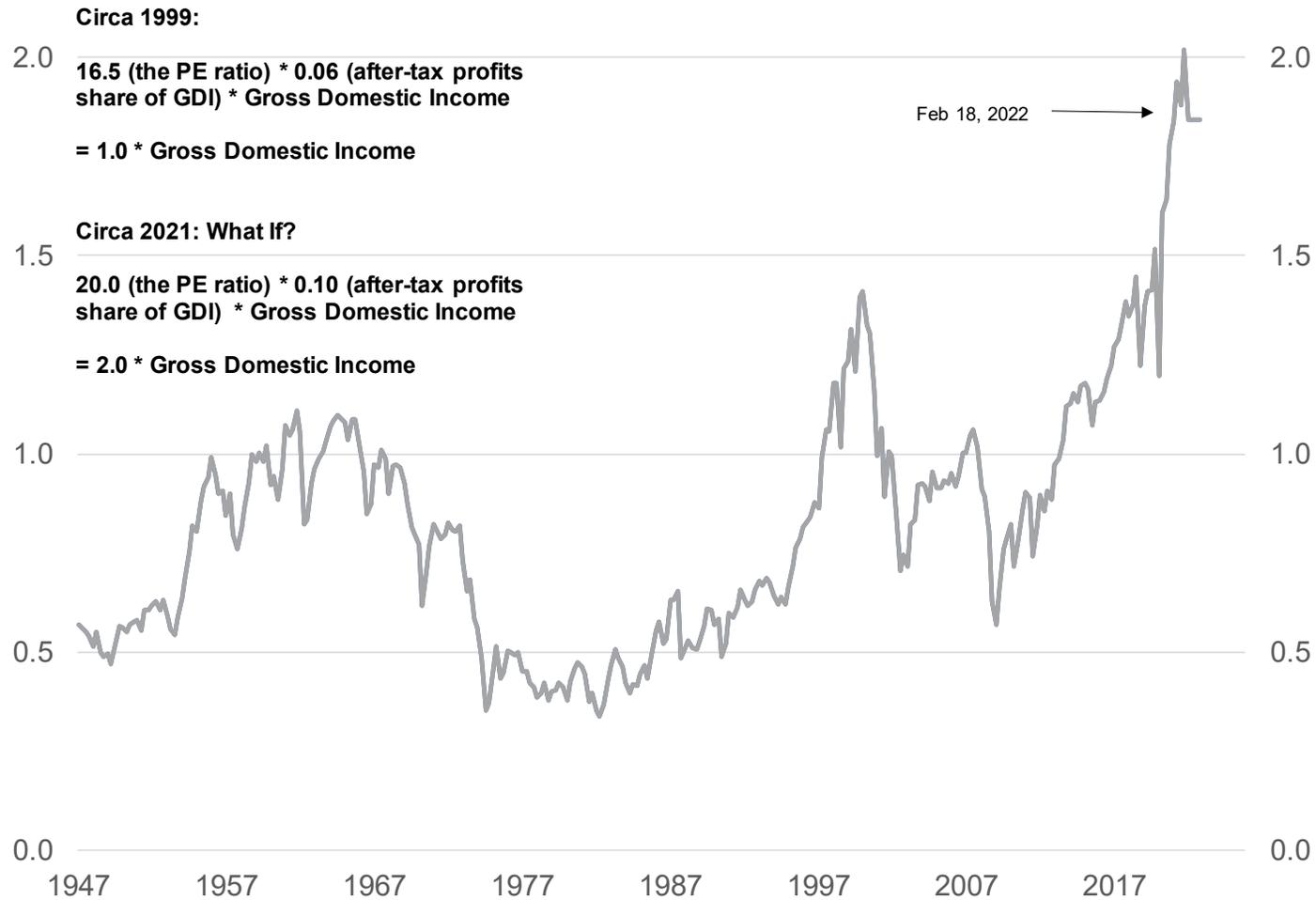

A light gray world map with white outlines of continents and countries, centered on the Atlantic Ocean. The text "Back to the Future" is overlaid on the left side of the map.

Back to the Future

February 22, 2022

What Do You Think? Bubble or a New Economic Normal?

Ratio of the value of the U.S. stock market to Gross Domestic Income



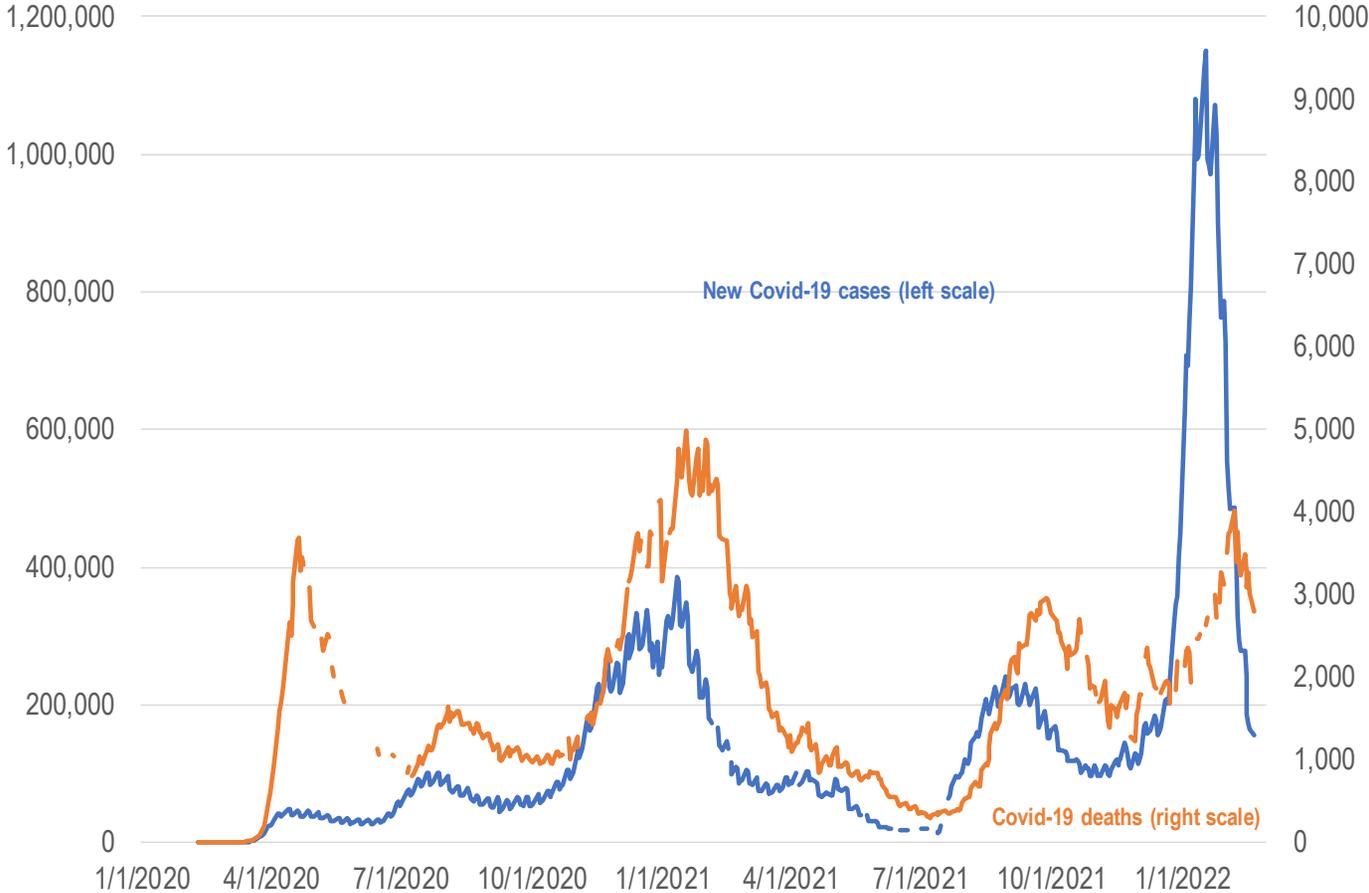
Sources: Haver Analytics; Federal Reserve Board; U.S. Department of Commerce. Updated through 2021 Q3 (GDI) and February 18, 2022 (Wilshire 5000).

Because We're Back On Our
Feet ...

Vaccines Broke the Link to the Economy ...

New Covid-19 cases (daily #, 7-day moving average)

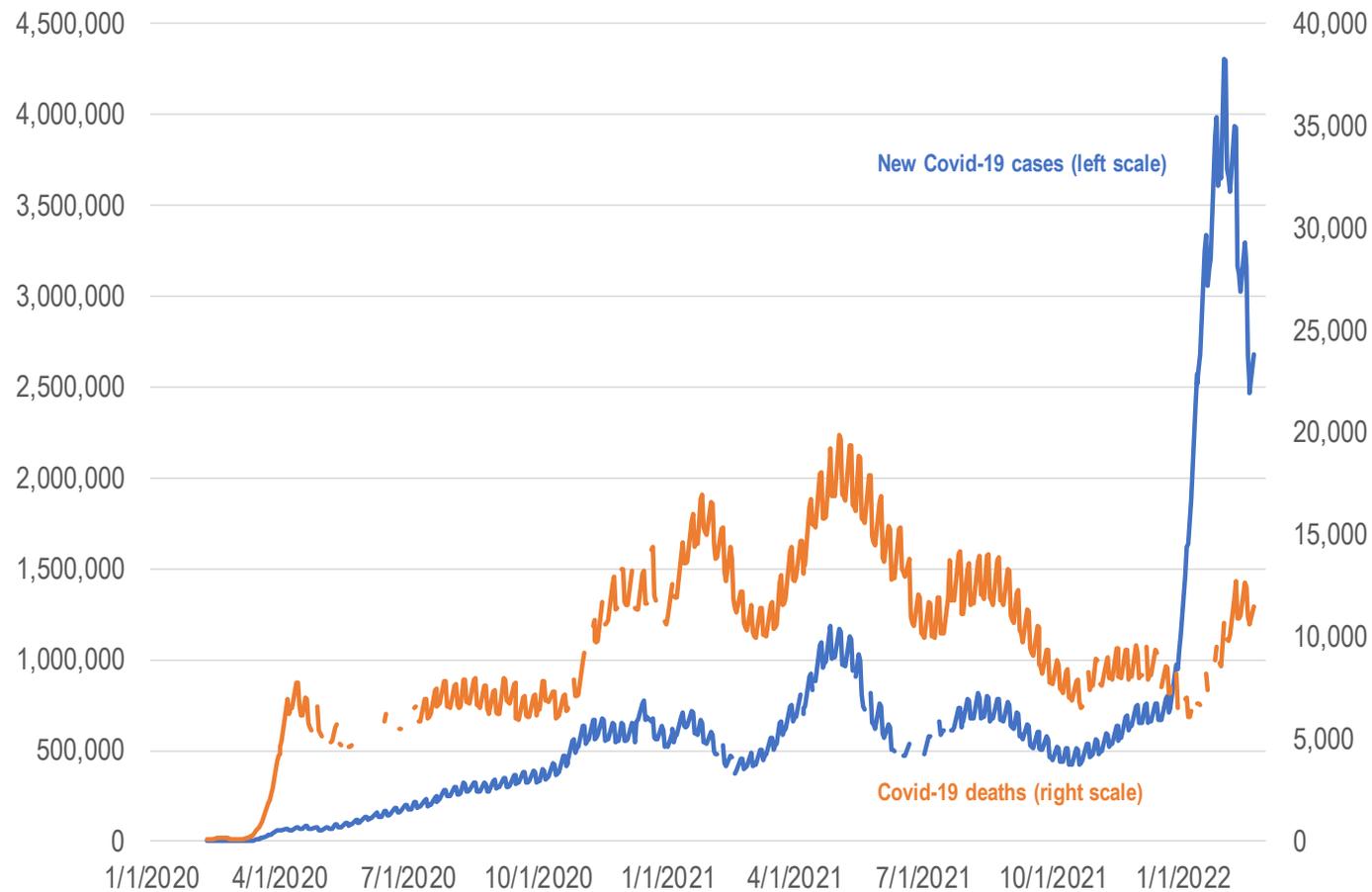
Covid-19 casualties (daily #, 7-day moving average)



Sources: Haver Analytics; Johns Hopkins University. Updated through February 21, 2022.

... Here and Elsewhere

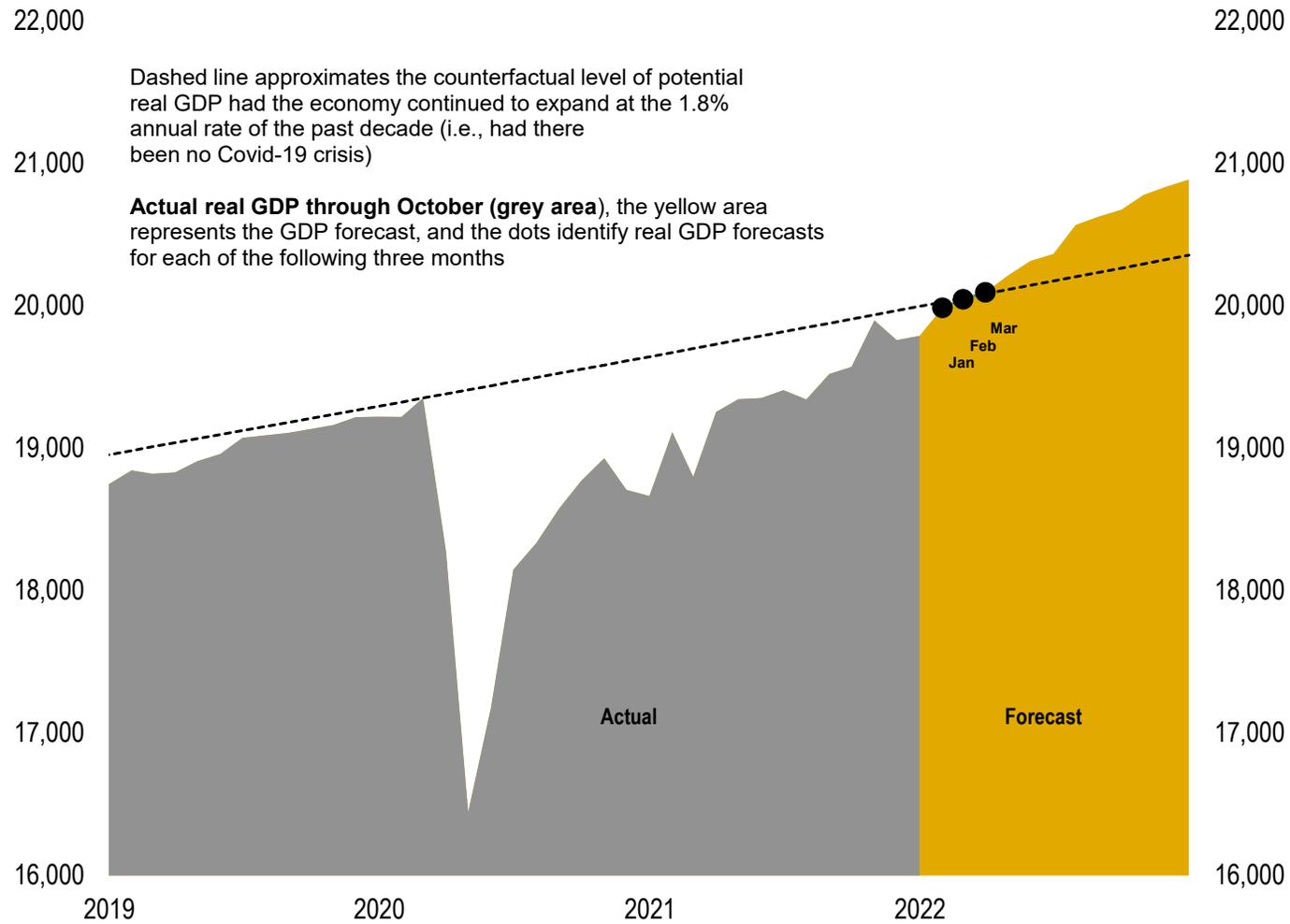
New Covid-19 cases outside the U.S. (daily #, 7-day moving average) Covid-19 casualties (daily #, 7-day moving average)



Sources: Haver Analytics; Johns Hopkins University. Updated through February 21, 2022.

National Output Is Back on the Road

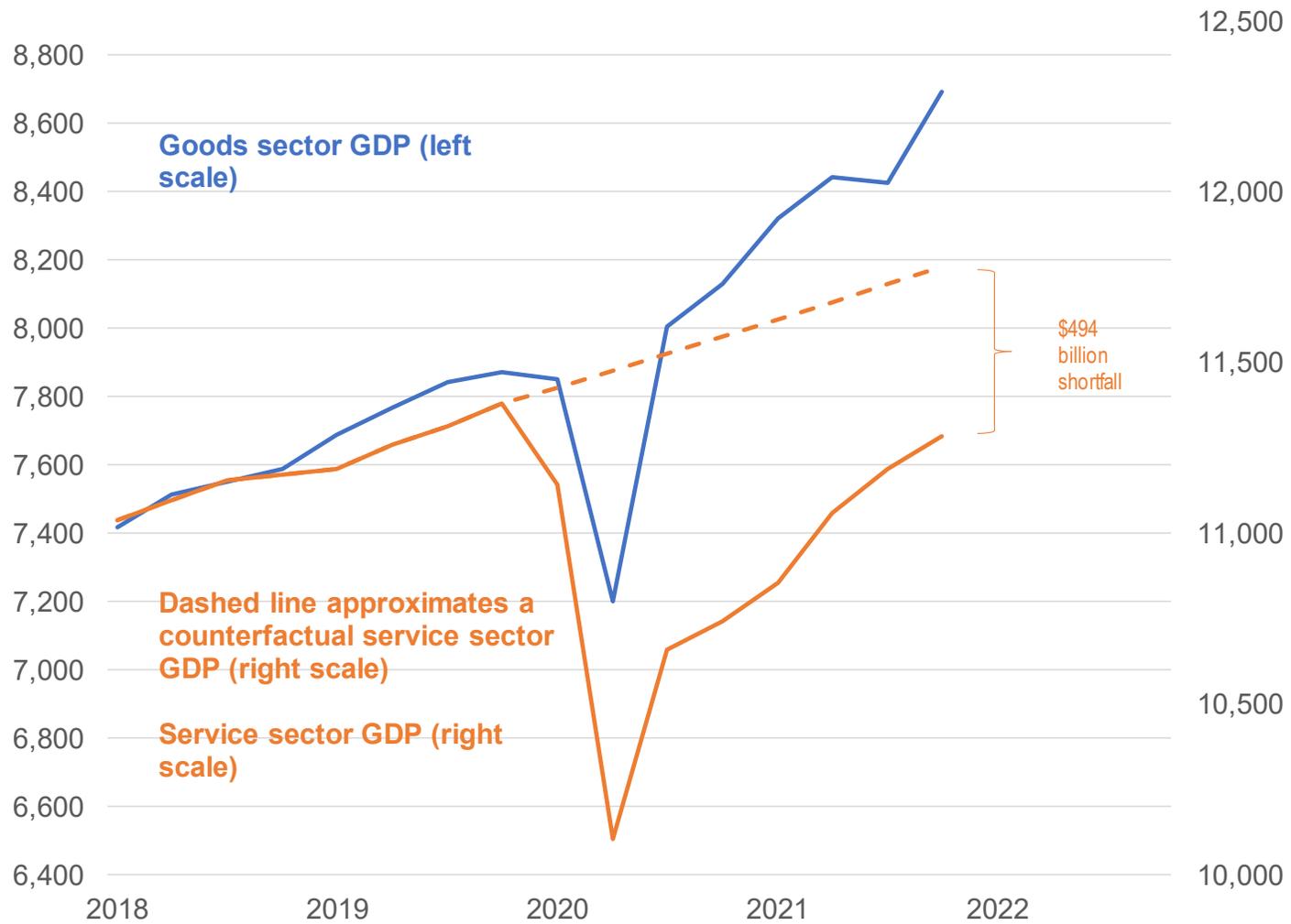
Real GDP and counterfactual real GDP scenario (billions of chained 2012 dollars)



Sources: Haver Analytics; IHS Markit Updated through December 2021.

[Those Living in the Goods Economy Won the Lottery]

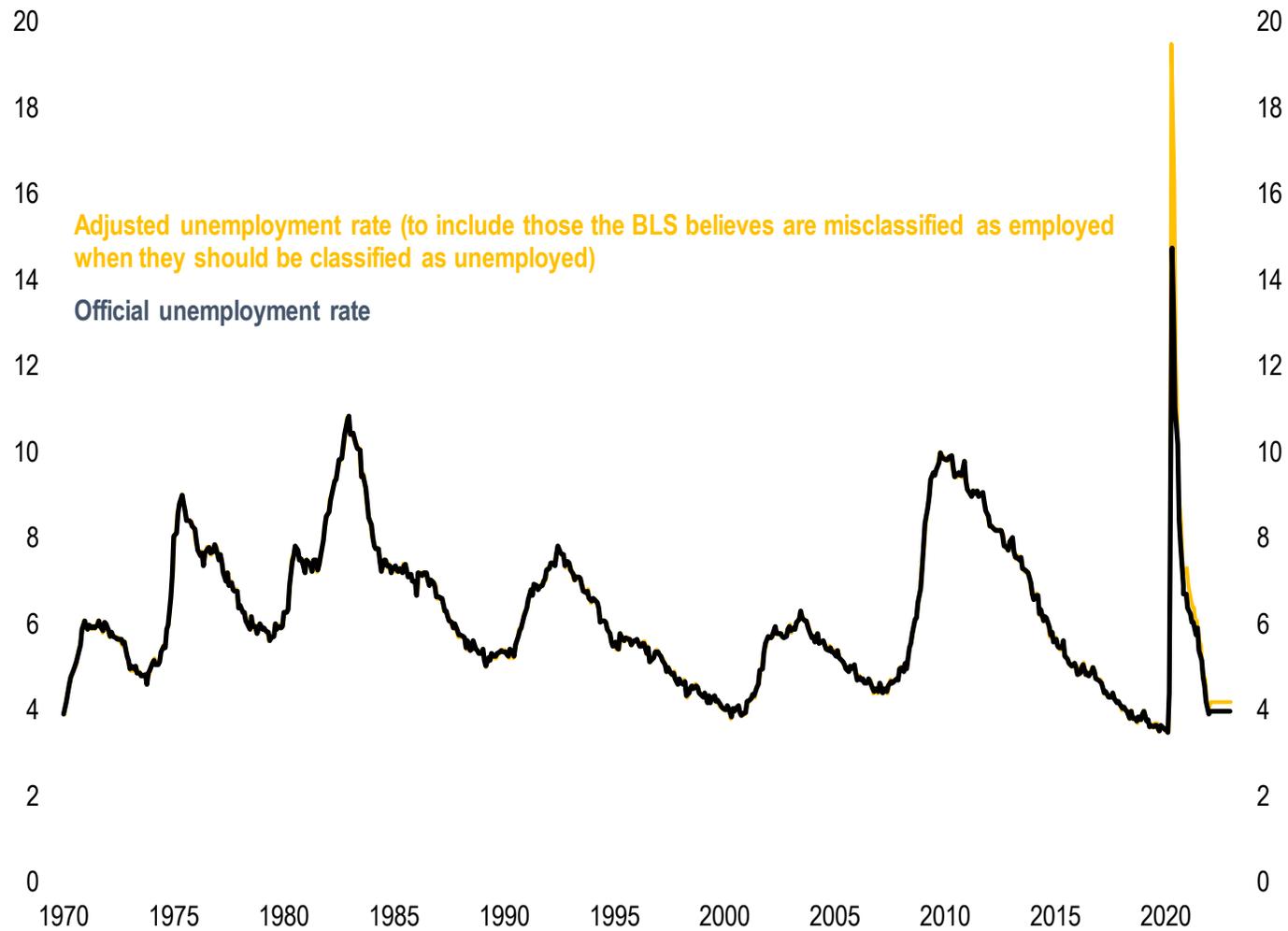
Real GDP in the goods and services economy (chained 2012 dollars)



Sources: Haver Analytics, U.S. Department of Commerce. Updated through 2021 Q4.

Unemployment Is Back on the Road

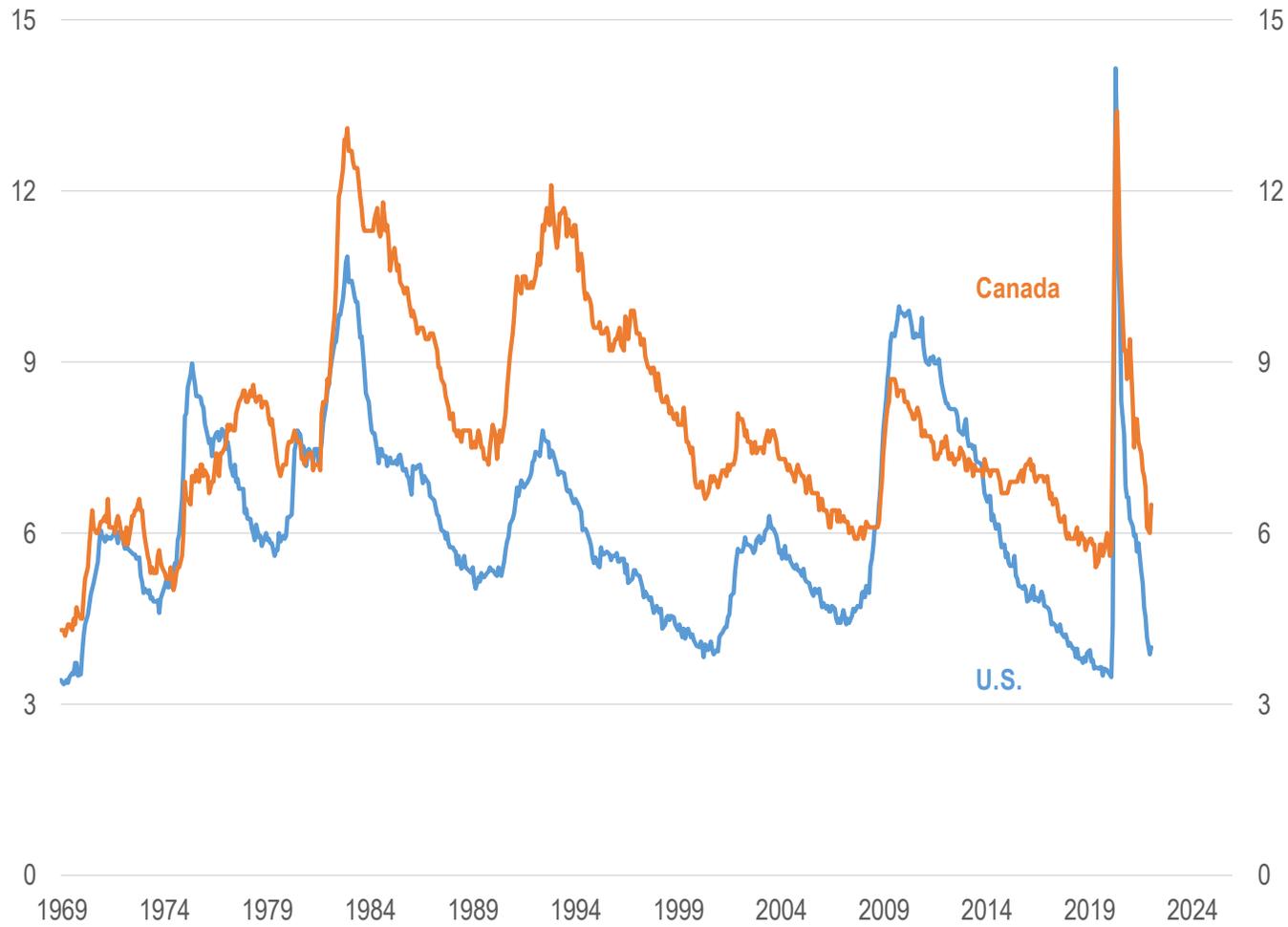
Unemployment (percent of the labor force)



Sources: Haver Analytics; U.S. Department of Labor. Updated through January 2022.

... Up Here ...

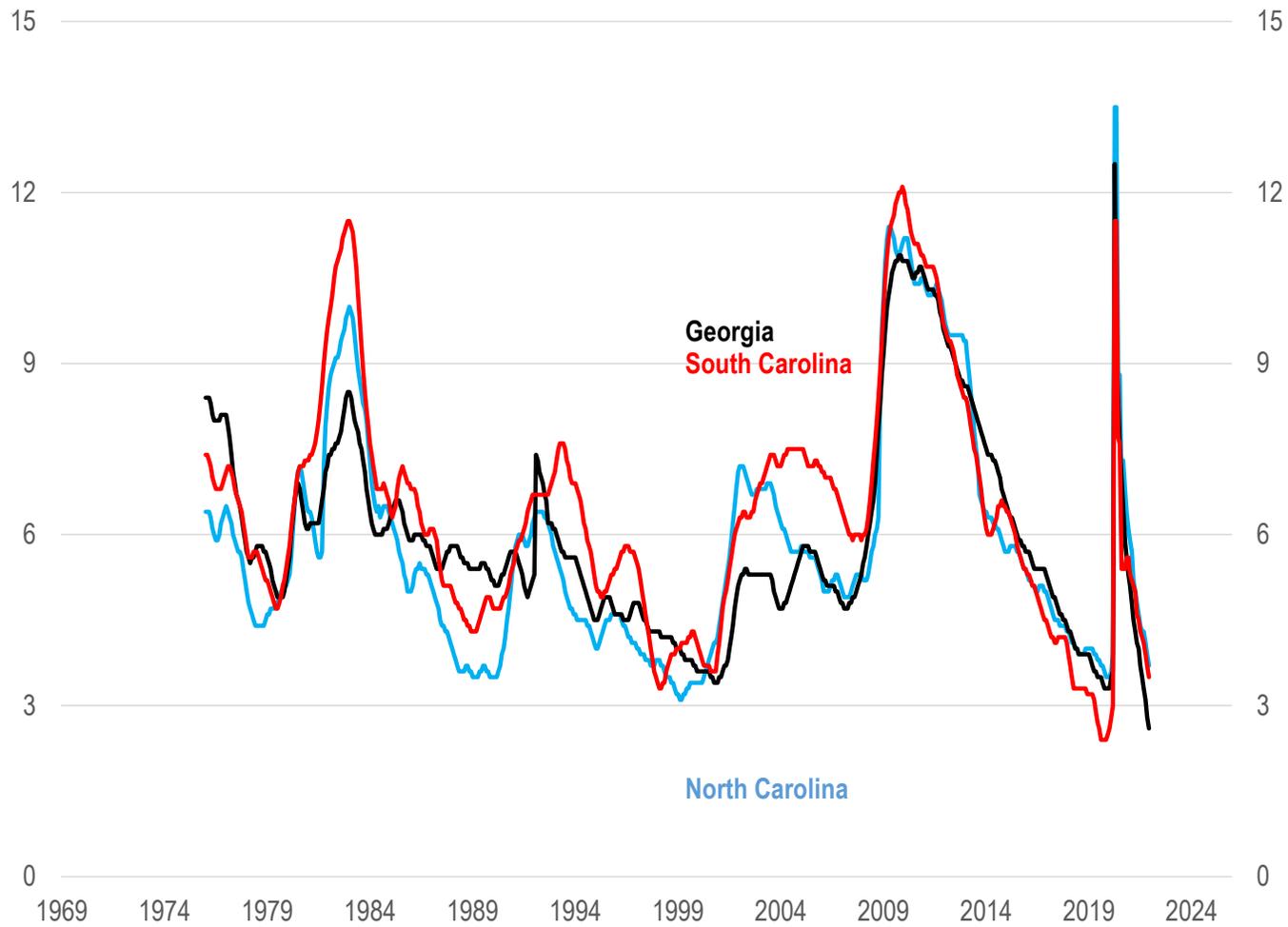
Unemployment (percent of the labor force)



Sources: Haver Analytics; U.S. Department of Labor. Updated through January 2021.

... in the Southeast ...

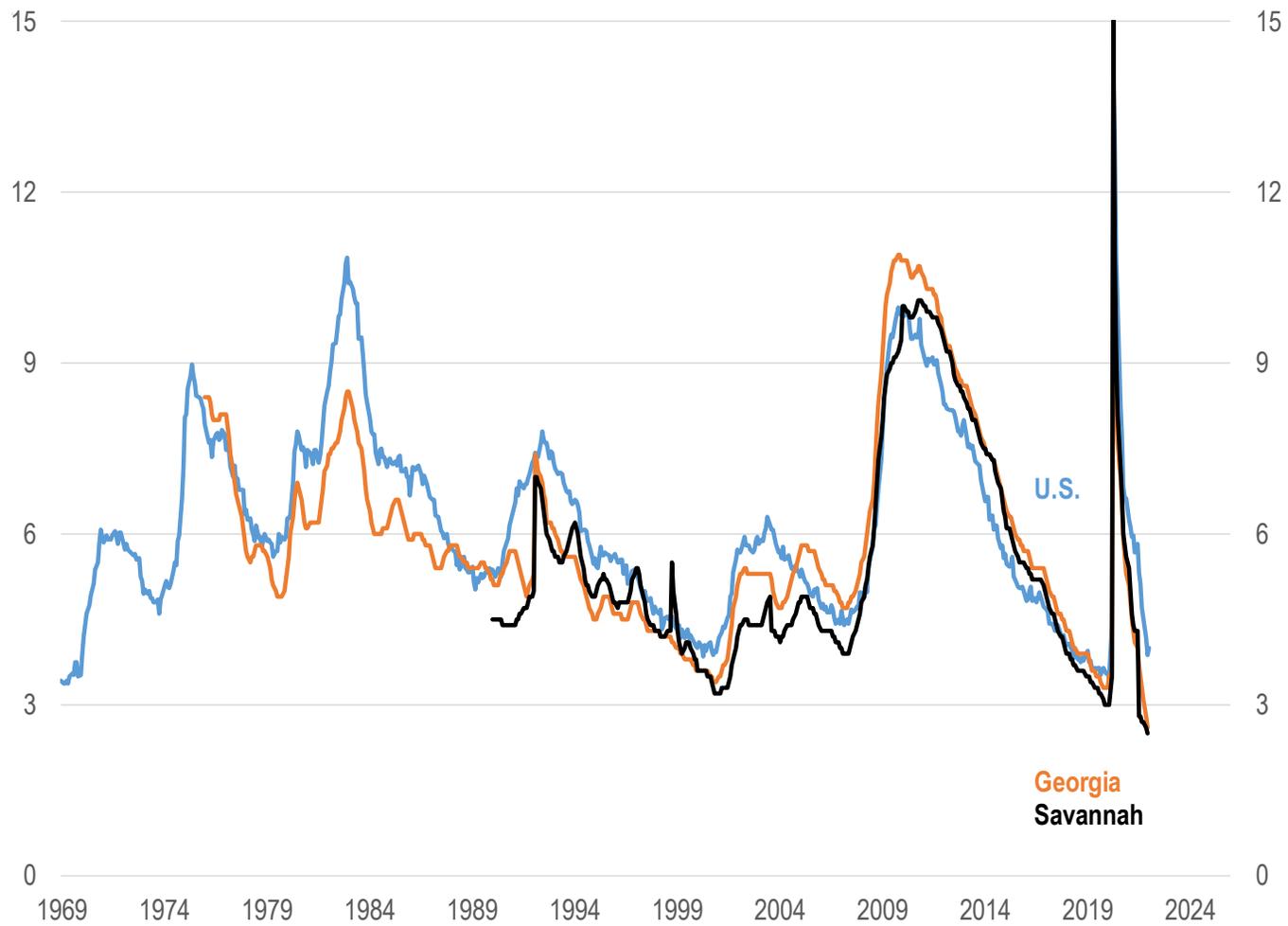
Unemployment (percent of the labor force)



Sources: Haver Analytics; U.S. Department of Labor. Updated through December 2021 (Tennessee) and January 2022 (U.S.).

... Savannah ...

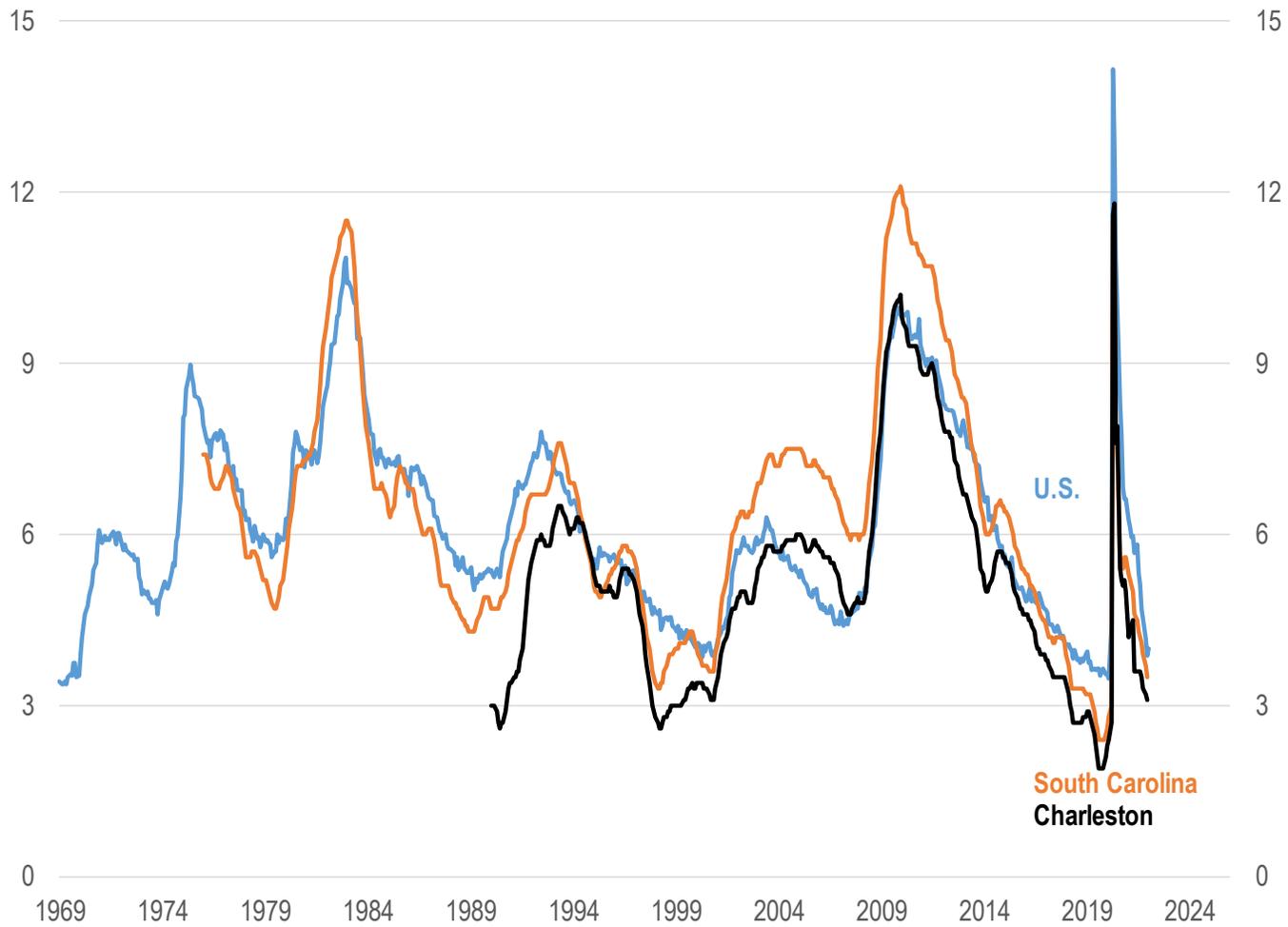
Unemployment (percent of the labor force)



Sources: Haver Analytics; U.S. Department of Labor. Updated through December 2021 (Tennessee) and January 2022 (U.S.).

... Charleston ...

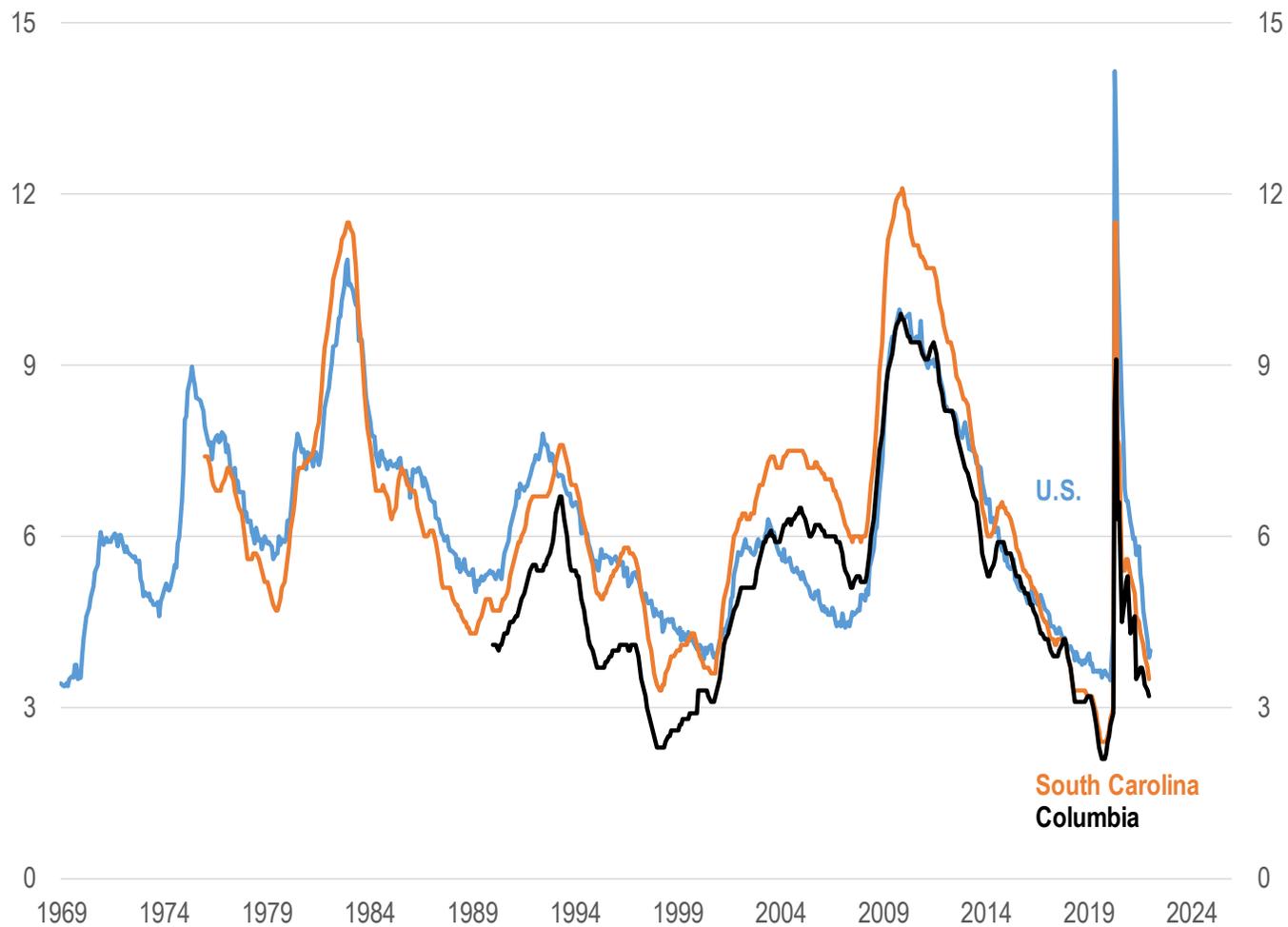
Unemployment (percent of the labor force)



Sources: Haver Analytics; U.S. Department of Labor. Updated through December 2021 (Tennessee) and January 2022 (U.S.).

