Economics. Explained.

Rate Hikes – Too Little, Too Late

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NumberNomics
www.numbernomics.com

Economics. Explained.

The Highlights

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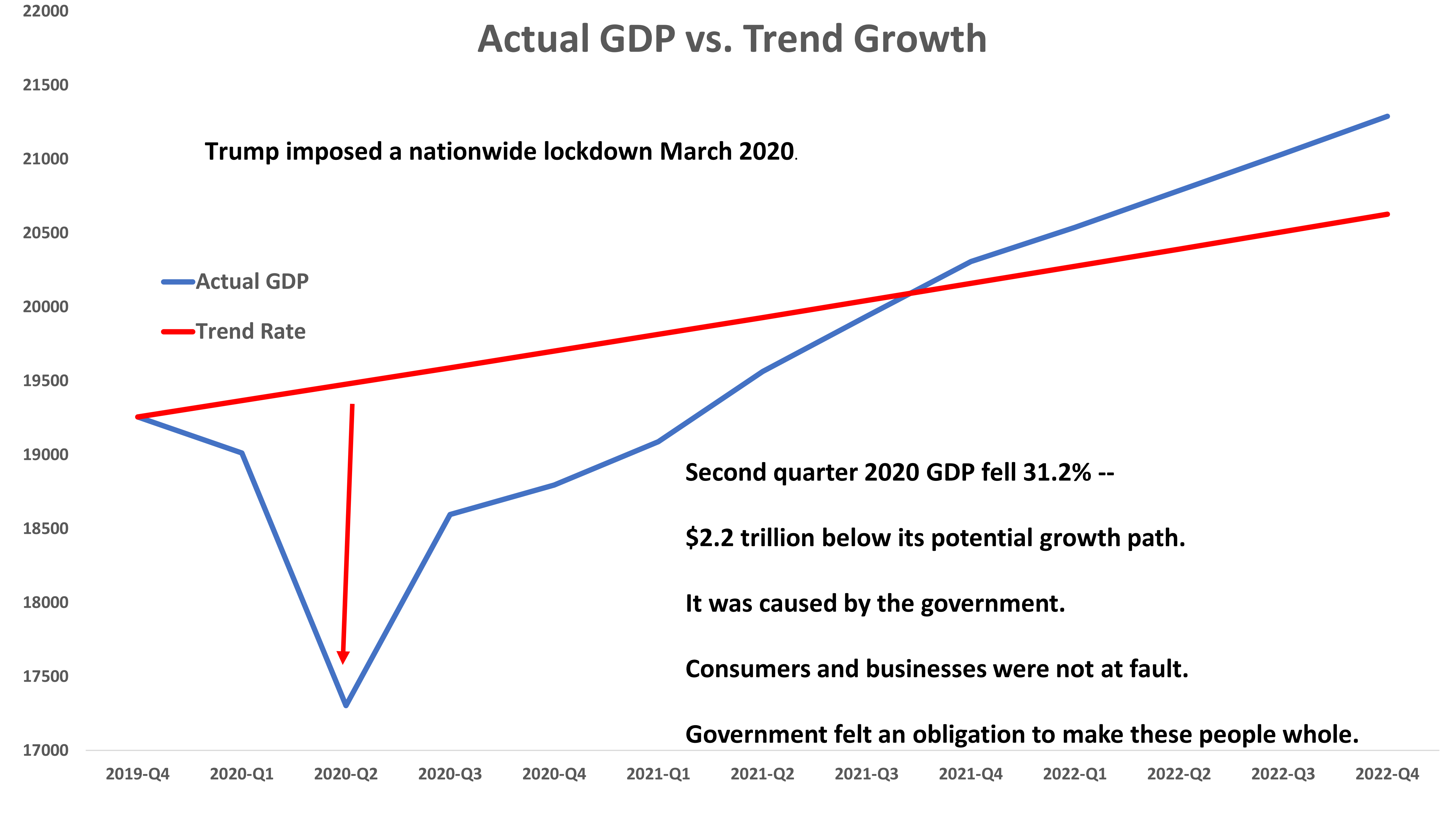
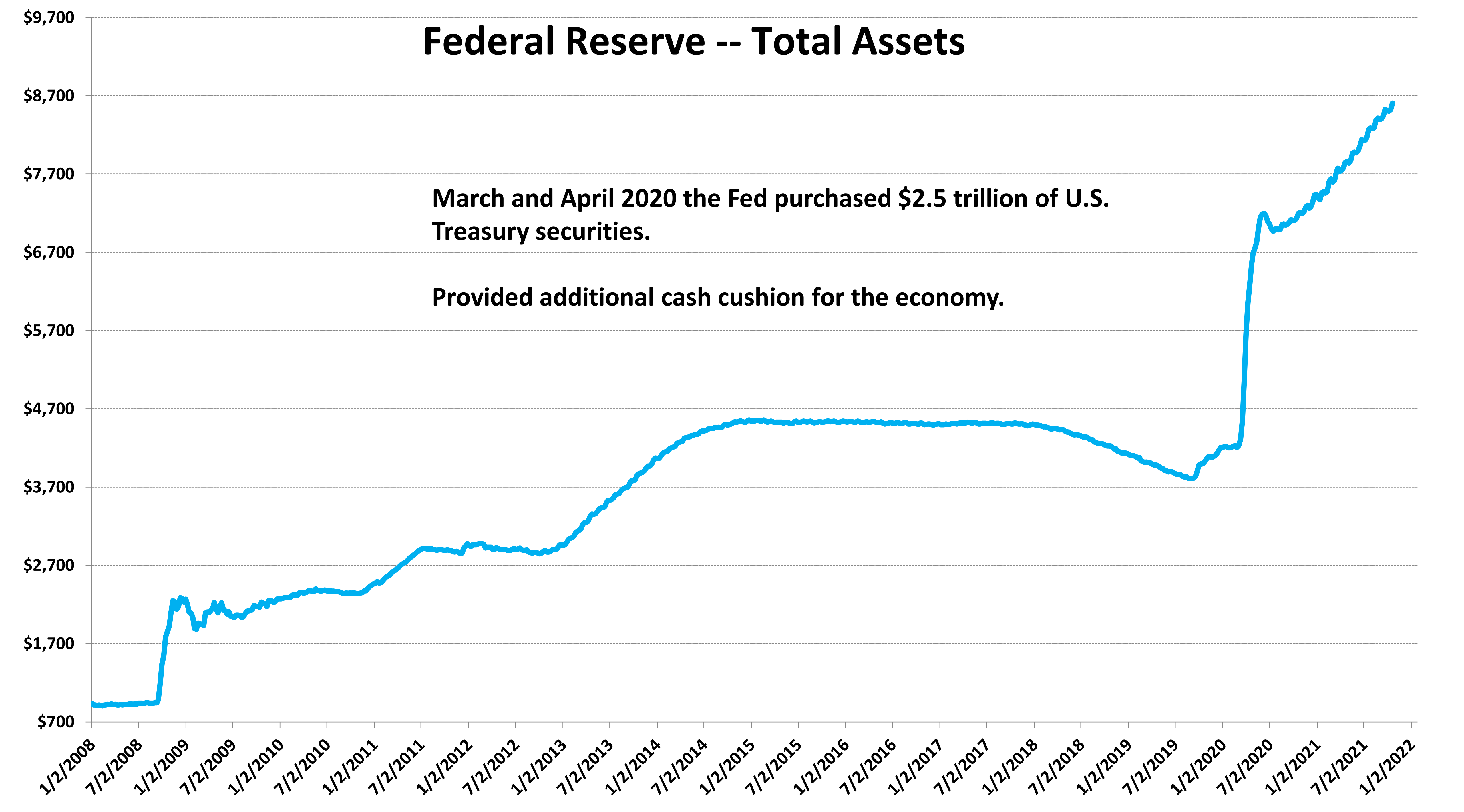
5. But real rates will remain negative for years.
6. Little chance of recession until real rates positive.



Actual GDP vs. Trend Growth
Trump imposed a nationwide lockdown March 2020.
Actual GDP
Trend Rate
Second quarter 2020 GDP fell 31.2% --
$2.2 trillion below its potential growth path.
It was caused by the government.
Consumers and businesses were not at fault.
Government felt an obligation to make these people whole.
22000
21500
21000
20500
20000
19500
19000
18500
18000
17500
17000
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

March 27, 2020

The $2.5 Trillion Stimulus Package


Federal Reserve -- Total Assets
March and April 2020 the Fed purchased $2.5 trillion of U.S. Treasury securities.
Provided additional cash cushion for the economy.
$9,700
$8,700
$7,700
$6,700
$5,700
$4,700
$3,700
$2,700
$1,700
$700
1/2/2008
7/2/2008
1/2/2009
7/2/2009
1/2/2010
7/2/2010
1/2/2011
7/2/2011
1/2/2012
7/2/2012
1/2/2013
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7/2/2014
1/2/2015
7/2/2015
1/2/2016
7/2/2016
1/2/2017
7/2/2017
1/2/2018
7/2/2018
1/2/2019
7/2/2019
1/2/2020
7/2/2020
1/2/2021
7/2/2021
1/2/2022

Economics. Explained.

But the stimulus kept on coming.

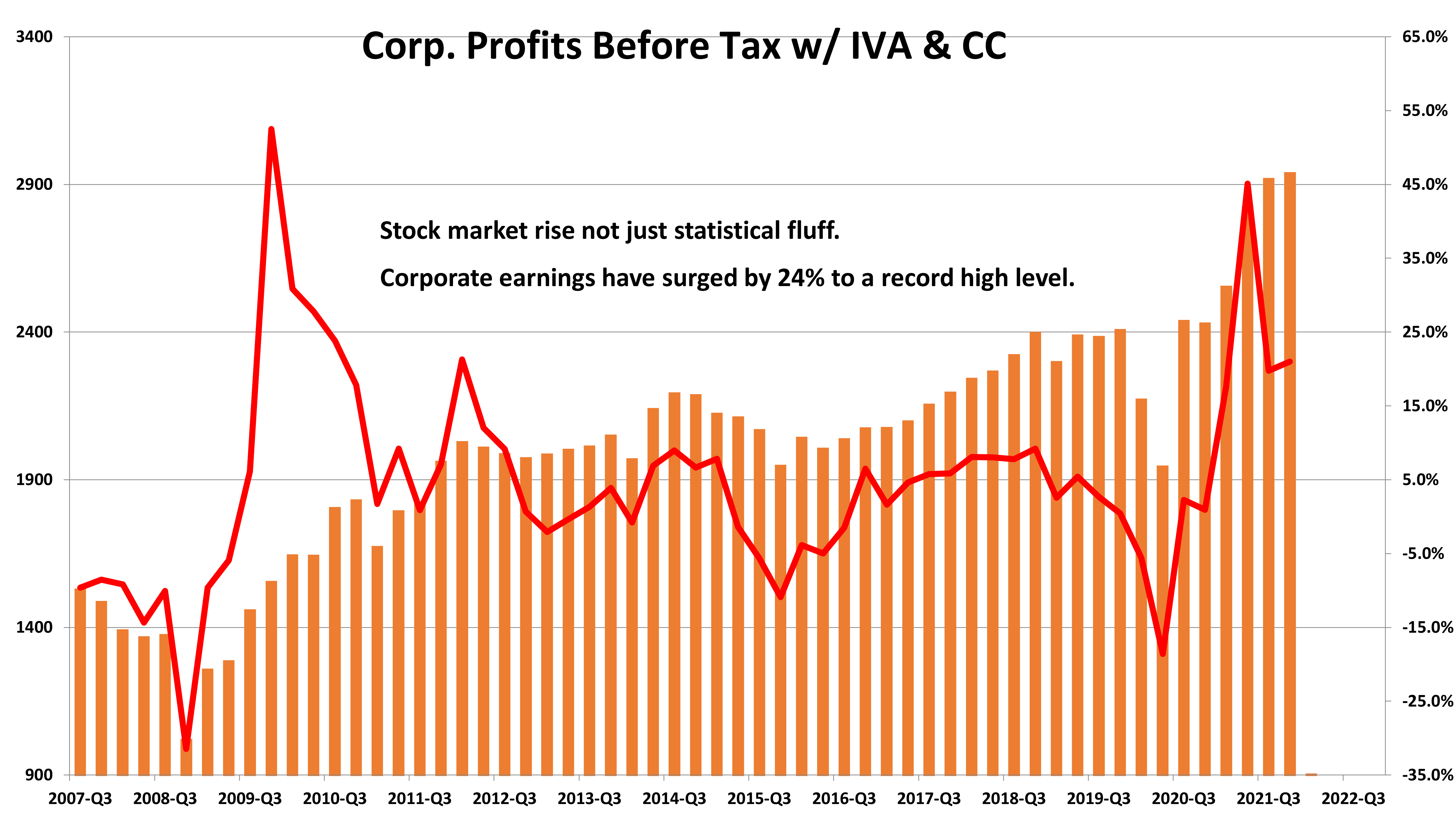
March 2020	-- $2.5 trillion (Fiscal stimulus)
March/April 2020	-- $2.5 trillion (Fed)
January 2021	-- $0.9 trillion (Fiscal stimulus)
March 2021	-- $1.9 trillion (Fiscal stimulus)
May 2020 – Mar. 2022	-- <u>$2.2 trillion</u> (Fed)
Total	-- $10.0 trillion

Gross overkill

GDP Shortfall	--	\$2.2 trillion
Stimulus	--	\$10.0 trillion

The economy has come roaring back.


S&P 500
The stock market came roaring back. Unprecedented rebound.
Regained everything that it lost in 5 months. 2008-09 it took 5 years.
S&P 500 index kept going and going.
The Ukraine/Russia war triggered a 10% correction,
but underlying economy seems quite strong.
Stocks will rebound as year progresses.
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
1/2/2021
5/2/2021
9/2/2021
1/2/2022
5/2/2022



Corp. Profits Before Tax w/ IVA & CC
Stock market rise not just statistical fluff.
Corporate earnings have surged by 24% to a record high level.
3400
2900
2400
1900
1400
900
65.0%
55.0%
45.0%
35.0%
25.0%
15.0%
5.0%
-5.0%
-15.0%
-25.0%
-35.0%
2007-Q3
2008-Q3
2009-Q3
2010-Q3
2011-Q3
2012-Q3
2013-Q3
2014-Q3
2015-Q3
2016-Q3
2017-Q3
2018-Q3
2019-Q3
2020-Q3
2021-Q3
2022-Q3

Consumer.

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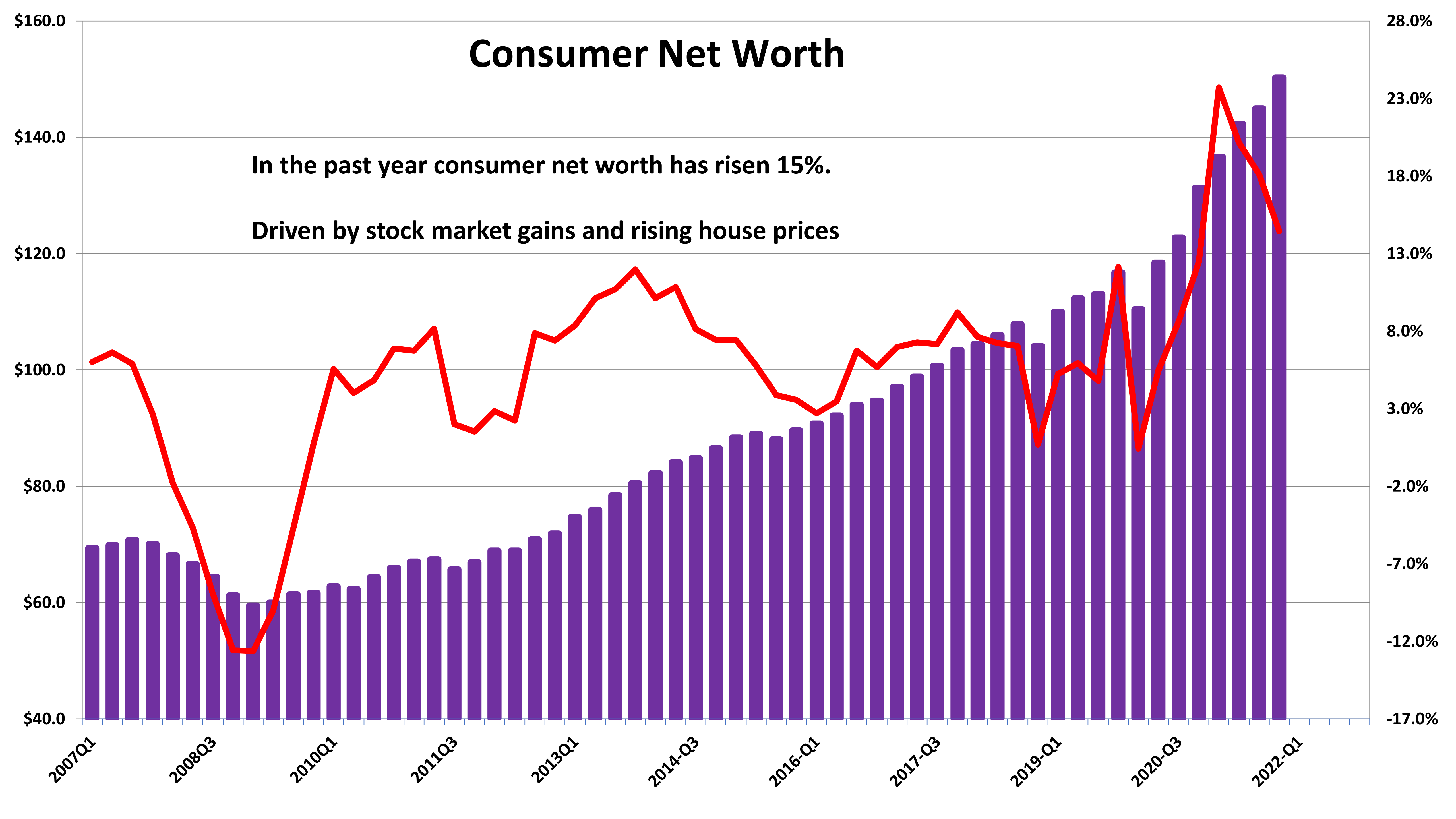
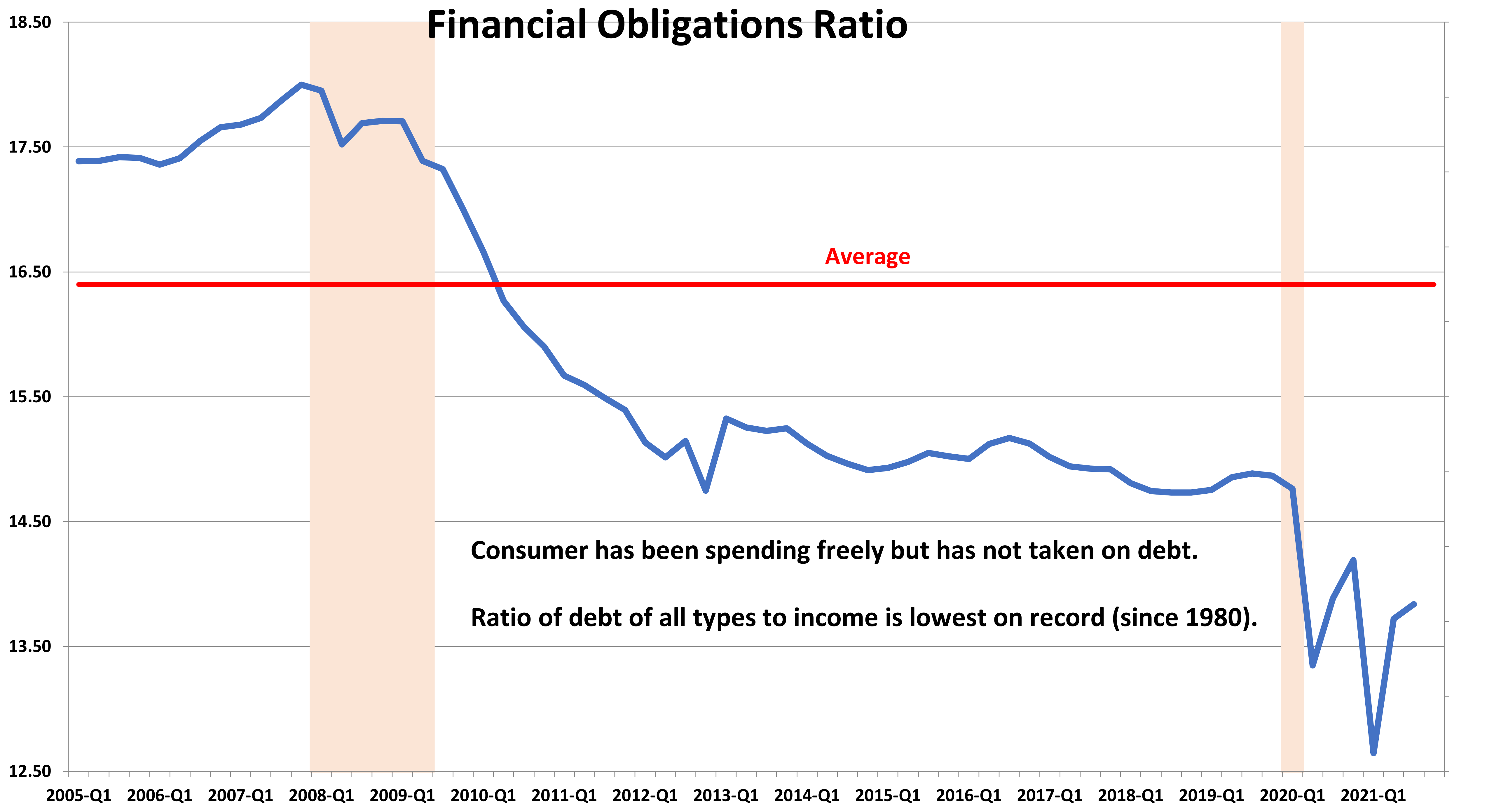
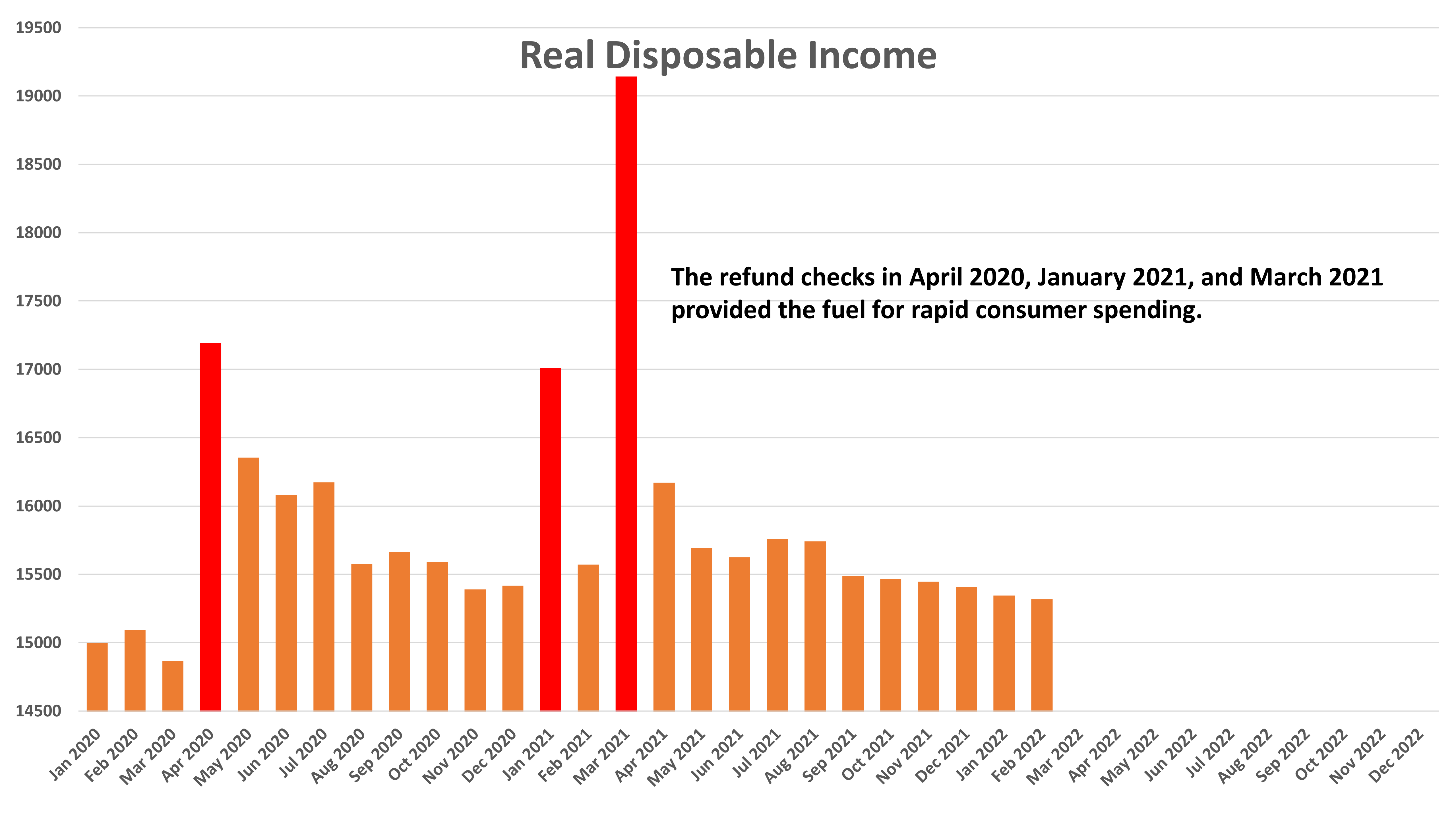


