Number Nomics

Economics. Explained.

No Recession Yet – But it is Almost Inevitable

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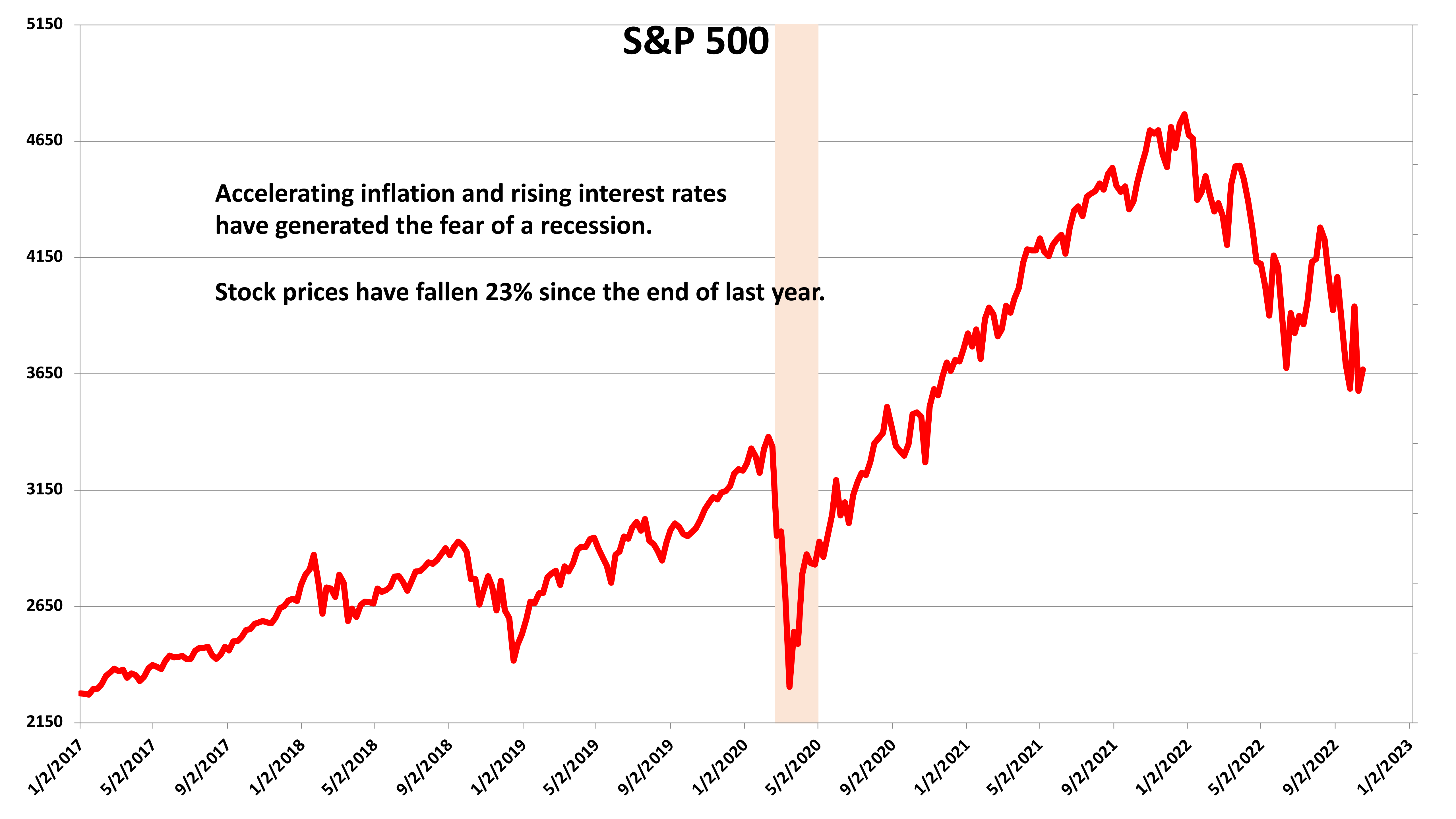
NumberNomics
www.numbernomics.com

Economics. Explained.

The Highlights

1. How high must interest rates go to curtail inflation?
2. Can the Fed do this without causing a recession?
3. What indicators will tell us when a recession is coming?
4. How quickly will the inflation rate decline?
5. When will interest rates start to decline?

Financial Markets.


S&P 500
Accelerating inflation and rising interest rates
have generated the fear of a recession.
Stock prices have fallen 23% since the end of last year.
5150
4650
4150
3650
3150
2650
2150
1/2/2017
5/2/2017
9/2/2017
1/2/2018
5/2/2018
9/2/2018
1/2/2019
5/2/2019
9/2/2019
1/2/2020
5/2/2020
9/2/2020
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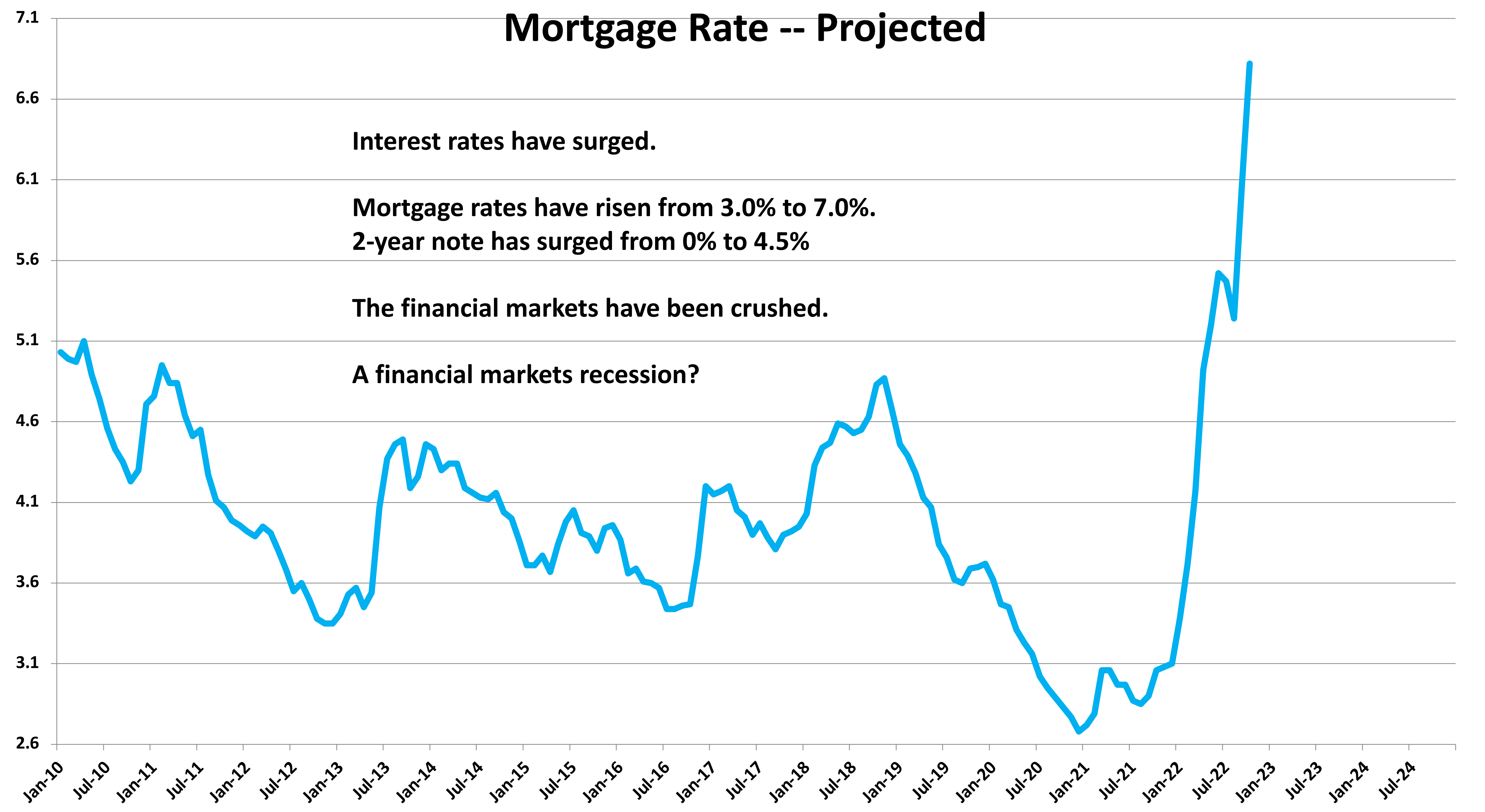
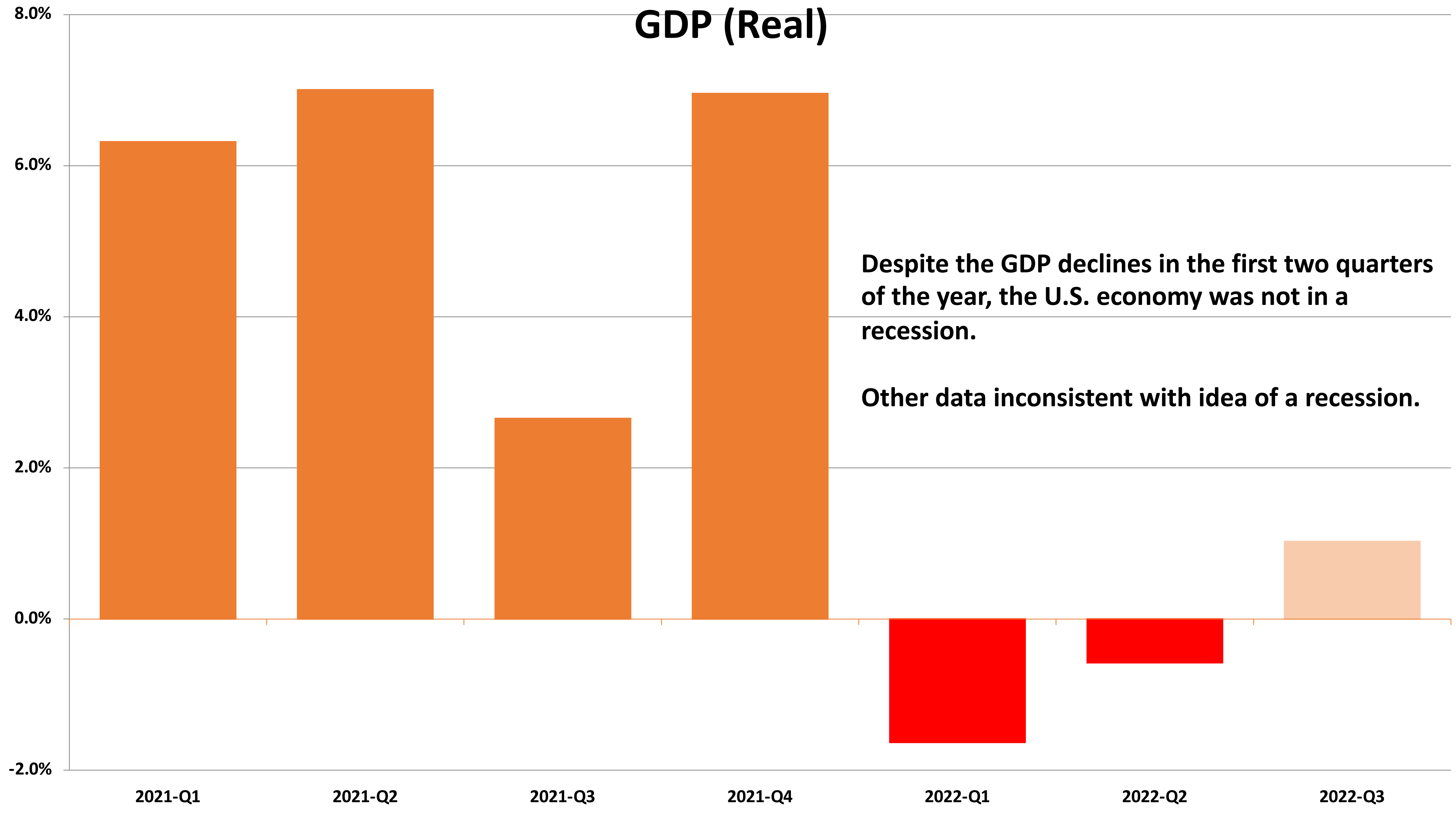
9/2/2022
1/2/2023

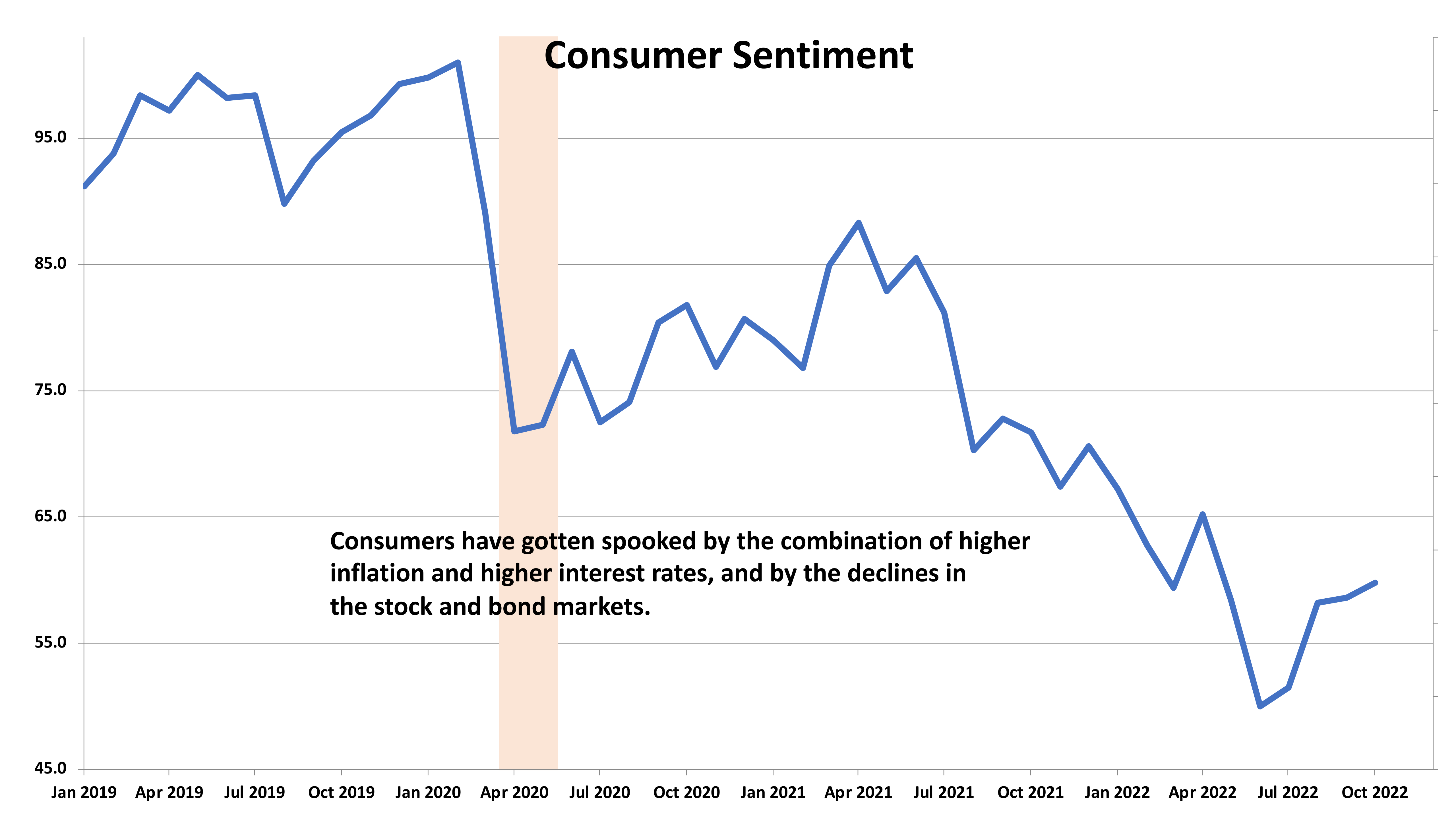

Mortgage Rate -- Projected
Interest rates have surged.
Mortgage rates have risen from 3.0% to 7.0%.
2-year note has surged from 0% to 4.5%
The financial markets have been crushed.
A financial markets recession?
7.1
6.6
6.1
5.6
5.1
4.6
4.1
3.6
3.1
2.6
Jan-10
Jul-10
Jan-11
Jul-11
Jan-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
Jan-17
Jul-17
Jan-18
Jul-18
Jan-19
Jul-19
Jan-20
Jul-20
Jan-21
Jul-21
Jan-22
Jul-22
Jan-23
Jul-23
Jan-24
Jul-24

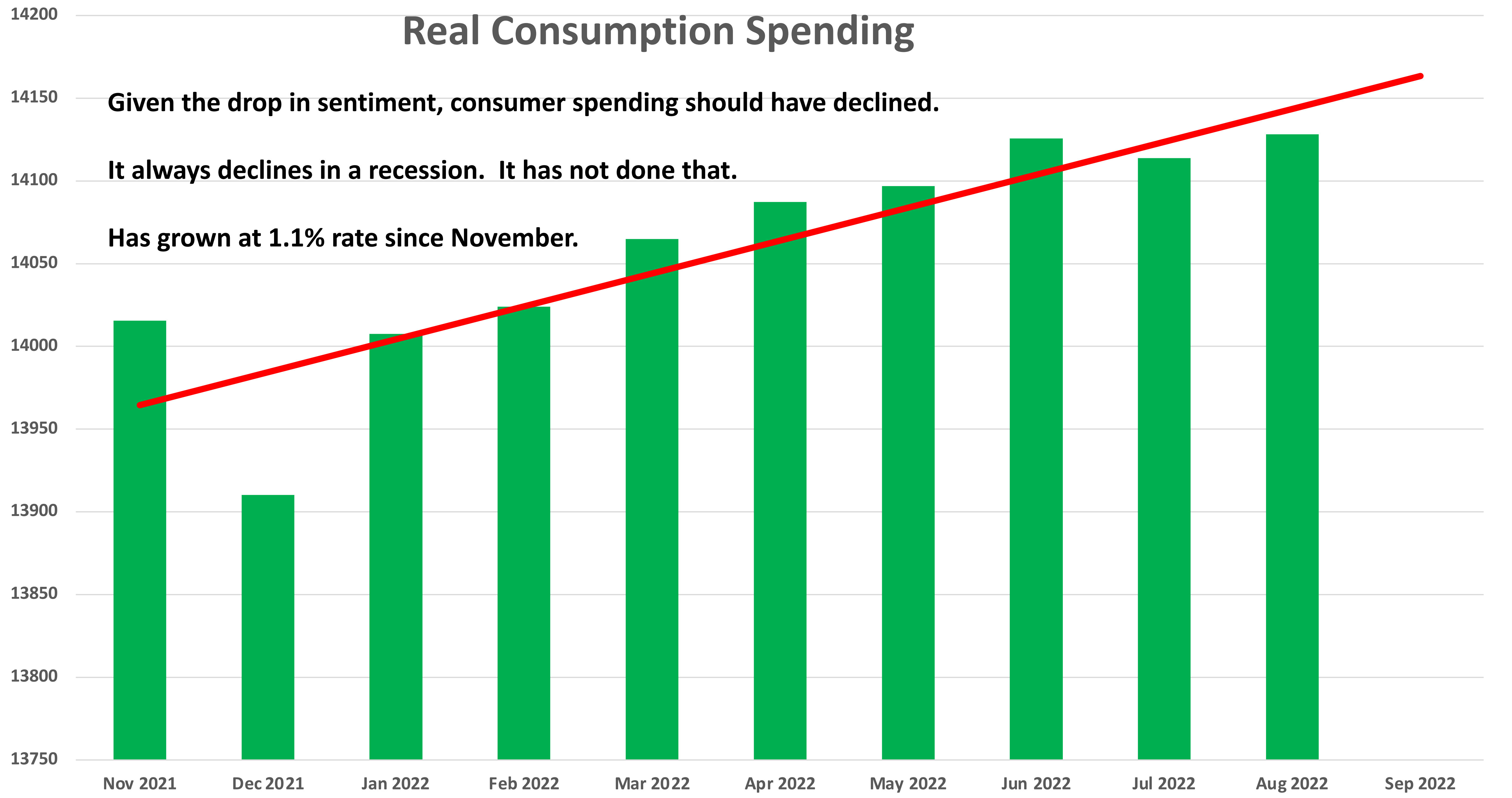
The Economy.


GDP (Real)
8.0%
6.0%
4.0%
2.0%
0.0%
-2.0%
2021-Q1
2021-Q2
2021-Q3
2021-Q4
2022-Q1
2022-Q2
2022-Q3
Despite the GDP declines in the first two quarters of the year, the U.S. economy was not in a recession.
Other data inconsistent with idea of a recession.

Economics. Explained.

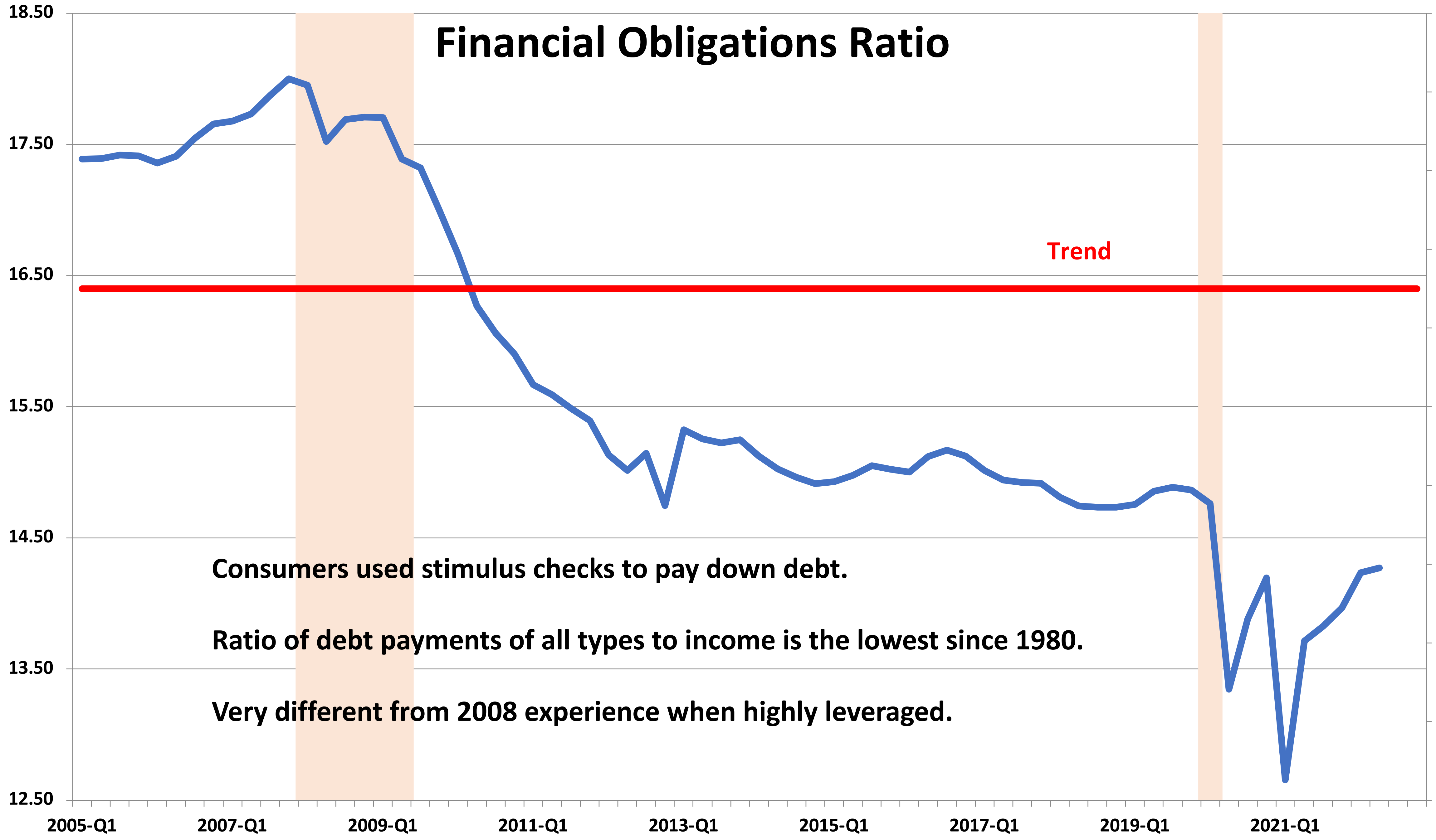
Consumption Spending.

