Constructing Long Term Capital Market Assumptions

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Analysis in this presentation reflects data as of 30Dec`21

Purpose of this presentation

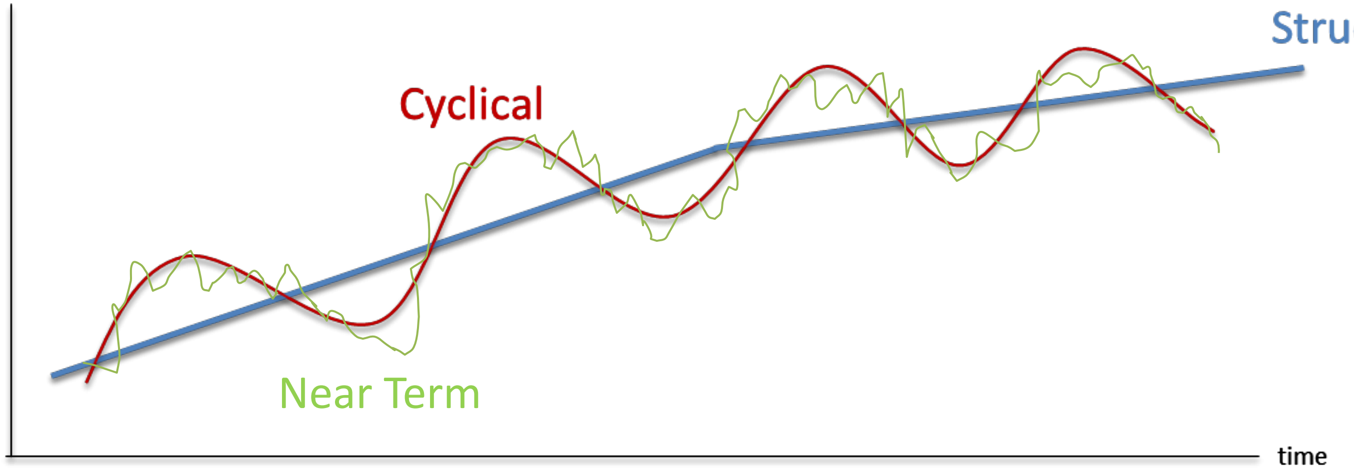
This presentation is designed to provide a bit of guidance on how to develop long term capital market assumptions (CMAs).

My approach is “top down”. The macroeconomy determines earnings growth and discount rates, which drive asset prices. Throughout, I acknowledge a potential simultaneity.

