INTEREST RATES, INFLATION AND ECONOMIC GROWTH

Update

SPECIAL REPORT | SEPTEMBER 2023

MORRISON STREET RESEARCH

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SOURCES:
Morrison Street Research
Bureau of Economic Analysis
Federal Reserve Economic Data (FRED)
ICE Data Indices
U.S. Bureau of Labor Statistics
U.S. Congress
U.S. Census Bureau

Letter from the Editor

RANCE GREGORY
CEO

This 2023 report has been produced at the request of investors who want to further understand inflation and interest rates, and their relationships to growth in the economy. The objective of the selected charts and data is to provide a framework for evaluating how these factors can be incorporated to derive forecast values at various stages of economic development and at different points in a business cycle.

As always, please let us know if you have any questions or feedback.

Contributors:

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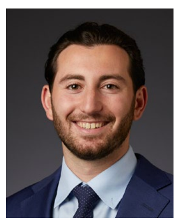
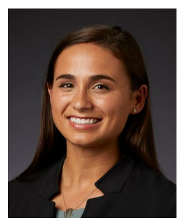


PETER SHERMAN



MARY GRACE MARKGRAFF

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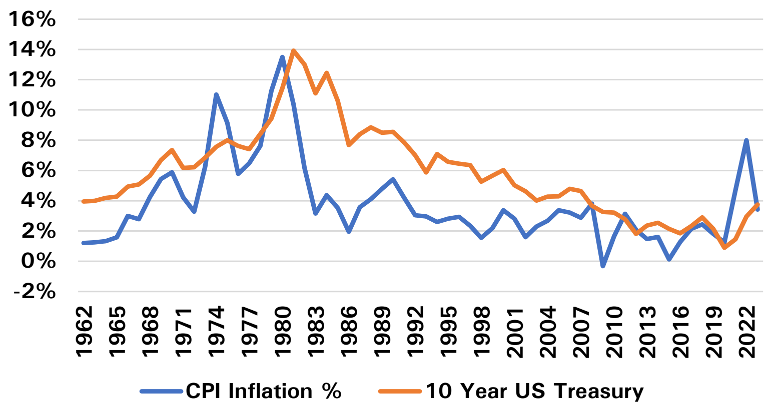
Significant economic factors have changed since our original analysis in 2021. Most notably, excesses of fiscal and monetary stimulus produced a spike in inflation and the Federal Reserve responded with historically aggressive increases in the Fed Funds Rate. A major consequence of these post-Covid federal interventions has been an alarming increase in the national debt, soon to surpass a total of $33 trillion. A key question markets are currently addressing is whether the sudden expansion in debt and deficits has crossed a threshold beyond which markets require a higher level of interest rates to compensate for an increase in credit risk.

In late 2021, when we first placed inflation and interest rates on the same graph, they looked somewhat correlated other than timing and magnitude differences. Directionally, much was the same. This may not have corresponded to the gut feeling of many that low interest rates beget high inflation and high interest rates lead to low inflation. If anything, until shifting in 2021-2022, the broad trend since 1980's peaks had simply been absolute percentages trending lower for longer for both interest rates and inflation.

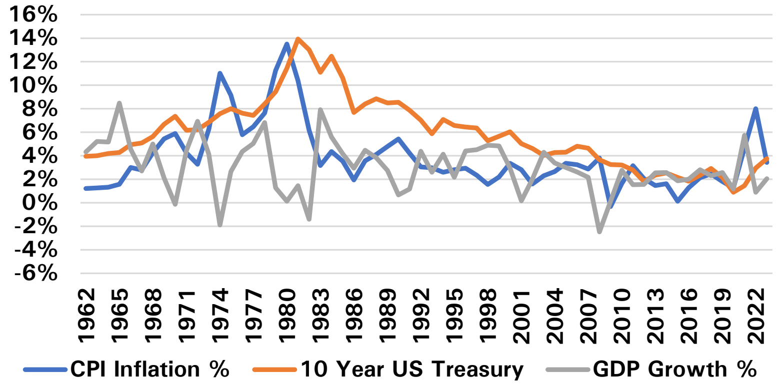
In the post-Covid phase, Federal stimulus supercharged growth amidst a burdened supply chain, causing a large spike in inflation, followed by a quick and substantial rise in interest rates as an attempt to cool the economy.

Adding GDP growth to the same graph visually indicates periods in which rising GDP precedes inflation, but also a few periods in which GDP rose following an

CPI Inflation and Interest Rates



Inflation, Interest Rates and GDP Growth



outbreak of inflation. What seems to apply most often is that periods of rising interest rates precede slowdowns in economic growth.

Tracking the progress of key economic indicators since 2020, we can see that Congressional and Fed stimulus policies produced rebound gains in employment and GDP growth, at the cost of inflation and higher interest rates.

	Average Quarterly Unemployment Rate	Quarterly Change in Real GDP	10 Yr UST Quarterly Average	Average Quarterly Headline PCE Inflation (annualized)
Q1 2020	7.6%	-4.6%	1.4%	1.5%
Q2 2020	11.5%	-29.9%	0.7%	-1.8%
Q3 2020	7.7%	35.3%	0.7%	3.3%
Q4 2020	6.6%	3.9%	0.9%	1.6%
Q1 2021	6.1%	6.3%	1.3%	4.4%
Q2 2021	5.7%	7.0%	1.6%	6.3%
Q3 2021	5.1%	2.7%	1.5%	5.5%
Q4 2021	4.2%	7.0%	2.0%	6.0%
Q1 2022	3.8%	-1.6%	2.9%	7.3%
Q2 2022	3.6%	-0.6%	3.1%	7.1%
Q3 2022	3.6%	3.2%	3.8%	4.3%
Q4 2022	3.6%	2.6%	3.6%	3.7%
Q1 2023	3.5%	2.0%	3.6%	4.0%
Q2 2023	3.6%	2.1%	4.1%	2.6%