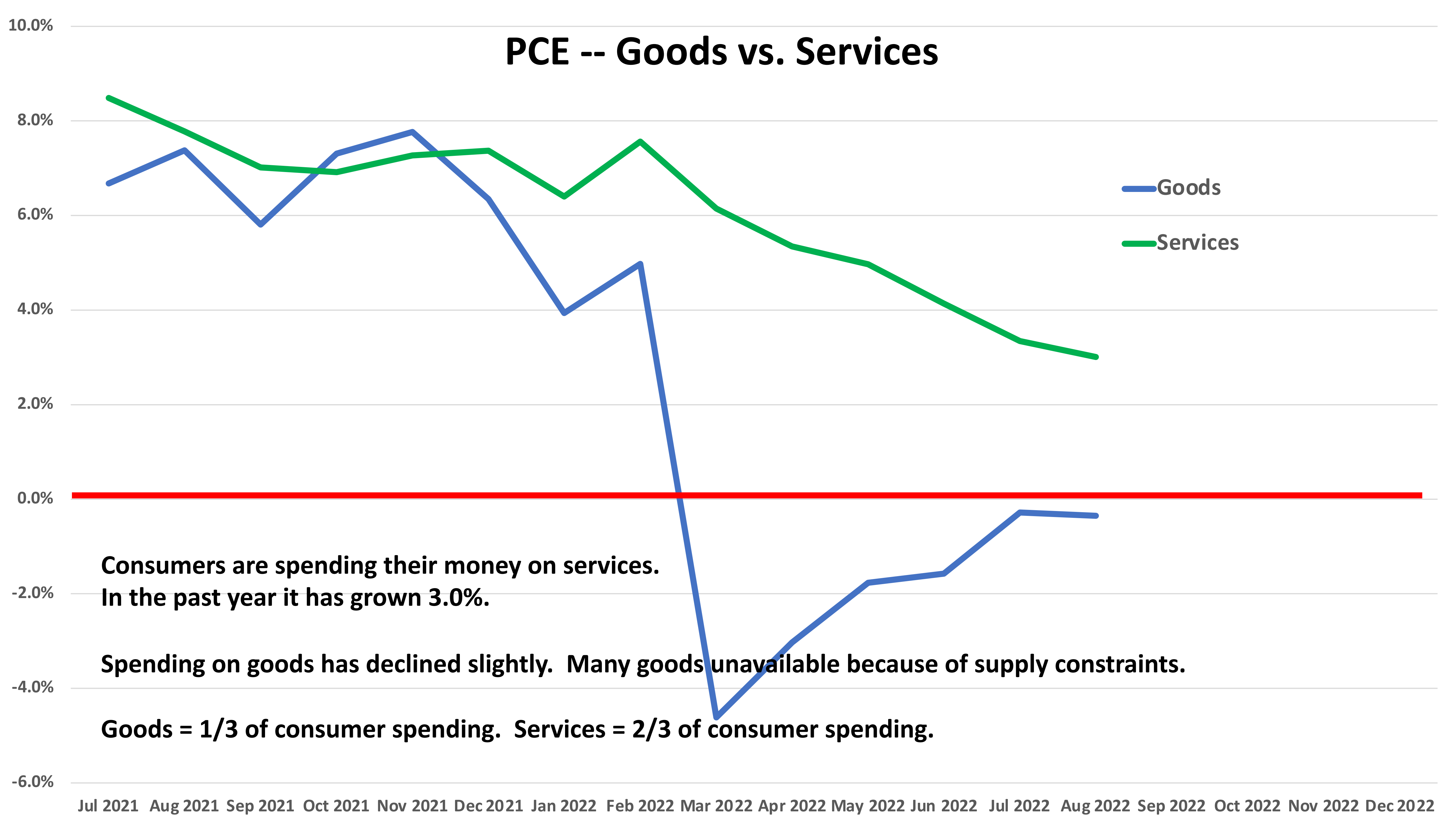

Consumer Sentiment
95.0
85.0
75.0
65.0
55.0
45.0
Jan 2019
Apr 2019
Jul 2019
Oct 2019
Jan 2020
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Consumers have gotten spooked by the combination of higher inflation and higher interest rates, and by the declines in the stock and bond markets.

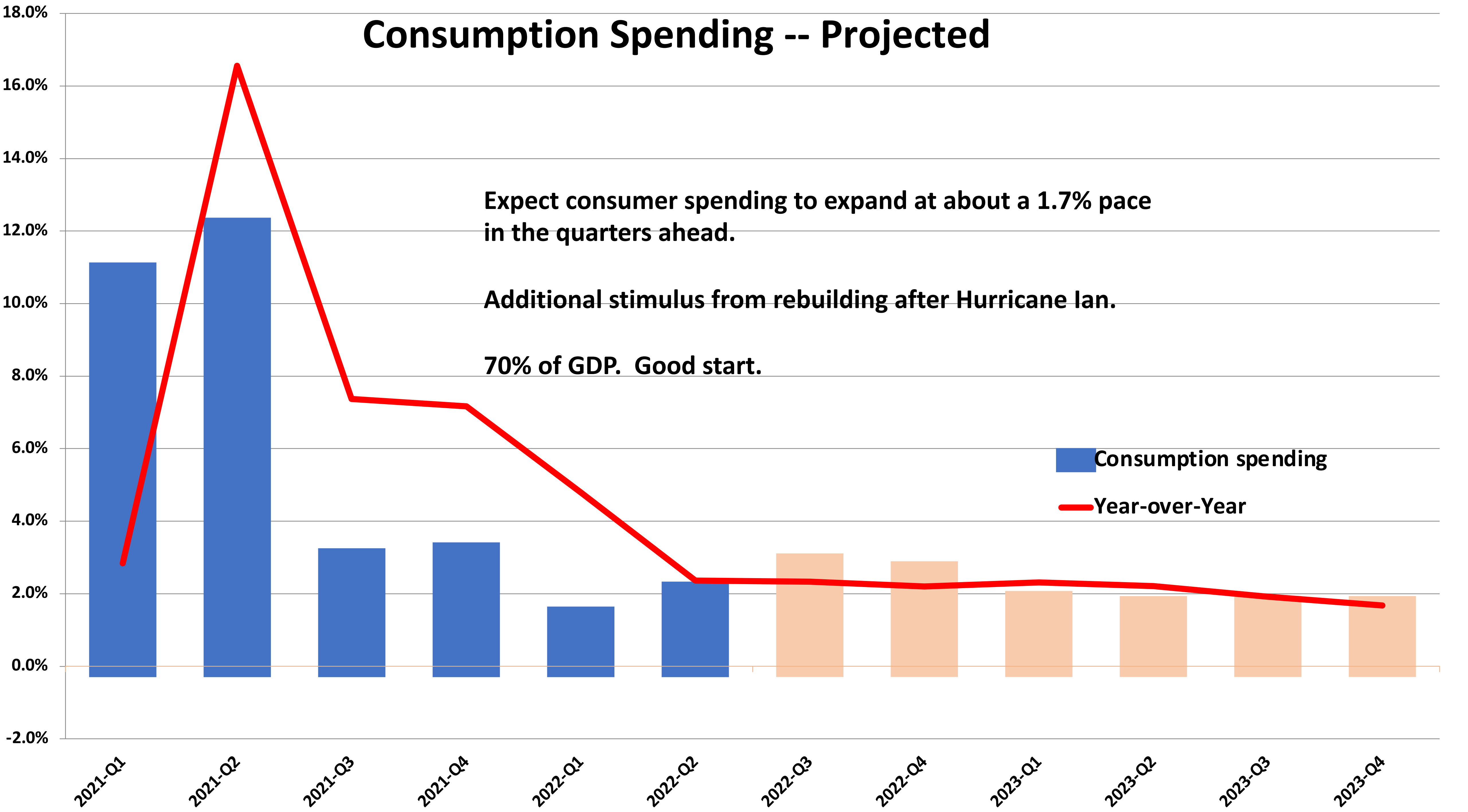


Real Consumption Spending
Given the drop in sentiment, consumer spending should have declined.
It always declines in a recession. It has not done that.
Has grown at 1.1% rate since November.
14200
14150
14100
14050
14000
13950
13900
13850
13800
13750
Nov 2021
Dec 2021
Jan 2022
Feb 2022
Mar 2022
Apr 2022
May 2022
Jun 2022
Jul 2022
Aug 2022
Sep 2022


Unemployment Rate
Perhaps the biggest reason for continued spending is that people are not worried about their job.
At 3.5% the unemployment rate is below full employment (4.0%). That means everybody who wants a job has one.
Job openings are plentiful.
If no chance you are going to lose your job, keep spending.
Full Employment
16.0
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
Jan-20
Apr-20
Jul-20
Oct-20
Jan-21
Apr-21
Jul-21
Oct-21
Jan-22
Apr-22
Jul-22
Oct-22


Financial Obligations Ratio
Trend
Consumers used stimulus checks to pay down debt.
Ratio of debt payments of all types to income is the lowest since 1980.
Very different from 2008 experience when highly leveraged.
18.50
17.50
16.50
15.50
14.50
13.50
12.50
2005-Q1
2007-Q1
2009-Q1
2011-Q1
2013-Q1
2015-Q1
2017-Q1
2019-Q1
2021-Q1


PCE -- Goods vs. Services
10.0%
8.0%
6.0%
4.0%
2.0%
0.0%
-2.0%
-4.0%
-6.0%
Goods
Services
Consumers are spending their money on services.
In the past year it has grown 3.0%.
Spending on goods has declined slightly. Many goods unavailable because of supply constraints.
Goods = 1/3 of consumer spending. Services = 2/3 of consumer spending.
Jul 2021 Aug 2021 Sep 2021 Oct 2021 Nov 2021 Dec 2021 Jan 2022 Feb 2022 Mar 2022 Apr 2022 May 2022 Jun 2022 Jul 2022 Aug 2022 Sep 2022 Oct 2022 Nov 2022 Dec 2022


Consumption Spending -- Projected
Expect consumer spending to expand at about a 1.7% pace
in the quarters ahead.
Additional stimulus from rebuilding after Hurricane Ian.
70% of GDP. Good start.
Consumption spending
Year-over-Year
18.0%
16.0%
14.0%
12.0%
10.0%
8.0%
6.0%
4.0%
2.0%
0.0%
-2.0%
2021-Q1
2021-Q2
2021-Q3
2021-Q4
2022-Q1
2022-Q2
2022-Q3
2022-Q4
2023-Q1
2023-Q2
2023-Q3
2023-Q4

Housing.

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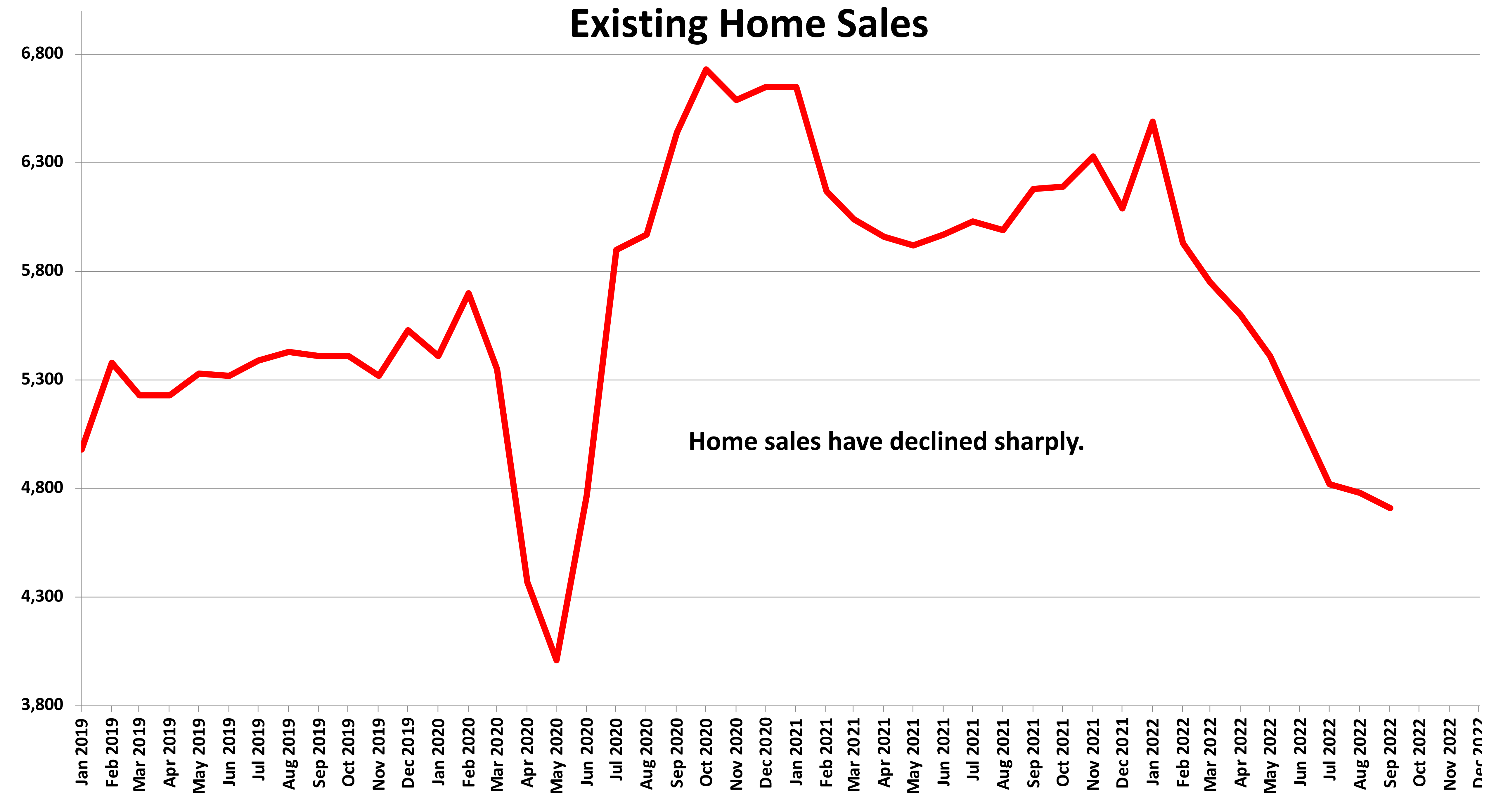
Existing Home Sales
6,800
6,300
5,800
5,300
4,800
4,300
3,800
Home sales have declined sharply.
Jan 2019
Feb 2019
Mar 2019
Apr 2019
May 2019
Jun 2019
Jul 2019
Aug 2019
Sep 2019
Oct 2019
Nov 2019
Dec 2019
Jan 2020
Feb 2020
Mar 2020
Apr 2020
May 2020
Jun 2020
Jul 2020
Aug 2020
Sep 2020
Oct 2020
Nov 2020
Dec 2020
Jan 2021
Feb 2021
Mar 2021
Apr 2021
May 2021
Jun 2021
Jul 2021
Aug 2021
Sep 2021
Oct 2021
Nov 2021
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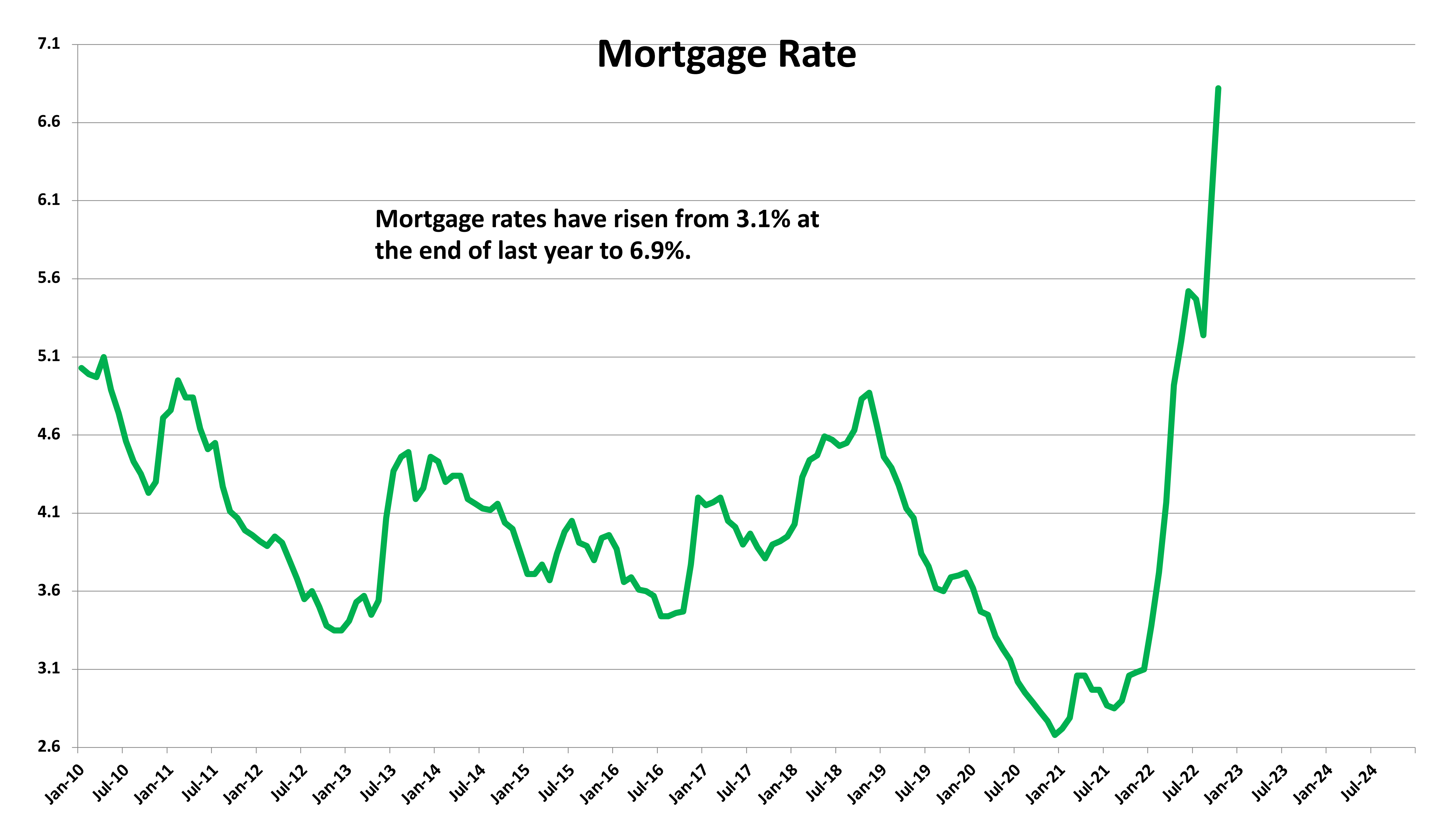
Sep 2022
Oct 2022
Nov 2022



Mortgage Rate
Mortgage rates have risen from 3.1% at the end of last year to 6.9%.
7.1
6.6
6.1
5.6
5.1
4.6
4.1
3.6
3.1
2.6
Jan-10
Jul-10
Jan-11
Jul-11
Jan-12
Jul-12
Jan-13
Jul-13
Jan-14
Jul-14
Jan-15
Jul-15
Jan-16
Jul-16
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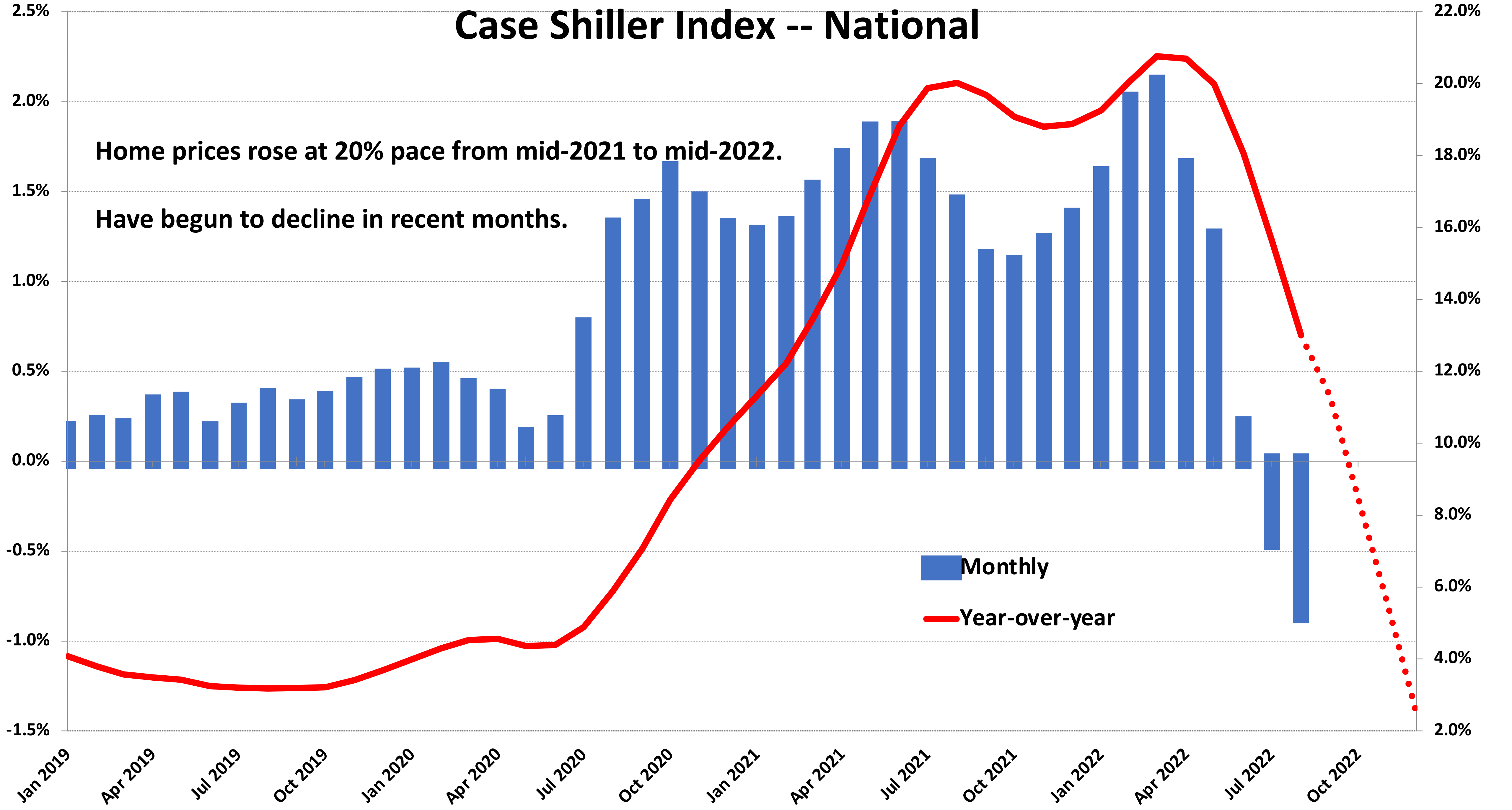
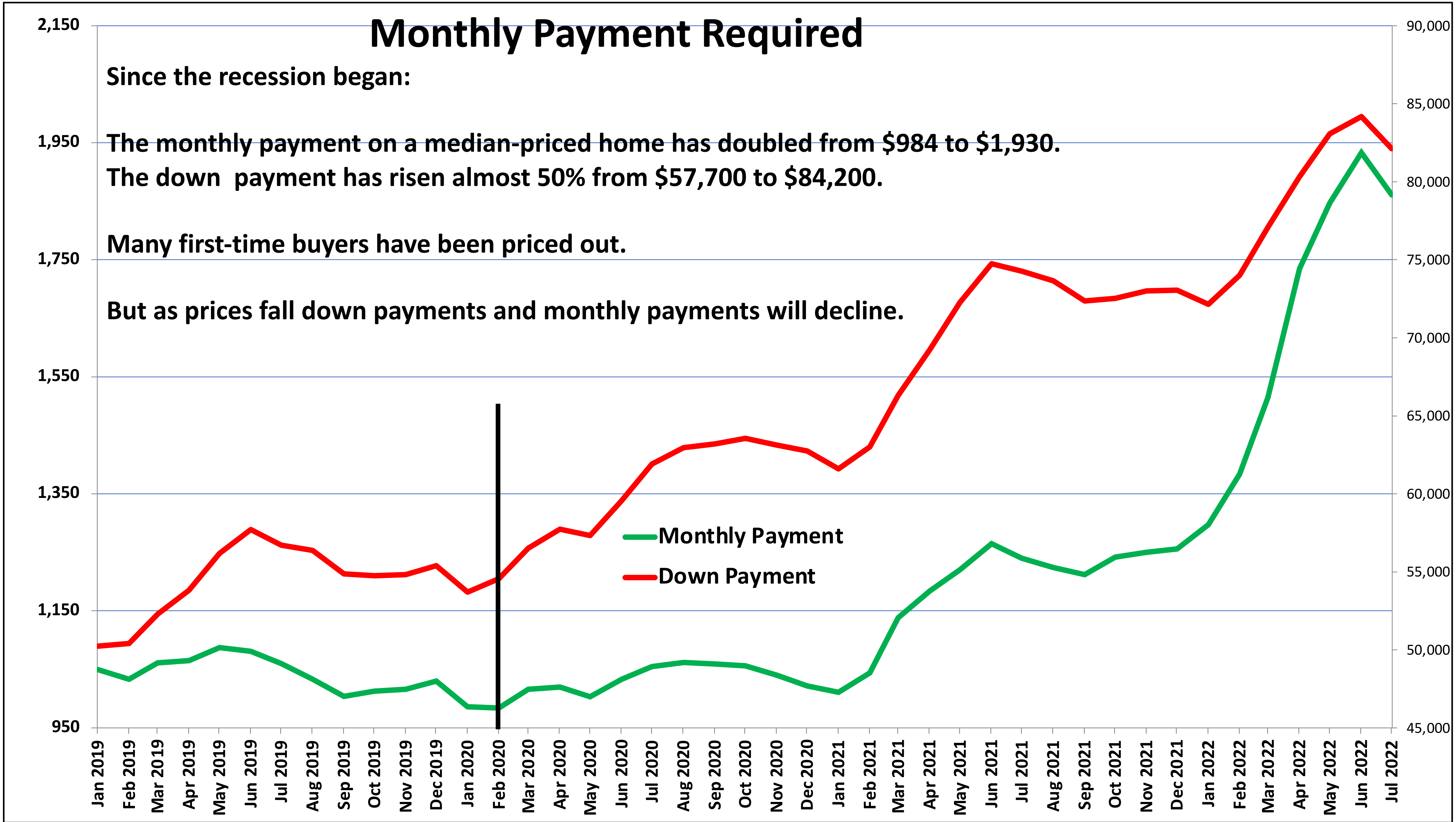
Jul-23
Jan-24
Jul-24



Case Shiller Index -- National
Home prices rose at 20% pace from mid-2021 to mid-2022.
Have begun to decline in recent months.
Monthly
Year-over-year
2.5%
2.0%
1.5%
1.0%
0.5%
0.0%
-0.5%
-1.0%
-1.5%
22.0%
20.0%
18.0%
16.0%
14.0%
12.0%
10.0%
8.0%
6.0%
4.0%
2.0%
Jan 2019
Apr 2019
Jul 2019
Oct 2019
Jan 2020
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022