Consumer Net Worth
In the past year consumer net worth has risen 15%.
Driven by stock market gains and rising house prices
$160.0
$140.0
$120.0
$100.0
$80.0
$60.0
$40.0
28.0%
23.0%
18.0%
13.0%
8.0%
3.0%
-2.0%
-7.0%
-12.0%
-17.0%
2007Q1
2008Q3
2010Q1
2011Q3
2013Q1
2014-Q3
2016-Q1
2017-Q3
2019-Q1
2020-Q3
2022-Q1


Financial Obligations Ratio
18.50
17.50
16.50
15.50
14.50
13.50
12.50
Average
Consumer has been spending freely but has not taken on debt.
Ratio of debt of all types to income is lowest on record (since 1980).
2005-Q1
2006-Q1
2007-Q1
2008-Q1
2009-Q1
2010-Q1
2011-Q1
2012-Q1
2013-Q1
2014-Q1
2015-Q1
2016-Q1
2017-Q1
2018-Q1
2019-Q1
2020-Q1
2021-Q1


Real Disposable Income
The refund checks in April 2020, January 2021, and March 2021 provided the fuel for rapid consumer spending.
19500
19000
18500
18000
17500
17000
16500
16000
15500
15000
14500
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
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Nov 2021
Dec 2021
Jan 2022
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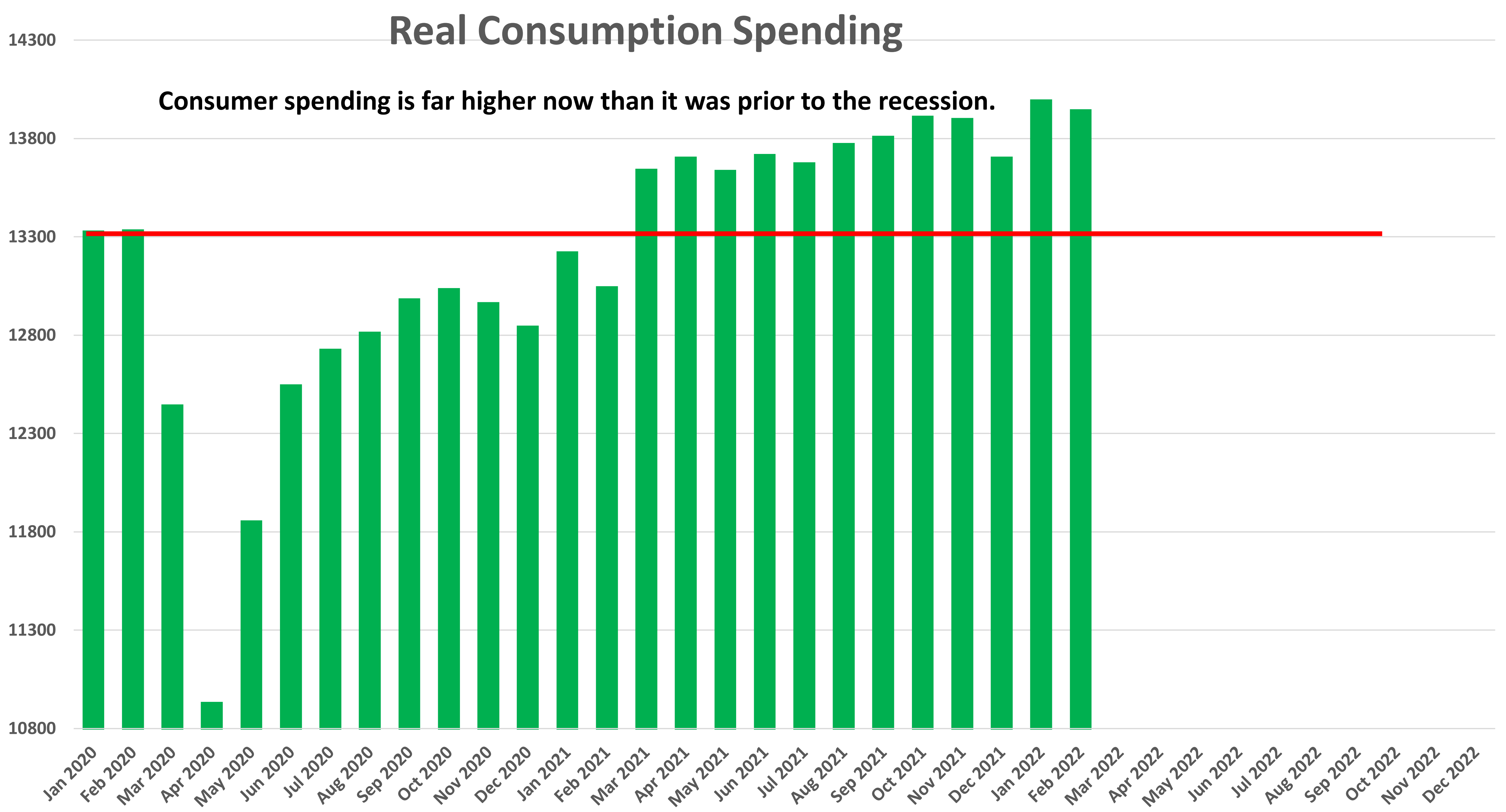
Oct 2022
Nov 2022
Dec 2022


Real Consumption Spending
Consumer spending is far higher now than it was prior to the recession.
14300
13800
13300
12800
12300
11800
11300
10800
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
Feb 2022
Mar 2022
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May 2022
Jun 2022
Jul 2022
Aug 2022
Sep 2022
Oct 2022
Nov 2022
Dec 2022

Housing.

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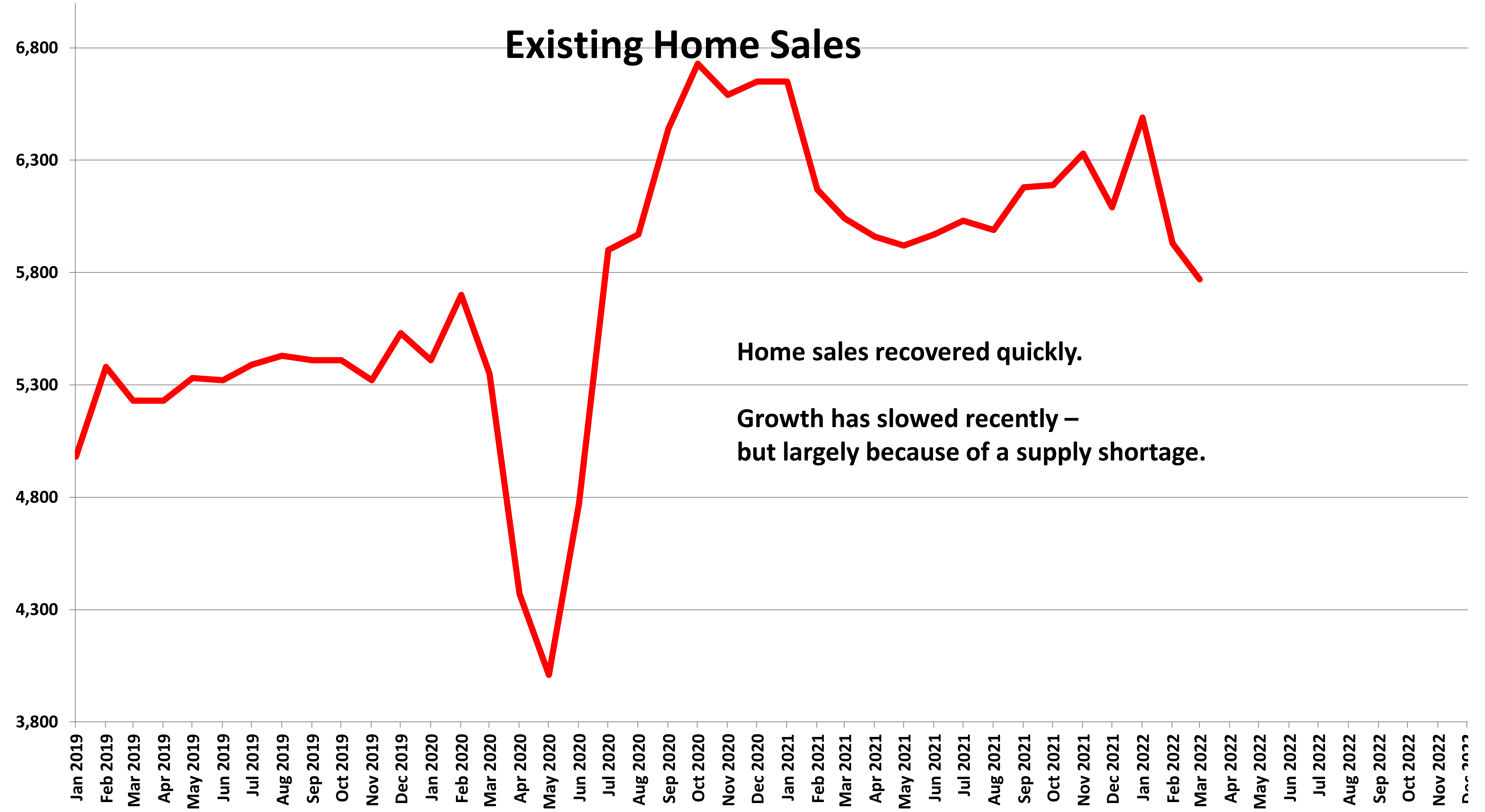
Existing Home Sales
Home sales recovered quickly.
Growth has slowed recently –
but largely because of a supply shortage.
6,800
6,300
5,800
5,300
4,800
4,300
3,800
Jan 2019
Feb 2019
Mar 2019
Apr 2019
May 2019
Jun 2019
Jul 2019
Aug 2019
Sep 2019
Oct 2019
Nov 2019
Dec 2019
Jan 2020
Feb 2020
Mar 2020
Apr 2020
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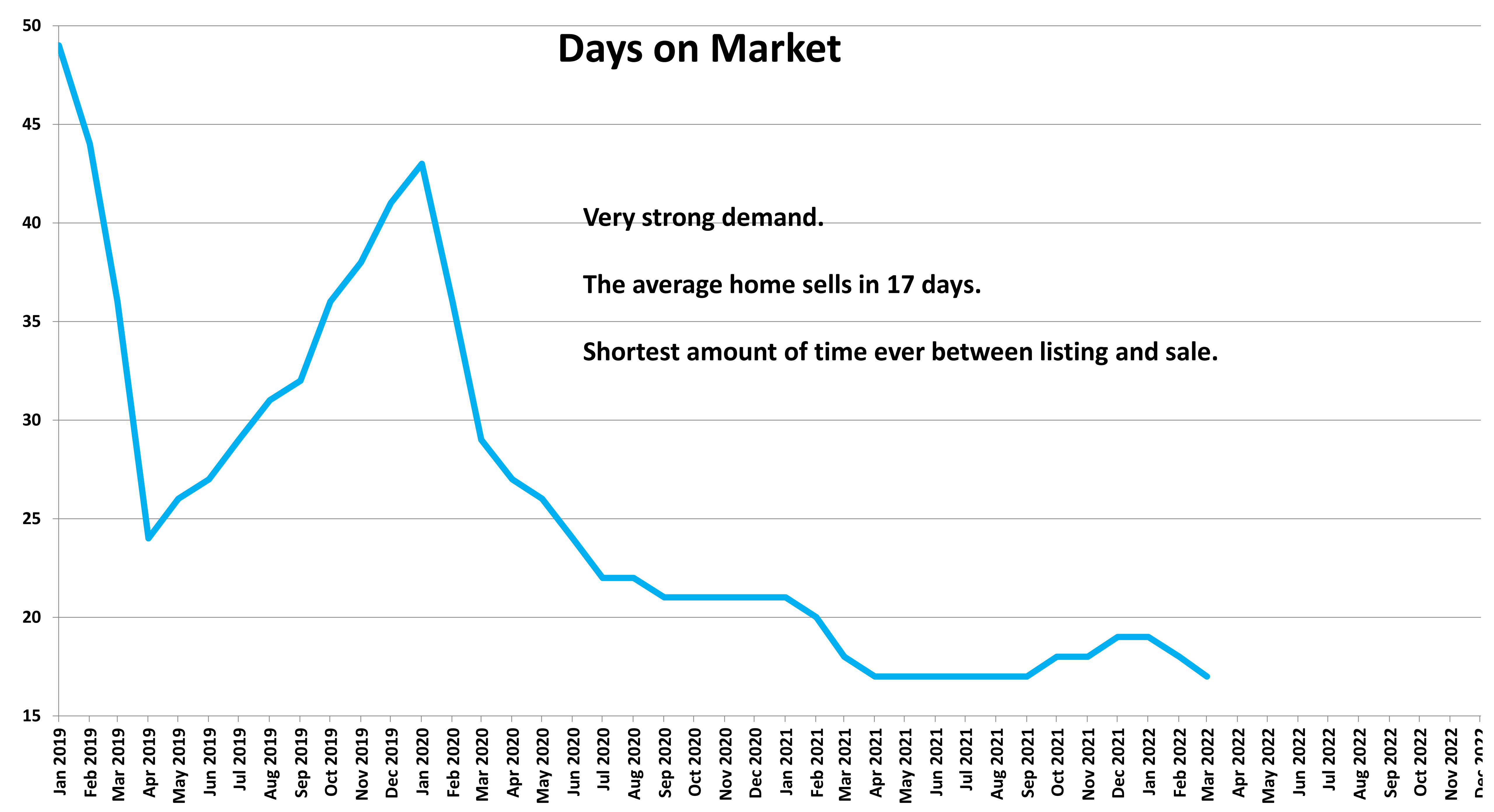
Sep 2022
Oct 2022
Nov 2022


Days on Market
Very strong demand.
The average home sells in 17 days.
Shortest amount of time ever between listing and sale.
50
45
40
35
30
25
20
15
Jan 2019
Feb 2019
Mar 2019
Apr 2019
May 2019
Jun 2019
Jul 2019
Aug 2019
Sep 2019
Oct 2019
Nov 2019
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Nov 2021
Dec 2021
Jan 2022
Feb 2022
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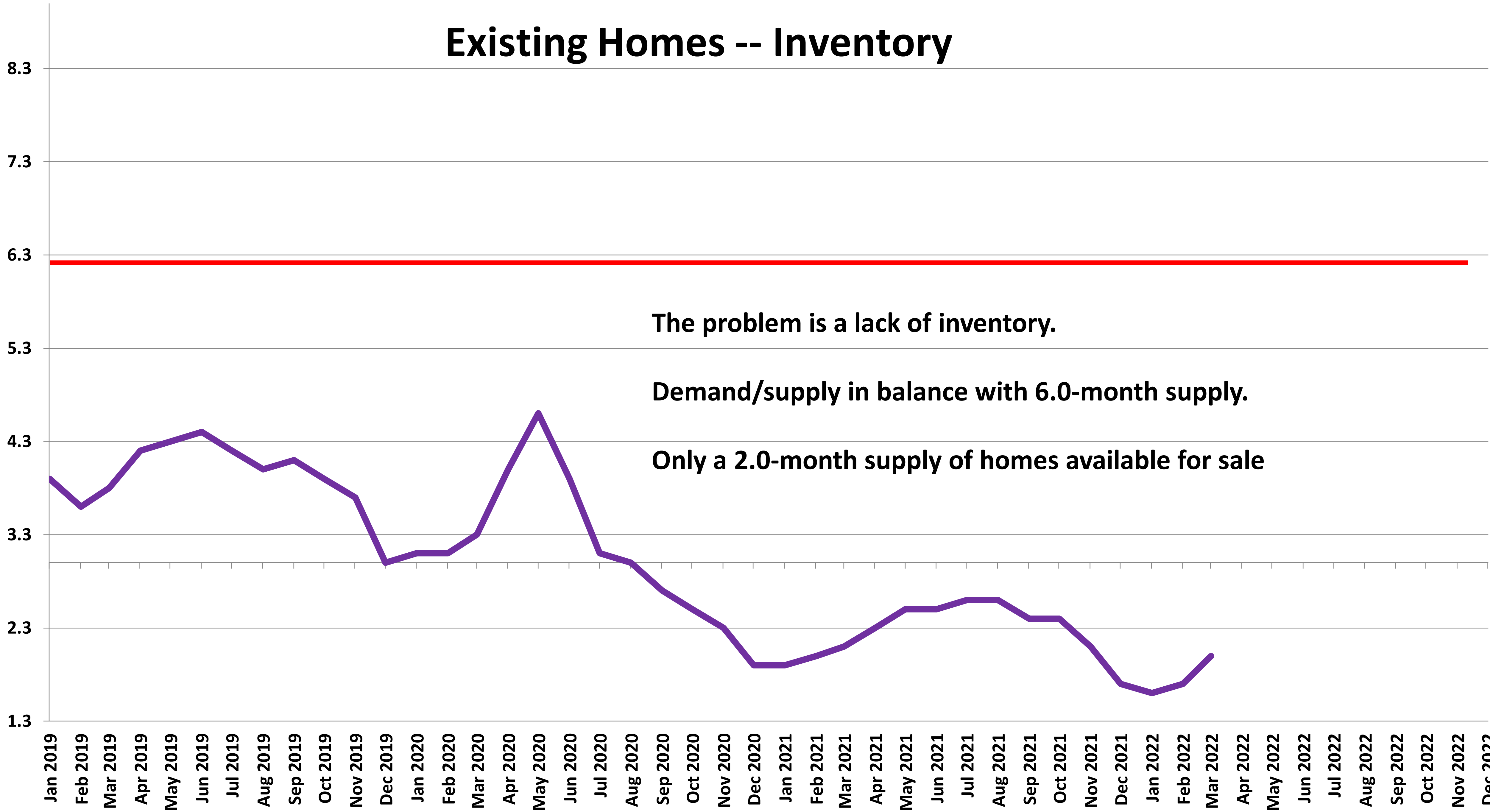
Jul 2022
Aug 2022
Sep 2022
Oct 2022
Nov 2022