	Not Good	Concerning	Meh	Good	Great
Key					

Fiscal Stimulus

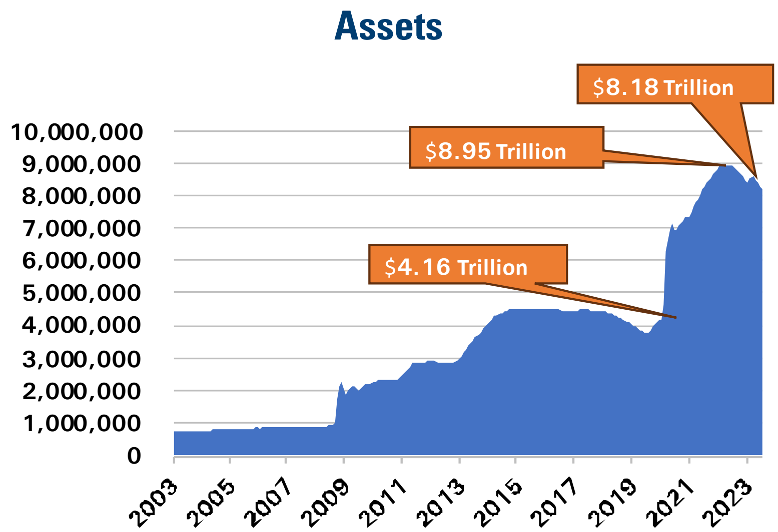
This chart below shows total Congressional interventions into the economy since 2020. We have chosen to measure Federal fiscal stimulus as a percentage of the average annual GDP during the period of primary impact, that is to say the time frame of January 2020 to October 2022. We find that $6.9 trillion equates to an astounding cumulative total of 29.7% of average GDP (a nominal annual addition of 7.4%) during this period.

Congressional Spending

Relief Act	Date	Amount
Coronavirus Preparedness and Response Supplemental Appropriations Act, 2020	March 6, 2020	$8.3 billion
Families First Coronavirus Response Act	March 18, 2020	$192 billion
Coronavirus Aid, Relief, and Economic Security Act (CARES)	March 27, 2020	$2.2 trillion
Paycheck Protection Program and Health Care Enhancement Act	April 24, 2020	$484 billion
Consolidated Appropriations Act, 2021	December 27, 2020 (stimulus component of a $2.3 trillion spending bill)	$866 billion
American Rescue Plan Act of 2021	March 11, 2021	$1.9 trillion
Infrastructure Investment and Jobs Act (IIJA)	November 15, 2021 (above baseline component of $1.2 billion bill)	$544 billion
Inflation Reduction Act	August 22, 2022	$437 billion
Combined above baseline spending in 2022 and 2023 spending bills	2022-2023	$272 billion
Total Since March 2020		**$6.90 trillion**

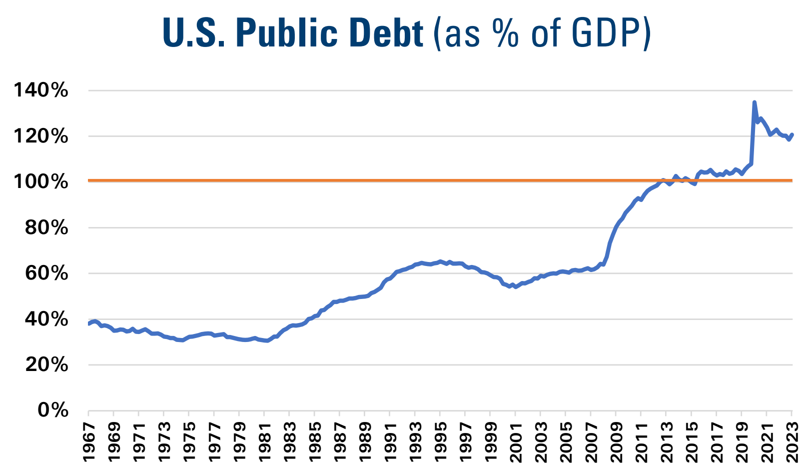
Monetary Stimulus

The Fed's balance sheet ballooned from $4.16 trillion to $8.95 trillion by April 2022. It has since reduced modestly to $8.18 trillion. Viewing the nearly $4.6 trillion peak growth in the balance sheet as a measure of monetary stimulus, when combined with fiscal stimulus of $6.9 trillion, total stimulus equaled $11.49 trillion or 49.4% of 2020-2022 average GDP.

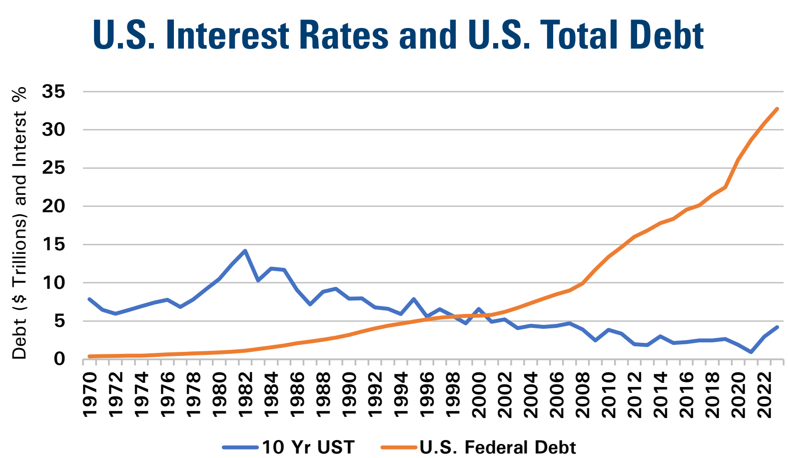


As observed in our 2021 White Paper, one of the conundrums for governments and central bankers of later-stage developed countries is that each time they step in to mitigate or prevent recession, fiscal/monetary policy interventions can increase the debt burden of the country. The higher the debt-to-GDP ratio, the more difficult it becomes for all but the fastest growing economies to weather higher interest rates. The higher the debt levels in the system, the higher the interest payments. When interest rates and debt service payments get too high, growth slows, recessions follow, and central banks intervene to keep rates lower for longer.

Over the past four decades, the cumulative effect has been increasing total leverage while reducing interest rates. Each time there's a new crisis, the central bank must react from a starting point of already low rates. Federal, state and local governments respond to economic downturns by adding spending on top of already high debt burdens.