... Columbia ...

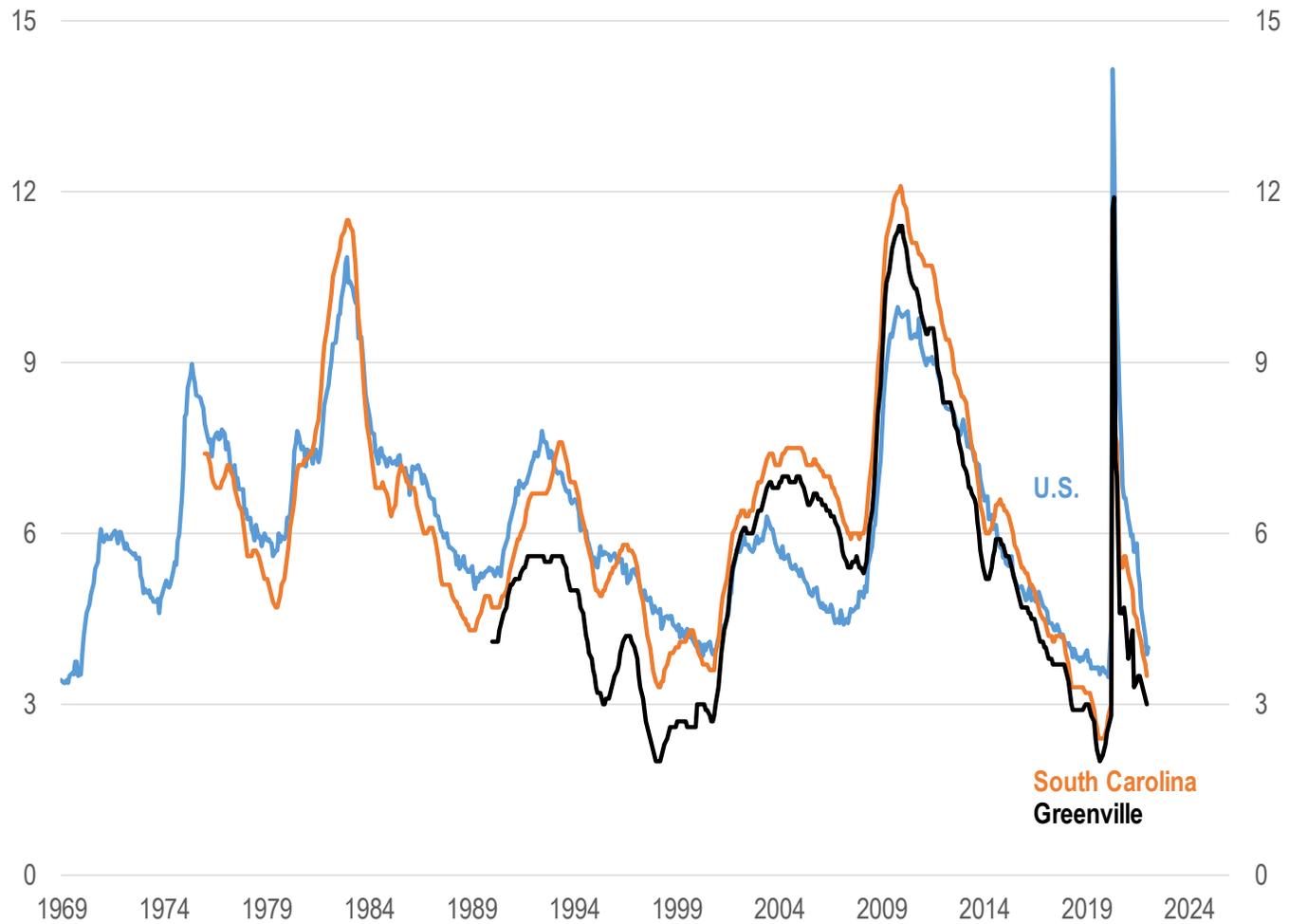
Unemployment (percent of the labor force)



Sources: Haver Analytics; U.S. Department of Labor. Updated through December 2021 (Oregon and Washington) and January 2022 (U.S.).

... Greenville ...

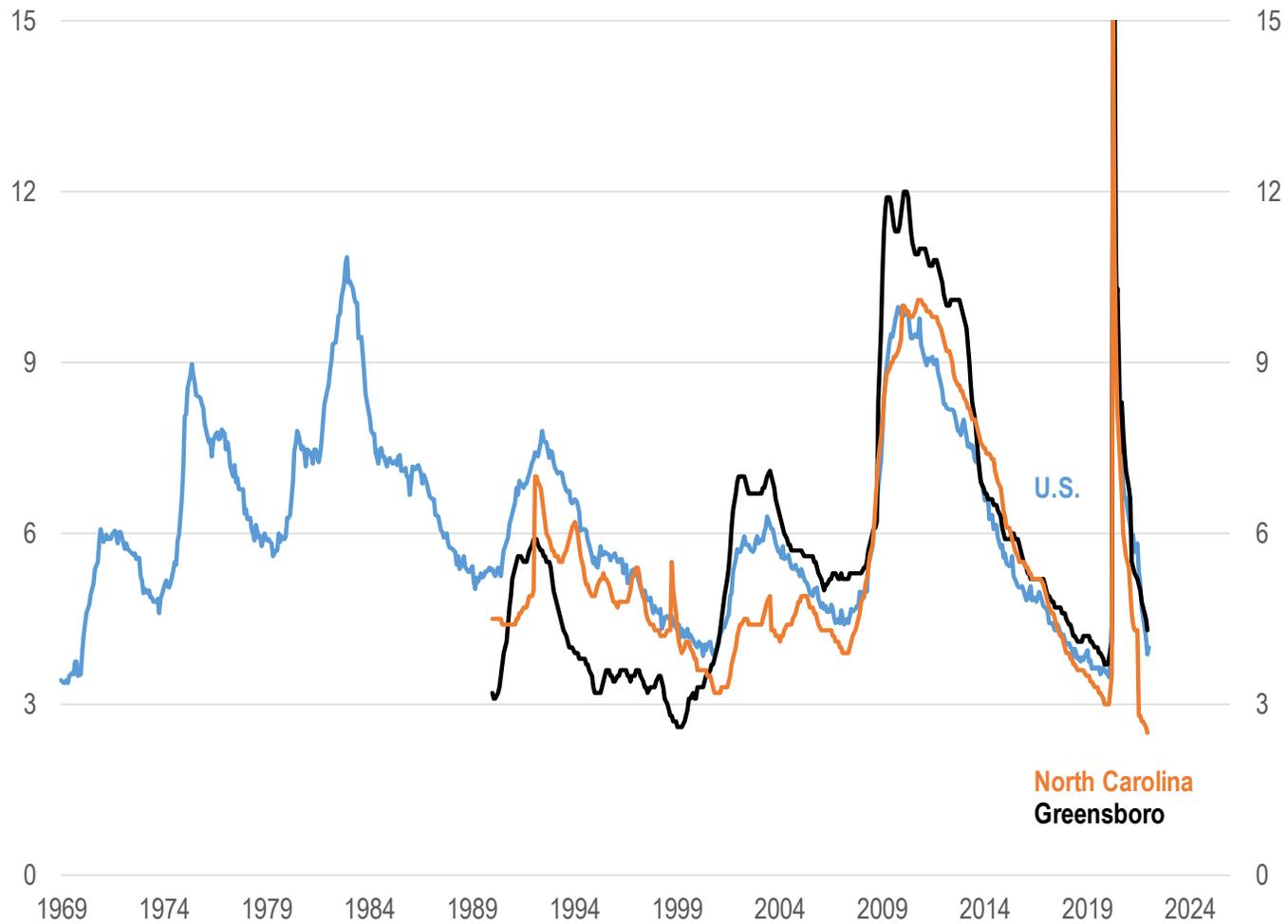
Unemployment (percent of the labor force)



Sources: Haver Analytics; U.S. Department of Labor. Updated through December 2021 (Oregon and Washington) and January 2022 (U.S.).

... Greensboro ...

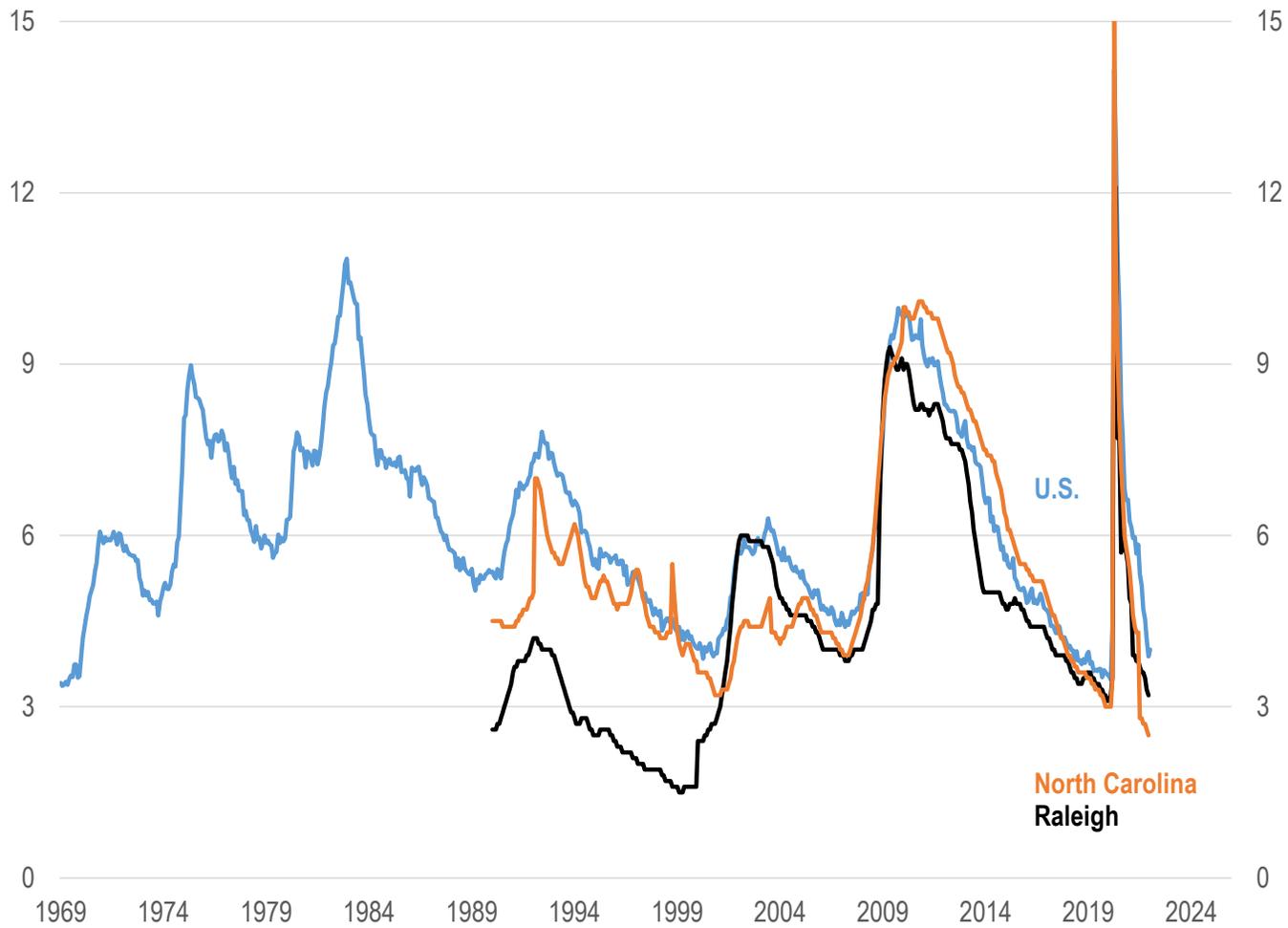
Unemployment (percent of the labor force)



Sources: Haver Analytics; U.S. Department of Labor. Updated through December 2021 (Oregon and Washington) and January 2022 (U.S.).

... and Raleigh

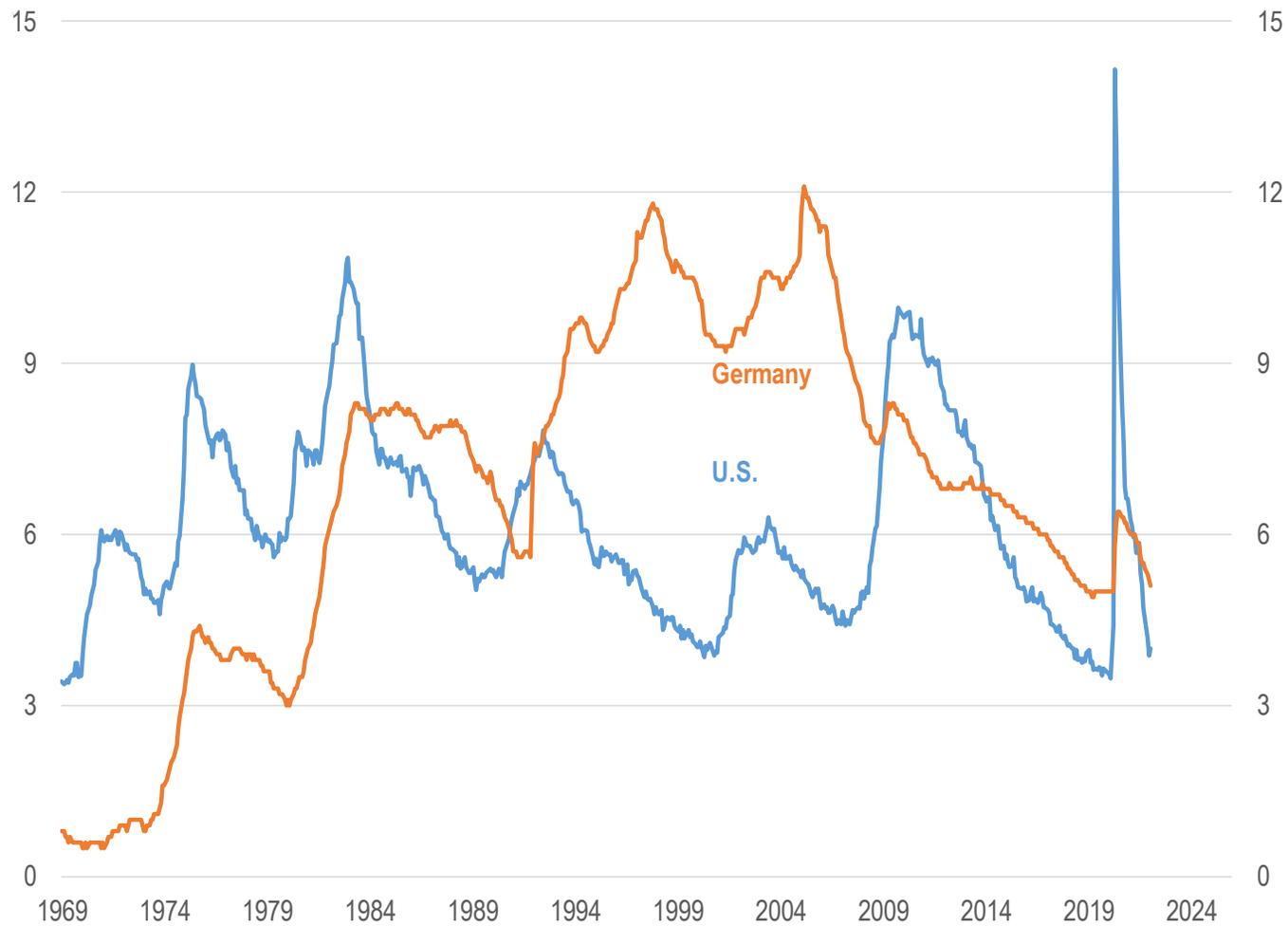
Unemployment (percent of the labor force)



Sources: Haver Analytics; U.S. Department of Labor. Updated through December 2021 (Oregon and Washington) and January 2022 (U.S.).

P.S. Germany Has Something to Think About

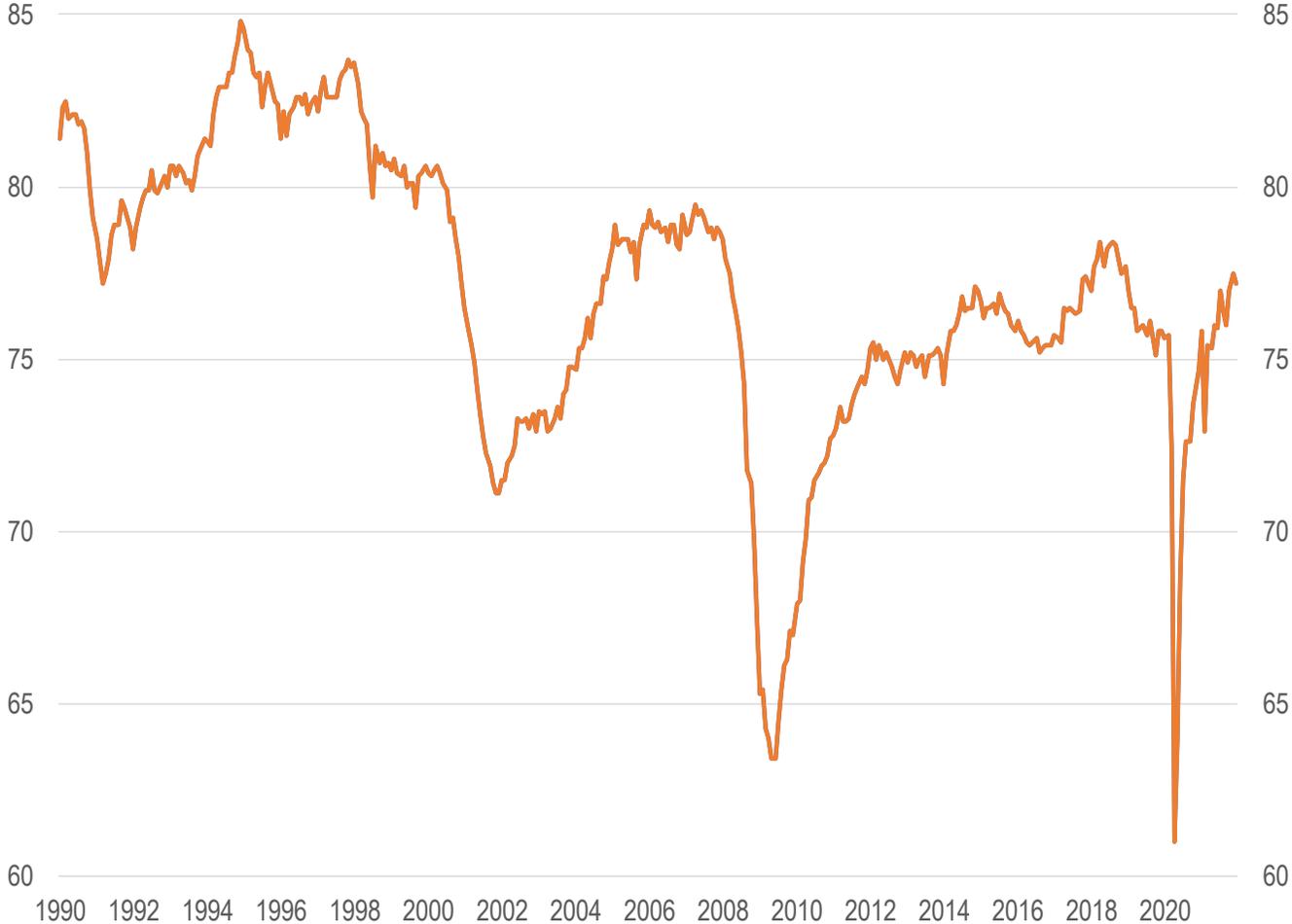
Unemployment (percent of the labor force)



Sources: Haver Analytics; U.S. Department of Labor; Eurostat.. Updated through November 2021.

Factories Are Humming

Manufacturing capacity utilization (percent of capacity in use)

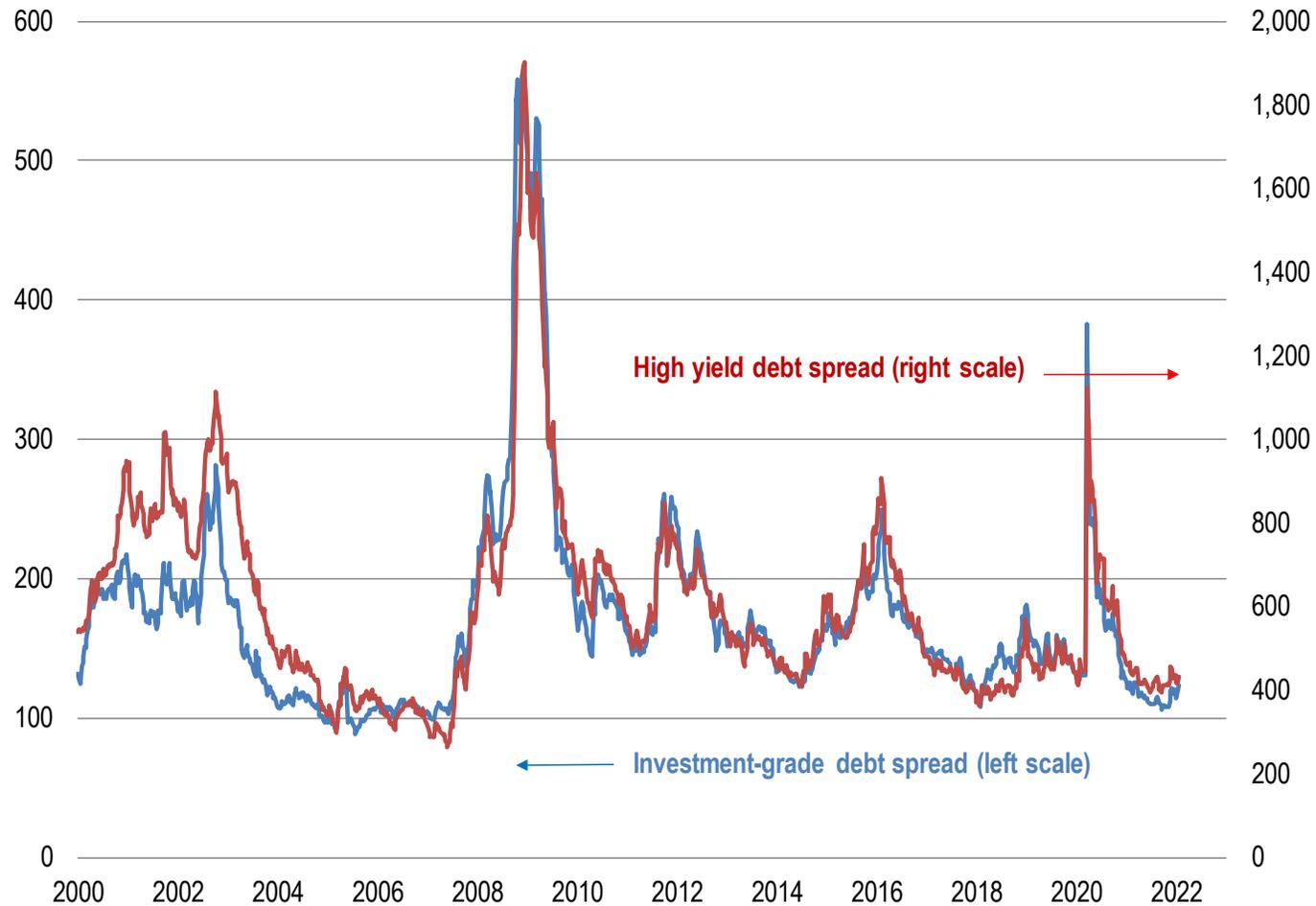


Sources: Haver Analytics; Federal Reserve Board. Updated through November 2021.

Market Barometers of Distress See Little to Fear ...

Investment grade (spread over 10-year Treasury yield)

Noninvestment grade debt (spread over 10-year Treasury yield)

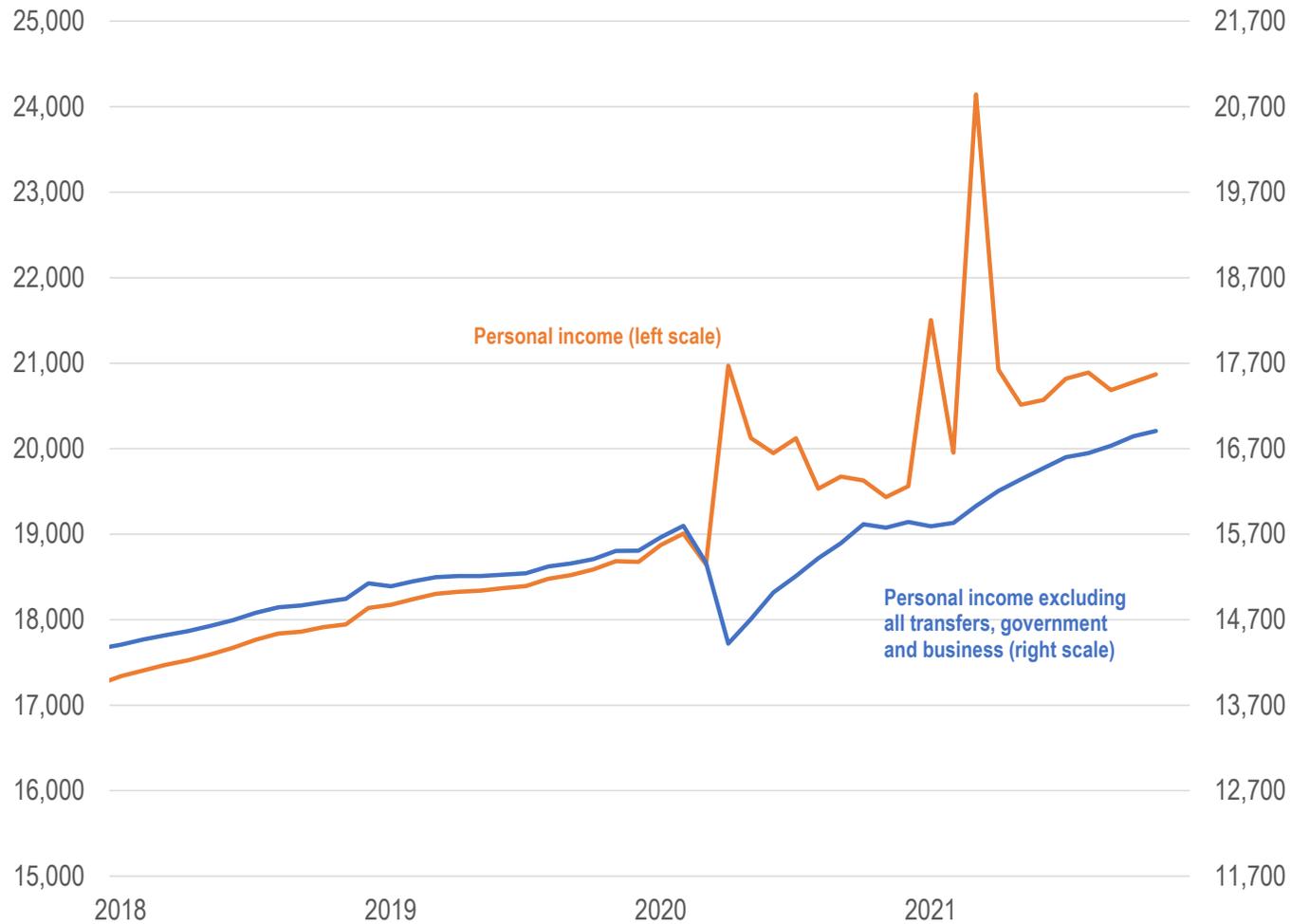


Sources: Haver Analytics; JPMorgan. February 3, 2022.

... Because the Unprecedented Policy Response ...

Personal income (billions of dollars)

Personal income excluding all transfers (billions of dollars)

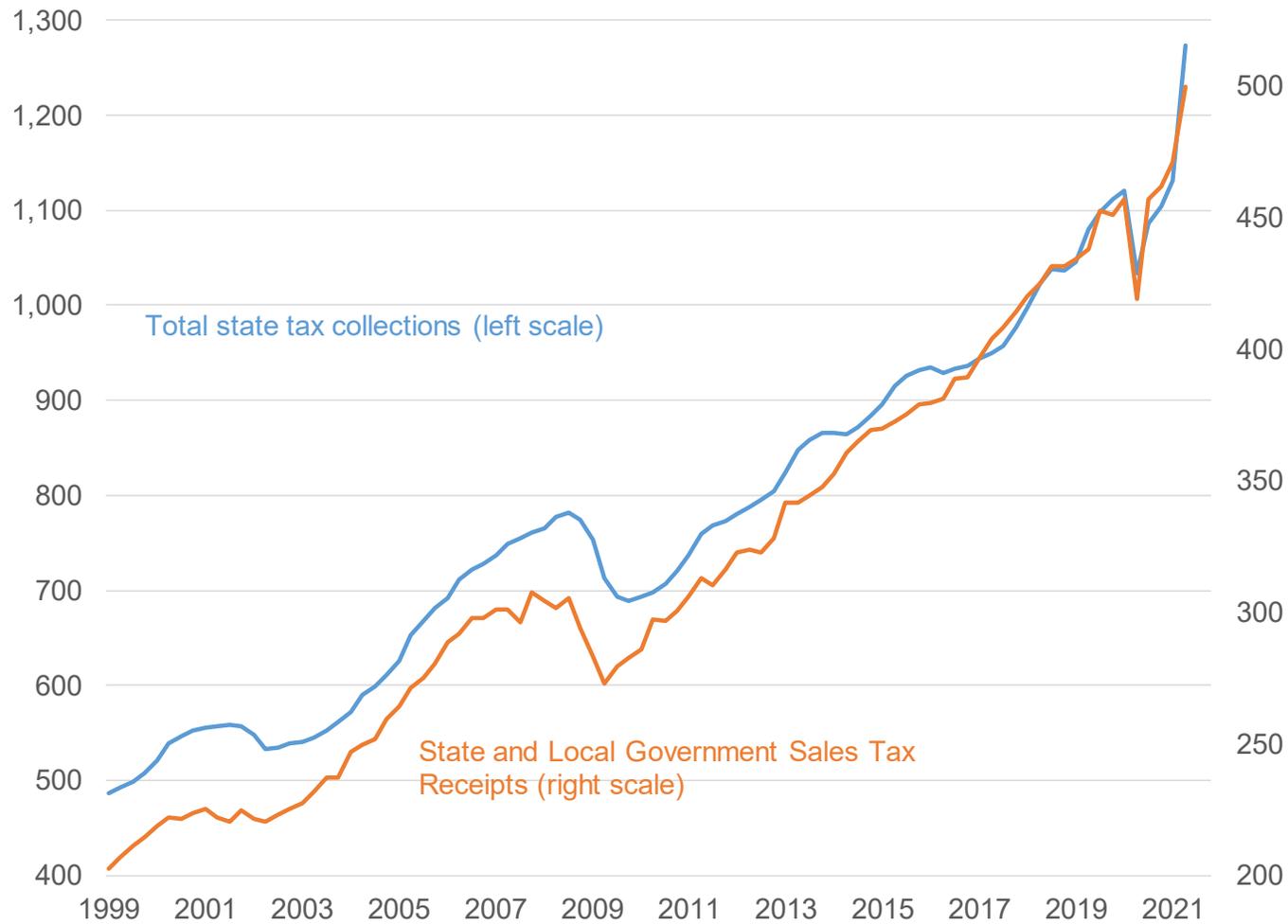


Sources: Haver Analytics; U.S. Department of Commerce. Updated through November 2021.

... Beefed Up Municipal Government Finances, ...

State tax collections (\$ billions, 4-qtr sum)

State & local government sales tax collections (\$ billions, saar)



Sources: Haver Analytics; Census; Bureau of Economic Analysis. Updated through June 2021.

... and Tore Up the Business Cycle Script

NBER-Designated Business Cycles

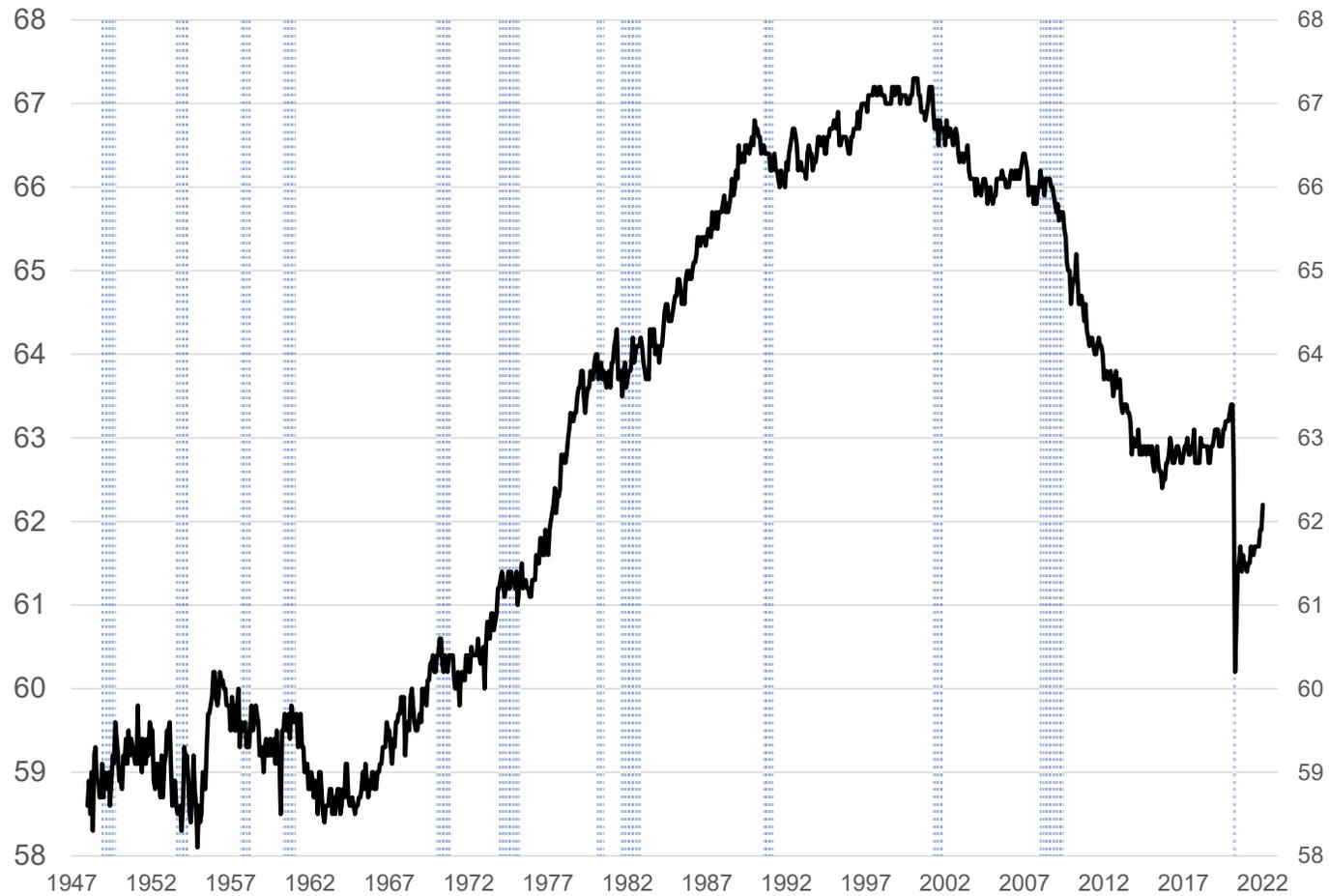
National Economy Bottom		National Economy Peak		Duration of Expansion	Duration of Next Downturn
(Month)	(Year)	(Month)	(Year)	(Months)	(Months)
December	1854	June	1857	30	18
December	1858	October	1860	22	8
June	1861	April	1865	46	32
December	1867	June	1869	18	18
December	1870	October	1873	34	65
March	1879	March	1882	36	38
May	1885	March	1887	22	13
April	1888	July	1890	27	10
May	1891	January	1893	20	17
June	1894	December	1895	18	6
June	1897	June	1899	24	18
December	1900	September	1902	21	23
August	1904	May	1907	33	13
June	1908	January	1910	19	24
January	1912	January	1913	12	23
December	1914	August	1918	44	7
March	1919	January	1920	10	18
July	1921	May	1923	22	14
July	1924	October	1926	27	13
November	1927	August	1929	21	43
March	1933	May	1937	50	13
June	1938	February	1945	80	8
October	1945	November	1948	37	11
October	1949	July	1953	45	10
May	1954	August	1957	39	8
April	1958	April	1960	24	10
February	1961	December	1969	106	11
November	1970	November	1973	36	16
March	1975	January	1980	58	6
July	1980	July	1981	12	16
November	1982	July	1990	92	8
March	1991	March	2001	120	8
November	2001	December	2007	73	18
June	2009	February	2020	128	2
April	2020				

Source: Haver Analytics; NBER. Updated through July 2021.

... For Sure, Not Quite Sure
Where “Maximum
Employment” Lies ...

Many Stepped Aside, Temporarily? ...

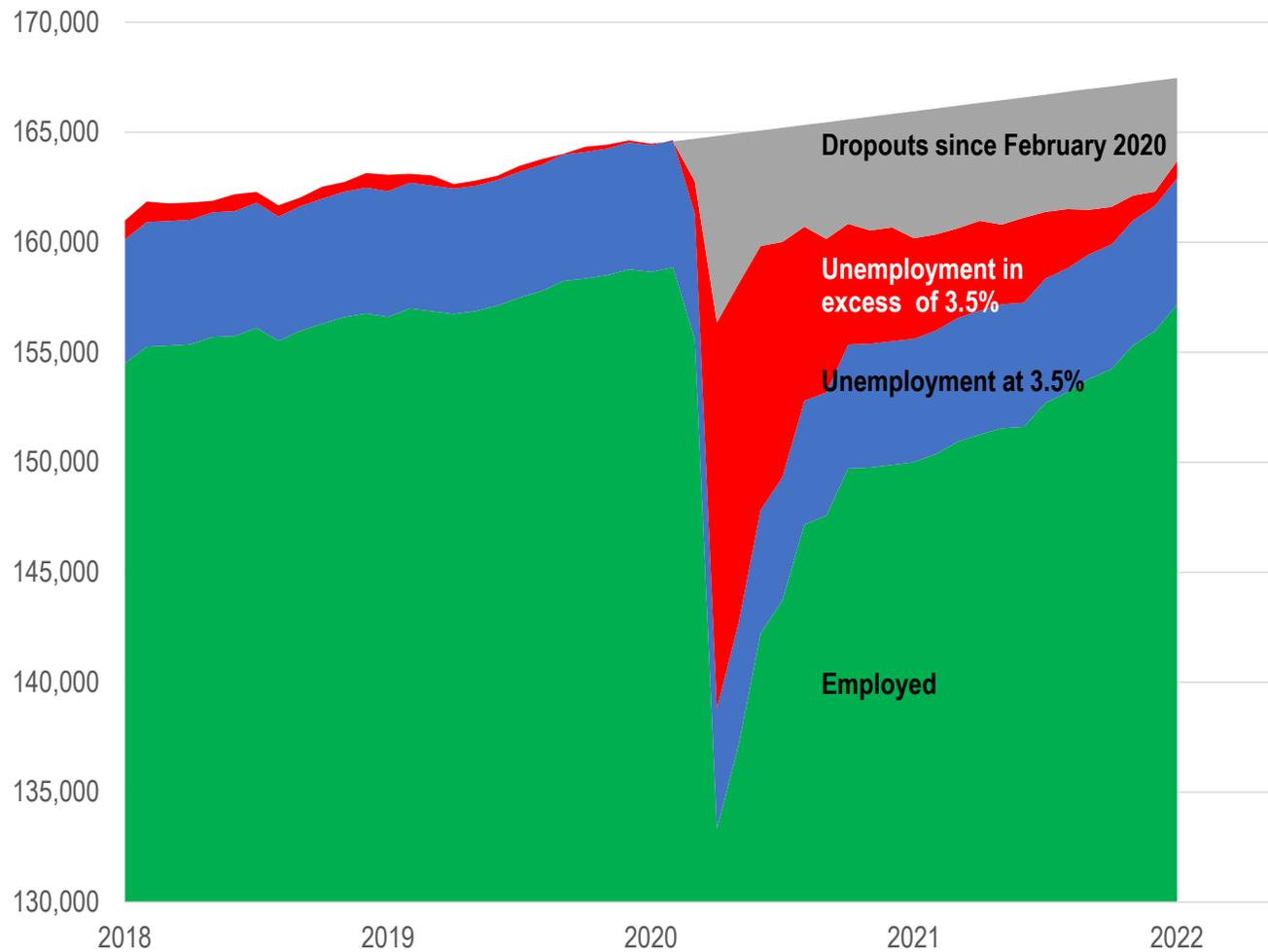
Labor force participation rate (labor force as a percent of the population)



Sources: Haver Analytics; NBER-designated recessions; U.S. Department of Labor. Updated through January 2022.