Monthly Payment Required
Since the recession began:
The monthly payment on a median-priced home has doubled from $984 to $1,930.
The down payment has risen almost 50% from $57,700 to $84,200.
Many first-time buyers have been priced out.
But as prices fall down payments and monthly payments will decline.
Monthly Payment
Down Payment
2,150
1,950
1,750
1,550
1,350
1,150
950
90,000
85,000
80,000
75,000
70,000
65,000
60,000
55,000
50,000
45,000
Jan 2019
Feb 2019
Mar 2019
Apr 2019
May 2019
Jun 2019
Jul 2019
Aug 2019
Sep 2019
Oct 2019
Nov 2019
Dec 2019
Jan 2020
Feb 2020
Mar 2020
Apr 2020
May 2020
Jun 2020
Jul 2020
Aug 2020
Sep 2020
Oct 2020
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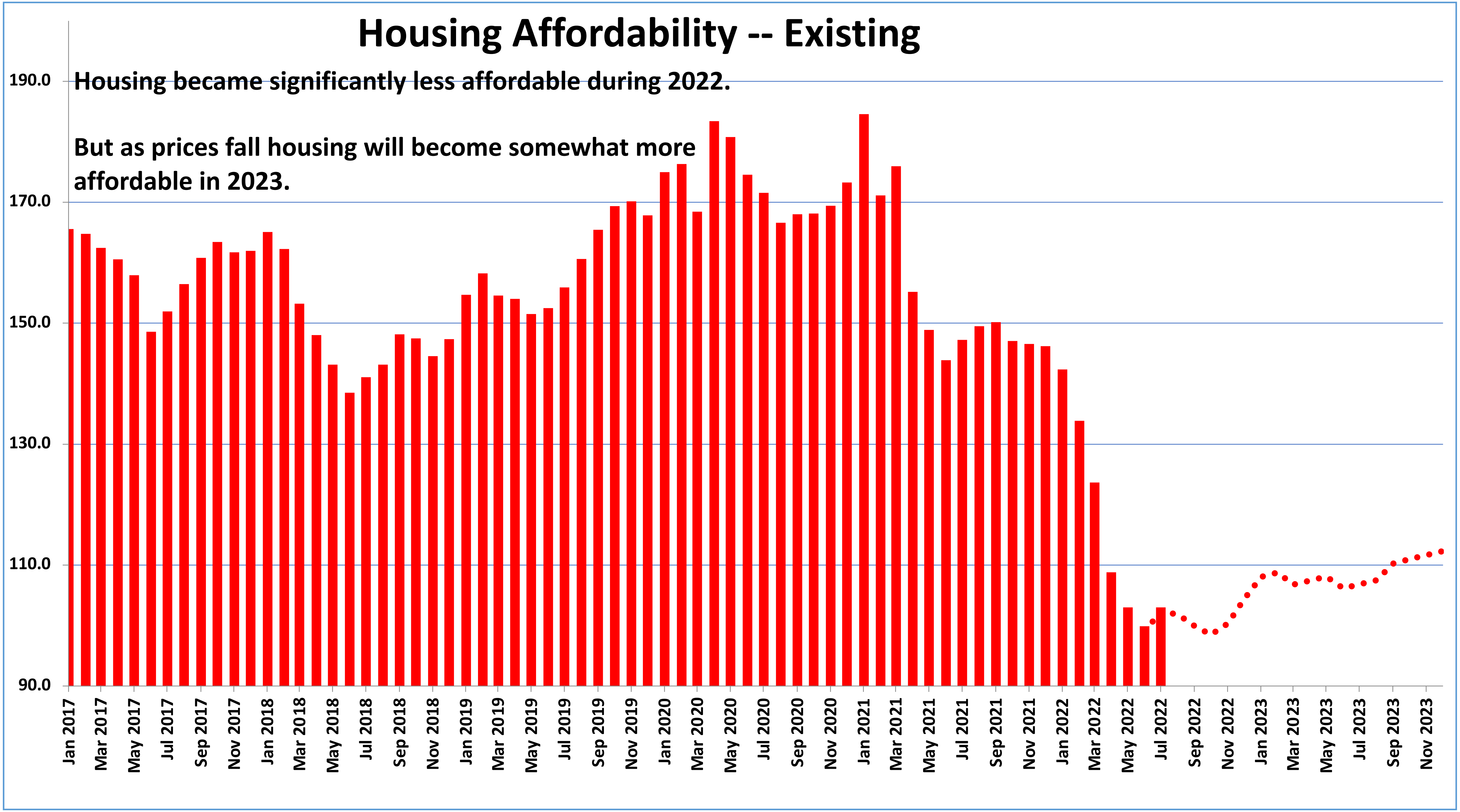
May 2022
Jun 2022
Jul 2022



Housing Affordability -- Existing
Housing became significantly less affordable during 2022.
But as prices fall housing will become somewhat more affordable in 2023.
190.0
170.0
150.0
130.0
110.0
90.0
Jan 2017
Mar 2017
May 2017
Jul 2017
Sep 2017
Nov 2017
Jan 2018
Mar 2018
May 2018
Jul 2018
Sep 2018
Nov 2018
Jan 2019
Mar 2019
May 2019
Jul 2019
Sep 2019
Nov 2019
Jan 2020
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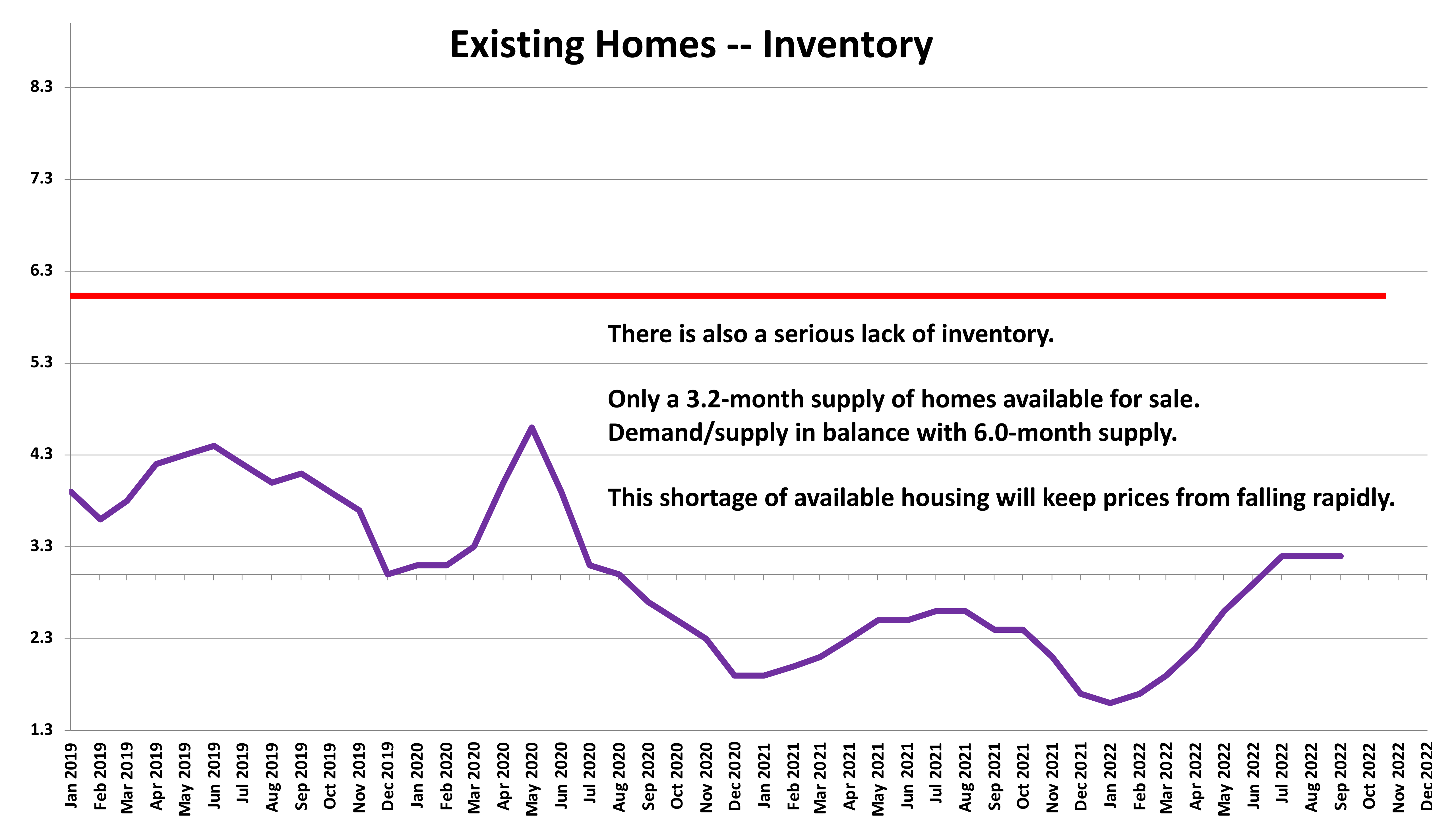
Jul 2023
Sep 2023
Nov 2023


Existing Homes -- Inventory
8.3
7.3
6.3
5.3
4.3
3.3
2.3
1.3
There is also a serious lack of inventory.
Only a 3.2-month supply of homes available for sale.
Demand/supply in balance with 6.0-month supply.
This shortage of available housing will keep prices from falling rapidly.
Jan 2019
Feb 2019
Mar 2019
Apr 2019
May 2019
Jun 2019
Jul 2019
Aug 2019
Sep 2019
Oct 2019
Nov 2019
Dec 2019
Jan 2020
Feb 2020
Mar 2020
Apr 2020
May 2020
Jun 2020
Jul 2020
Aug 2020
Sep 2020
Oct 2020
Nov 2020
Dec 2020
Jan 2021
Feb 2021
Mar 2021
Apr 2021
May 2021
Jun 2021
Jul 2021
Aug 2021
Sep 2021
Oct 2021
Nov 2021
Dec 2021
Jan 2022
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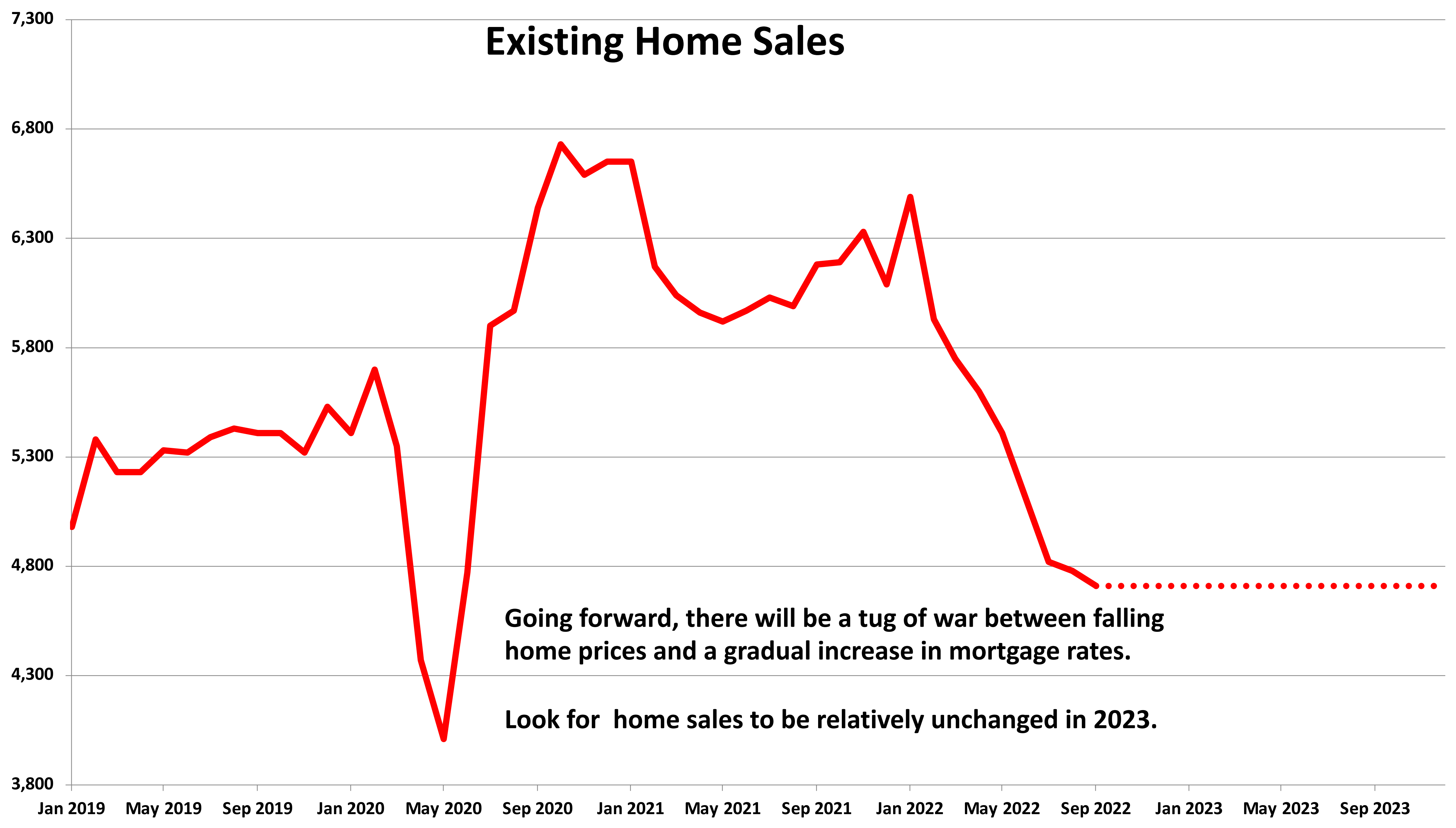
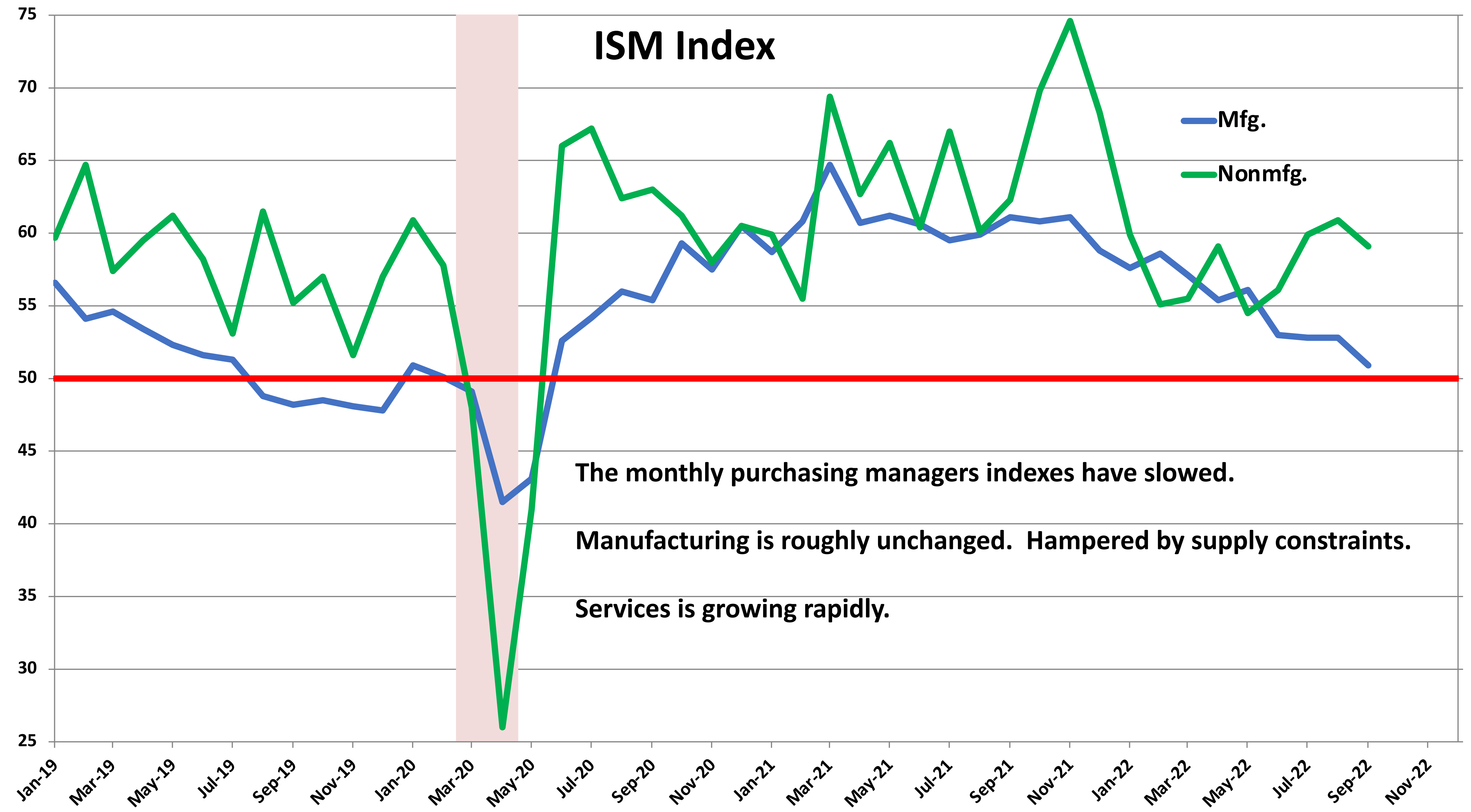
Apr 2022
May 2022
Jun 2022
Jul 2022
Aug 2022
Sep 2022
Oct 2022
Nov 2022
Dec 2022


Existing Home Sales
7,300
6,800
6,300
5,800
5,300
4,800
4,300
3,800
Jan 2019
May 2019
Sep 2019
Jan 2020
May 2020
Sep 2020
Jan 2021
May 2021
Sep 2021
Jan 2022
May 2022
Sep 2022
Jan 2023
May 2023
Sep 2023
Going forward, there will be a tug of war between falling home prices and a gradual increase in mortgage rates.
Look for home sales to be relatively unchanged in 2023.

Production.



ISM Index
Mfg.
Nonmfg.
The monthly purchasing managers indexes have slowed.
Manufacturing is roughly unchanged. Hampered by supply constraints.
Services is growing rapidly.
75
70
65
60
55
50
45
40
35
30
25
Jan-19
Mar-19
May-19
Jul-19
Sep-19
Nov-19
Jan-20
Mar-20
May-20
Jul-20
Sep-20
Nov-20
Jan-21
Mar-21
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Jul-21
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Nov-21
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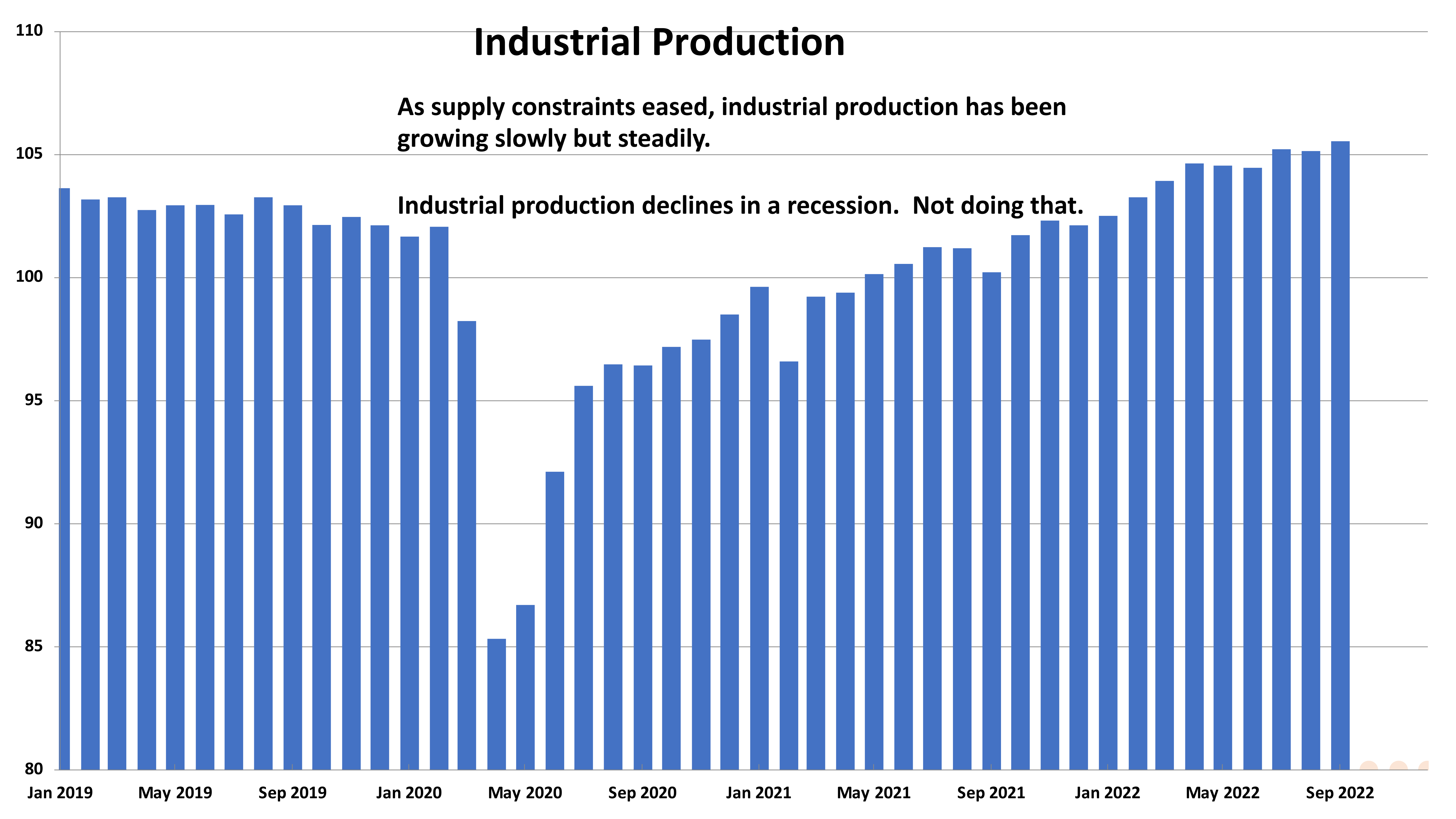
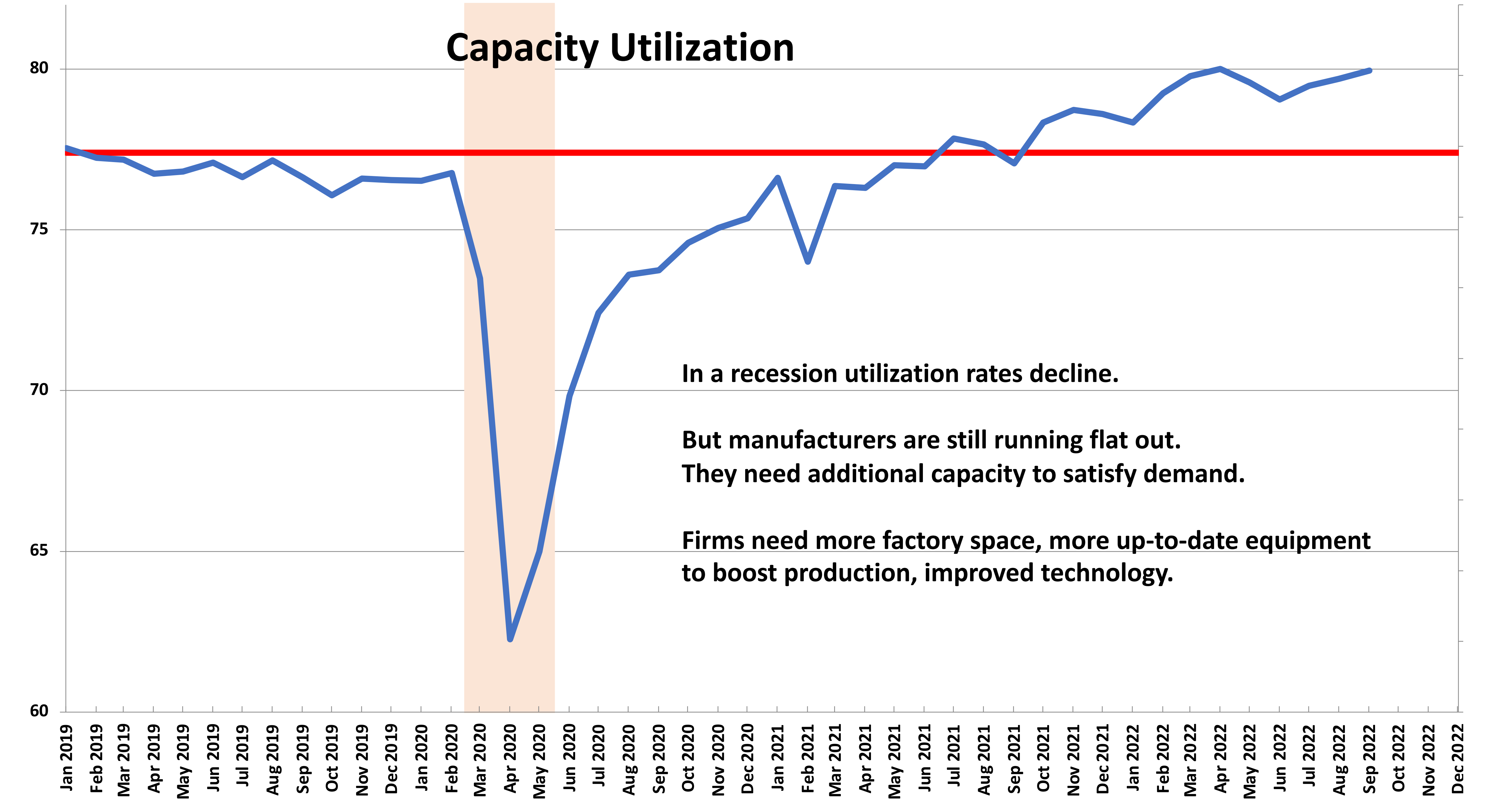
Mar-22
May-22
Jul-22
Sep-22
Nov-22


Industrial Production
As supply constraints eased, industrial production has been growing slowly but steadily.
Industrial production declines in a recession. Not doing that.
110
105
100
95
90
85
80
Jan 2019
May 2019
Sep 2019
Jan 2020
May 2020
Sep 2020
Jan 2021
May 2021
Sep 2021
Jan 2022
May 2022
Sep 2022