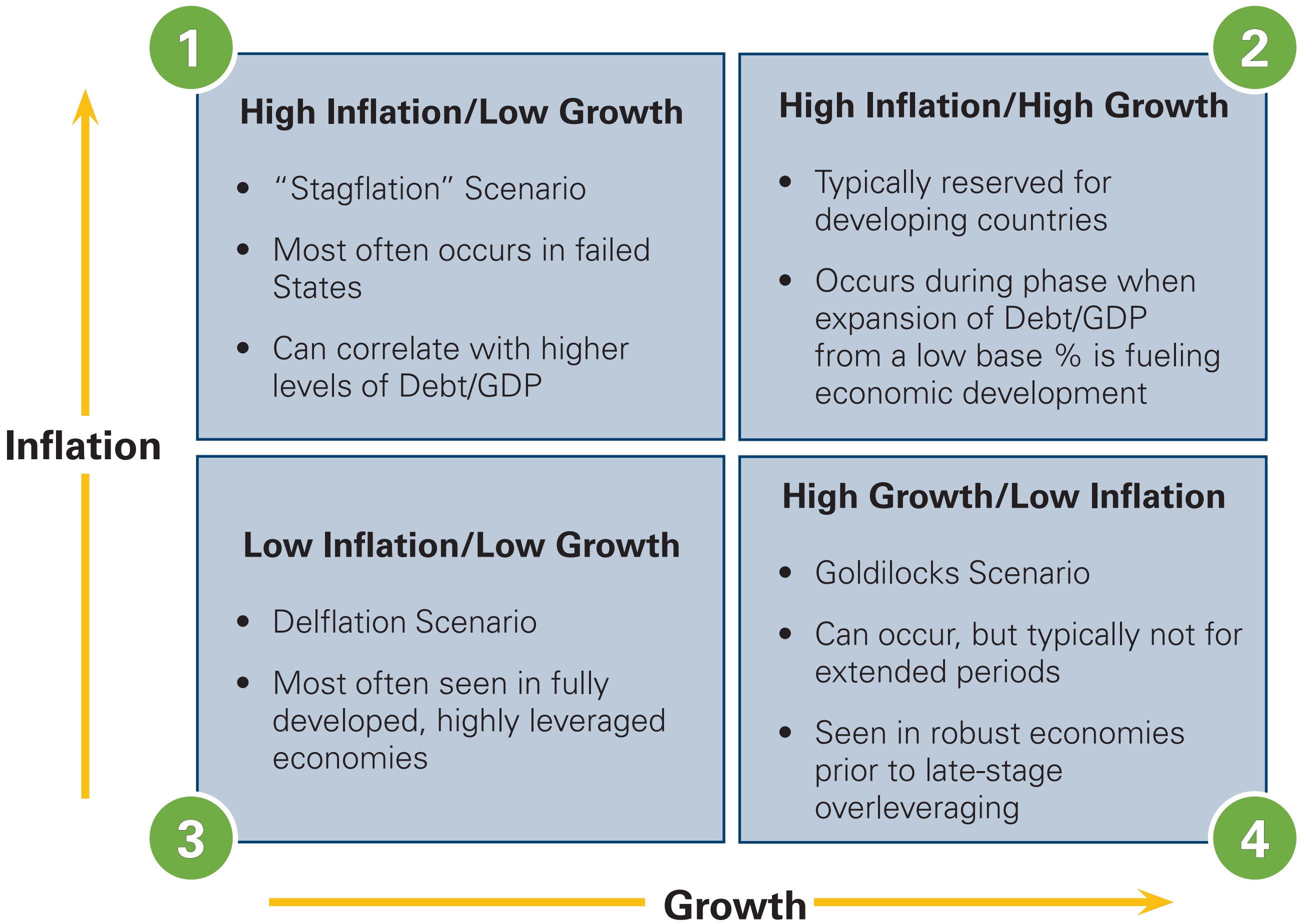


This cycle plays out in almost all advanced economies unable to maintain high enough rates of fertility or inmigration to offset the growth drag caused by excess debt. Eventually, the need to deleverage to regain growth potential can only result in one of two paths: a quick and painful credit crash, or a slow-motion resizing of the debt-to-GDP equation. In the latter scenario, very low inflation or even deflationary conditions can persist for extended periods.



Note: Left axis numbers represent both interest rates in percent terms and dollars of debt in trillions (i.e.: 10-year rates are currently 4.19% and Federal debt is $32.74 trillion).

We designed the following matrix to think through the potential combinations of inflation and growth, and to assess where the U.S. should be more likely to reside at its stage of economic development.

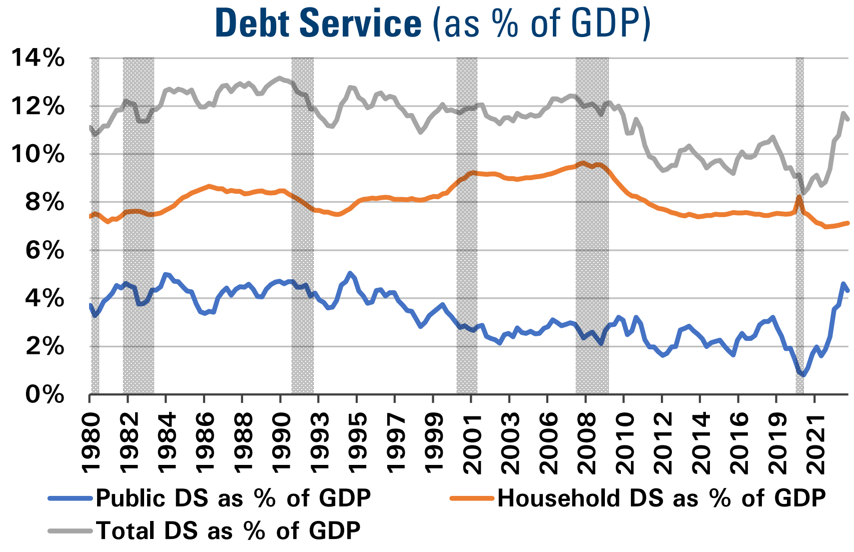


As an advanced, developed economy, it becomes less likely the U.S. will spend extensive periods in the high growth boxes labeled 2 or 4. The U.S. is enduring a brief stagflationary period (#1) following Covid-19 shutdowns and excess post-Covid fiscal and monetary stimulus. The stagflationary phase required to clear supplychain bottlenecks and absorb massive amounts of new debt and spending should normalize following a slowdown or recession. Once a fully developed economy accumulates an excess of debt and deficits, a price will eventually be paid via a hard financial crash (e.g. Italy, Greece), or an extended deleveraging phase, characterized by low inflation and low growth (e.g. Japan) (#3).