... But They Will be Back ...

Employment and (official and hidden) unemployment (thousands of people)

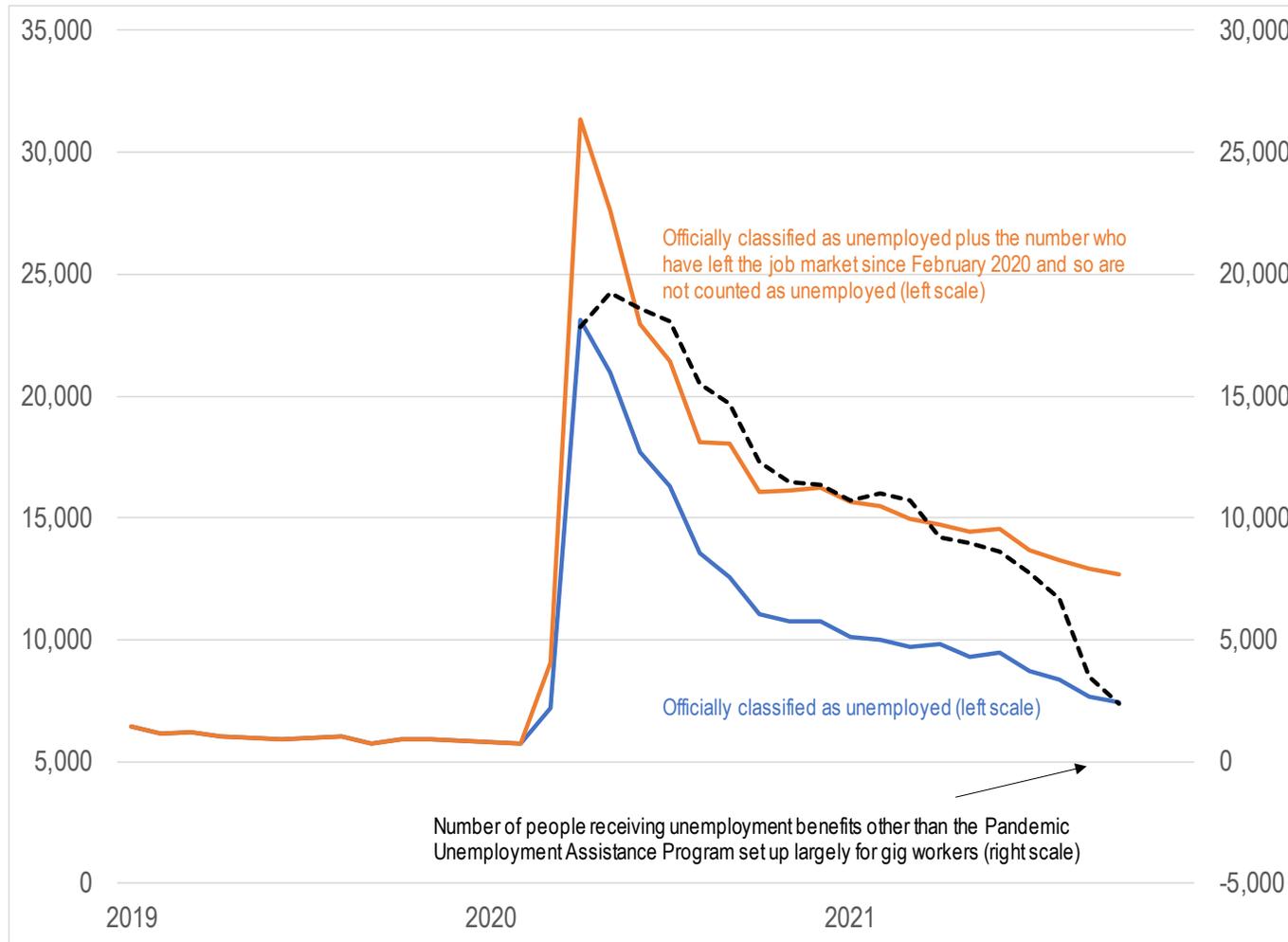


Note: Figures are based on the Household Survey.
Sources: Haver Analytics; U.S. Department of Labor. Updated through January 2022.

... the 4 Million Who Jumped Ship Had Benefits

Unemployed and job leavers (thousands)

Recipients of unemployment benefits from various UI programs (thousands)

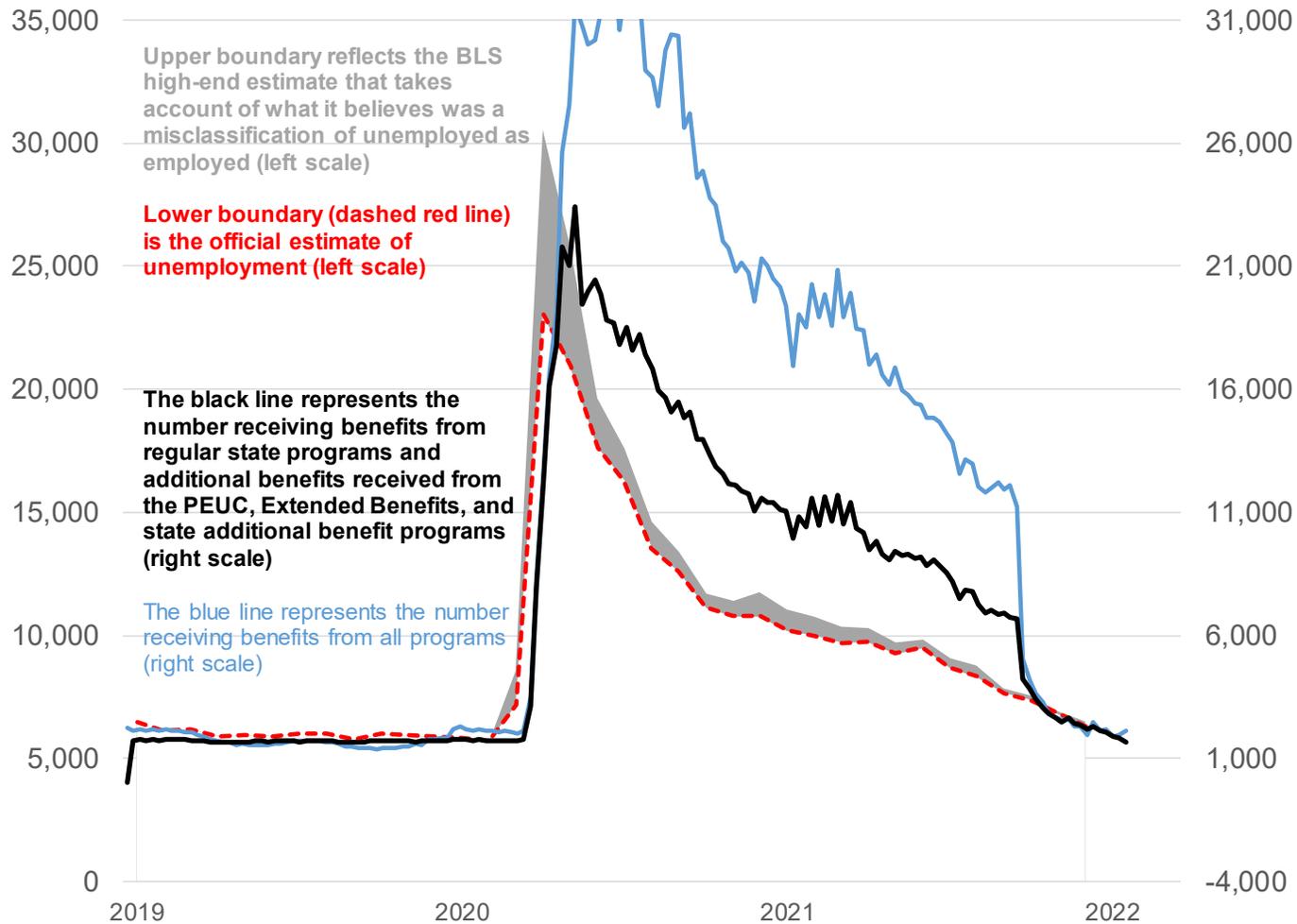


Sources: Haver Analytics; U.S. Department of Labor. Updated through January 2022.

[P.S. GIG Workers Are Marked as Self Employed]

Monthly unemployment estimates, Household Survey (thousands)

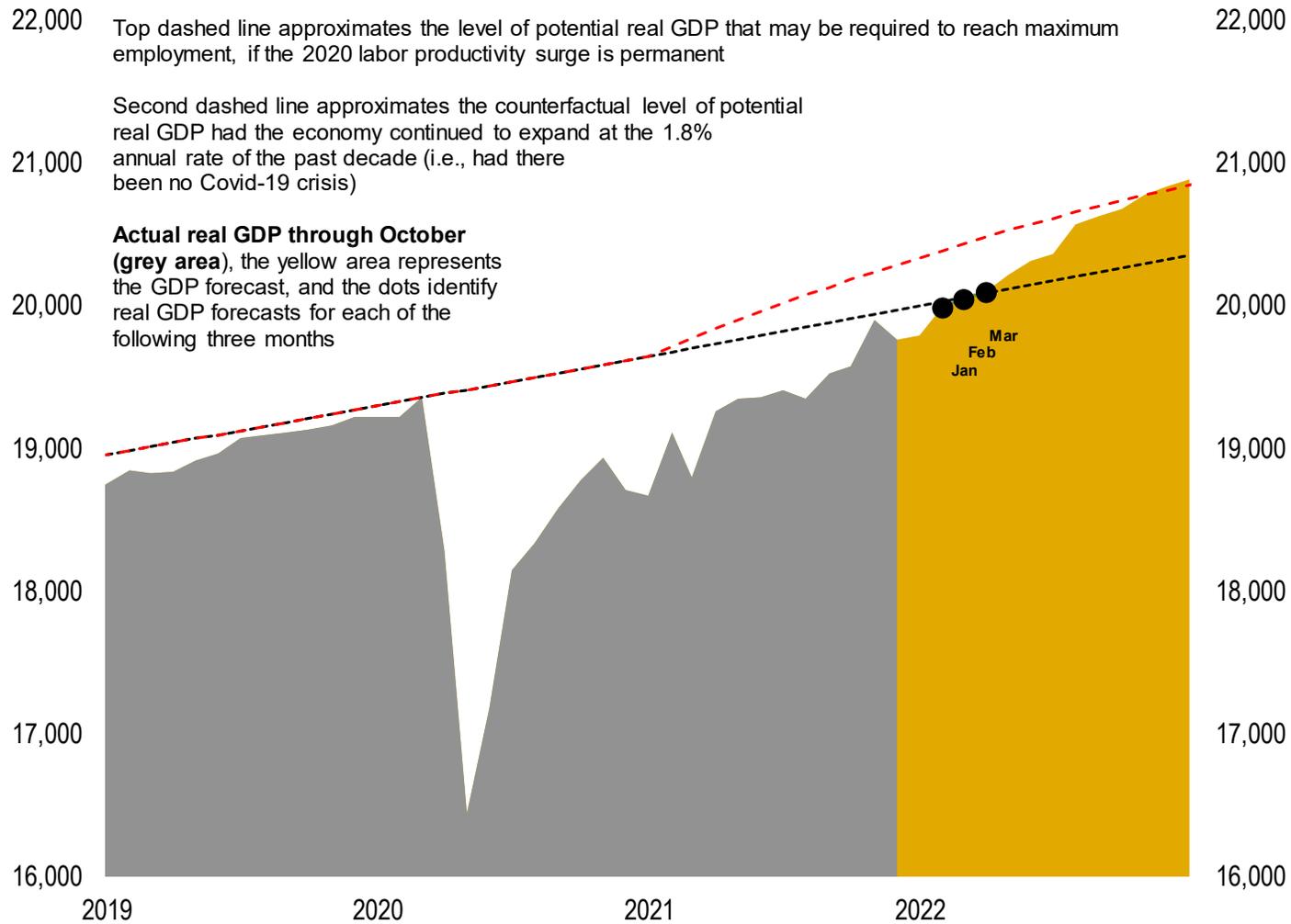
Insured unemployment, regular programs and PEUC, EB, and state EB programs (thousands)



Sources: Haver Analytics; U.S. Department of Labor. Updated through December 2021 (unemployment), January 1, 2022 (additional benefit programs) and January 8, 2022 (regular state claimants).

We May Need More GDP to Absorb Them

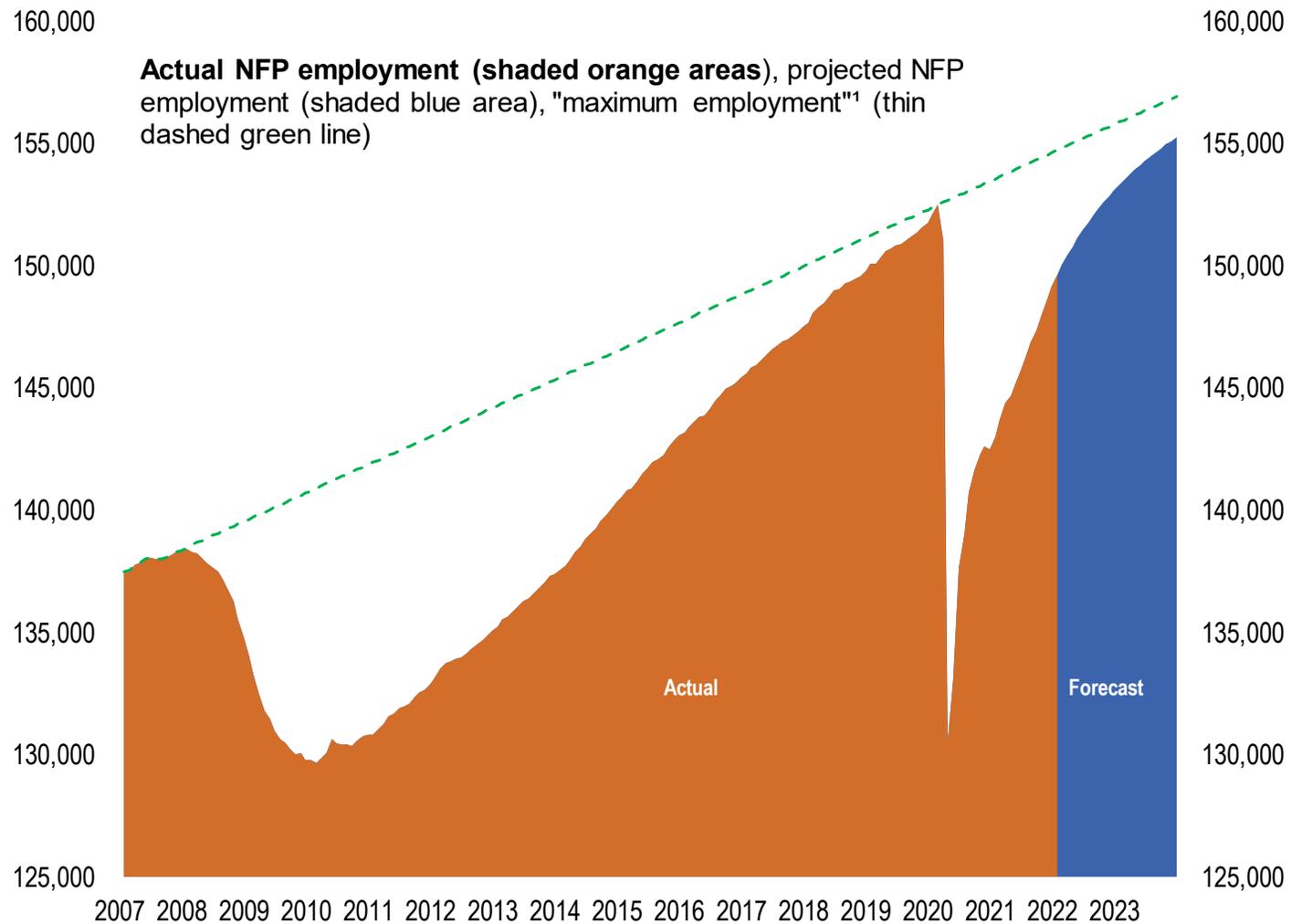
Real GDP and counterfactual real GDP scenarios (billions of chained 2012 dollars)



Sources: Haver Analytics; IHS Markit Updated through December 2021.

True, Employment Isn't Quite There, Because ...

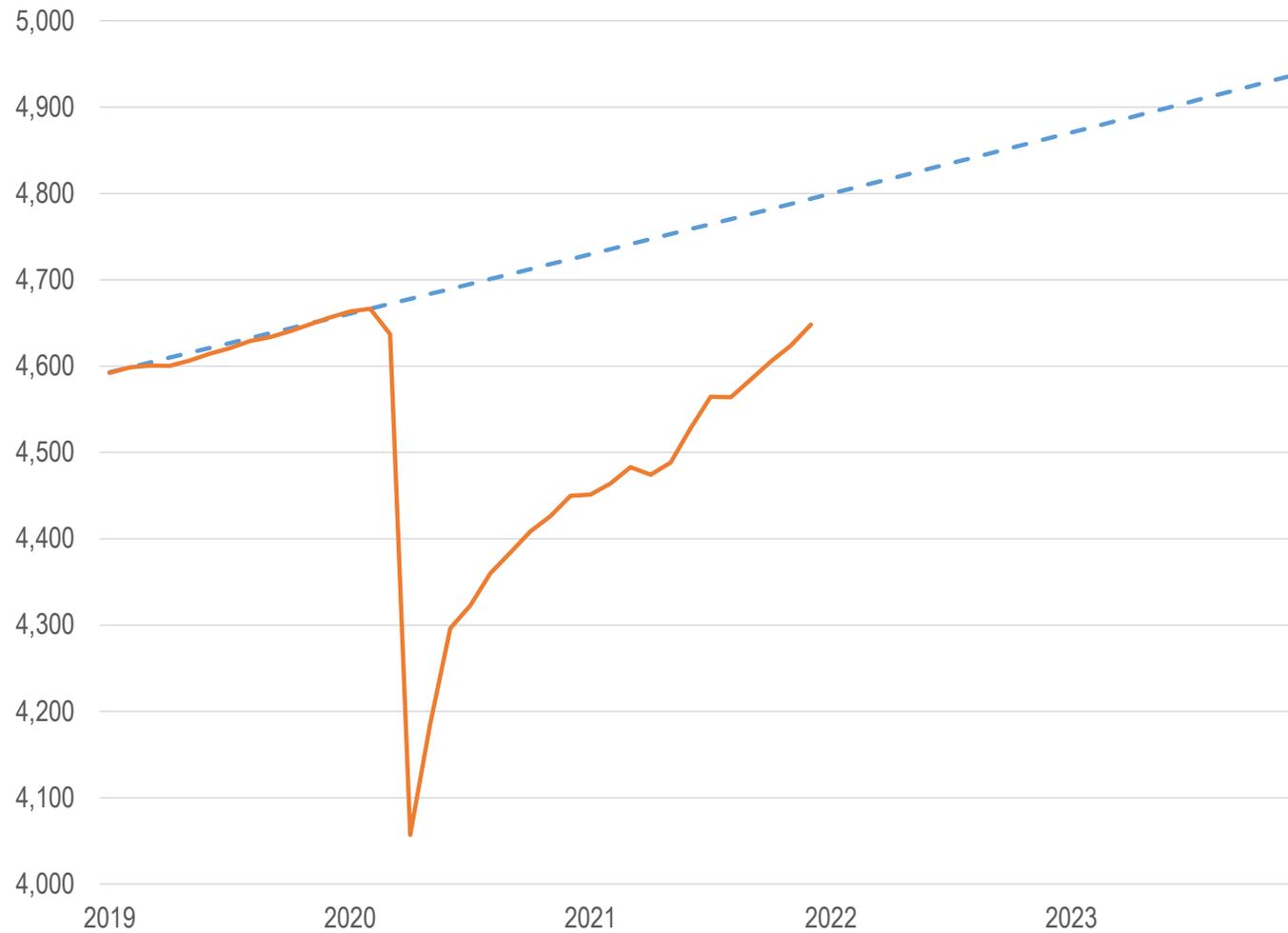
Nonfarm payrolls (thousands of jobs)



Sources: Haver Analytics, U.S. Department of Labor. Updated through January 2022.

[P.S. Georgia ...

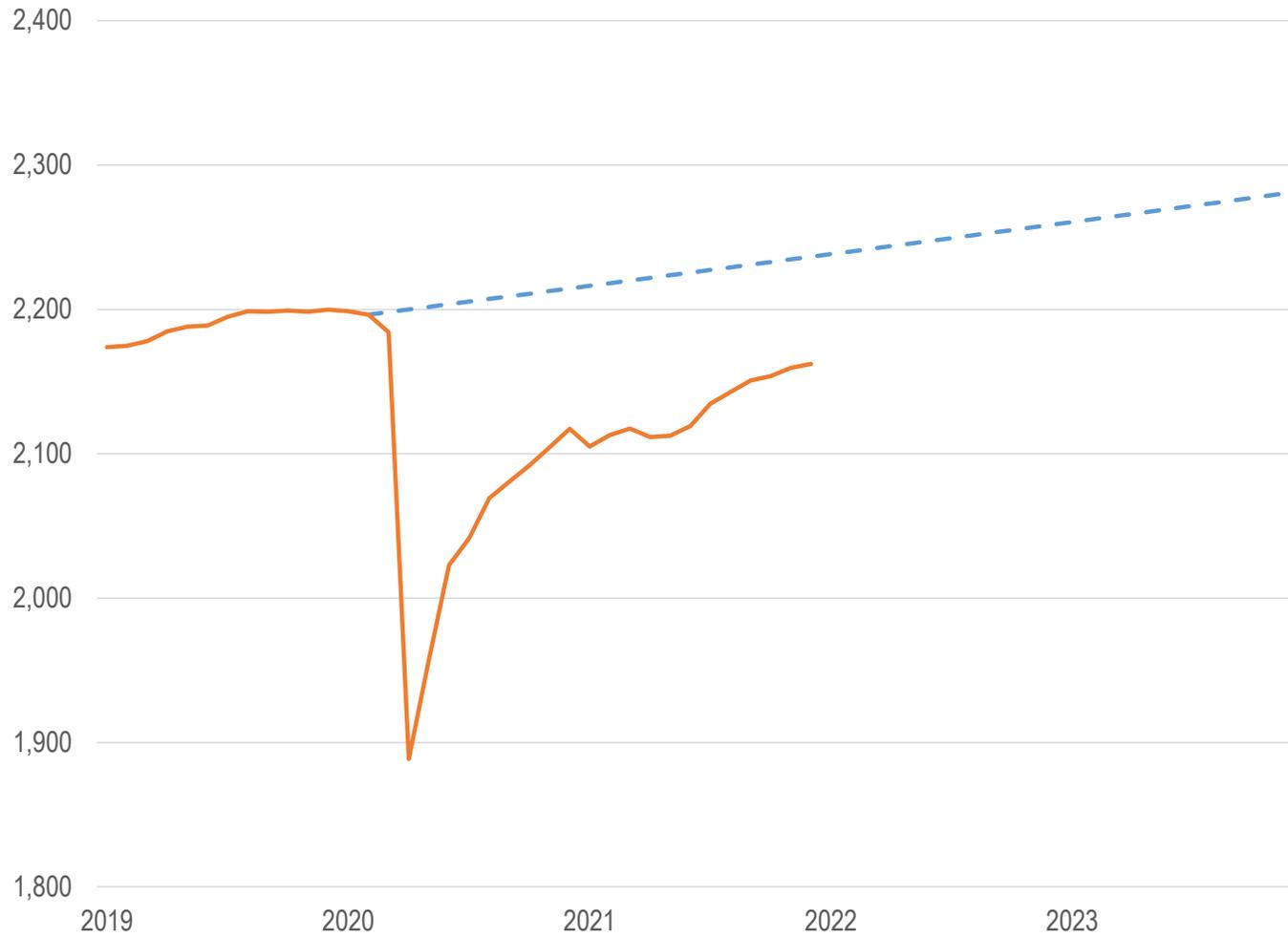
Nonfarm payrolls (thousands of jobs)



Sources: Haver Analytics, U.S. Department of Labor. Updated through January 2022.

... South Carolina ...

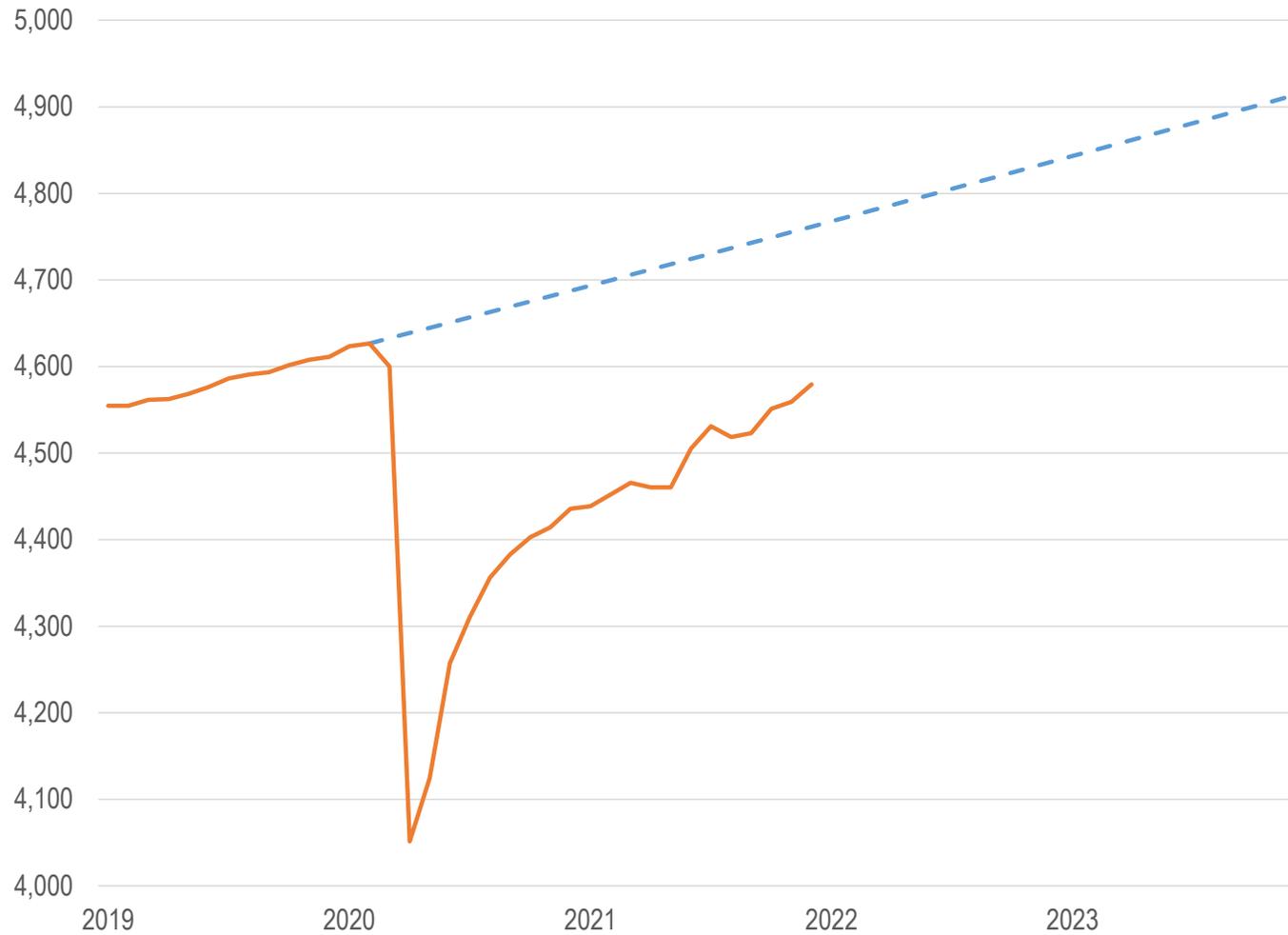
Nonfarm payrolls (thousands of jobs)



Sources: Haver Analytics, U.S. Department of Labor. Updated through January 2022.

... and North Carolina]

Nonfarm payrolls (thousands of jobs)



Sources: Haver Analytics, U.S. Department of Labor. Updated through January 2022.

... We're 4-7 Million Shy of the Fed's 'Max Emp' Goal ...

	Compared with Pre-Pandemic Levels (February 2020)	Compared With a No-Pandemic Counterfactual ¹	
	(thousands)	(thousands)	(% shortfall)
Labor Force	-2,024	-4,107	
Employed (Headcount)	-2,785	-5,159	-3.2%
Self Employed	281	281	
Other	-3,066	-5,440	
Unemployed	796	1,052	
Household Survey Approximation of the Nonfarm Payroll Concept ²	-4,847	-7,296	-4.7%
Nonfarm Payrolls (Job Count)	-2,875	-5,098	-3.3%

¹ The counterfactual reference point assumes that the respective employment metric would have continued to increase at the 2019 pace --that is, by about 100,000 monthly--after February 2020.

² The measure of the number of jobs based on the Current Population Survey that approximates the population covered by nonfarm payroll for example, that excludes self employed workers and includes multiple job holdings (assuming such people hold only one other job).

... Mostly in Ed, Healthcare, and Leisure/Hospitality

Economic Indicator	Deviation from the "No-Pandemic" Path as of December 2021 ¹	
	Shortfall (thousands)	Shortfall (%)
GDP (if real GDP rose 1.0% in December)		-1.2
Nonfarm Payrolls (Establishment Survey)	-5,098	-3.8
Private Sector	-4,425	-3.4
Mining and Logging	-96	-14.1
Construction	-122	-1.6
Manufacturing	-81	-0.6
Trade, Transportation & Utilities	276	1.0
Wholesale Trade	-113	-2.5
Retail Trade	58	0.4
Transportation and Warehousing	314	5.2
Utilities	-8	-1.4
Information	50	1.7
Financial Activities	-91	-1.0
Professional and Business Services	-59	-0.3
Education and Health Services	-1,682	-6.6
Private Educational Services	-237	-6.0
Health care	-987	-5.8
Social Assistance	-469	-10.2
Leisure and Hospitality	-2,365	-13.4
Other Services	-4	-6.7
Government	-815	-3.6
Federal	-4	-0.1
State	-128	-2.4
Local	-683	-4.6
Memo: State and Local Education	-267	-2.5

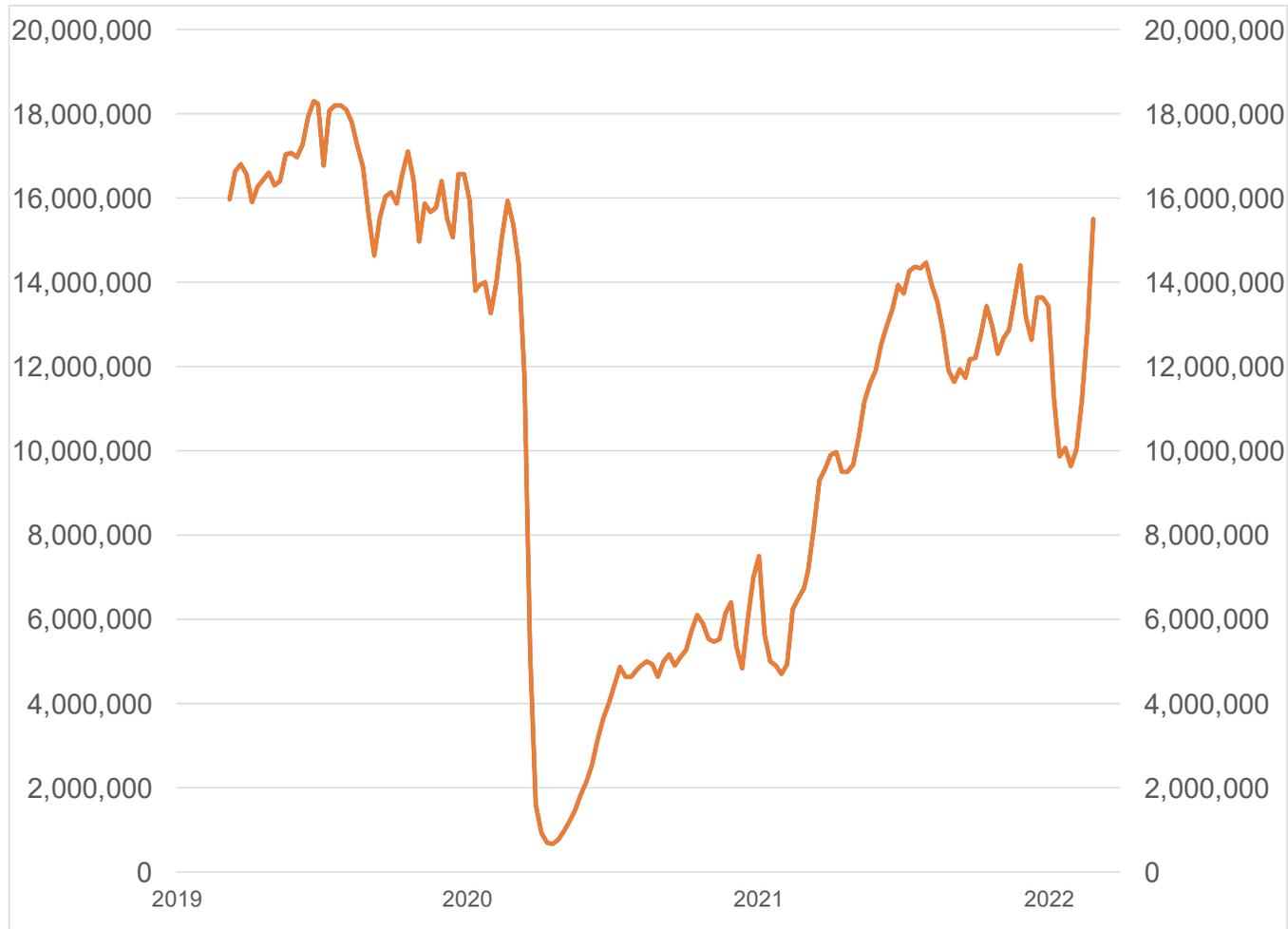
¹ Each "No-Pandemic" path starts with the actual February 2020 level and then expands at the 2019 pace.

P.S. Hard to Gauge the Gender Impact Lately

<u>Household Survey (Head Count)</u>			
Employed		-2,785	
Women		-1,304	
Men		-381	
Residual		-100	
Unemployed		796	
Women		309	
Men		462	
Residual		25	
Number of People Who Have Left the Workforce Since February 2020		914	
Women Who Left the Workforce After February 2020		995	
Participation Rate in February 2020		57.9	
Participation Rate in December 2021		56.8	
Percent Change in the Participation Rate		-1.9%	-1.1
Men Who Have Left the Workforce Since February 2020		-81	
Participation Rate in February 2020		69.3	
Participation Rate in December 2021		67.9	
Percent Change in the Participation Rate		-2.0%	-1.4
<u>Payroll Survey (Job Count)</u>			
Nonfarm Payrolls		-2,875	
Change in the Number of People Working Several Jobs		-813	
Jobs Held by Women		-1,820	
Change in the Number of Women Working Several Jobs		-538	
Jobs Held by Men		-1,055	
Change in the Number of Men Working Several Jobs		-245	

And Air Travel Still Has a Little Wood to Chop ...

Number of travelers passing through TSA security lines each week

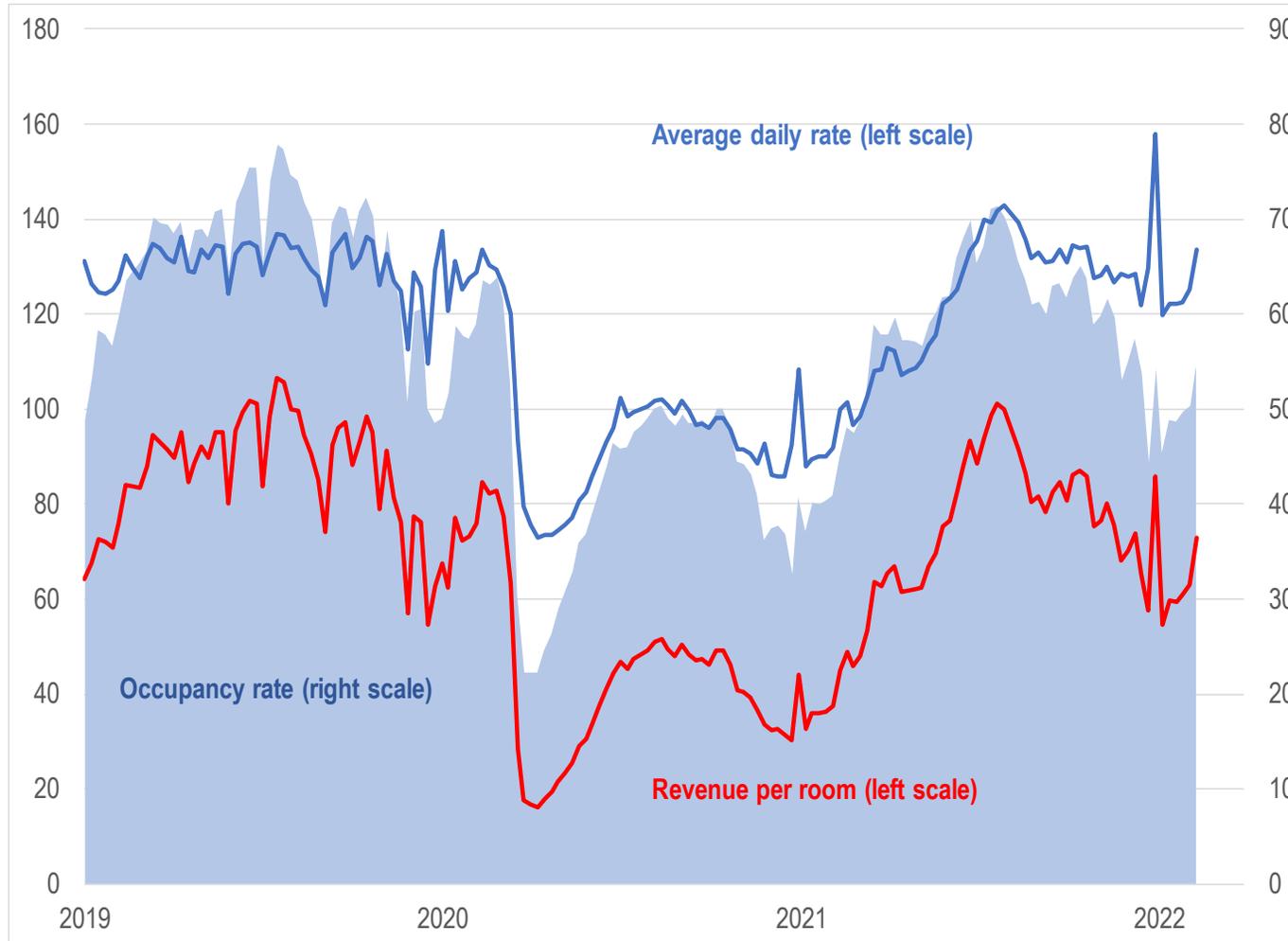


Sources: Haver Analytics; Transportation Security Administration. Updated through February 21, 2022.

... and Hotels

Daily rate (dollars)

Hotel occupancy rate (percent of occupancy)



Sources: Haver Analytics; Smith Travel Research Hotel Statistics Weekly. Updated through February 12, 2022.

... the Fed Is Moving to the Sidelines

The FOMC's Mandates Are In View ...