Capacity Utilization
80
75
70
65
60
In a recession utilization rates decline.
But manufacturers are still running flat out.
They need additional capacity to satisfy demand.
Firms need more factory space, more up-to-date equipment
to boost production, improved technology.
Jan 2019
Feb 2019
Mar 2019
Apr 2019
May 2019
Jun 2019
Jul 2019
Aug 2019
Sep 2019
Oct 2019
Nov 2019
Dec 2019
Jan 2020
Feb 2020
Mar 2020
Apr 2020
May 2020
Jun 2020
Jul 2020
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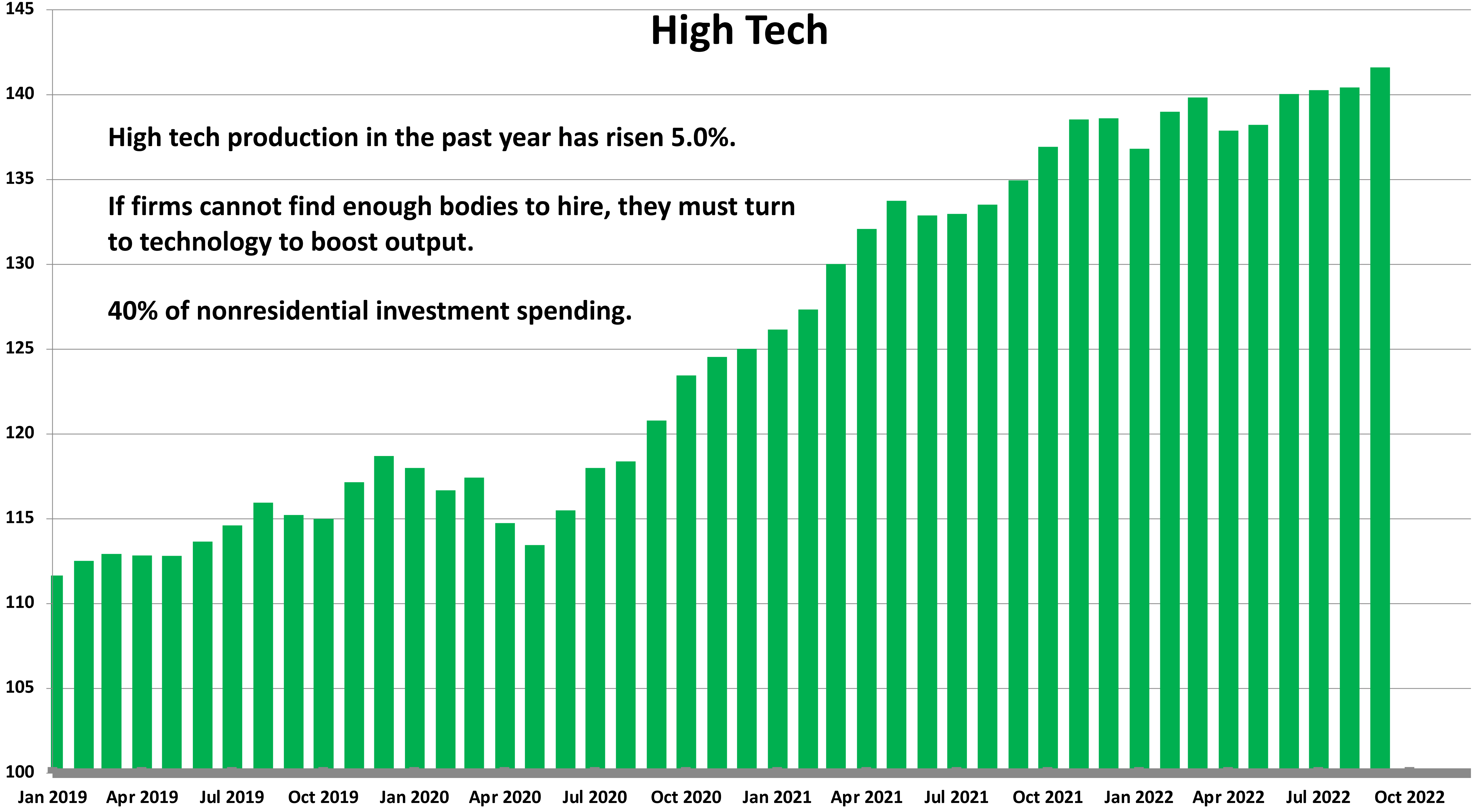
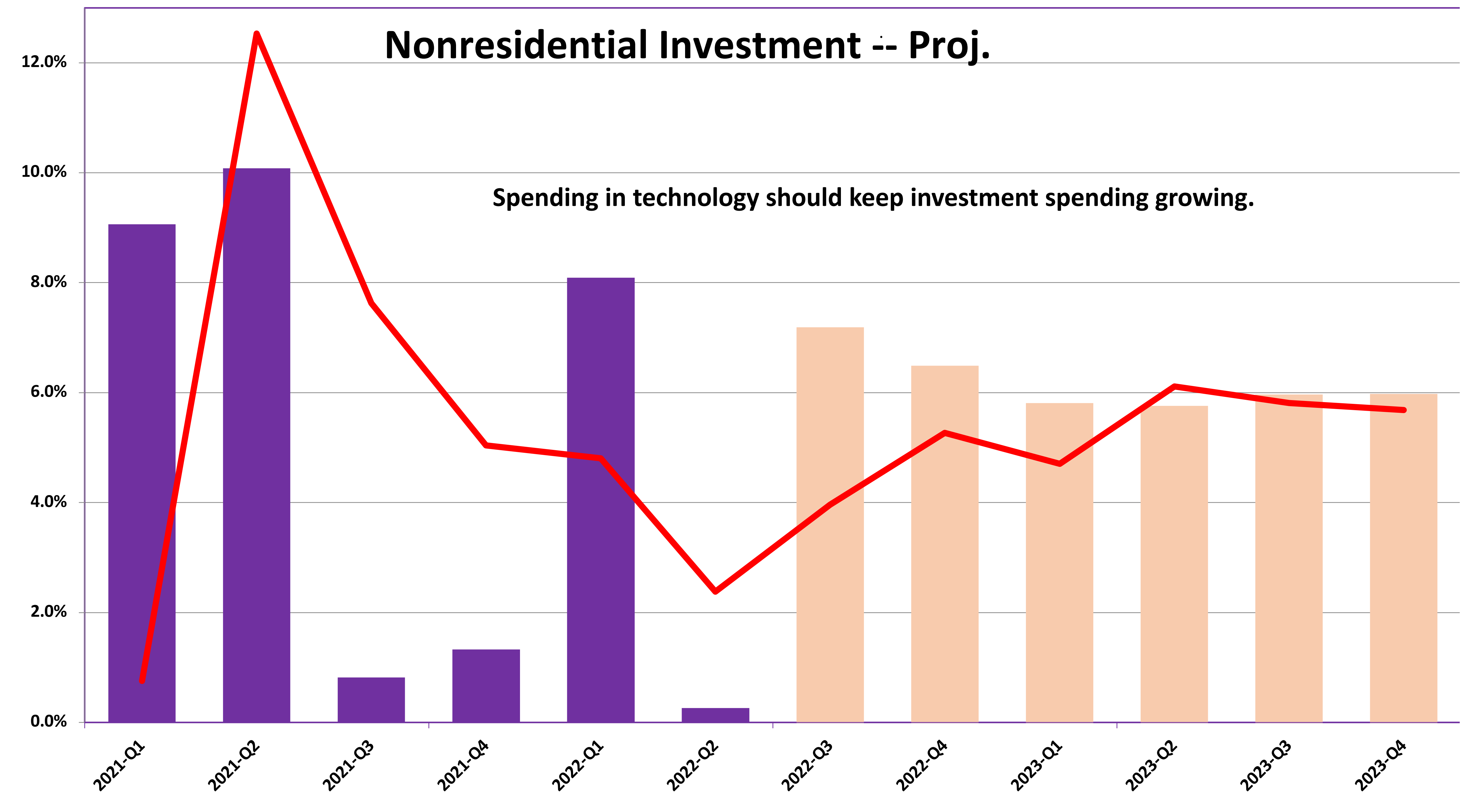
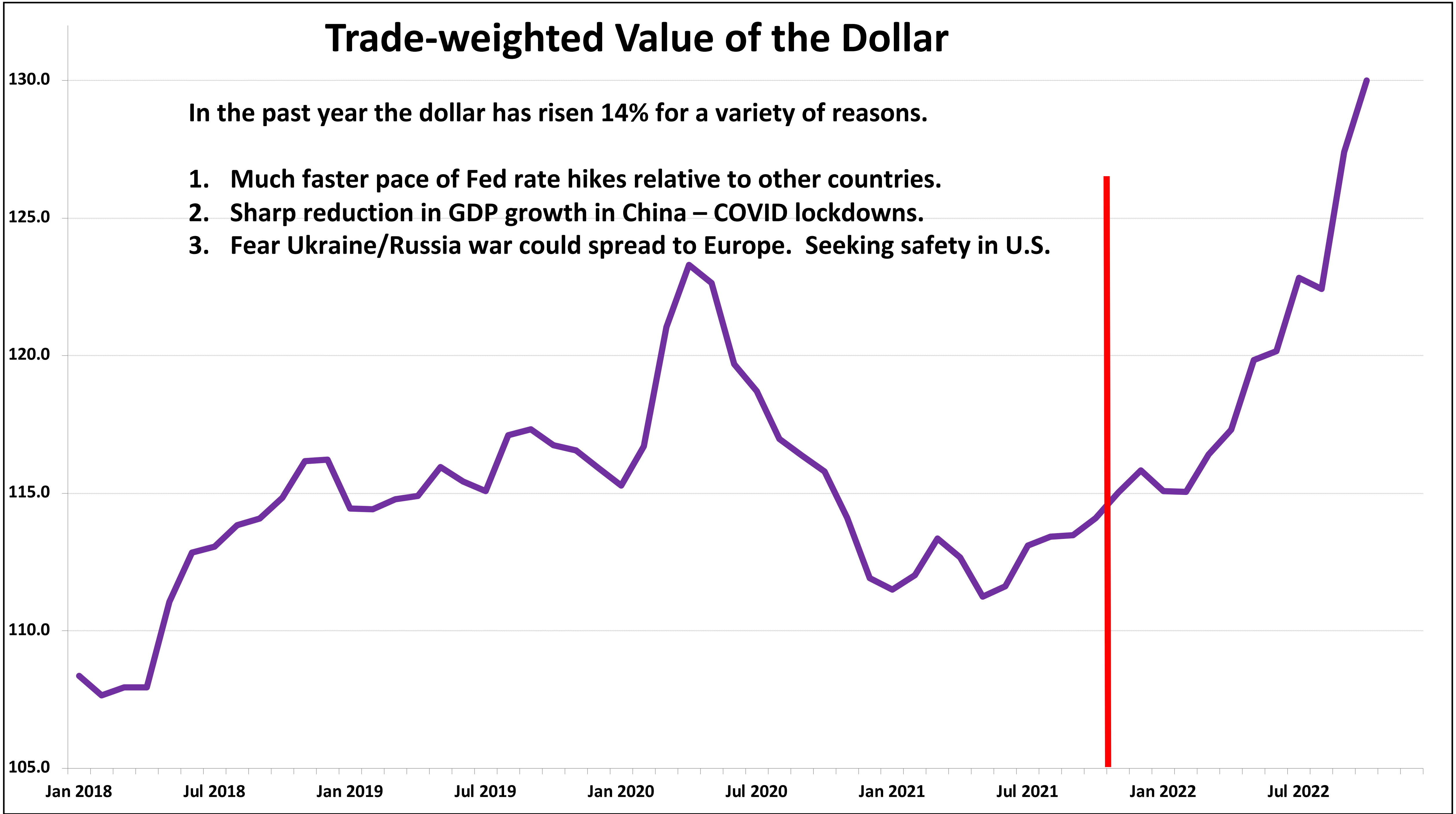
Nov 2022
Dec 2022


High Tech
High tech production in the past year has risen 5.0%.
If firms cannot find enough bodies to hire, they must turn to technology to boost output.
40% of nonresidential investment spending.
145
140
135
130
125
120
115
110
105
100
Jan 2019
Apr 2019
Jul 2019
Oct 2019
Jan 2020
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022


Nonresidential Investment -- Proj.
Spending in technology should keep investment spending growing.
12.0%
10.0%
8.0%
6.0%
4.0%
2.0%
0.0%
2021-Q1
2021-Q2
2021-Q3
2021-Q4
2022-Q1
2022-Q2
2022-Q3
2022-Q4
2023-Q1
2023-Q2
2023-Q3
2023-Q4

Trade.

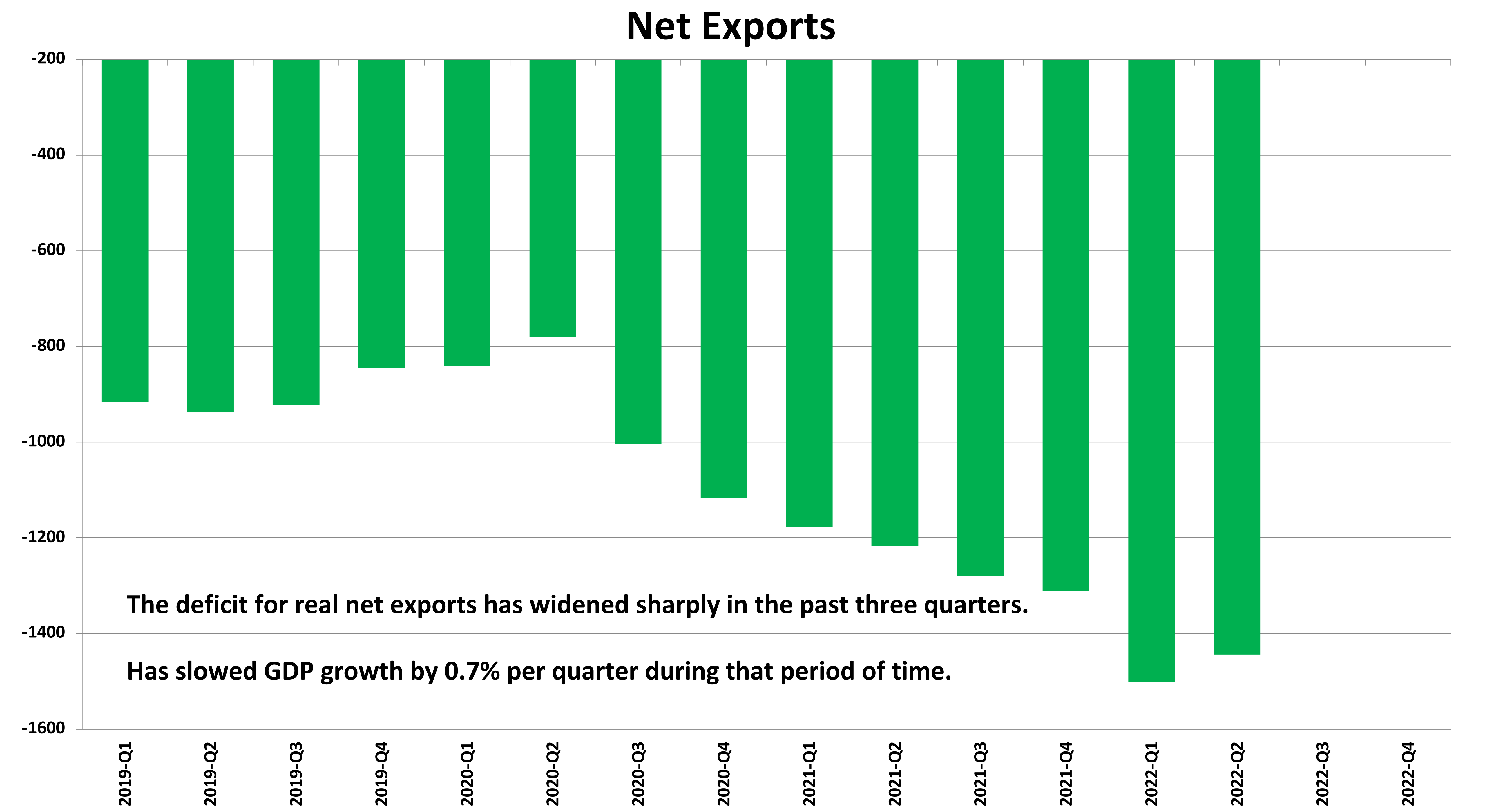

Trade-weighted Value of the Dollar
In the past year the dollar has risen 14% for a variety of reasons.
1. Much faster pace of Fed rate hikes relative to other countries.
2. Sharp reduction in GDP growth in China – COVID lockdowns.
3. Fear Ukraine/Russia war could spread to Europe. Seeking safety in U.S.
130.0
125.0
120.0
115.0
110.0
105.0
Jan 2018
Jul 2018
Jan 2019
Jul 2019
Jan 2020
Jul 2020
Jan 2021
Jul 2021
Jan 2022
Jul 2022

A stronger dollar does many things.

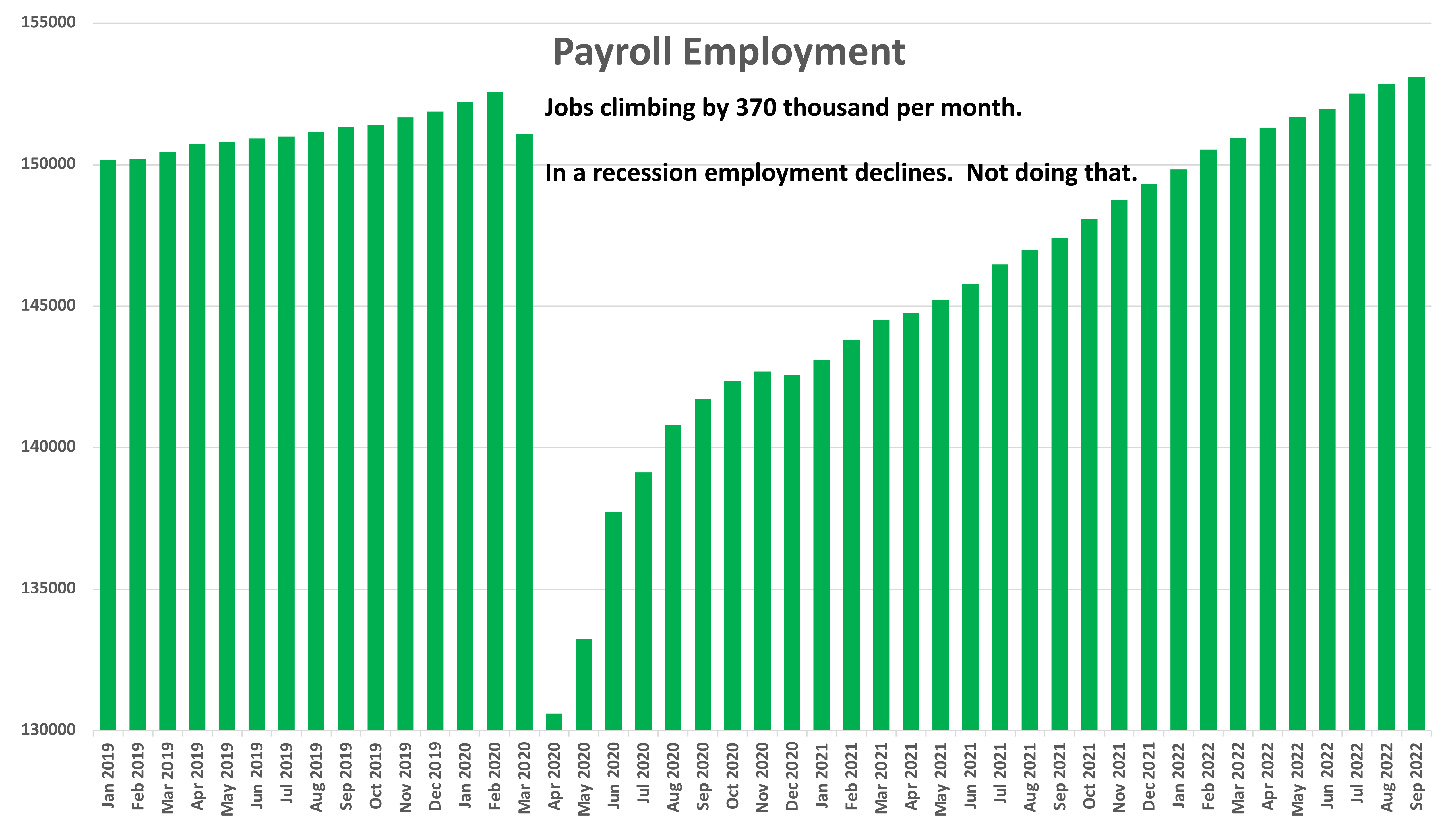
U.S. goods more expensive. Exports growth slows.

Imported goods cheaper. Faster growth imports.

Trade deficit widens. Drag on GDP growth.


Net Exports
-200
-400
-600
-800
-1000
-1200
-1400
-1600
The deficit for real net exports has widened sharply in the past three quarters.
Has slowed GDP growth by 0.7% per quarter during that period of time.
2019-Q1
2019-Q2
2019-Q3
2019-Q4
2020-Q1
2020-Q2
2020-Q3
2020-Q4
2021-Q1
2021-Q2
2021-Q3
2021-Q4
2022-Q1
2022-Q2
2022-Q3
2022-Q4

Employment.


Payroll Employment
Jobs climbing by 370 thousand per month.
In a recession employment declines. Not doing that.
155000
150000
145000
140000
135000
130000
Jan 2019
Feb 2019
Mar 2019
Apr 2019
May 2019
Jun 2019
Jul 2019
Aug 2019
Sep 2019
Oct 2019
Nov 2019
Dec 2019
Jan 2020
Feb 2020
Mar 2020
Apr 2020
May 2020
Jun 2020
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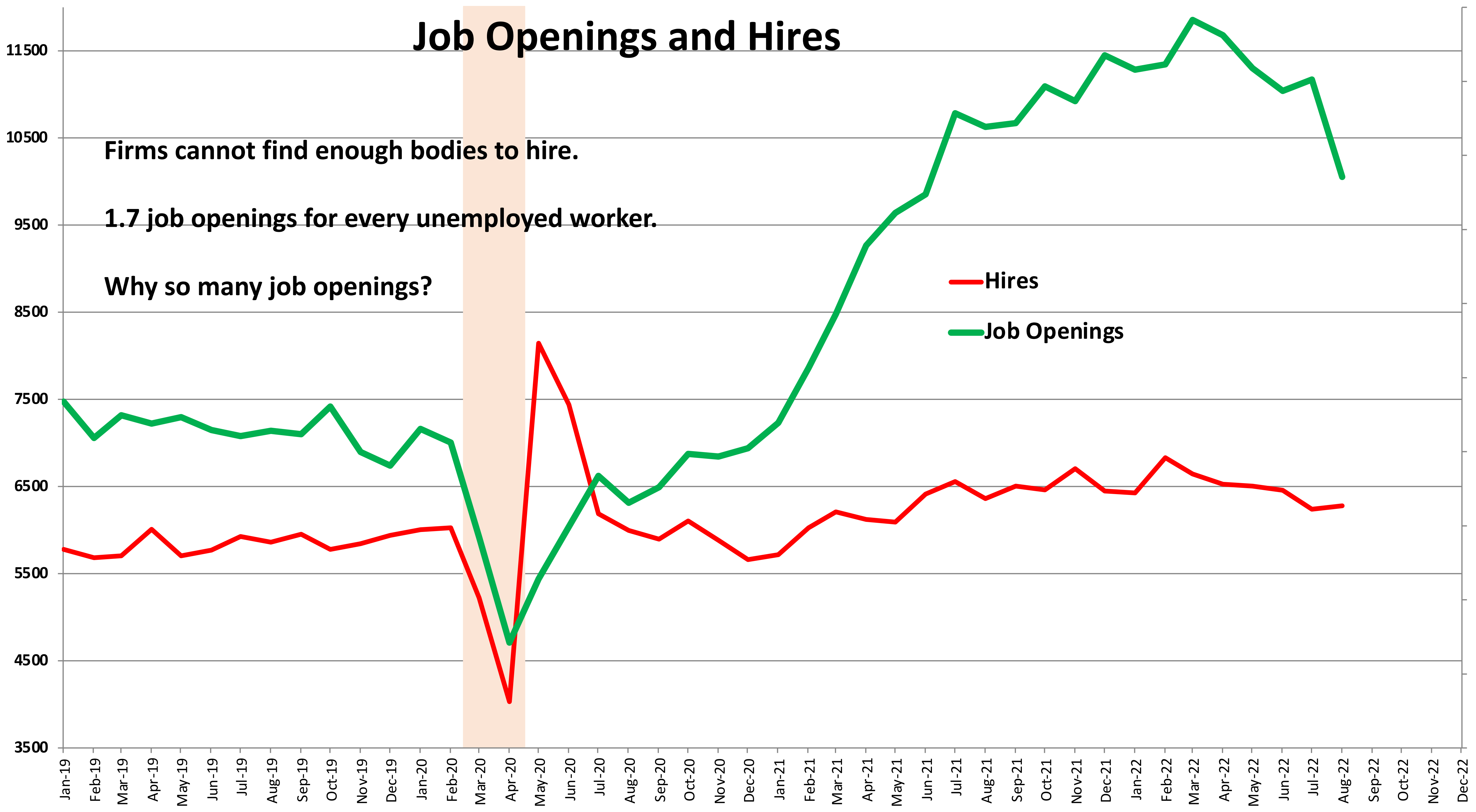
Jul 2022
Aug 2022
Sep 2022



Job Openings and Hires
Firms cannot find enough bodies to hire.
1.7 job openings for every unemployed worker.
Why so many job openings?
Hires
Job Openings
11500
10500
9500
8500
7500
6500
5500
4500
3500
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
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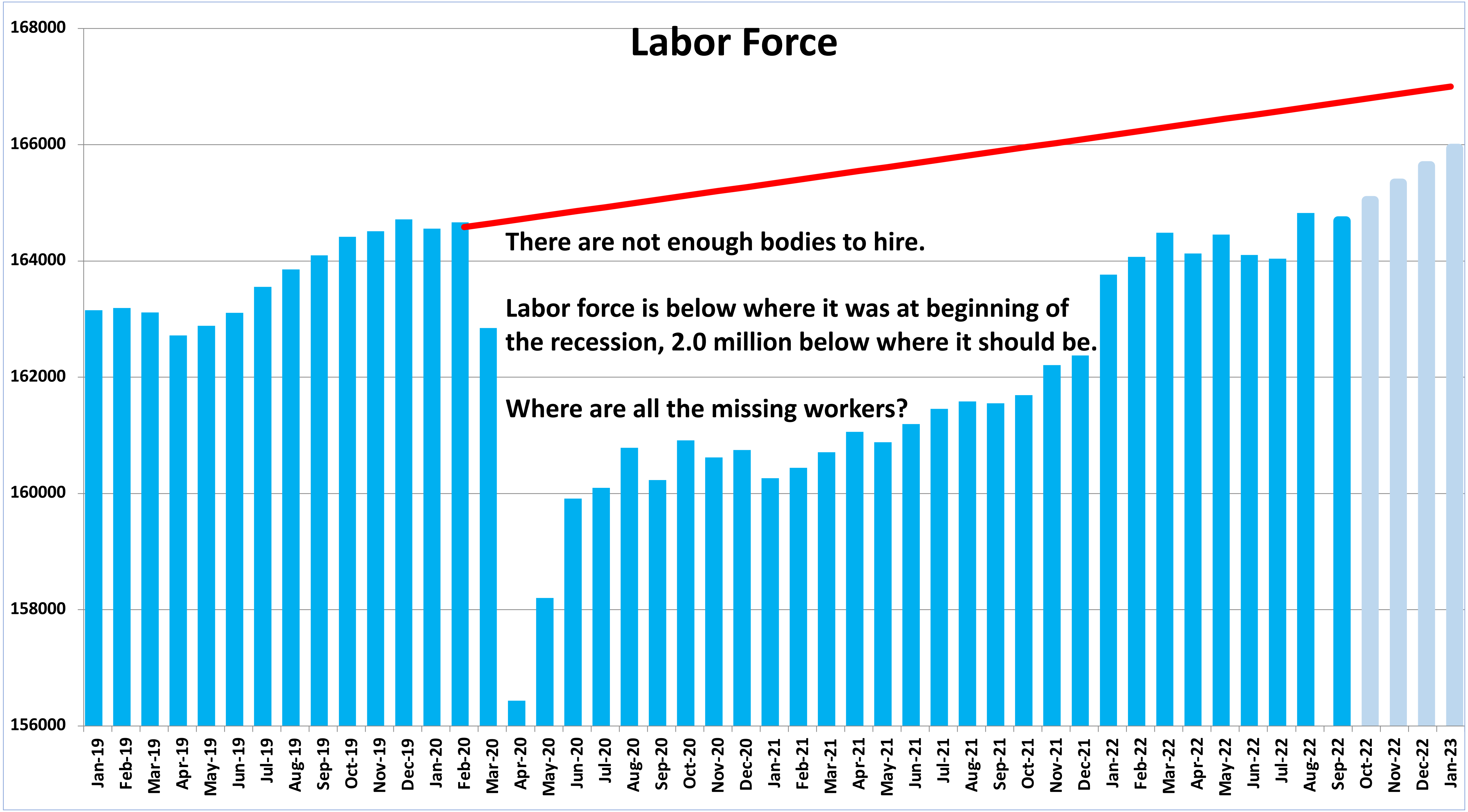
Nov-22
Dec-22


Labor Force
There are not enough bodies to hire.
Labor force is below where it was at beginning of the recession, 2.0 million below where it should be.
Where are all the missing workers?
168000
166000
164000
162000
160000
158000
156000
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
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May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22
Jan-23

2.0 million missing workers.