Impact of Debt on the Economy

The following analysis shows measurements of debt, GDP and interest rates comparing 1980 and 2023. The idea here was to establish a rough proxy for the Federal debt burden using the 10-year UST against total federal debt. In 1980, when the debt-to-GDP ratio was only 31.8% but 10-year interest rates averaged 11.40%, the effective federal debt service burden was 3.6% of GDP. In 2023, total federal debt is 120% of annual GDP. At a recent 10-year UST yield of 4.19%, the equivalent debt service burden is now 4.10% of GDP. Due to the increase in total debt since 1980, the economy is no longer able to tolerate more elevated levels of interest rates without risking recession. Recall that when Paul Volcker went full throttle in order to cause a recession, 10-year Treasury rates averaged nearly 14% in 1981 and 13% in 1982, and then began a declining trendline that broadly persisted until 2021.

In addition to summarizing the impact of public debt, we have also included a parallel analysis of household debt based on Federal Reserve data. Household interest rates are significantly higher rates than Treasuries given the mix of borrowings for consumer credit. Interestingly, the 1980 and 2023 household debt burdens are not far apart at 7.4% of GDP and 7.1% of GDP, respectively (derived from historic household debt, averages of debt service as a % of disposable income and GDP). The total result is that due to lower interest rates, today's combined Federal and Household debt service burden of 11.1% of GDP today is only slightly higher than the 11.0% of GDP debt service burden of 1980.



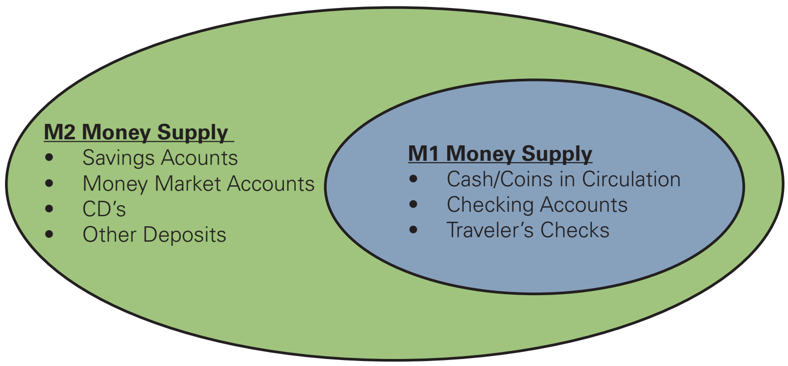
Shaded bars represent recessions.

To show the magnitude of additional interest rate increases on the economy, the following is based on a range of 10-year US Treasury yields from 5.0% to 10.0%. As you can see, by comparing the debt service graph above to the chart below, even at a 5.0% 10-year UST yield, the hypothetical debt service burden of 13.5% would exceed all years, including the 13.2% record in 1990.

What If Analysis (increasing 10-year UST rates)

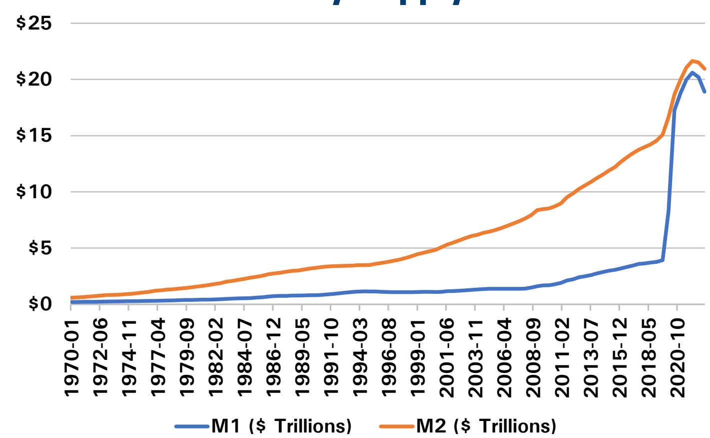
	2023+ ?	Public Debt Burden	Household/Non-Profit Debt Burden	Total Debt Burden
	10 Year UST	% of GDP	% of GDP	% of GDP
Debt Service as a % of GDP	**5.0%**	**5.9%**	**7.6%**	**13.5%**
	6.0%	7.0%	8.4%	15.4%
	7.0%	8.2%	9.1%	17.3%
	8.0%	9.4%	9.8%	19.2%
	9.0%	10.6%	10.5%	21.1%
	10.0%	11.7%	11.2%	23.0%

Money Supply



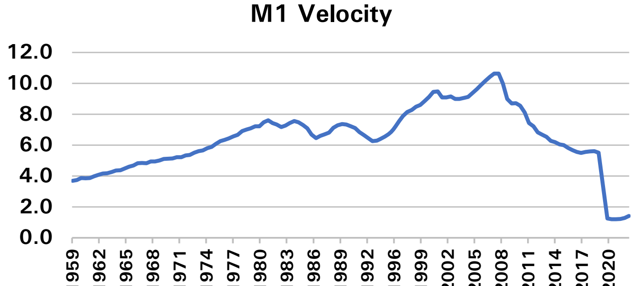
The relative proportions between M1 and M2 have changed markedly before and after Covid. At the start of 2020, M1 was only 50% of the amount of M2, and has now increased to more than 90%.

Money Supply

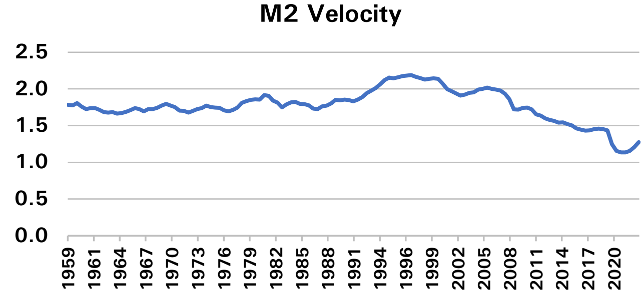


In the wake of massive increases in post-Covid money supply, the velocity decreased significantly, but has rebounded modestly in recent quarters.