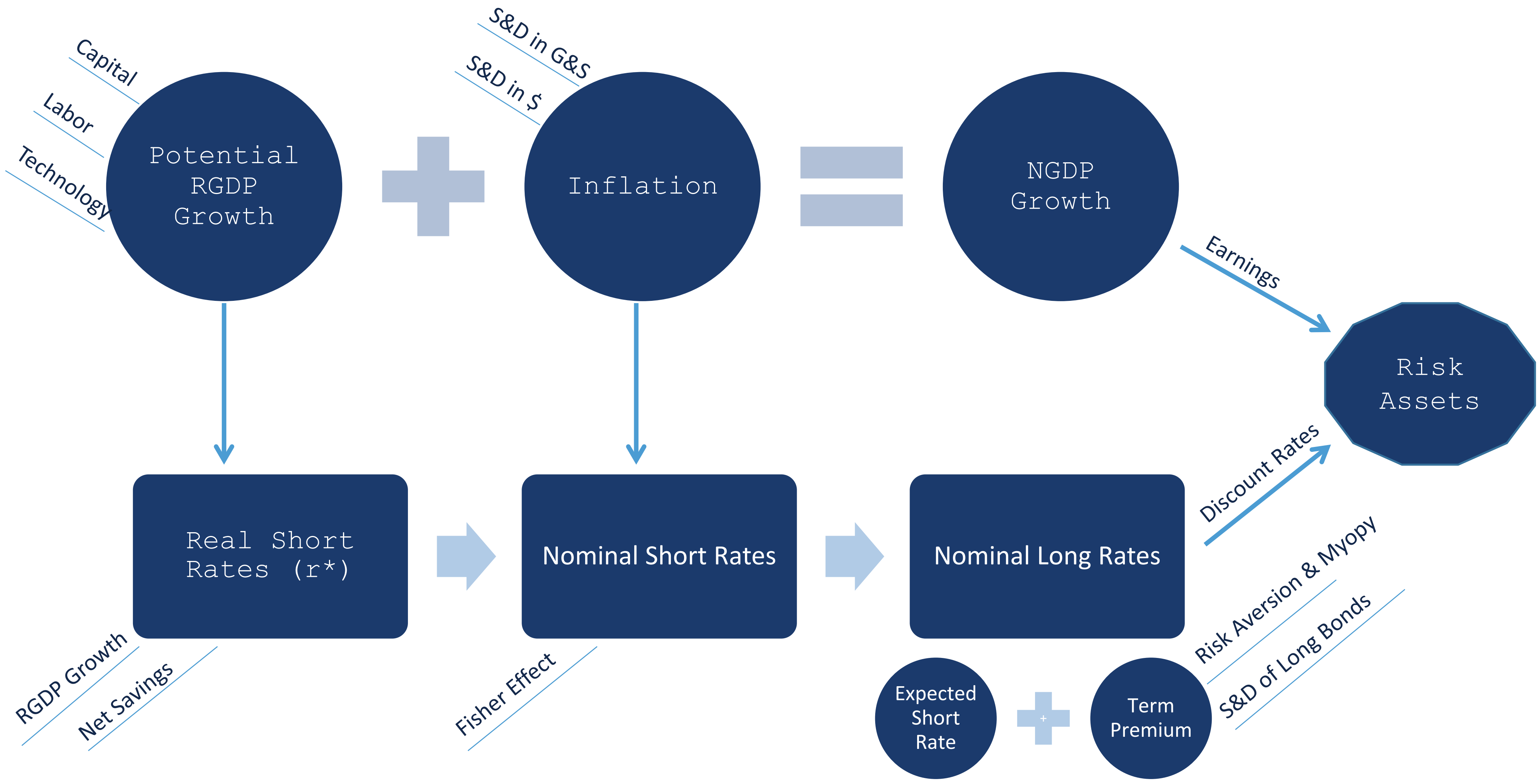
The intended audience is new practitioners and advanced students.

Horizon

1. Structural Outlook for long term asset allocation (5yrs-30yrs) ← *Focus of this presentation*
2. Cyclical Outlook for medium term asset allocation (3mths-5yrs)
3. Near Term Outlook for short term tactical positioning (1day-3mths)



