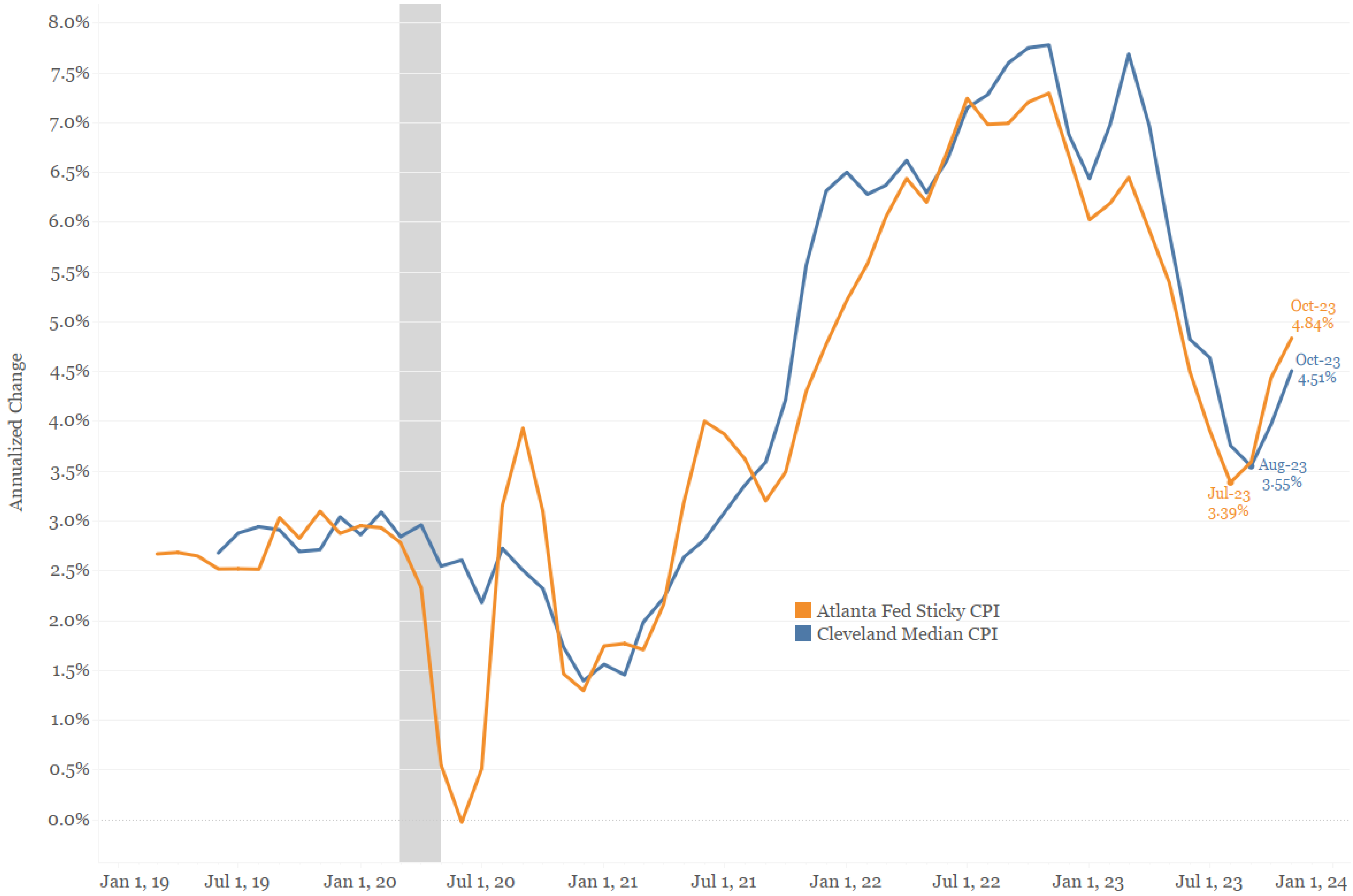
Cumulative Increase



Source: The Bureau of Labor Statistics

Has Inflation Bottomed?

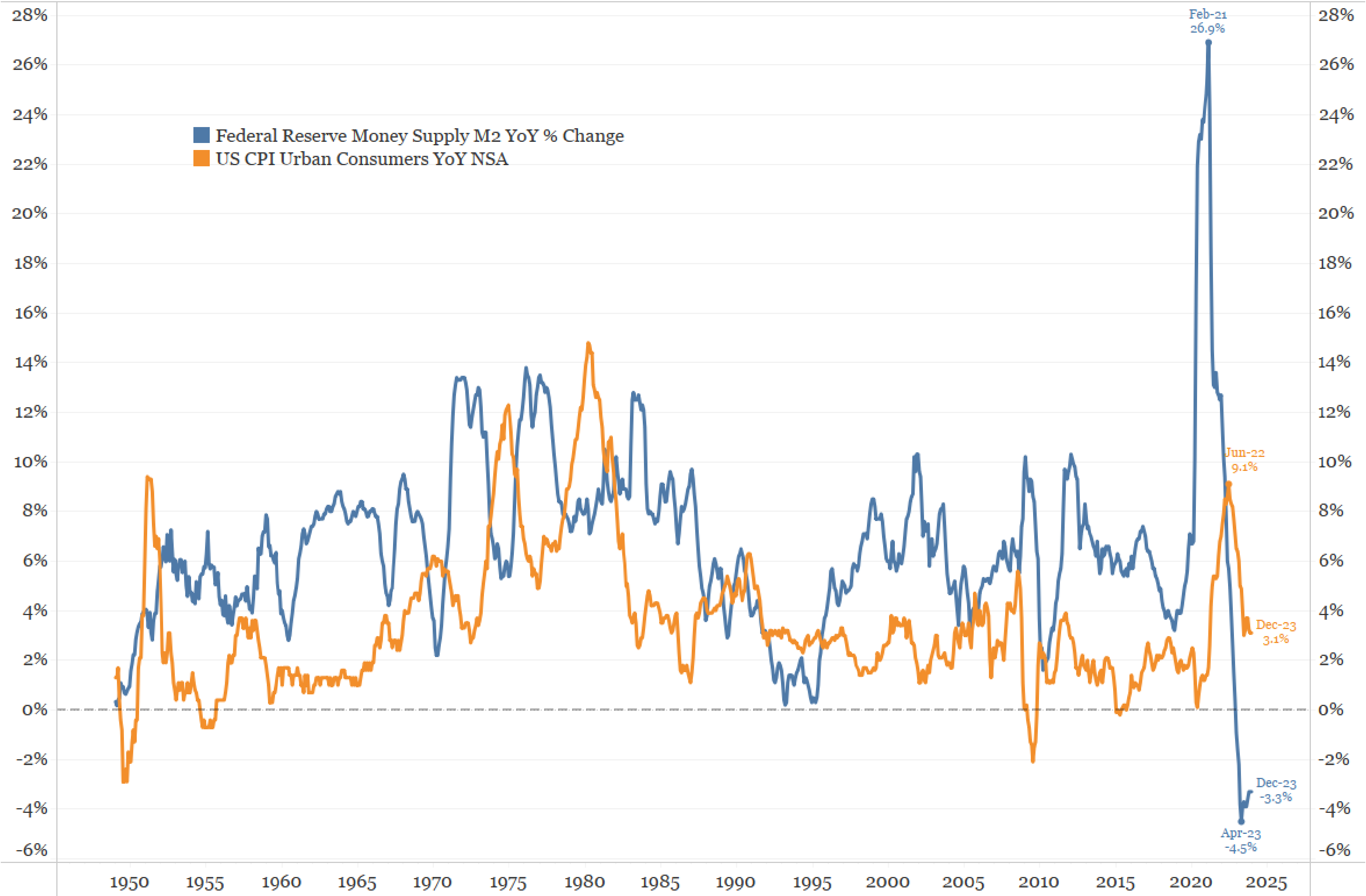
3-Month Annualized Rate



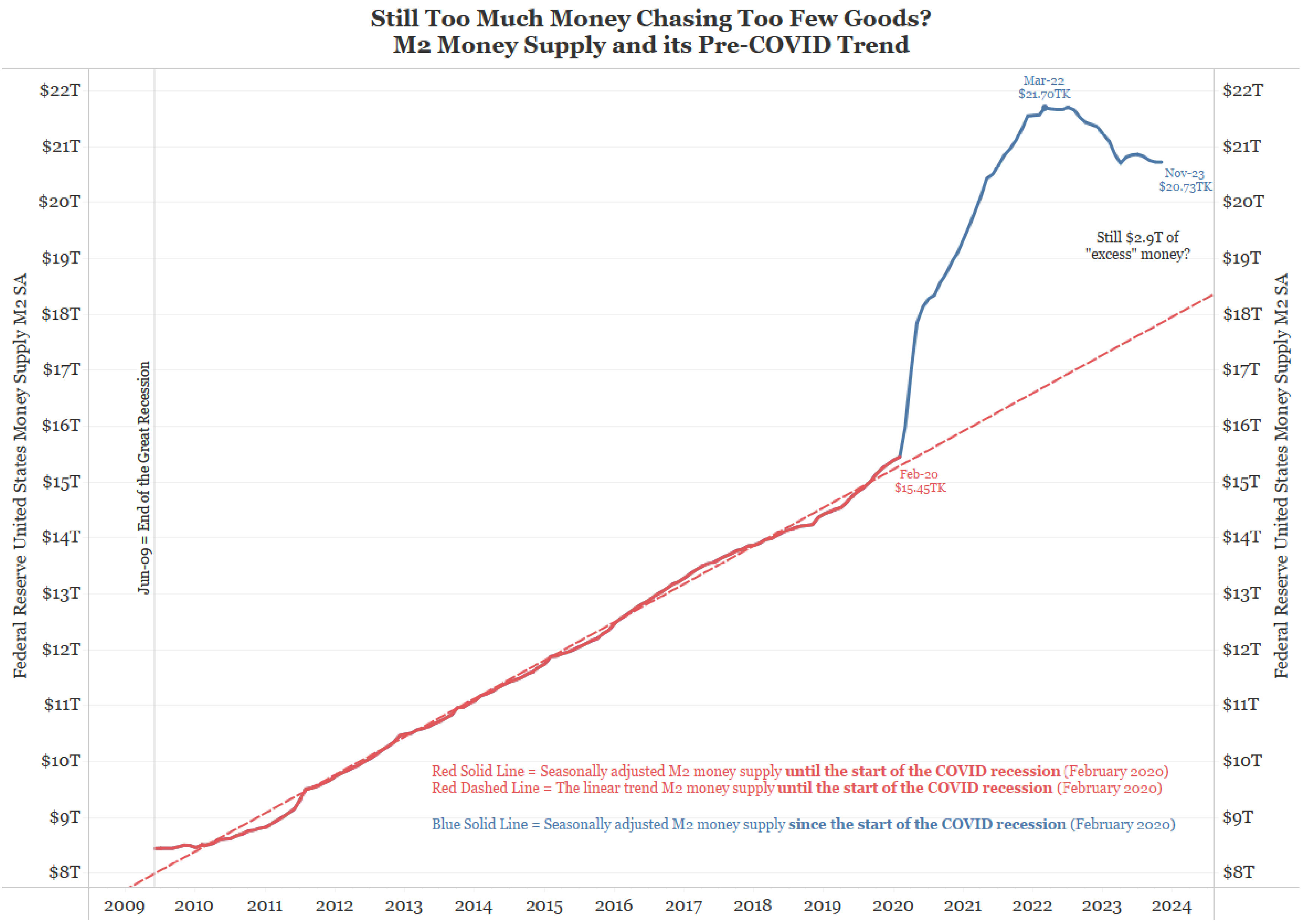
Source: Bloomberg, Atlanta Federal Reserve, Cleveland Federal Reserve

Money Supply and Inflation

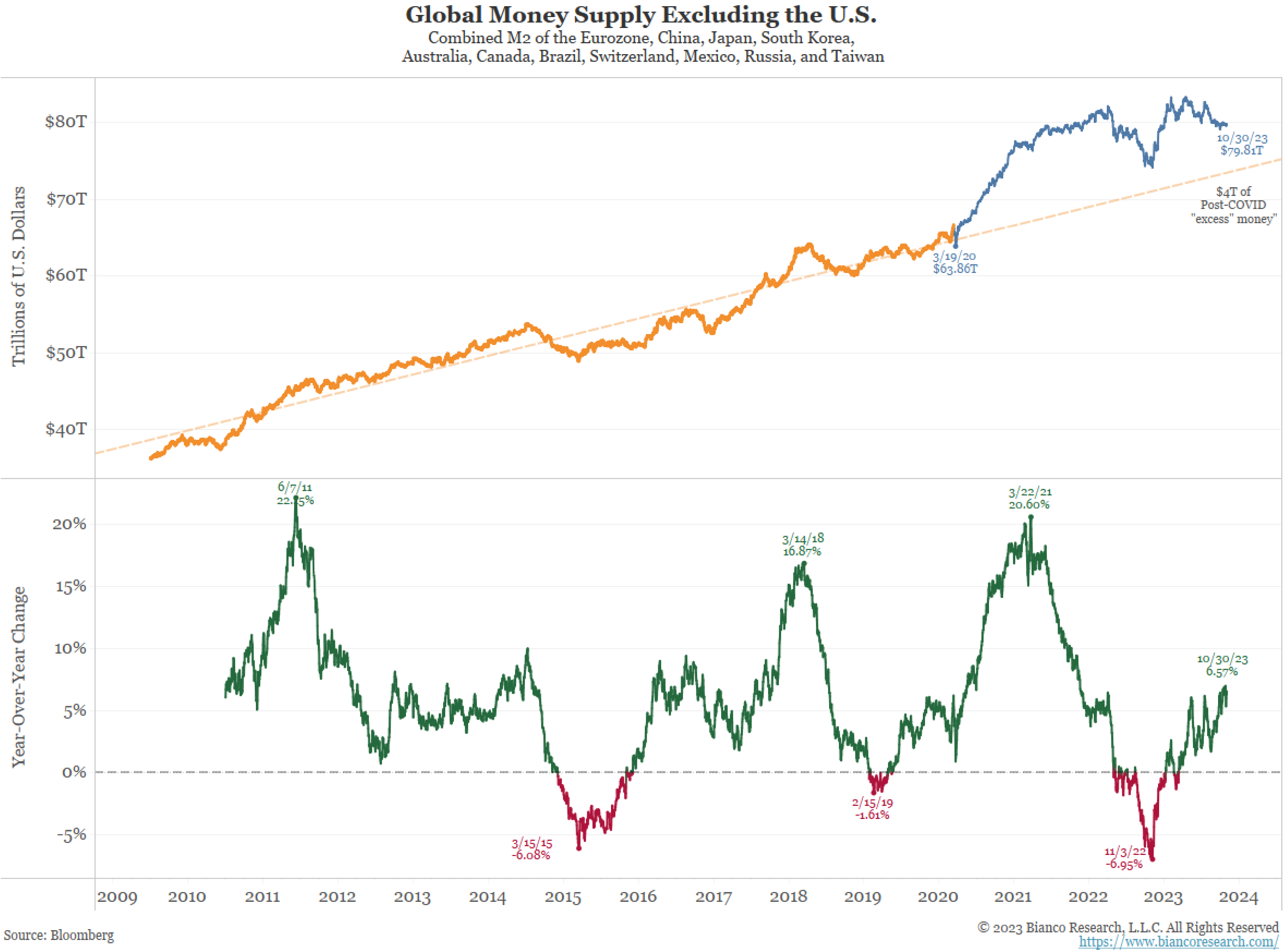
A Historically Weak Realtionship That Has Grown Weaker Over The Years