Existing Homes -- Inventory
The problem is a lack of inventory.
Demand/supply in balance with 6.0-month supply.
Only a 2.0-month supply of homes available for sale
8.3
7.3
6.3
5.3
4.3
3.3
2.3
1.3
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
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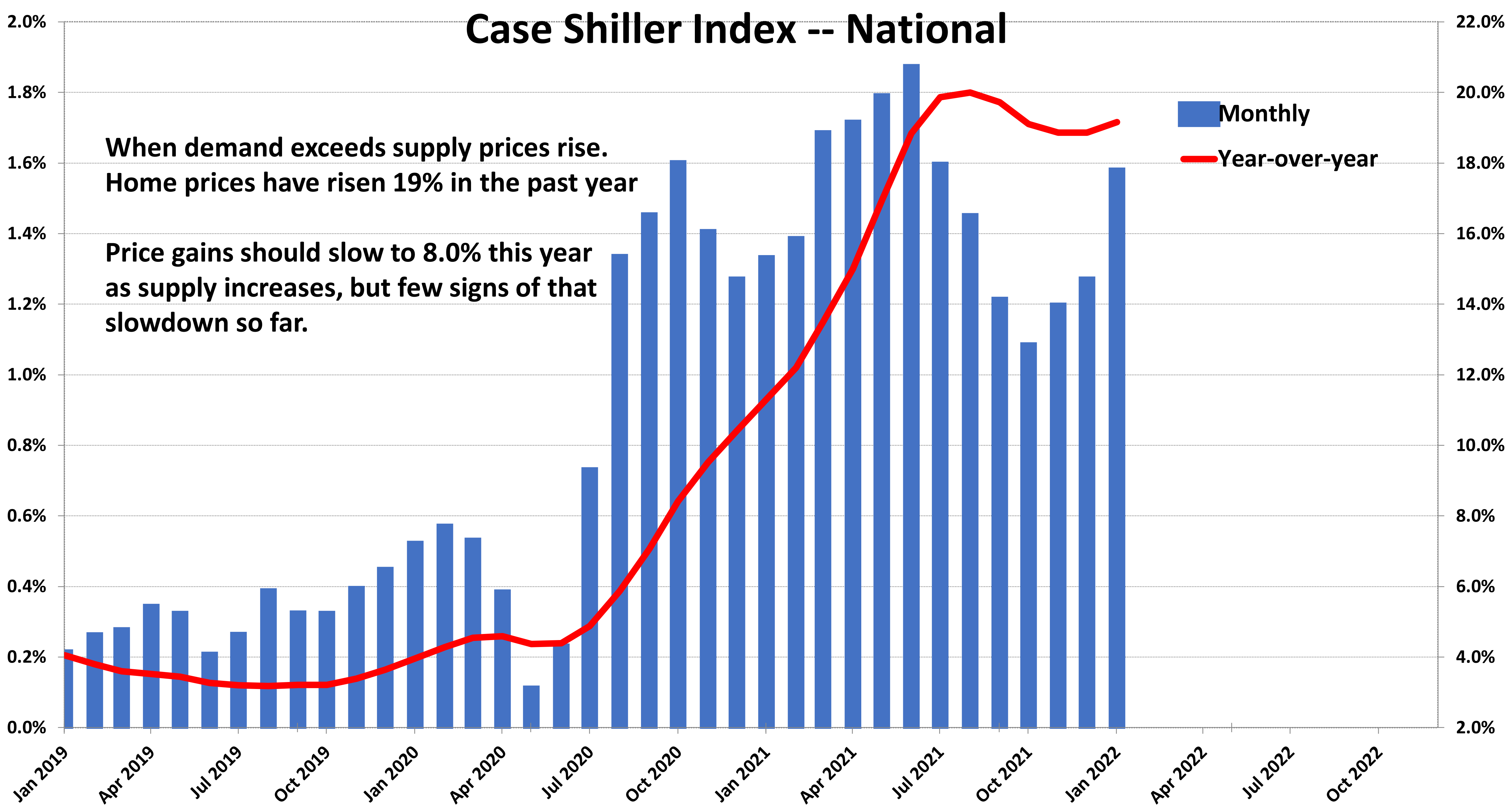
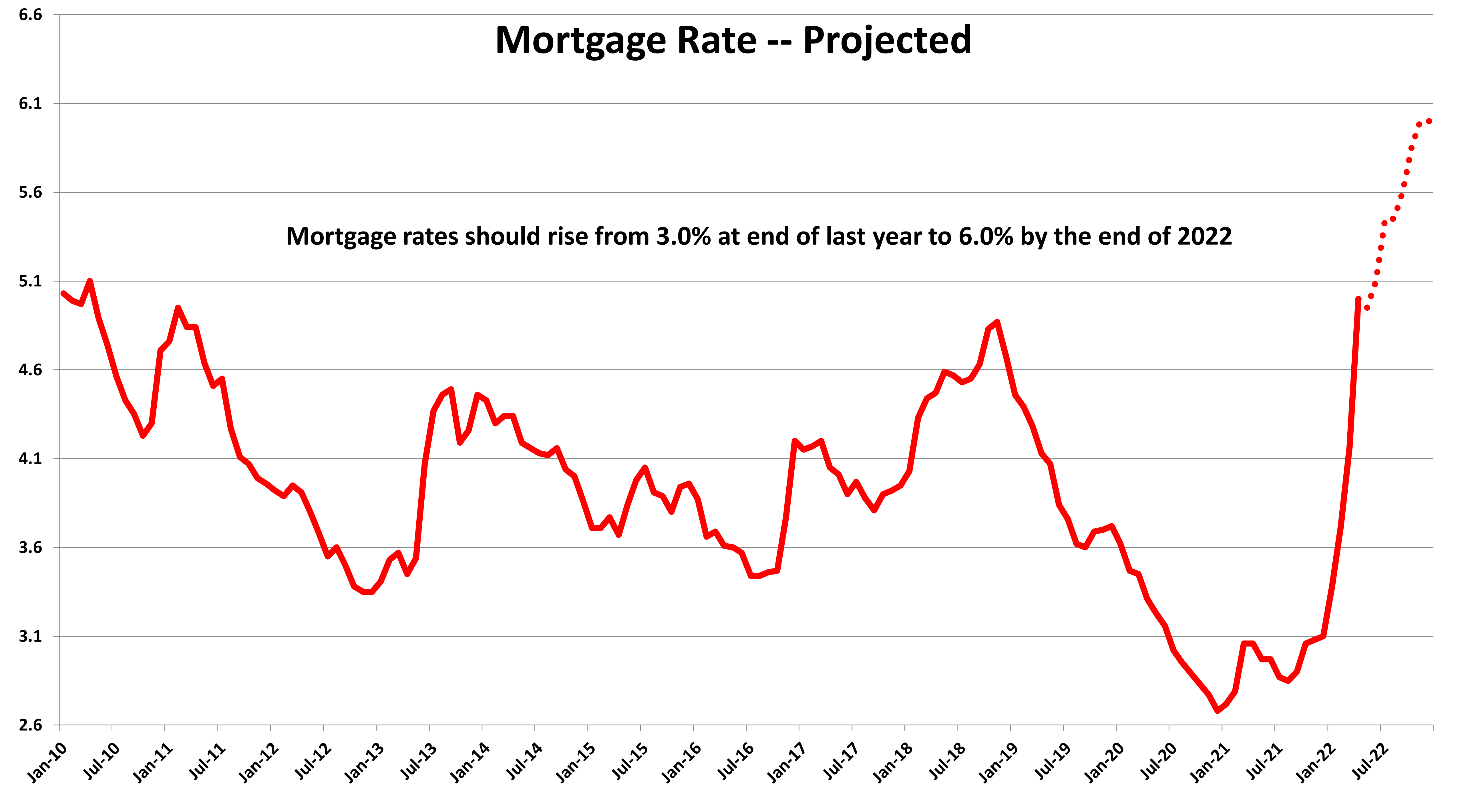
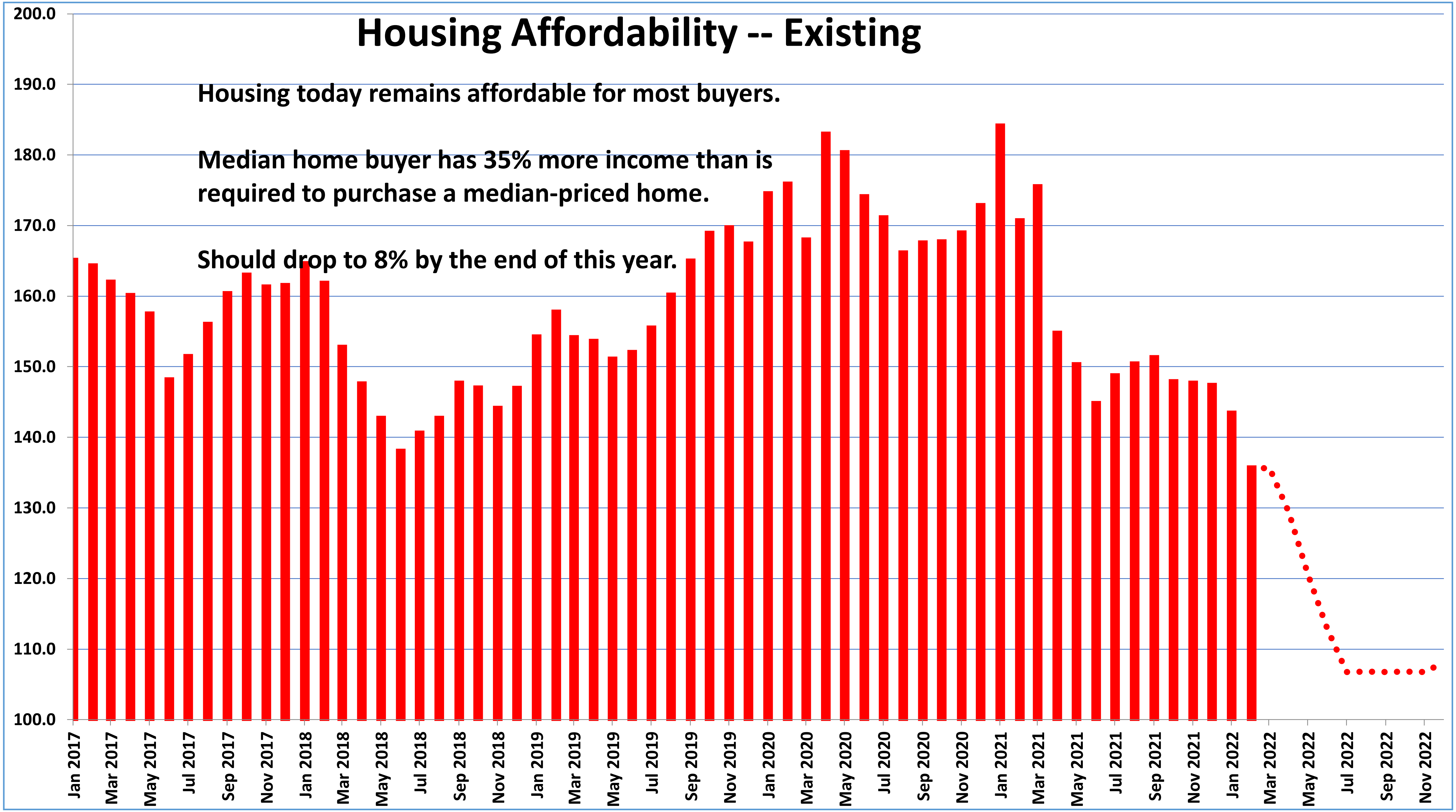
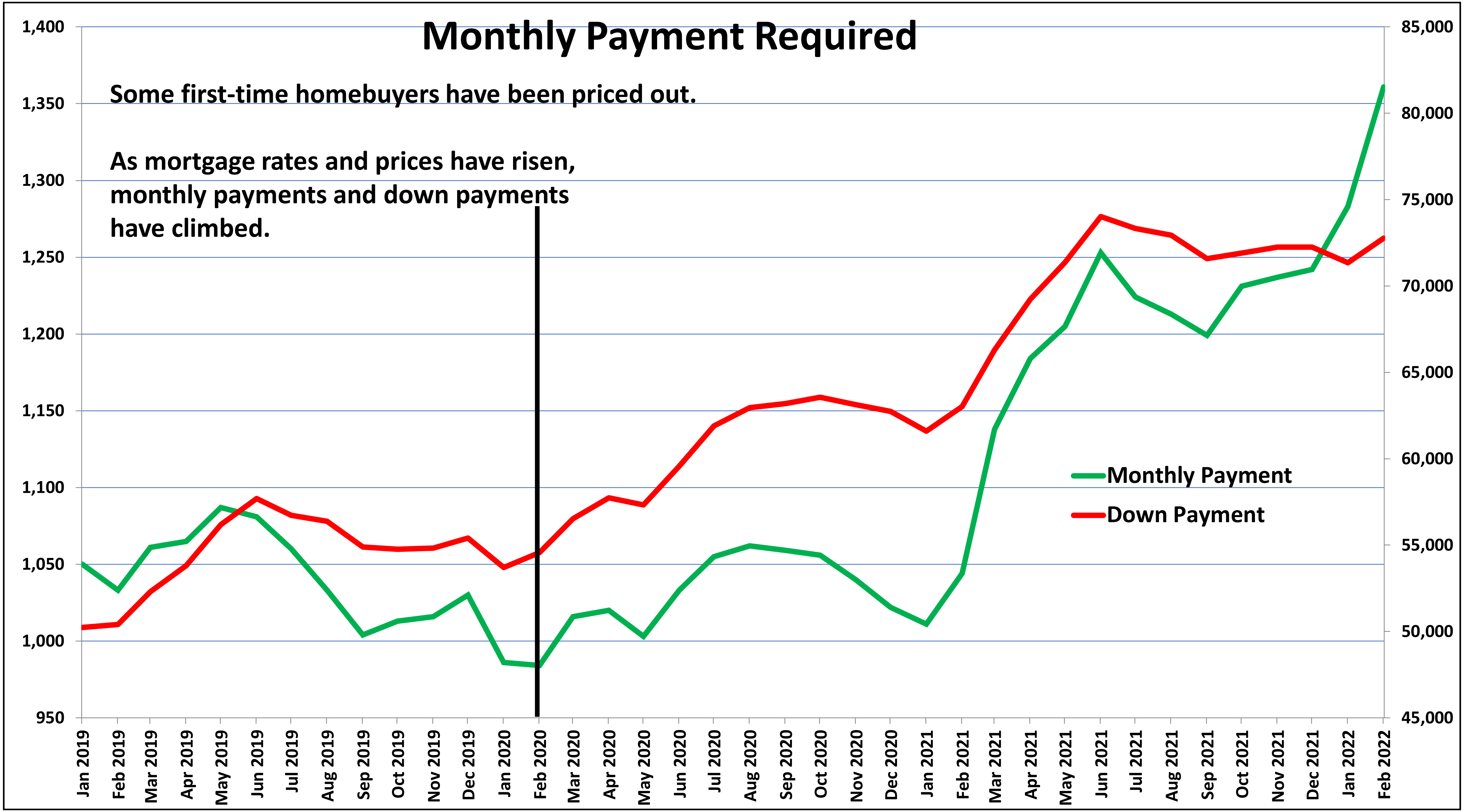
Sep 2022
Oct 2022
Nov 2022


Case Shiller Index -- National
When demand exceeds supply prices rise.
Home prices have risen 19% in the past year
Price gains should slow to 8.0% this year as supply increases, but few signs of that slowdown so far.
Monthly
Year-over-year
2.0%
1.8%
1.6%
1.4%
1.2%
1.0%
0.8%
0.6%
0.4%
0.2%
0.0%
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



Mortgage Rate -- Projected
Mortgage rates should rise from 3.0% at end of last year to 6.0% by the end of 2022
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


Housing Affordability -- Existing
Housing today remains affordable for most buyers.
Median home buyer has 35% more income than is required to purchase a median-priced home.
Should drop to 8% by the end of this year.
200.0
190.0
180.0
170.0
160.0
150.0
140.0
130.0
120.0
110.0
100.0
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
Mar 2020
May 2020
Jul 2020
Sep 2020
Nov 2020
Jan 2021
Mar 2021
May 2021
Jul 2021
Sep 2021
Nov 2021
Jan 2022
Mar 2022
May 2022
Jul 2022
Sep 2022
Nov 2022


Monthly Payment Required
Some first-time homebuyers have been priced out.
As mortgage rates and prices have risen,
monthly payments and down payments
have climbed.
Monthly Payment
Down Payment
1,400
1,350
1,300
1,250
1,200
1,150
1,100
1,050
1,000
950
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
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Aug 2020
Sep 2020
Oct 2020
Nov 2020
Dec 2020
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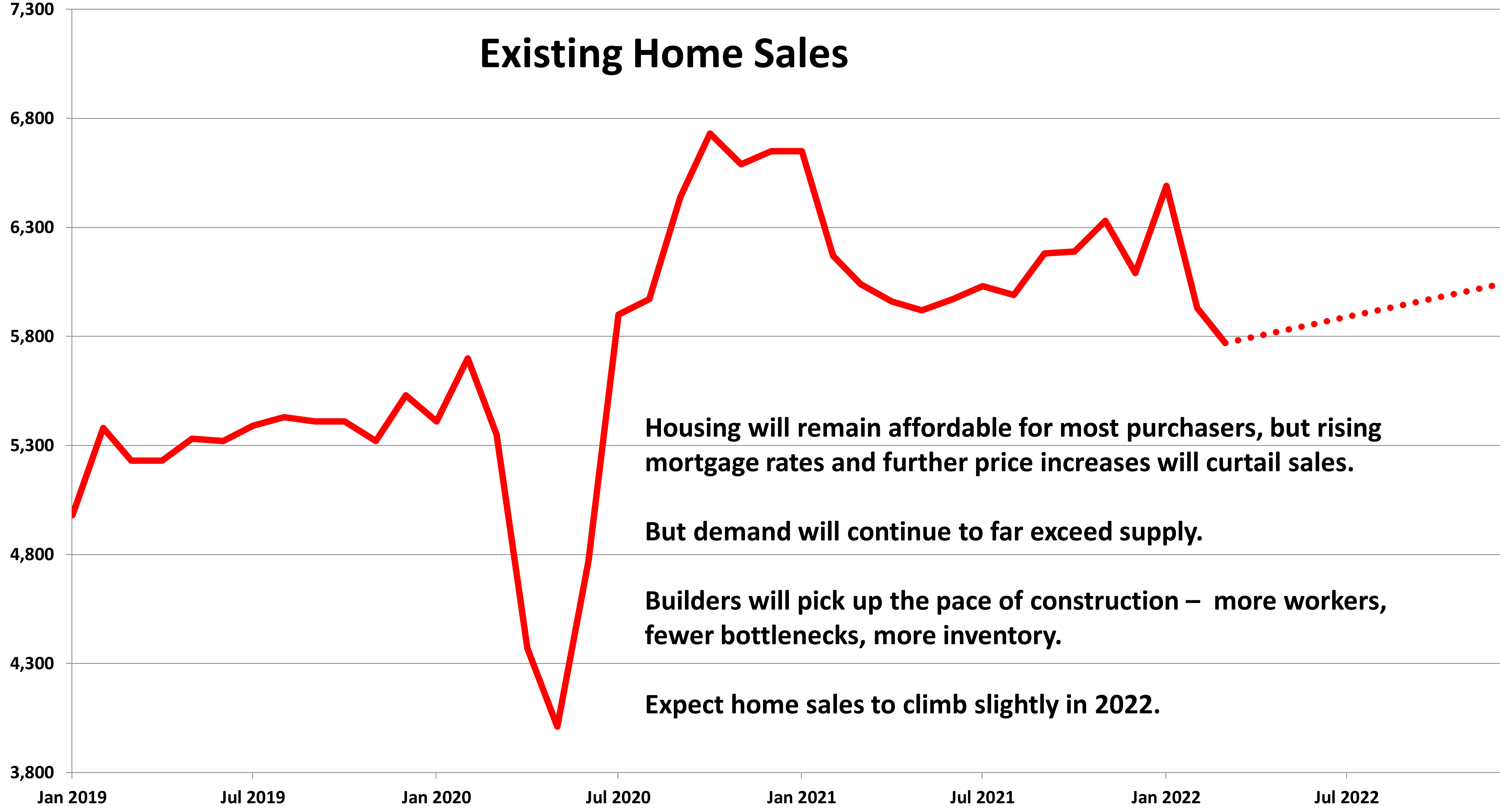
Sep 2021
Oct 2021
Nov 2021
Dec 2021
Jan 2022
Feb 2022


Existing Home Sales
7,300
6,800
6,300
5,800
5,300
4,800
4,300
3,800
Jan 2019
Jul 2019
Jan 2020
Jul 2020
Jan 2021
Jul 2021
Jan 2022
Jul 2022
Housing will remain affordable for most purchasers, but rising mortgage rates and further price increases will curtail sales.
But demand will continue to far exceed supply.
Builders will pick up the pace of construction – more workers, fewer bottlenecks, more inventory.
Expect home sales to climb slightly in 2022.

The demand for goods and services is hot.

The production sector is improving slowly.

Manufacturing.