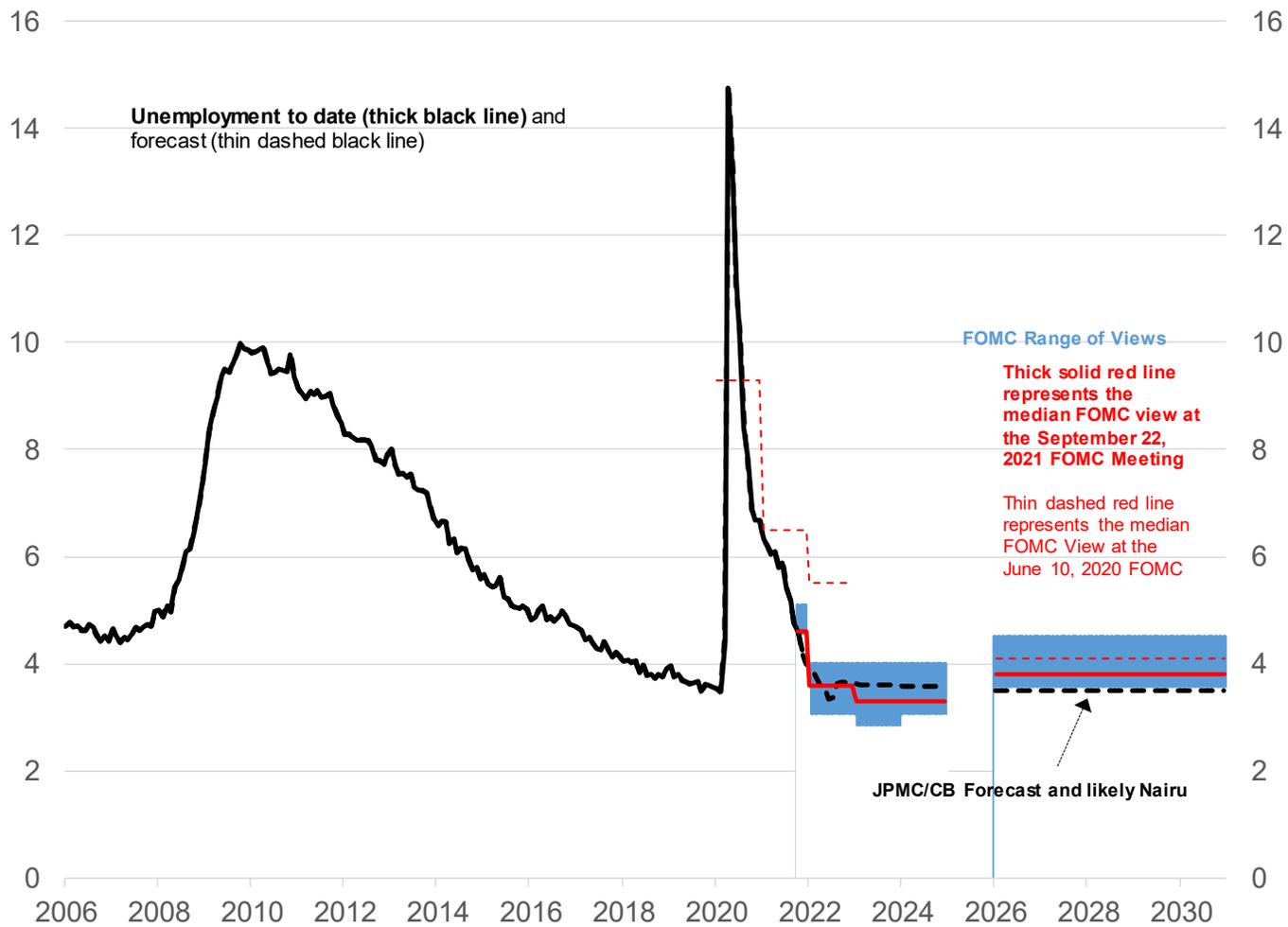
FOMC forecasts (percent change over the four quarters of the respective year or, in the case of unemployment and the funds rate, the rate at year's end)

	<u>2021</u>	<u>2022</u>	<u>2023</u>	<u>2024</u>	<u>Long Term</u>
Real GDP (% Change Over the Four Quarters)					
Median	5.5	4.0	2.2	2.0	1.8
Central Tendency	5.5	3.6 - 4.5	2.0 - 2.5	1.8 - 2.0	1.8 - 2.0
Range	5.3 - 5.8	3.2 - 4.6	1.8 - 2.8	1.7 - 2.3	1.6 - 2.2
PCE Inflation (% Change Over the Four Quarters)					
Median	5.3	2.6	2.3	2.1	2.0
Central Tendency	5.3 - 5.4	2.2 - 3.0	2.1 - 2.5	2.0 - 2.2	2.0
Range	5.3 - 5.5	2.0 - 3.2	2.0 - 2.5	2.0 - 2.2	2.0
Unemployment Rate (% by the Fourth Quarter)					
Median	4.3	3.5	3.5	3.5	4.0
Central Tendency	4.2 - 4.3	3.4 - 3.7	3.2 - 3.6	3.2 - 3.7	3.8 - 4.2
Range	4.0 - 4.4	3.0 - 4.0	2.8 - 4.0	3.1 - 4.0	3.5 - 4.3
Federal Funds Rate (% by the Fourth Quarter)					
Median	0.125	0.875	1.625	2.125	2.500
Central Tendency	0.125	0.625 - 0.875	1.375 - 1.875	1.875 - 2.875	2.250 - 2.500
Range	0.125	0.375 - 1.125	1.125 - 2.125	1.875 - 3.125	2.000 - 3.000

Source: Federal Reserve Board. As of December 15, 2021.

... Maximum Employment ...

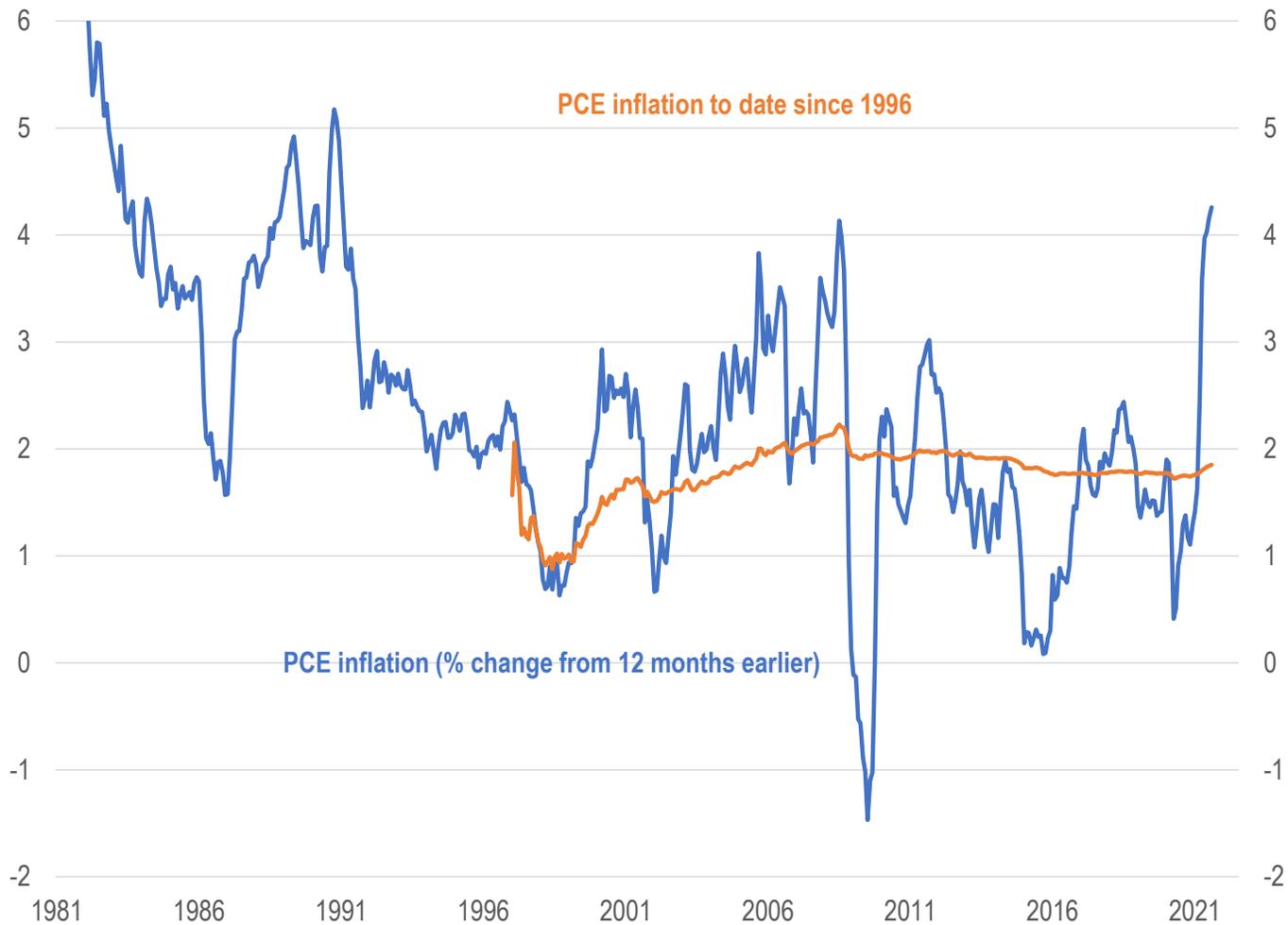
Unemployment rate (percent of the labor force)



Sources: Haver Analytics; U.S. Department of Labor; Federal Reserve Board. Updated through November 2021 (unemployment) and September 22, 2021 (FOMC).

... and 2% Inflation, Looking Beyond, ...

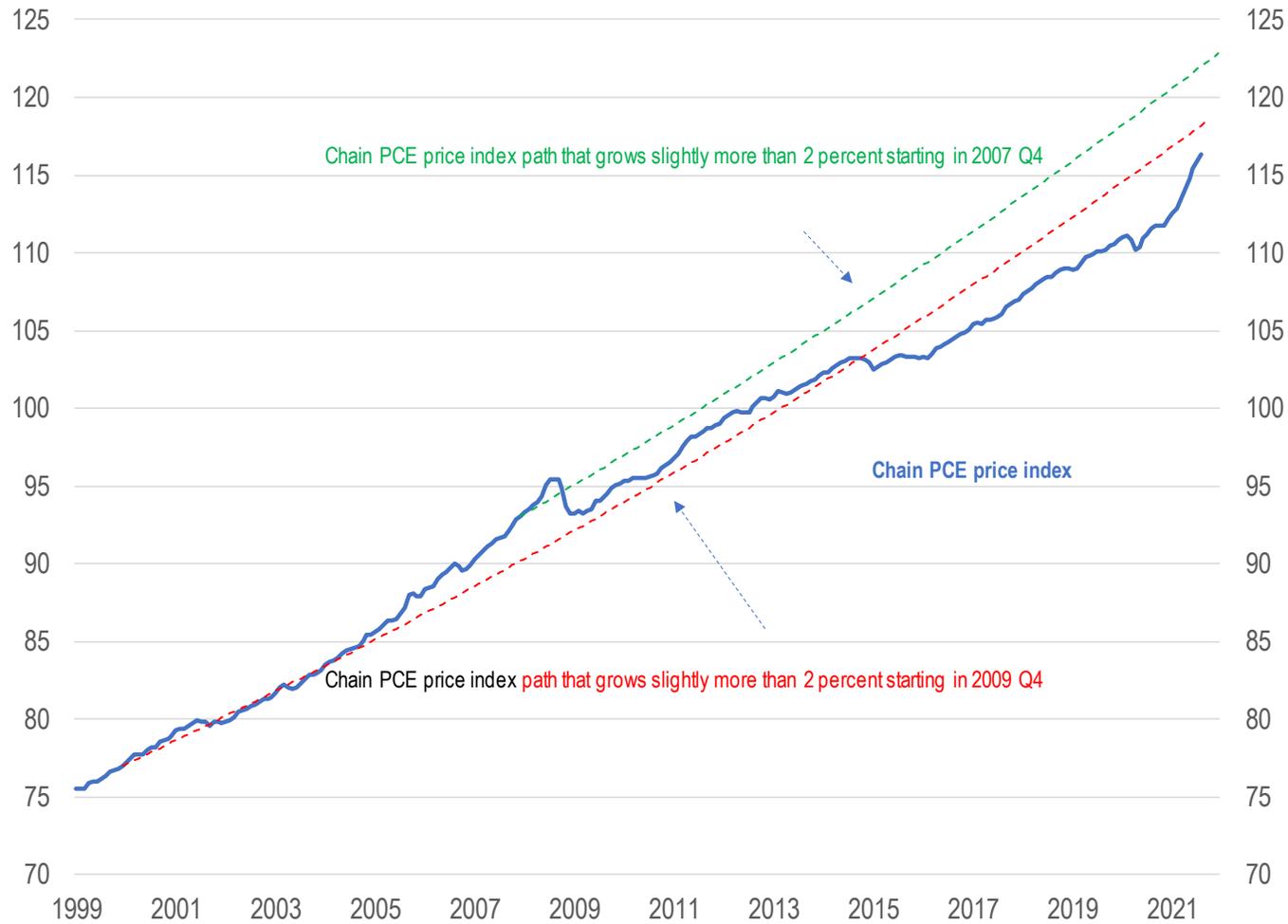
Chain PCE price index, annual change and 1996-to-date rate (annual percent change)



Sources: Haver Analytics; U.S. Department of Labor; U.S. Department of Commerce. Updated through August 2021.

... —That Is, Looking Over the Cycle— ...

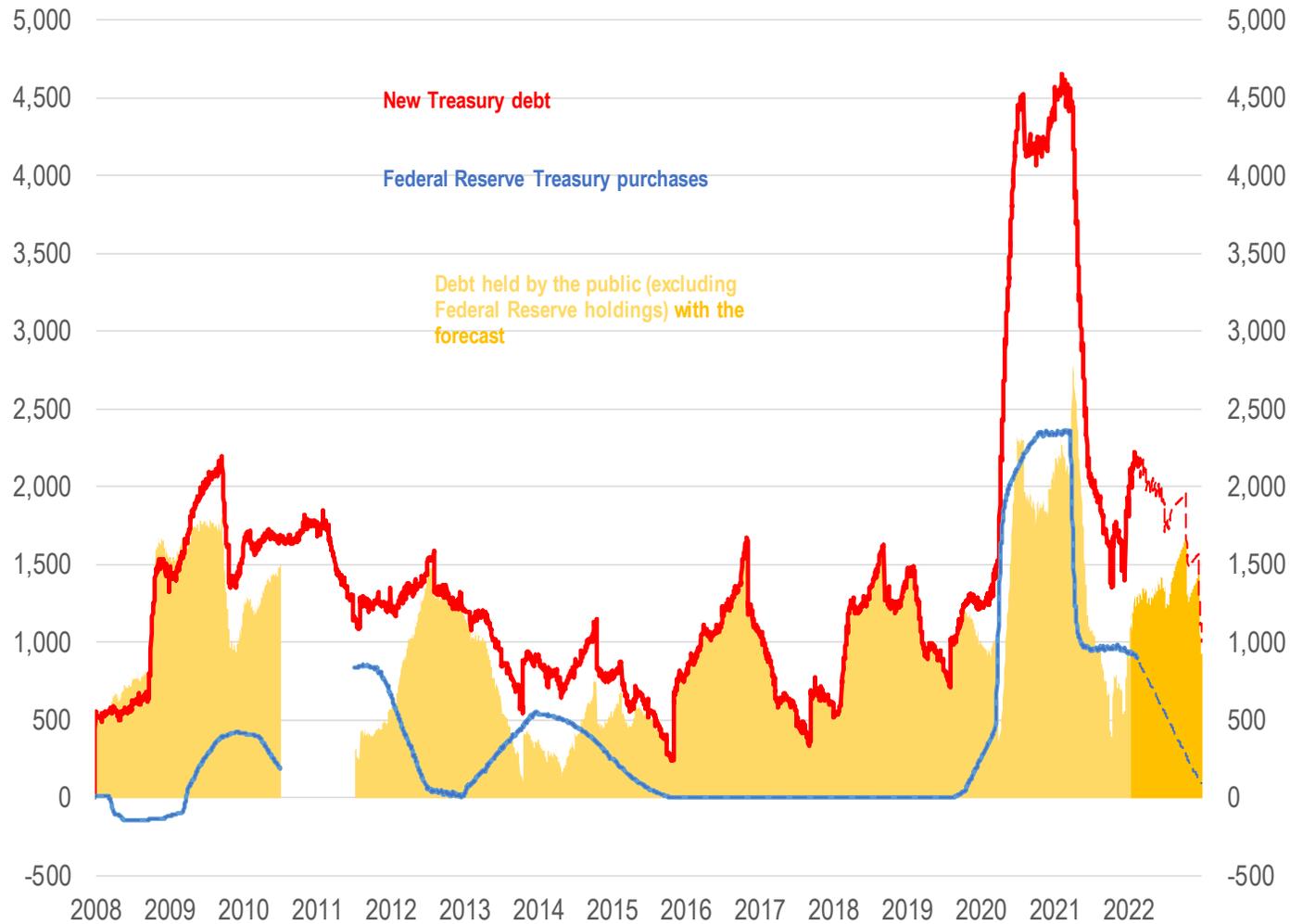
Chain PCE price index and the Federal Reserve's 2% target (2012 = 100)



Sources: Haver Analytics; U.S. Department of Commerce, Eurostat; Bank of Japan. Updated through September 2021.

The Fed Is Tapering but So Is the Treasury ...

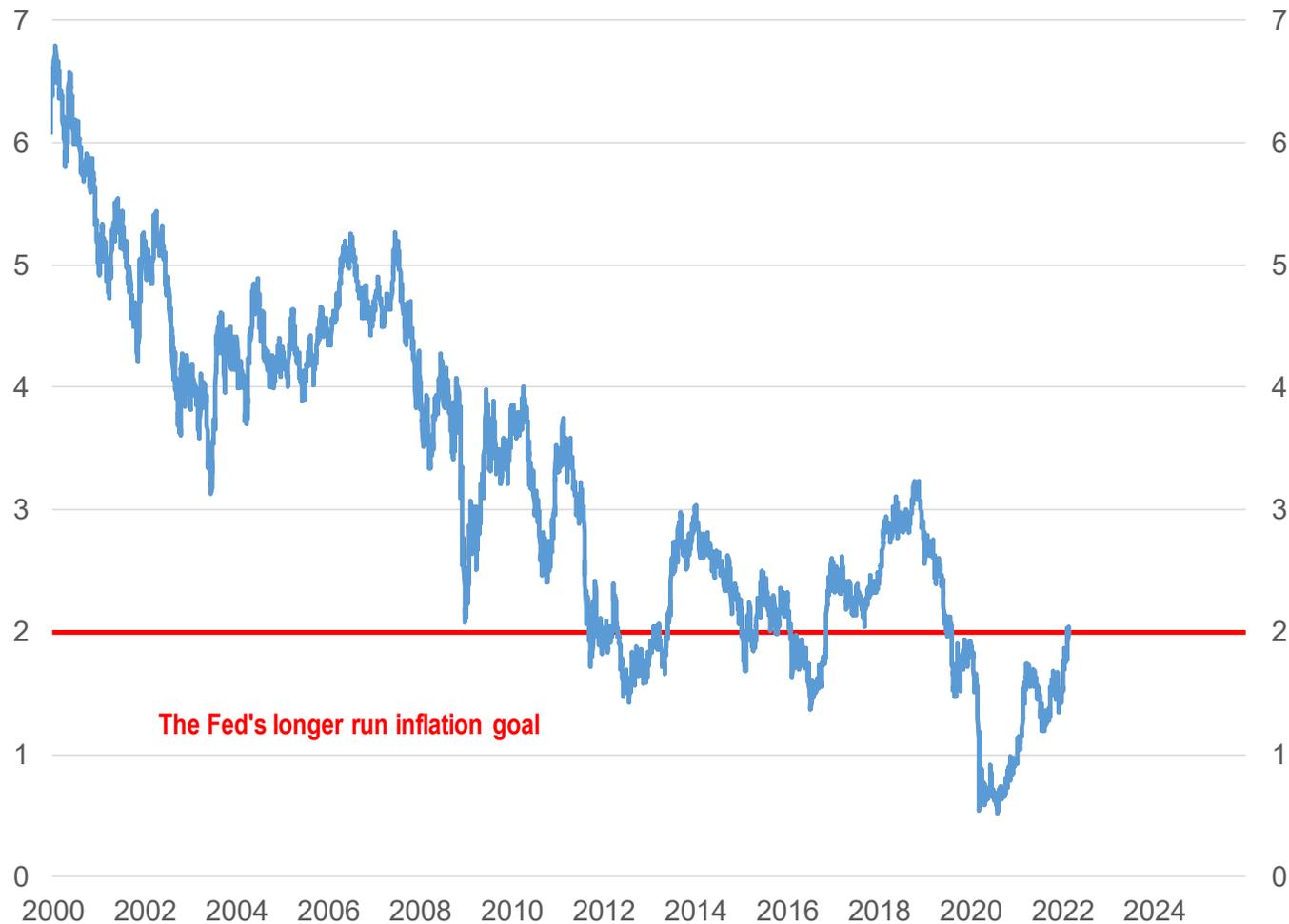
Flows of Treasury debt, Federal Reserve holdings of Treasuries, and public Treasury holdings (\$ billions, change over the most recent 12 months)



Sources: Haver Analytics; U.S. Treasury; Federal Reserve Board. Updated through February 14, 2022.

... and That's Why Bond Investors Are Taking Their Time

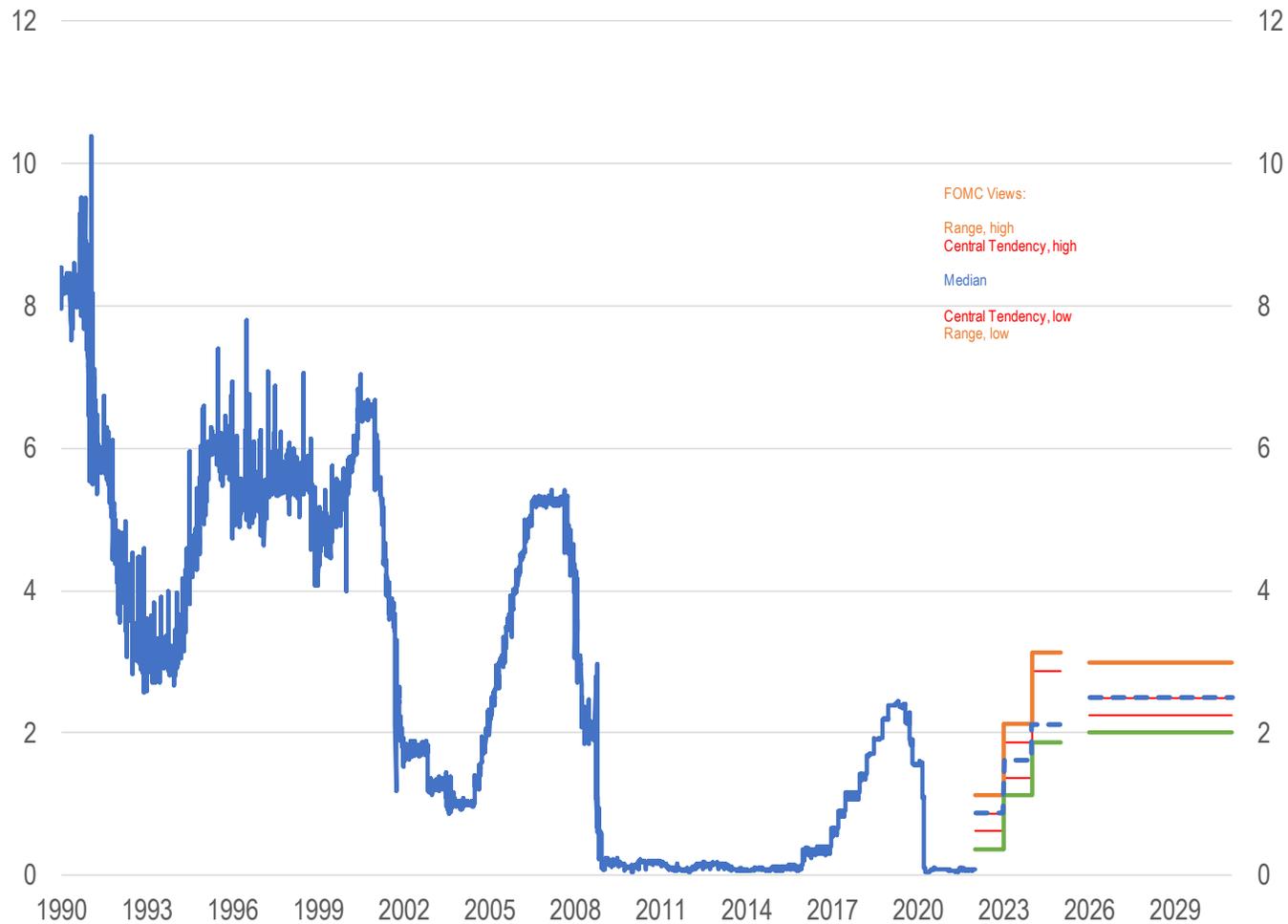
10-year Treasury note yield (percent)



Sources: Haver Analytics; Federal Reserve Board. Updated through February 15, 2022.

Next Come Short-term Interest Rate Increases

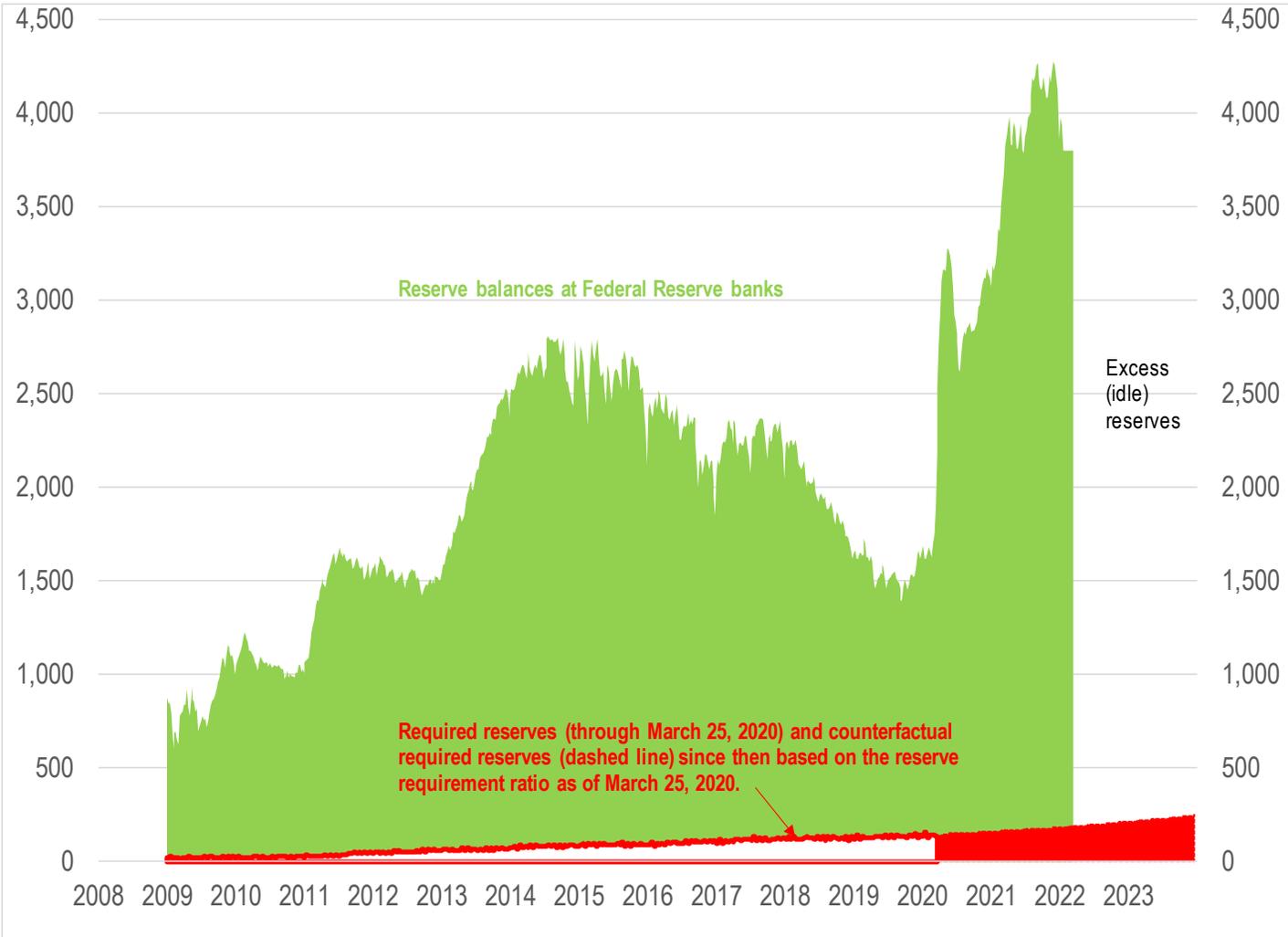
Effective federal funds rate and FOMC rate forecasts (percent per annum)



Sources: Haver Analytics; Federal Reserve Board. Updated through December 15, 2021 (FOMC forecasts) and December 31, 2021 (funds rate).

Then a Weight-Loss Program for the Balance Sheet

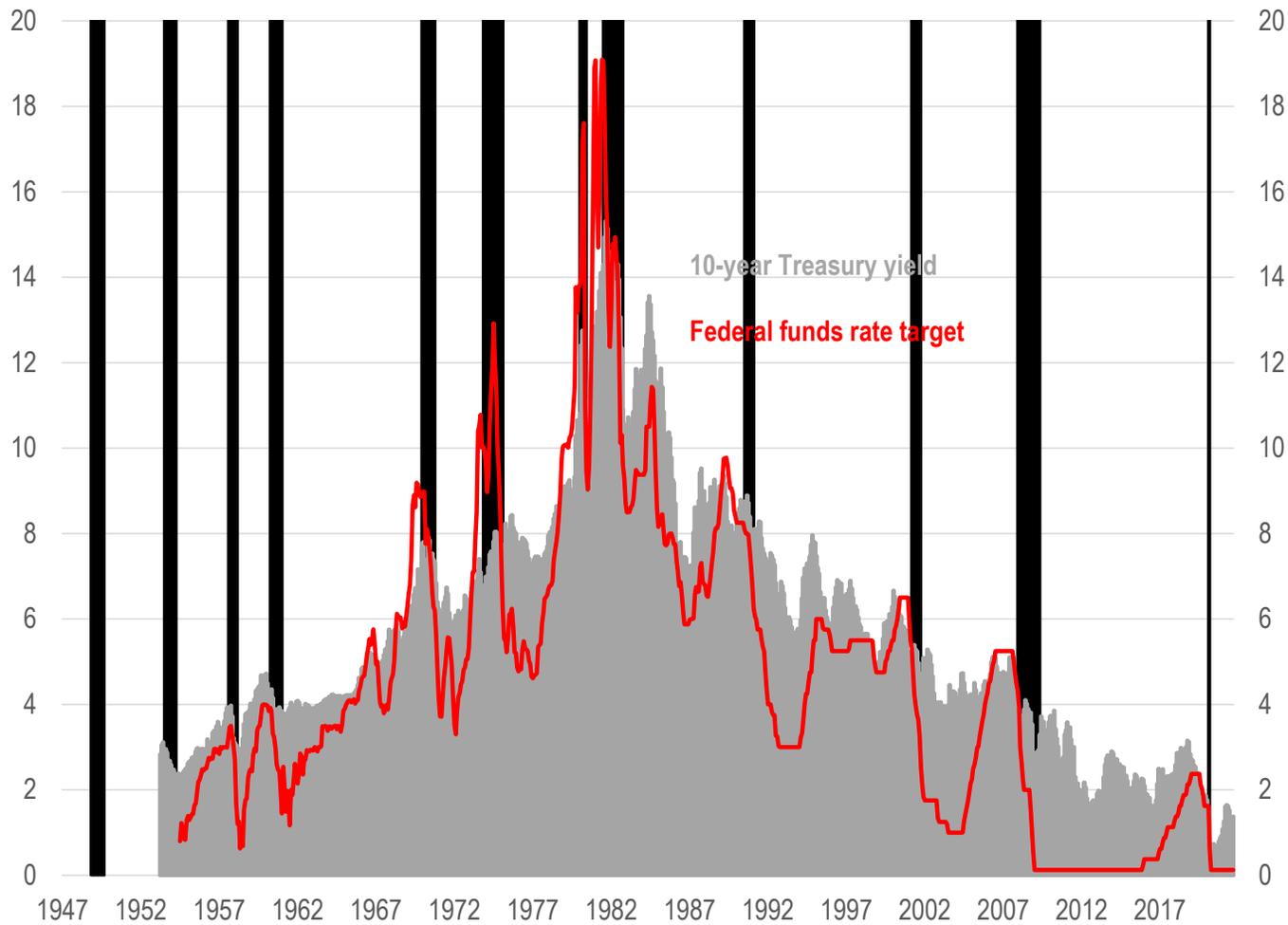
Reserves, required reserves and estimated required reserves (billions of dollars)



Sources: Haver Analytics; Federal Reserve Board. Updated through February 9, 2022.

[P.S. QE's Back Story]

Federal funds rate and 10-year Treasury yield (percent)

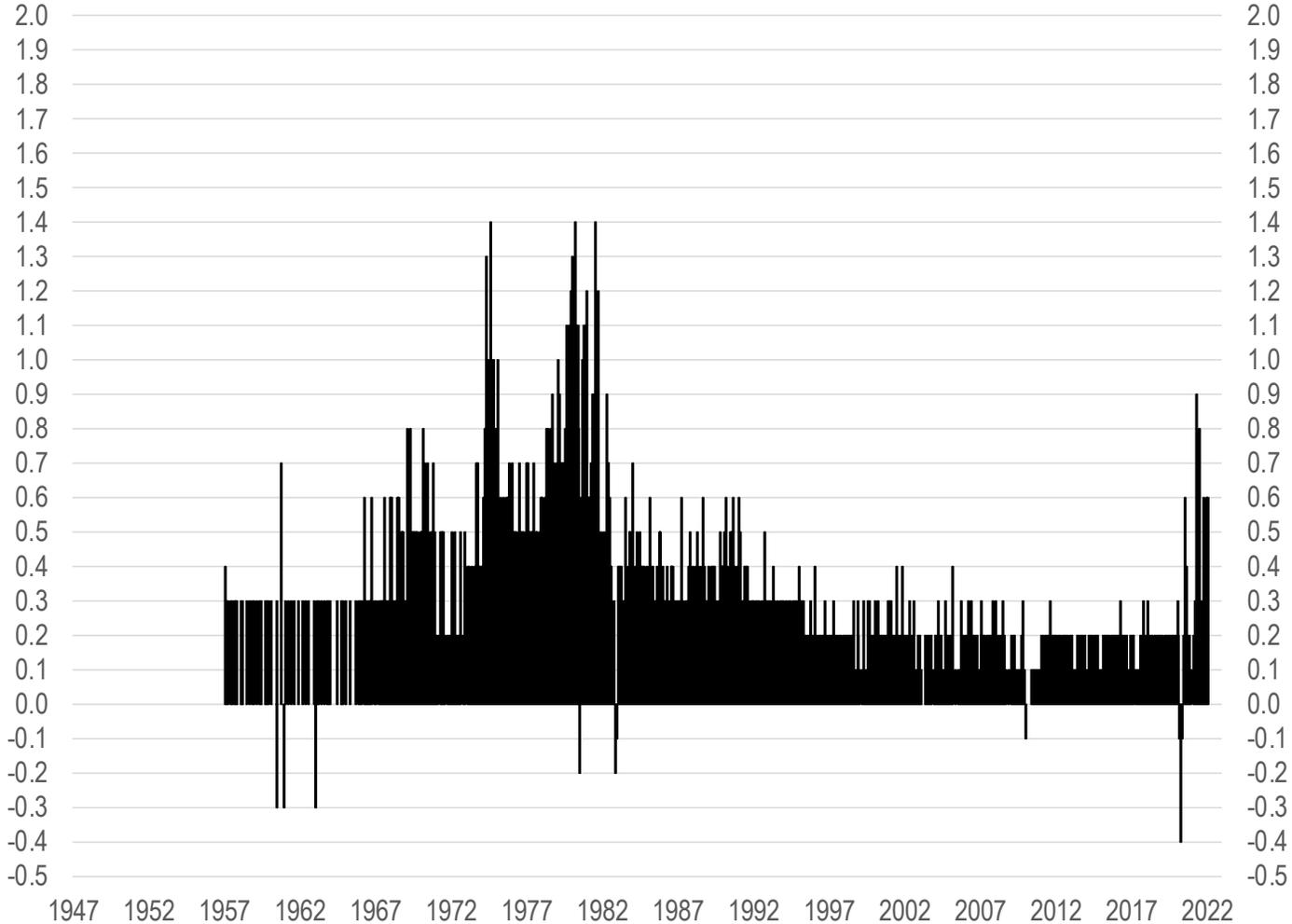


Sources: Haver Analytics; NBER-designated recession bars; Federal Reserve Board. Updated through October 22, 2021.

Bottlenecks and Pricing Convulsion Will Pass

Businesses Were Caught Flat Footed, Understandably

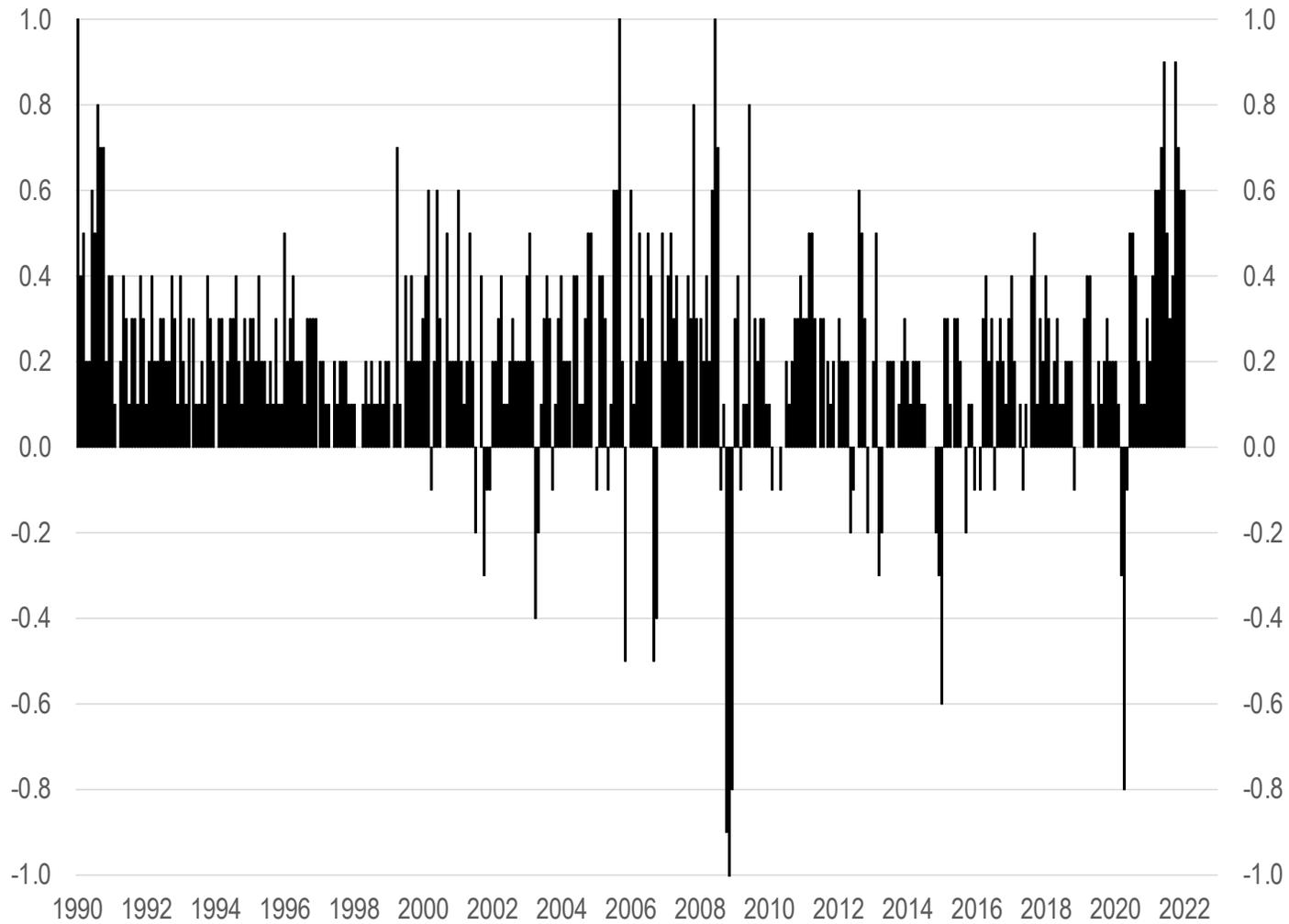
Consumer prices index (annualized percent change from the previous month)



Sources: Haver Analytics; U.S. Department of Labor. Updated through January 2022.

This Was Sudden and ...

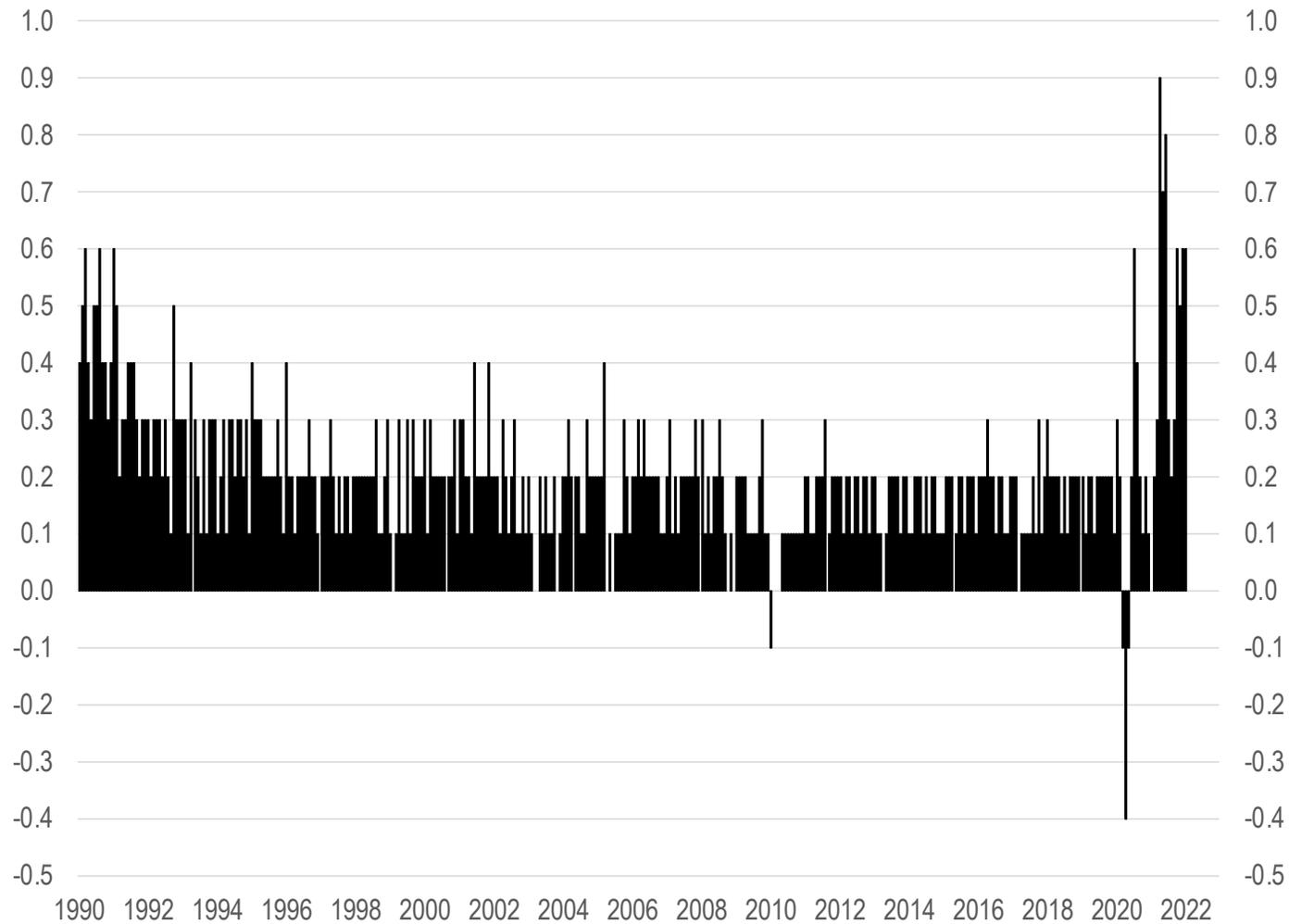
CPI (percent change from the previous month)



Sources: Haver Analytics; U.S. Department of Labor. Updated through January 2022.