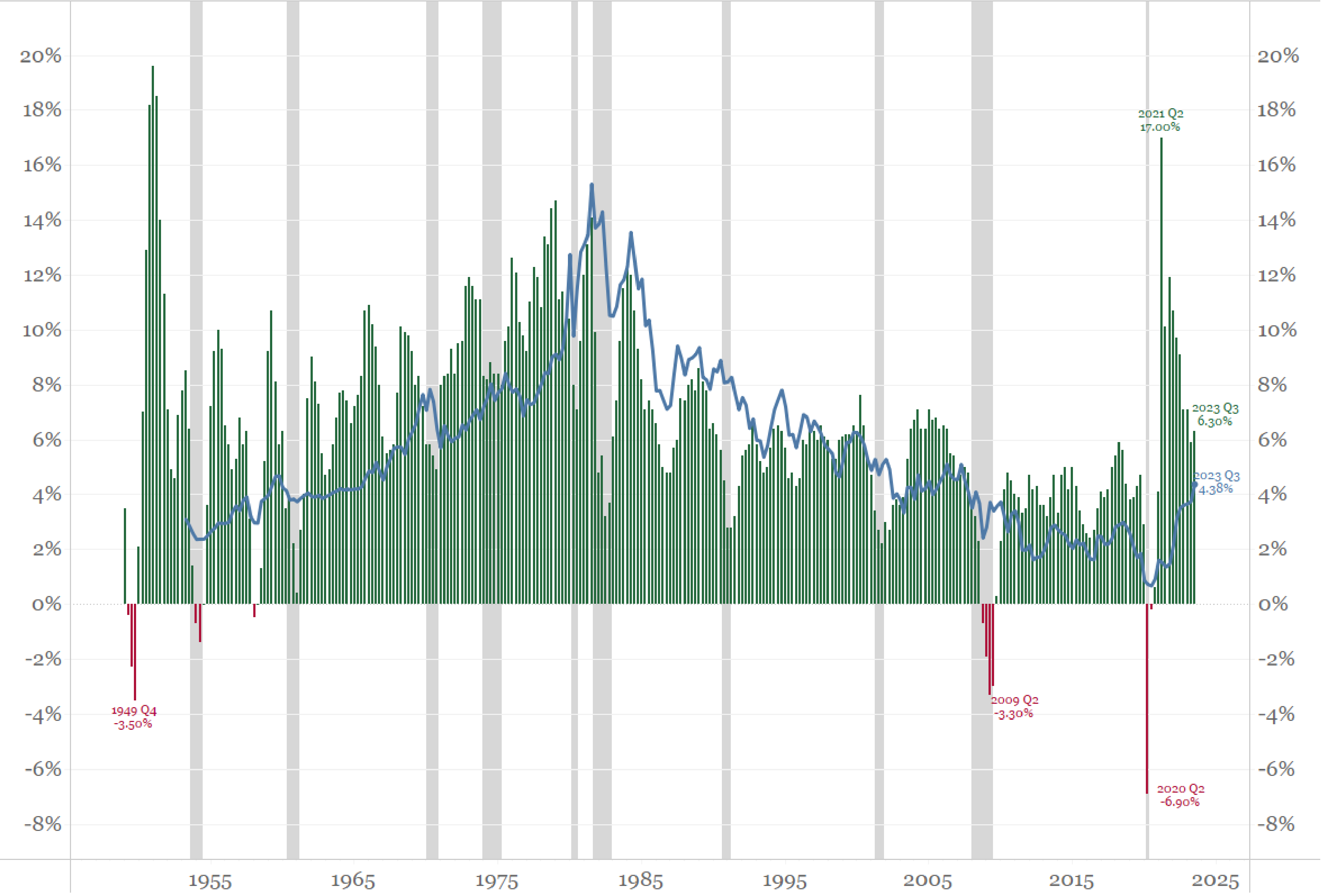
Data Source: New York Federal Reserve, Bloomberg



Data Source: New York Federal Reserve, Bloomberg


Global Money Supply Excluding the U.S.
Combined M2 of the Eurozone, China, Japan, South Korea,
Australia, Canada, Brazil, Switzerland, Mexico, Russia, and Taiwan
Trillions of U.S. Dollars
$80T
$70T
$60T
$50T
$40T
10/30/23
$79.81T
$4T of
Post-COVID
"excess" money
3/19/20
$63.86T
Year-Over-Year Change
20%
15%
10%
5%
0%
-5%
6/7/11
22.15%
3/22/21
20.60%
3/14/18
16.87%
10/30/23
6.57%
3/15/15
-6.08%
2/15/19
-1.61%
11/3/22
-6.95%
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Source: Bloomberg
© 2023 Bianco Research, L.L.C. All Rights Reserved
https://www.biancoresearch.com/

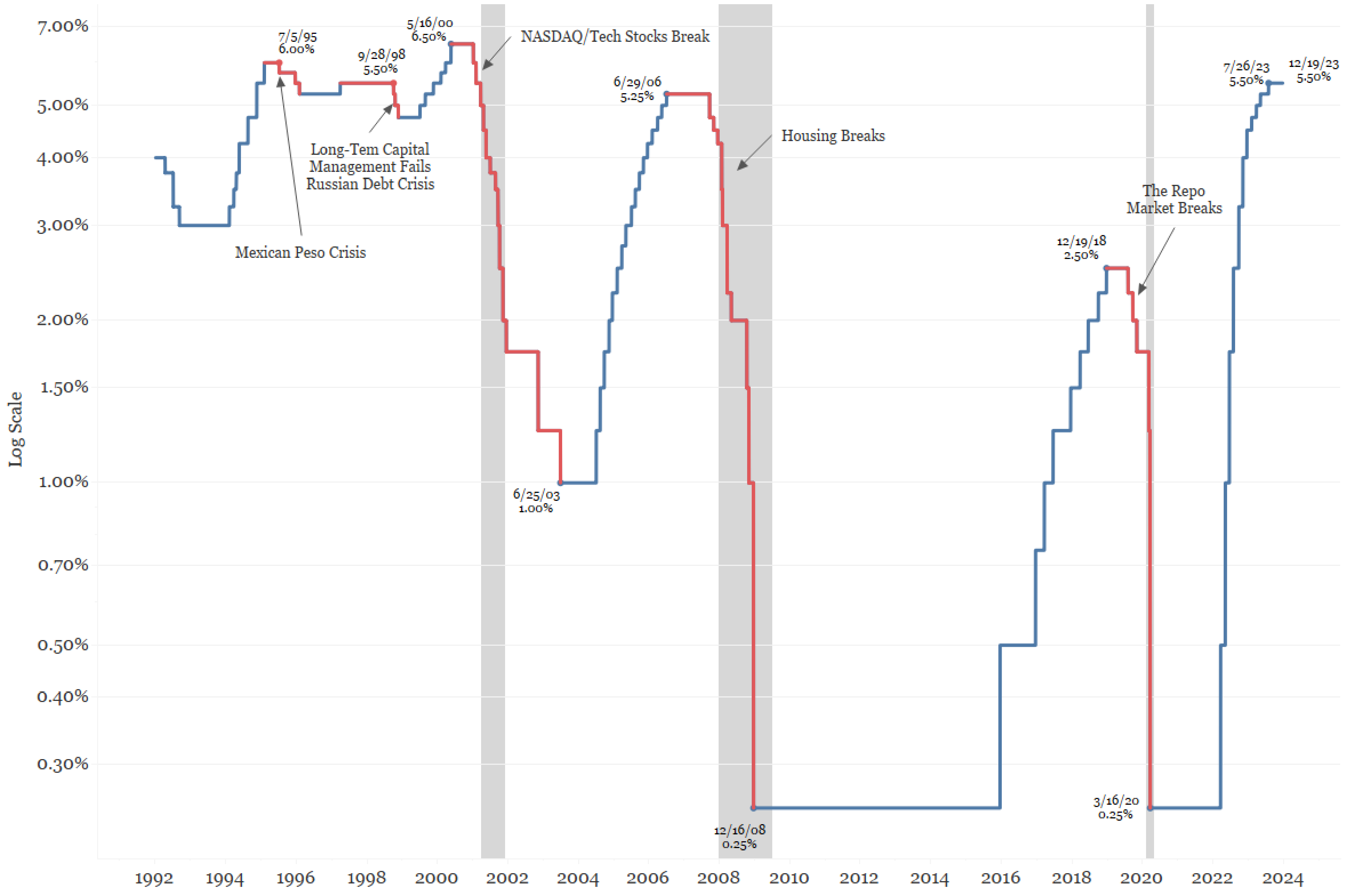
Nominal GDP and 10-Year Yield



Data Source: Bloomberg

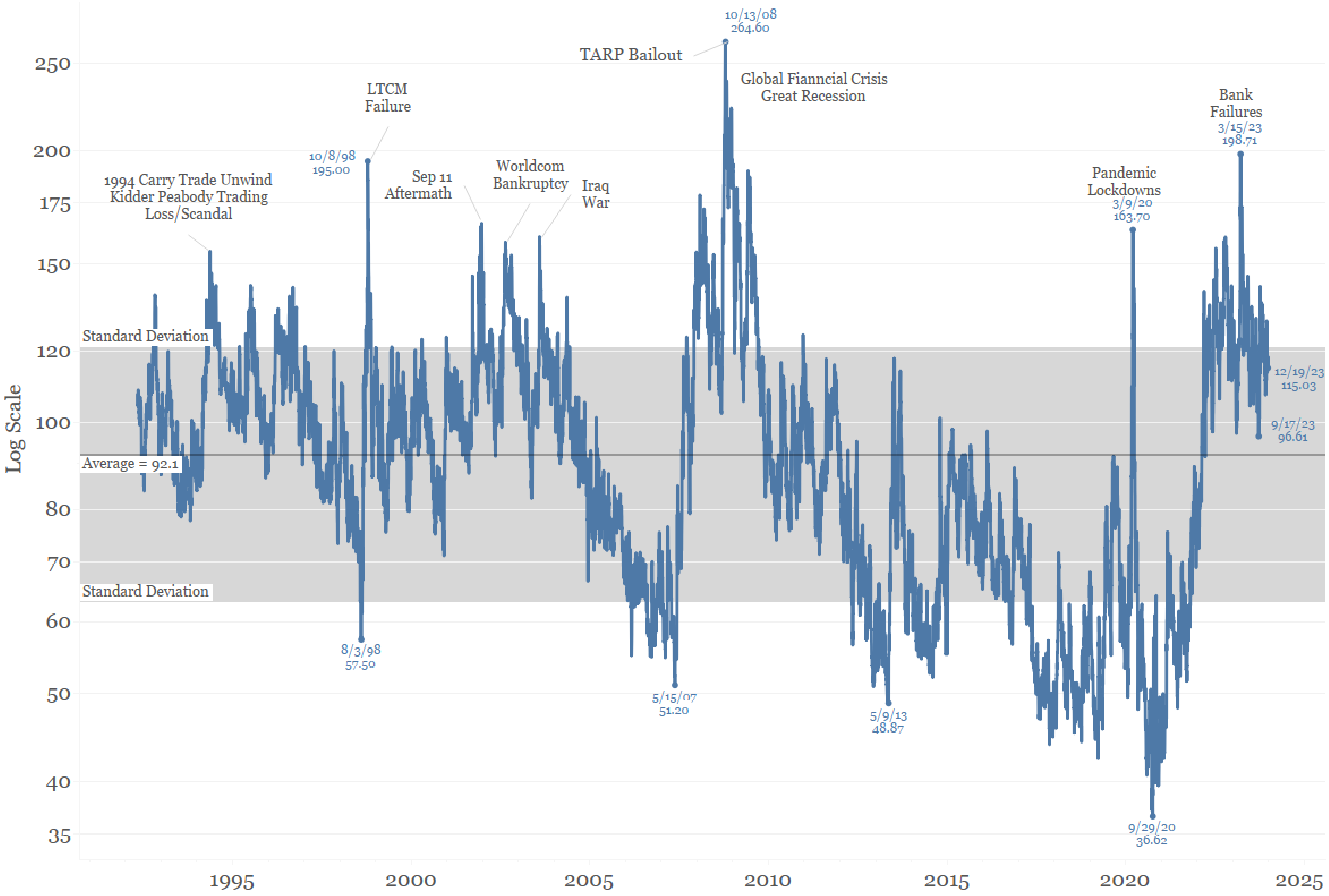
The Fed Hikes Too Much and Something Breaks

The Target Federal Funds Rate Since 1992



Source: Bloomberg

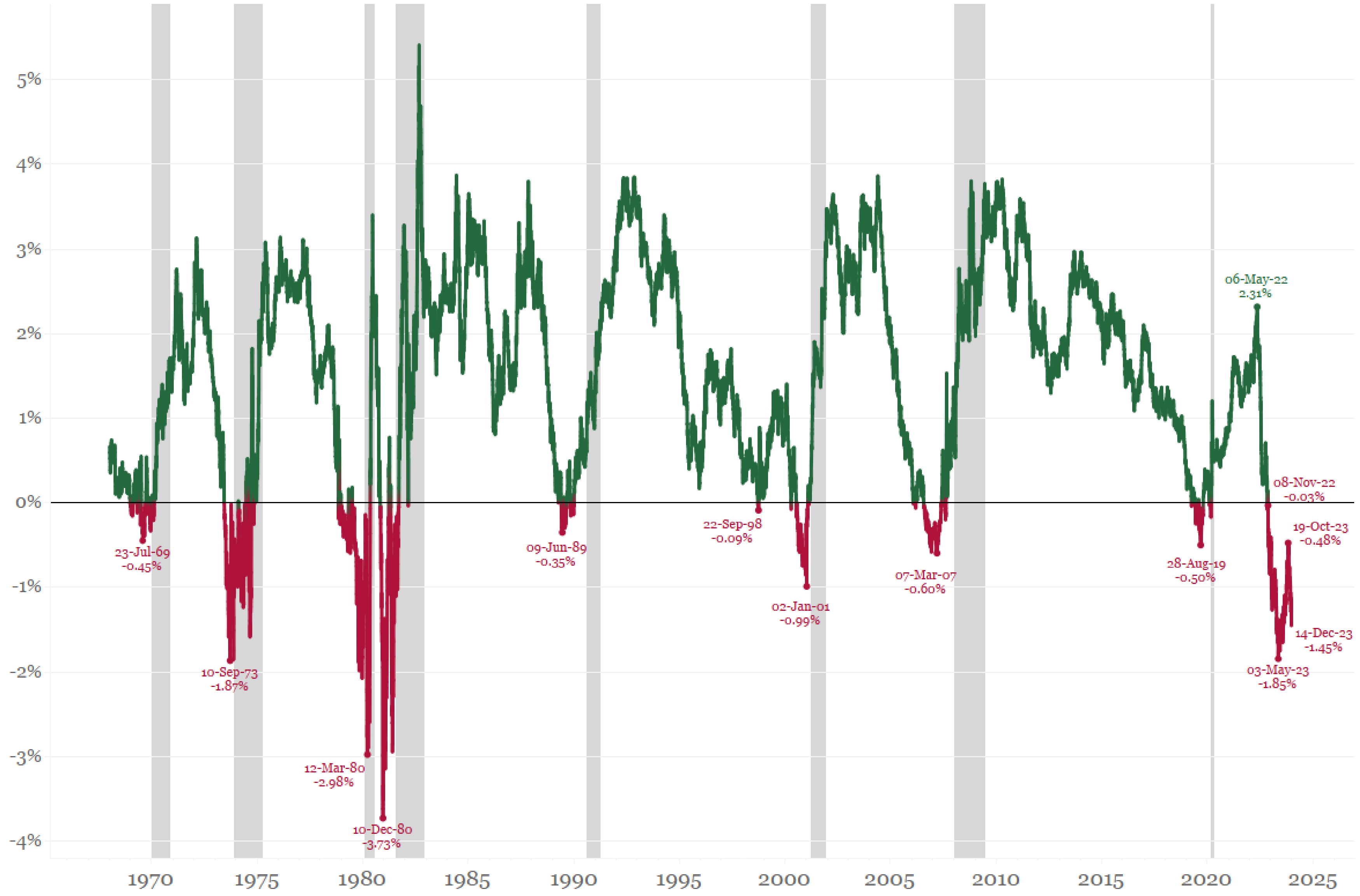
MOVE Index



Source: Bloomberg

Yield Curve Inversions Lead Recessions

10-Year less 3-Month Yield Curve



Data Source: Federal Reserve and Bloomberg

https://www.biancoresearch.com/

How Long Until the Recession?