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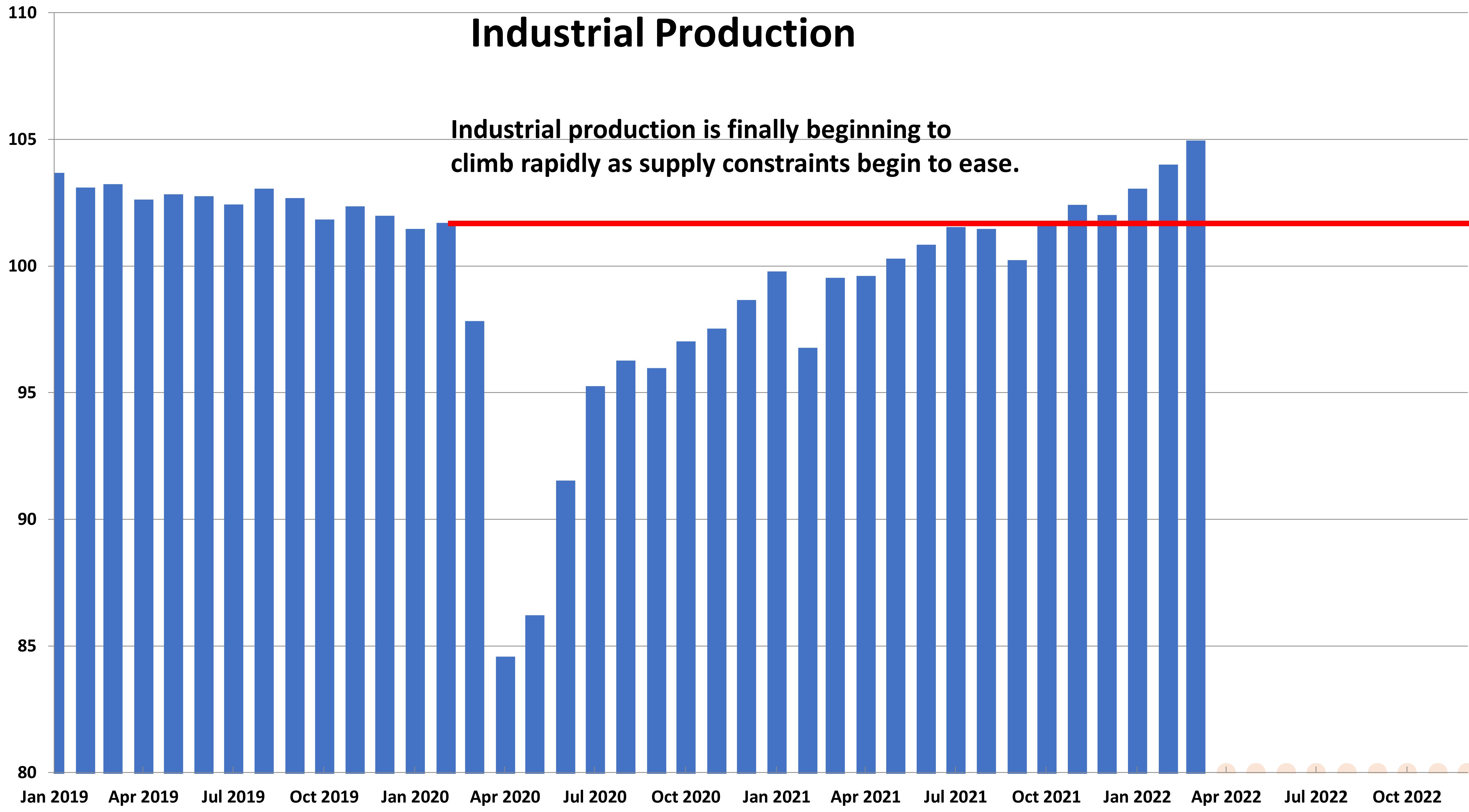
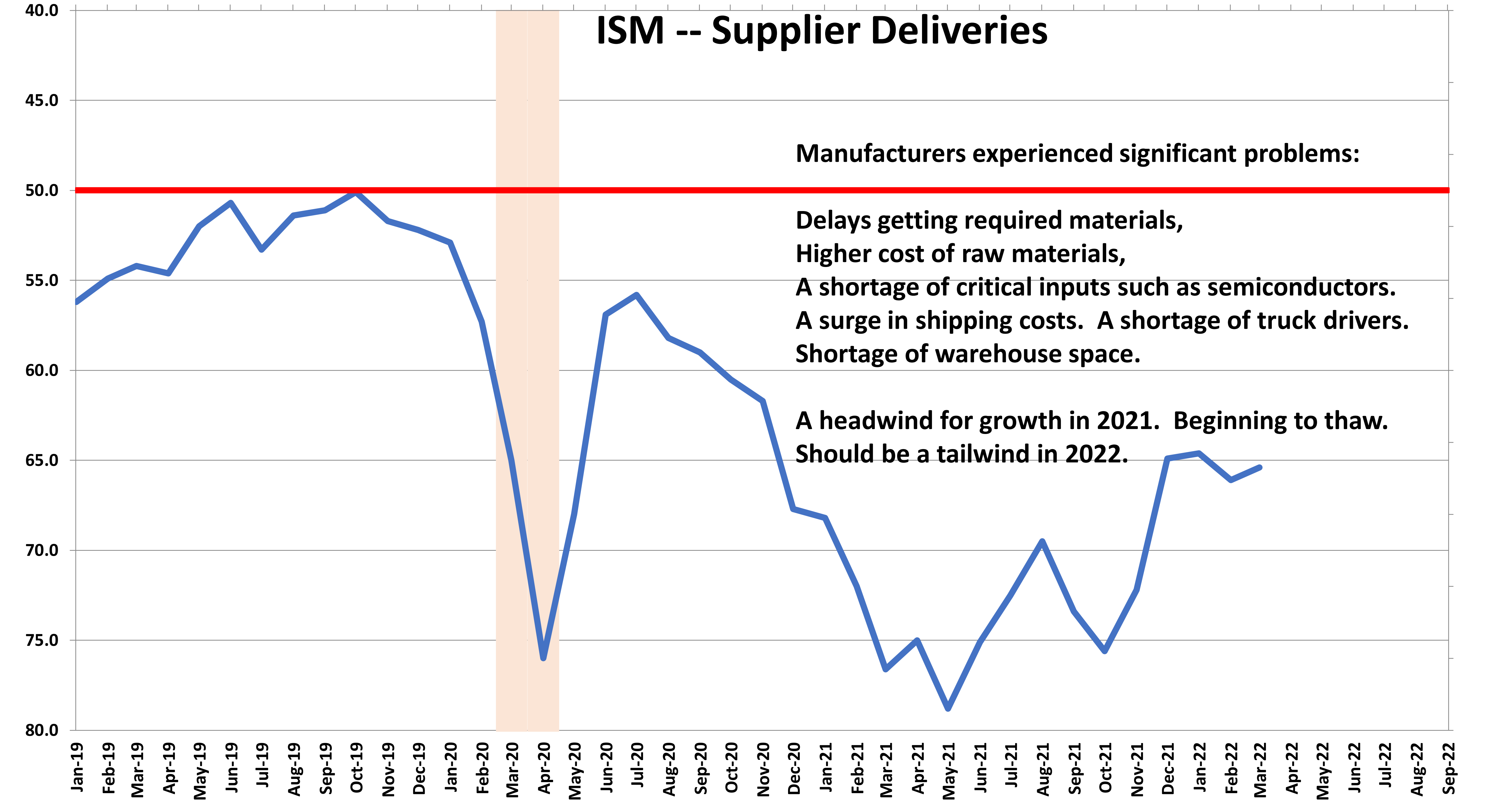


Industrial Production
Industrial production is finally beginning to climb rapidly as supply constraints begin to ease.
110
105
100
95
90
85
80
Jan 2019
Apr 2019
Jul 2019
Oct 2019
Jan 2020
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022



ISM -- Supplier Deliveries
Manufacturers experienced significant problems:
Delays getting required materials,
Higher cost of raw materials,
A shortage of critical inputs such as semiconductors.
A surge in shipping costs. A shortage of truck drivers.
Shortage of warehouse space.
A headwind for growth in 2021. Beginning to thaw.
Should be a tailwind in 2022.
40.0
45.0
50.0
55.0
60.0
65.0
70.0
75.0
80.0
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
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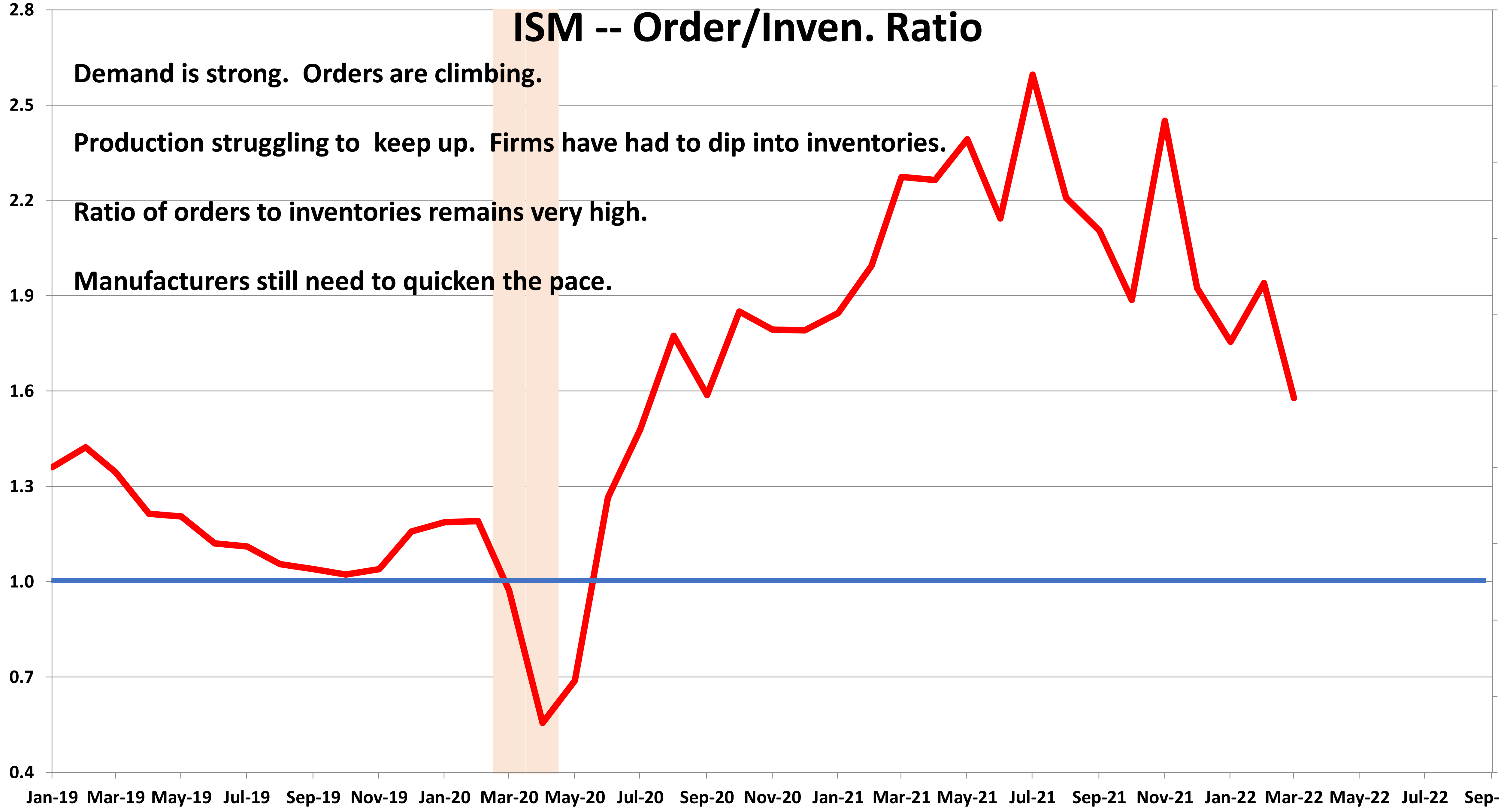
Jun-22
Jul-22
Aug-22
Sep-22


ISM -- Order/Inven. Ratio
Demand is strong. Orders are climbing.
Production struggling to keep up. Firms have had to dip into inventories.
Ratio of orders to inventories remains very high.
Manufacturers still need to quicken the pace.
2.8
2.5
2.2
1.9
1.6
1.3
1.0
0.7
0.4
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 May-21 Jul-21 Sep-21 Nov-21 Jan-22 Mar-22 May-22 Jul-22 Sep-

Labor Market.

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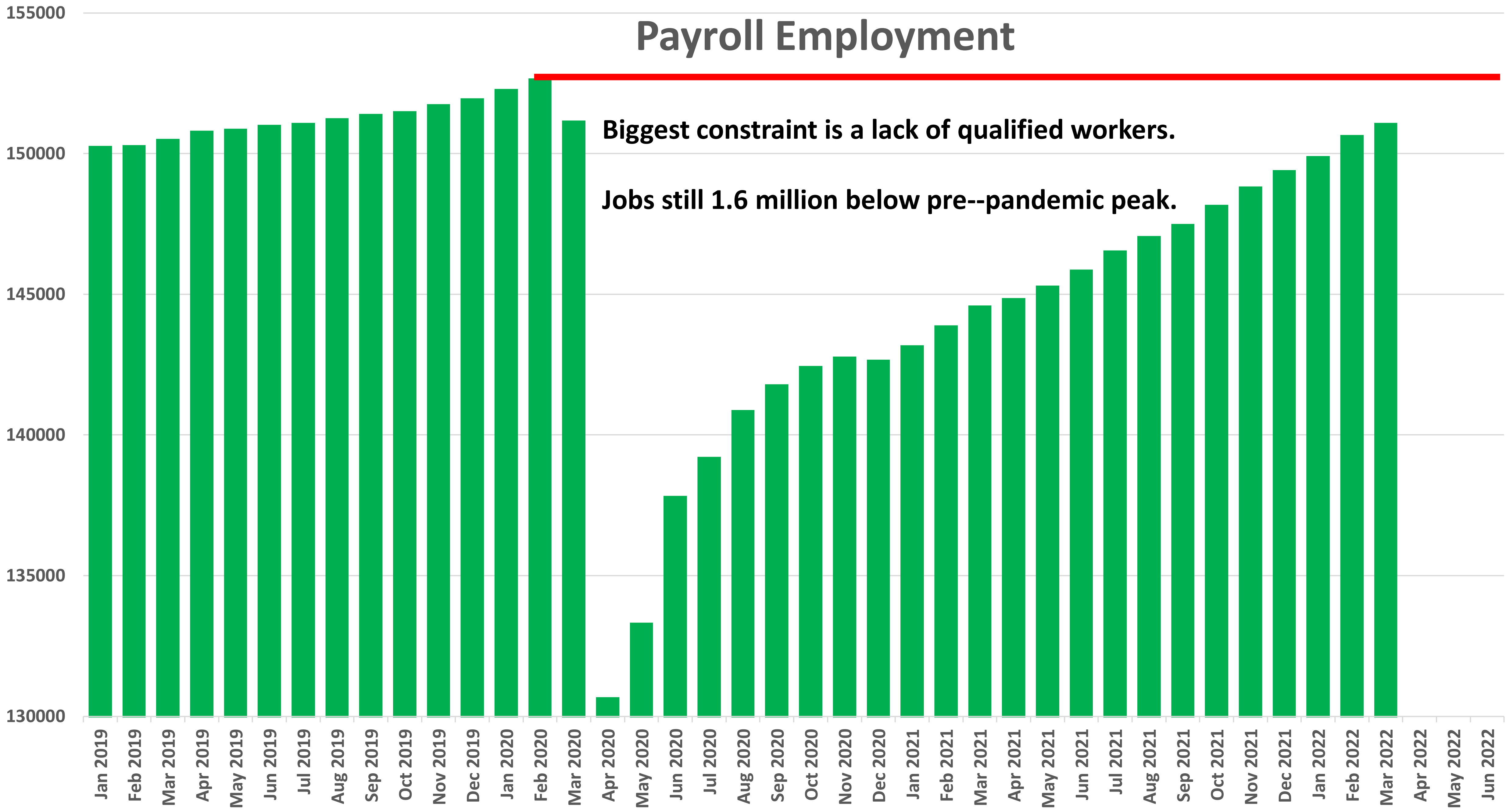
Payroll Employment
Biggest constraint is a lack of qualified workers.
Jobs still 1.6 million below pre--pandemic peak.
155000
150000
145000
140000
135000
130000
Jan 2019
Feb 2019
Mar 2019
Apr 2019
May 2019
Jun 2019
Jul 2019
Aug 2019
Sep 2019
Oct 2019
Nov 2019
Dec 2019
Jan 2020
Feb 2020
Mar 2020
Apr 2020
May 2020
Jun 2020
Jul 2020
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Jan 2021
Feb 2021
Mar 2021
Apr 2021
May 2021
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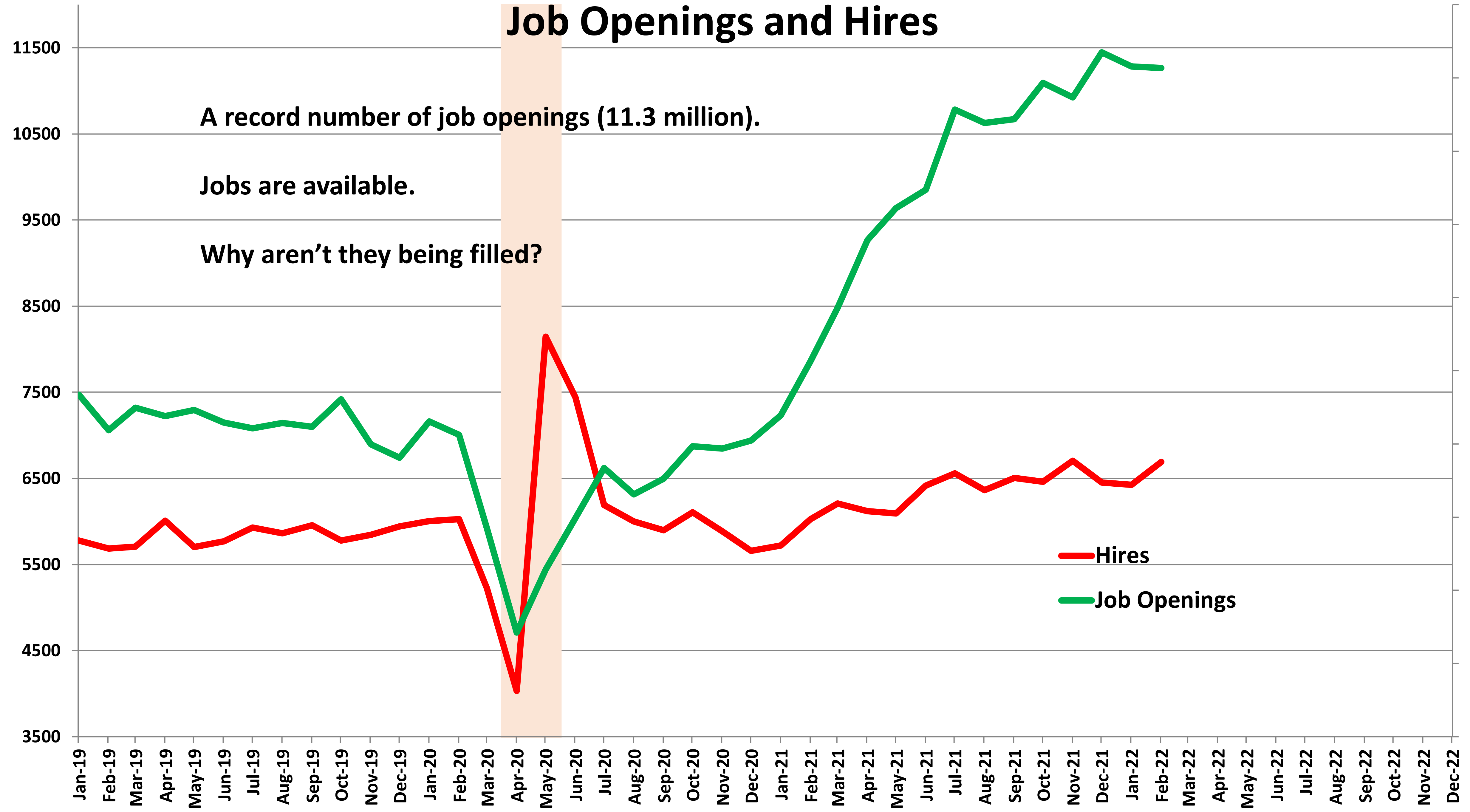
Sep 2021
Oct 2021
Nov 2021
Dec 2021
Jan 2022
Feb 2022
Mar 2022
Apr 2022
May 2022
Jun 2022


Job Openings and Hires
A record number of job openings (11.3 million).
Jobs are available.
Why aren't they being filled?
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
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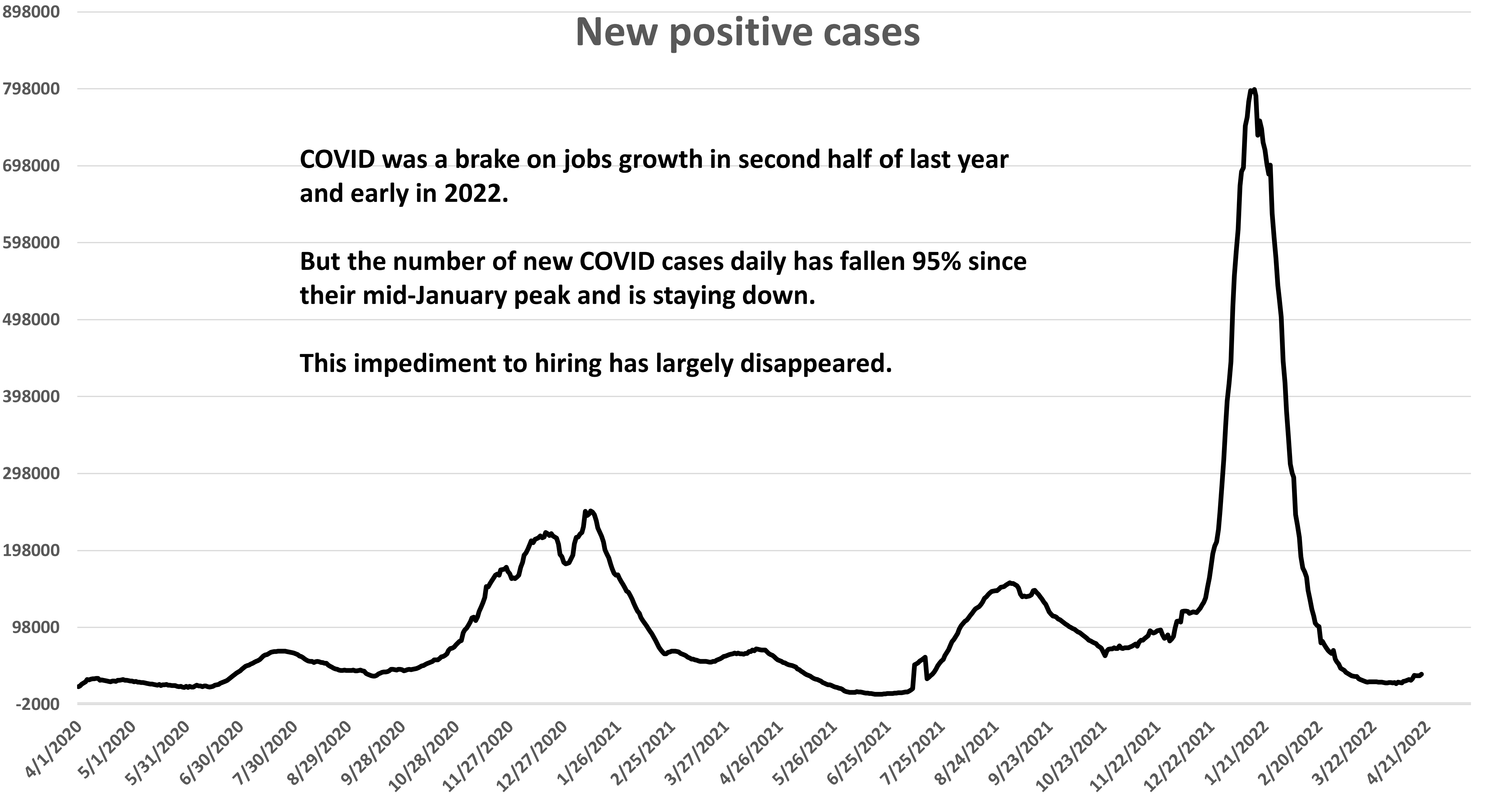
Sep-21
Oct-21
Nov-21
Dec-21
Jan-22
Feb-22
Mar-22
Apr-22
May-22
Jun-22
Jul-22
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22

Where have the 1.6 million missing workers gone?