... Narrowly Based ...

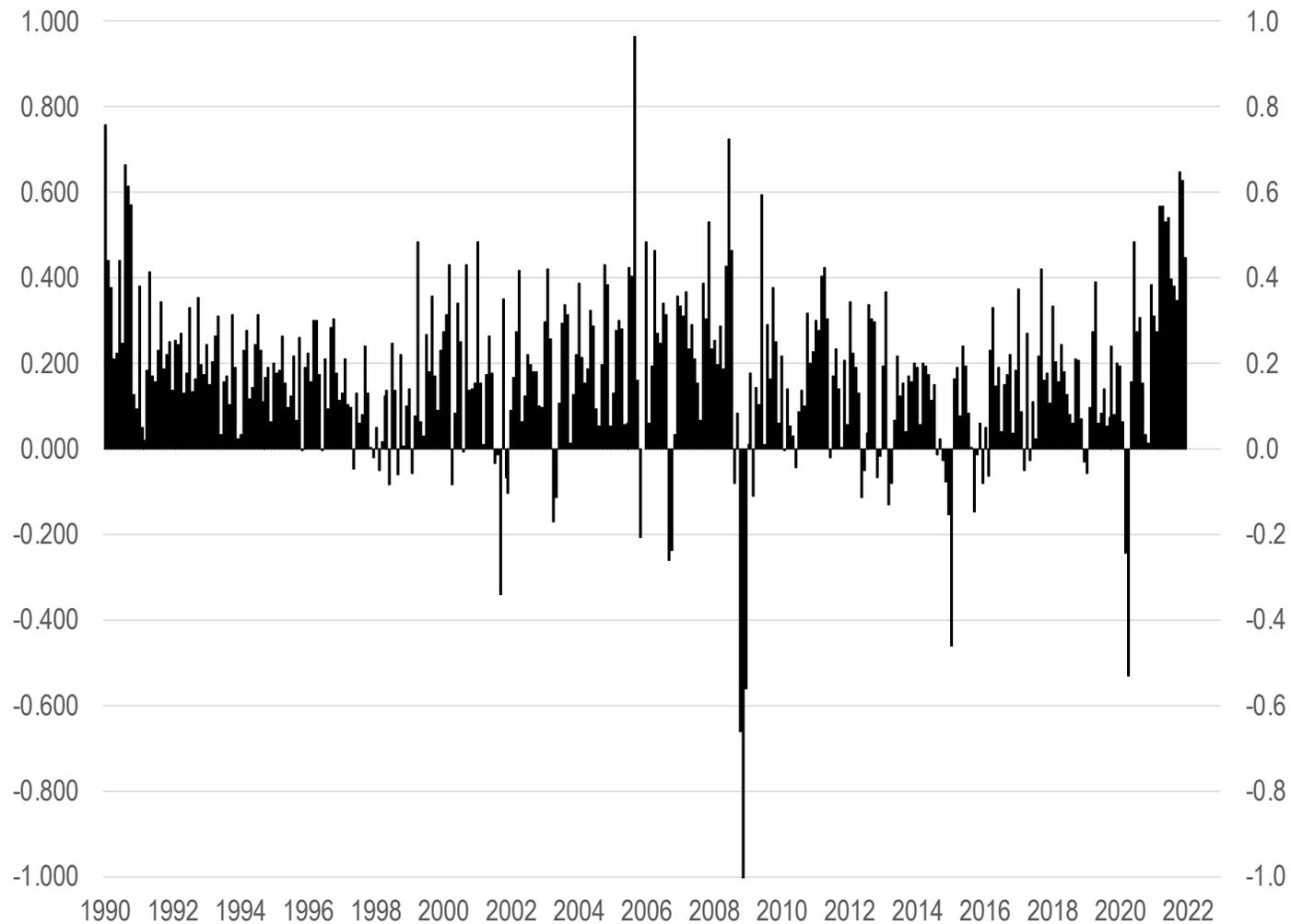
Core CPI (percent change from the previous month)



Sources: Haver Analytics; U.S. Department of Labor. Updated through January 2022.

... and Is More About the Businesses ...

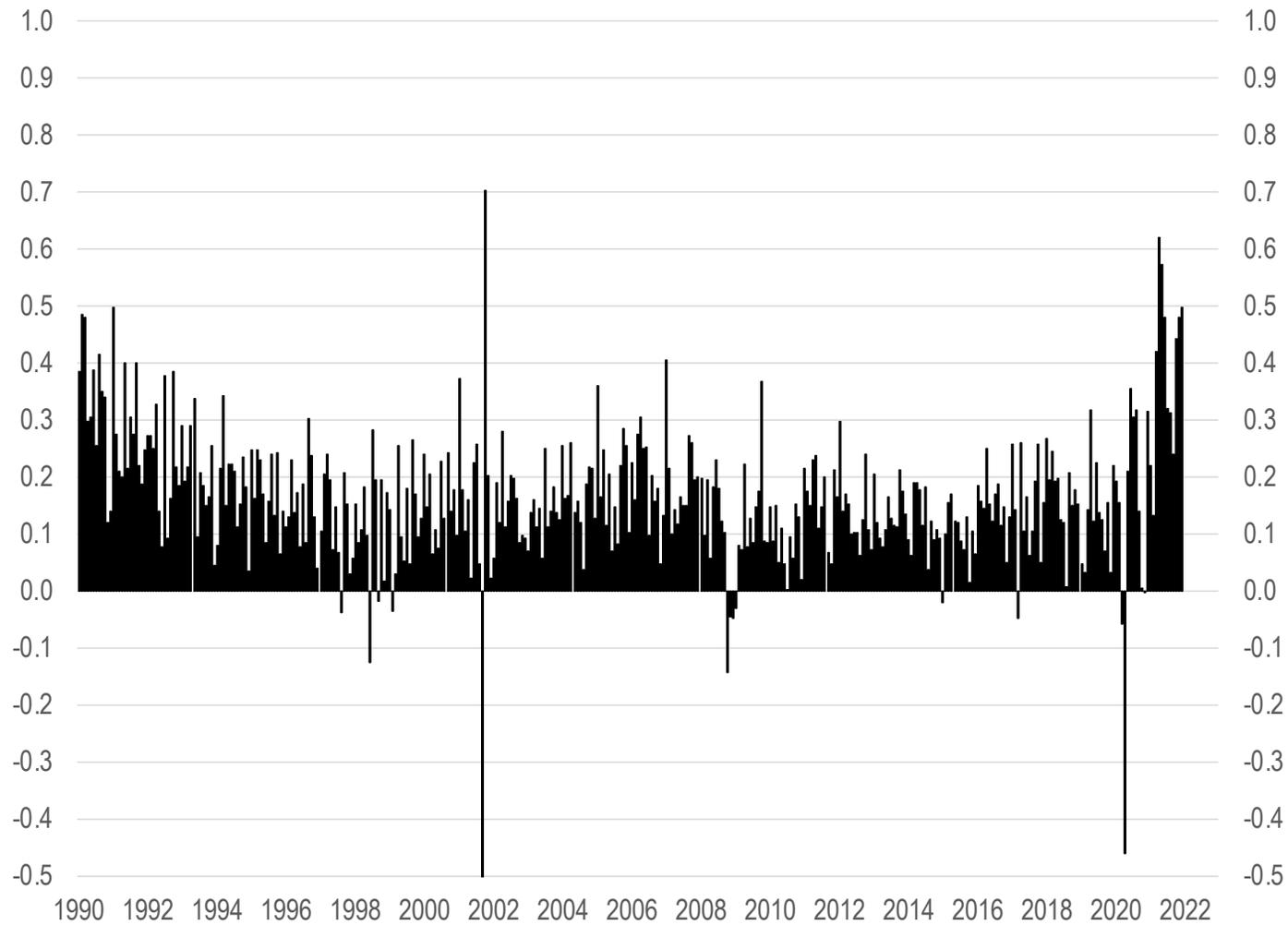
Chain PCE price index (percent change from the previous month)



Sources: Haver Analytics; U.S. Department of Commerce. Updated through December 2021.

... Who Were Focuses on Survival

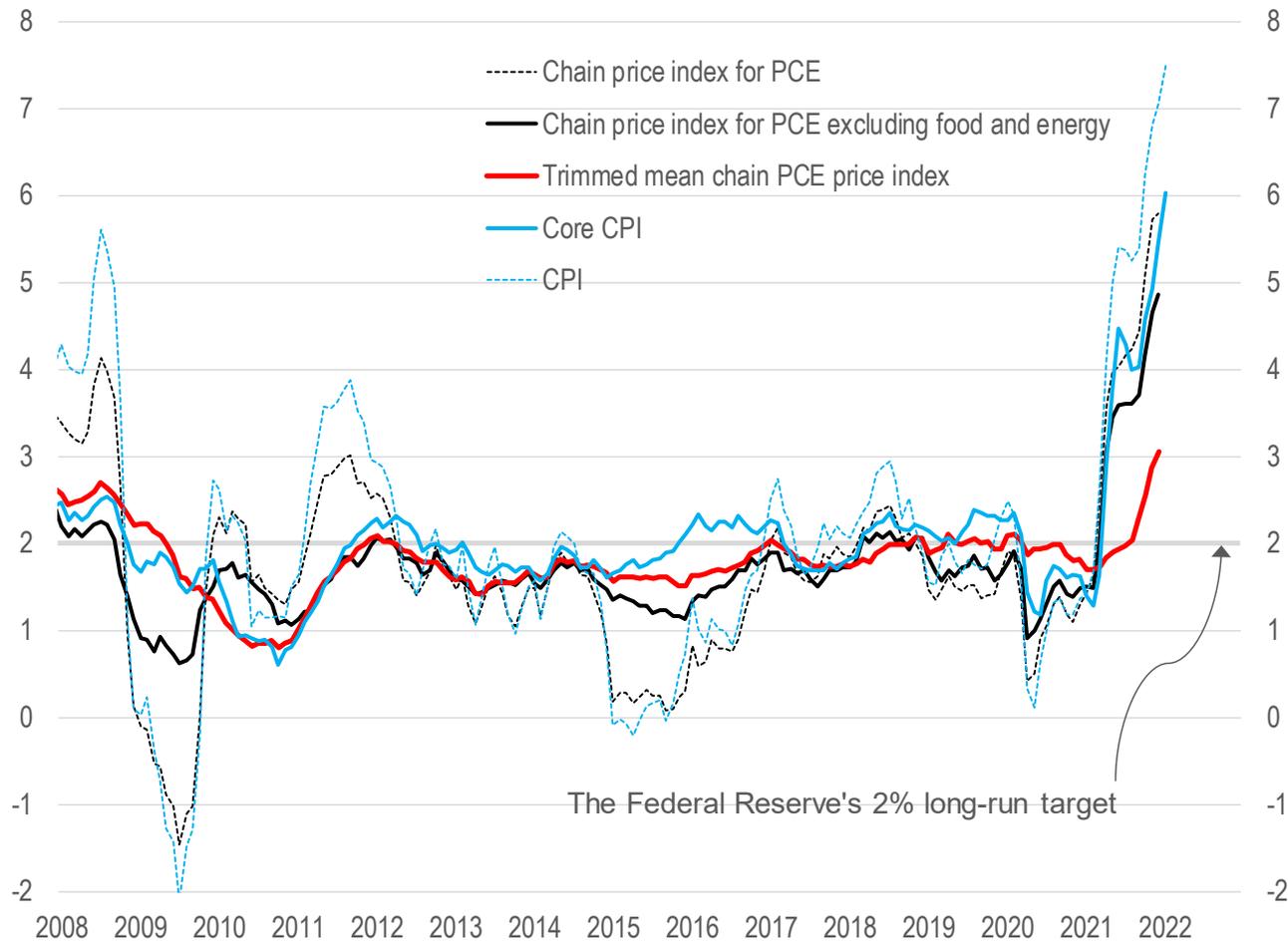
Core chain PCE price index (percent change from the previous month)



Sources: Haver Analytics; U.S. Department of Commerce. Updated through December 2021.

This Has “Pandemic” Written All Over It

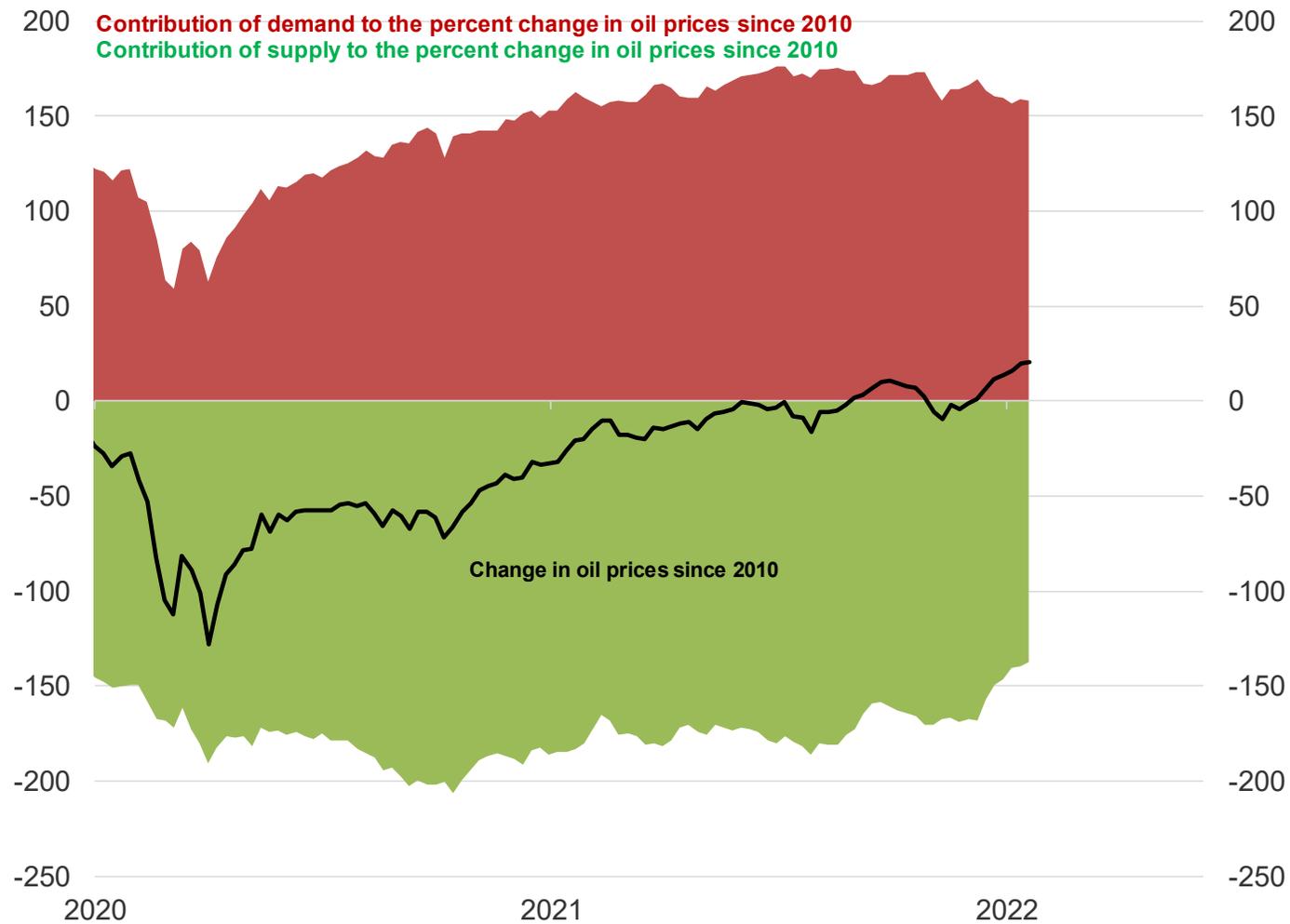
Selected inflation measures (percent change from 12 months earlier)



Sources: Haver Analytics; U.S. Department of Commerce; U.S. Department of Labor; Federal Reserve Bank of Dallas. Updated through December 2021 (PCE readings) and January 2022 (CPI)

The Energy Sector Is On the Front Lines of This Story

Estimated contribution of demand and supply factors to Brent oil prices (percent change since 2010)

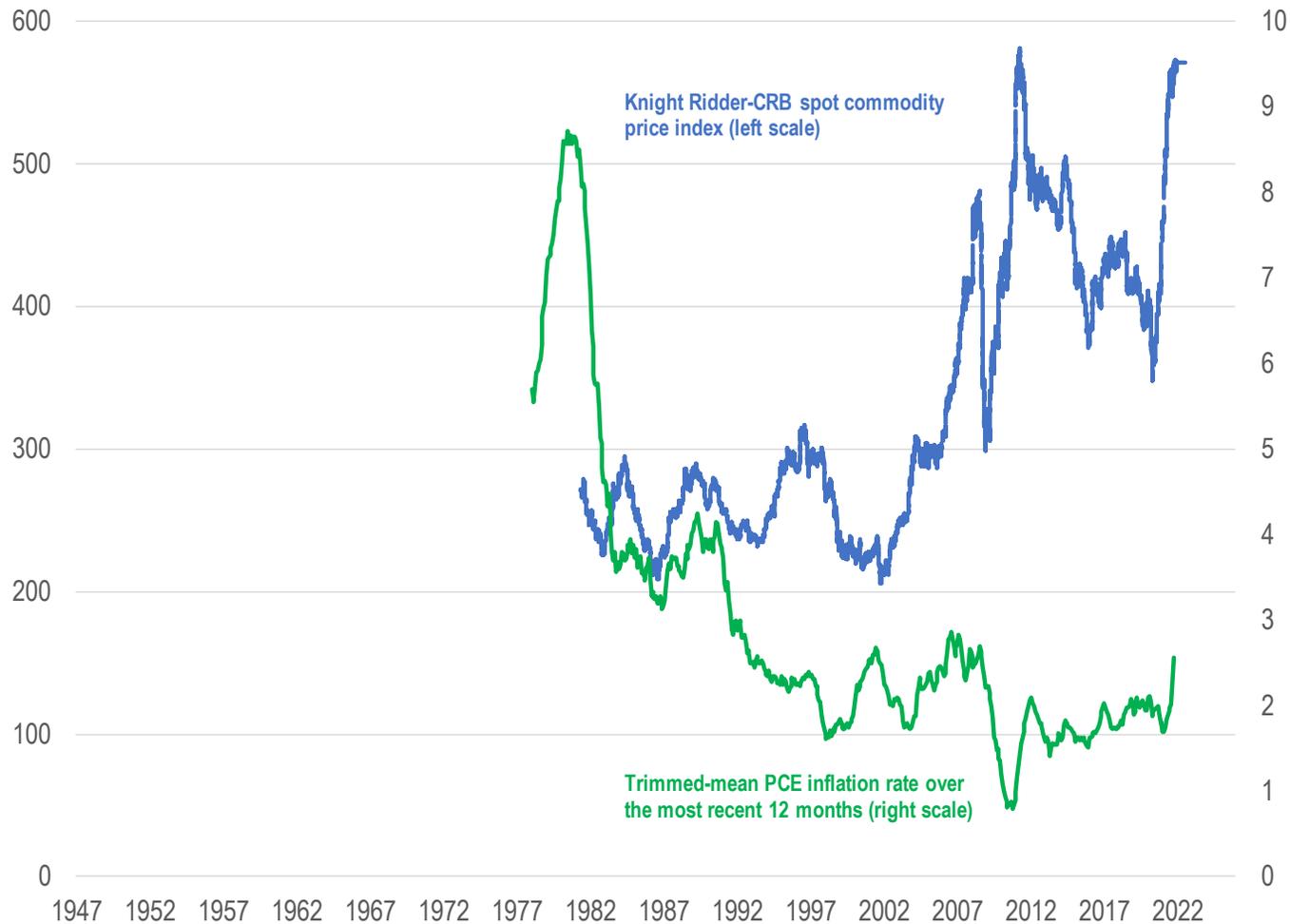


Source: Federal Reserve Bank of New York. Updated through February 11, 2022.

Despite a Convulsion of Price Increases ...

CRB spot commodity price index (1967 = 100)

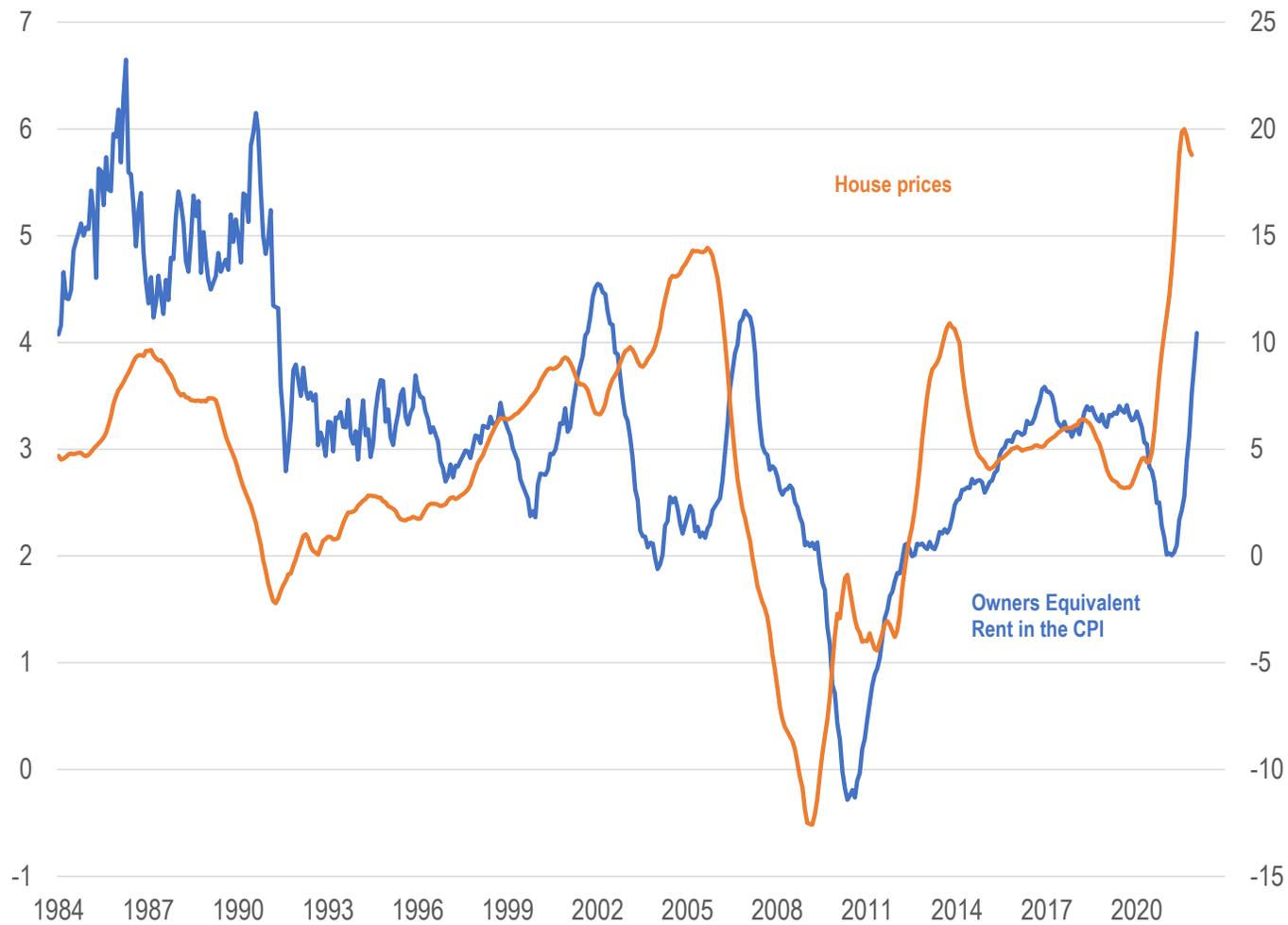
Trimmed-mean PCE inflation rate (annual percent change)



Sources: Haver Analytics; Commodity Research Bureau; Federal Reserve Bank of Dallas. Updated through November 2021 (inflation) and December 20, 2021 (CRB).

P.S. Price Indexes Don't See What Realtors See

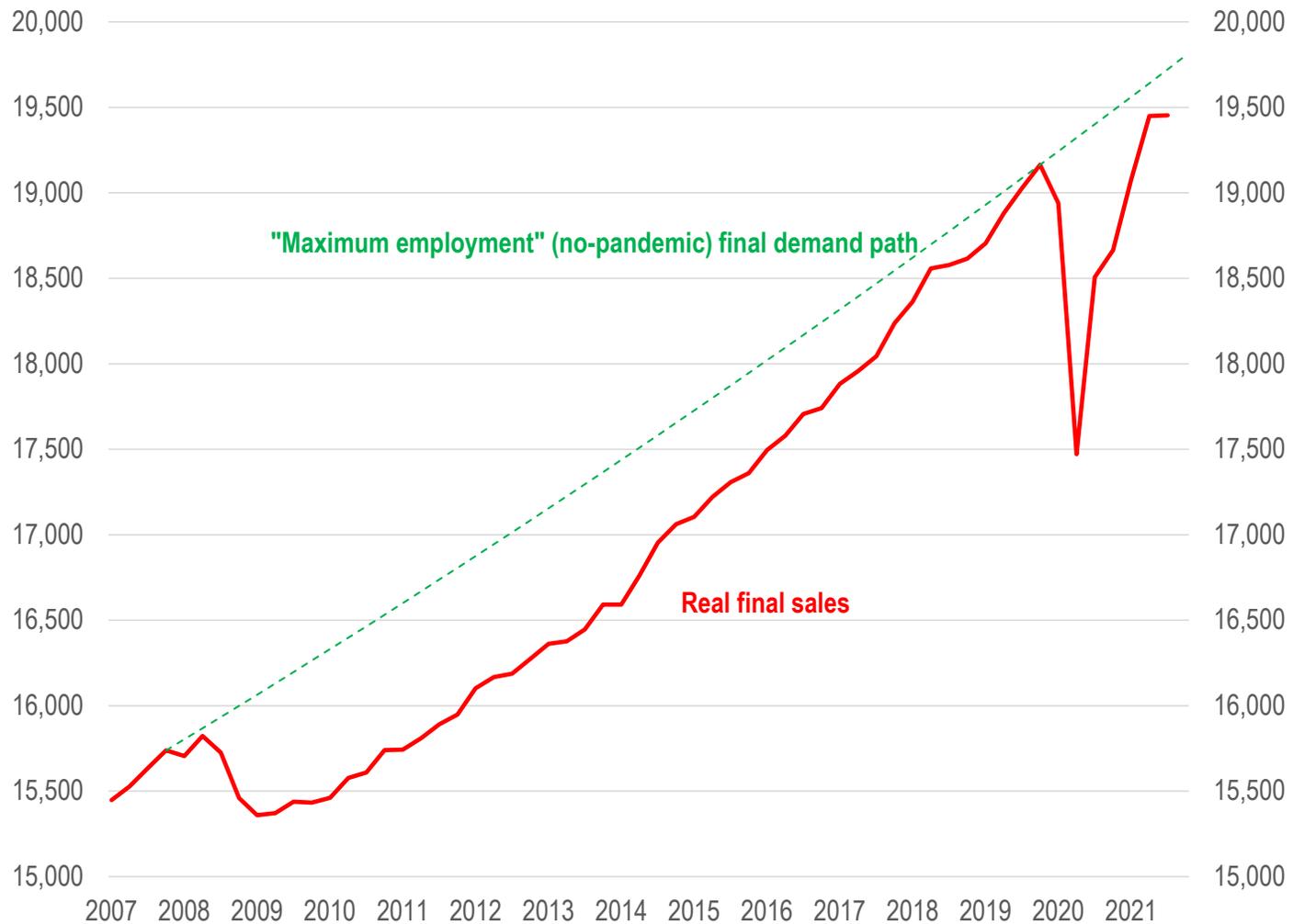
House prices and owners' equivalent rent (percent change from 12 months earlier)



Sources: Haver Analytics; Case-Shiller; U.S. Department of Labor. Updated through September 2021.

Don't Blame Demand

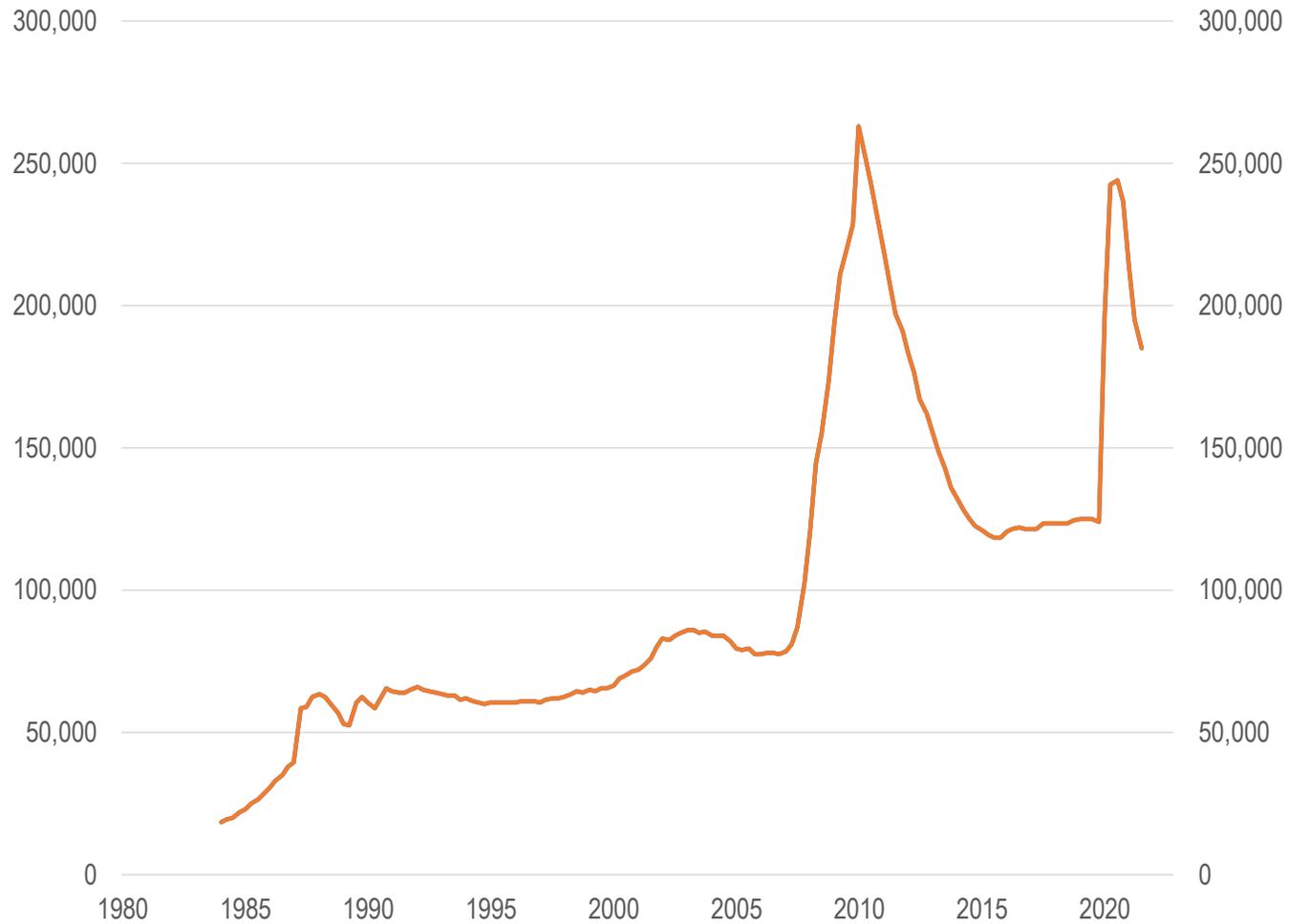
Actual and counterfactual real final sales (chained 2012 dollars)



Sources: Haver Analytics; U.S. Department of Commerce. Updated through 2021 Q3.

The Picture of Fear Symbolized Business Views ...

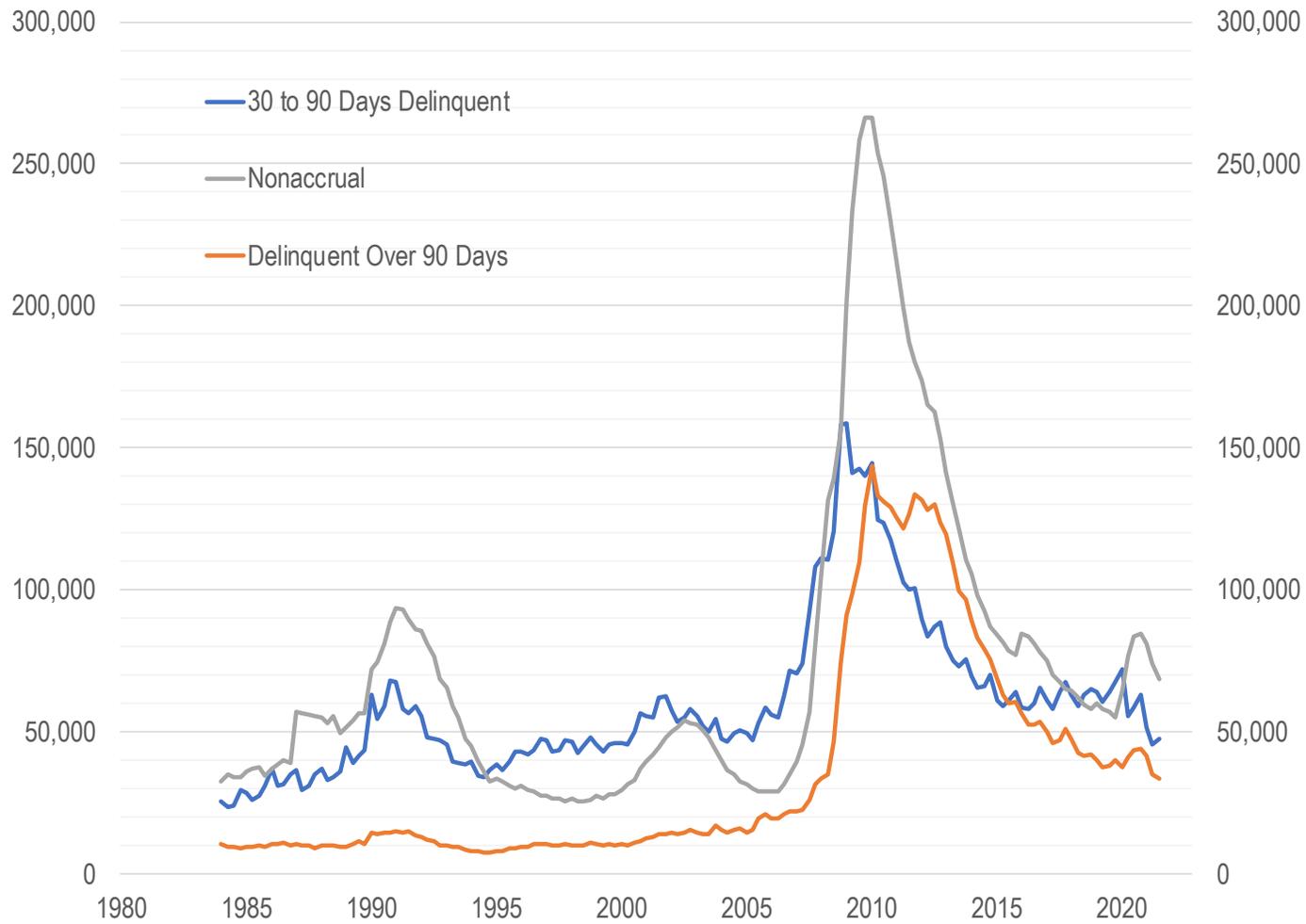
Loan loss provisions (millions of dollars)



Sources: Haver Analytics; FDIC. Updated through September 30, 2021.

... Fear that Never Materialized

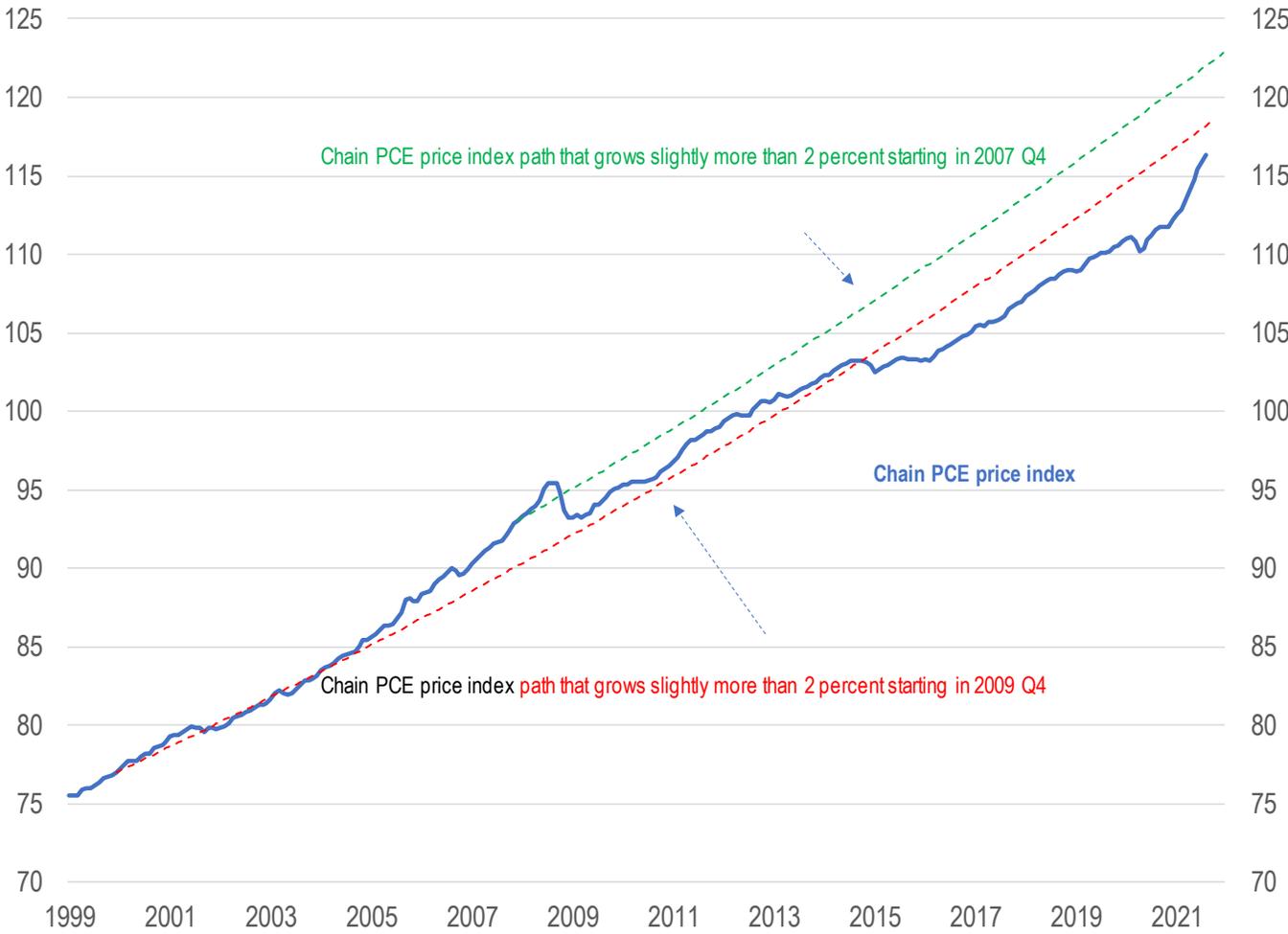
Status of bank loans (number of people)



Sources: Haver Analytics; FDIC. Updated through September 30, 2021.

We're Not Even Back on the Fed's 2% Path

Chain PCE price index and the Federal Reserve's 2% target (2012 = 100)



Sources: Haver Analytics; U.S. Department of Commerce, Eurostat; Bank of Japan. Updated through September 2021.