When the 3-month to 10-year yield curve uninverts for 10 consecutive days

Date of Inversion	Date of Uninversion	Days Inverted	Date of Next Recession	Calendar Days to Recession From Inversion Date	Calendar Days to Recession From Universion Date
1/10/1969	2/21/1969	42	Dec-69	325	283
6/14/1973	9/30/1974	473	Nov-73	140	-333
12/8/1978	5/13/1980	522	Jan-80	389	-133
11/7/1980	3/31/1981	144	Jul-81	236	92
6/6/1989	9/7/1989	93	Jul-90	390	297
7/31/2000	2/8/2001	192	Mar-01	213	21
8/1/2006	6/11/2007	314	Dec-07	487	173
6/6/2019	10/23/2019	139	Feb-20	268	129
11/22/2022	*????*	*394*	*????*	*394*	*????*
Average		**257**		**316**	**66**

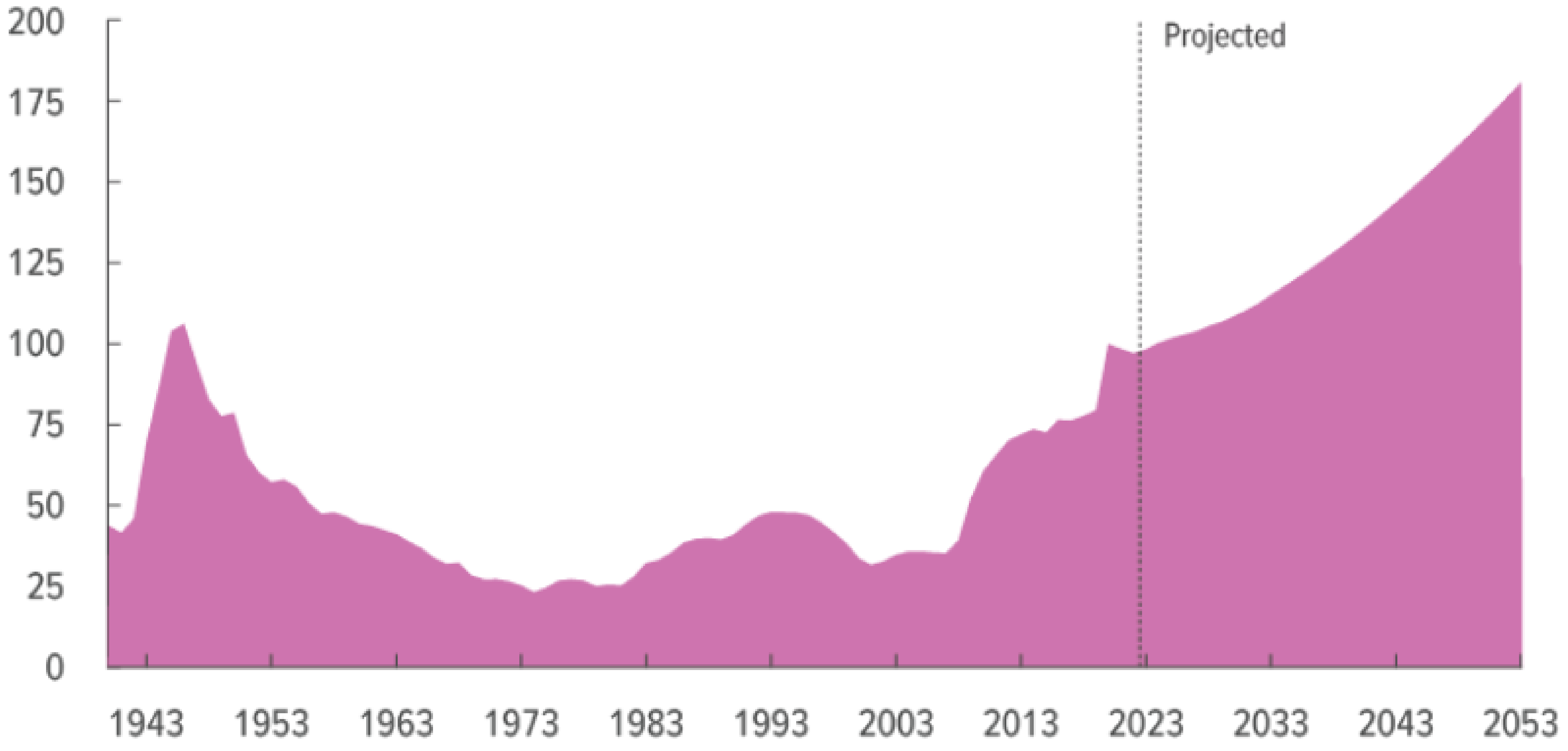
1/10/1969 = Inverted for 24 calendar days, went positive for 33 days, then inverted again for 53 days

6/6/1989 = Inverted for 30 calendar days, went postive for 9 days, inverted again for 26 days

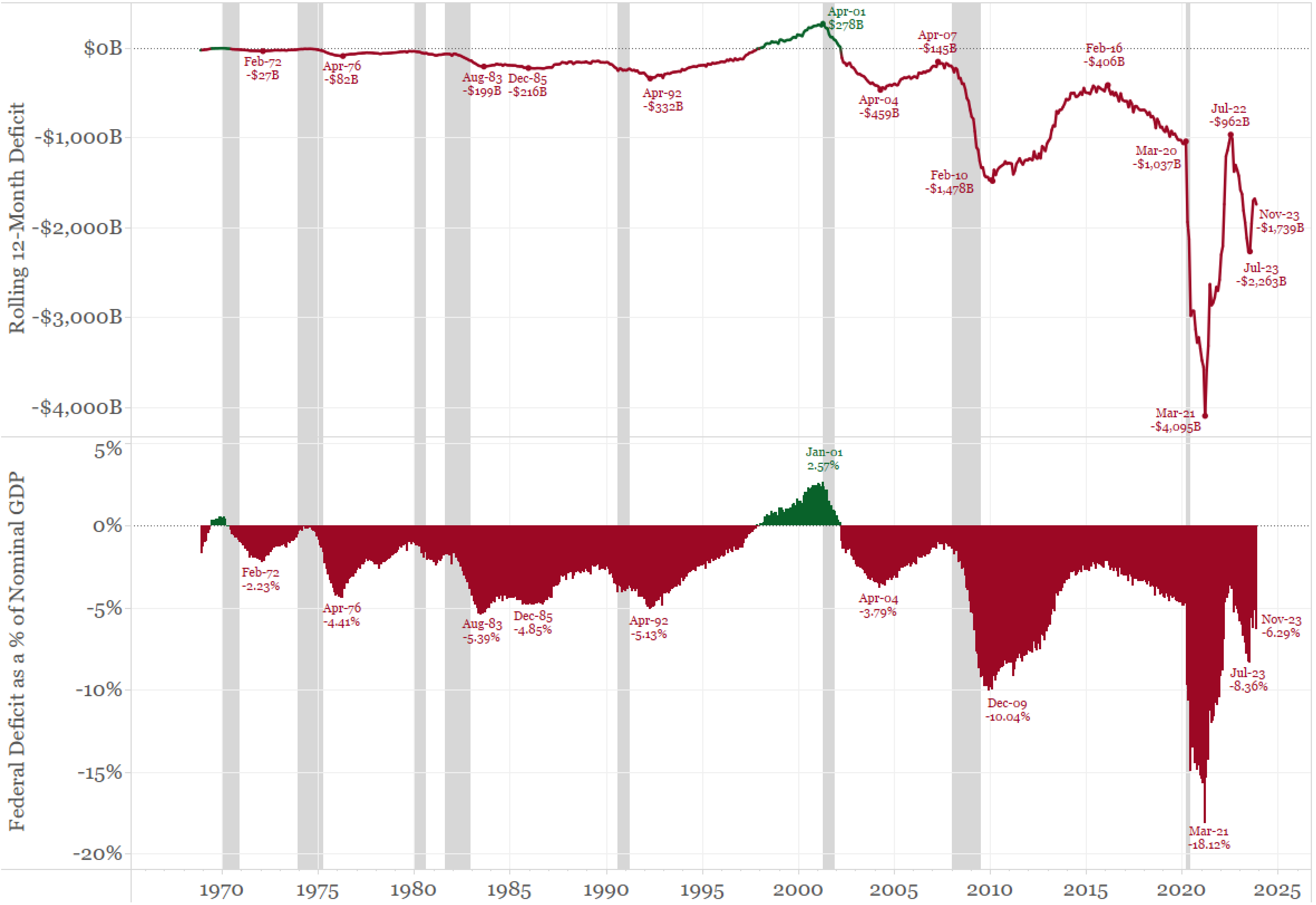
6/6/2019 = Inverted 41 consecutive trading days, went positive for 1 day, then inverted again for 67 days

Federal Debt Held by the Public

Percentage of GDP



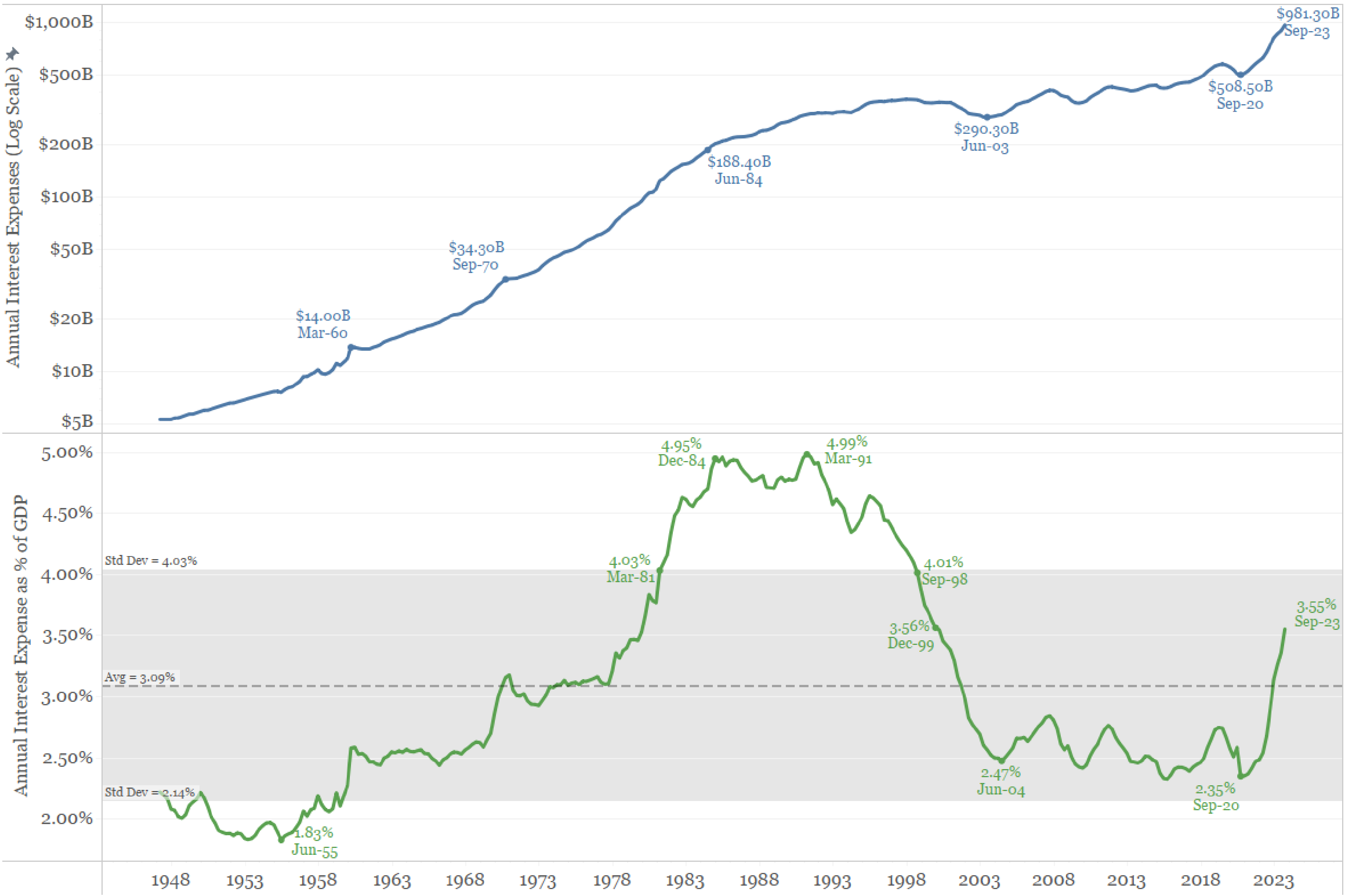
The U.S. Federal Deficit



Data Source: US Treasury, Commerce Department

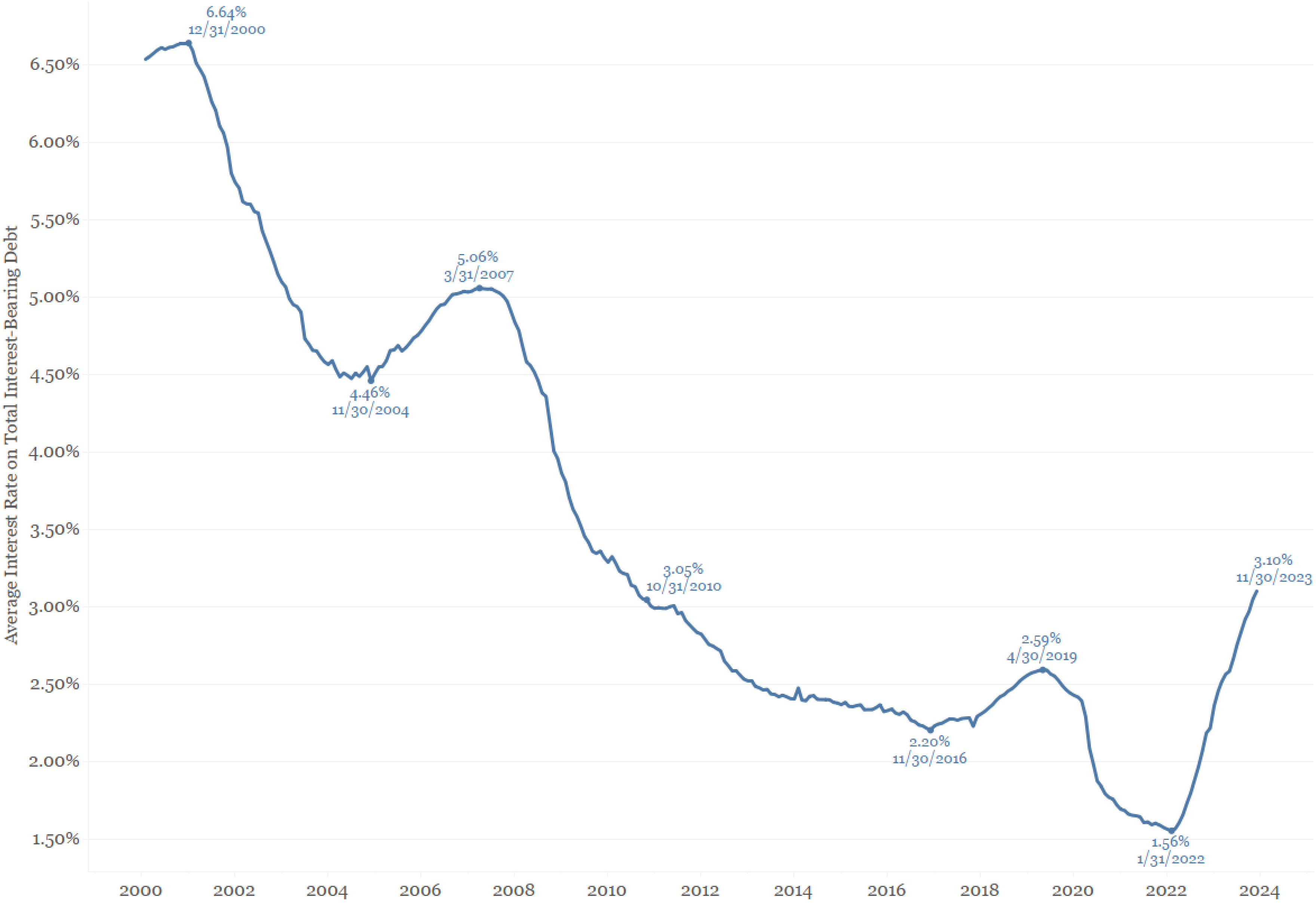
How Much Interest Does the U.S. Treasury Pay on Its Debt in a Year?