Structural Framework

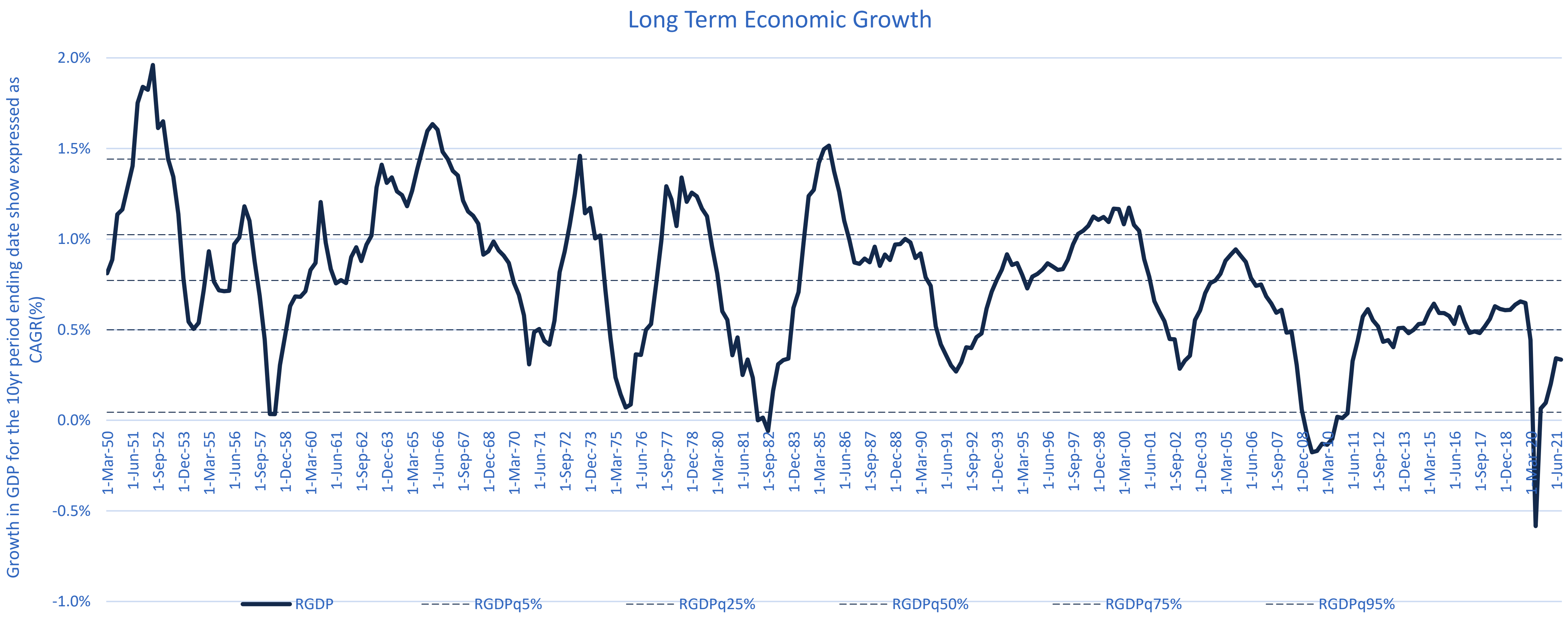


-2	-1	**0**	+1	+2

Output

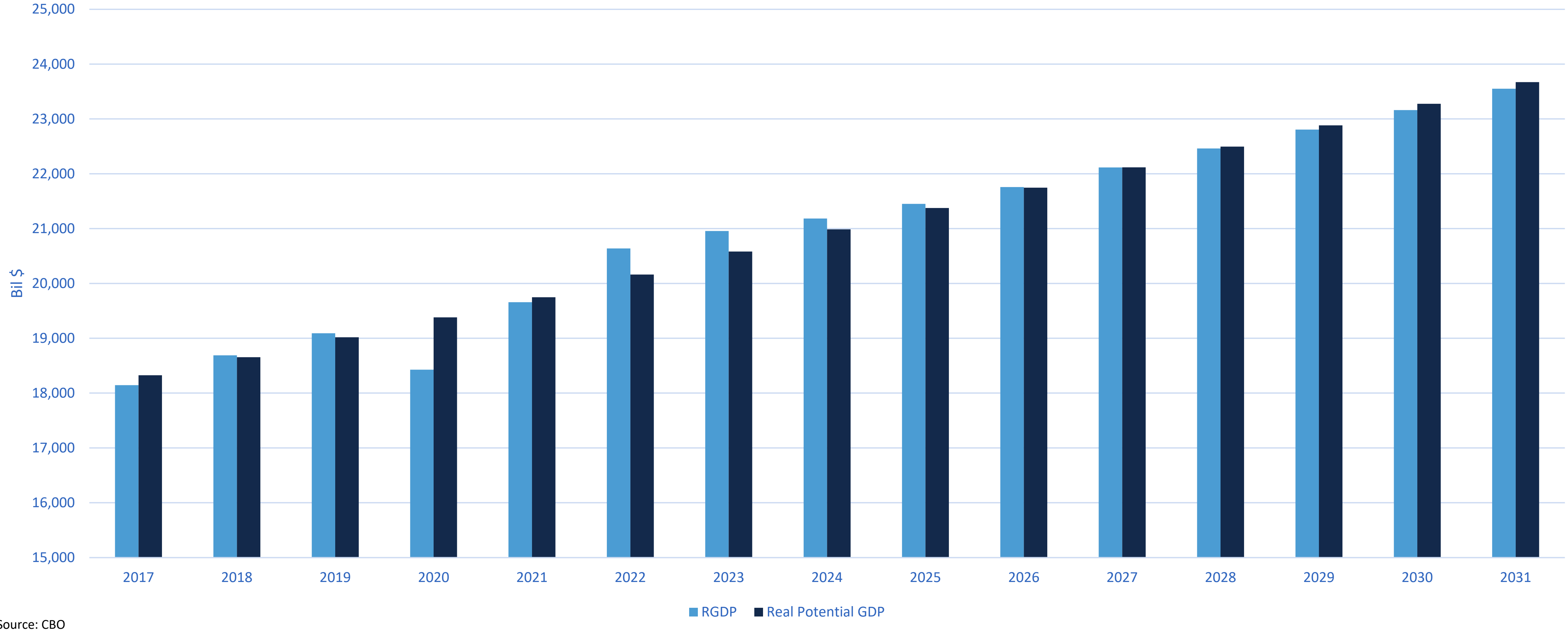
- Labor Force continues to decline due to demographic trends