M1 Velocity

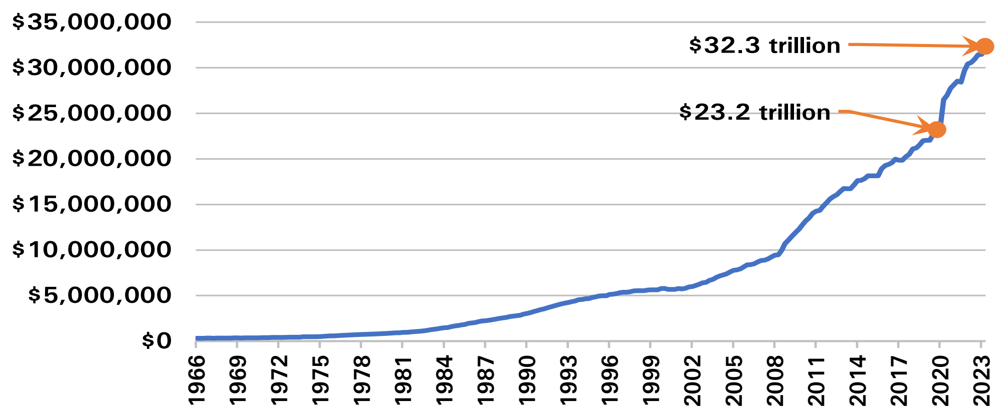


M2 Velocity



As a reference point, the public debt was $408 billion in 1922 (using 2022 inflation-adjusted dollars). As of August 2023, federal debt totals almost $33 trillion. Astoundingly, public debt has increased 39.2% in the past 3.5 years alone. The U.S. economy is now in uncharted territory.

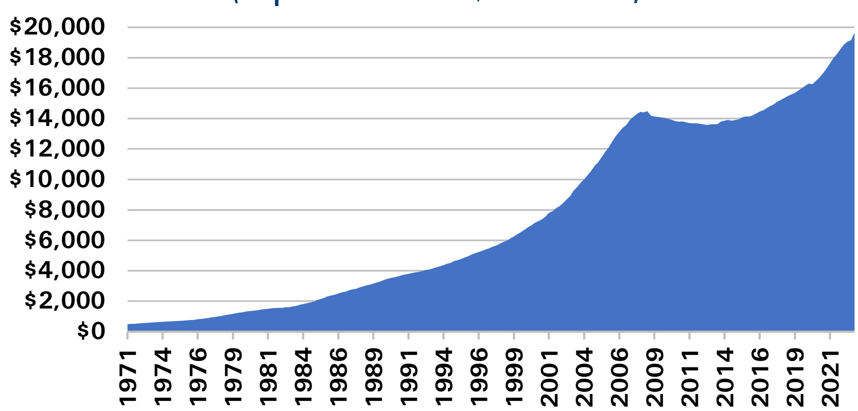
U.S. Public Debt - $ Millions
(top of chart is $35 trillion)



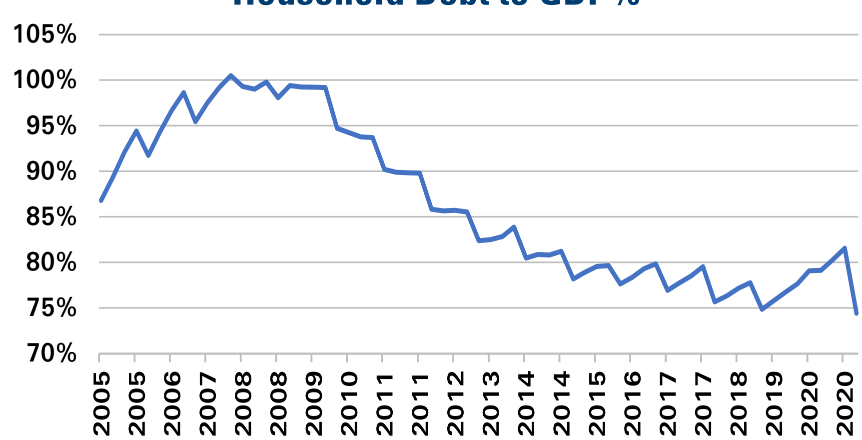
Household Debt

In an economic bright spot, although the chart for total household debt is alarming, it has been declining as a percentage of GDP. Of course, this was largely via fiscal and monetary stimulus transfer of private debt to public debt.

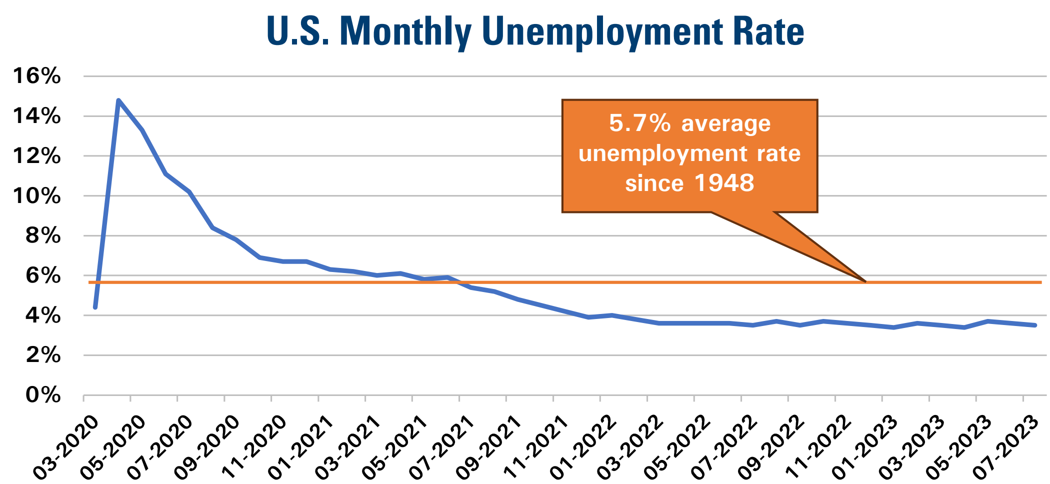
Total Household Debt
(top of chart is $20 trillion)