1. 1.0 million retired. Rising stock market and home prices.

2. Younger workers became tired of lousy pay, long hours, bad working conditions.

3. Many may return to work as the year progresses.

4. Stock prices have declined. Others will get bored.

5. Stimulus money runs out. Low wage jobs now pay lots more.


Unemployment Rate
We expect the economy to generate 1.5 million jobs by end of 2023 or 215 thousand per month (versus about 370 thousand currently).
If so, the current 3.5% unemployment rate should rise to 4.0% by end of 2023. But 4.0% is supposed to be full employment.
Everybody who wants a job still has one. Not high enough to reduce inflation.
Full Employment
15.0
14.0
13.0
12.0
11.0
10.0
9.0
8.0
7.0
6.0
5.0
4.0
3.0
Jan-20
Mar-20
May-20
Jul-20
Sep-20
Nov-20
Jan-21
Mar-21
May-21
Jul-21
Sep-21
Nov-21
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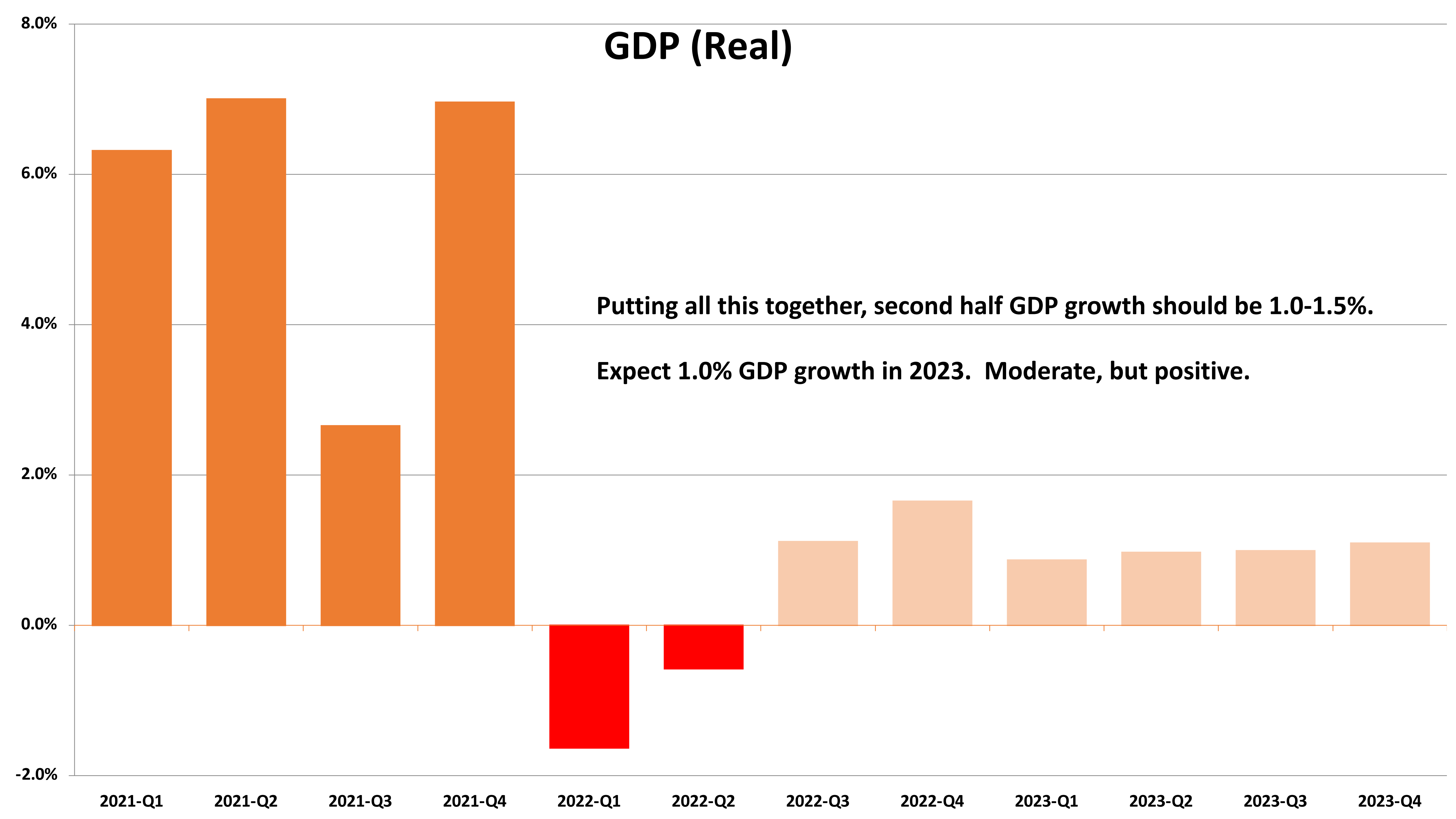
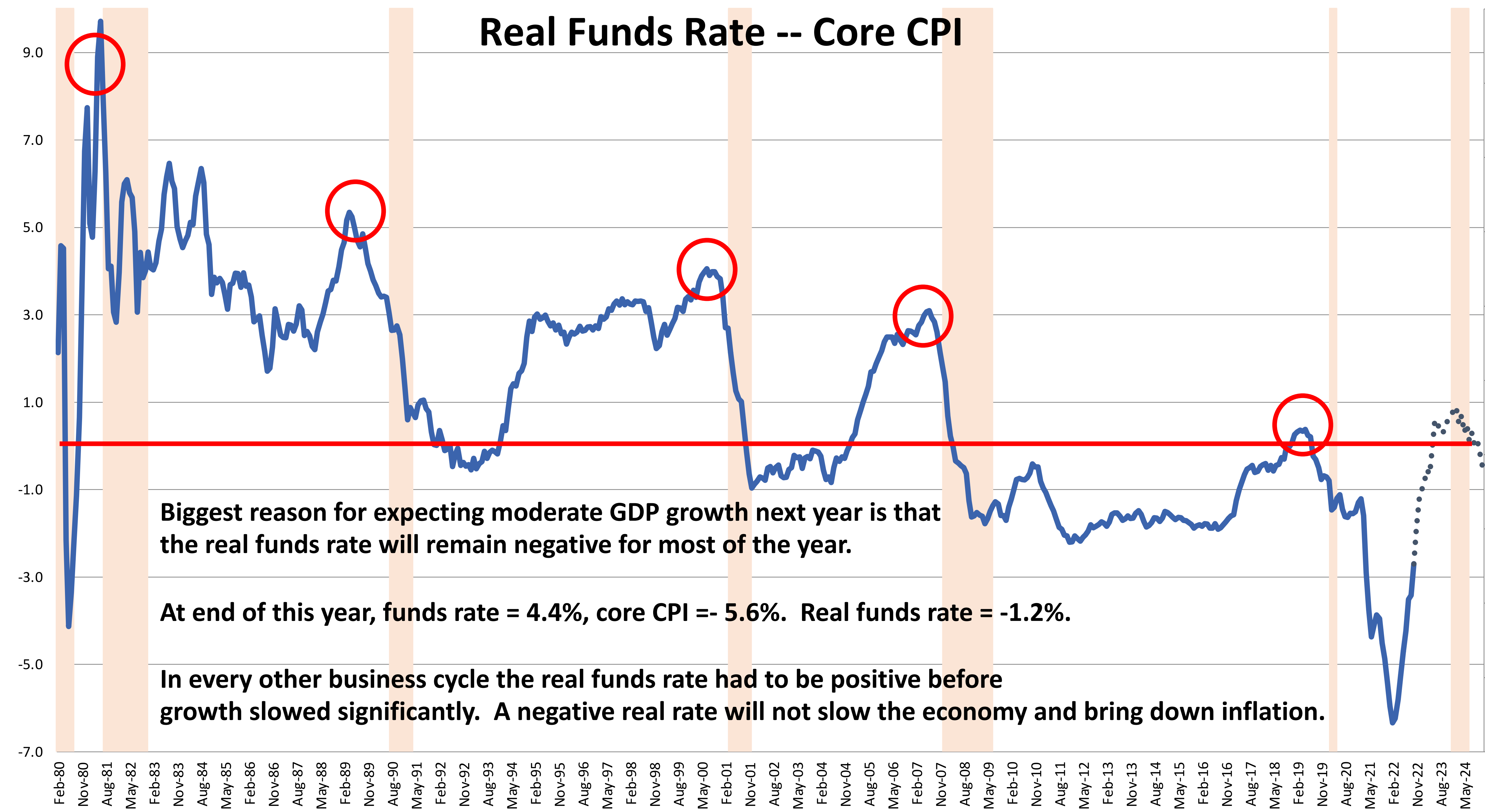
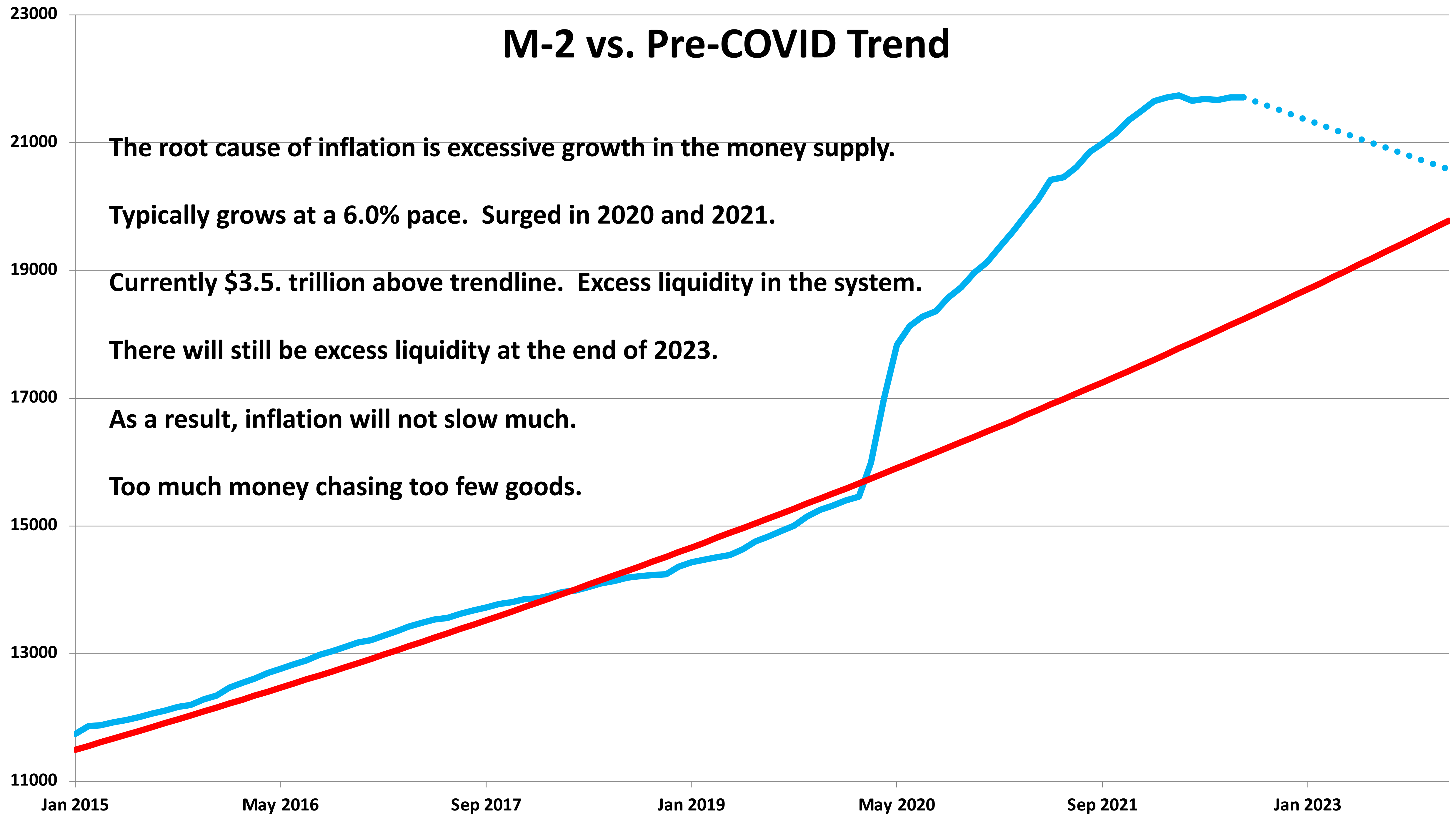
Jul-23
Sep-23
Nov-23

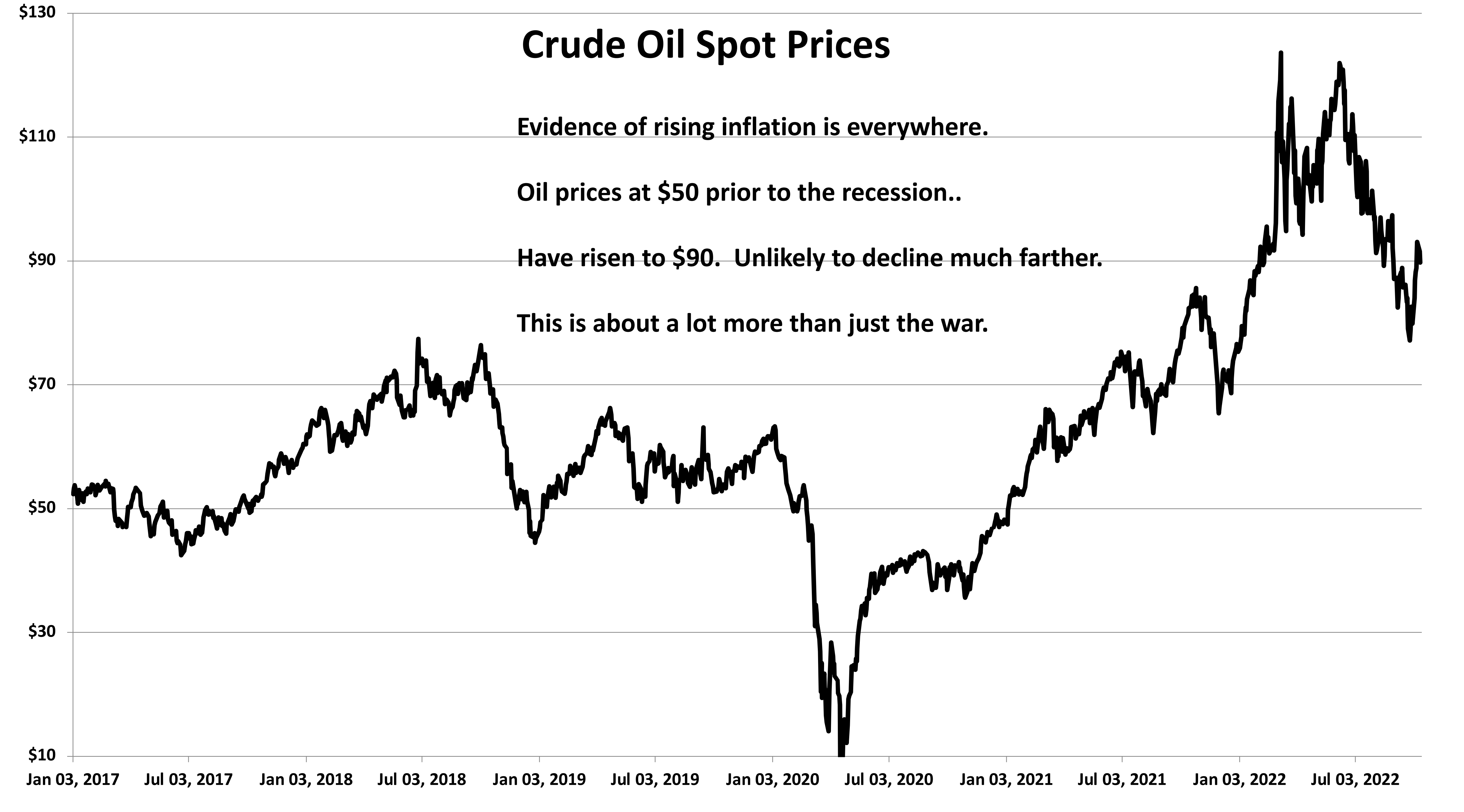


GDP (Real)
Putting all this together, second half GDP growth should be 1.0-1.5%.
Expect 1.0% GDP growth in 2023. Moderate, but positive.
8.0%
6.0%
4.0%
2.0%
0.0%
-2.0%
2021-Q1
2021-Q2
2021-Q3
2021-Q4
2022-Q1
2022-Q2
2022-Q3
2022-Q4
2023-Q1
2023-Q2
2023-Q3
2023-Q4

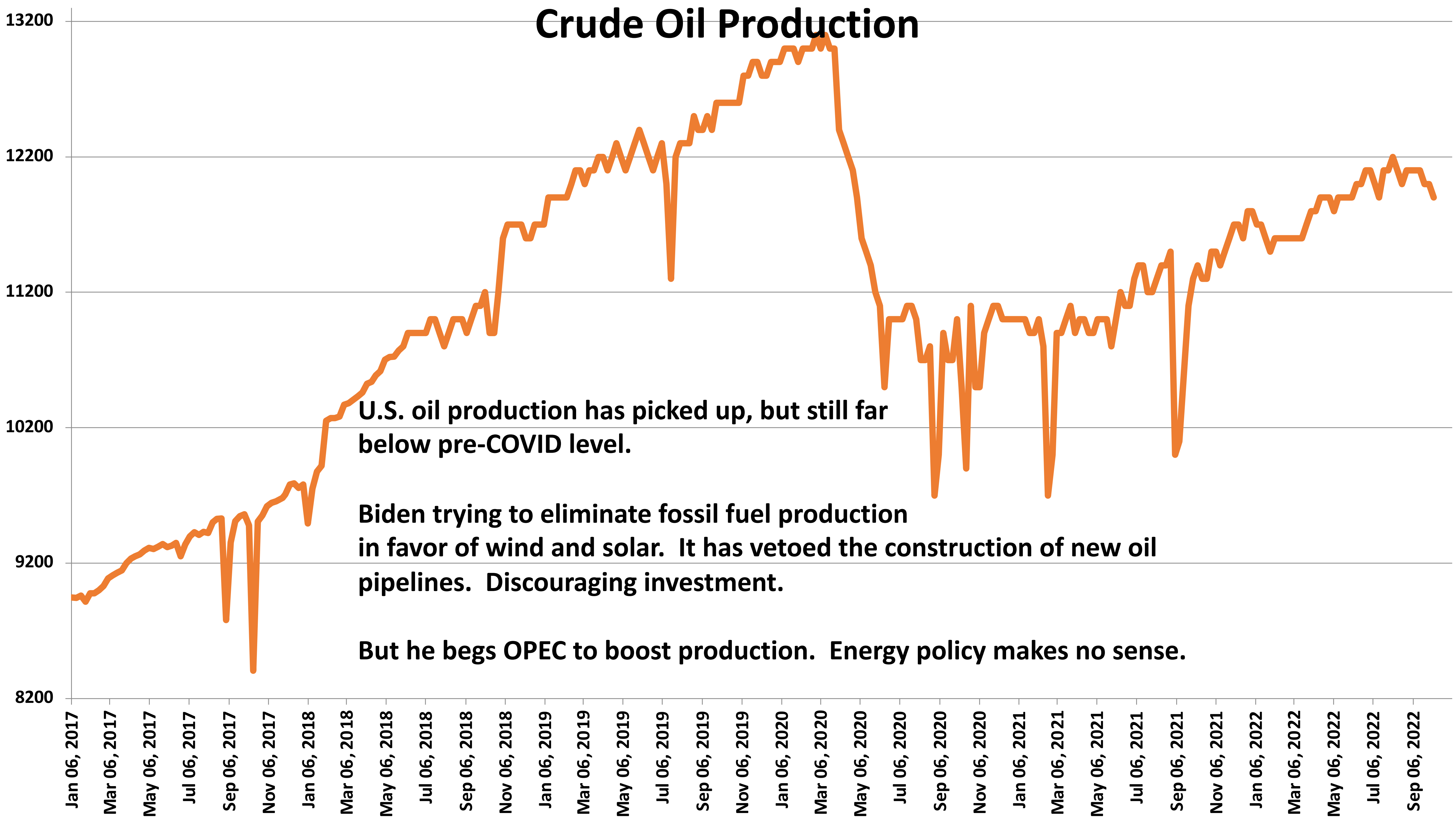

Real Funds Rate -- Core CPI
Biggest reason for expecting moderate GDP growth next year is that the real funds rate will remain negative for most of the year.
At end of this year, funds rate = 4.4%, core CPI =- 5.6%. Real funds rate = -1.2%.
In every other business cycle the real funds rate had to be positive before growth slowed significantly. A negative real rate will not slow the economy and bring down inflation.
9.0
7.0
5.0
3.0
1.0
-1.0
-3.0
-5.0
-7.0
Feb-80
Nov-80
Aug-81
May-82
Feb-83
Nov-83
Aug-84
May-85
Feb-86
Nov-86
Aug-87
May-88
Feb-89
Nov-89
Aug-90
May-91
Feb-92
Nov-92
Aug-93
May-94
Feb-95
Nov-95
Aug-96
May-97
Feb-98
Nov-98
Aug-99
May-00
Feb-01
Nov-01
Aug-02
May-03
Feb-04
Nov-04
Aug-05
May-06
Feb-07
Nov-07
Aug-08
May-09
Feb-10
Nov-10
Aug-11
May-12
Feb-13
Nov-13
Aug-14
May-15
Feb-16
Nov-16
Aug-17
May-18
Feb-19
Nov-19
Aug-20
May-21
Feb-22
Nov-22
Aug-23
May-24

Inflation.