- Capital Stock stuck. One hope is federal infrastructure spending.
- Need more investment to bolster productivity

US Growth Still Below Average



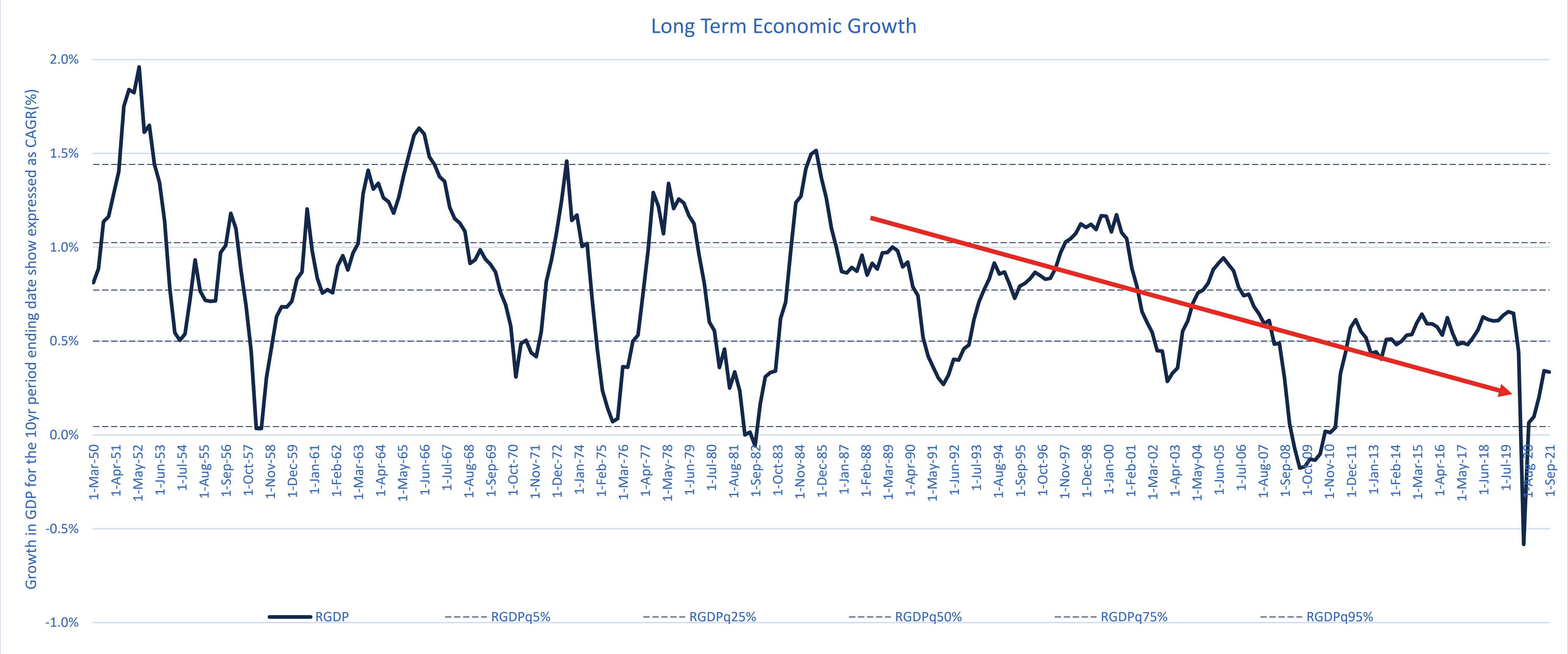
Source: multpl.com and author calculations