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

2. Some became self-employed.
   Tired of lousy pay, long hours, bad working conditions.

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

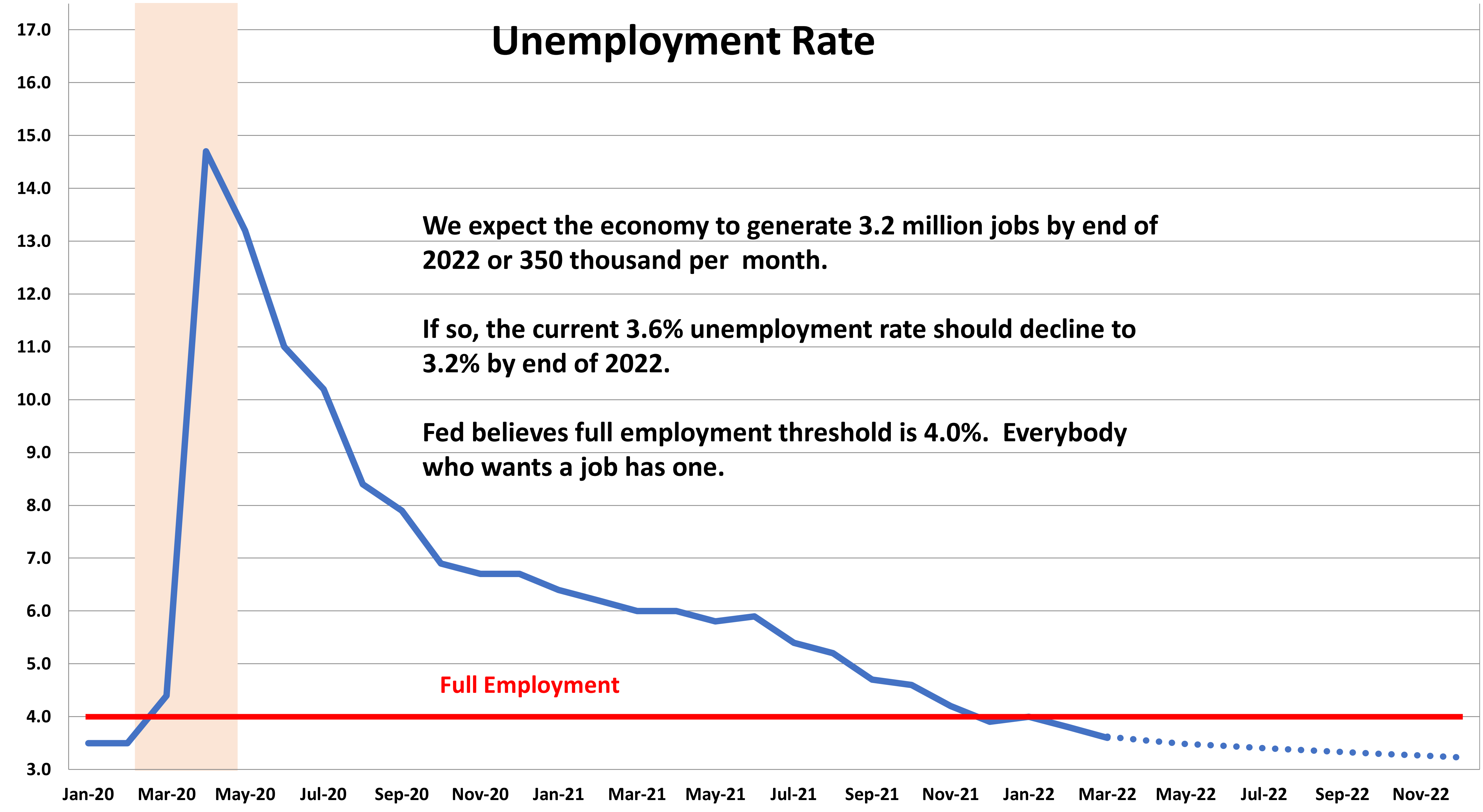


New positive cases
COVID was a brake on jobs growth in second half of last year and early in 2022.
But the number of new COVID cases daily has fallen 95% since their mid-January peak and is staying down.
This impediment to hiring has largely disappeared.
898000
798000
698000
598000
498000
398000
298000
198000
98000
-2000
4/1/2020
5/1/2020
5/31/2020
6/30/2020
7/30/2020
8/29/2020
9/28/2020
10/28/2020
11/27/2020
12/27/2020
1/26/2021
2/25/2021
3/27/2021
4/26/2021
5/26/2021
6/25/2021
7/25/2021
8/24/2021
9/23/2021
10/23/2021
11/22/2021
12/22/2021
1/21/2022
2/20/2022
3/22/2022
4/21/2022

If COVID remains in check consumer spending will climb.

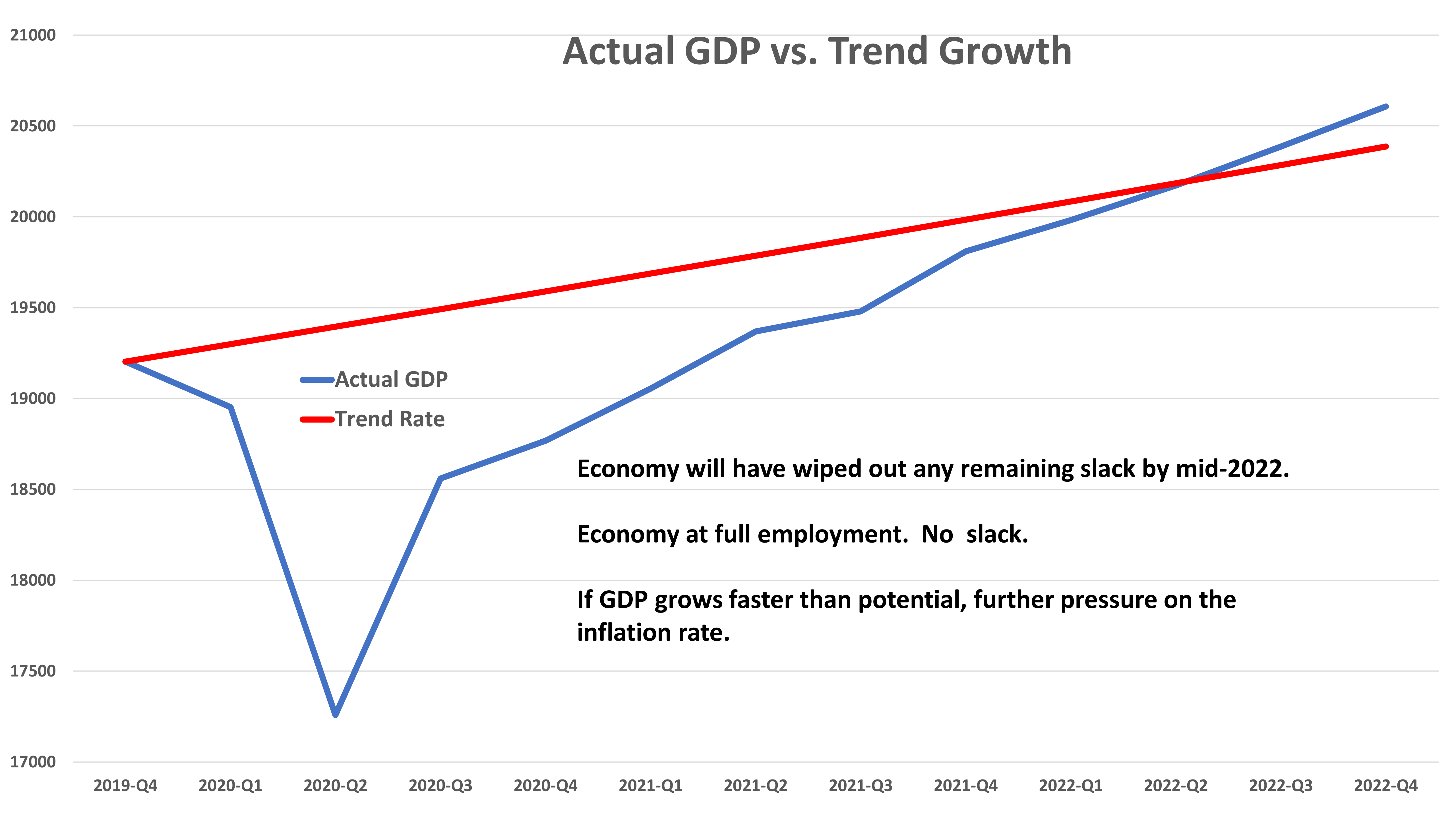
People will again feel safe going to restaurants and bars
Travel on airlines
Stay in hotels
Go to museums
Go to sporting events.

As those industries grow, a need to hire more workers.


Unemployment Rate
We expect the economy to generate 3.2 million jobs by end of 2022 or 350 thousand per month.
If so, the current 3.6% unemployment rate should decline to 3.2% by end of 2022.
Fed believes full employment threshold is 4.0%. Everybody who wants a job has one.
Full Employment
17.0
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
Mar-20
May-20
Jul-20
Sep-20
Nov-20
Jan-21
Mar-21
May-21
Jul-21
Sep-21
Nov-21
Jan-22
Mar-22
May-22
Jul-22
Sep-22
Nov-22

GDP (Real)

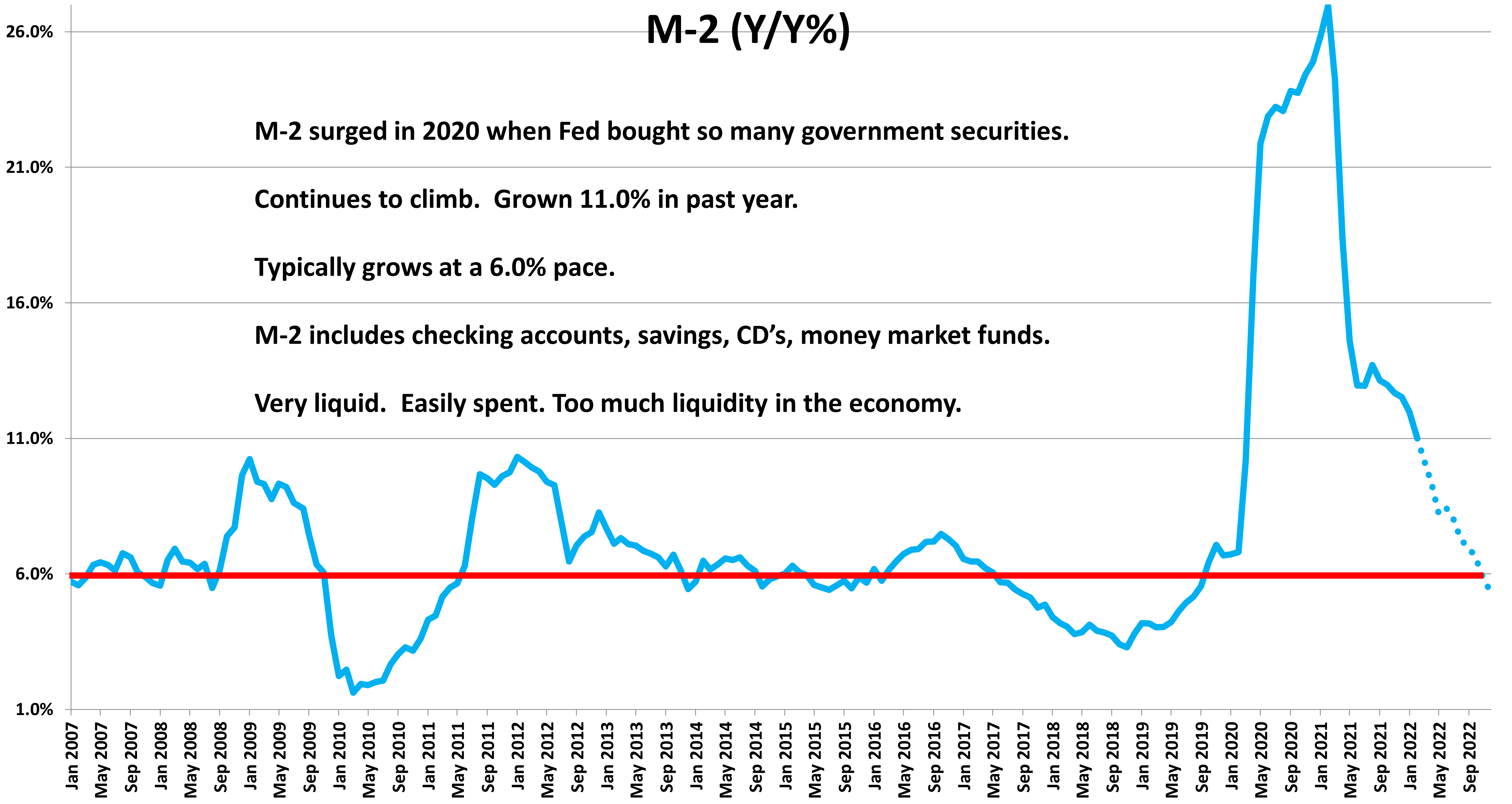
We expect GDP growth of 2.5% growth in Q1 as COVID and the fear of war take a toll.
We expect 3.5% in 2022 and 3.0% in 2023 as more workers become available and supply shortages abate.
Steamy growth. Potential growth rate is 1.8%.
35.0%
25.0%
15.0%
5.0%
-5.0%
-15.0%
-25.0%
-35.0%
2019-Q1
2019-Q3
2020-Q1
2020-Q3
2021-Q1
2021-Q3
2022-Q1
2022-Q3



Actual GDP vs. Trend Growth
21000
20500
20000
19500
19000
18500
18000
17500
17000
Actual GDP
Trend Rate
Economy will have wiped out any remaining slack by mid-2022.
Economy at full employment. No slack.
If GDP grows faster than potential, further pressure on the inflation rate.
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

Inflation

It will continue to grow rapidly.