Nominal Dollars and as Percentage of GDP



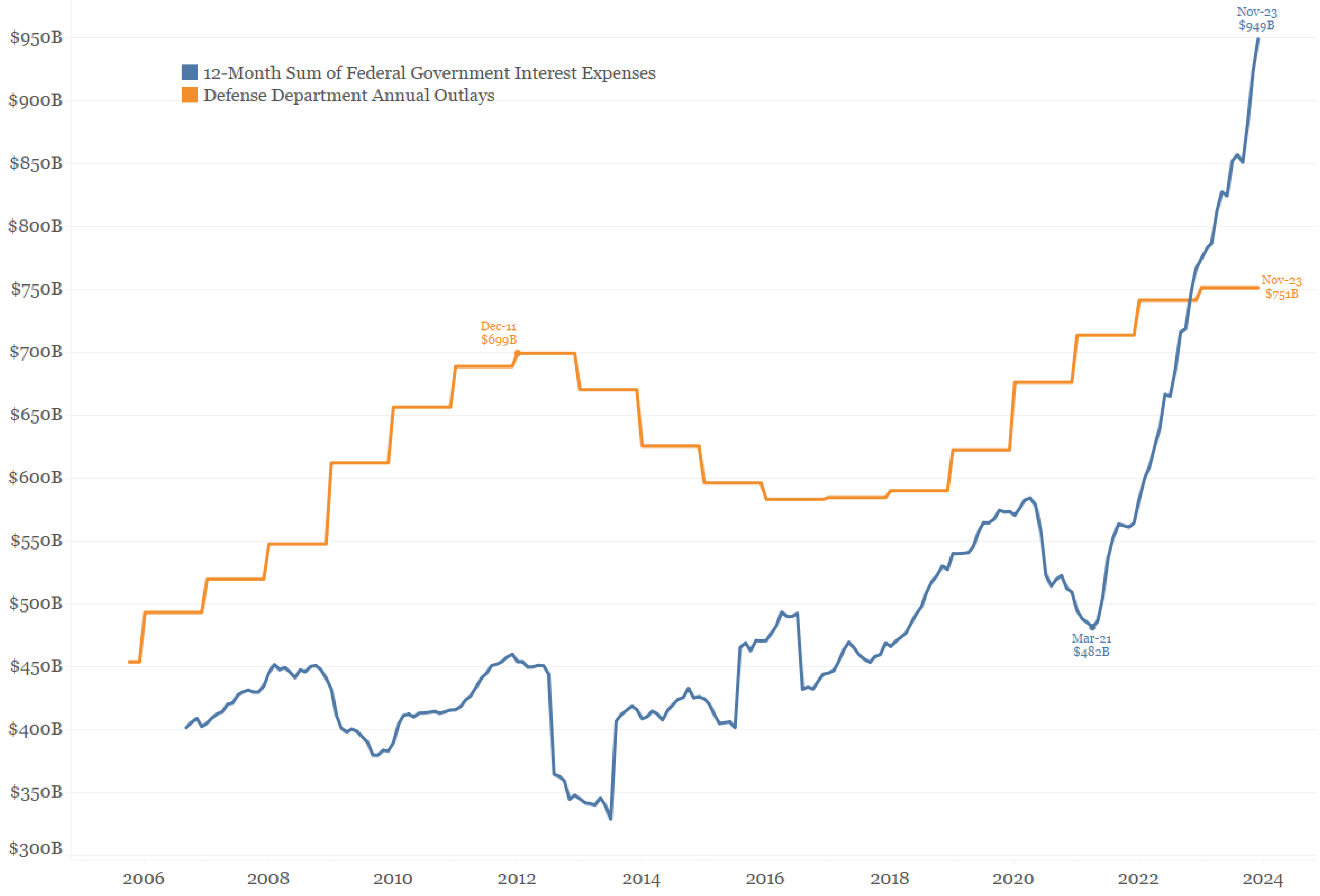
Source: U.S. Treasury, BEA

What Is the Average Interest Rate the U.S. Treasury Pays on Its Debt?

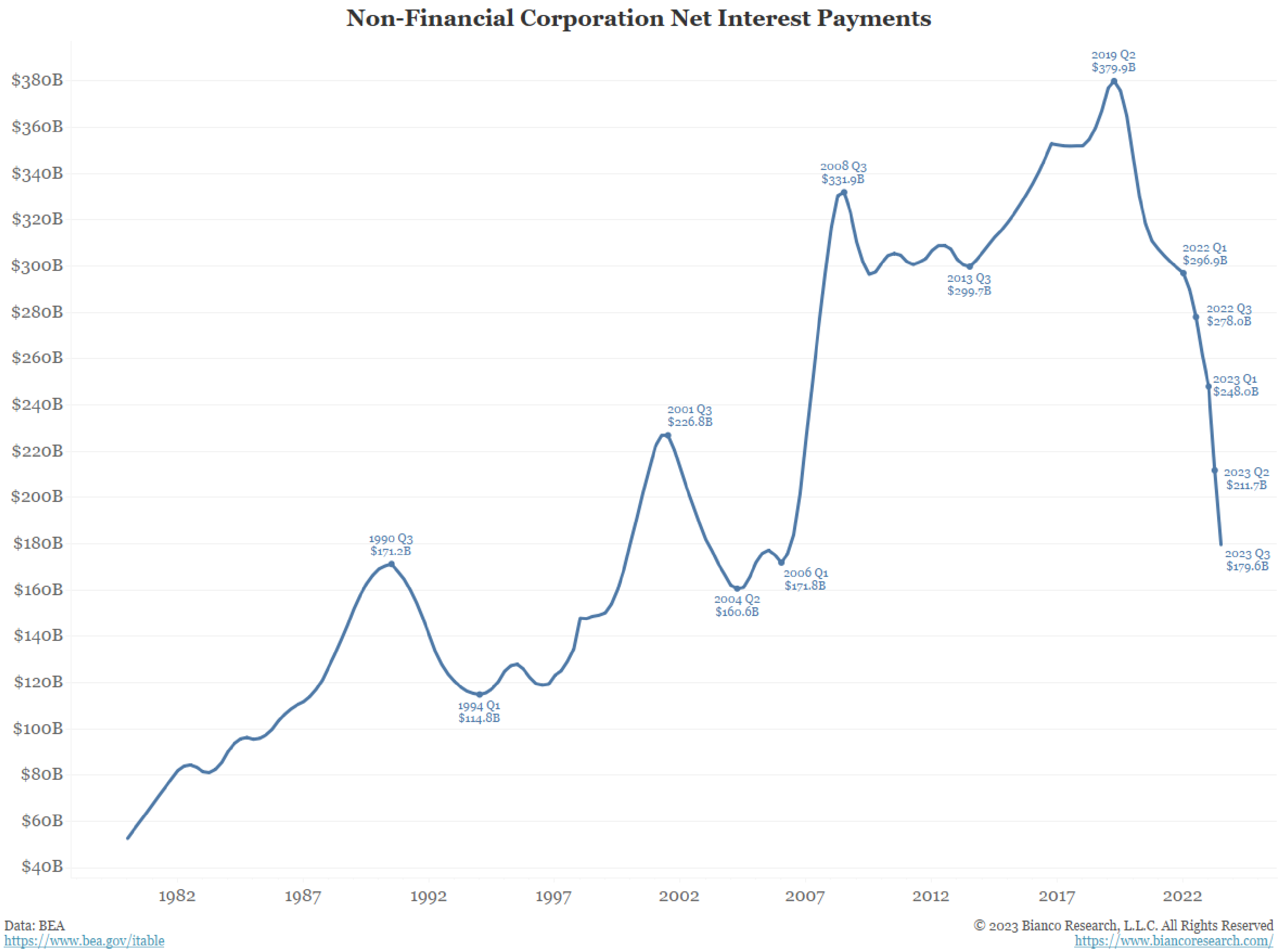


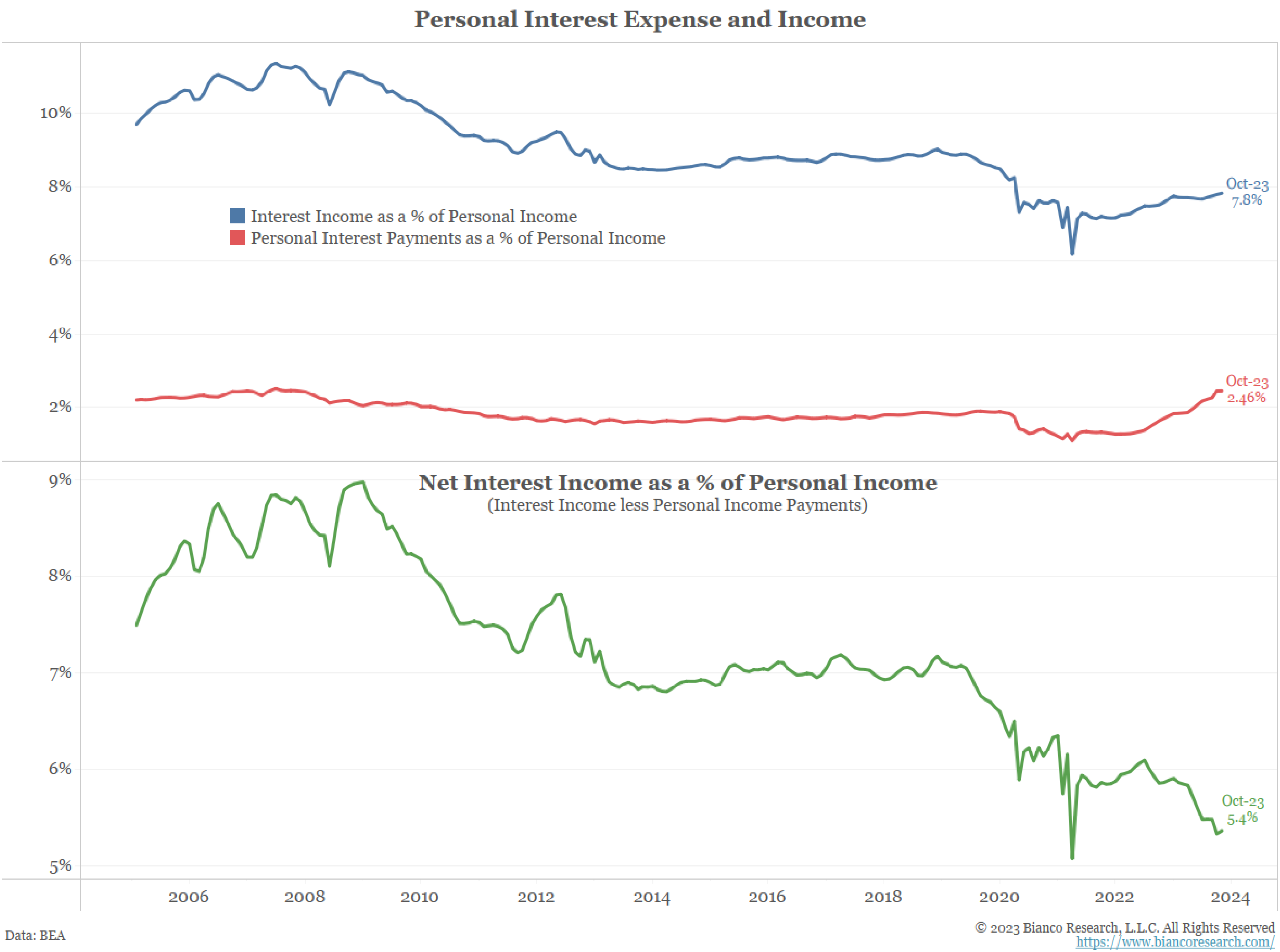
Source: U.S. Treasury

Interest Costs Now Exceed Defense Spending

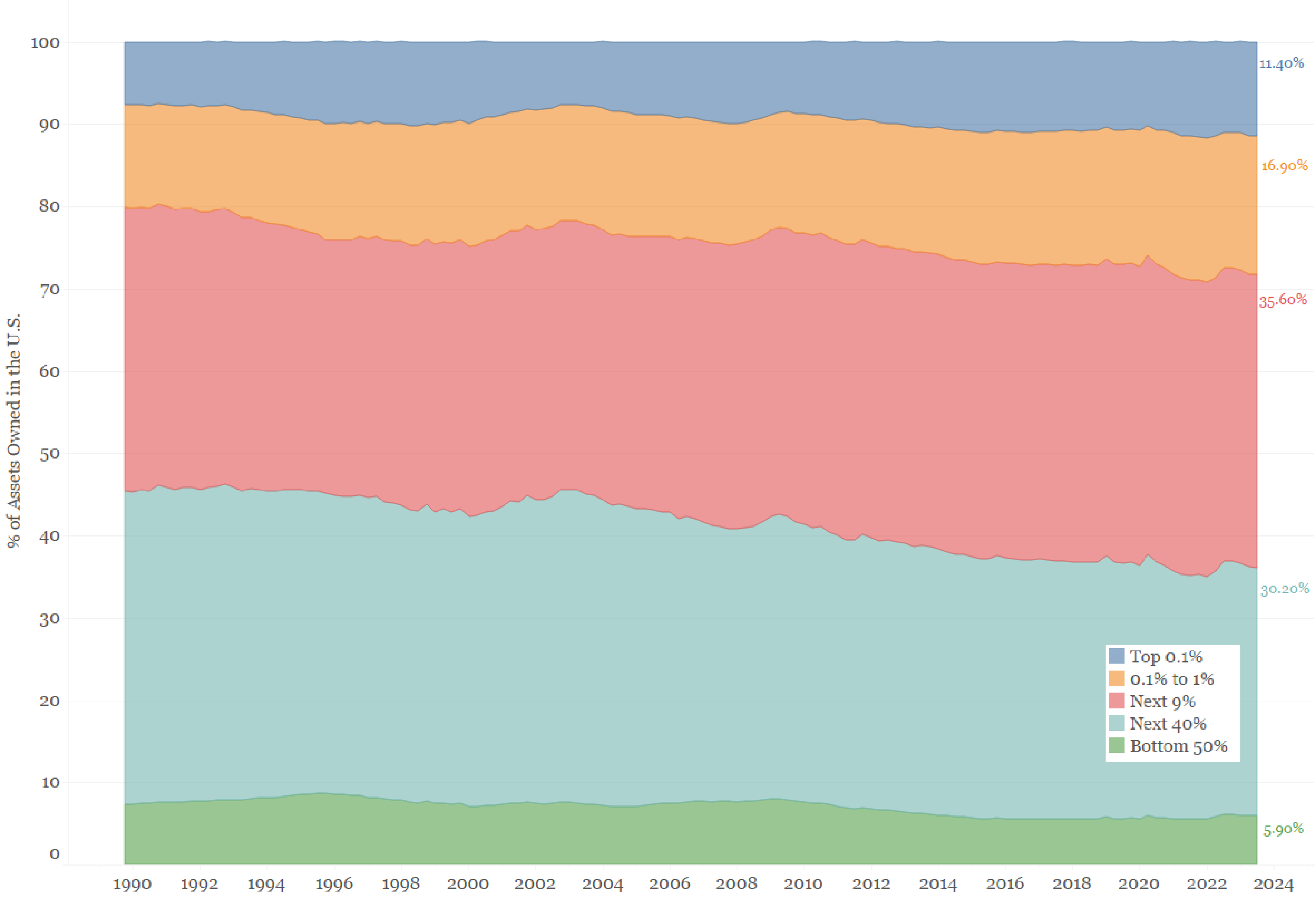


Source: U.S. Treasury


Non-Financial Corporation Net Interest Payments
$380B
$360B
$340B
$320B
$300B
$280B
$260B
$240B
$220B
$200B
$180B
$160B
$140B
$120B
$100B
$80B
$60B
$40B
1982
1987
1992
1997
2002
2007
2012
2017
2022
1990 Q3 $171.2B
1994 Q1 $114.8B
2001 Q3 $226.8B
2004 Q2 $160.6B
2006 Q1 $171.8B
2008 Q3 $331.9B
2013 Q3 $299.7B
2019 Q2 $379.9B
2022 Q1 $296.9B
2022 Q3 $278.0B
2023 Q1 $248.0B
2023 Q2 $211.7B
2023 Q3 $179.6B
Data: BEA
https://www.bea.gov/itable
© 2023 Bianco Research, L.L.C. All Rights Reserved
https://www.biancoresearch.com/