COVID bounce will last until 2026 and then we return to sub potential



Source: CBO

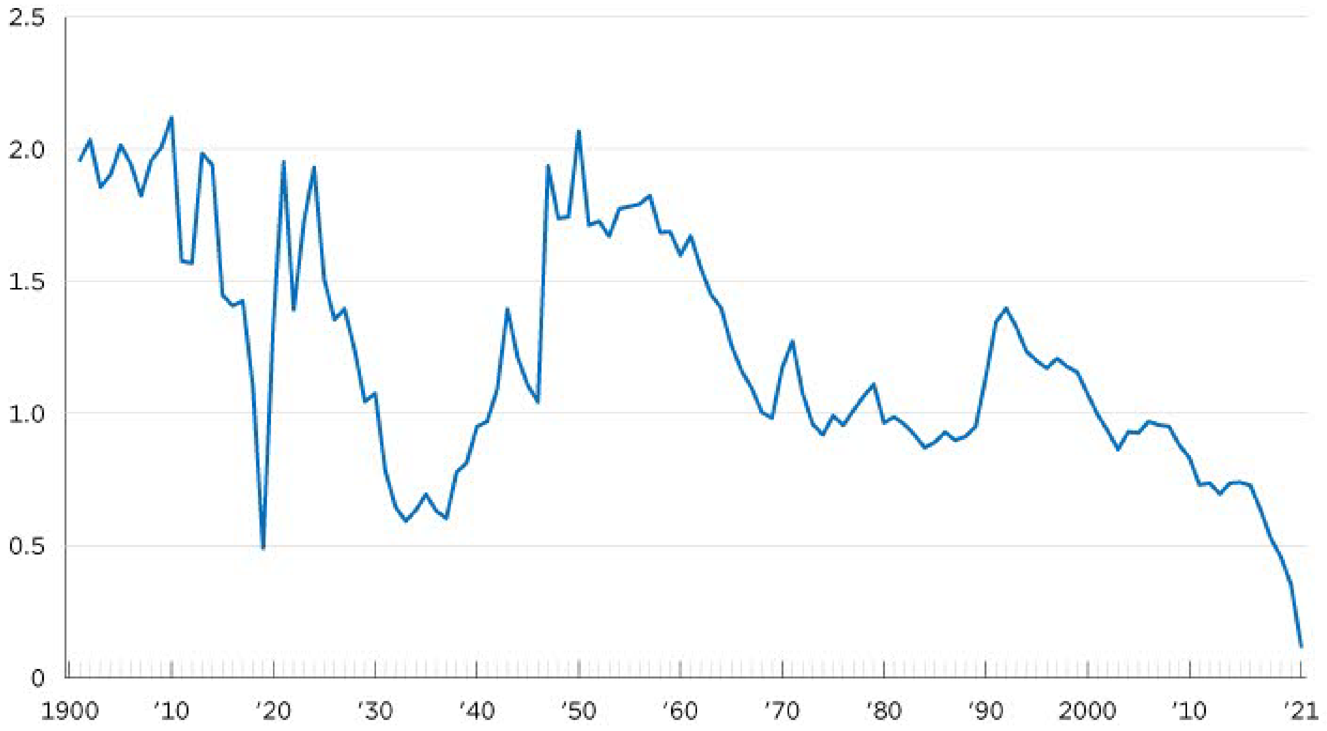
Structural Slowdown Linked to Labor, Capital, and Technology