Bond Investors Think This Will Pass

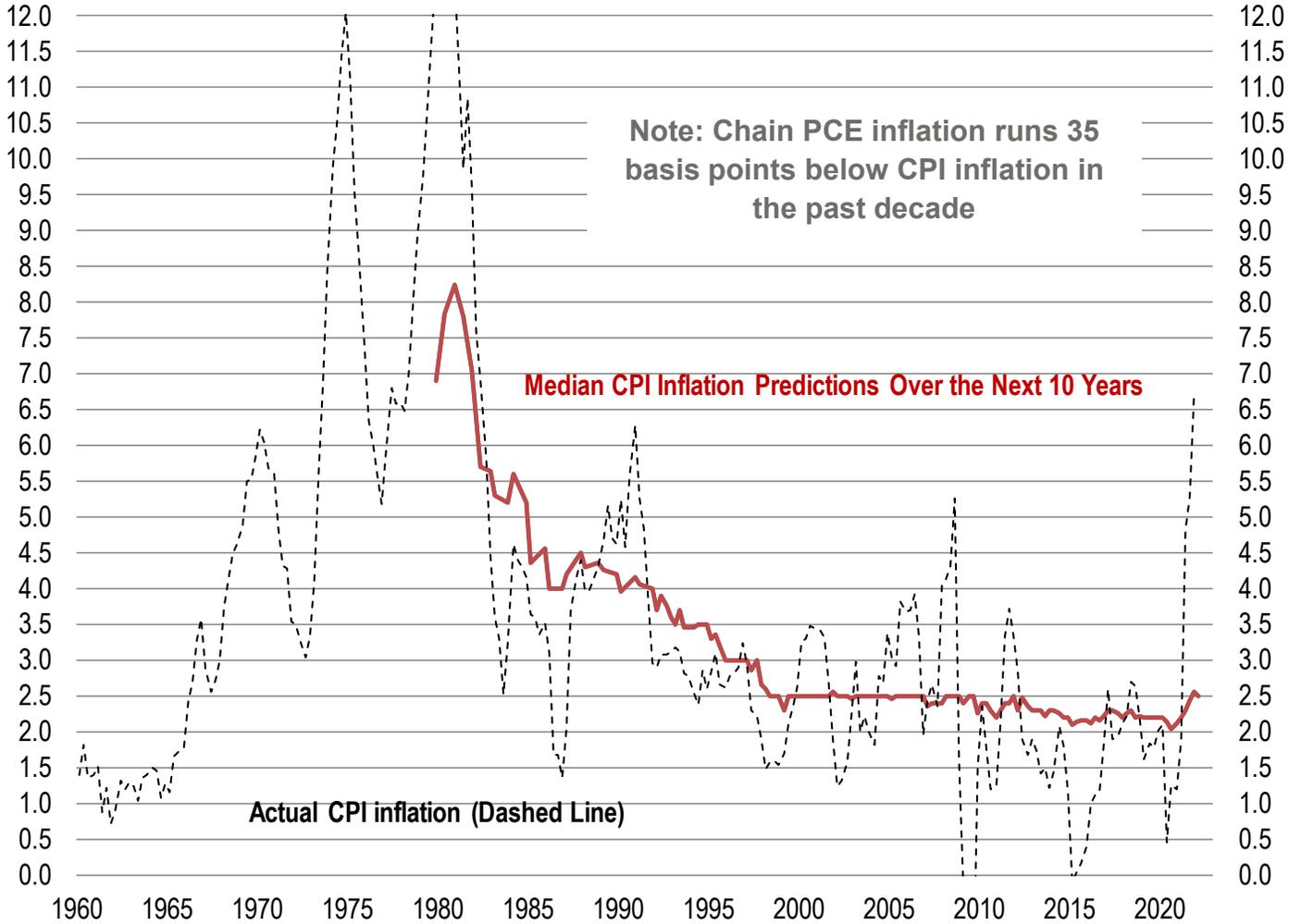
Market-based inflation expectations over the subsequent 10 years (annual rate)



Note: Assumes that the PCE inflation rate will be 0.34 percentage point, the historical differential, below the CPI inflation expectations reflected in the Treasury nominal and TIPS securities yields. Takes account of the TIPS liquidity risk premium and the inflation risk premium.
Source: Haver Analytics; Federal Reserve Board. Updated through January 31, 2022.

Professional Forecasters Do Too

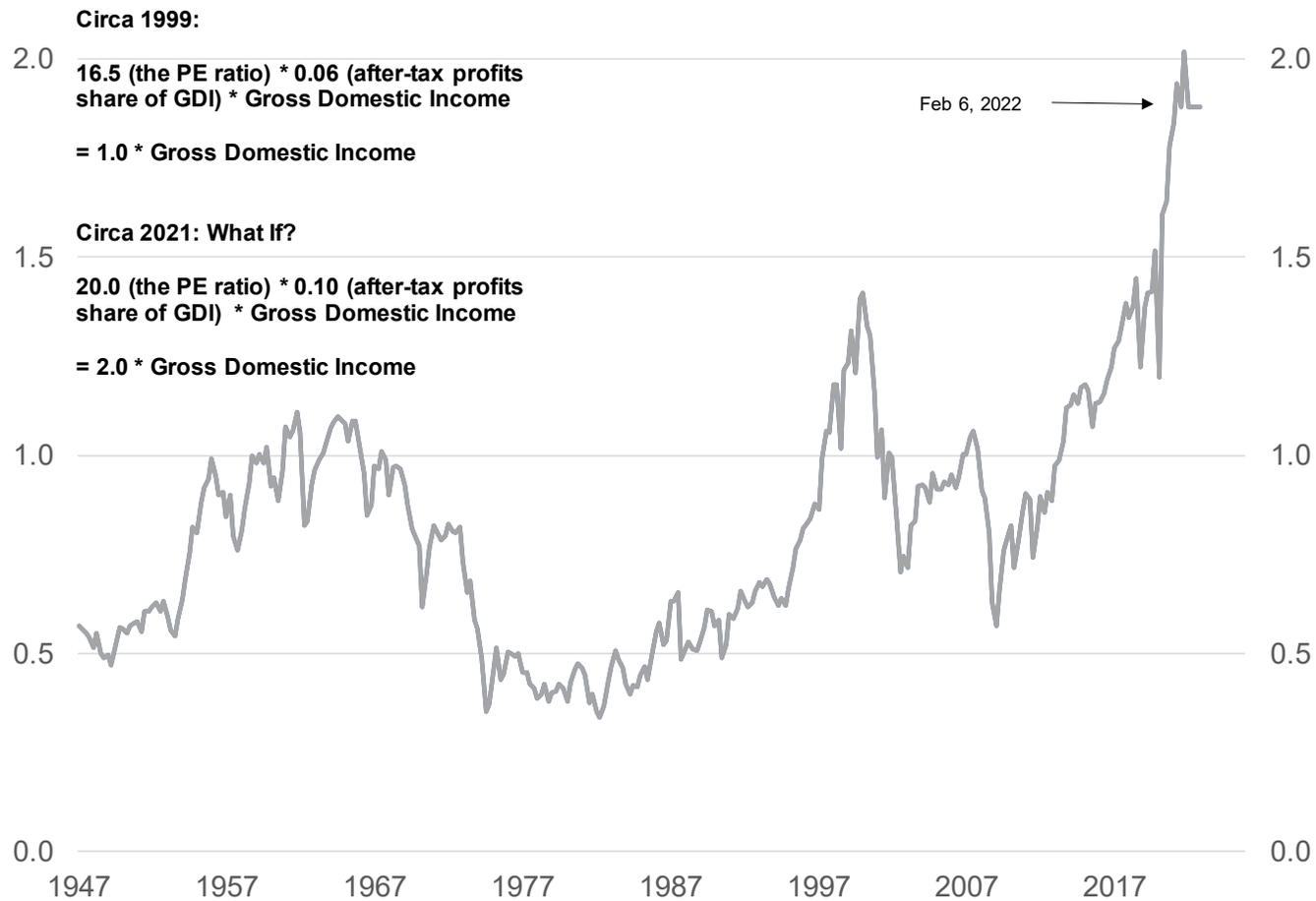
Surveys of long-term chain CPI inflation expectations of professional forecasters (annual rate)



Sources: Haver Analytics; U.S. Department of Commerce; Federal Reserve Bank of Philadelphia. Updated through January 2022 (inflation) and 2022 Q1 (FRB Pa SPF).

Equity Investors Implicitly Do Too

Ratio of the value of the U.S. stock market to Gross Domestic Income

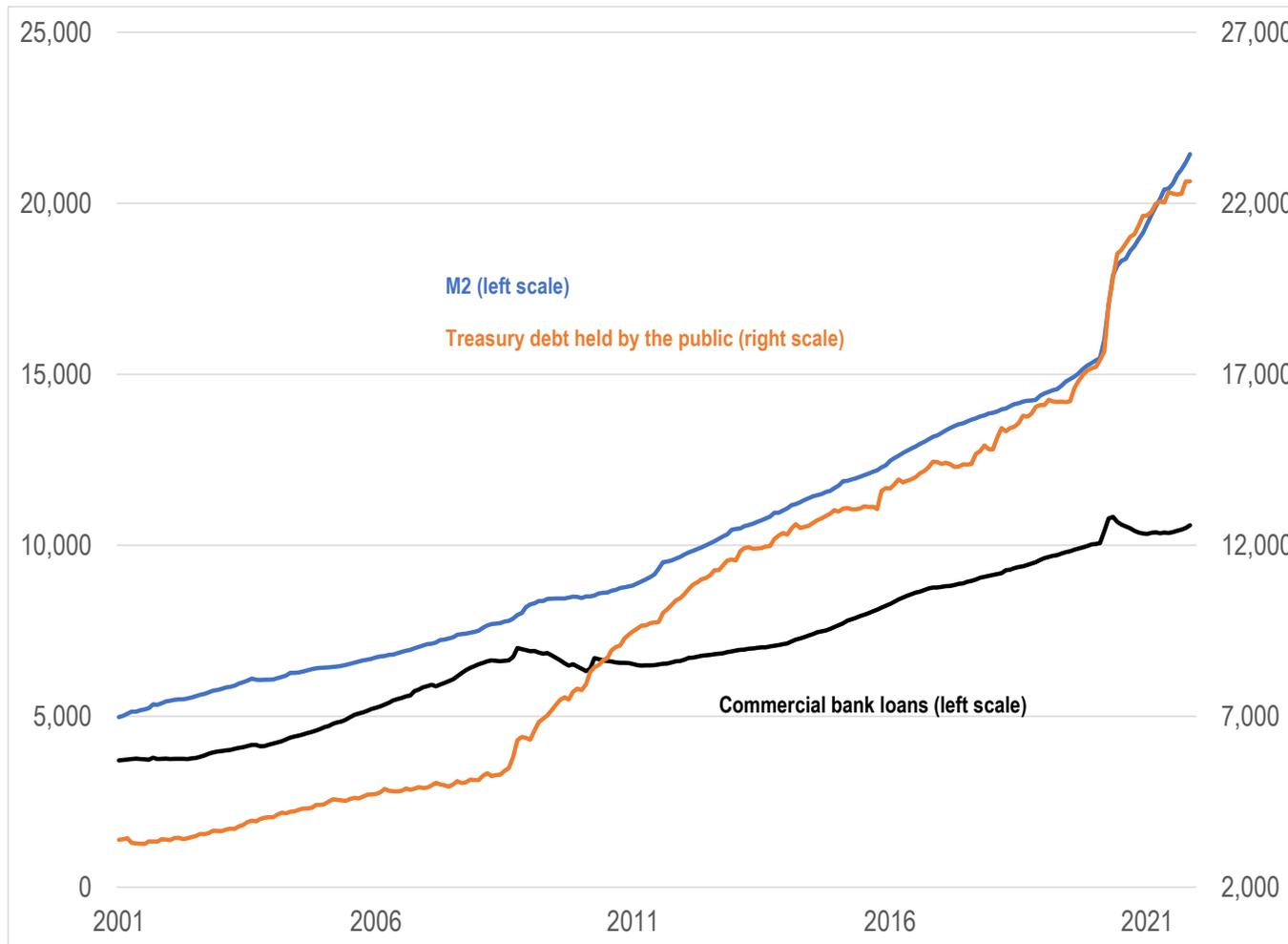


Sources: Haver Analytics; Federal Reserve Board; U.S. Department of Commerce. Updated through 2021 Q3 (GDI) and February 6, 2022 (Wilshire 5000).

Not 'Always and Everywhere a Monetary Phenomenon'

M2 and commercial bank loans (\$ billions)

Treasury debt held by the public (\$ billions)



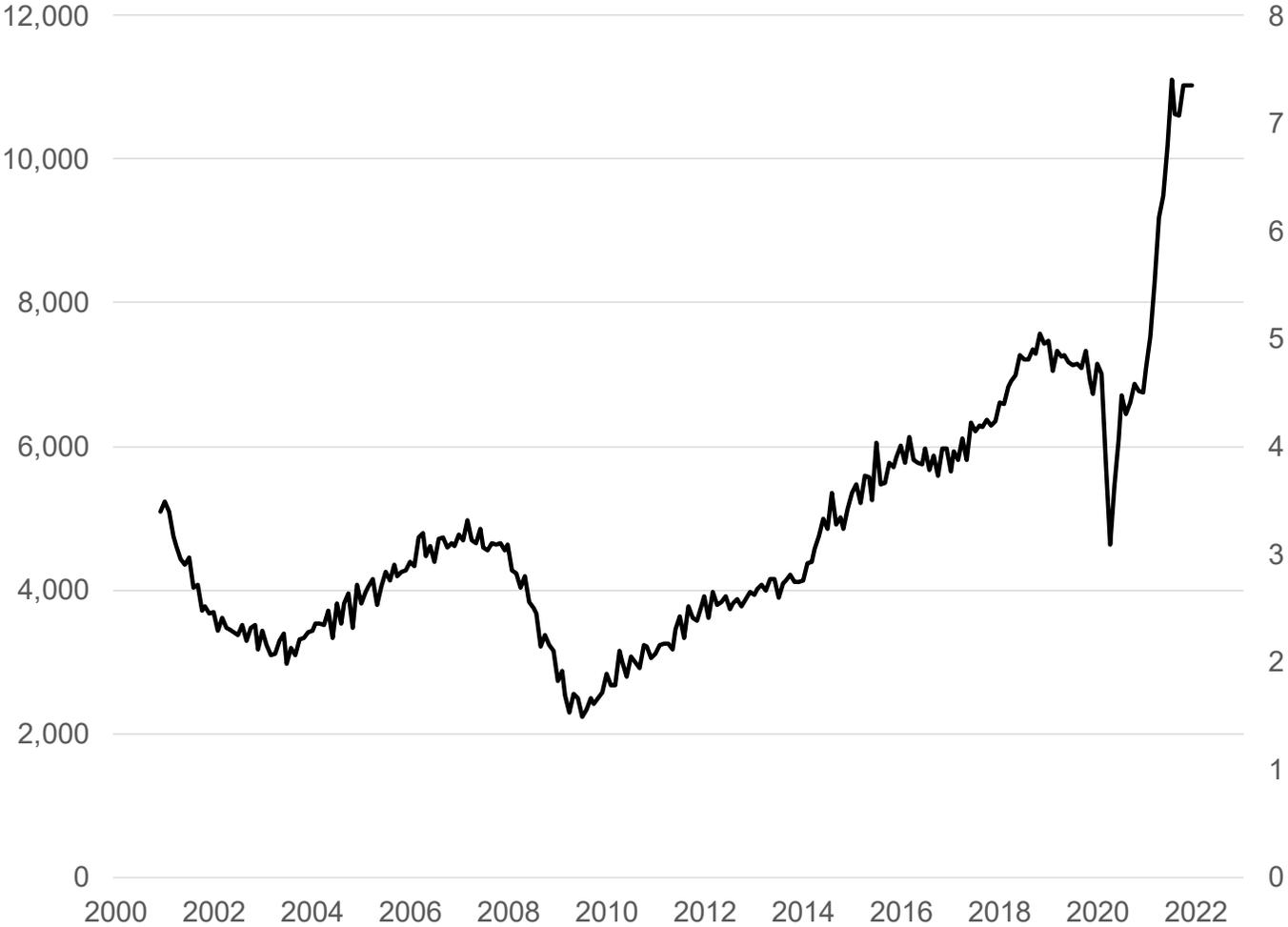
Sources: Haver Analytics; Federal Reserve Board; Treasury. Updated through November 2021.

But Could Labor Pressures Morph Into a Longer-Lasting Inflation Problem?

Labor Shortages Aren't a New Phenomenon

Job openings (number)

(percent of employment plus job openings)

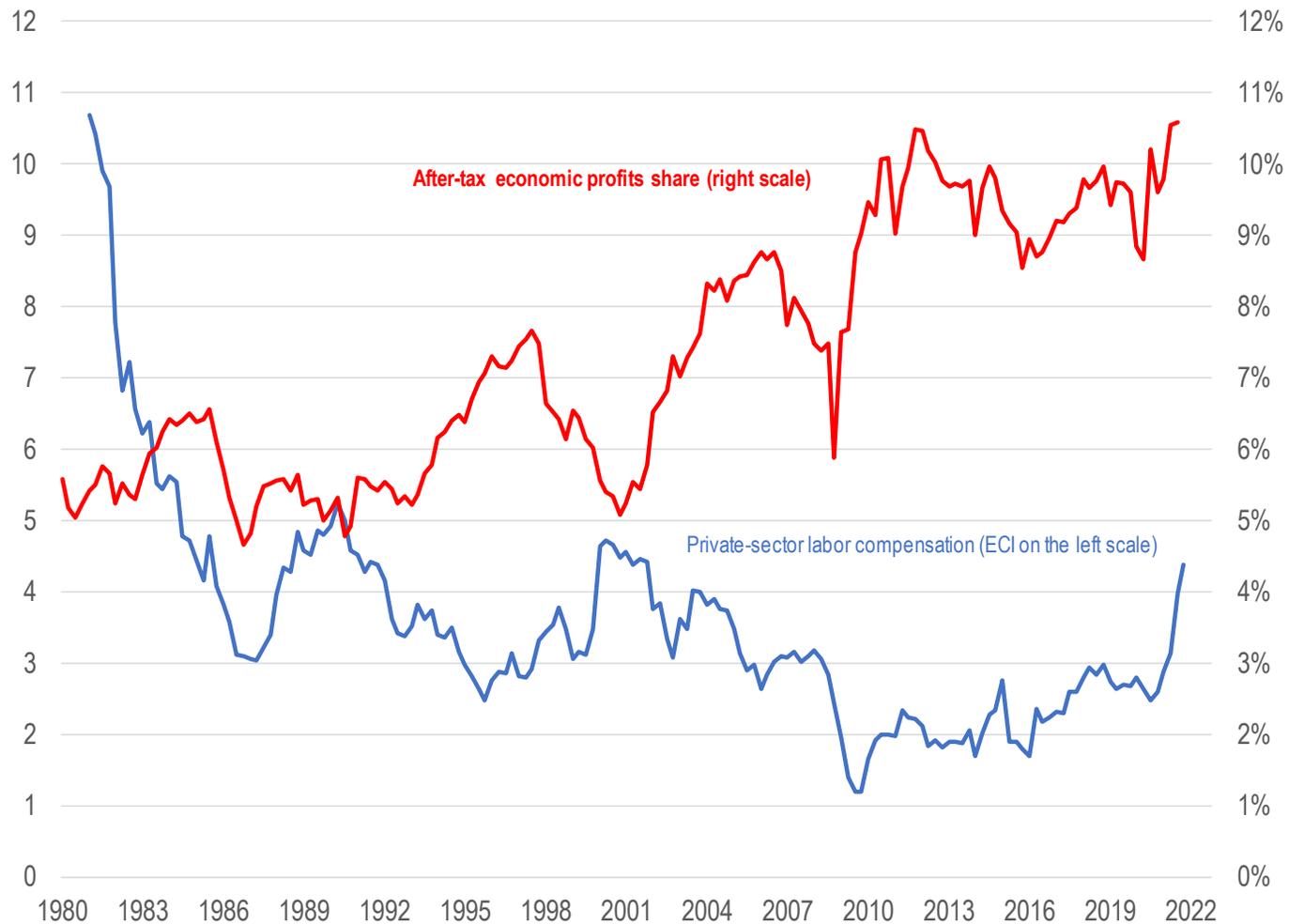


Sources: Haver Analytics; U.S. Department of Labor. Updated through October 2021.

Tell Your Grandfather, Wages Don't Cause Inflation ...

Housing starts (thousands of units at a seasonally adjusted rate)

30-year mortgage rate (percent)



Sources: Haver Analytics; Census; Wall Street Journal. Updated through December 2021 (starts) and January 21, 2022 (mortgage rates).

... Not When Productivity Is Rising Too

Housing starts (thousands of units at a seasonally adjusted rate)

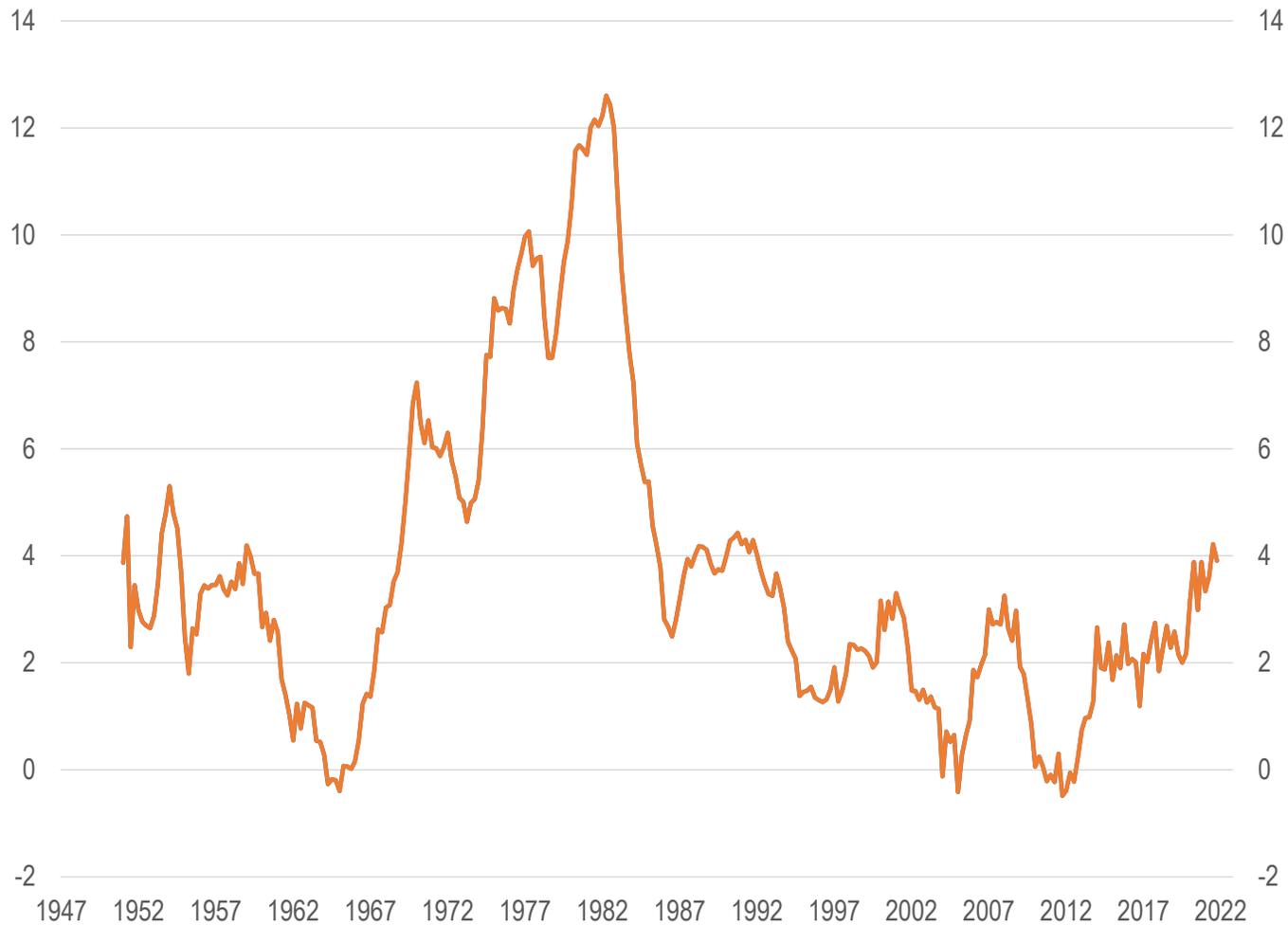
30-year mortgage rate (percent)

Sources: Haver Analytics; Census; Wall Street Journal. Updated through December 2021 (starts) and January 21, 2022 (mortgage rates).

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30-year mortgage rate (percent)



Sources: Haver Analytics; Census; Wall Street Journal. Updated through December 2021 (starts) and January 21, 2022 (mortgage rates).

Drivers and Headwinds In 2022

2022 Looks Promising, Thanks to Consumer Supports, ...

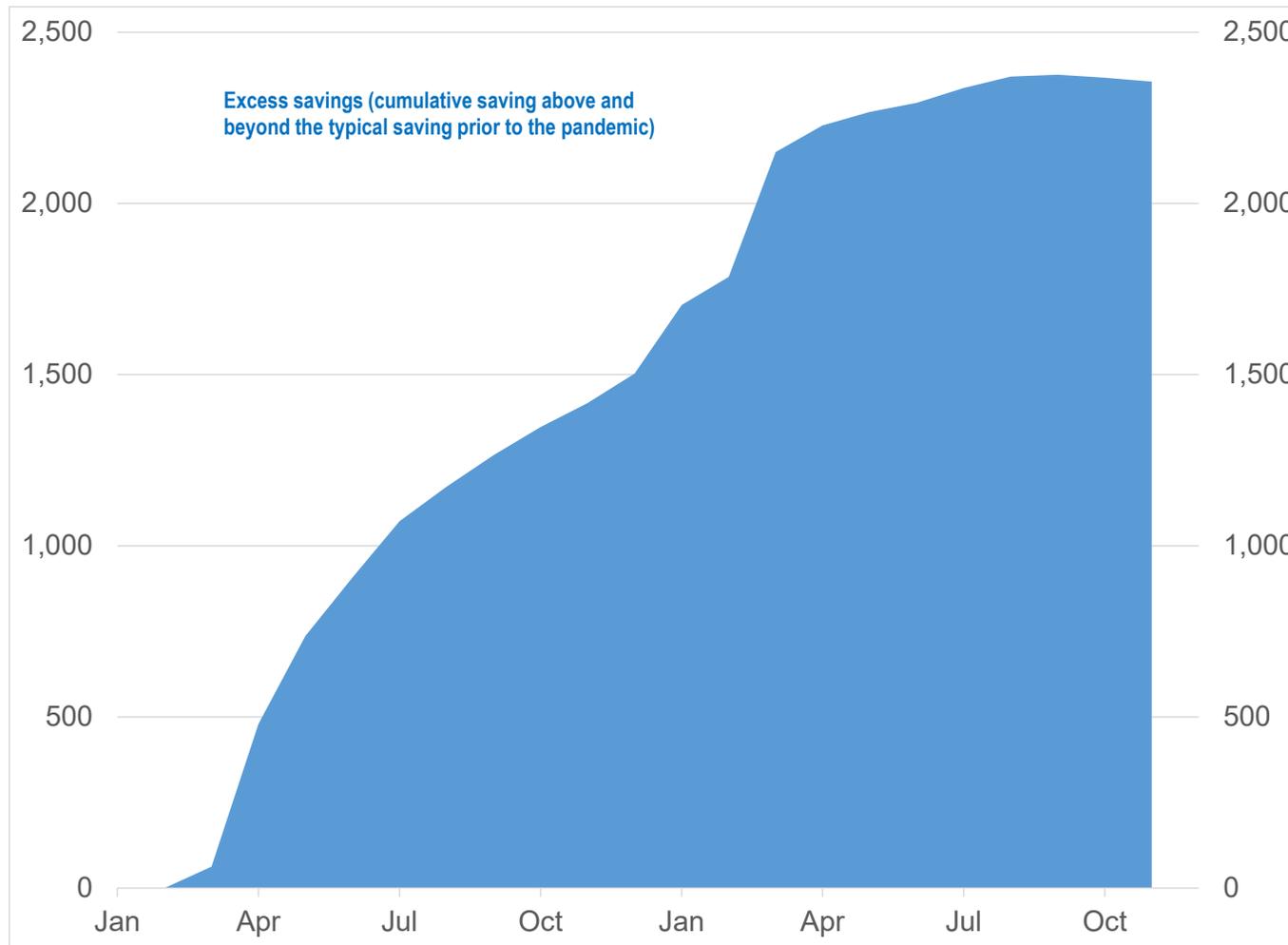
Monthly household saving compared with pre-crisis saving (billions of dollars)



Sources: Haver Analytics; U.S. Department of Commerce. Updated through November 2021.

... a Savings Buildup, and ...

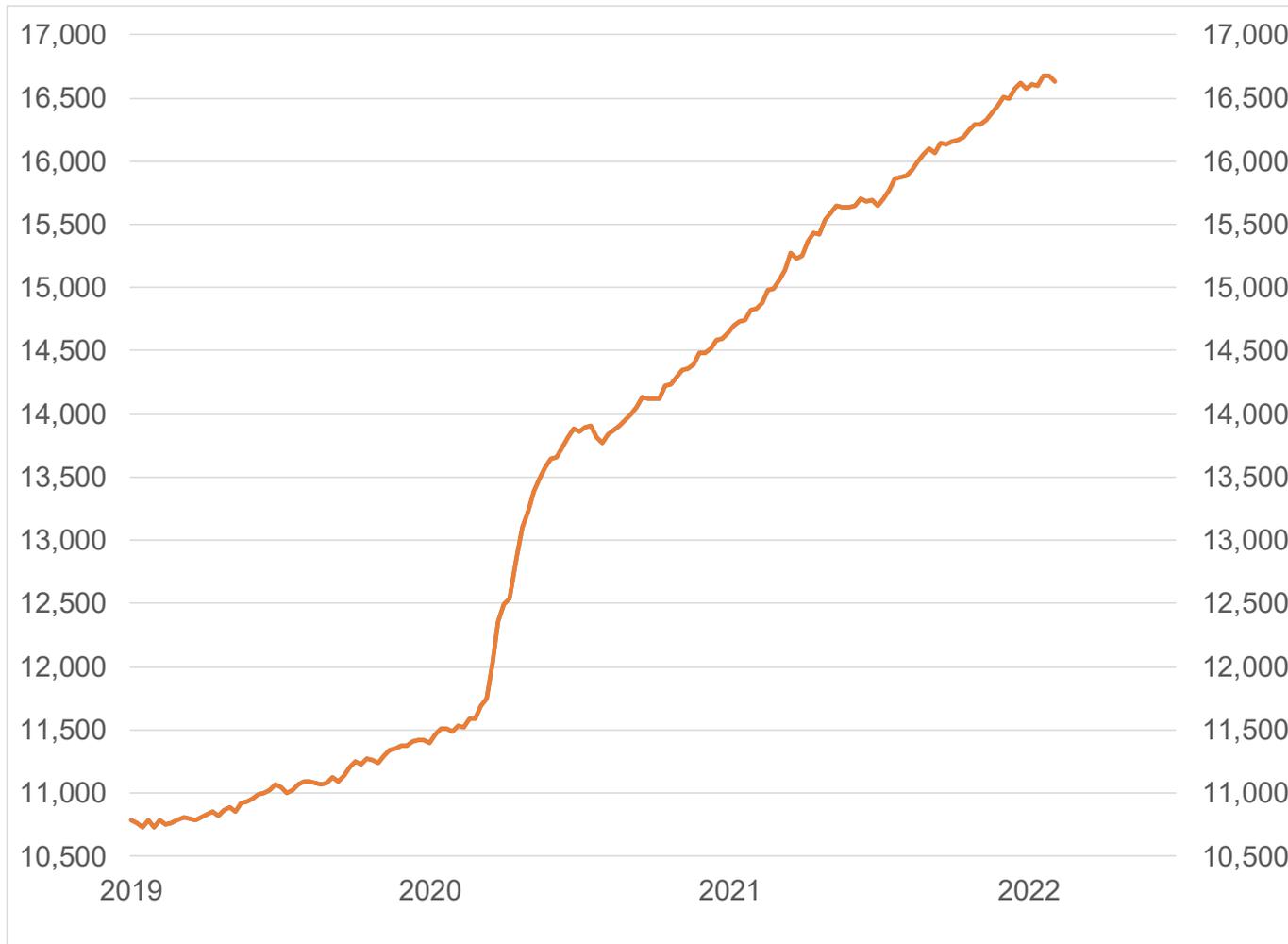
Accumulation of saving over and above the normal pace since February 2020 (billions of dollars)



Sources: Haver Analytics; U.S. Department of Commerce. Updated through November 2021.

... That Is Still Sitting In the Bank

Commercial bank deposits other than large time deposits (billions of dollars)



Sources: Haver Analytics; Federal Reserve Board. Updated through February 9, 2022.

... Inventory Spend Has Wood to Chop (Worth 2½% of GDP)

Ratio of private nonfarm inventories to final sales of goods plus structures spending

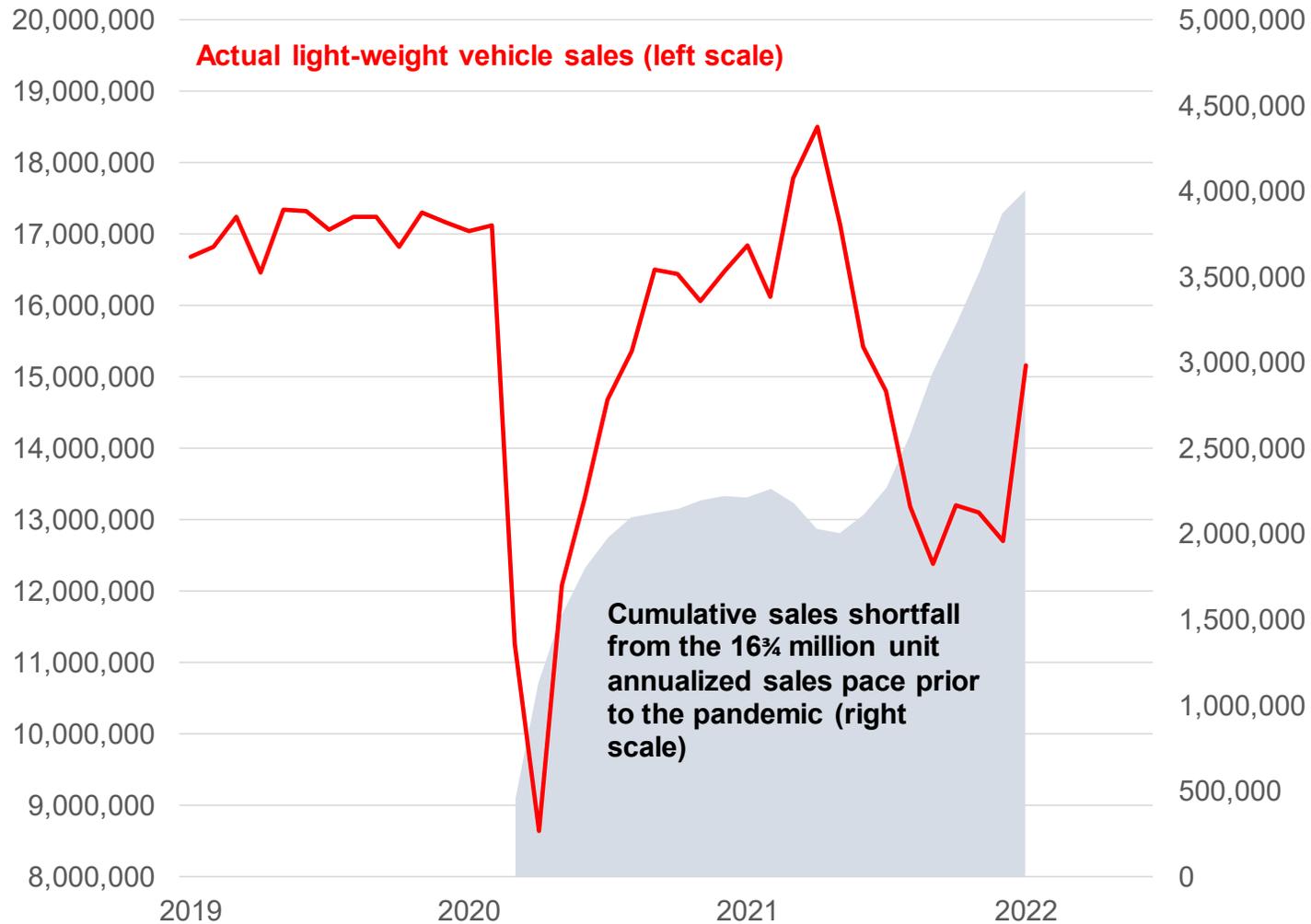


Sources: Haver Analytics; U.S. Department of Commerce. Updated through 2021 Q4.

E.g. 3¾ Million Unit Pent-Up Final Demand for Cars

Light-weight vehicle sales (millions of units annualized)

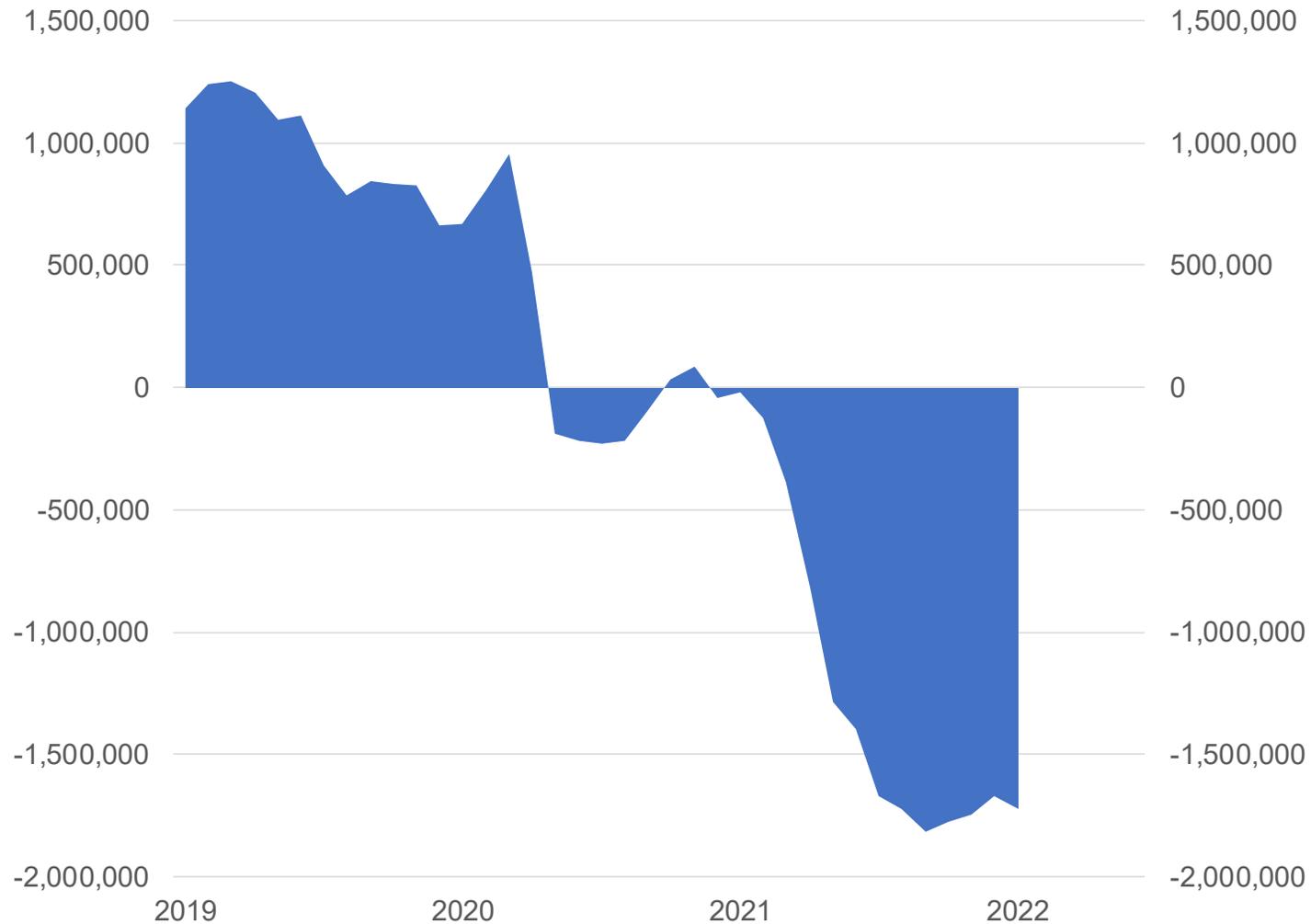
Cumulative sales shortfall from the pre-pandemic sales pace (millions of units)



Sources: Haver Analytics; U.S. Department of Commerce. Updated through January 2022.