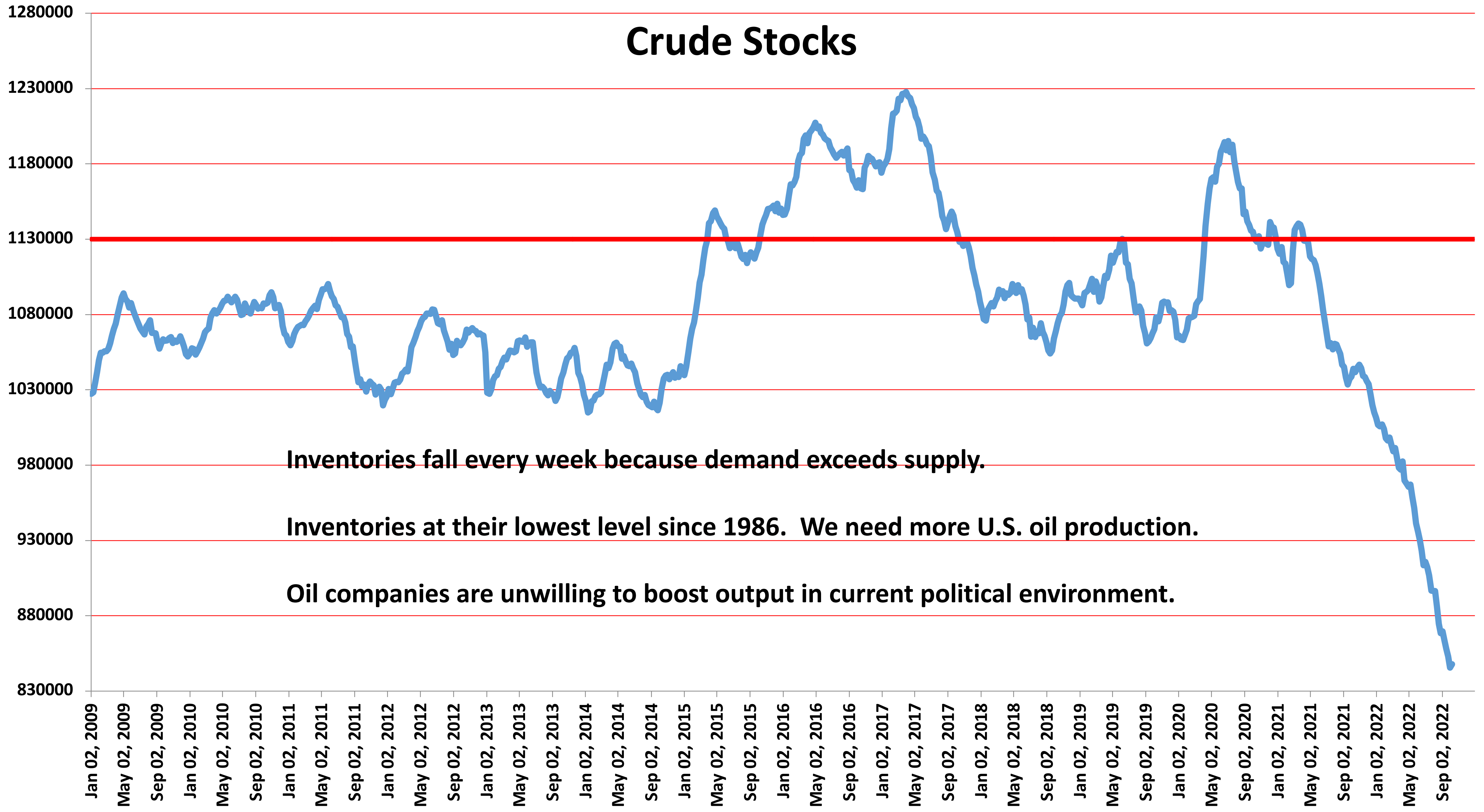

M-2 vs. Pre-COVID Trend
The root cause of inflation is excessive growth in the money supply.
Typically grows at a 6.0% pace. Surged in 2020 and 2021.
Currently $3.5. trillion above trendline. Excess liquidity in the system.
There will still be excess liquidity at the end of 2023.
As a result, inflation will not slow much.
Too much money chasing too few goods.
23000
21000
19000
17000
15000
13000
11000
Jan 2015
May 2016
Sep 2017
Jan 2019
May 2020
Sep 2021
Jan 2023

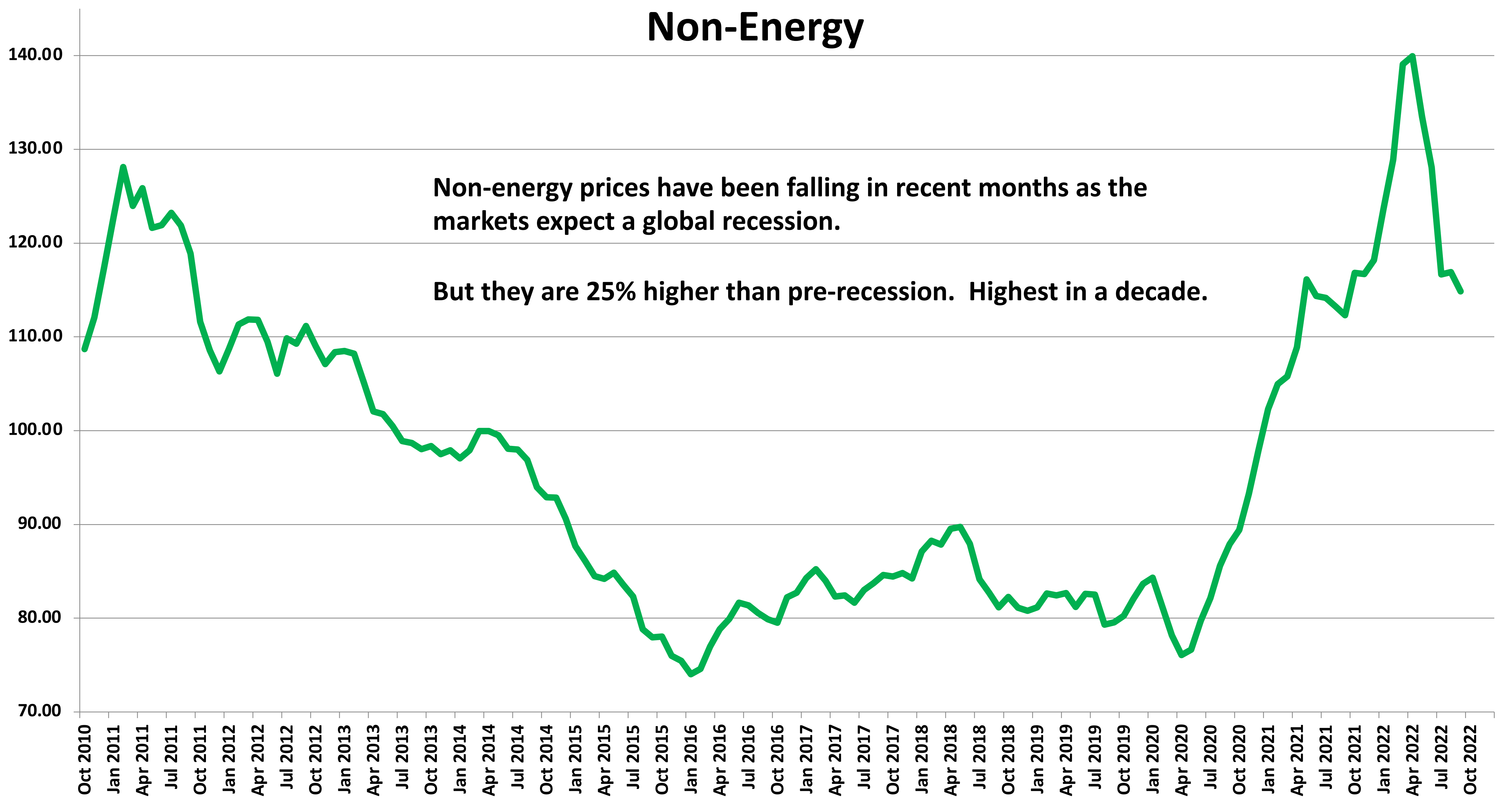


Crude Oil Spot Prices
Evidence of rising inflation is everywhere.
Oil prices at $50 prior to the recession..
Have risen to $90. Unlikely to decline much farther.
This is about a lot more than just the war.
$130
$110
$90
$70
$50
$30
$10
Jan 03, 2017
Jul 03, 2017
Jan 03, 2018
Jul 03, 2018
Jan 03, 2019
Jul 03, 2019
Jan 03, 2020
Jul 03, 2020
Jan 03, 2021
Jul 03, 2021
Jan 03, 2022
Jul 03, 2022

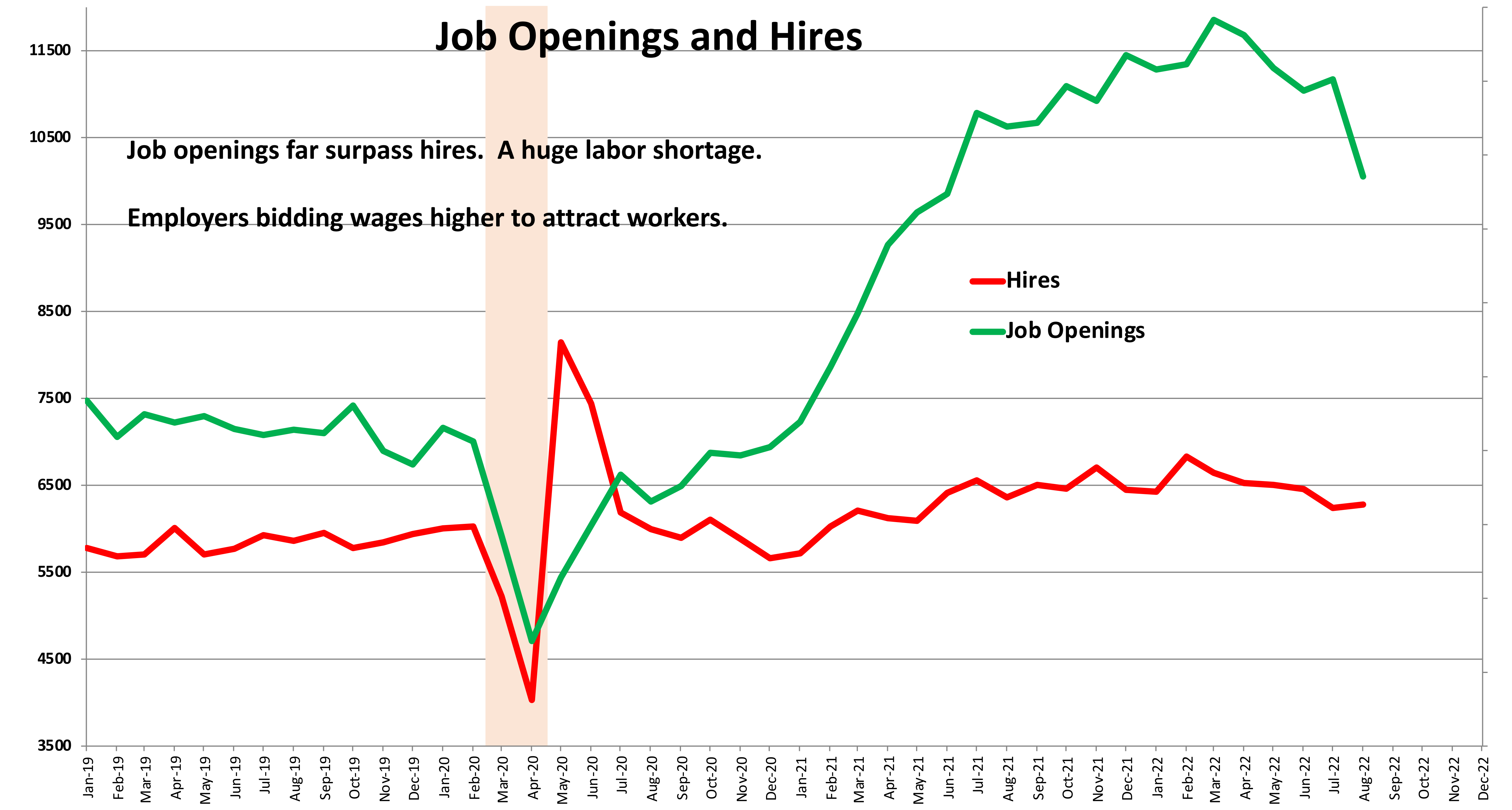


Crude Oil Production
13200
12200
11200
10200
9200
8200
U.S. oil production has picked up, but still far below pre-COVID level.
Biden trying to eliminate fossil fuel production in favor of wind and solar. It has vetoed the construction of new oil pipelines. Discouraging investment.
But he begs OPEC to boost production. Energy policy makes no sense.
Jan 06, 2017
Mar 06, 2017
May 06, 2017
Jul 06, 2017
Sep 06, 2017
Nov 06, 2017
Jan 06, 2018
Mar 06, 2018
May 06, 2018
Jul 06, 2018
Sep 06, 2018
Nov 06, 2018
Jan 06, 2019
Mar 06, 2019
May 06, 2019
Jul 06, 2019
Sep 06, 2019
Nov 06, 2019
Jan 06, 2020
Mar 06, 2020
May 06, 2020
Jul 06, 2020
Sep 06, 2020
Nov 06, 2020
Jan 06, 2021
Mar 06, 2021
May 06, 2021
Jul 06, 2021
Sep 06, 2021
Nov 06, 2021
Jan 06, 2022
Mar 06, 2022
May 06, 2022
Jul 06, 2022
Sep 06, 2022


Crude Stocks
Inventories fall every week because demand exceeds supply.
Inventories at their lowest level since 1986. We need more U.S. oil production.
Oil companies are unwilling to boost output in current political environment.
1280000
1230000
1180000
1130000
1080000
1030000
980000
930000
880000
830000
Jan 02, 2009
May 02, 2009
Sep 02, 2009
Jan 02, 2010
May 02, 2010
Sep 02, 2010
Jan 02, 2011
May 02, 2011
Sep 02, 2011
Jan 02, 2012
May 02, 2012
Sep 02, 2012
Jan 02, 2013
May 02, 2013
Sep 02, 2013
Jan 02, 2014
May 02, 2014
Sep 02, 2014
Jan 02, 2015
May 02, 2015
Sep 02, 2015
Jan 02, 2016
May 02, 2016
Sep 02, 2016
Jan 02, 2017
May 02, 2017
Sep 02, 2017
Jan 02, 2018
May 02, 2018
Sep 02, 2018
Jan 02, 2019
May 02, 2019
Sep 02, 2019
Jan 02, 2020
May 02, 2020
Sep 02, 2020
Jan 02, 2021
May 02, 2021
Sep 02, 2021
Jan 02, 2022
May 02, 2022
Sep 02, 2022


Non-Energy
Non-energy prices have been falling in recent months as the markets expect a global recession.
But they are 25% higher than pre-recession. Highest in a decade.
140.00
130.00
120.00
110.00
100.00
90.00
80.00
70.00
Oct 2010
Jan 2011
Apr 2011
Jul 2011
Oct 2011
Jan 2012
Apr 2012
Jul 2012
Oct 2012
Jan 2013
Apr 2013
Jul 2013
Oct 2013
Jan 2014
Apr 2014
Jul 2014
Oct 2014
Jan 2015
Apr 2015
Jul 2015
Oct 2015
Jan 2016
Apr 2016
Jul 2016
Oct 2016
Jan 2017
Apr 2017
Jul 2017
Oct 2017
Jan 2018
Apr 2018
Jul 2018
Oct 2018
Jan 2019
Apr 2019
Jul 2019
Oct 2019
Jan 2020
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022


Food
Food prices have risen 11.0% in the past year.
Ukraine is a big exporter of corn and wheat.
Fires and drought in the West will curtail crop production.
Food prices not coming down.
13.0%
11.0%
9.0%
7.0%
5.0%
3.0%
1.0%
Jan 2019
Apr 2019
Jul 2019
Oct 2019
Jan 2020
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022


Job Openings and Hires
Job openings far surpass hires. A huge labor shortage.
Employers bidding wages higher to attract workers.
Hires
Job Openings
11500
10500
9500
8500
7500
6500
5500
4500
3500
Jan-19
Feb-19
Mar-19
Apr-19
May-19
Jun-19
Jul-19
Aug-19
Sep-19
Oct-19
Nov-19
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
May-21
Jun-21
Jul-21
Aug-21
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
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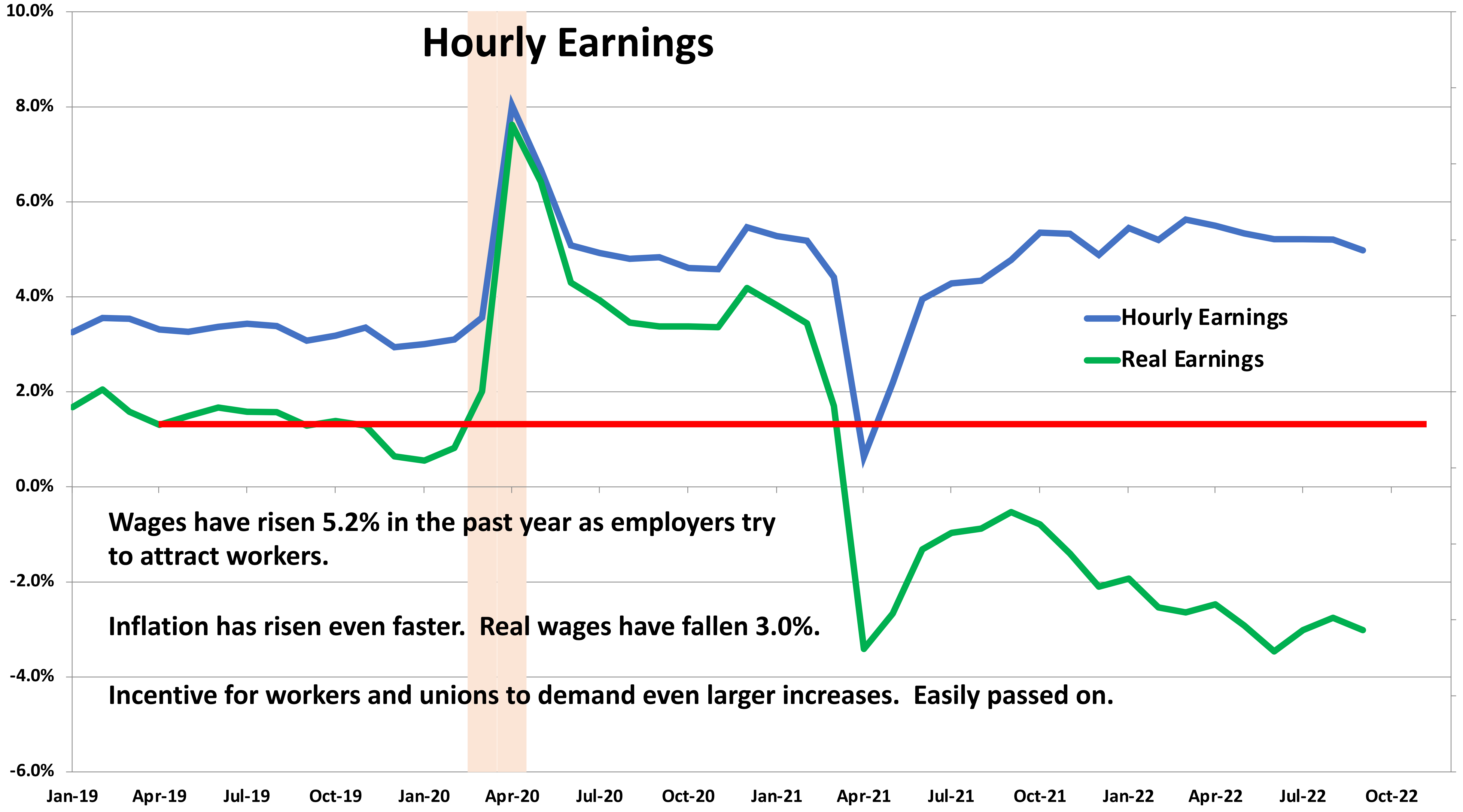
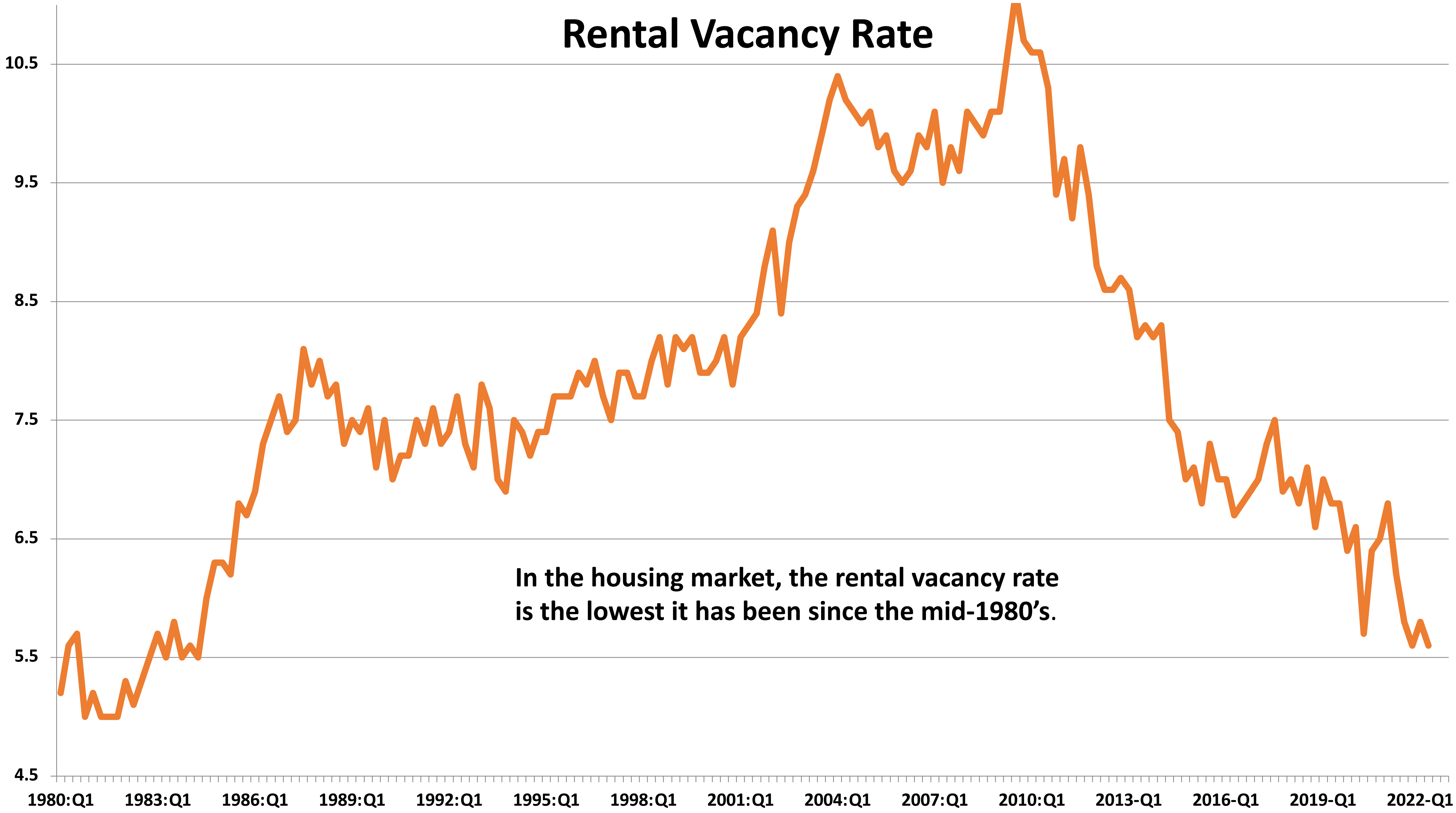
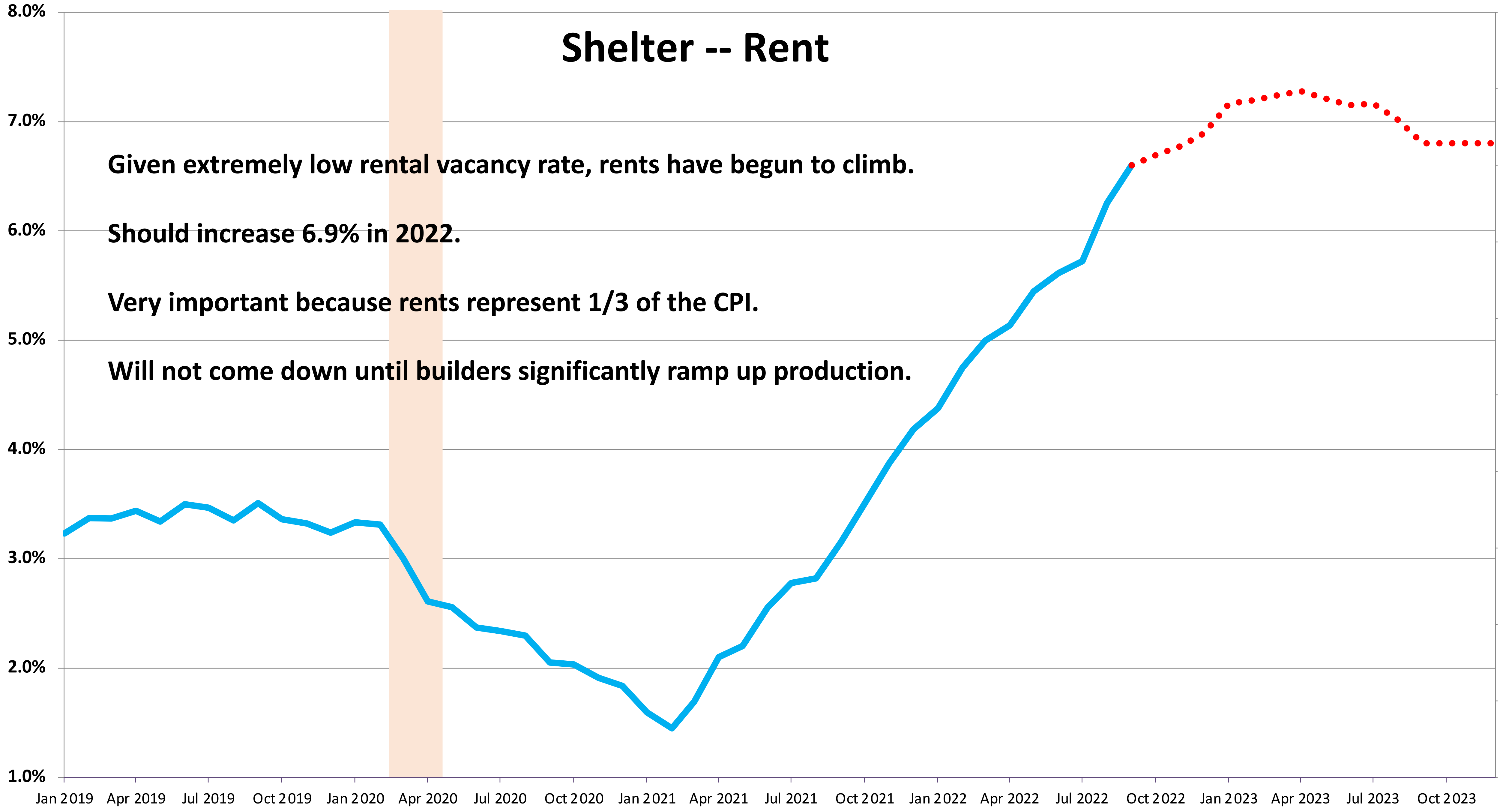
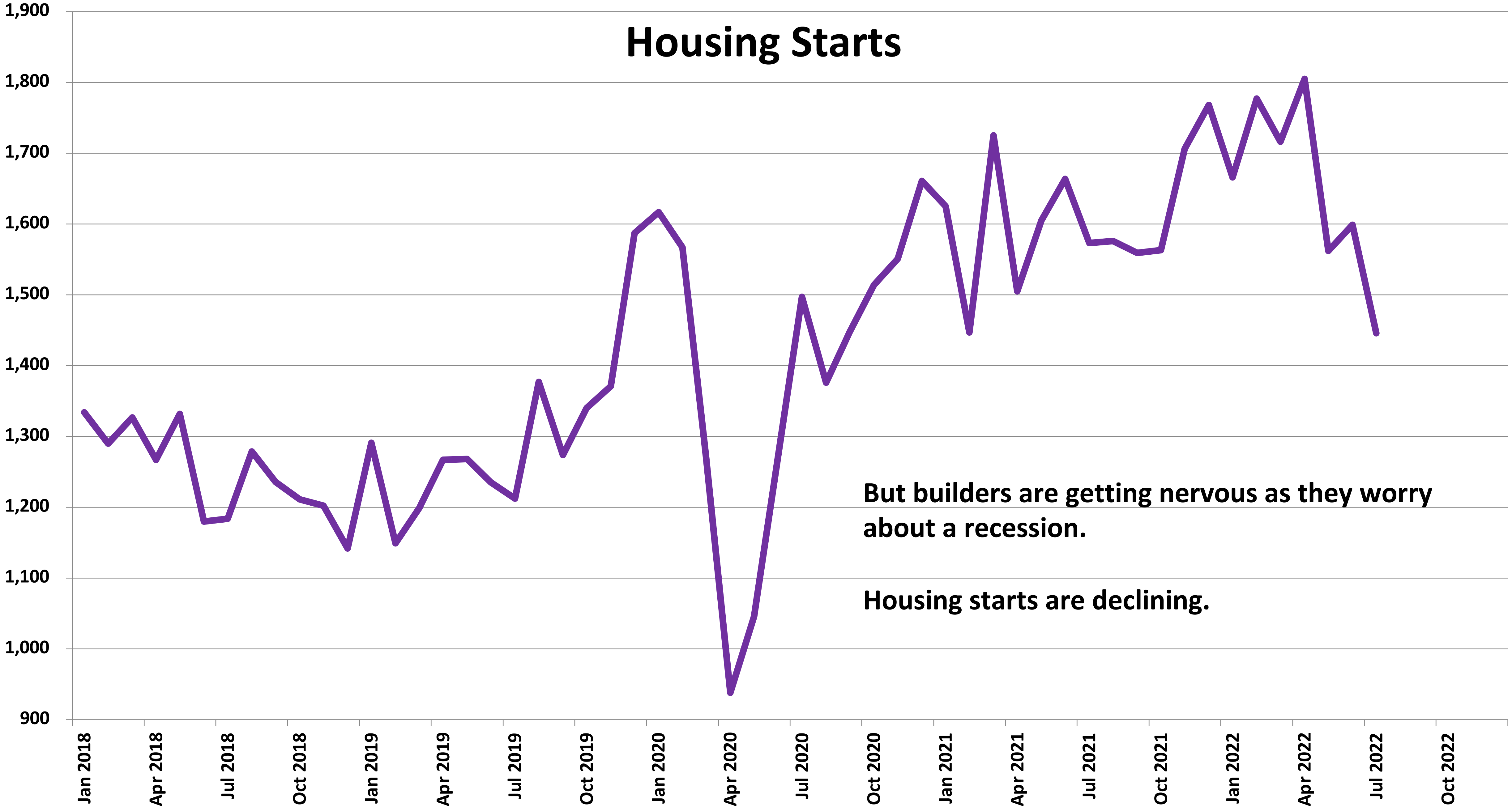
Oct-22
Nov-22
Dec-22