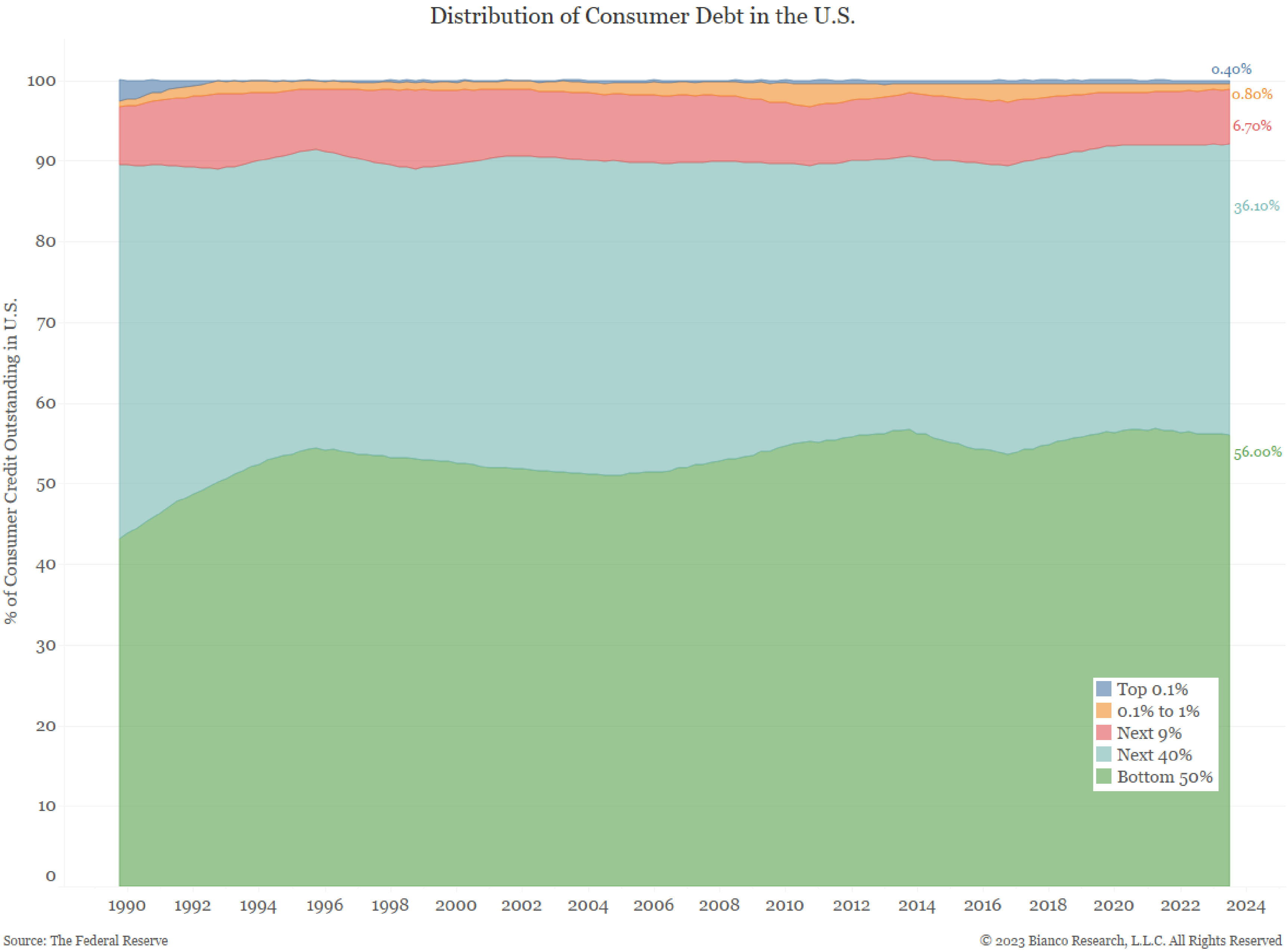

Personal Interest Expense and Income
10%
8%
6%
4%
2%
Interest Income as a % of Personal Income
Personal Interest Payments as a % of Personal Income
Oct-23
7.8%
Oct-23
2.46%
9%
8%
7%
6%
5%
Net Interest Income as a % of Personal Income
(Interest Income less Personal Income Payments)
Oct-23
5.4%
2006
2008
2010
2012
2014
2016
2018
2020
2022
2024
Data: BEA

Distribution of Assets in the U.S.



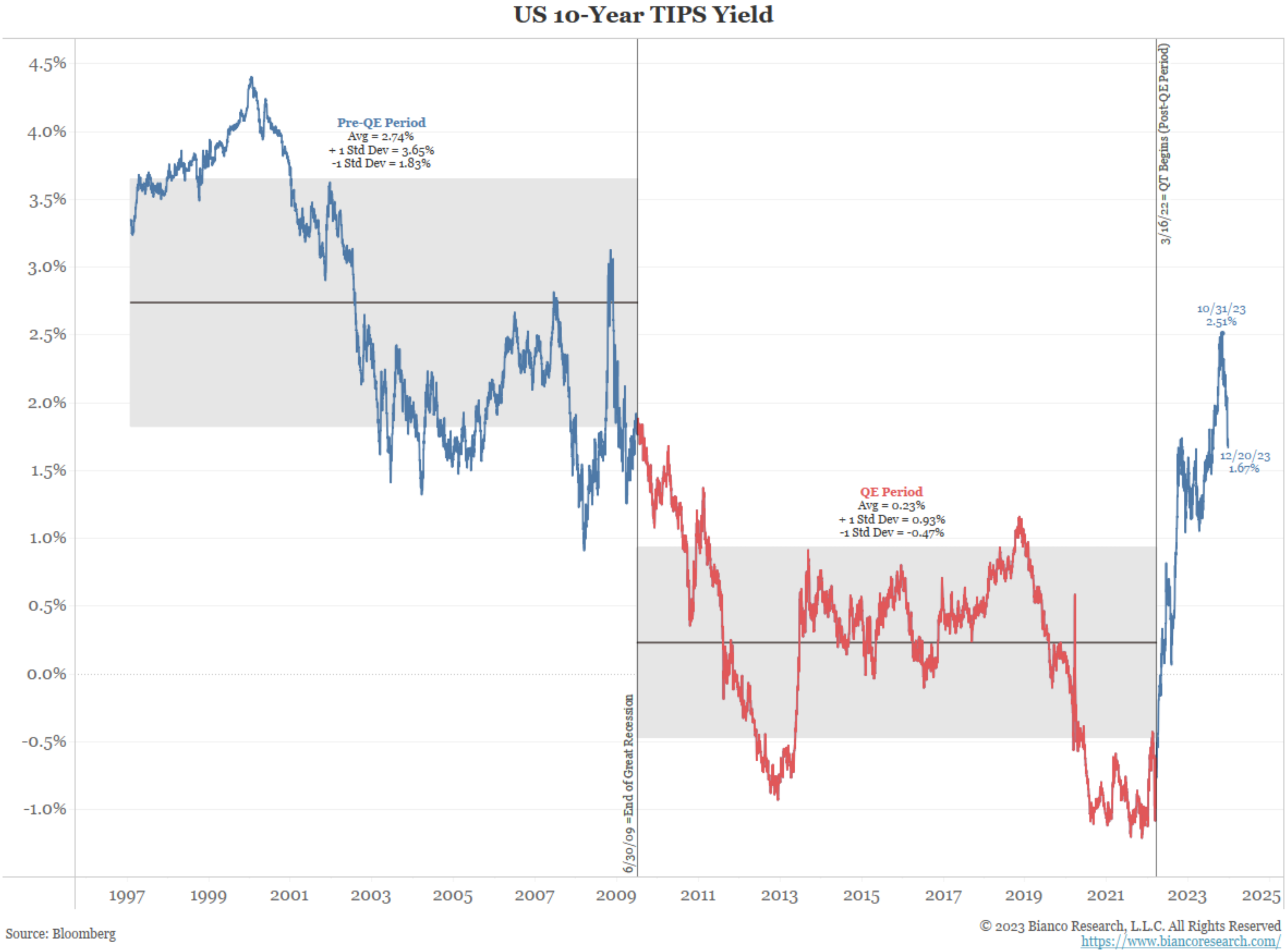
Source: The Federal Reserve

•***CNBC – (December 20, 2023) [62% of Americans are living paycheck to paycheck, as holiday spending, credit card debt rise](#)***
Half of consumers plan to take on more debt to cover those holiday expenses, according to another report by Ally Bank. Only 23% have a plan to pay it off within one to two months. “Not only is sticking to a budget harder today,” said Sarah Foster, a Bankrate analyst, “but it’s all the more imperative, too.” “Credit card financing rates have hovered at the highest levels ever recorded since last fall, meaning carrying a balance could cost a heavy price,” she said.



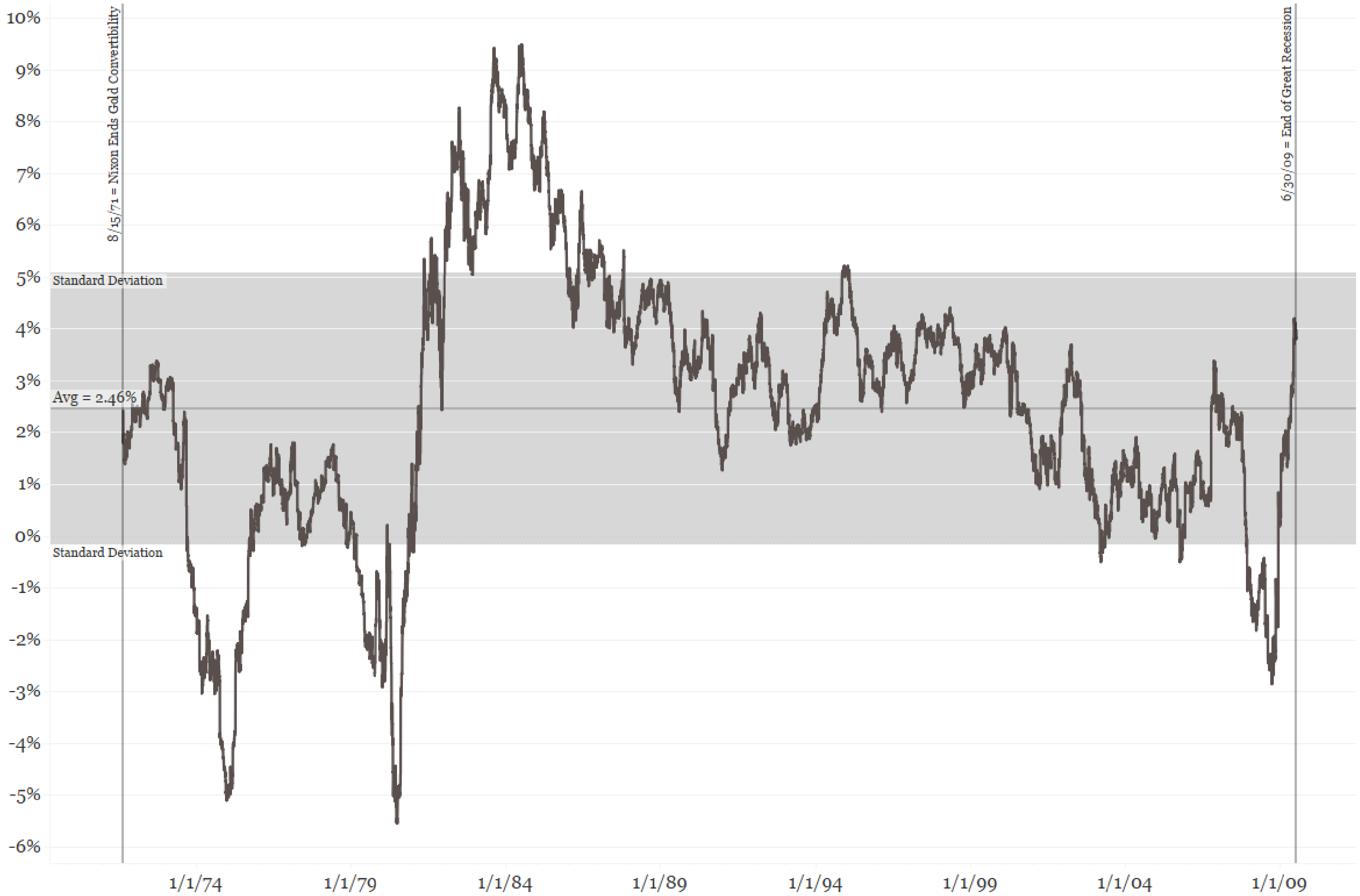
***Bloomberg* – (November 29, 2023) [Bill Ackman Bets Fed Will Cut Interest Rates as Soon as First Quarter]**
What's happening is the real rate of interest, which is what impacts the economy, keeps increasing as inflation declines," Ackman said in an upcoming episode of The David Rubenstein Show: Peer-to-Peer Conversations. Ackman said that if the Fed keeps rates in the roughly 5.5% range when inflation trends below 3%, "that's a very high real rate of interest."

***The Wall Street Journal* – (December 19, 2023) [Nick Timiraos: Fed Official Says Rate Cuts Could Be Needed Next Year to Prevent Overtightening]**
San Francisco Fed President Mary Daly said her outlook for interest rates and inflation was "very close" to the median of projections from 19 Fed officials last week. Most of them penciled in at least three rate cuts next year amid a faster decline in inflation than they anticipated…Daly said that if inflation continues its steady decline of recent months, the Fed's benchmark interest rate "will still be quite restrictive even if we [cut rates] three times next year."