Almost 2 Million Unit Pent-Up Dealer Inventory Restock

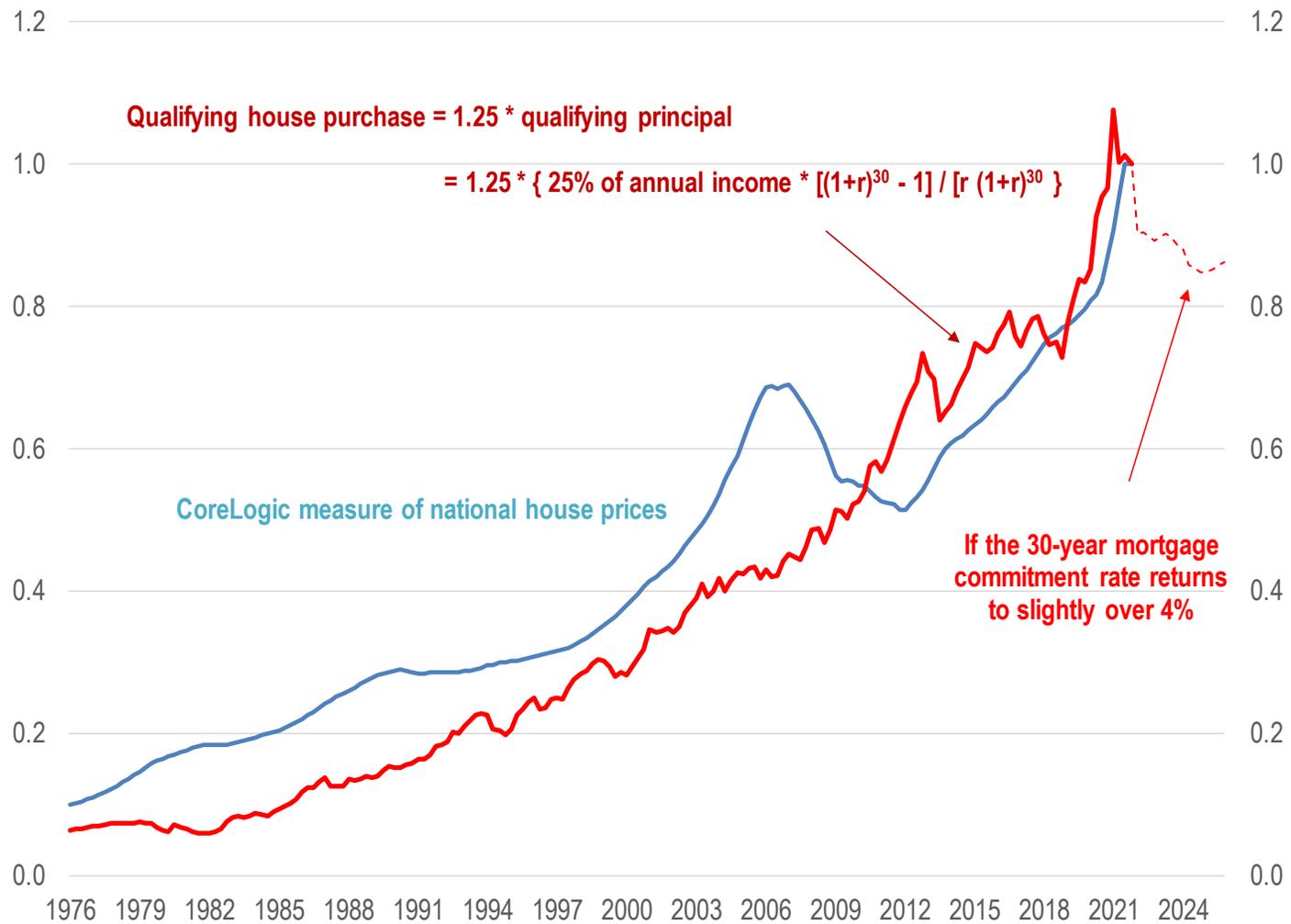
Deviation of dealer inventories of light-weight vehicles versus 60 days worth of inventory when sales are running at a 16 ¾ million-unit-annual-sales pace (number)



Sources: Haver Analytics; Wards Automotive Group. Updated through January 2022.

Rising Rates Hurt, Everything Else the Same

House prices and qualified mortgage borrowing amounts (ratio to 2021 Q2 level)

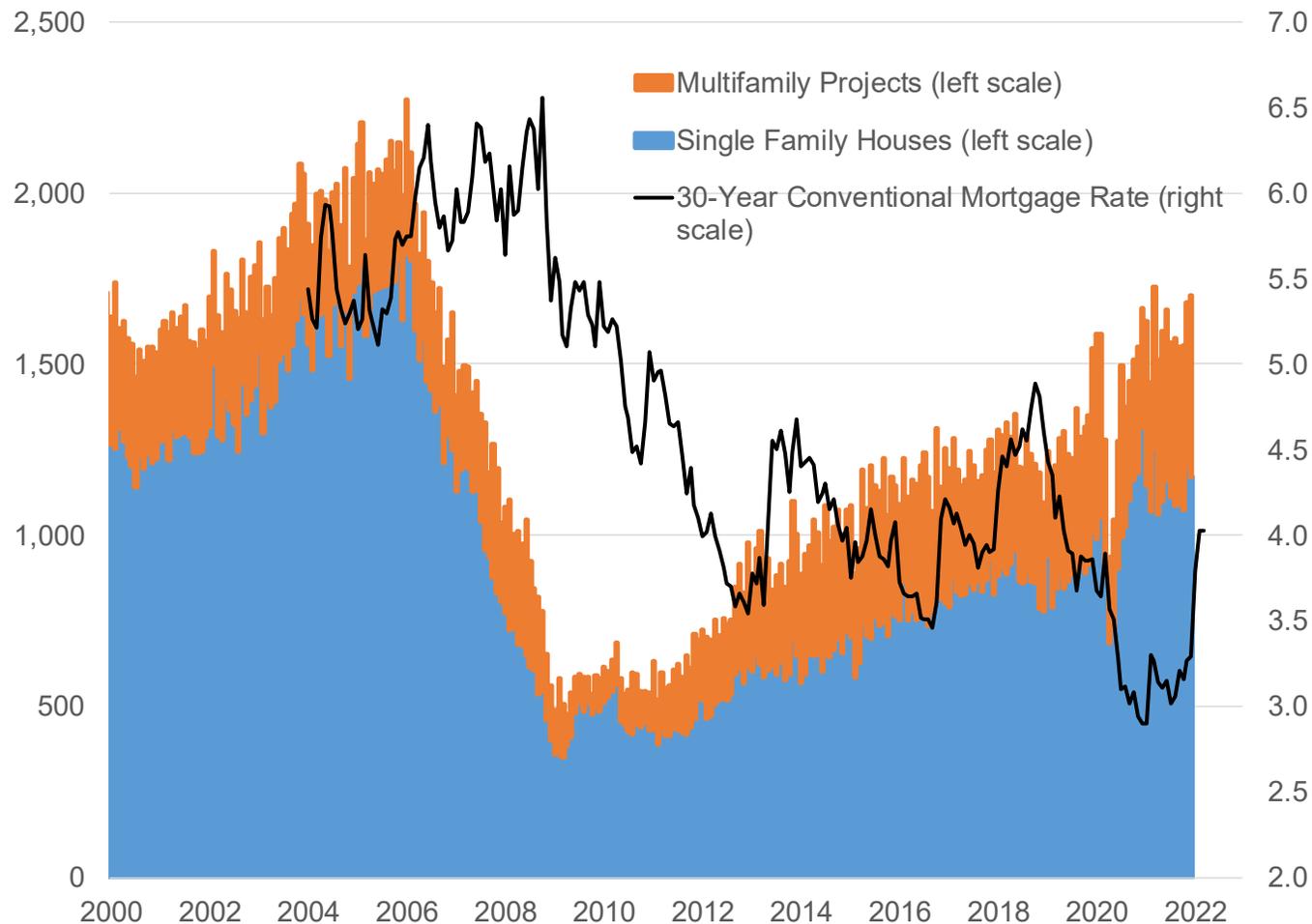


Sources: Haver Analytics; U.S. Department of Commerce; Standard and Poor's, Wall Street Journal. Updated through 2021 Q4 (house prices) and January 21, 2022 (30-year mortgage commitment rate).

But There's More to Real Estate Than Interest Rates

Housing starts (thousands of units at a seasonally adjusted rate)

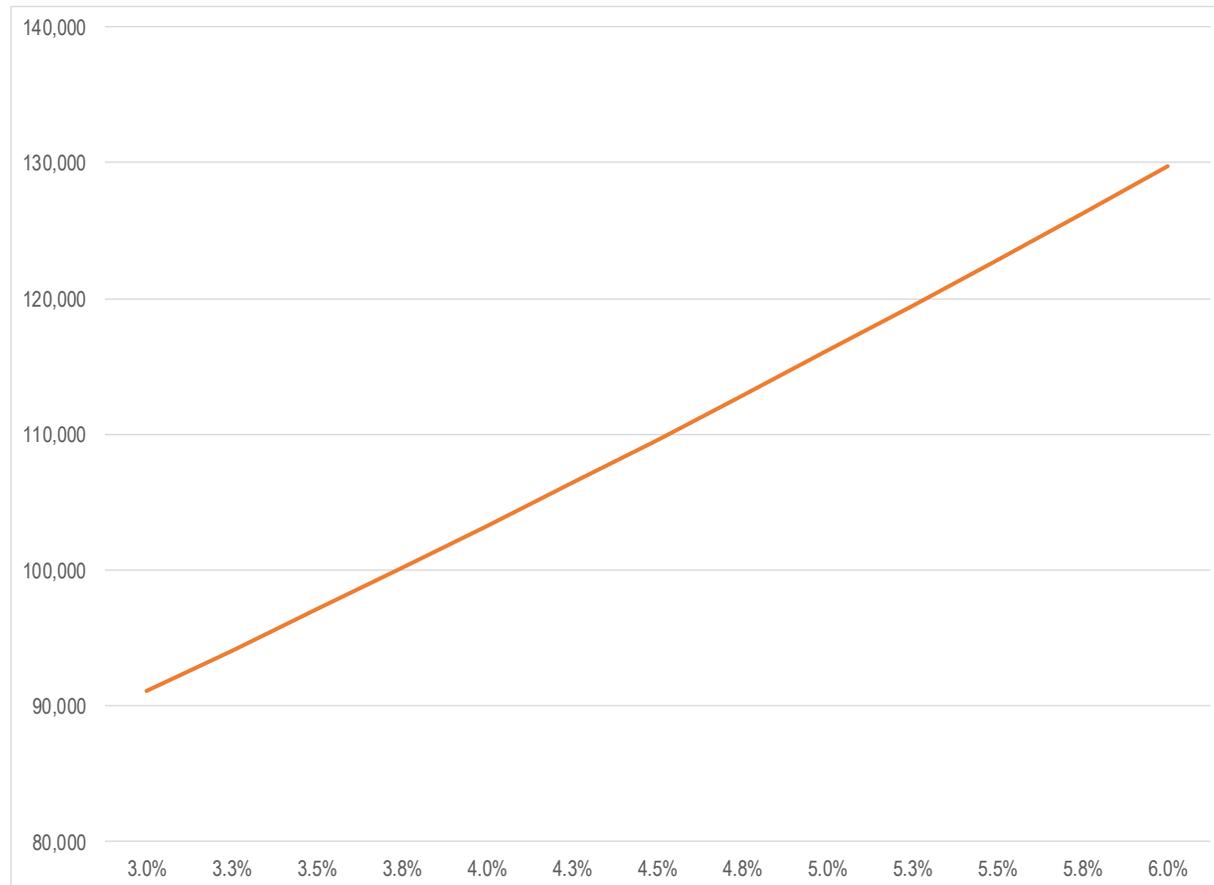
30-year mortgage rate (percent)



Sources: Haver Analytics; Census; Wall Street Journal. Updated through December 2021 (starts) and February 11, 2022 (mortgage rates).

Because Income Gives What Rates Take ...

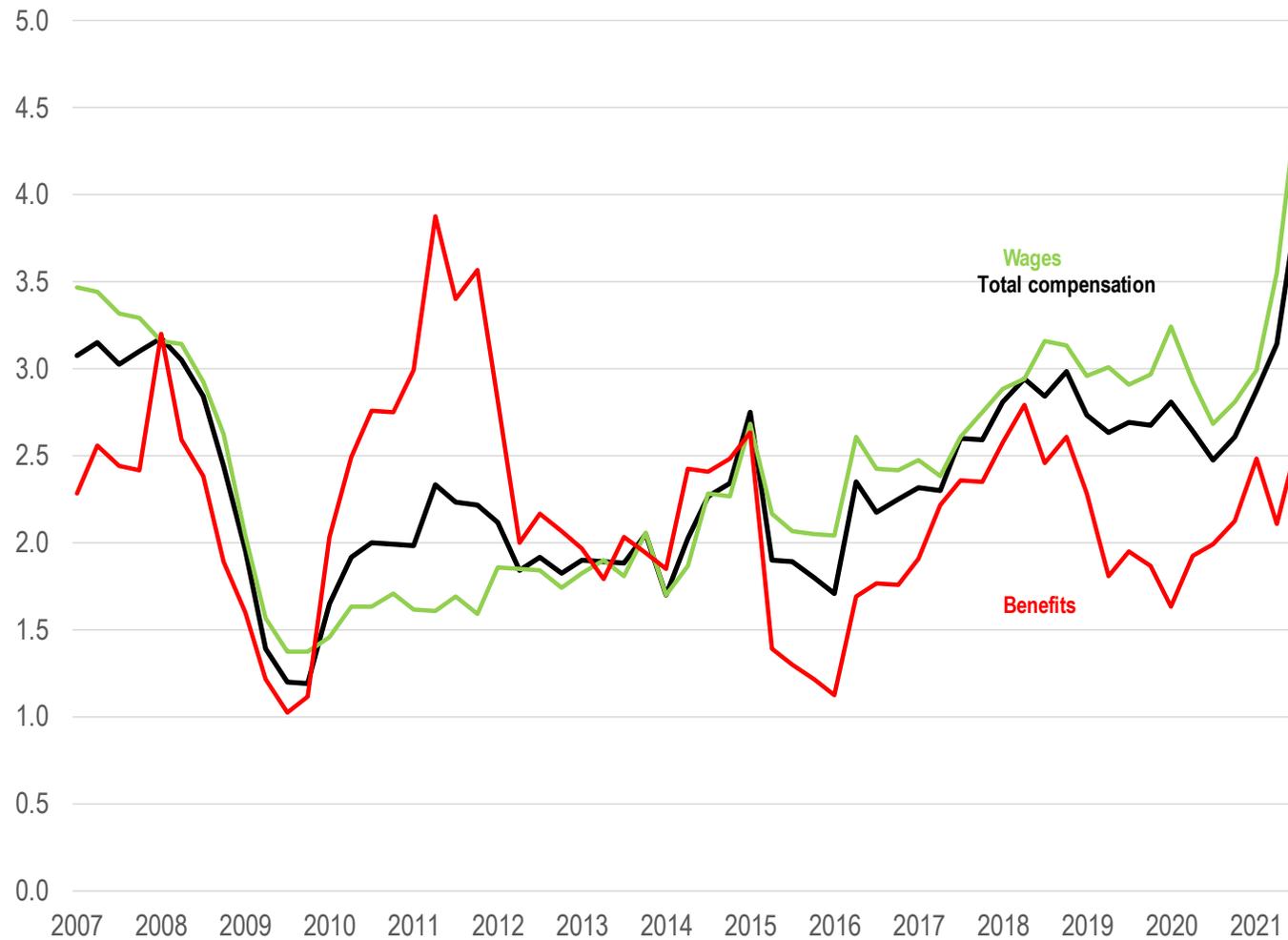
Hypothetical income required to qualify for a \$500,000 mortgage at selected mortgage rates (thousands of dollars annually)



30-year mortgage commitment rate (percent)

... and a Worker Shortage Is Boosting Pay and Income

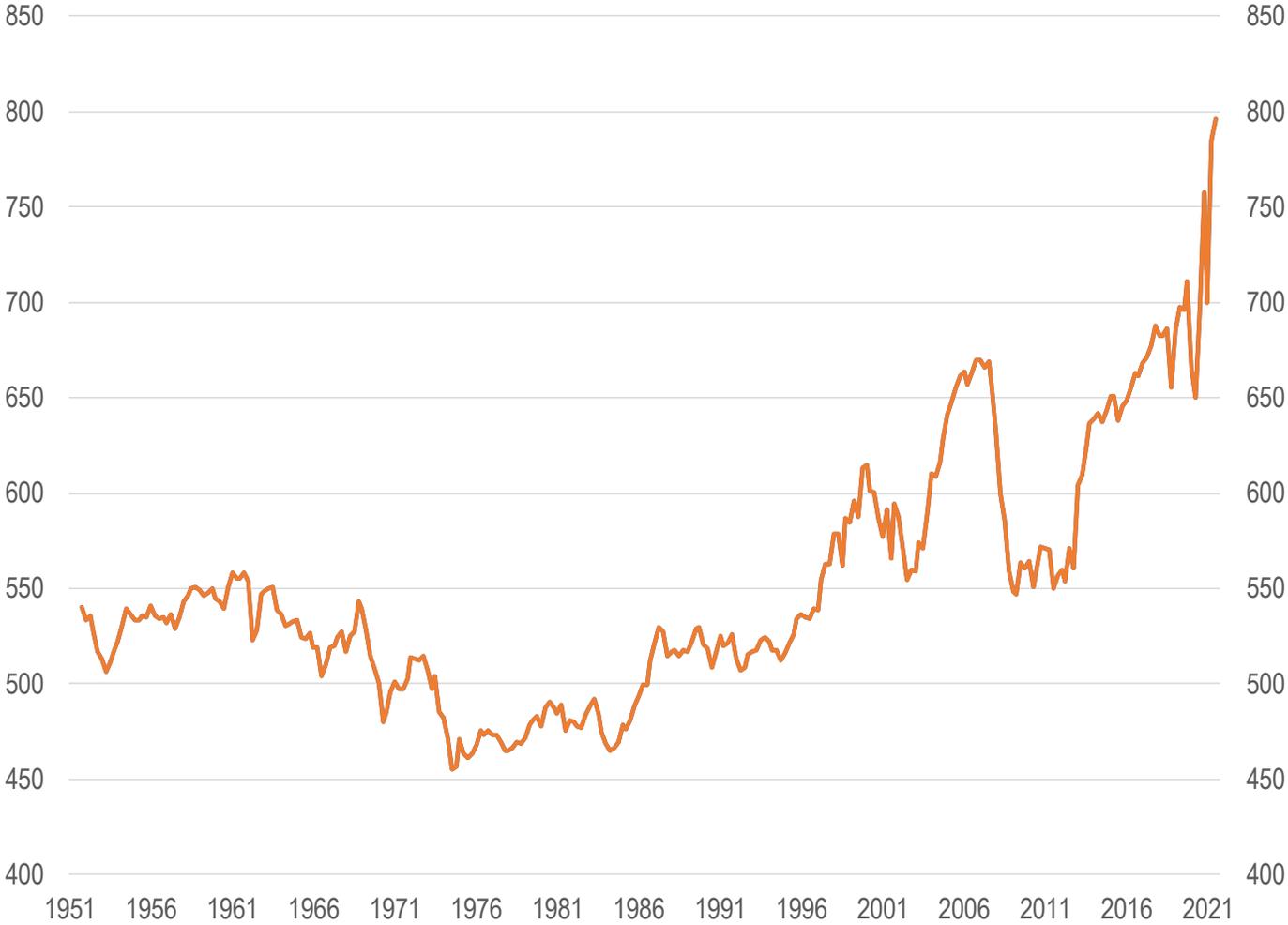
House prices and qualified mortgage borrowing amounts (ratio to 2021 Q2 level)



Sources: Haver Analytics; U.S. Department of Commerce; Standard and Poor's, Wall Street Journal. Updated through 2021 Q4 (house prices) and January 21, 2022 (30-year mortgage commitment rate).

Record Wealth Positions Help With Down Payments

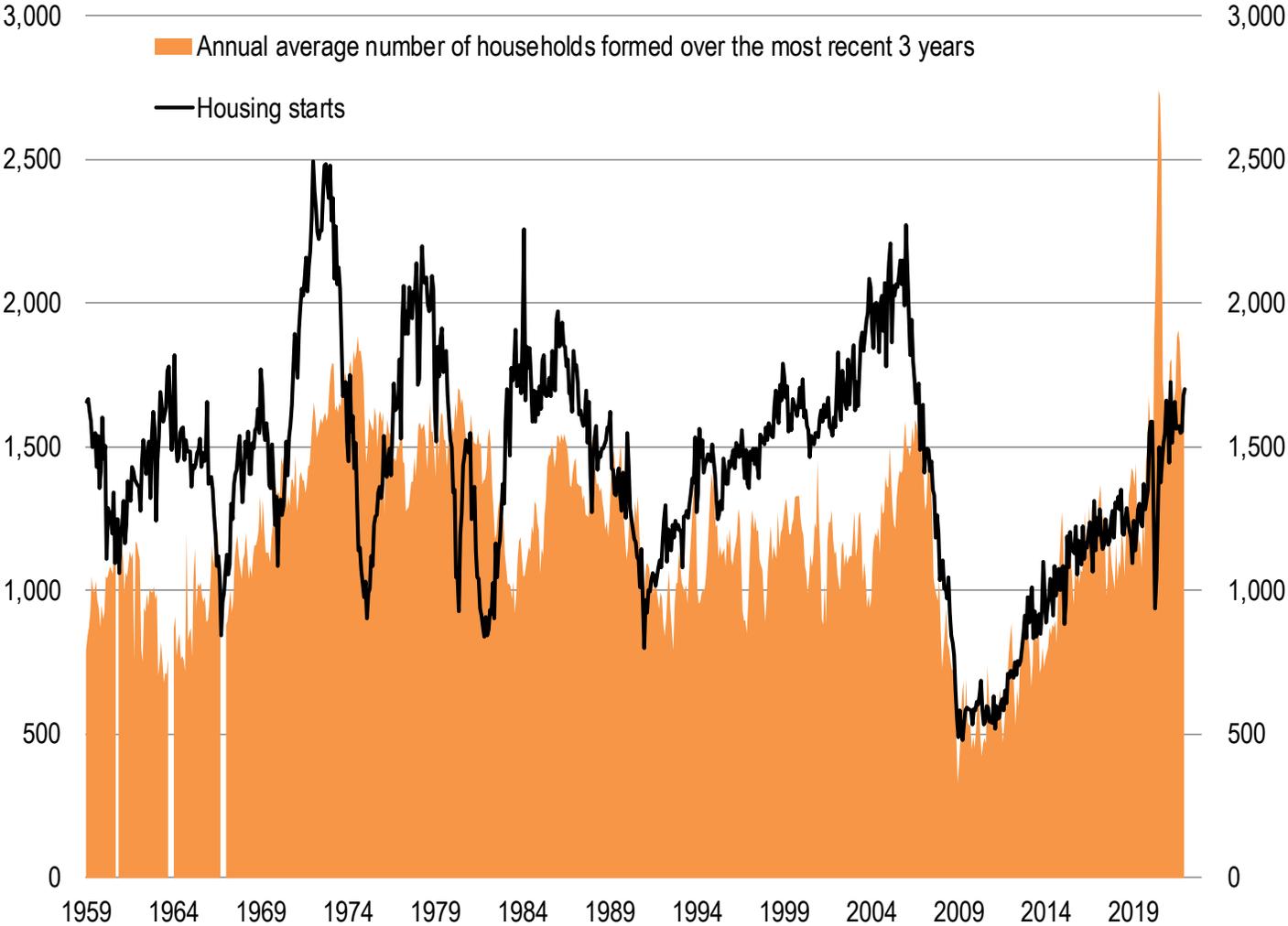
House prices and qualified mortgage borrowing amounts (ratio to 2021 Q2 level)



Sources: Haver Analytics; U.S. Department of Commerce; Standard and Poor's, Wall Street Journal. Updated through 2021 Q4 (house prices) and January 21, 2022 (30-year mortgage commitment rate).

Coming of Age Lifts Household Formation

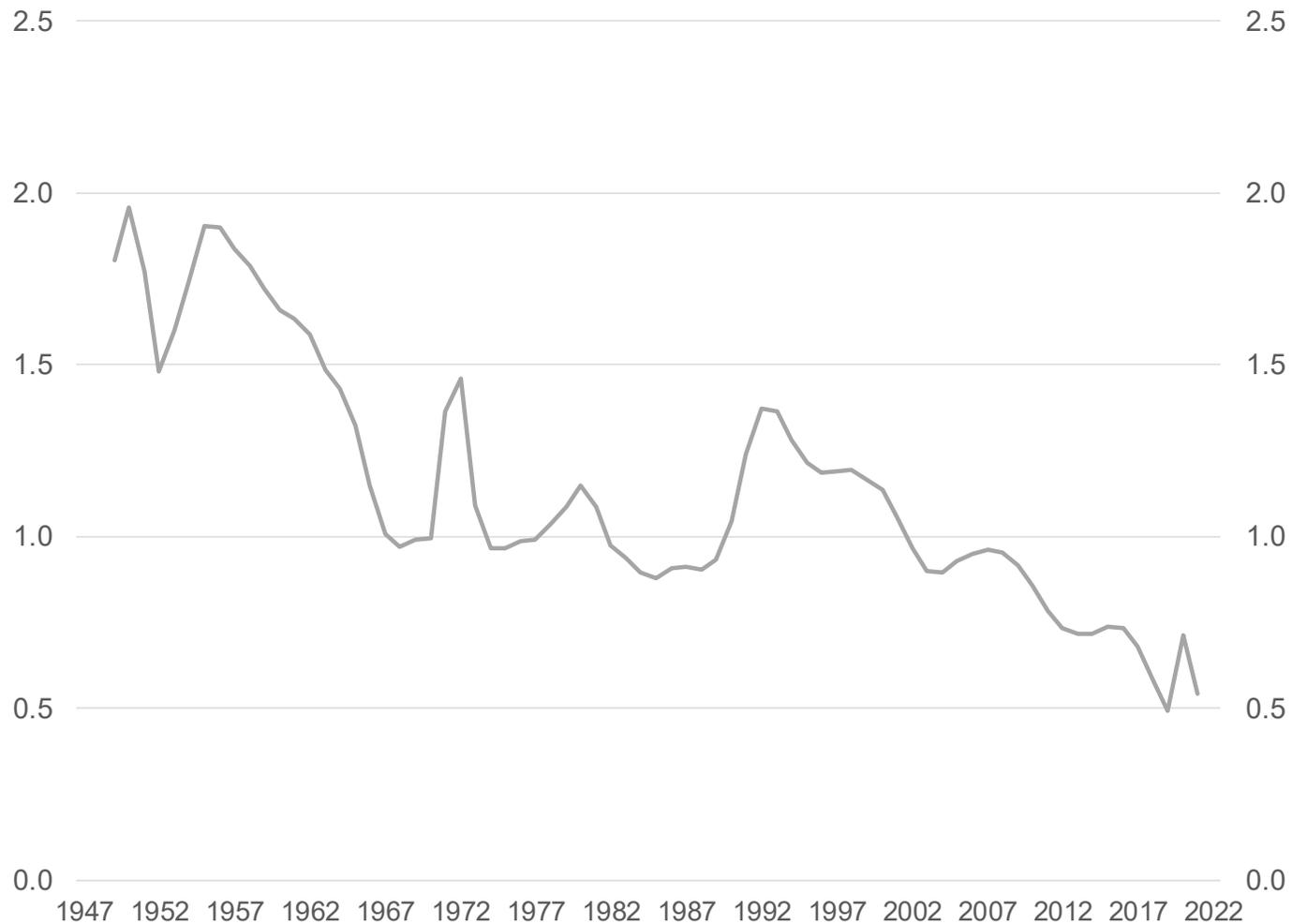
House prices and qualified mortgage borrowing amounts (ratio to 2021 Q2 level)



Sources: Haver Analytics; U.S. Department of Commerce; Standard and Poor's, Federal Reserve Board. Updated through 2021 Q2.

And, Despite Slowing Population Growth, ...

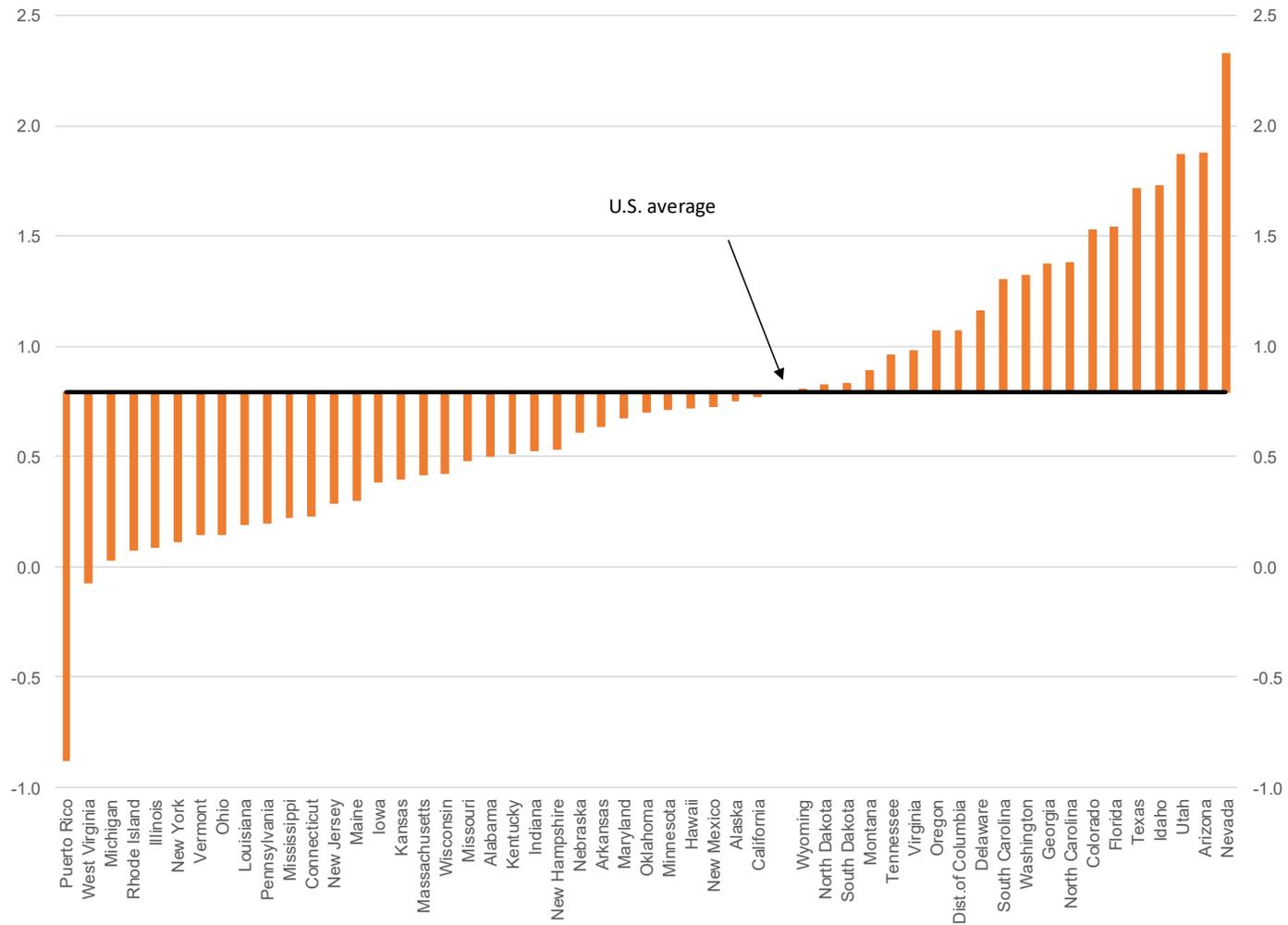
U.S. population growth (annual percent change over two-year rolling intervals)



Sources: Haver Analytics; U.S. Department of Labor. Updated through January 2021.

... A Population in Motion ...

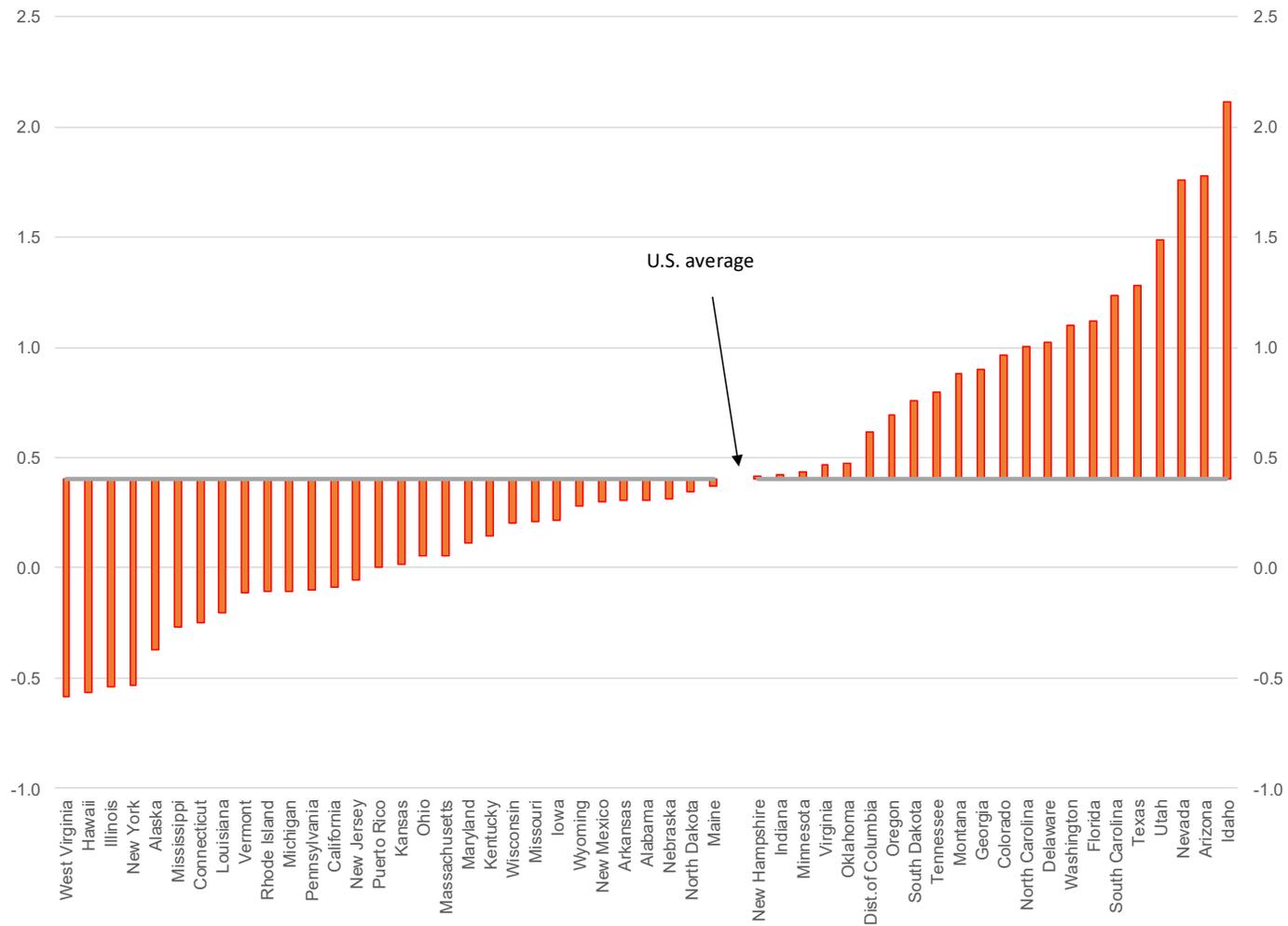
Annual population growth since 1999 (percent change)



Sources: Haver Analytics; Census. Updated through 2020.

... All Across the Nation

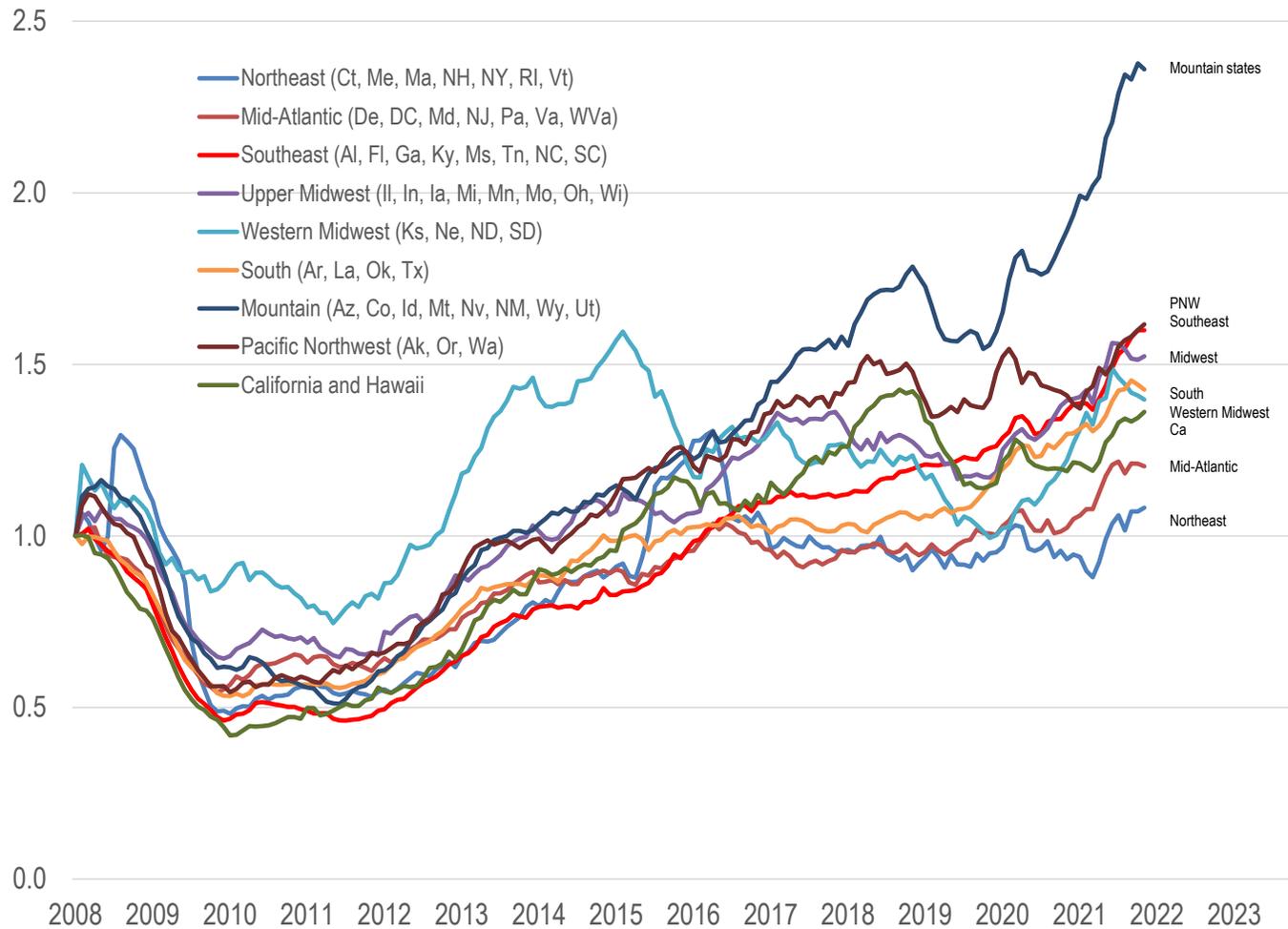
Annual percent change since 2018 (percent)



Sources: Haver Analytics; Census. Updated through 2020.

... Pulls Housing With It

Housing starts by region (ratio to smoothed level of housing starts at the 2007 economic peak)

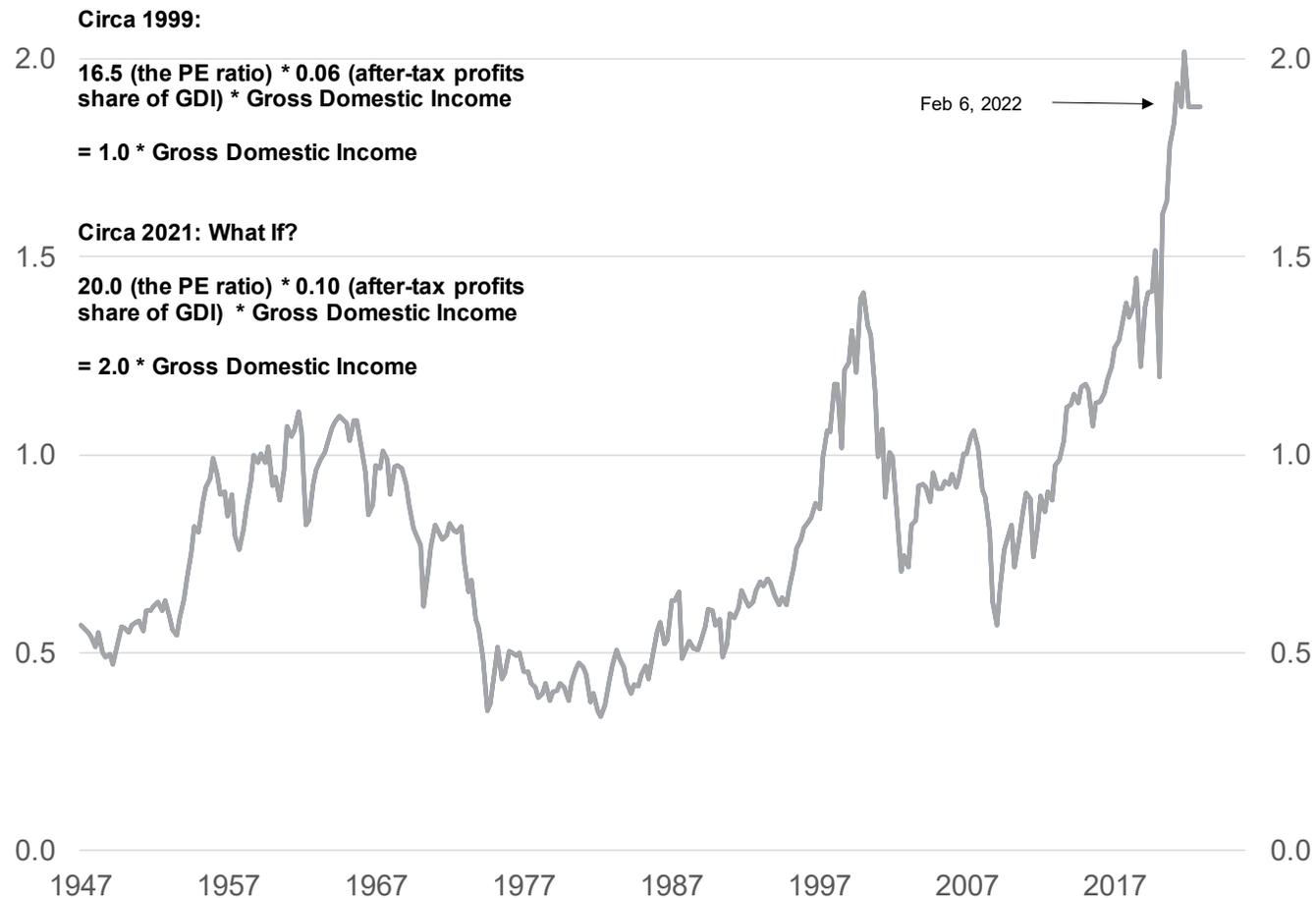


Sources: Haver Analytics; Census. Updated through November 2021.