Source: multpl.com and author calculations

Slowing Population Growth Drags on Potential GDP

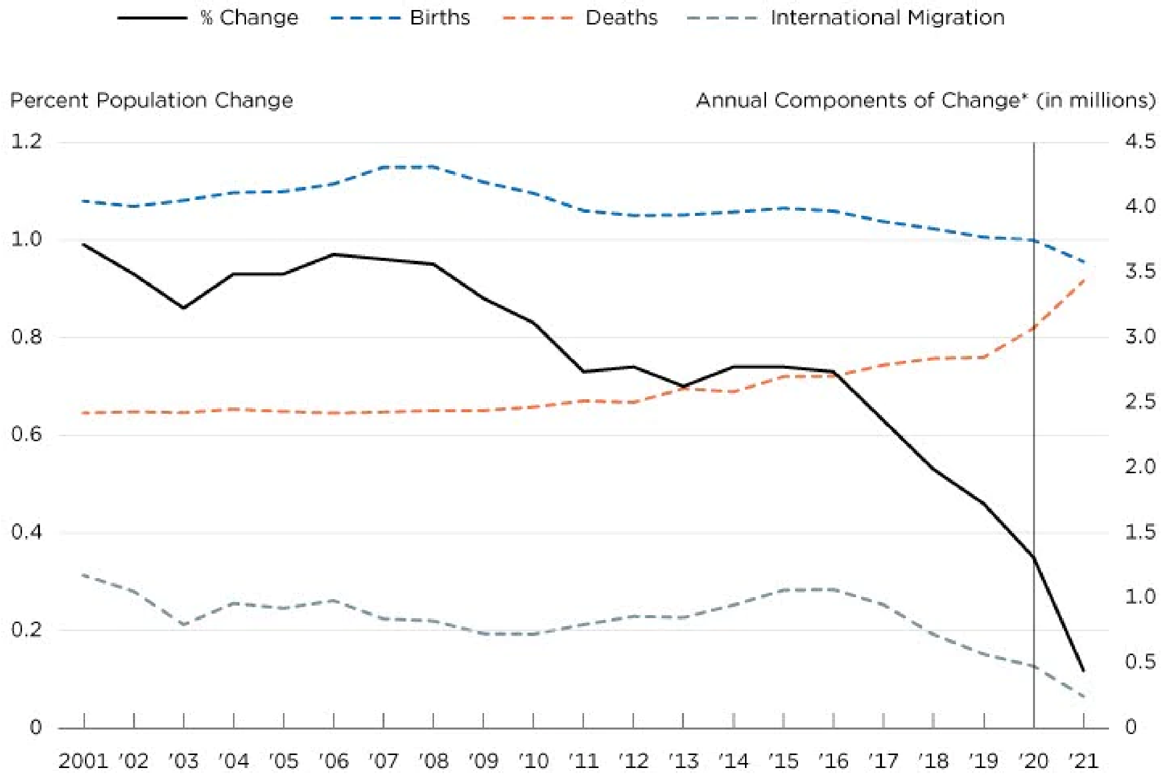
Figure 1.
Annual Percent Change in the U.S. Population: 1900–2021



Note: 1917-1919 includes U.S. Armed Forces overseas.
Source: U.S. Census Bureau, Vintage 2020 Estimates; Vintage 2021 Estimates; 1900-1990, 1990-2000 & 2000-2010 Intercensal Estimates.