M-2 (Y/Y%)
M-2 surged in 2020 when Fed bought so many government securities.
Continues to climb. Grown 11.0% in past year.
Typically grows at a 6.0% pace.
M-2 includes checking accounts, savings, CD's, money market funds.
Very liquid. Easily spent. Too much liquidity in the economy.
26.0%
21.0%
16.0%
11.0%
6.0%
1.0%
Jan 2007
May 2007
Sep 2007
Jan 2008
May 2008
Sep 2008
Jan 2009
May 2009
Sep 2009
Jan 2010
May 2010
Sep 2010
Jan 2011
May 2011
Sep 2011
Jan 2012
May 2012
Sep 2012
Jan 2013
May 2013
Sep 2013
Jan 2014
May 2014
Sep 2014
Jan 2015
May 2015
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Jan 2016
May 2016
Sep 2016
Jan 2017
May 2017
Sep 2017
Jan 2018
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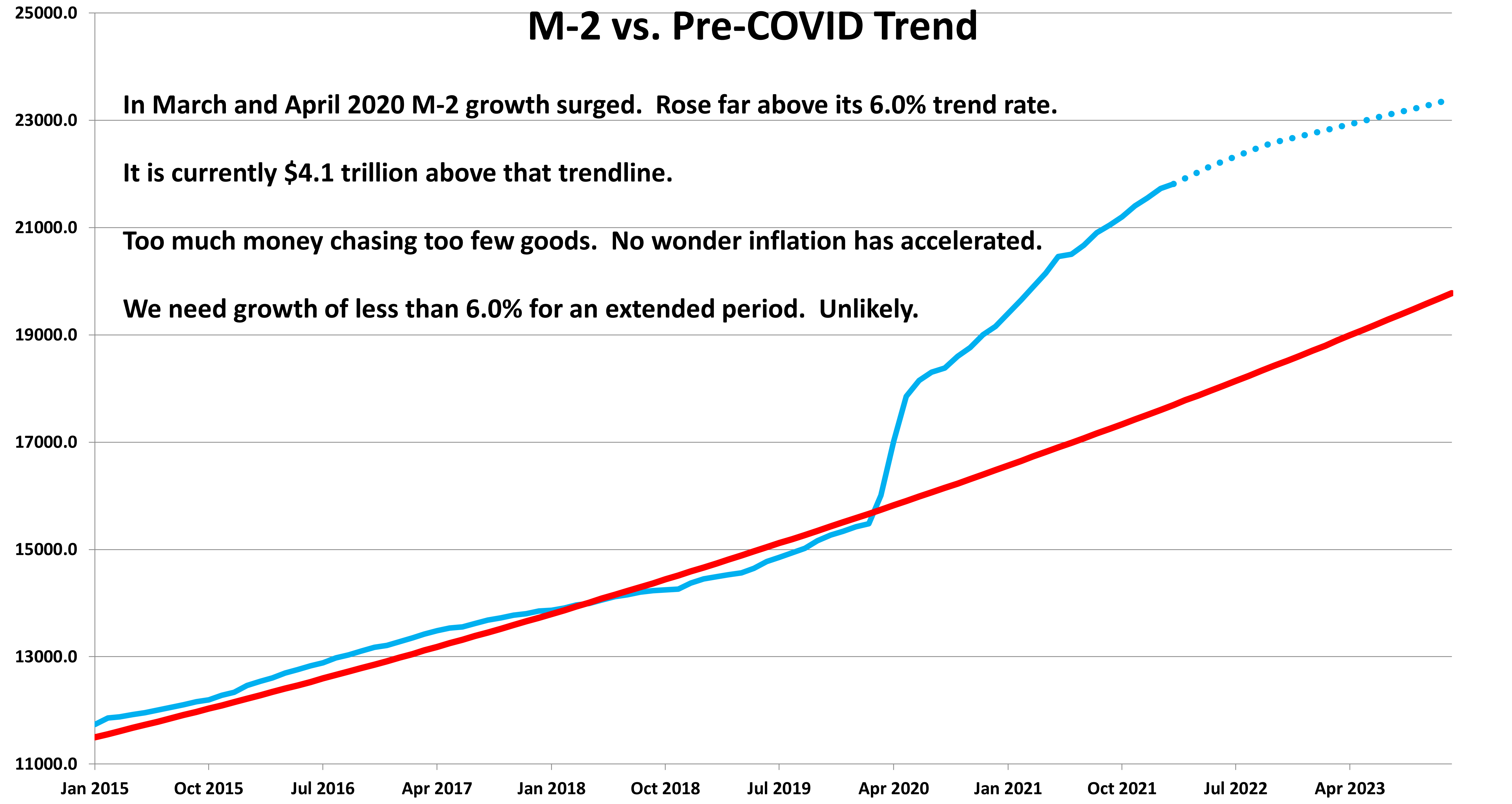
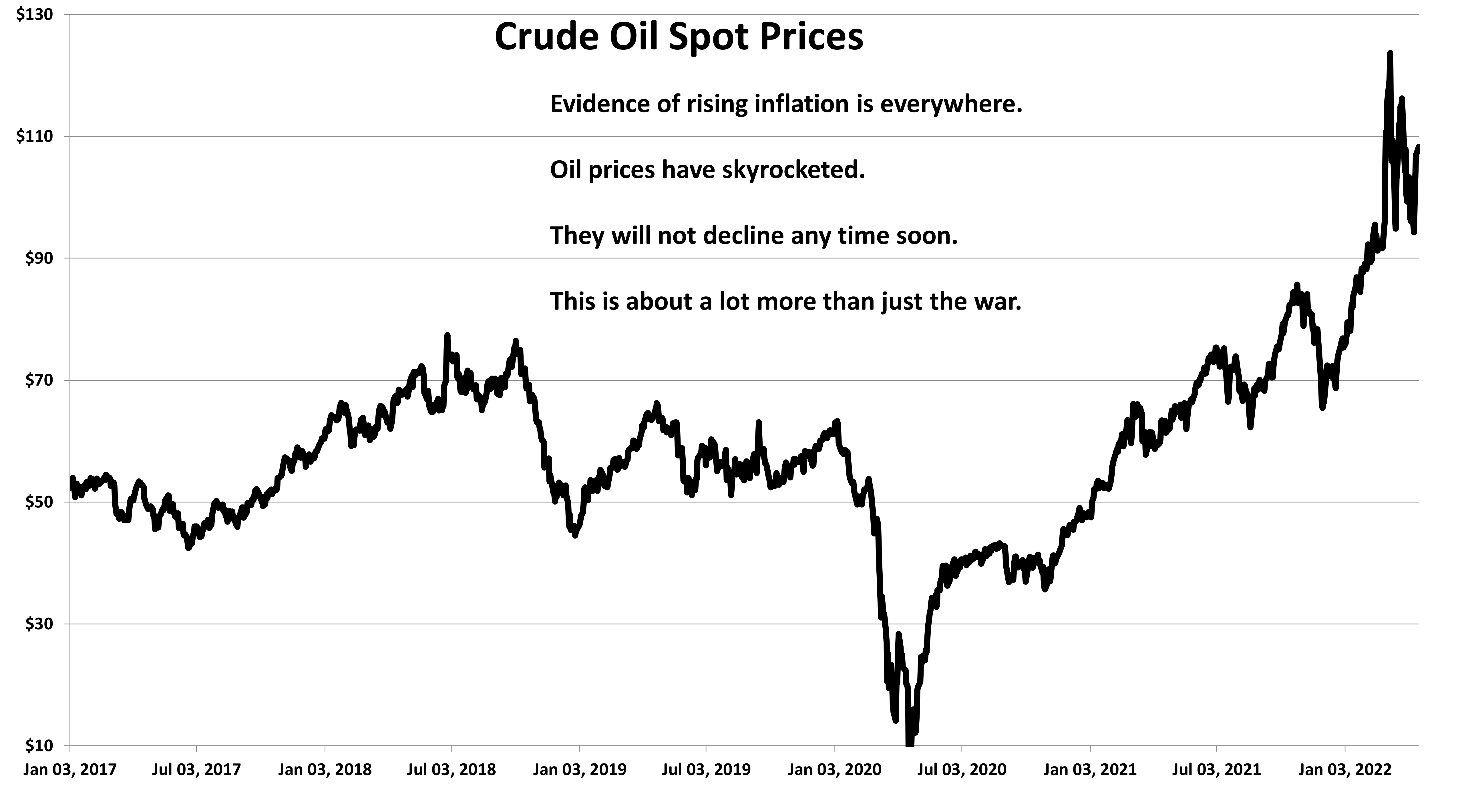
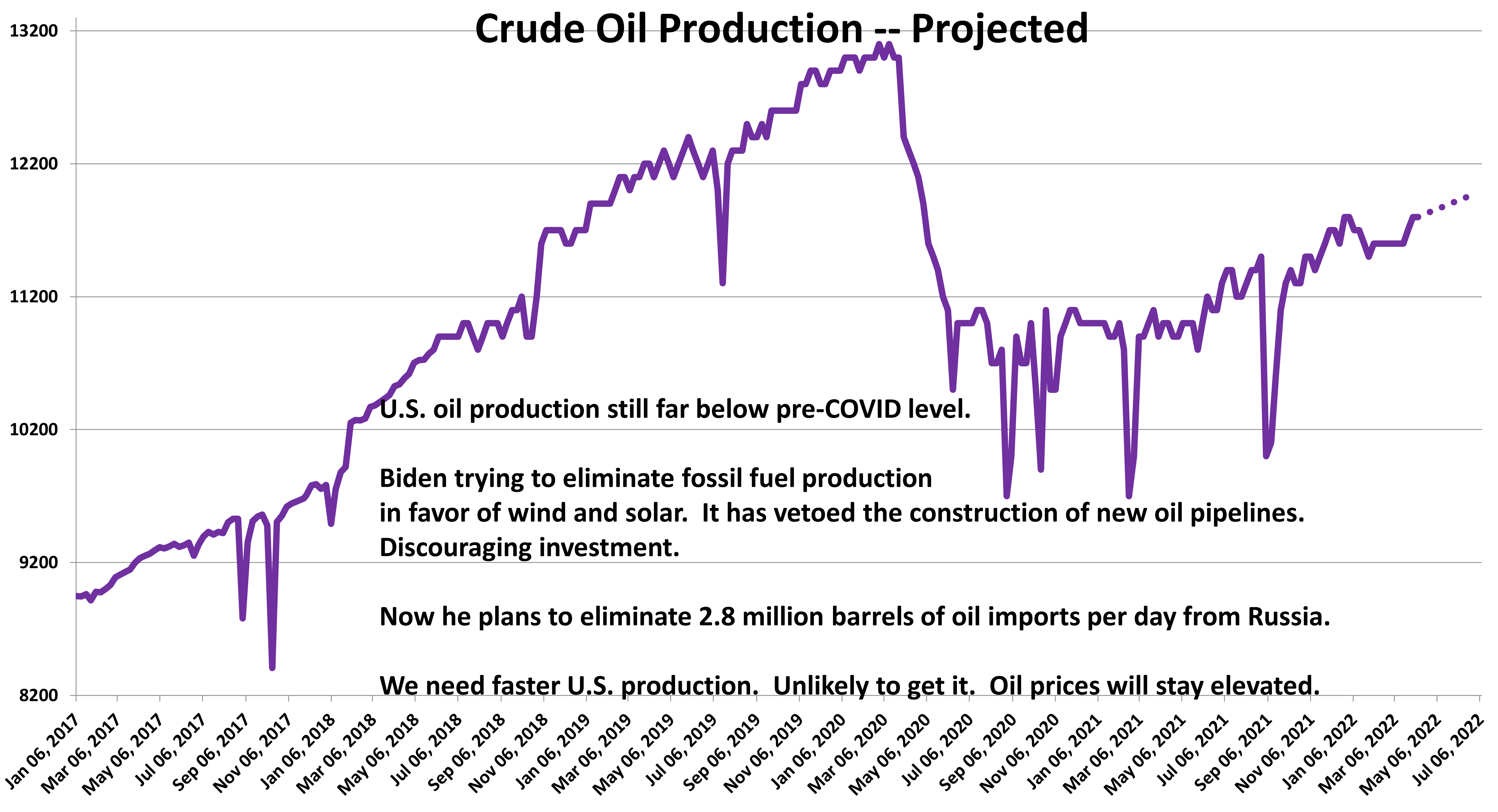
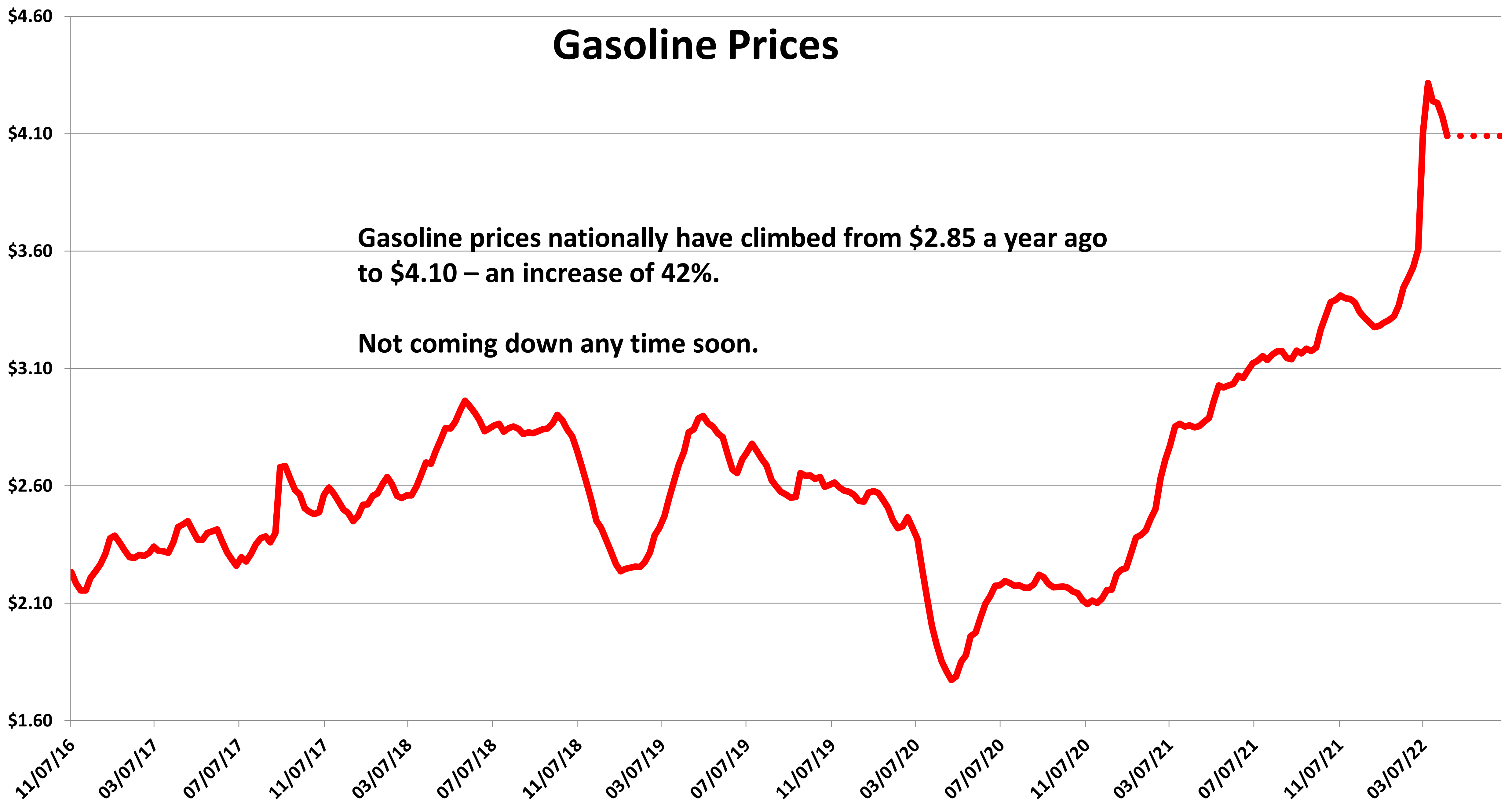
May 2021
Sep 2021
Jan 2022
May 2022
Sep 2022

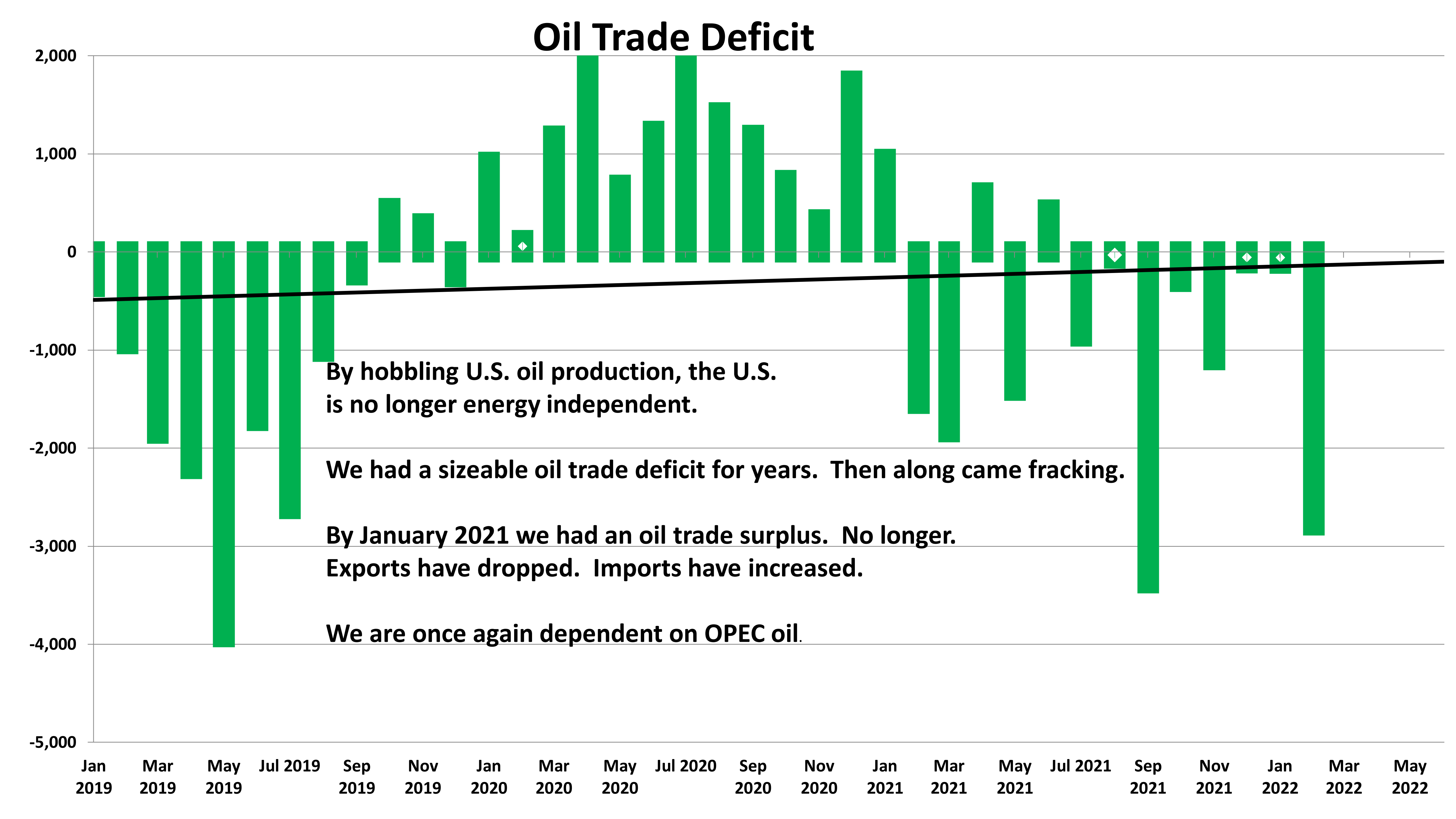

M-2 vs. Pre-COVID Trend
In March and April 2020 M-2 growth surged. Rose far above its 6.0% trend rate.
It is currently $4.1 trillion above that trendline.
Too much money chasing too few goods. No wonder inflation has accelerated.
We need growth of less than 6.0% for an extended period. Unlikely.
25000.0
23000.0
21000.0
19000.0
17000.0
15000.0
13000.0
11000.0
Jan 2015
Oct 2015
Jul 2016
Apr 2017
Jan 2018
Oct 2018
Jul 2019
Apr 2020
Jan 2021
Oct 2021
Jul 2022
Apr 2023


Crude Oil Spot Prices
Evidence of rising inflation is everywhere.
Oil prices have skyrocketed.
They will not decline any time soon.
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

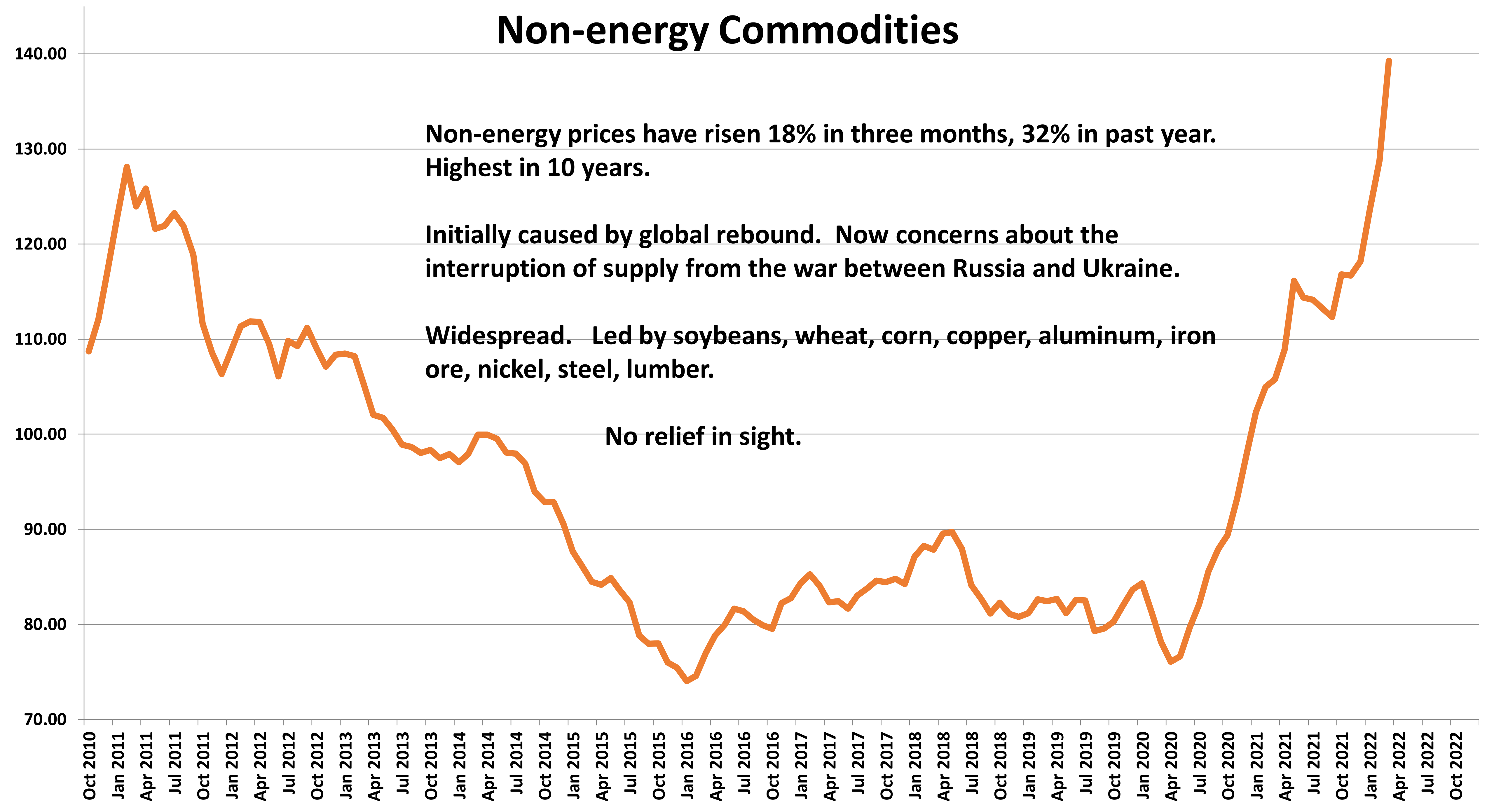


Crude Oil Production -- Projected
13200
12200
11200
10200
9200
8200
U.S. oil production still far below pre-COVID level.
Biden trying to eliminate fossil fuel production
in favor of wind and solar. It has vetoed the construction of new oil pipelines.
Discouraging investment.
Now he plans to eliminate 2.8 million barrels of oil imports per day from Russia.
We need faster U.S. production. Unlikely to get it. Oil prices will stay elevated.
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


Gasoline Prices
Gasoline prices nationally have climbed from $2.85 a year ago
to $4.10 – an increase of 42%.
Not coming down any time soon.
$4.60
$4.10
$3.60
$3.10
$2.60
$2.10
$1.60
11/07/16
03/07/17
07/07/17
11/07/17
03/07/18
07/07/18
11/07/18
03/07/19
07/07/19
11/07/19
03/07/20
07/07/20
11/07/20
03/07/21
07/07/21
11/07/21
03/07/22



Oil Trade Deficit
2,000
1,000
0
-1,000
-2,000
-3,000
-4,000
-5,000
By hobbling U.S. oil production, the U.S.
is no longer energy independent.
We had a sizeable oil trade deficit for years. Then along came fracking.
By January 2021 we had an oil trade surplus. No longer.
Exports have dropped. Imports have increased.
We are once again dependent on OPEC oil.
Jan 2019
Mar 2019
May 2019
Jul 2019
Sep 2019
Nov 2019
Jan 2020
Mar 2020
May 2020
Jul 2020
Sep 2020
Nov 2020
Jan 2021
Mar 2021
May 2021
Jul 2021
Sep 2021
Nov 2021
Jan 2022
Mar 2022
May 2022



Non-energy Commodities
Non-energy prices have risen 18% in three months, 32% in past year.
Highest in 10 years.
Initially caused by global rebound. Now concerns about the
interruption of supply from the war between Russia and Ukraine.
Widespread. Led by soybeans, wheat, corn, copper, aluminum, iron
ore, nickel, steel, lumber.
No relief in sight.
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
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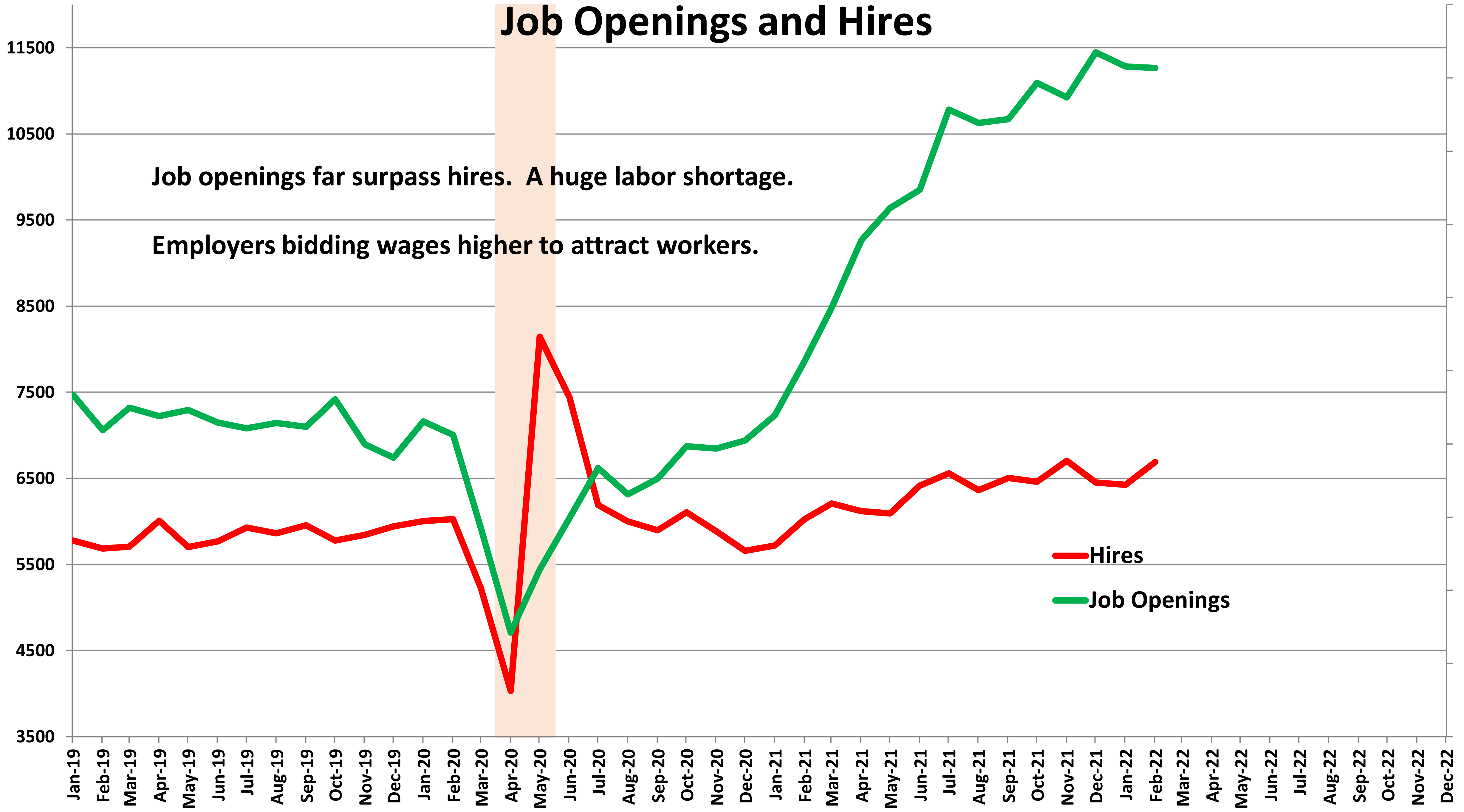
Jan 2018
Apr 2018
Jul 2018
Oct 2018
Jan 2019
Apr 2019
Jul 2019
Oct 2019
Jan 2020
Apr 2020
Jul 2020
Oct 2020
Jan 2021
Apr 2021
Jul 2021
Oct 2021
Jan 2022
Apr 2022
Jul 2022
Oct 2022