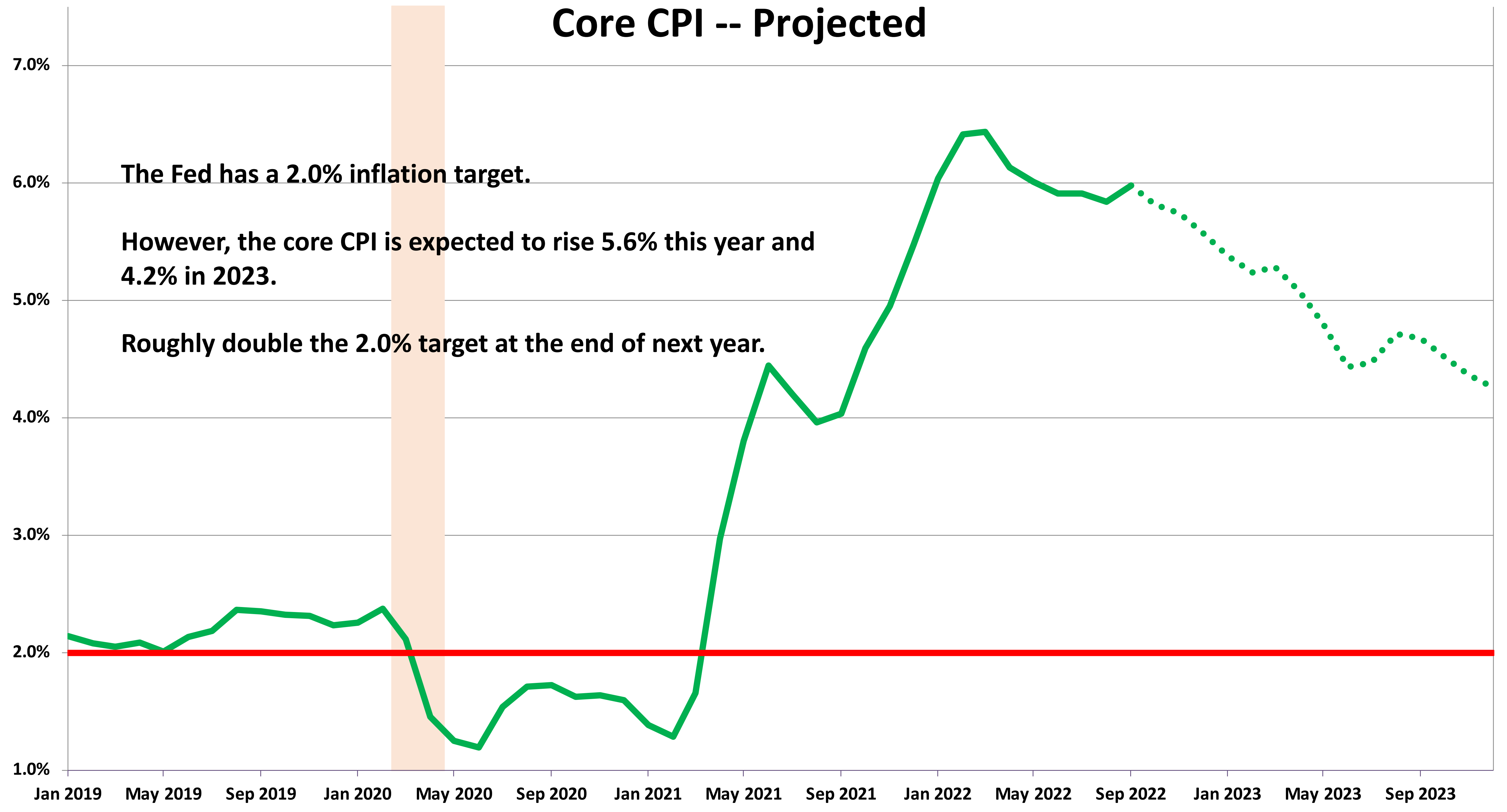

Hourly Earnings
10.0%
8.0%
6.0%
4.0%
2.0%
0.0%
-2.0%
-4.0%
-6.0%
Hourly Earnings
Real Earnings
Wages have risen 5.2% in the past year as employers try to attract workers.
Inflation has risen even faster. Real wages have fallen 3.0%.
Incentive for workers and unions to demand even larger increases. Easily passed on.
Jan-19
Apr-19
Jul-19
Oct-19
Jan-20
Apr-20
Jul-20
Oct-20
Jan-21
Apr-21
Jul-21
Oct-21
Jan-22
Apr-22
Jul-22
Oct-22


Rental Vacancy Rate
10.5
9.5
8.5
7.5
6.5
5.5
4.5
1980:Q1
1983:Q1
1986:Q1
1989:Q1
1992:Q1
1995:Q1
1998:Q1
2001:Q1
2004:Q1
2007:Q1
2010:Q1
2013-Q1
2016-Q1
2019-Q1
2022-Q1
In the housing market, the rental vacancy rate
is the lowest it has been since the mid-1980’s.


Shelter -- Rent
Given extremely low rental vacancy rate, rents have begun to climb.
Should increase 6.9% in 2022.
Very important because rents represent 1/3 of the CPI.
Will not come down until builders significantly ramp up production.
8.0%
7.0%
6.0%
5.0%
4.0%
3.0%
2.0%
1.0%
Jan 2019
Apr 2019
Jul 2019
Oct 2019
Jan 2020
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022
Jan 2023
Apr 2023
Jul 2023
Oct 2023



Housing Starts
But builders are getting nervous as they worry about a recession.
Housing starts are declining.
1,900
1,800
1,700
1,600
1,500
1,400
1,300
1,200
1,100
1,000
900
Jan 2018
Apr 2018
Jul 2018
Oct 2018
Jan 2019
Apr 2019
Jul 2019
Oct 2019
Jan 2020
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022



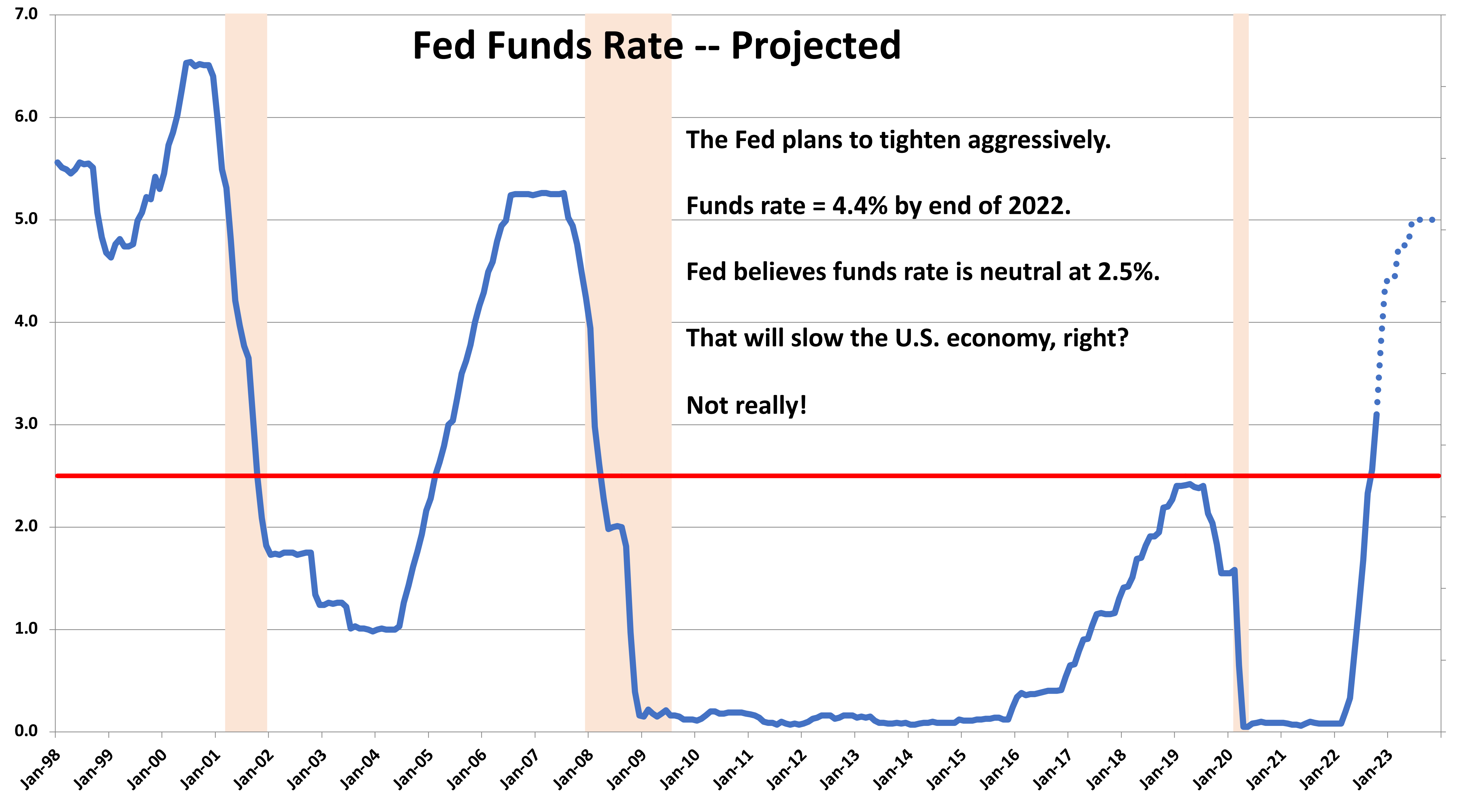
Core CPI -- Projected
7.0%
6.0%
5.0%
4.0%
3.0%
2.0%
1.0%
The Fed has a 2.0% inflation target.
However, the core CPI is expected to rise 5.6% this year and 4.2% in 2023.
Roughly double the 2.0% target at the end of next year.
Jan 2019
May 2019
Sep 2019
Jan 2020
May 2020
Sep 2020
Jan 2021
May 2021
Sep 2021
Jan 2022
May 2022
Sep 2022
Jan 2023
May 2023
Sep 2023

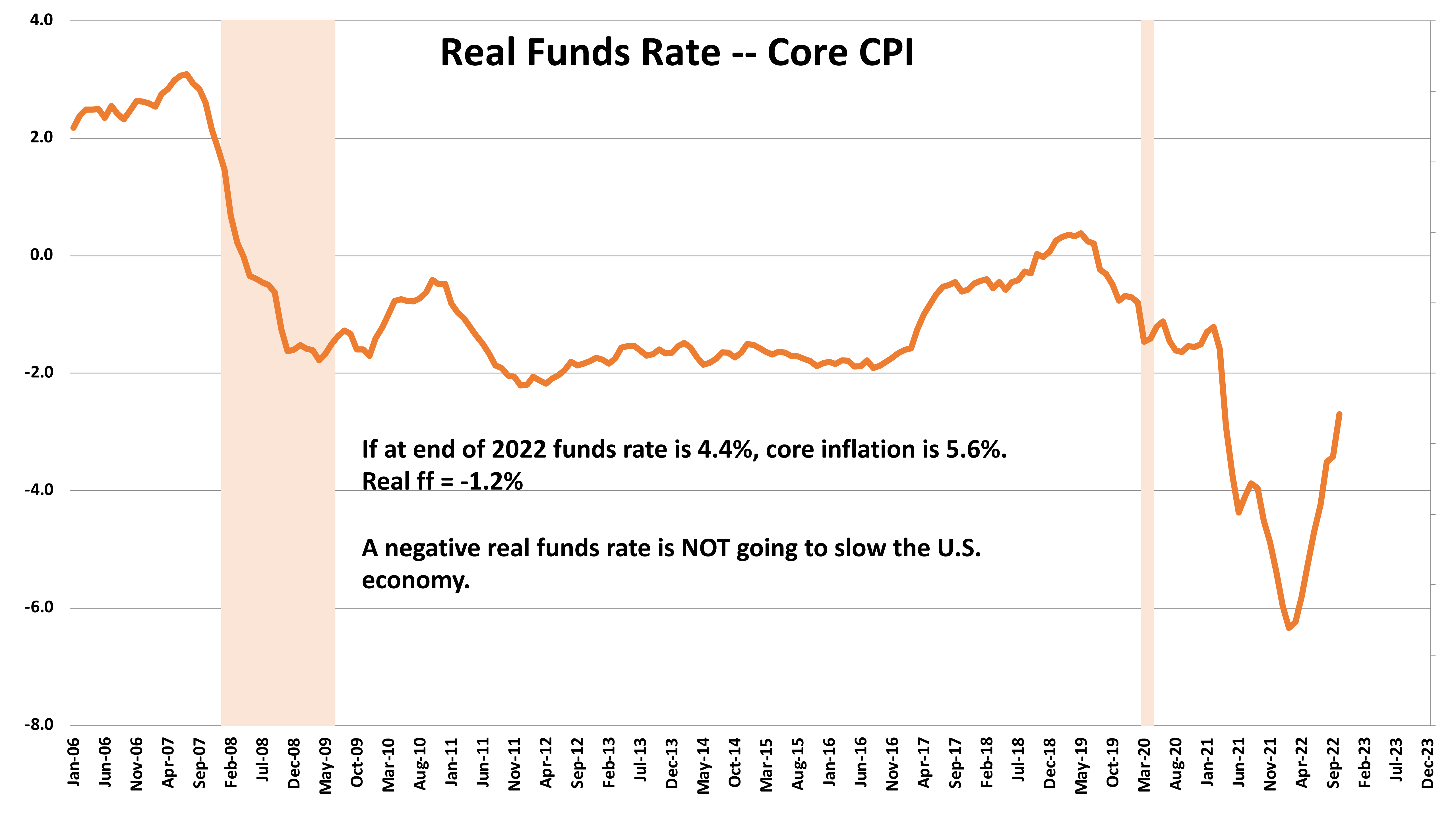
How will the Fed respond to this?

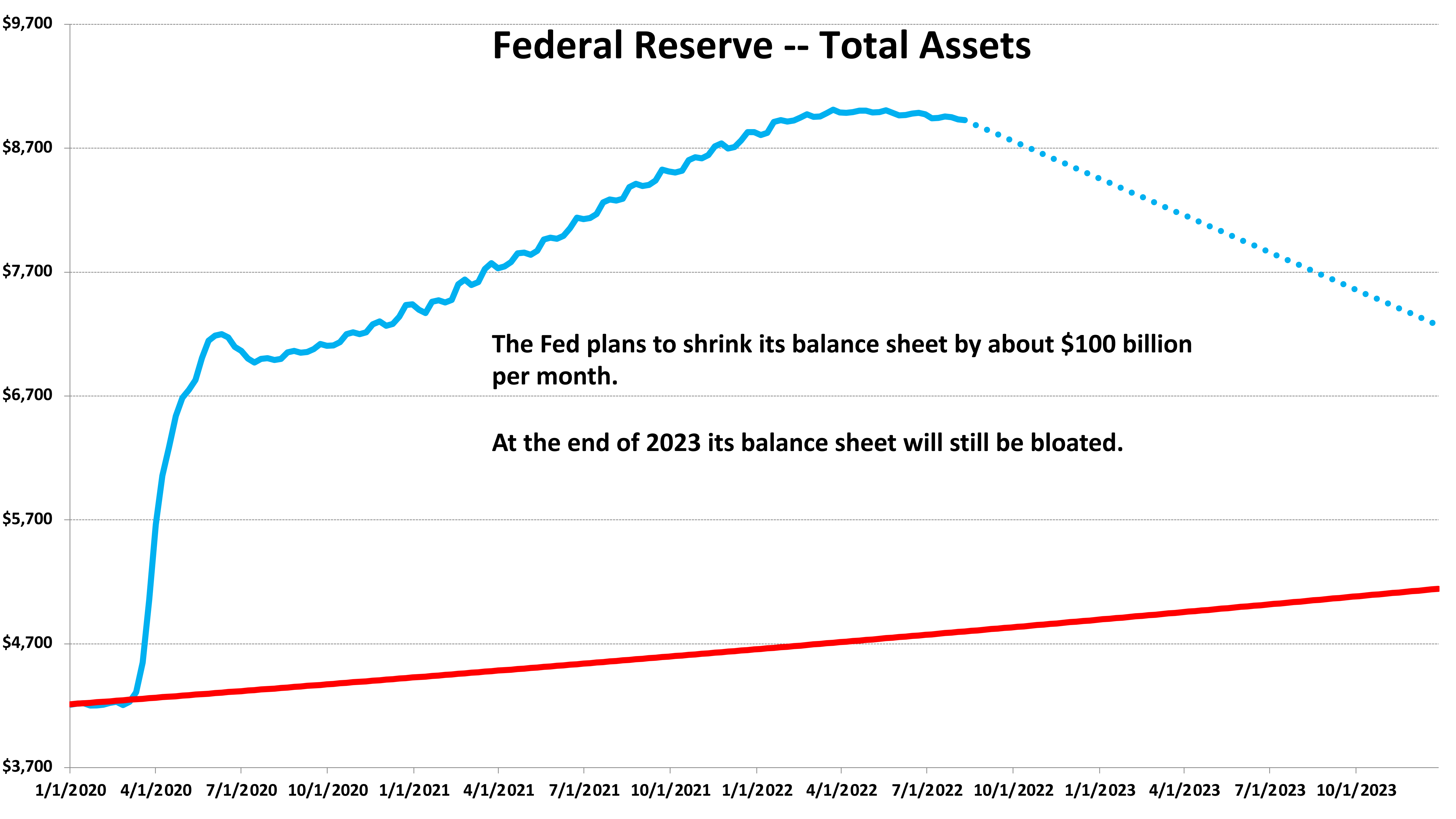
The Fed plans to:

1. Raise the fed funds rate.

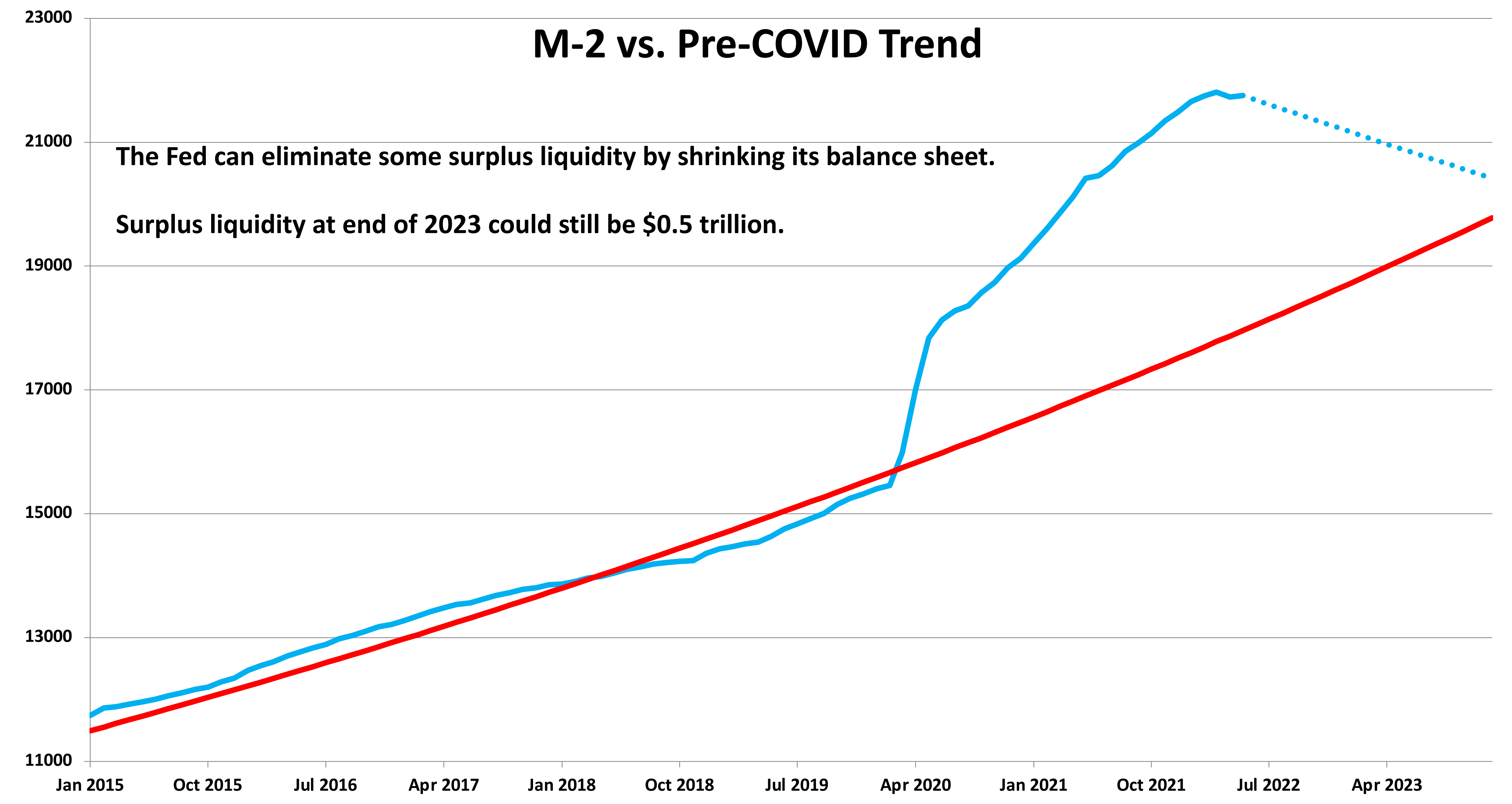
2. Shrink its balance sheet.