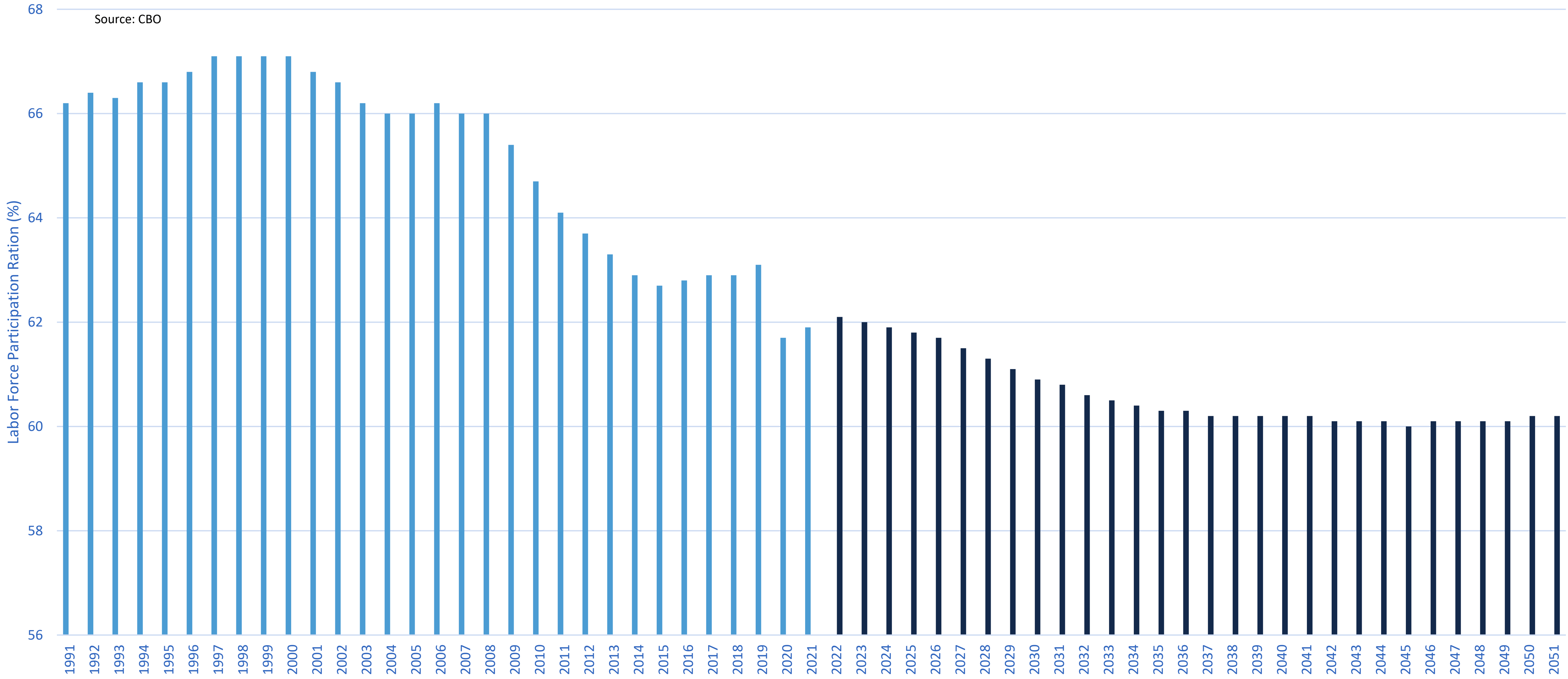
COVID Deaths Added to Slowing Births & Migration