Food
Food prices have risen 8.5% in the past year.
Ukraine is a big exporter of corn and wheat.
War will curtail those exports. Food prices not coming down.
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



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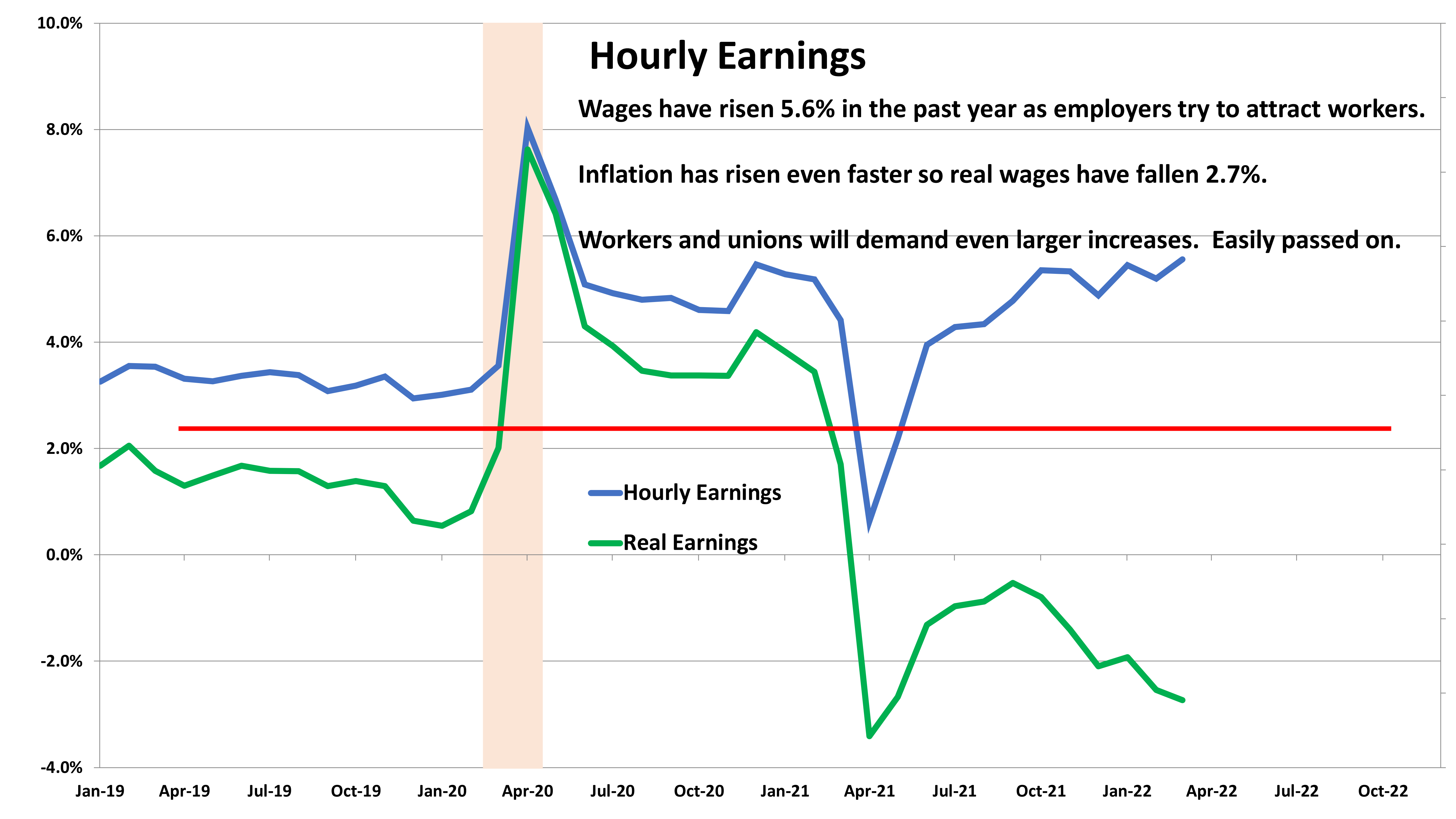
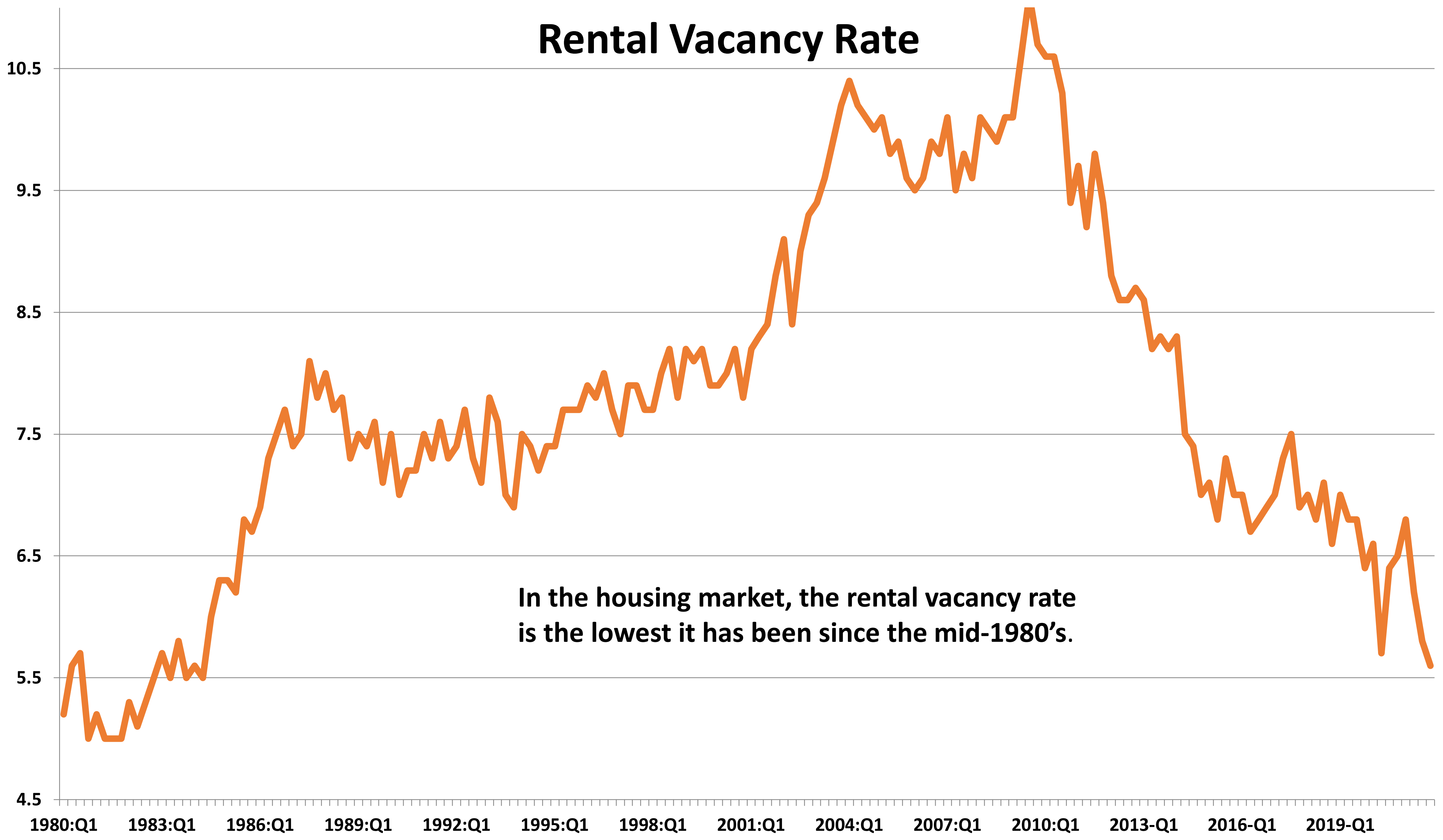
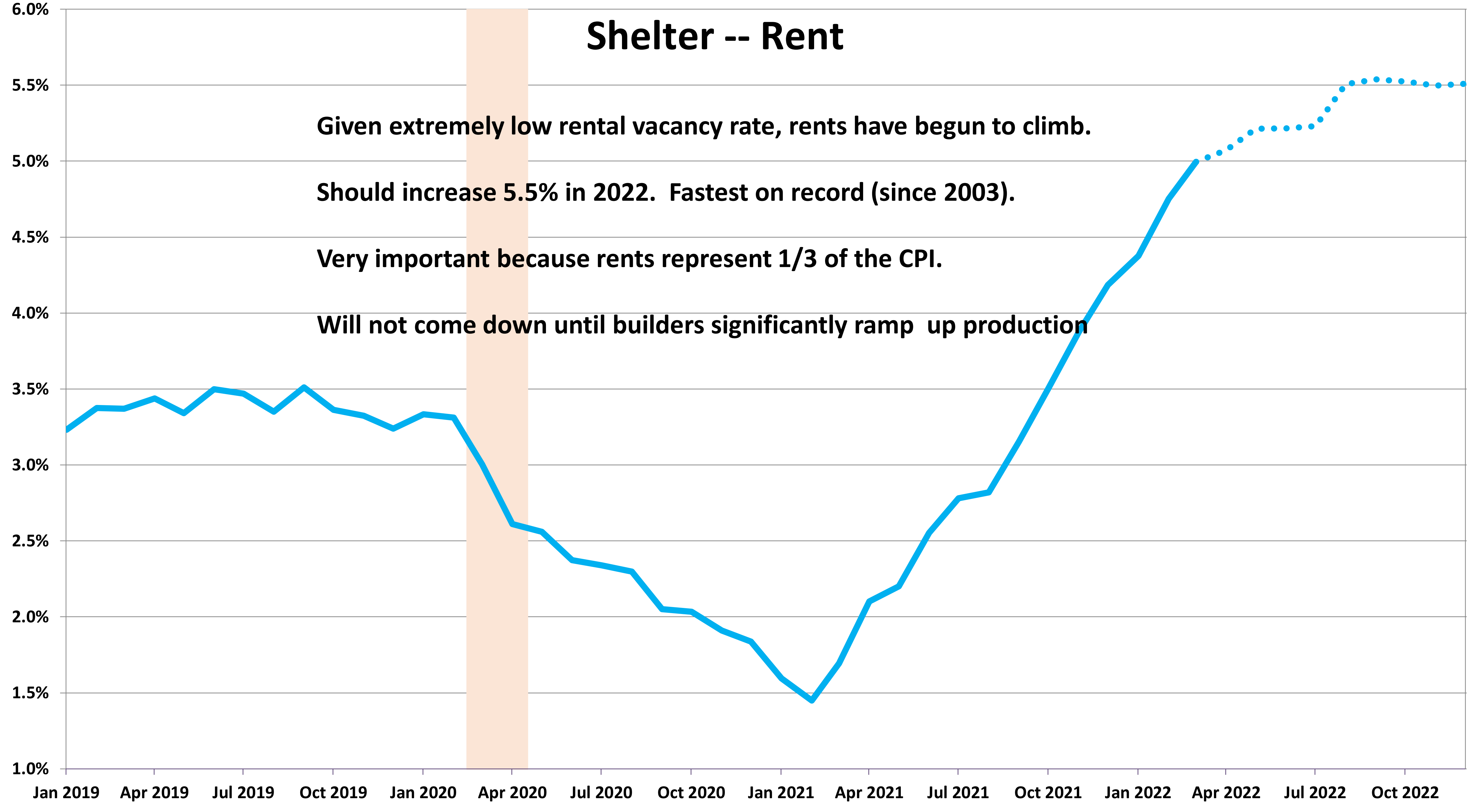
Aug-22
Sep-22
Oct-22
Nov-22
Dec-22

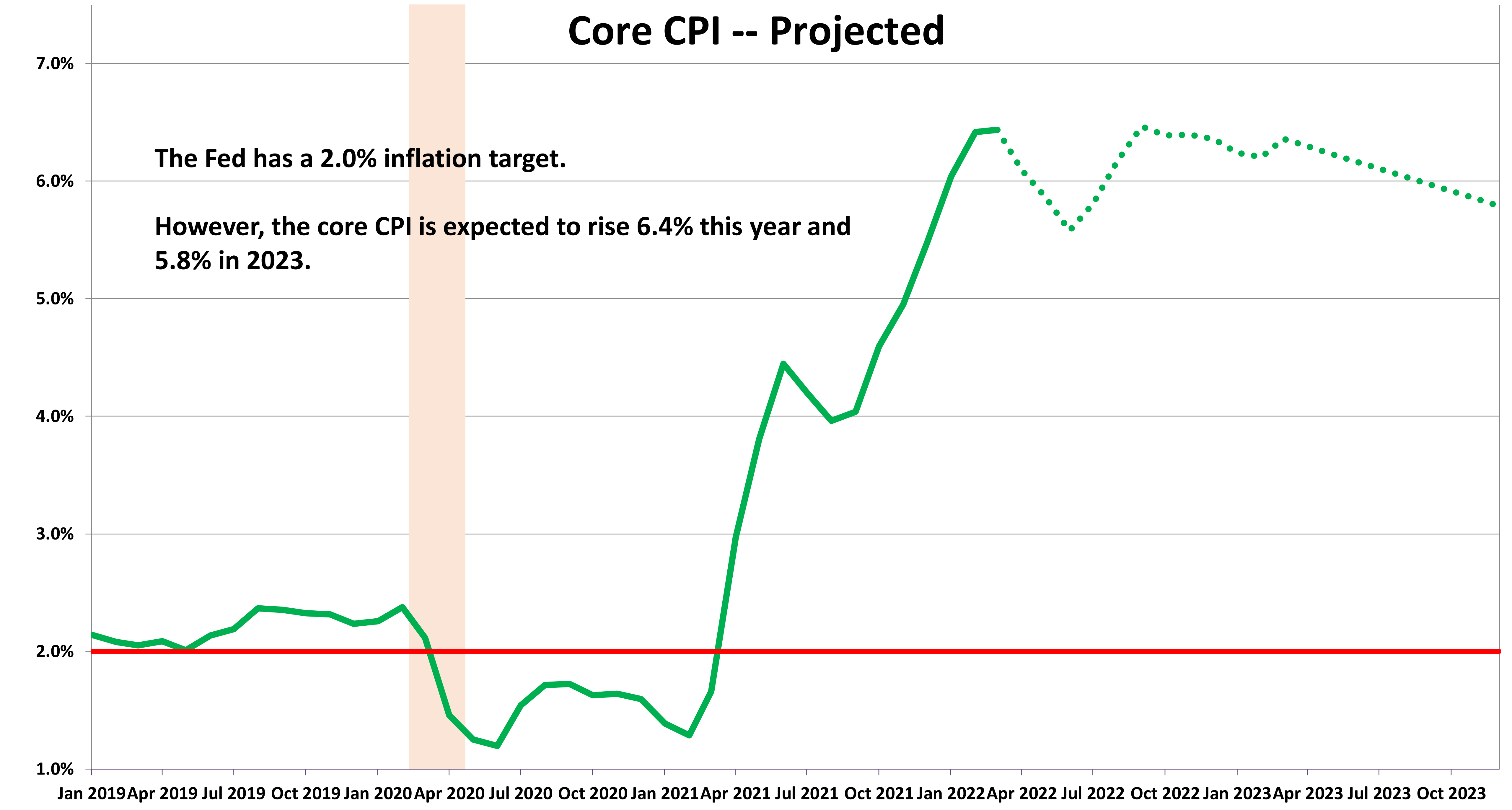

Hourly Earnings
Wages have risen 5.6% in the past year as employers try to attract workers.
Inflation has risen even faster so real wages have fallen 2.7%.
Workers and unions will demand even larger increases. Easily passed on.
Hourly Earnings
Real Earnings
10.0%
8.0%
6.0%
4.0%
2.0%
0.0%
-2.0%
-4.0%
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
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 5.5% in 2022. Fastest on record (since 2003).
Very important because rents represent 1/3 of the CPI.
Will not come down until builders significantly ramp up production
6.0%
5.5%
5.0%
4.5%
4.0%
3.5%
3.0%
2.5%
2.0%
1.5%
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


Core CPI -- Projected
The Fed has a 2.0% inflation target.
However, the core CPI is expected to rise 6.4% this year and 5.8% in 2023.
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

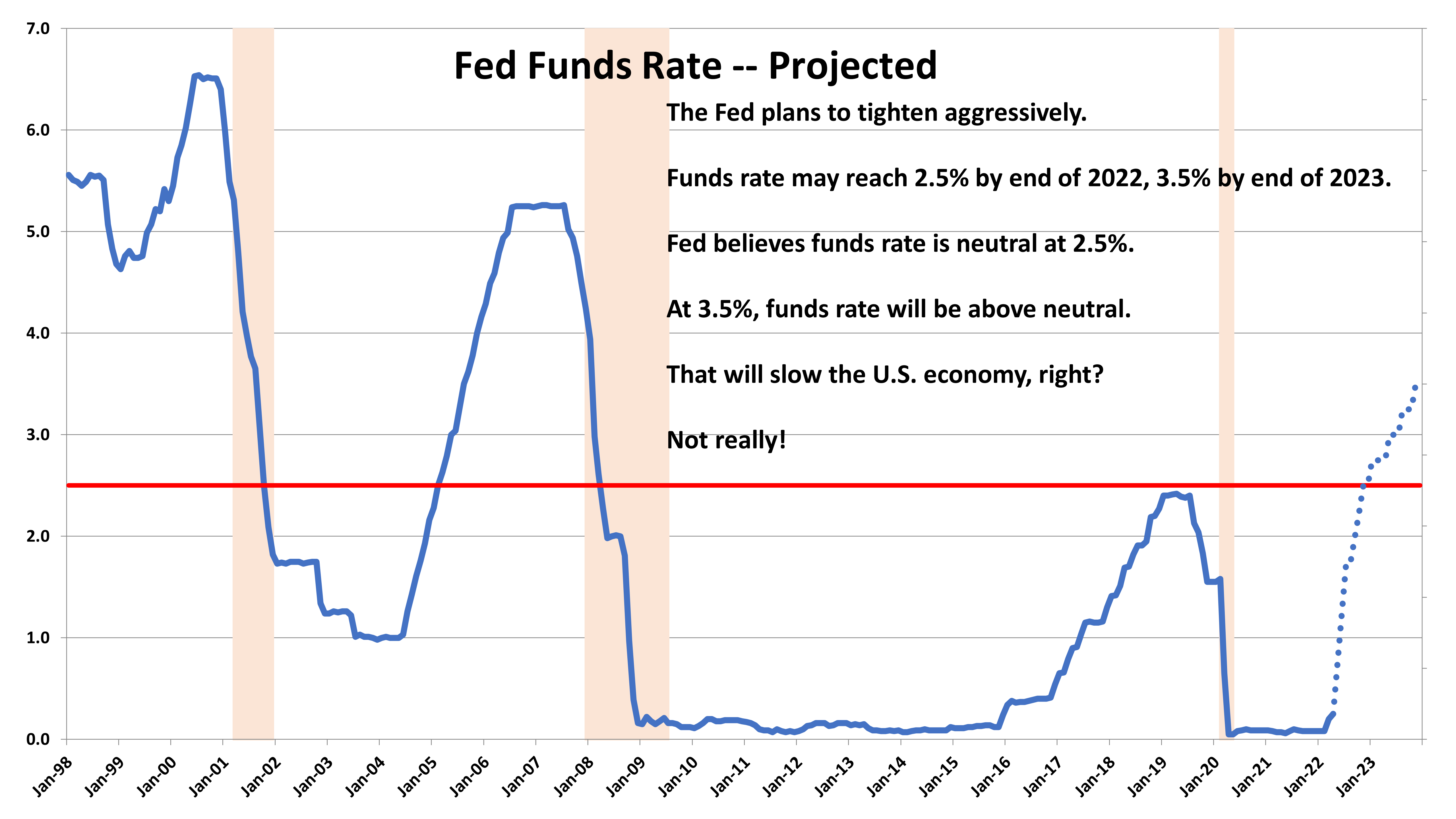
How will the Fed respond to this?