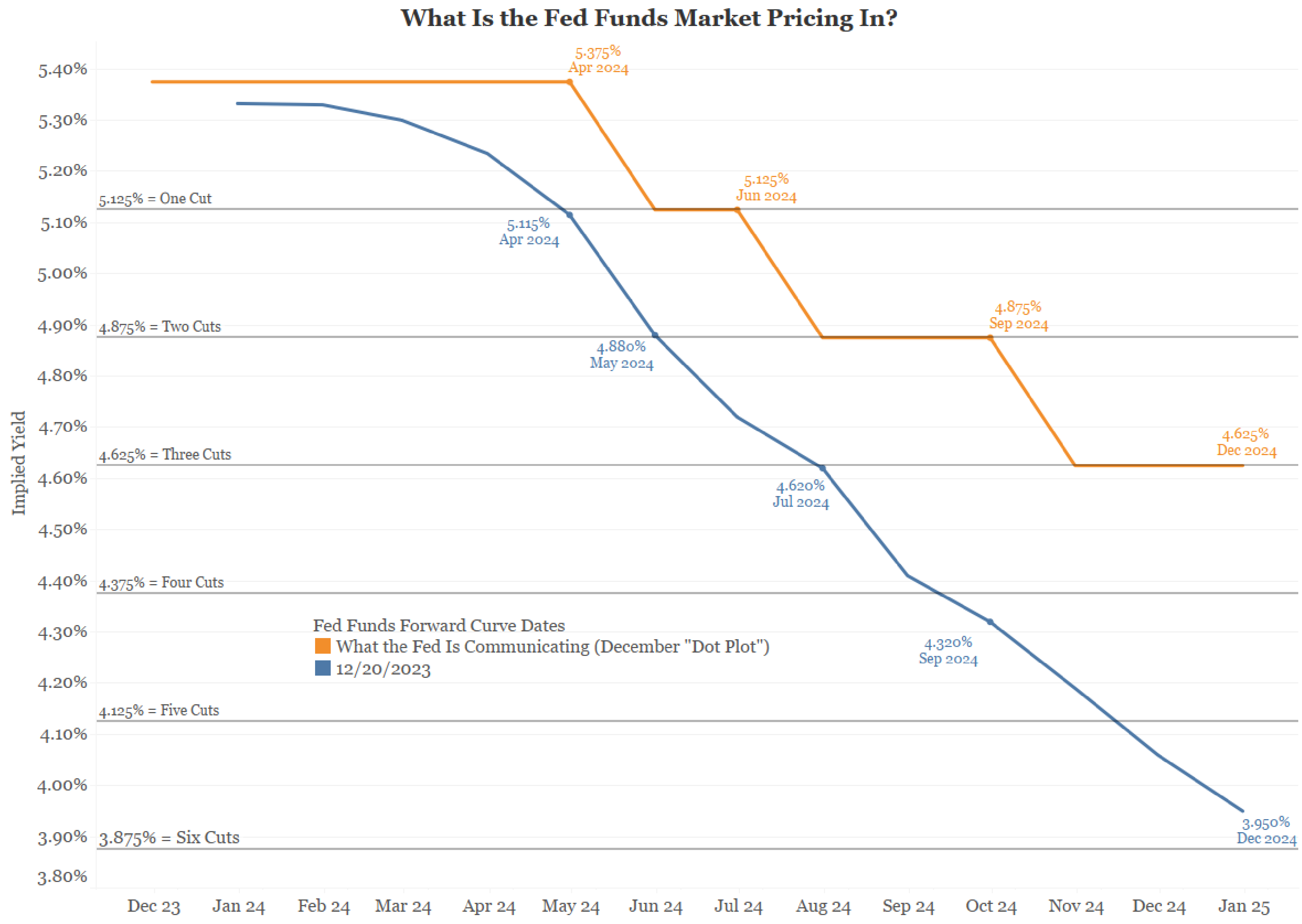


United States Real 10-Year Yields

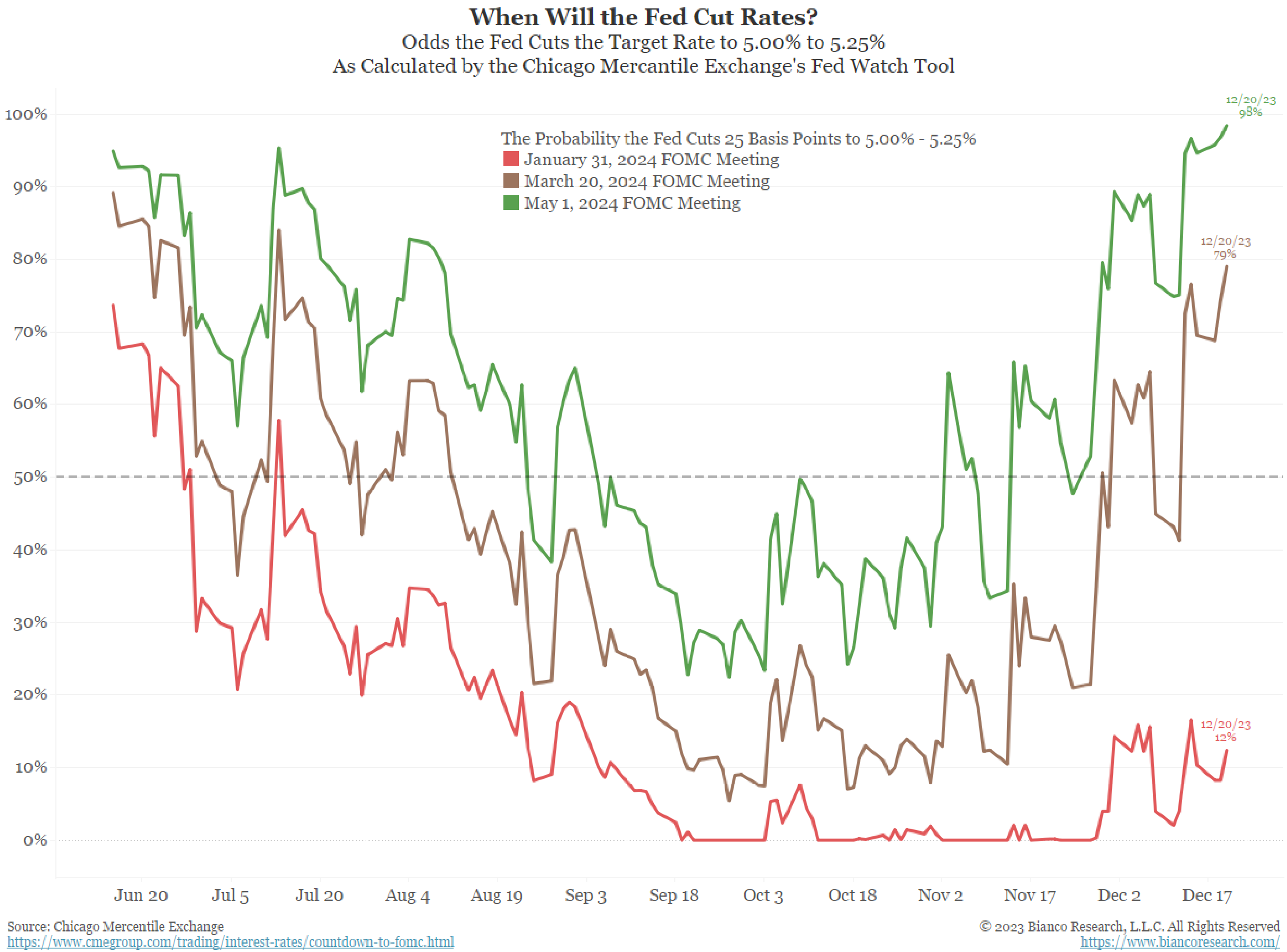
10-Year Yields Deflated by Headline CPI



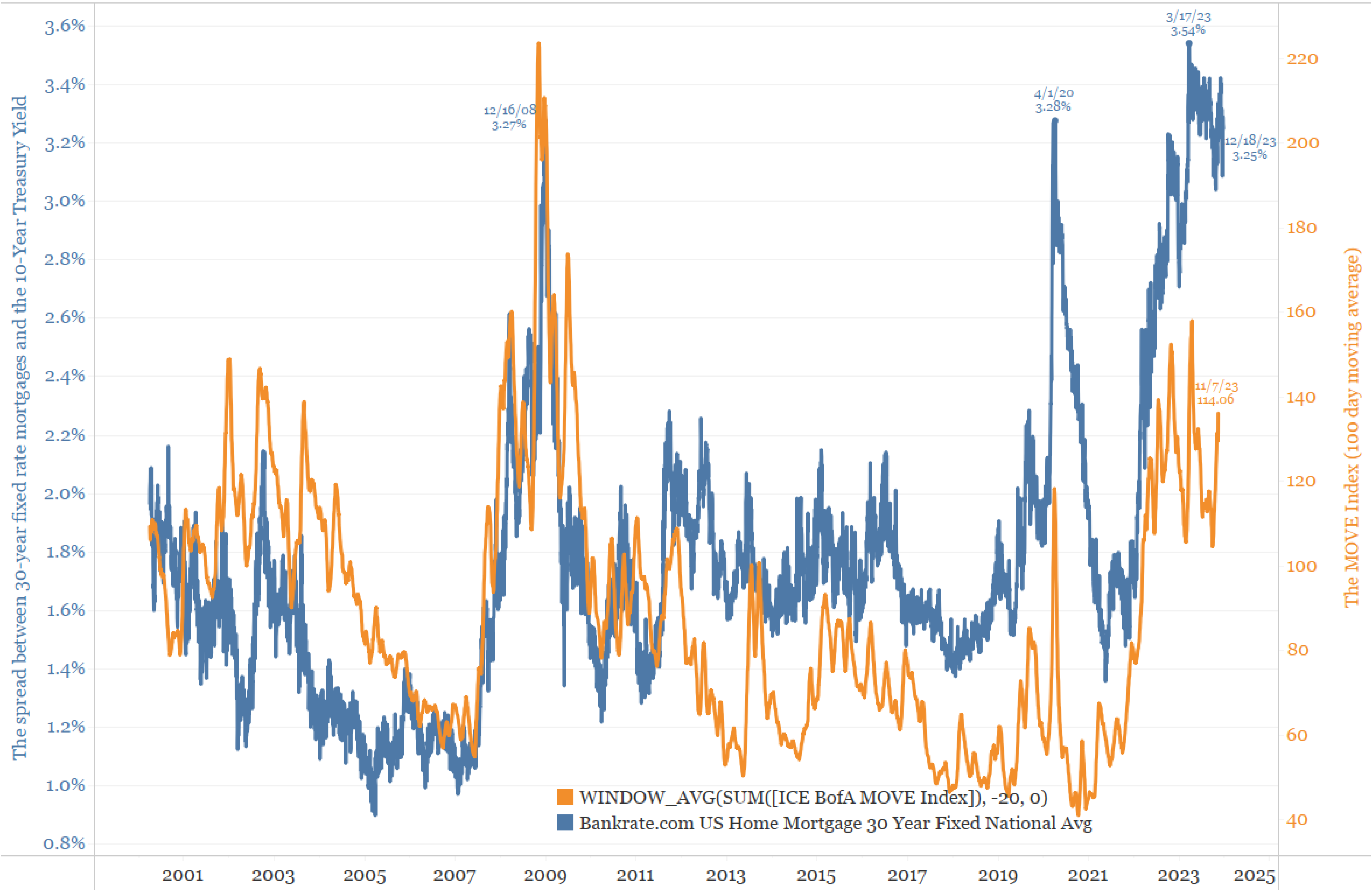
Source: Bloomberg



Source: Chicago Mercantile Exchange, Bloomberg

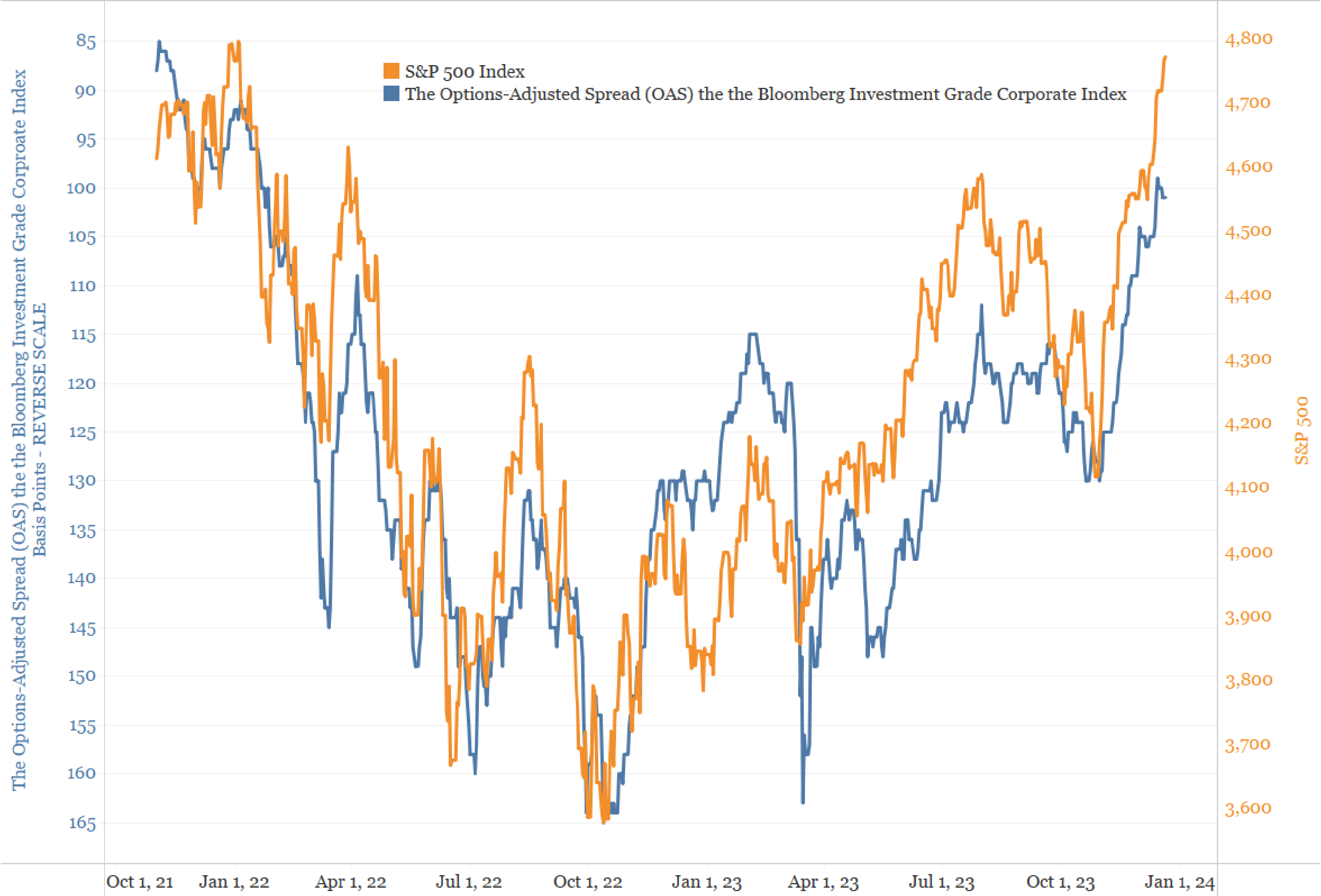

When Will the Fed Cut Rates?
Odds the Fed Cuts the Target Rate to 5.00% to 5.25%
As Calculated by the Chicago Mercantile Exchange's Fed Watch Tool
The Probability the Fed Cuts 25 Basis Points to 5.00% - 5.25%
January 31, 2024 FOMC Meeting
March 20, 2024 FOMC Meeting
May 1, 2024 FOMC Meeting
12/20/23 98%
12/20/23 79%
12/20/23 12%
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Jun 20
Jul 5
Jul 20
Aug 4
Aug 19
Sep 3
Sep 18
Oct 3
Oct 18
Nov 2
Nov 17
Dec 2
Dec 17
Source: Chicago Mercentile Exchange
https://www.cmegroup.com/trading/interest-rates/countdown-to-fomc.html
© 2023 Bianco Research, L.L.C. All Rights Reserved
https://www.biancoresearch.com/