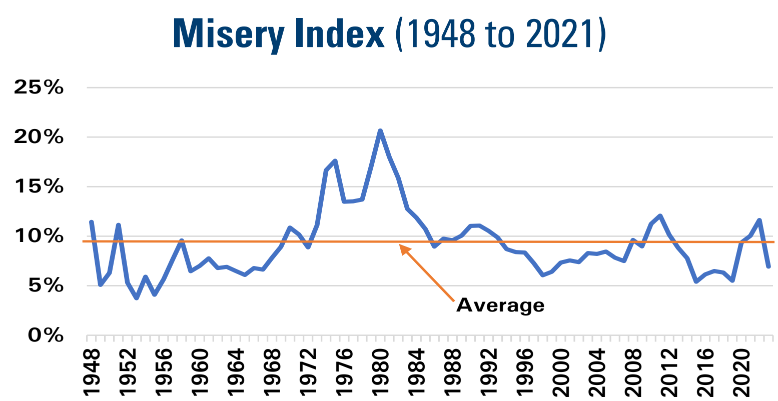
Household Debt to GDP%



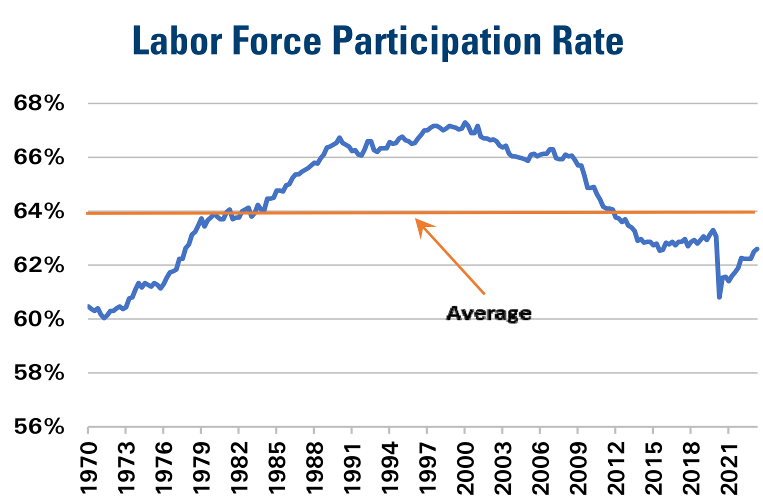
The labor market continues to be tight relative to both recent and historical levels.



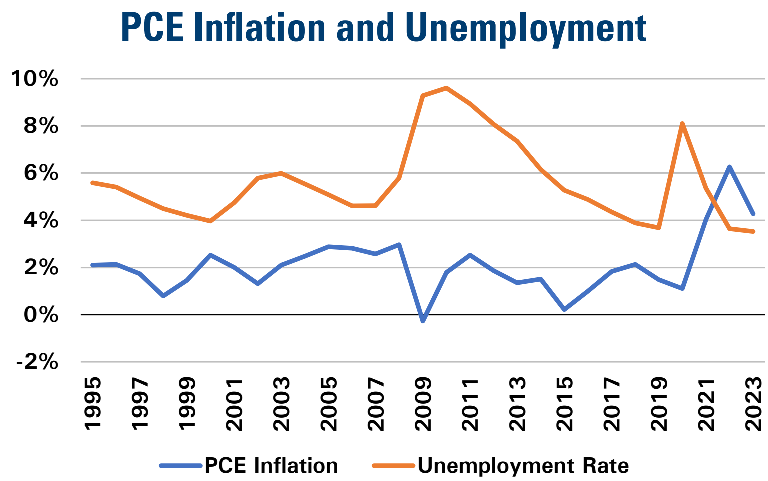
The Misery Index is the sum of CPI inflation and the unemployment rate. After spiking following Covid, recent decreases in the pace of inflation combined with a tight labor market have the Misery Index suddenly trending well below the historic average.



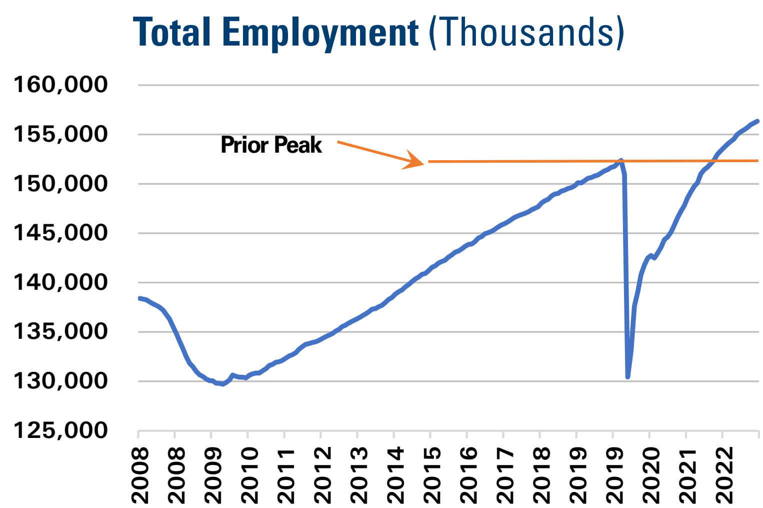
Despite recent improvement, overall below average labor force participation is a stubborn contributor to tight job markets and difficulty for many employers in filling open positions.



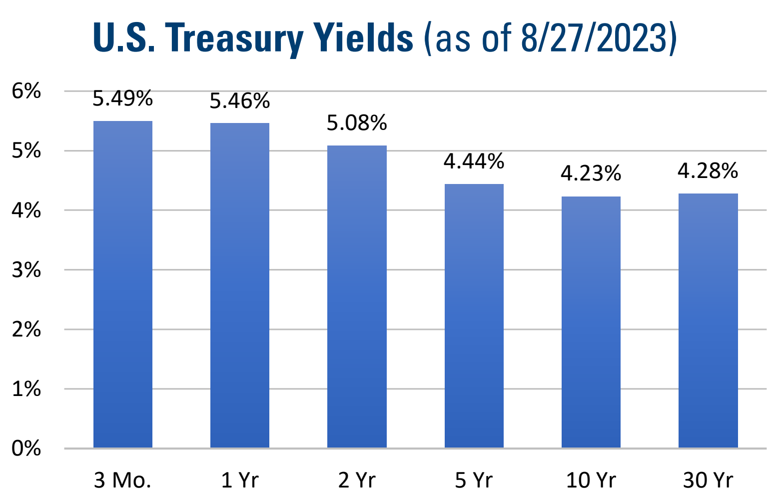
The relationship between unemployment and the broad PCE inflation measurement is shown here. In theory, as unemployment goes down, inflation should go up--and vice versa when inflation goes down after unemployment increases (time lags).