The Fed plans to use two tools

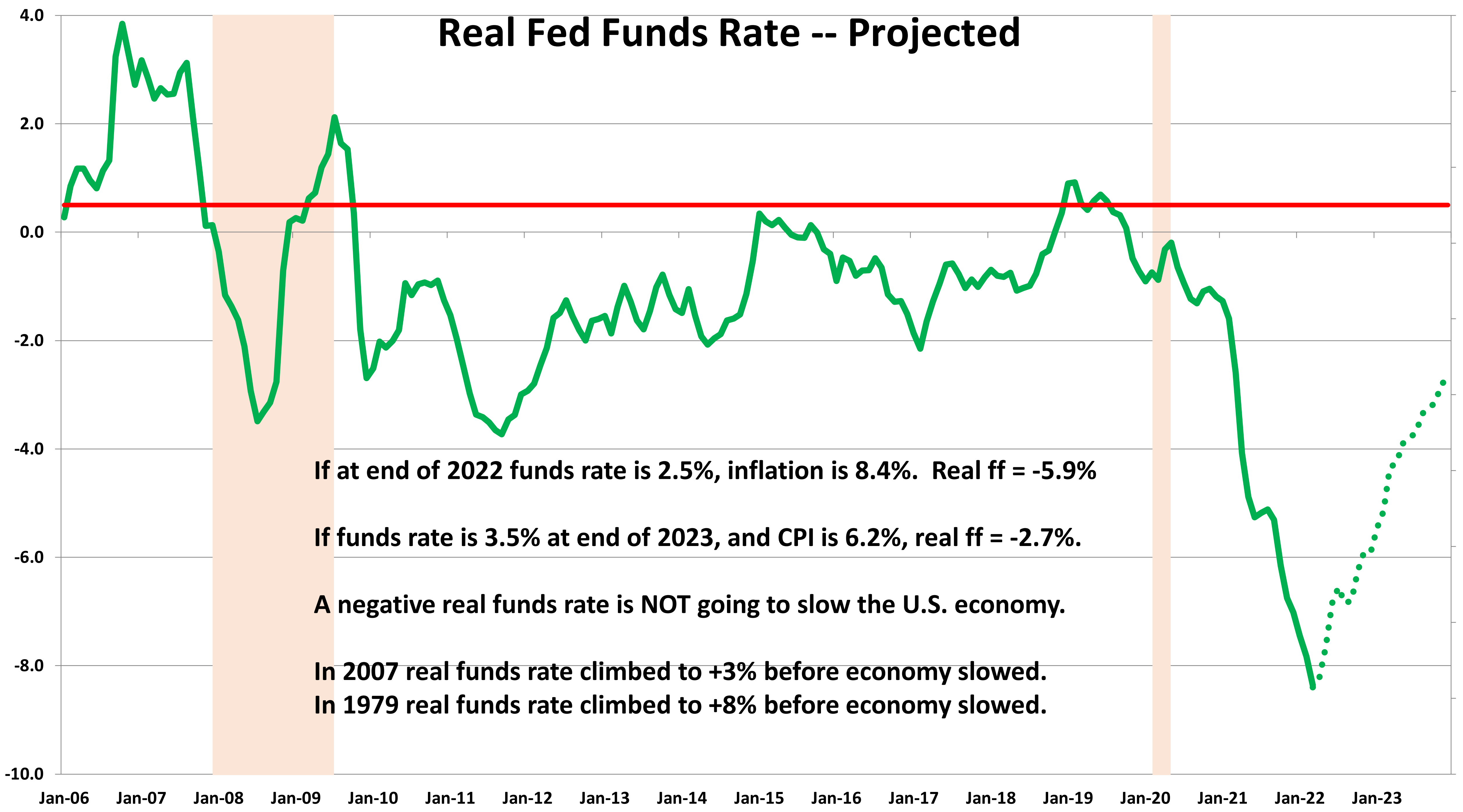
1. Raise the fed funds rate.

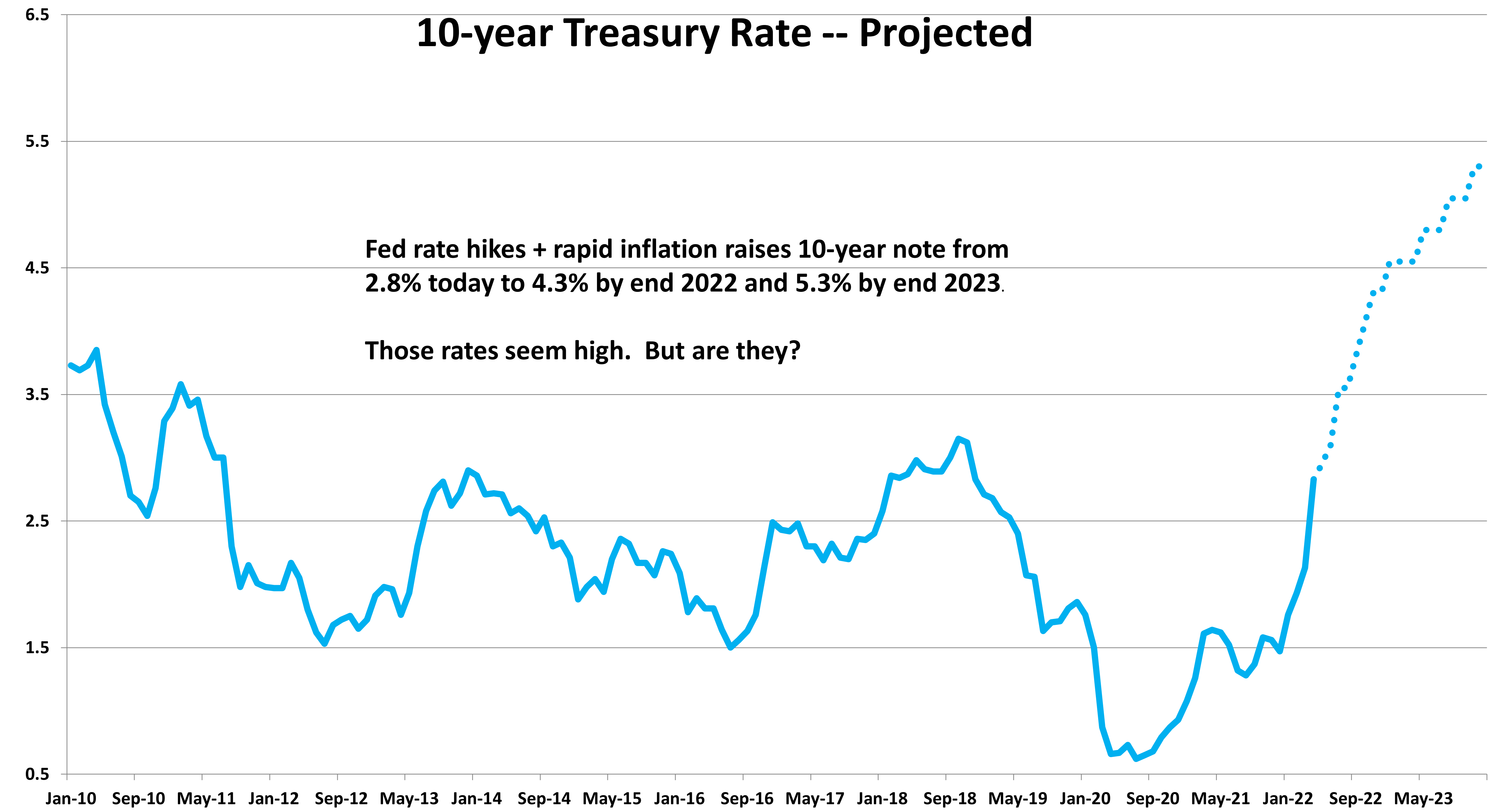
2. Shrink its balance sheet.

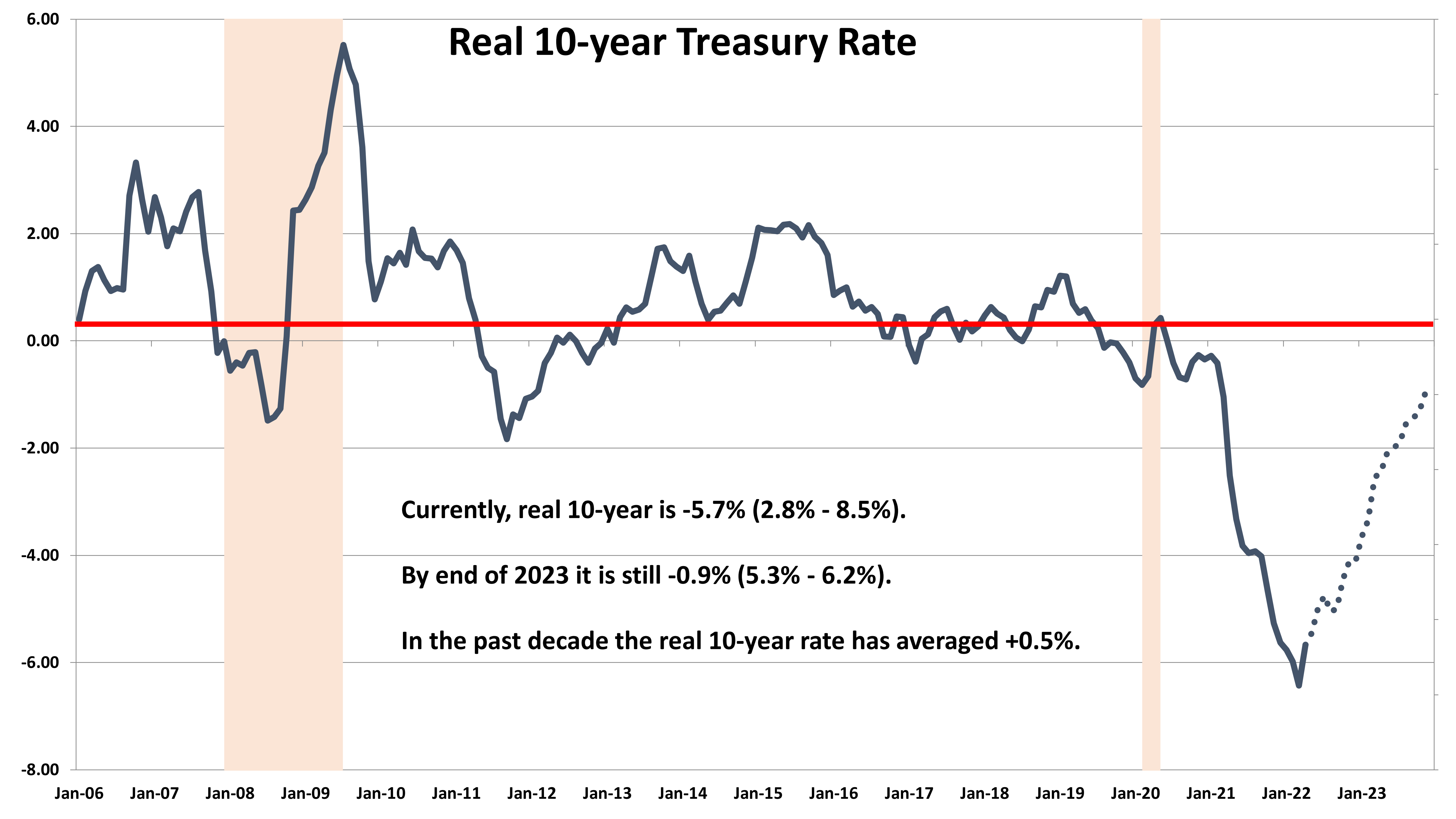
1. Change the funds rate



Fed Funds Rate -- Projected
The Fed plans to tighten aggressively.
Funds rate may reach 2.5% by end of 2022, 3.5% by end of 2023.
Fed believes funds rate is neutral at 2.5%.
At 3.5%, funds rate will be above neutral.
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 Fed Funds Rate -- Projected
4.0
2.0
0.0
-2.0
-4.0
-6.0
-8.0
-10.0
If at end of 2022 funds rate is 2.5%, inflation is 8.4%. Real ff = -5.9%
If funds rate is 3.5% at end of 2023, and CPI is 6.2%, real ff = -2.7%.
A negative real funds rate is NOT going to slow the U.S. economy.
In 2007 real funds rate climbed to +3% before economy slowed.
In 1979 real funds rate climbed to +8% before economy slowed.
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


10-year Treasury Rate -- Projected
Fed rate hikes + rapid inflation raises 10-year note from
2.8% today to 4.3% by end 2022 and 5.3% by end 2023.
Those rates seem high. But are they?
6.5
5.5
4.5
3.5
2.5
1.5
0.5
Jan-10
Sep-10
May-11
Jan-12
Sep-12
May-13
Jan-14
Sep-14
May-15
Jan-16
Sep-16
May-17
Jan-18
Sep-18
May-19
Jan-20
Sep-20
May-21
Jan-22
Sep-22
May-23

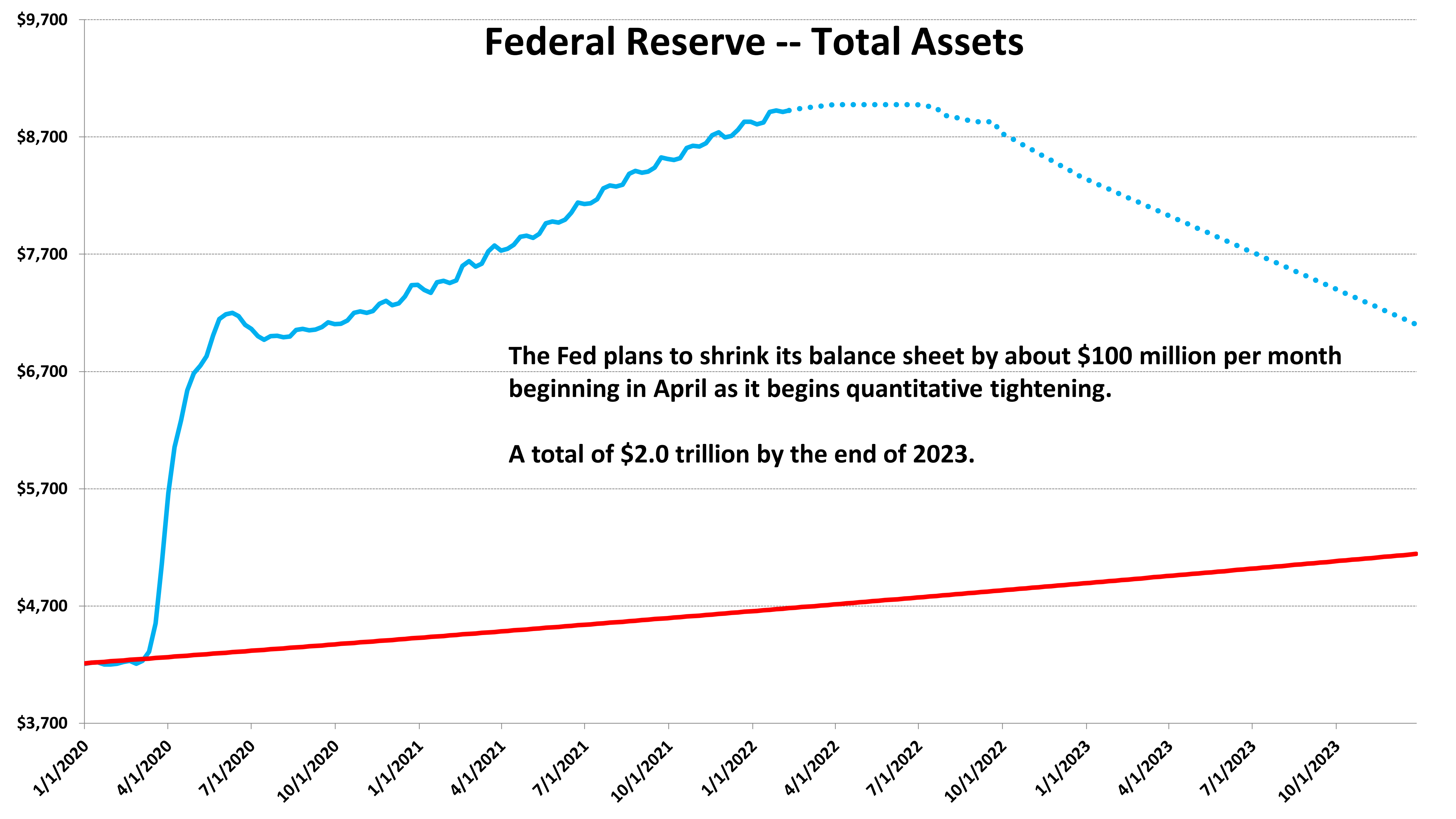

Real 10-year Treasury Rate
Currently, real 10-year is -5.7% (2.8% - 8.5%).
By end of 2023 it is still -0.9% (5.3% - 6.2%).
In the past decade the real 10-year rate has averaged +0.5%.
6.00
4.00
2.00
0.00
-2.00
-4.00
-6.00
-8.00
Jan-06
Jan-07
Jan-08
Jan-09
Jan-10
Jan-11
Jan-12
Jan-13
Jan-14
Jan-15
Jan-16
Jan-17
Jan-18
Jan-19
Jan-20
Jan-21
Jan-22
Jan-23

Real rates at end of 2023

	Nominal rate	Inflation	Real rate
Funds rate	3.5%	6.2%	-2.7%
10-year note	5.3%	6.2%	-0.9%

Will not slow the economy with negative real rates.

2. Shrink its balance sheet


Federal Reserve -- Total Assets
The Fed plans to shrink its balance sheet by about $100 million per month beginning in April as it begins quantitative tightening.
A total of $2.0 trillion by the end of 2023.
$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
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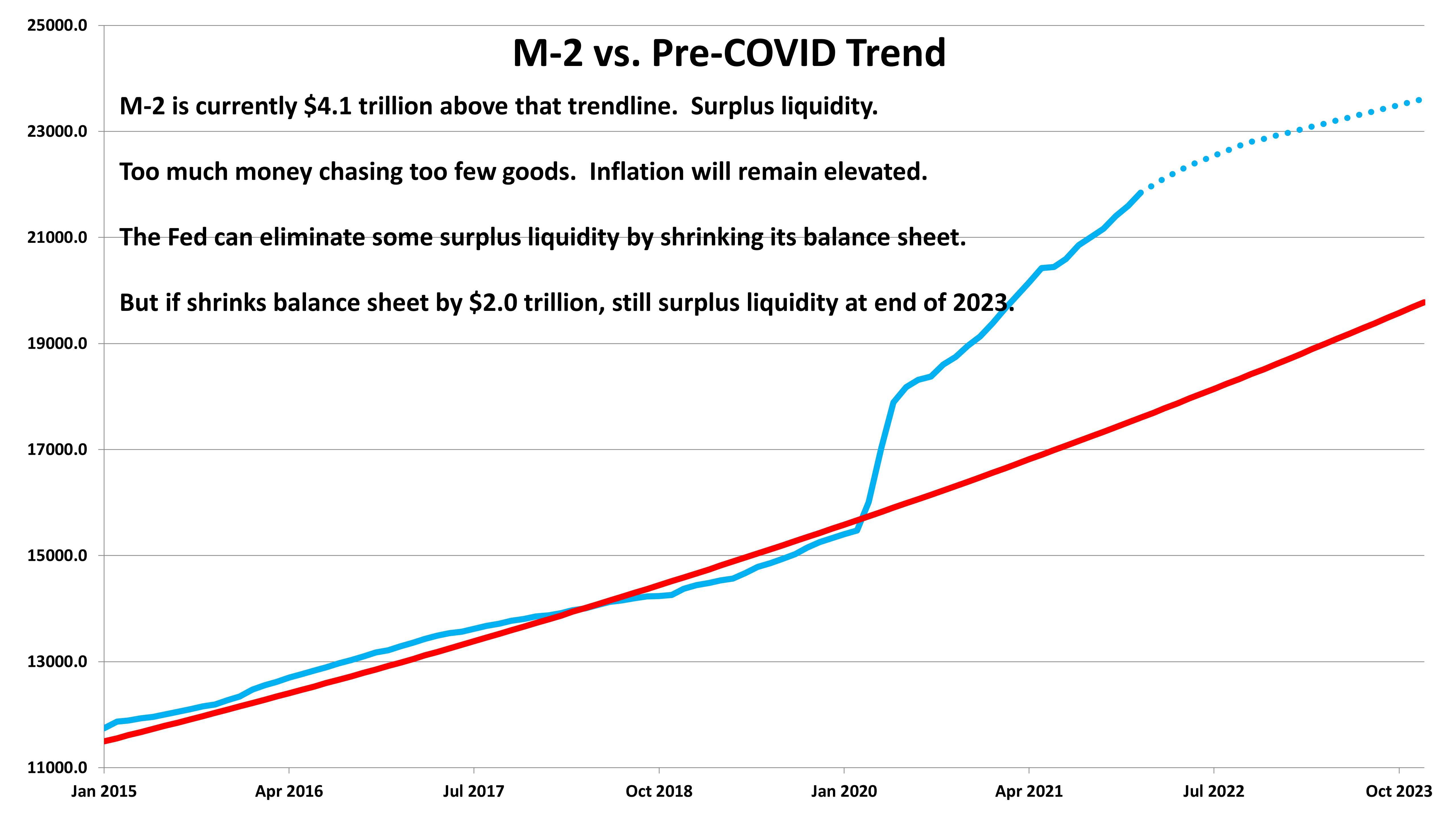
1/1/2023
4/1/2023
7/1/2023
10/1/2023


M-2 vs. Pre-COVID Trend
M-2 is currently $4.1 trillion above that trendline. Surplus liquidity.
Too much money chasing too few goods. Inflation will remain elevated.
The Fed can eliminate some surplus liquidity by shrinking its balance sheet.
But if shrinks balance sheet by $2.0 trillion, still surplus liquidity at end of 2023.
25000.0
23000.0
21000.0
19000.0
17000.0
15000.0
13000.0
11000.0
Jan 2015
Apr 2016
Jul 2017
Oct 2018
Jan 2020
Apr 2021
Jul 2022
Oct 2023

The combo of rate hikes plus quantitative tightening will not dump the economy into recession.

Real rates still negative at end of 2023.

Still surplus liquidity at yearend 2023.

Economics. Explained.

Forecasts – 2022/2023

	2021	2022	2023
GDP Growth --	5.5%	3.5%	3.0%
Unemployment Rate --	3.9%	3.2%	3.1%
Core CPI--	5.5%	6.4%	5.8%
Fed Funds Rate --	0.0%	2.5%	3.5%
10-Year Note --	1.5%	4.3%	5.3%
30-Year Mortgage Rate --	3.1%	6.0%	6.8%

Economics. Explained.

Rate Hikes –
Too Little, Too Late

Stephen D. Slifer
NumberNomics
www.numbernomics.com