Fed Funds Rate -- Projected
The Fed plans to tighten aggressively.
Funds rate = 4.4% by end of 2022.
Fed believes funds rate is neutral at 2.5%.
That will slow the U.S. economy, right?
Not really!
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23


Real Funds Rate -- Core CPI
If at end of 2022 funds rate is 4.4%, core inflation is 5.6%.
Real ff = -1.2%
A negative real funds rate is NOT going to slow the U.S. economy.
4.0
2.0
0.0
-2.0
-4.0
-6.0
-8.0
Jan-06
Jun-06
Nov-06
Apr-07
Sep-07
Feb-08
Jul-08
Dec-08
May-09
Oct-09
Mar-10
Aug-10
Jan-11
Jun-11
Nov-11
Apr-12
Sep-12
Feb-13
Jul-13
Dec-13
May-14
Oct-14
Mar-15
Aug-15
Jan-16
Jun-16
Nov-16
Apr-17
Sep-17
Feb-18
Jul-18
Dec-18
May-19
Oct-19
Mar-20
Aug-20
Jan-21
Jun-21
Nov-21
Apr-22
Sep-22
Feb-23
Jul-23
Dec-23



Federal Reserve -- Total Assets
The Fed plans to shrink its balance sheet by about $100 billion per month.
At the end of 2023 its balance sheet will still be bloated.
$9,700
$8,700
$7,700
$6,700
$5,700
$4,700
$3,700
1/1/2020
4/1/2020
7/1/2020
10/1/2020
1/1/2021
4/1/2021
7/1/2021
10/1/2021
1/1/2022
4/1/2022
7/1/2022
10/1/2022
1/1/2023
4/1/2023
7/1/2023
10/1/2023

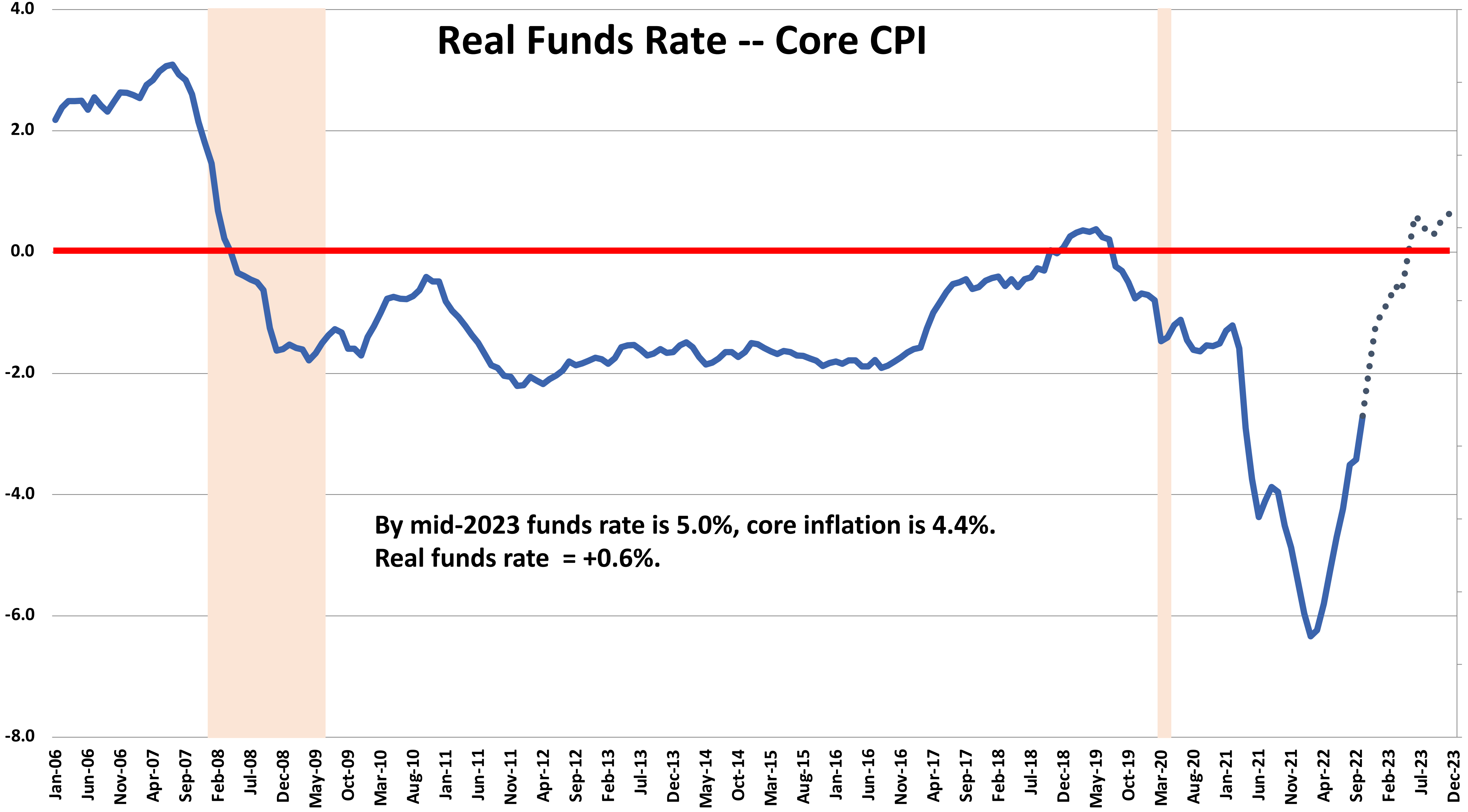

M-2 vs. Pre-COVID Trend
The Fed can eliminate some surplus liquidity by shrinking its balance sheet.
Surplus liquidity at end of 2023 could still be $0.5 trillion.
23000
21000
19000
17000
15000
13000
11000
Jan 2015
Oct 2015
Jul 2016
Apr 2017
Jan 2018
Oct 2018
Jul 2019
Apr 2020
Jan 2021
Oct 2021
Jul 2022
Apr 2023

When will the next recession occur?

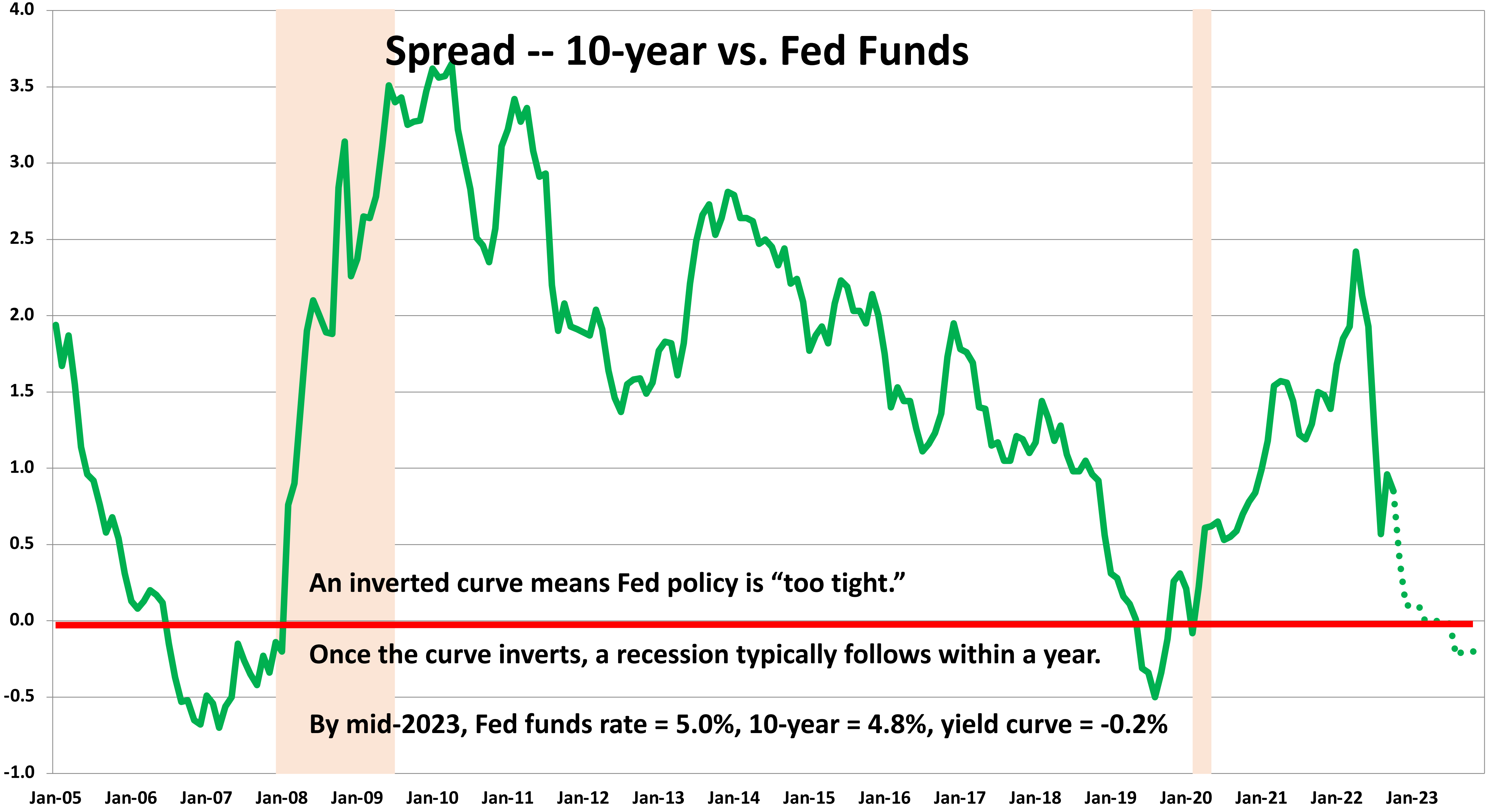
When will the next recession occur?

1. Positive real funds rate

2. Inverted yield curve.



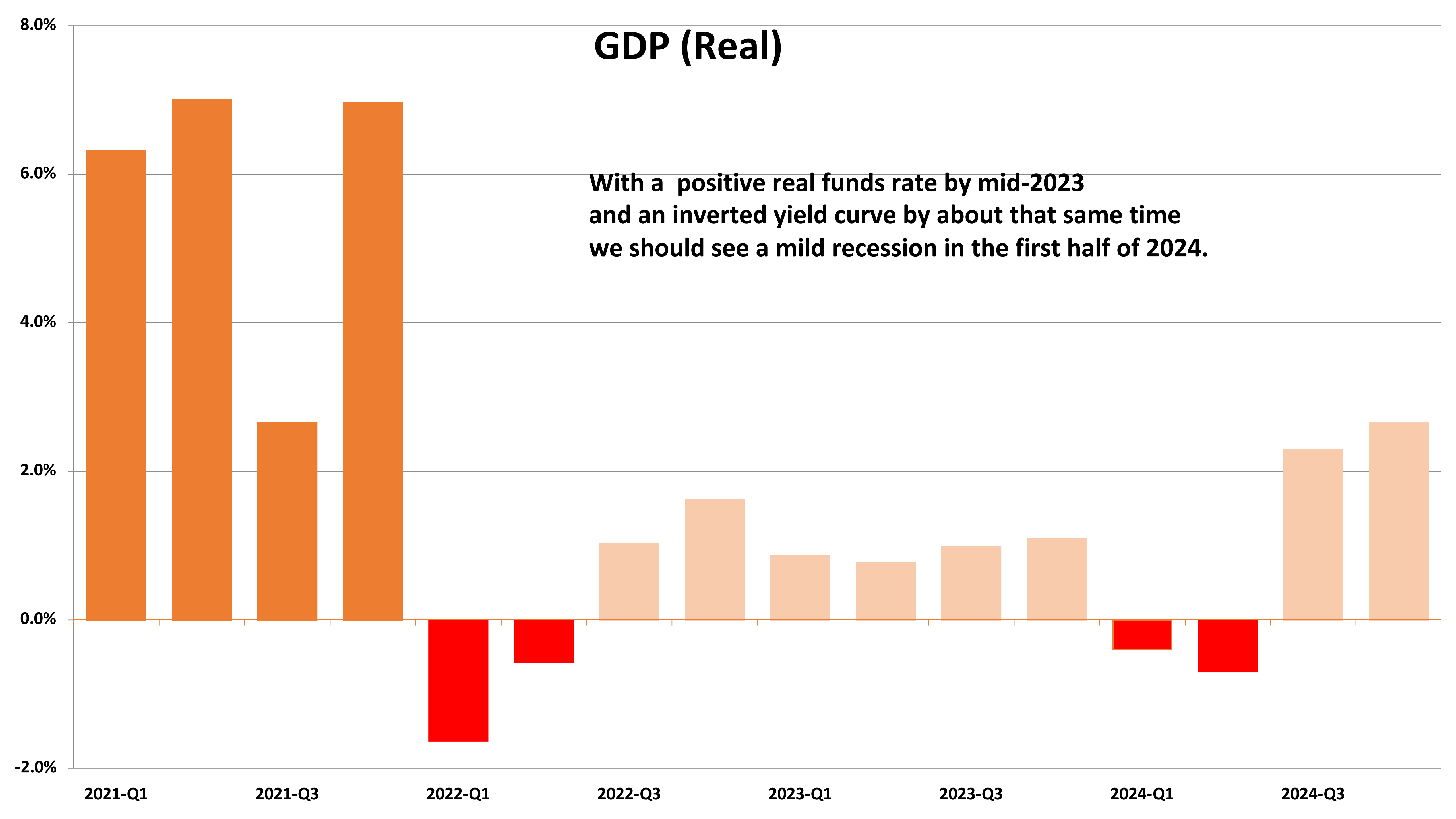
Real Funds Rate -- Core CPI
By mid-2023 funds rate is 5.0%, core inflation is 4.4%.
Real funds rate = +0.6%.
4.0
2.0
0.0
-2.0
-4.0
-6.0
-8.0
Jan-06
Jun-06
Nov-06
Apr-07
Sep-07
Feb-08
Jul-08
Dec-08
May-09
Oct-09
Mar-10
Aug-10
Jan-11
Jun-11
Nov-11
Apr-12
Sep-12
Feb-13
Jul-13
Dec-13
May-14
Oct-14
Mar-15
Aug-15
Jan-16
Jun-16
Nov-16
Apr-17
Sep-17
Feb-18
Jul-18
Dec-18
May-19
Oct-19
Mar-20
Aug-20
Jan-21
Jun-21
Nov-21
Apr-22
Sep-22
Feb-23
Jul-23
Dec-23


Spread -- 10-year vs. Fed Funds
An inverted curve means Fed policy is "too tight."
Once the curve inverts, a recession typically follows within a year.
By mid-2023, Fed funds rate = 5.0%, 10-year = 4.8%, yield curve = -0.2%
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
-0.5
-1.0
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23

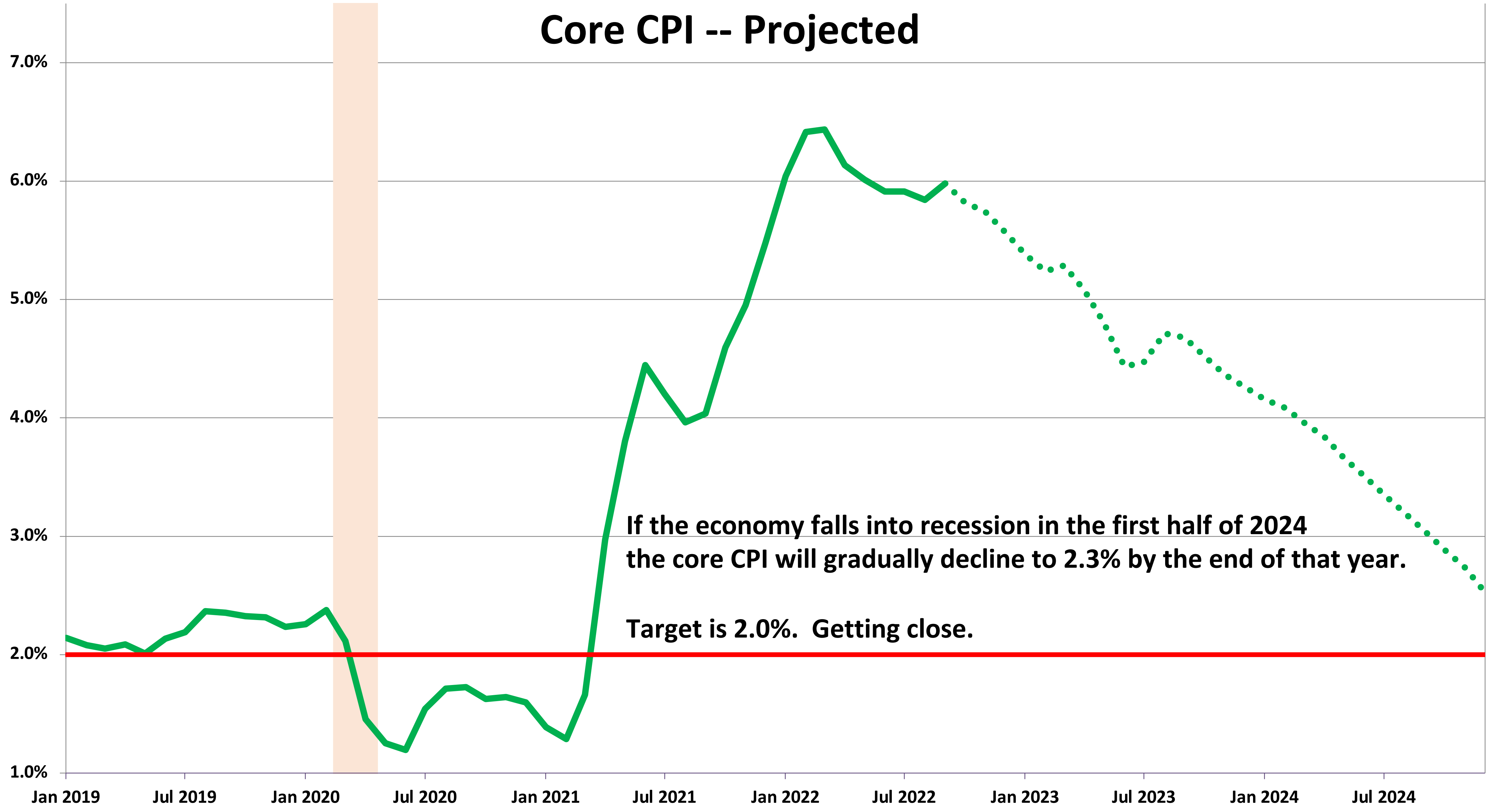
When will the next recession occur?

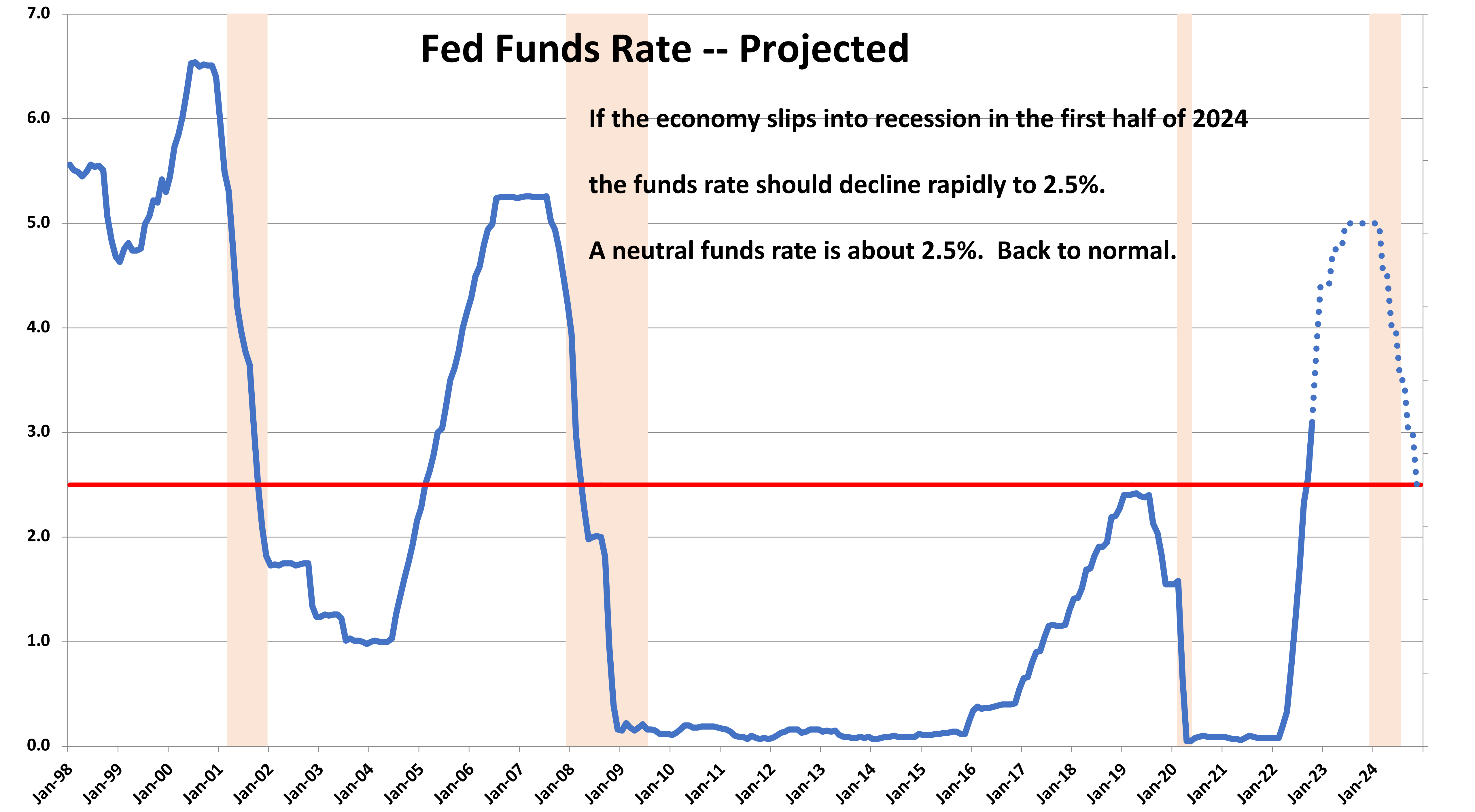
1. Positive real funds rate (by mid-2023 = +0.6%)

2. Inverted yield curve. (by mid-2023 = -0.2%)



GDP (Real)
With a positive real funds rate by mid-2023
and an inverted yield curve by about that same time
we should see a mild recession in the first half of 2024.
8.0%
6.0%
4.0%
2.0%
0.0%
-2.0%
2021-Q1
2021-Q3
2022-Q1
2022-Q3
2023-Q1
2023-Q3
2024-Q1
2024-Q3


Core CPI -- Projected
7.0%
6.0%
5.0%
4.0%
3.0%
2.0%
1.0%
Jan 2019
Jul 2019
Jan 2020
Jul 2020
Jan 2021
Jul 2021
Jan 2022
Jul 2022
Jan 2023
Jul 2023
Jan 2024
Jul 2024
If the economy falls into recession in the first half of 2024
the core CPI will gradually decline to 2.3% by the end of that year.
Target is 2.0%. Getting close.



Fed Funds Rate -- Projected
If the economy slips into recession in the first half of 2024
the funds rate should decline rapidly to 2.5%.
A neutral funds rate is about 2.5%. Back to normal.
7.0
6.0
5.0
4.0
3.0
2.0
1.0
0.0
Jan-98
Jan-99
Jan-00
Jan-01
Jan-02
Jan-03
Jan-04
Jan-05
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23
Jan-24

Economics. Explained.

Forecasts – 2023/2024

	2022	2023	2024
GDP Growth --	0.1%	0.9%	0.9%
Unemployment Rate --	3.6%	4.0%	4.2%
Core CPI--	6.0%	4.2%	2.3%
Fed Funds Rate --	4.4%	5.0%	2.5%
10-Year Note --	4.5%	4.8%	3.1%
30-Year Mortgage Rate --	7.0%	7.3%	5.6%

Economics. Explained.

No recession for now

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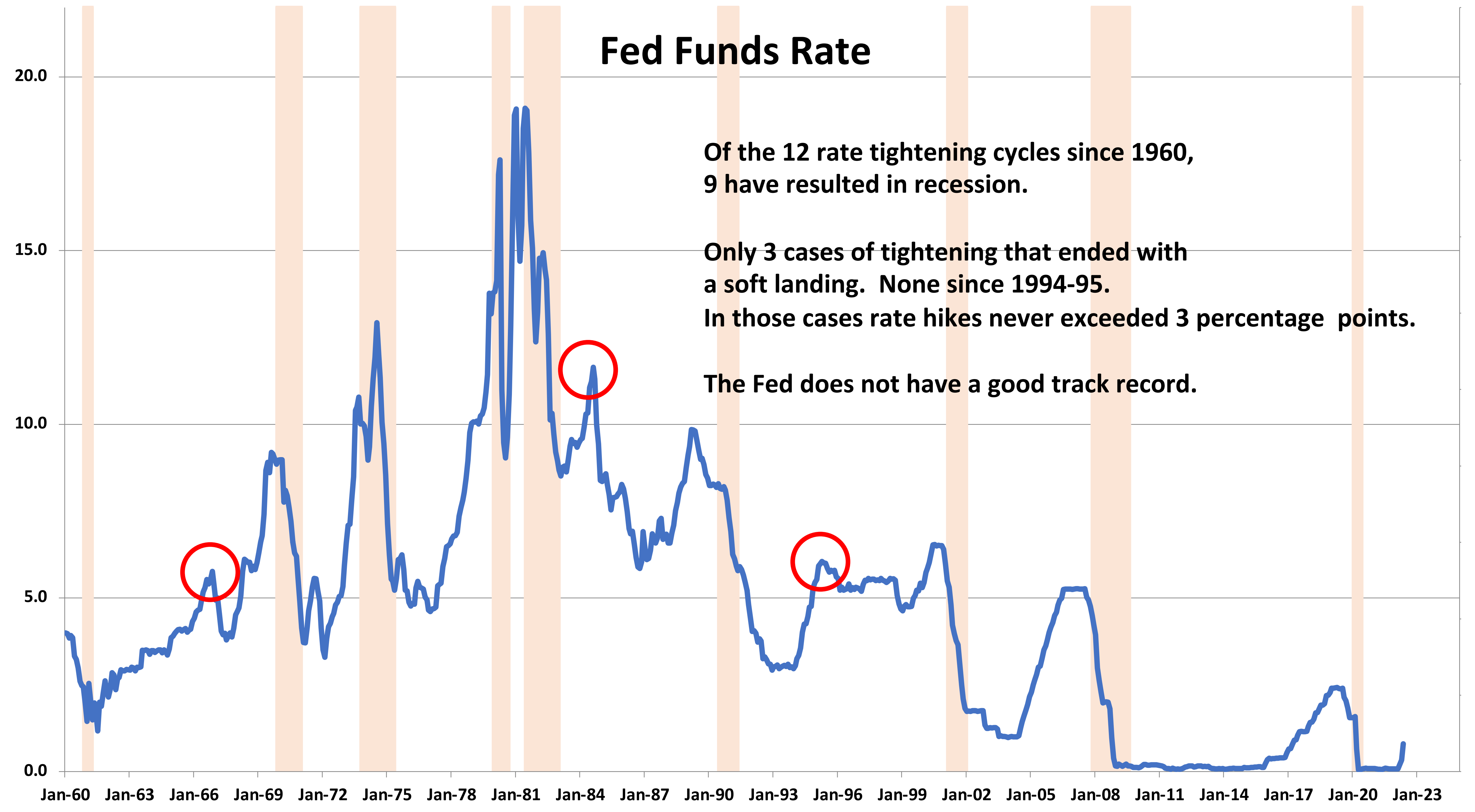
Fed Funds Rate
Of the 12 rate tightening cycles since 1960,
9 have resulted in recession.
Only 3 cases of tightening that ended with
a soft landing. None since 1994-95.
In those cases rate hikes never exceeded 3 percentage points.
The Fed does not have a good track record.
20.0
15.0
10.0
5.0
0.0
Jan-60
Jan-63
Jan-66
Jan-69
Jan-72
Jan-75
Jan-78
Jan-81
Jan-84
Jan-87
Jan-90
Jan-93
Jan-96
Jan-99
Jan-02
Jan-05
Jan-08
Jan-11
Jan-14
Jan-17
Jan-20
Jan-23

Economics. Explained.

No recession for now

but it is almost inevitable.

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