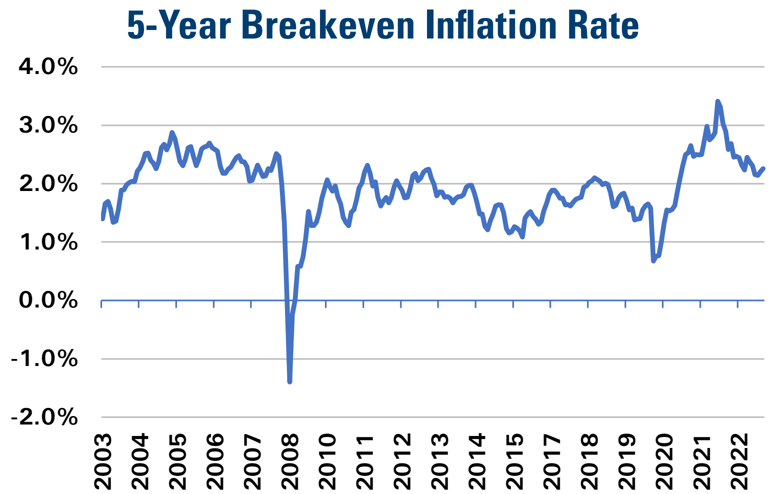
Total employment of 156.3 million now exceeds the January 2020 level of 152.0 million (2.8% increase).



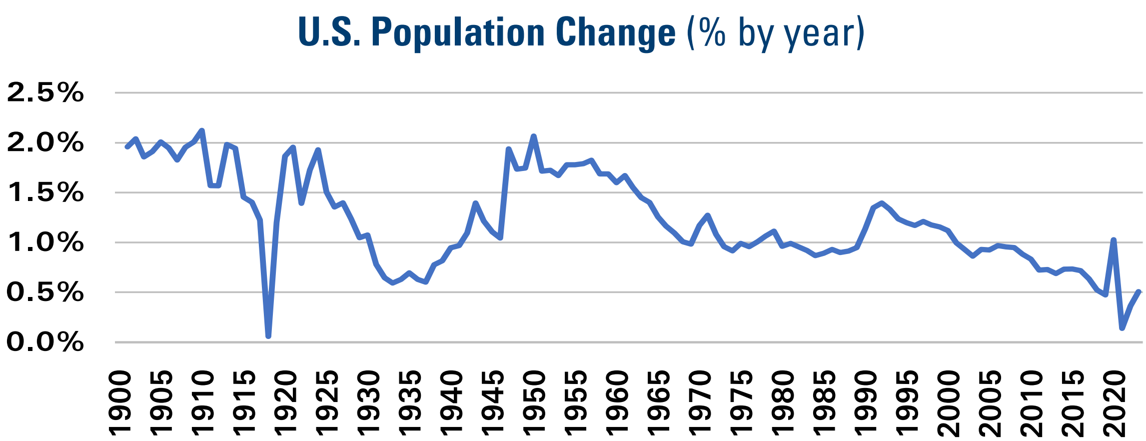
The yield curve is notable for its relatively high recent rates, as well as its downward slope, historically a strong indicator of pending recession.

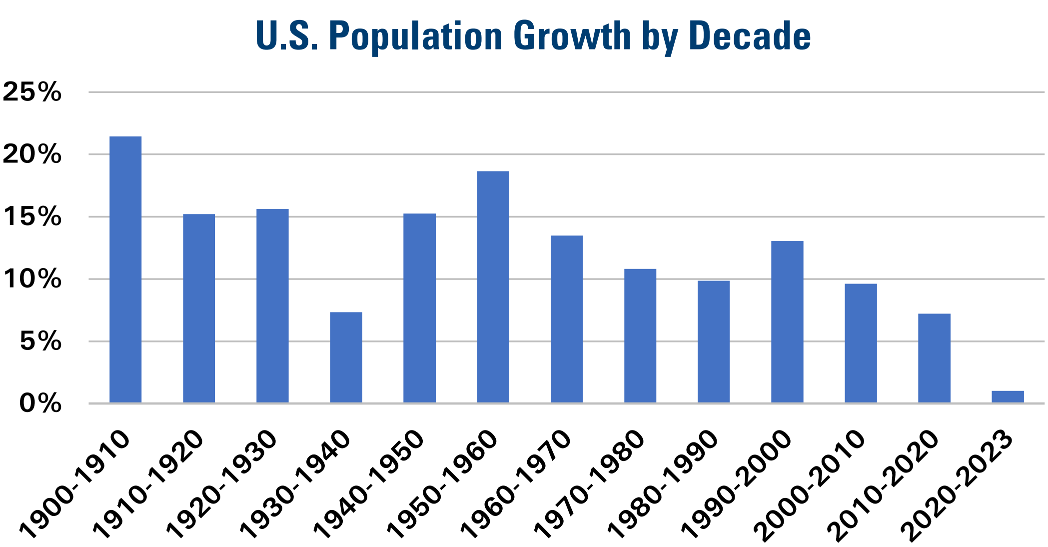


The breakeven inflation rate is a market based forecast indicator of inflation. It derives from comparing the nominal rate of a 5-year instrument such as a U.S. Treasury note to the equivalent 5-year rate on a security such as a TIPS (inflation-protected). The difference in yields for these two investments should represent the market's overall estimation of inflation during the ensuing 5-year period.



Population growth plays a crucial role in economic growth. As an advanced country with a declining birthrate, the U.S. faces a demographic headwind. As shown in the following two charts, population growth has slowed significantly over the past few decades.

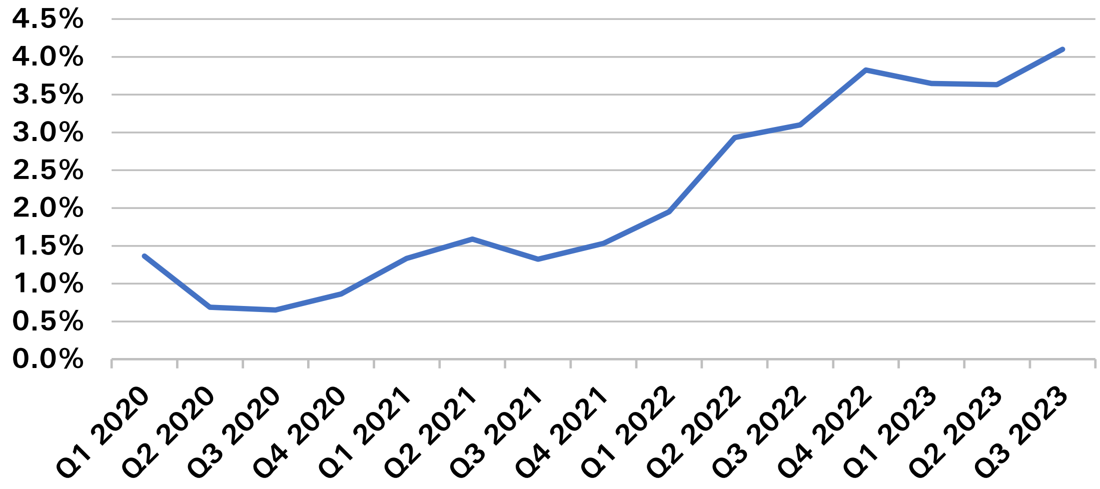




The next two graphs demonstrate the historic pace and magnitude of increases in the Fed Funds Rate from March 2021 through July 2023.