What About Stocks?

What About This? Bubble or a New Vision of the Future?

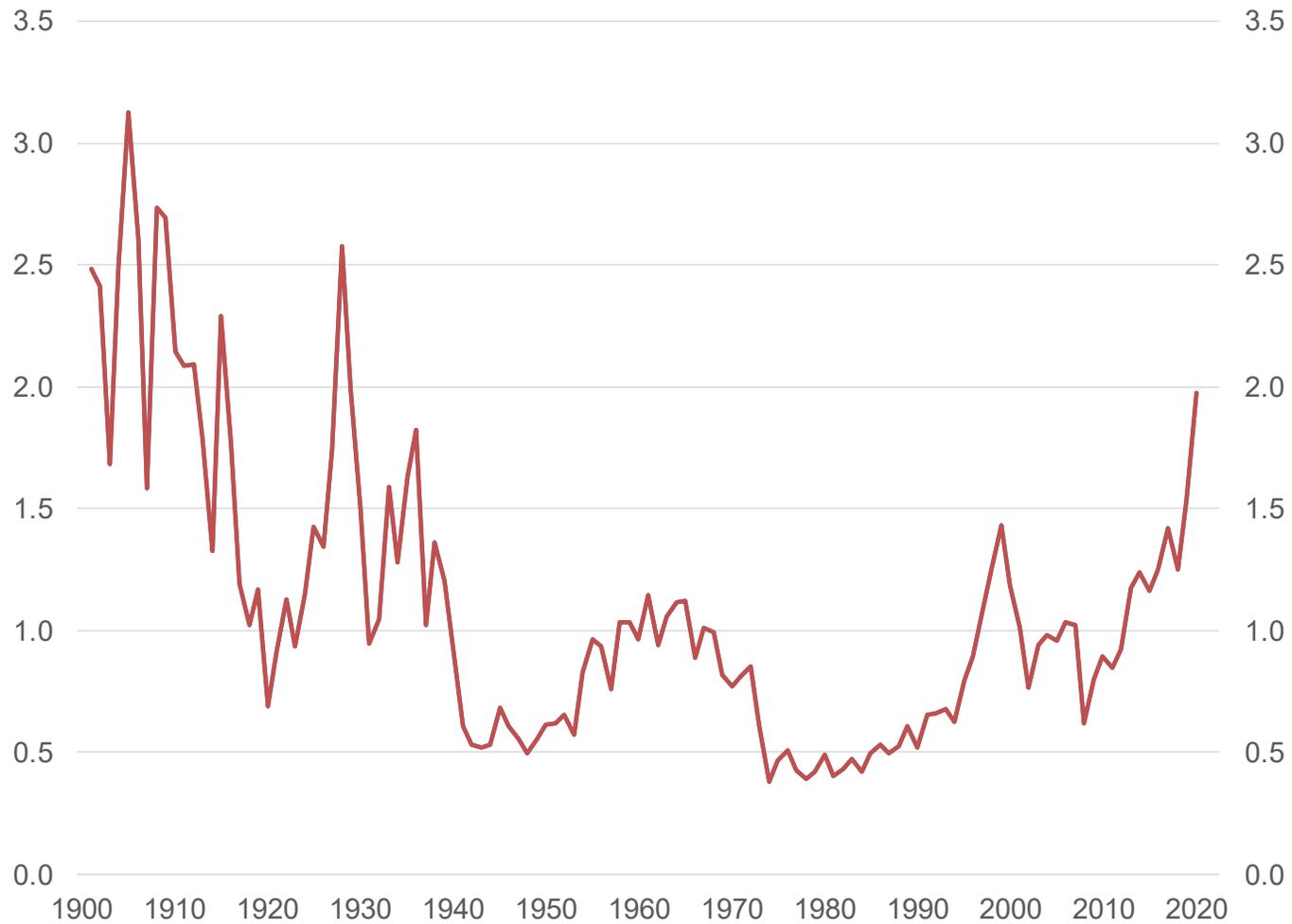
Ratio of the value of the U.S. stock market to Gross Domestic Income



Sources: Haver Analytics; Federal Reserve Board; U.S. Department of Commerce. Updated through 2021 Q3 (GDI) and February 6, 2022 (Wilshire 5000).

Some See an Echo of the 'Roaring Twenties'

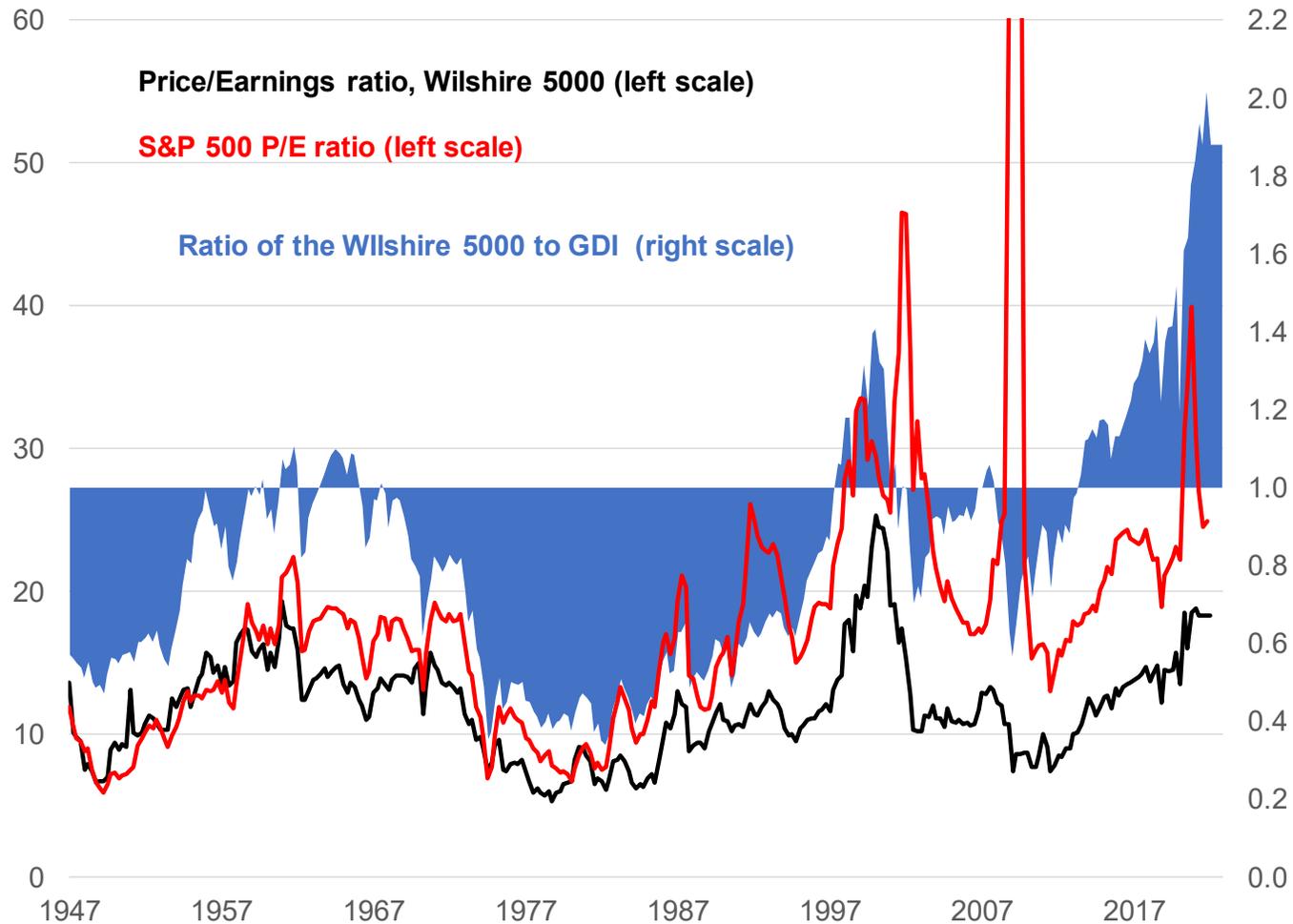
Ratio of the value of the U.S. stock market to Gross Domestic Product



Sources: Haver Analytics; Federal Reserve Board; U.S. Department of Commerce. Updated through 2020 Q3 (GDI) and May 11, 2021 (equities).

“Valuation measures are high relative to historical norms”

Selected measures of business profits (percent of Gross Domestic Income)



¹ GDP profits adjust for (translated to economic terms) different valuations of inventories and depreciation allowances.
Sources: Haver Analytics; U.S. Department of Commerce. Updated through 2021 Q2 and February 6, 2022 (stocks)

But Why Are Historical Norms Useful?

Equilibrium real risk-free rates are low by historical norms ...

Demographics (ageing workforces)

Global saving (lifted by international trade imbalances)

Risk premia are low by historical norms ...

Declining inflation risk, looking past pandemic dislocations

The Fed's 2% inflation target blunts political risk in monetary policy

The Fed's new reaction function lessens the chance of a monetary policy mistake

Geopolitical risks are low by historical norms, with the EU's survival through an economic crisis and living standards upping the cost of conflict (a future of elephants and tigers)

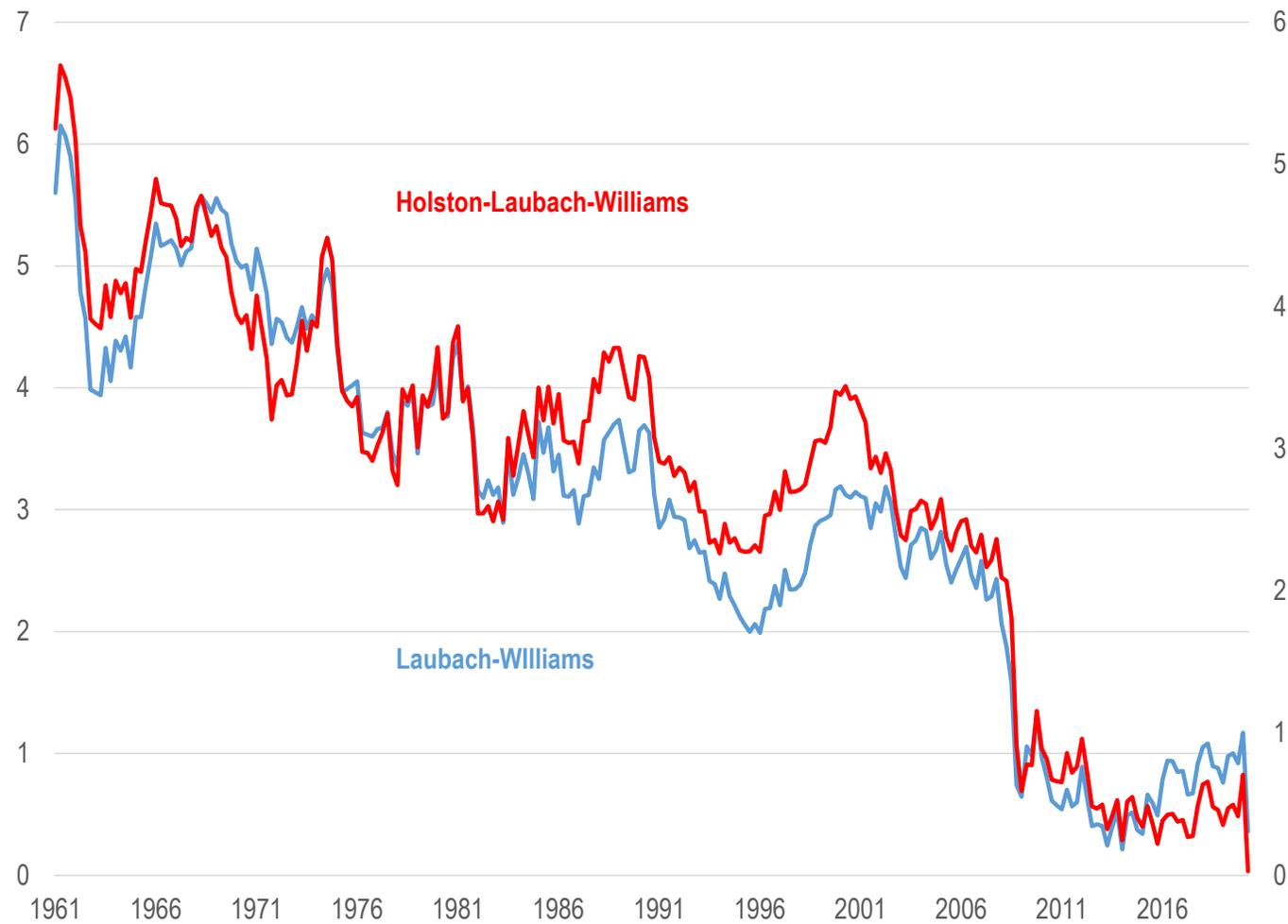
Business performance is elevated by historical norms ...

The unlocking of technological innovation forced by the pandemic

Global awakening increased the amount of GDP beyond the US borders

If Equilibrium Rates Have Dropped (PE Ratios Climbed)?

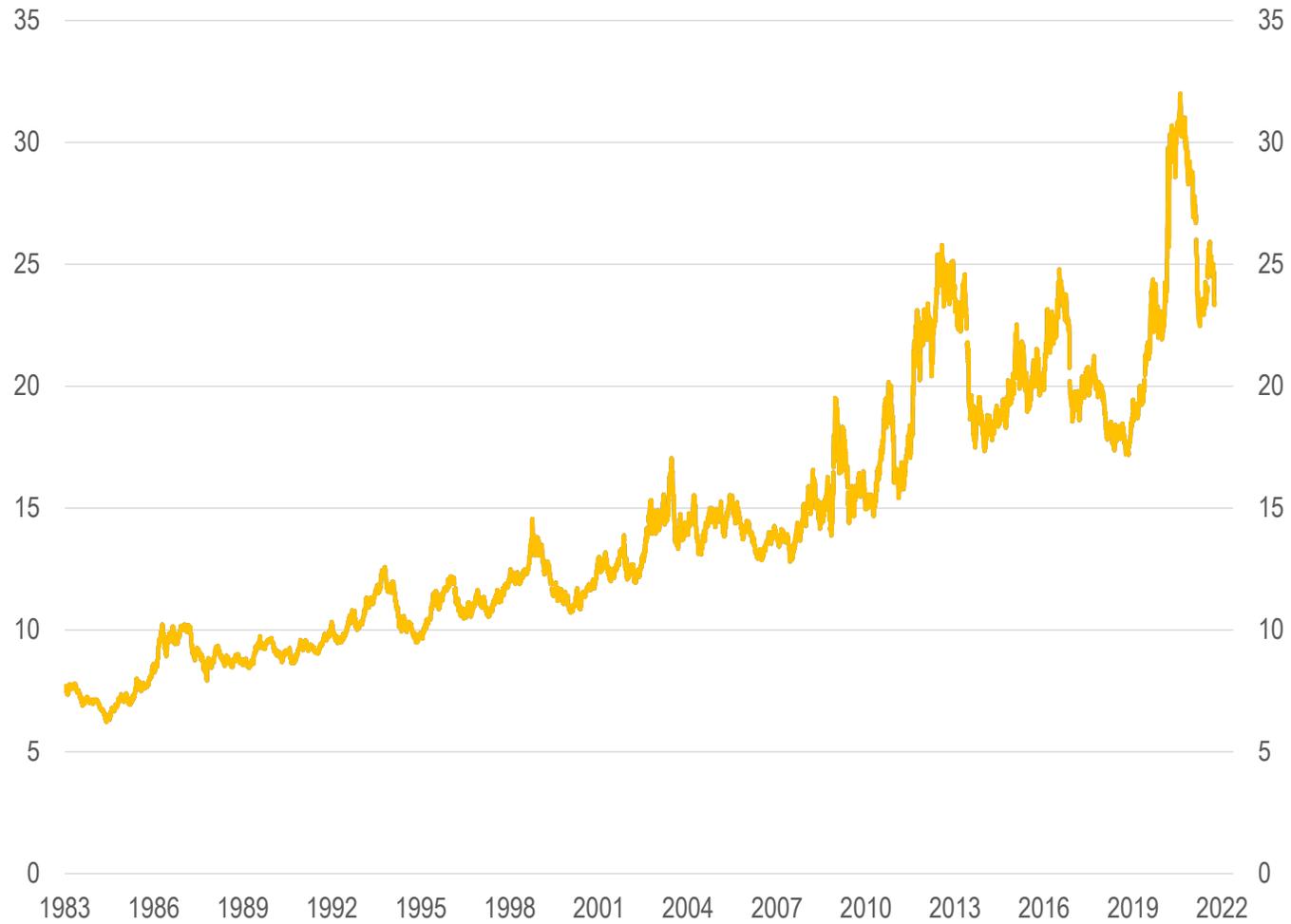
Equilibrium real risk-free rates, R-star (percent)



Source: "Measuring the Natural Rate of Interest," Holston, Laubach, and Williams. November 30, 2020.

[P-Es Should be Higher than Historical Norms]

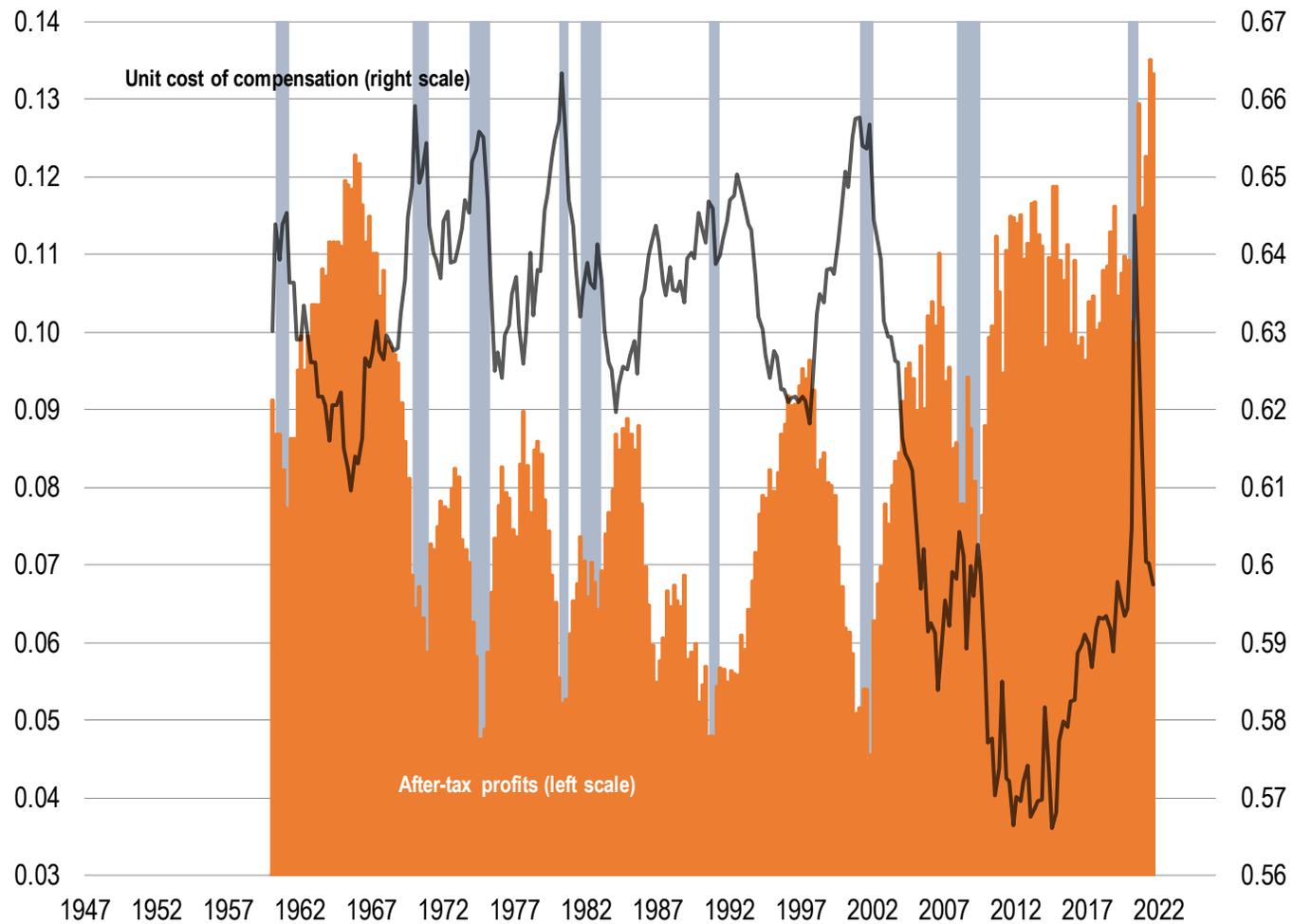
Implied P-E multiple (1/ (10-year Treasury yield plus 2 percentage points for the equity risk premium))



Source: Haver Analytics; Federal Reserve Board. Updated through September 30, 2021.

If Profit Margins ...

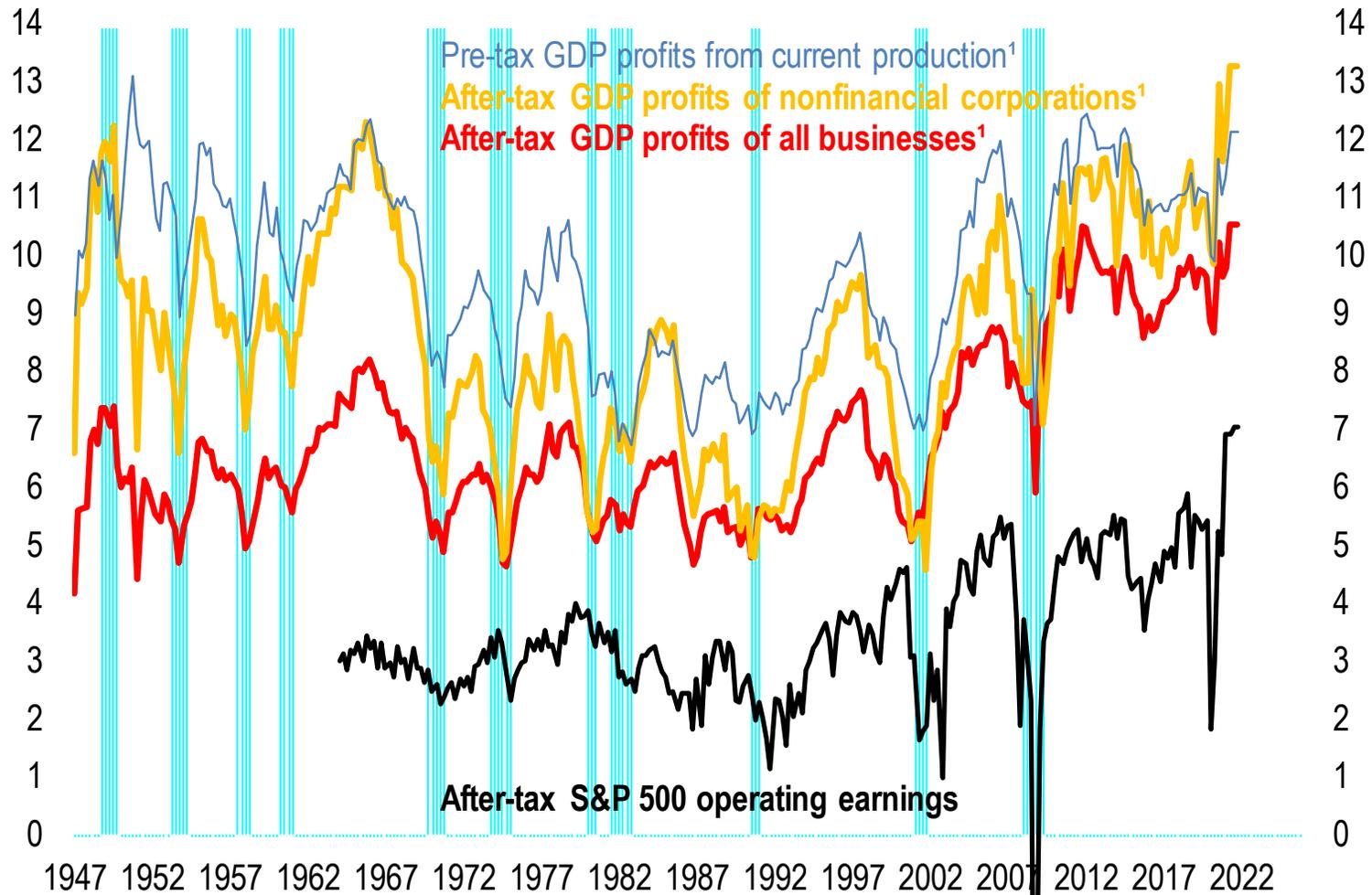
After-tax profits of nonfinancial corporations (percent of the sector's value added)



Sources: Haver Analytics; U.S. Department of Commerce. Updated through 2020 Q3.

... Refuse to Read from the (Historical Norms) Script?

Selected measures of business profits (percent of Gross Domestic Income)

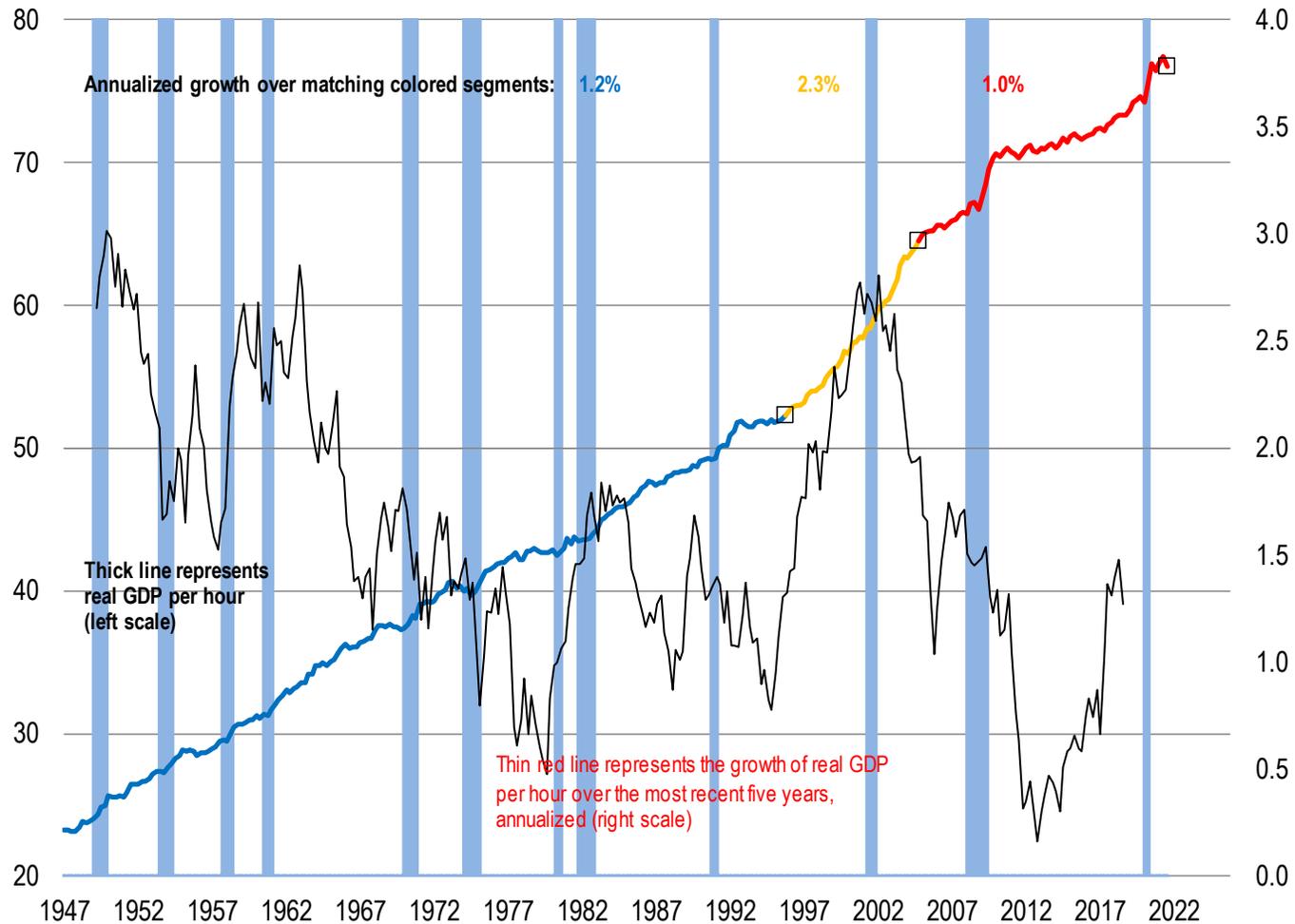


¹ GDP profits adjust for (translated to economic terms) different valuations of inventories and depreciation allowances.
Sources: Haver Analytics; U.S. Department of Commerce. Updated through 2021 Q1.

Innovation Gets Turbocharged in an Existential Crisis

Real GDP per hour (chained 2012 dollars)

Labor productivity (annualized percent change over the most recent 5 years)

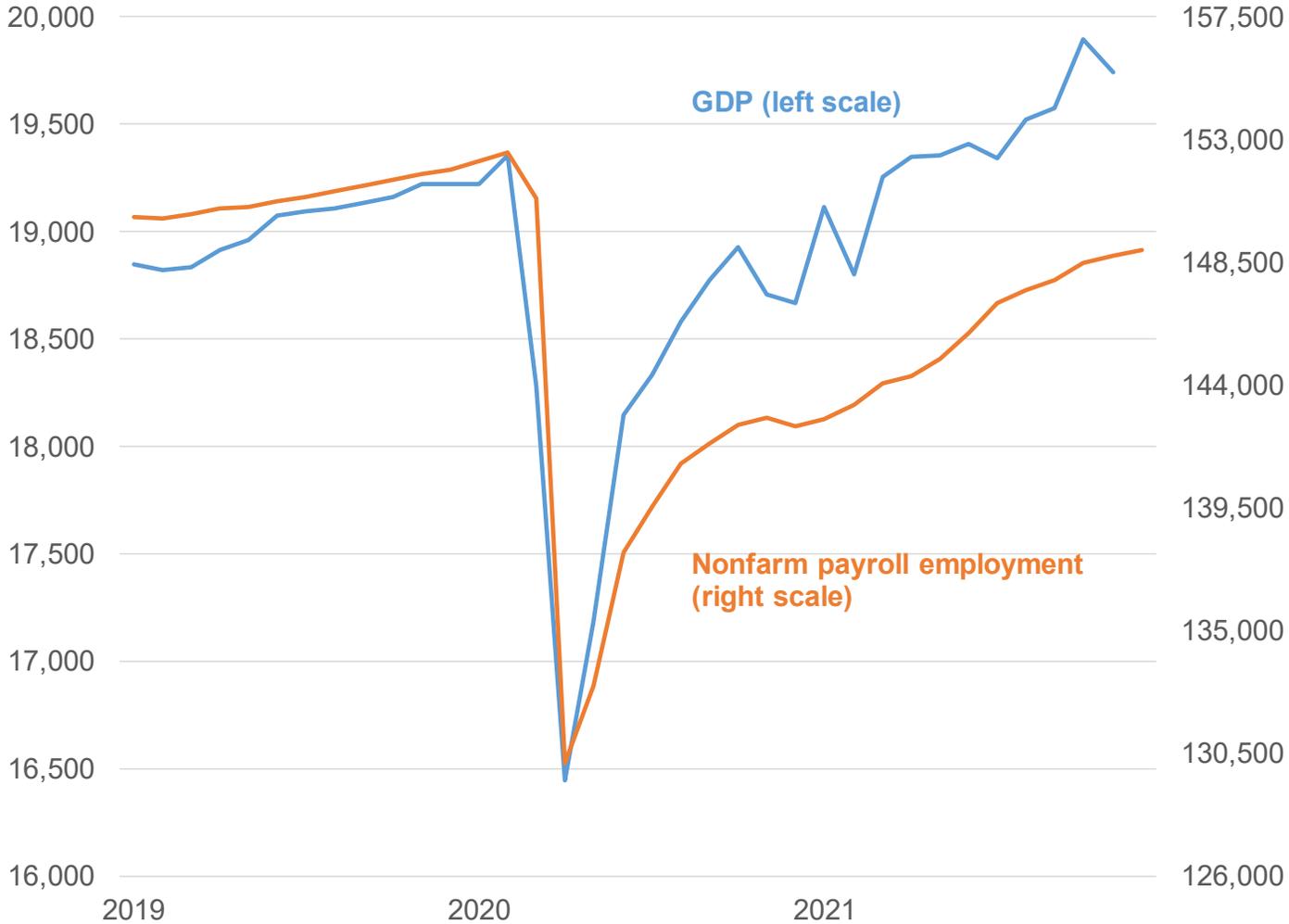


Sources: Haver Analytics; U.S. Department of Labor; U.S. Department of Commerce. Updated through 2021 Q3.

It Will Be the Legacy of the Pandemic

Real GDP (chained 2012 dollars)

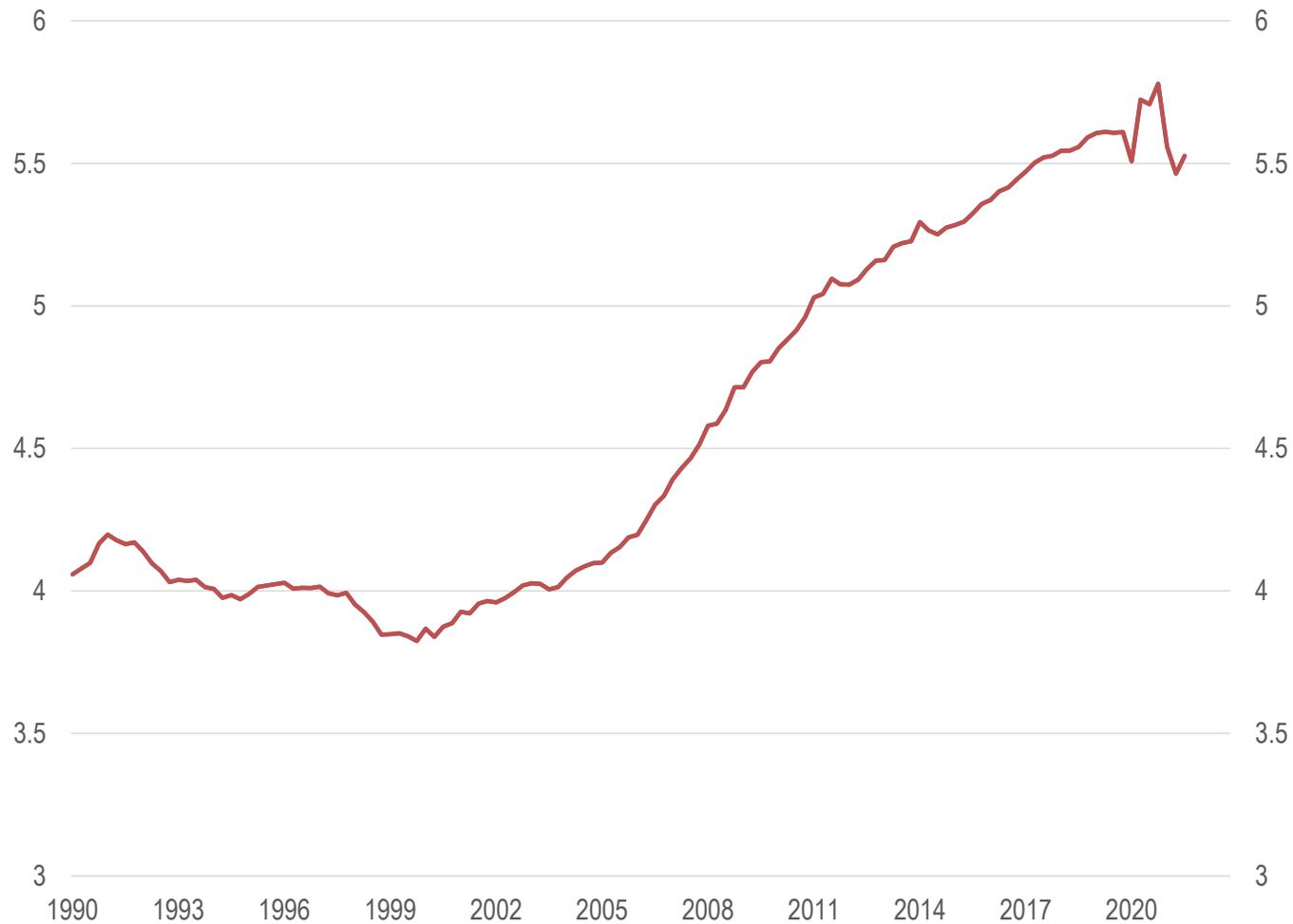
Nonfarm payrolls (thousands)



Sources: Haver Analytics; U.S. Department of Labor; U.S. Department of Commerce. Updated through November 2021 (GDP) and December 2021 (nonfarm payrolls).

And Opportunity Lies 'Somewhere Beyond the Sea' ...

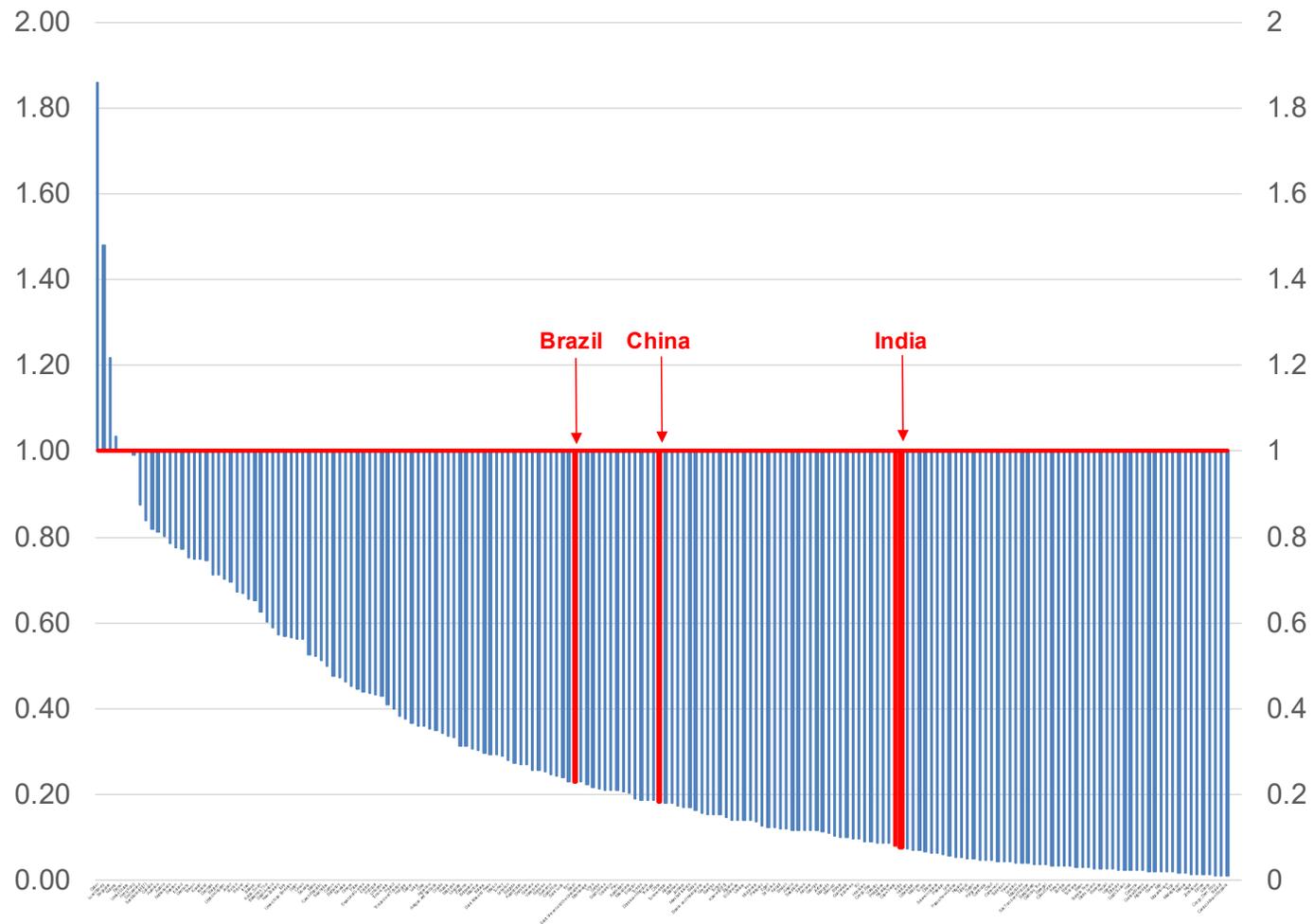
Beyond the shores of the U.S. (ratio of global real GDP to U.S. real GDP)



Sources: Haver Analytics; U.S. Department of Commerce; IMF. Updated through 2021 Q3.

... Because Others Have Ambitions Too

Relative real GDP per capita (ratio to U.S. real GDP per capita, 2016 dollars)



Sources: Haver Analytics; International Monetary Fund. Updated through 2020.

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jglassman@jpmorgan.com

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