Bankrate.com US Home Mortgage 30 Year Fixed National Avg And the Move Index

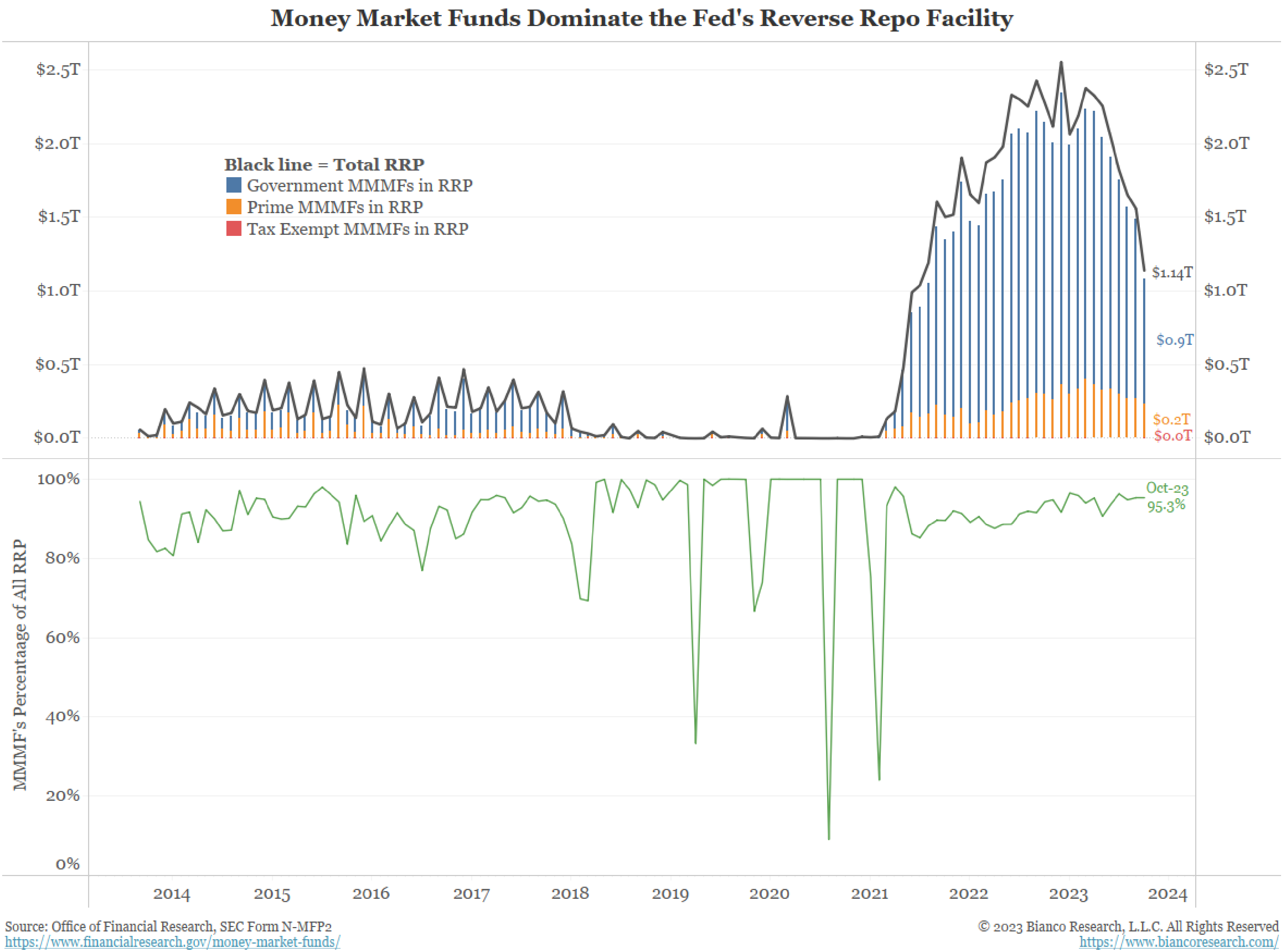


Data Source: Bloomberg, BankRate.com, Bank of America

Looking at US Aggregate Credit Index OAS and the S&P 500 Index

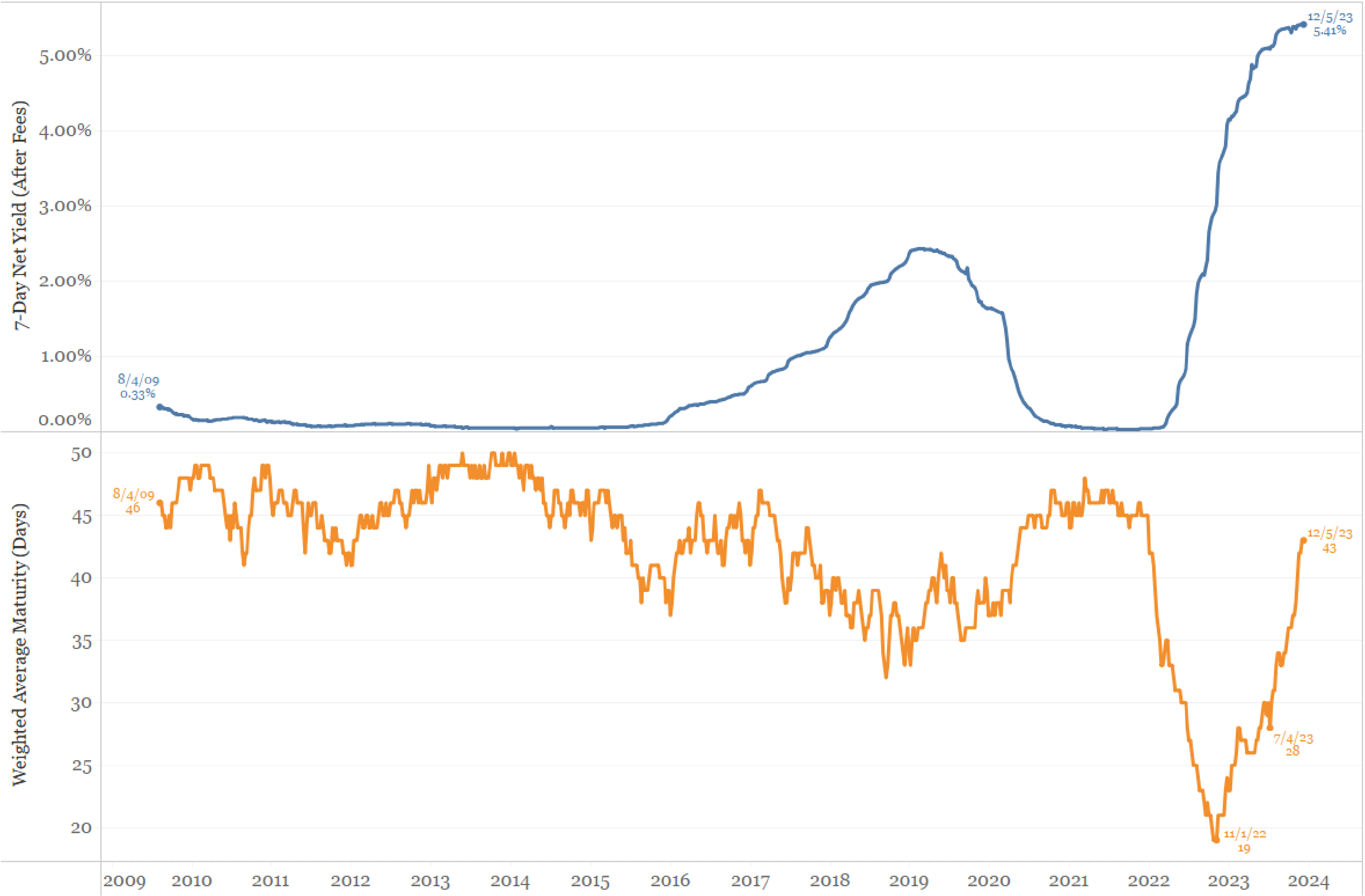


Source: Bloomberg

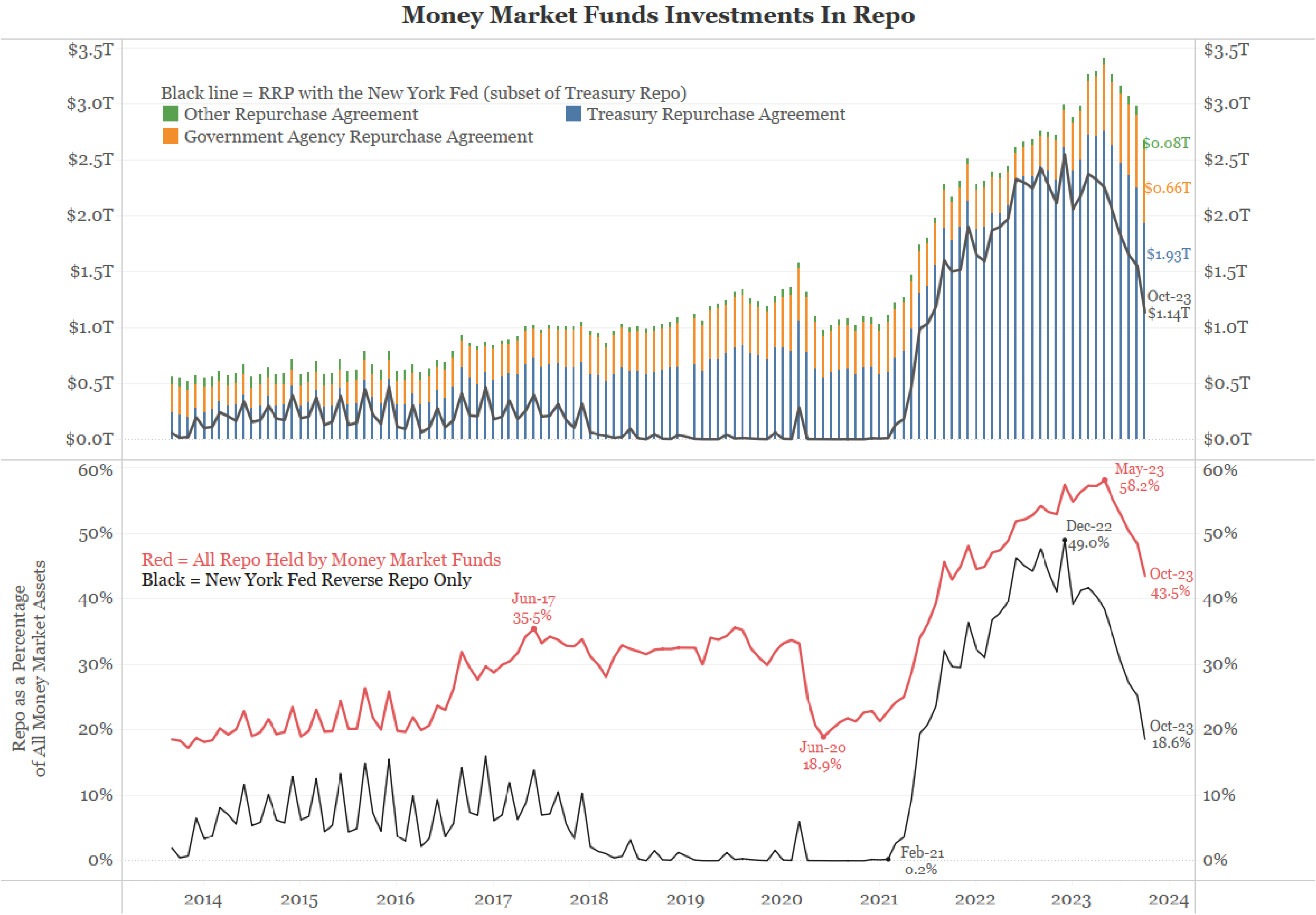


Money Market Funds Dominate the Fed's Reverse Repo Facility
Black line = Total RRP
Government MMMFs in RRP
Prime MMMFs in RRP
Tax Exempt MMMFs in RRP
$2.5T
$2.0T
$1.5T
$1.0T
$0.5T
$0.0T
$1.14T
$0.9T
$0.2T
$0.0T
100%
80%
60%
40%
20%
0%
MMMF's Percentage of All RRP
Oct-23
95.3%
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
Source: Office of Financial Research, SEC Form N-MFP2
https://www.financialresearch.gov/money-market-funds/
© 2023 Bianco Research, L.L.C. All Rights Reserved
https://www.biancoresearch.com/

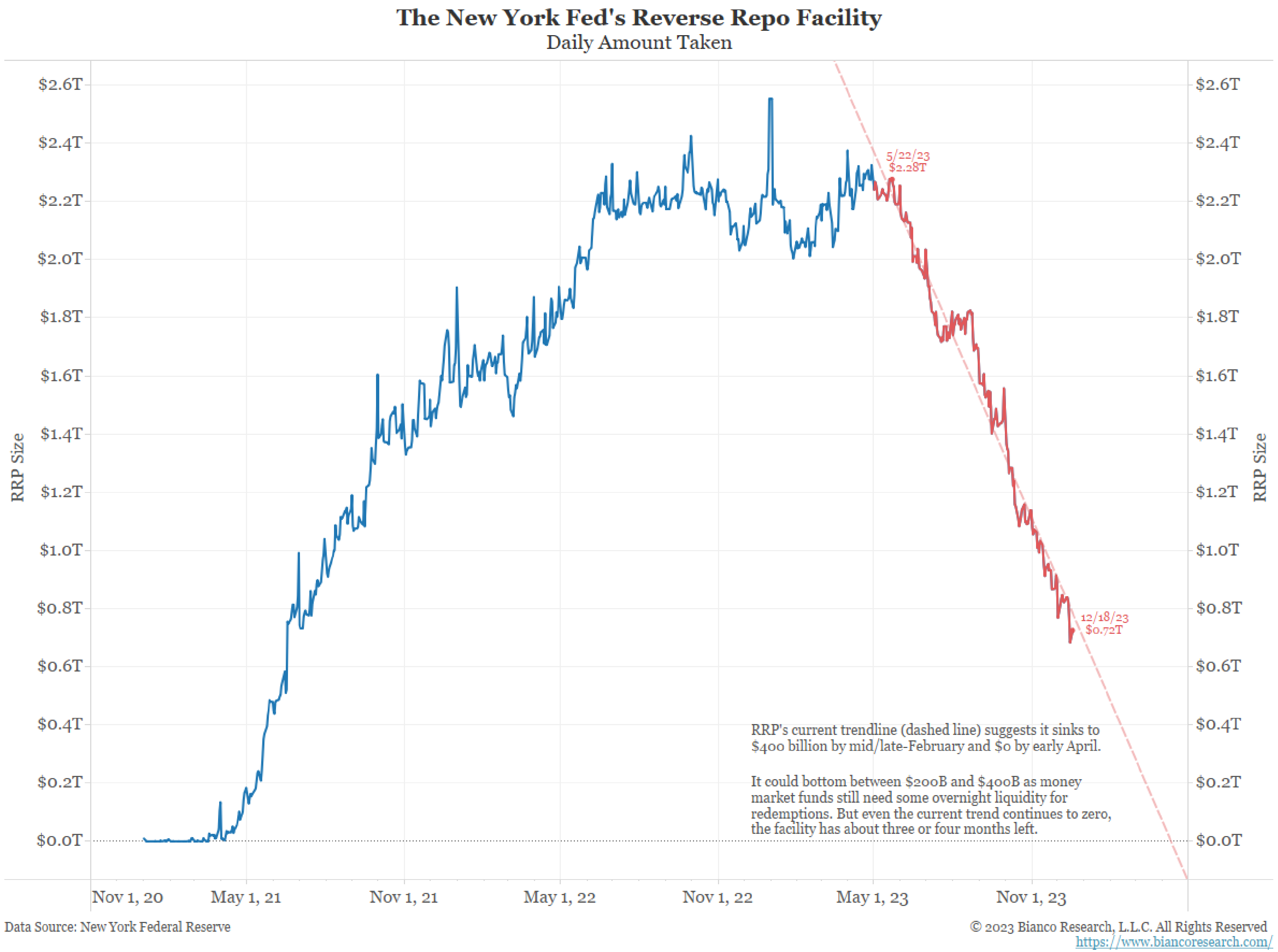
S&P AAA - AA Rated Goverment Investment Pools
Money Market Funds