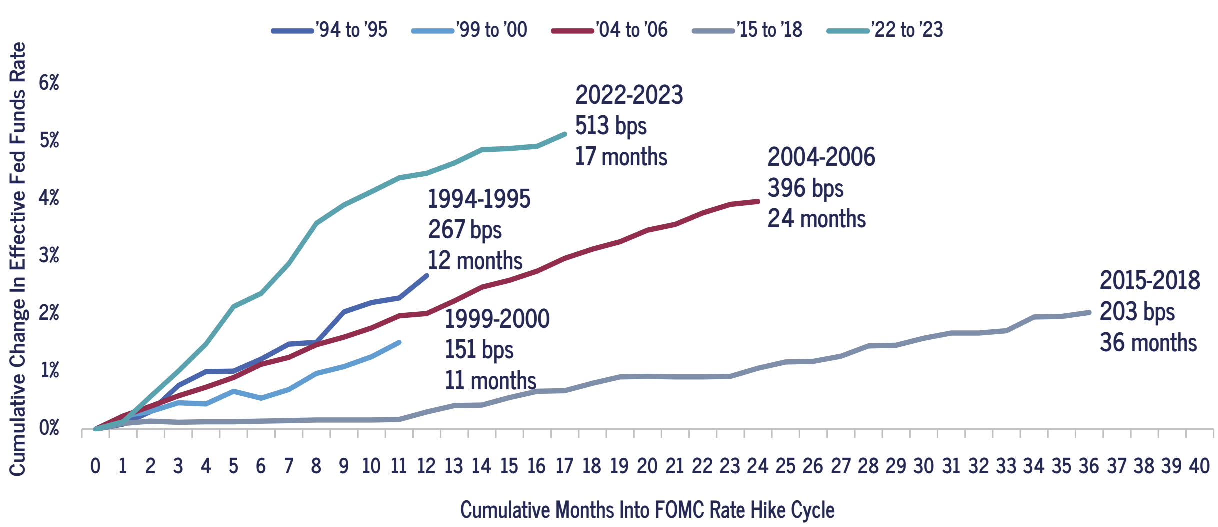
The pace of increases to the Fed Funds Rate transferred into associated increases in 10-year Treasury Rates moving from a quarterly average as low as 1.32% in 2021 up to 4.10% thus far in Q3 2023.

10-Year UST (quarterly average)

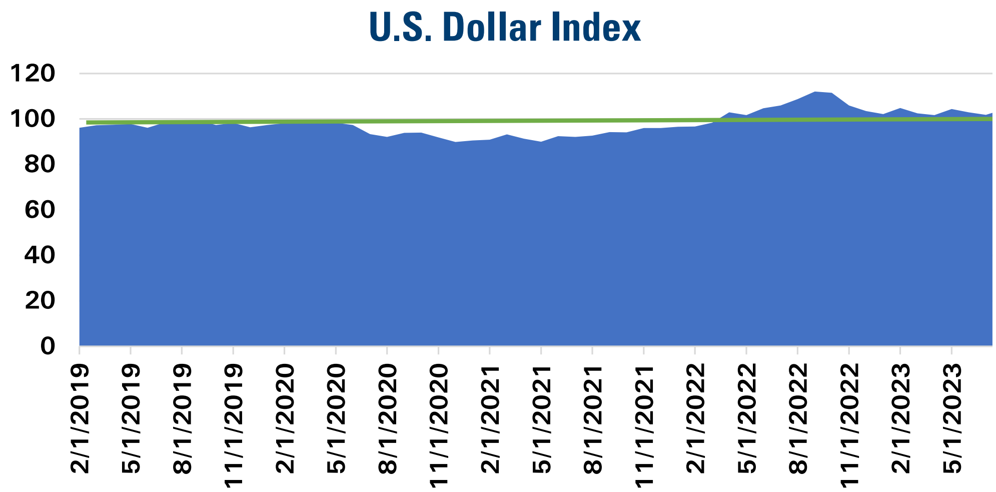


Effective Federal Funds Rate

- Federal Open Market Committee (FOMC) Hiking Rates Faster than at any time in modern history.
- The FOMC being caught flat-footed by inflation earlier in the year now means "all gas, no brakes".



Inflation can have significant negative effects on the value of a country's currency exchange rate by eroding purchasing power. Economists generally believe the exchange rate penalty for high inflation is much greater than the reward for low inflation. It's almost impossible to isolate inflation's specific impact on the value of a currency. Numerous additional factors can influence an exchange rate, such as trade balances, economic growth, expectations for growth and changes in monetary and fiscal policy. Nevertheless, unusually high levels of inflation are not good in terms of sustaining monetary value. The U.S. Dollar weakened from an index value of 99 in March 2020 to below 90 in December 2020. However, supply chain bottlenecks and excess government stimulus were worldwide post-Covid trends not unique to the U.S. The U.S. Dollar has resumed a strengthening posture back above 100.



Note: Green line is average for the period.

Key Observations

The sheer amount of post-Covid fiscal and monetary stimulus prevented an immediate recession/depression, albeit at the cost of higher inflation, higher interest rates, and a massive increase in public debt. The benefits included insurance against a deeper recession, and a low unemployment rate. Given that inflation has outpaced wages, that trade-off may not have been as favorable as policymakers hoped.

Higher interest rates haven't yet shown their full effect given historically high percentages of fixed-rate business and consumer loans. Inflation is cooling, so the Fed needs to avoid an overcorrection that could otherwise be caused by holding rates too high for too long. The health of the highly leveraged U.S. economy (including residential and commercial real estate markets) is closely tied to the level of interest rates and the availability of financing. The Fed is going to find that the economy's ability to withstand higher rates is limited to a (relatively) short period of burning off post-Covid stimulus and relief packages.

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