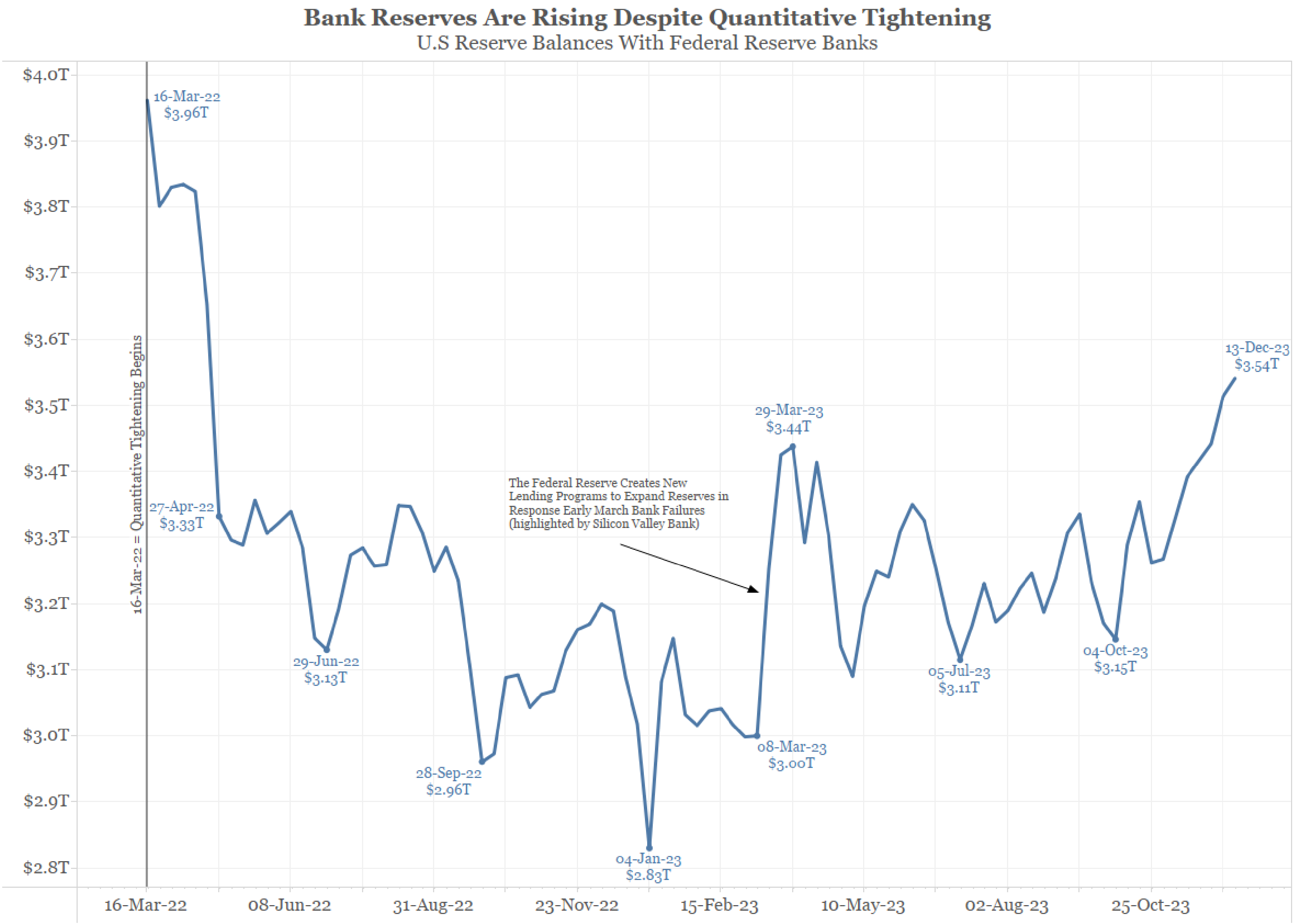


Source: Standard & Poors

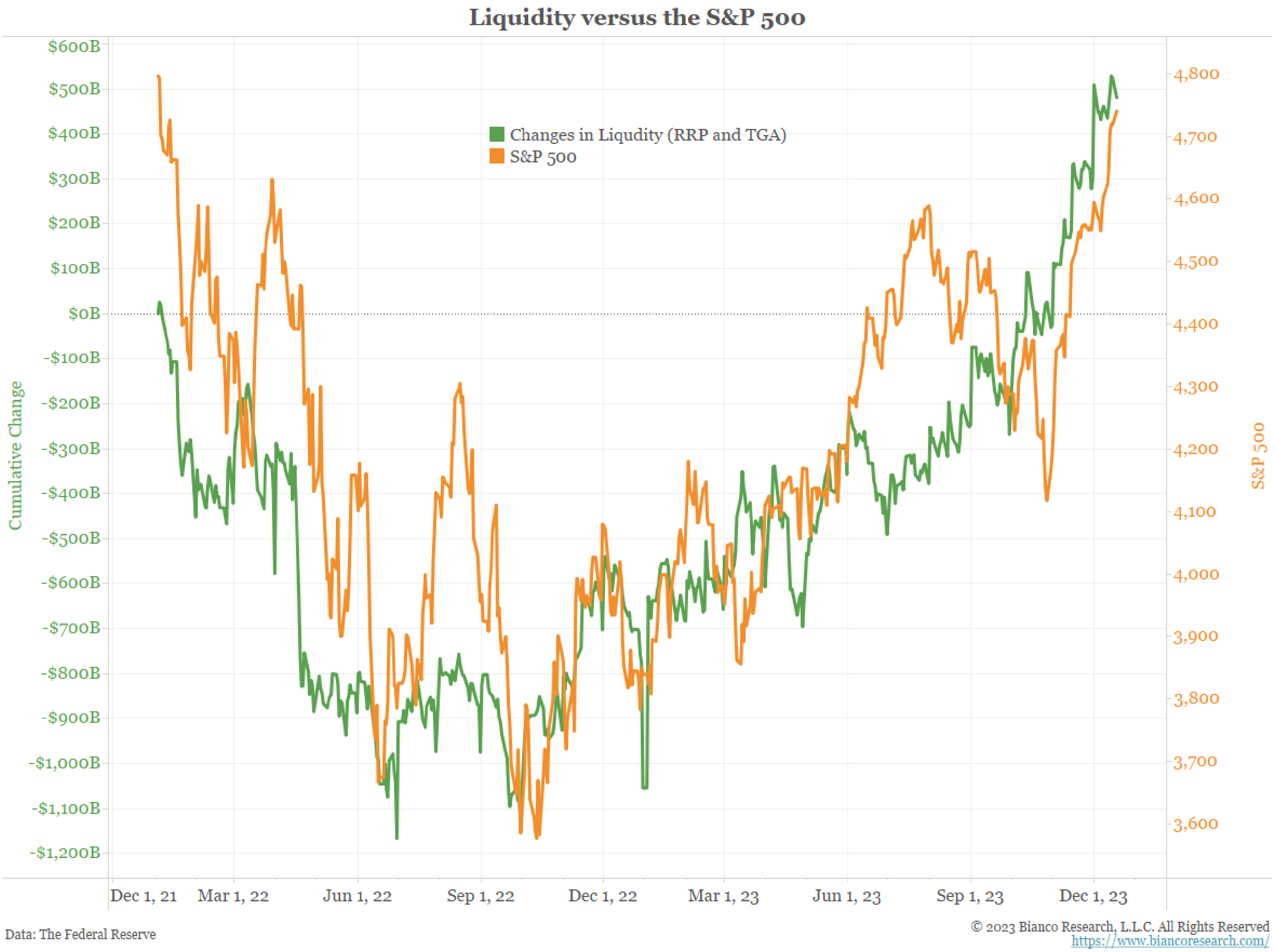


Source: Office of Financial Research, SEC Form N-MFP2
https://www.financialresearch.gov/money-market-funds/


The New York Fed's Reverse Repo Facility
Daily Amount Taken
RRP Size
$2.6T
$2.4T
$2.2T
$2.0T
$1.8T
$1.6T
$1.4T
$1.2T
$1.0T
$0.8T
$0.6T
$0.4T
$0.2T
$0.0T
Nov 1, 20
May 1, 21
Nov 1, 21
May 1, 22
Nov 1, 22
May 1, 23
Nov 1, 23
5/22/23
$2.28T
12/18/23
$0.72T
RRP's current trendline (dashed line) suggests it sinks to $400 billion by mid/late-February and $0 by early April.
It could bottom between $200B and $400B as money market funds still need some overnight liquidity for redemptions. But even the current trend continues to zero, the facility has about three or four months left.
Data Source: New York Federal Reserve
© 2023 Bianco Research, L.L.C. All Rights Reserved
https://www.biancoresearch.com/

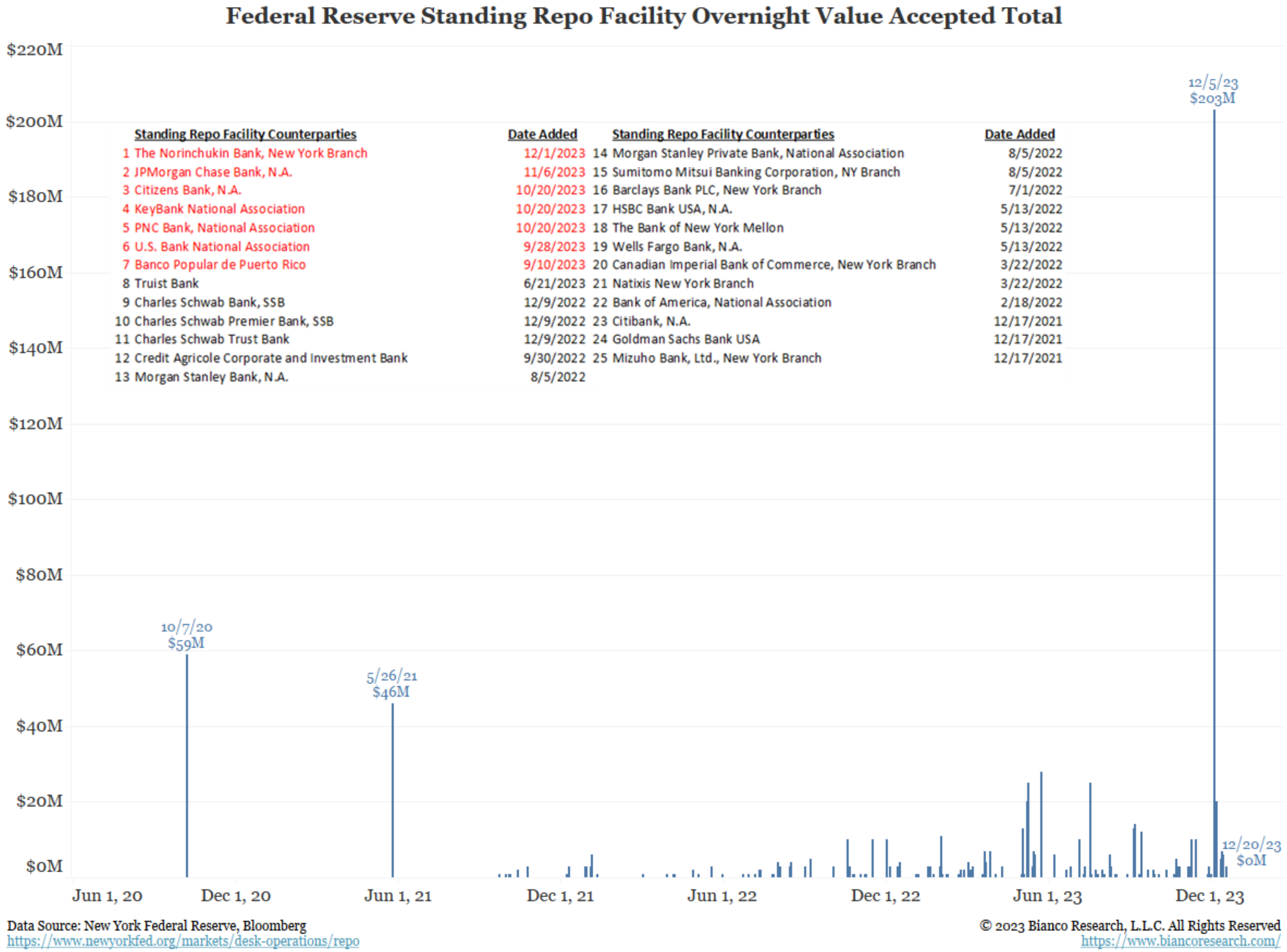


Data Source: Federal Resercve H41 Report
https://www.federalreserve.gov/feeds/H41.html

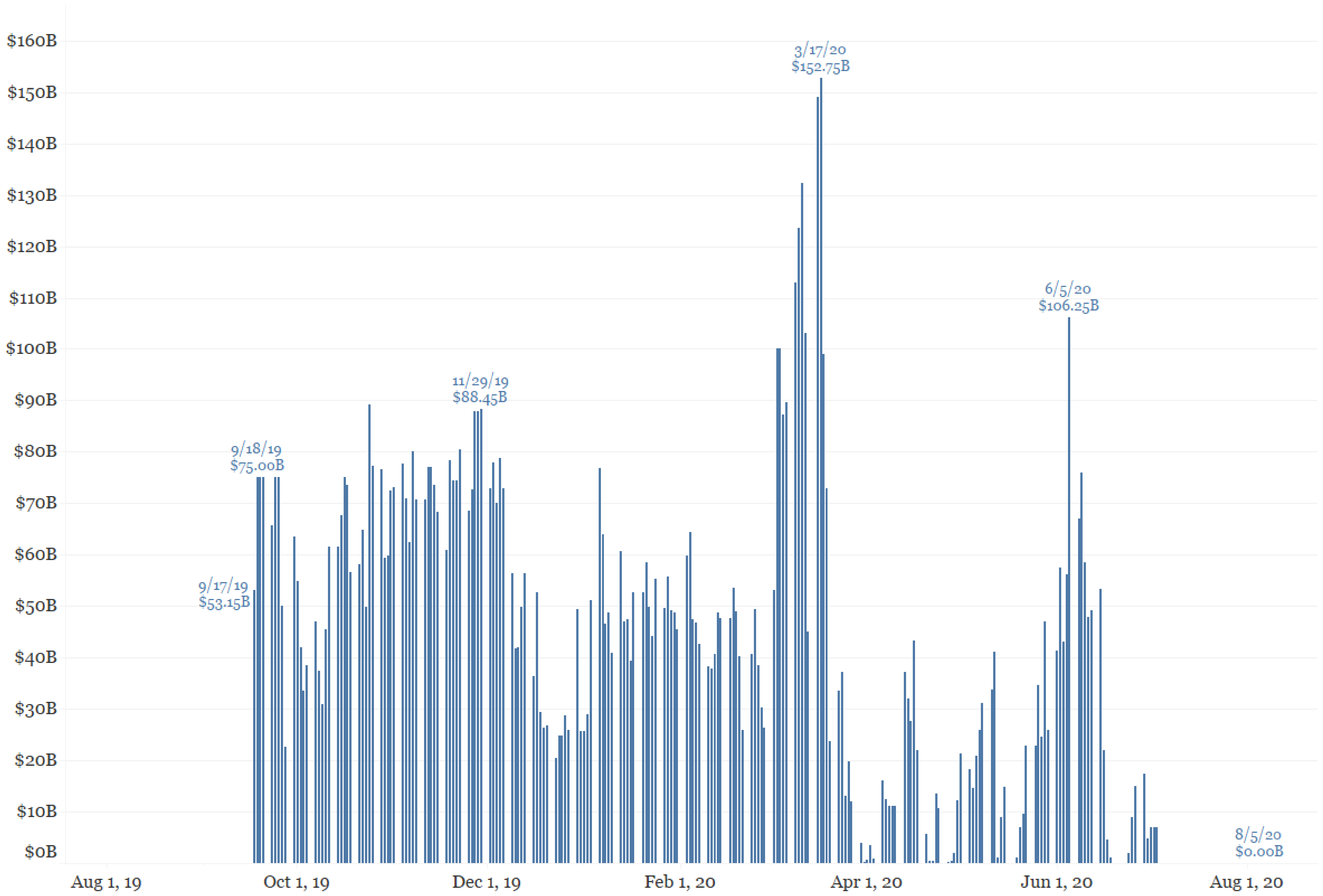

Liquidity versus the S&P 500
Changes in Liquidity (RRP and TGA)
S&P 500
Cumulative Change
$600B
$500B
$400B
$300B
$200B
$100B
$0B
-$100B
-$200B
-$300B
-$400B
-$500B
-$600B
-$700B
-$800B
-$900B
-$1,000B
-$1,100B
-$1,200B
4,800
4,700
4,600
4,500
4,400
4,300
4,200
4,100
4,000
3,900
3,800
3,700
3,600
Dec 1, 21
Mar 1, 22
Jun 1, 22
Sep 1, 22
Dec 1, 22
Mar 1, 23
Jun 1, 23
Sep 1, 23
Dec 1, 23
Data: The Federal Reserve
© 2023 Bianco Research, L.L.C. All Rights Reserved
https://www.biancoresearch.com/

***The Financial Times* – (December 20, 2023) [Spike in US overnight lending rates awakens fears of money market strains](#)**

A brief spike in US overnight lending rates this month is a likely harbinger of strains in money markets next year as the US government sells more Treasuries to cover its deficits, analysts have warned. Concerns were sparked by a sudden jump early this month in the rate for borrowing cash overnight in the market for short-term funds, a move that was not mirrored in the rate charged by the Federal Reserve to take in excess cash. A divergence between the two rates, which historically track each other closely, has raised fears over the potential for broader strains in the market lending rates for banks and customers, as cash becomes scarcer after years of excess liquidity...In the move earlier this month, the secured overnight borrowing rate, or Sofr, rose as much as 0.09 percentage points above the 5.3 per cent paid by the Fed to users of its overnight reverse repurchase facility. Analysts put the temporary spike down to a glut of new Treasuries, which briefly outstripped the cash available in the market for lending.



Federal Reserve Standing Repo Facility Overnight Value Accepted Total



Data Source: New York Federal Reserve, Bloomberg
https://www.newyorkfed.org/markets/desk-operations/repo

https://www.biancoresearch.com/

Bianco Research L.L.C.

For more information about the contents/ opinions contained in these reports:

President
James A. Bianco jbianco@biancoresearch.com

Analysts
Greg Blaha gblaha@biancoresearch.com
Alex Malitas amalitas@biancoresearch.com

For subscription/service Information:

Arbor Research & Trading, Inc.
Director of Sales & Marketing
Max Konzelman max.konzelman@arborresearch.com

Arbor Research & Trading, L.L.C

Domestic - For more information about Arbor Research & Trading and its services:

inforequest@arborresearch.com
http://www.arborresearch.com

New York Sales Office
Edward T. McElwreath ed.mcelwreath@arborresearch.com

International - For more information about Arbor Research & Trading and its services:

London Sales Office
Neil Tritton neil.tritton@arborresearch.com
Ben Gibson ben.gibson@arborresearch.com