Figure 2.
Population Change and the Components of Change: 2001–2021

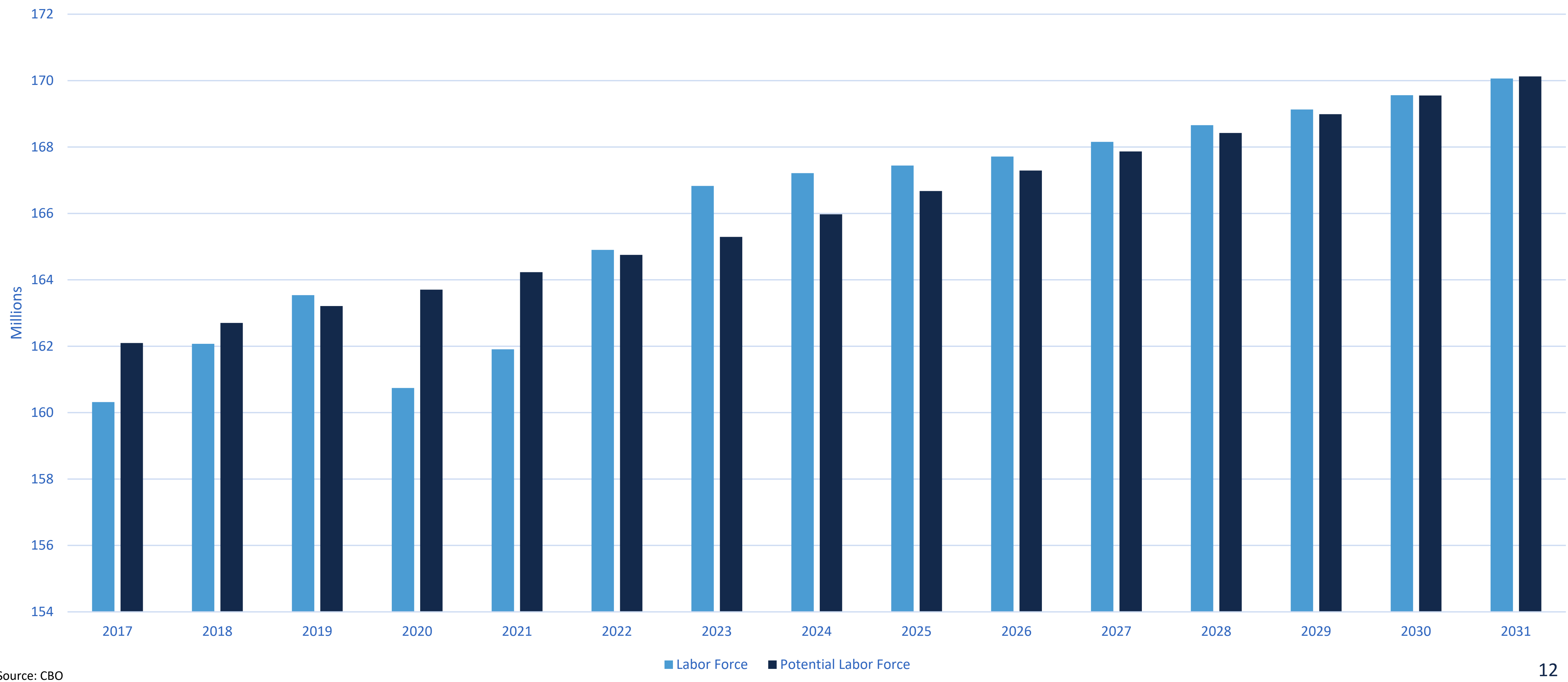


* Components of change include births, deaths and net international migration.
Note: Only data to the right of the line are from Vintage 2021.
Source: U.S. Census Bureau, Vintage 2020 Estimates; Vintage 2021 Estimates; 2000-2010 Intercensal Estimates.

Participation Rate Expected to Dwindle

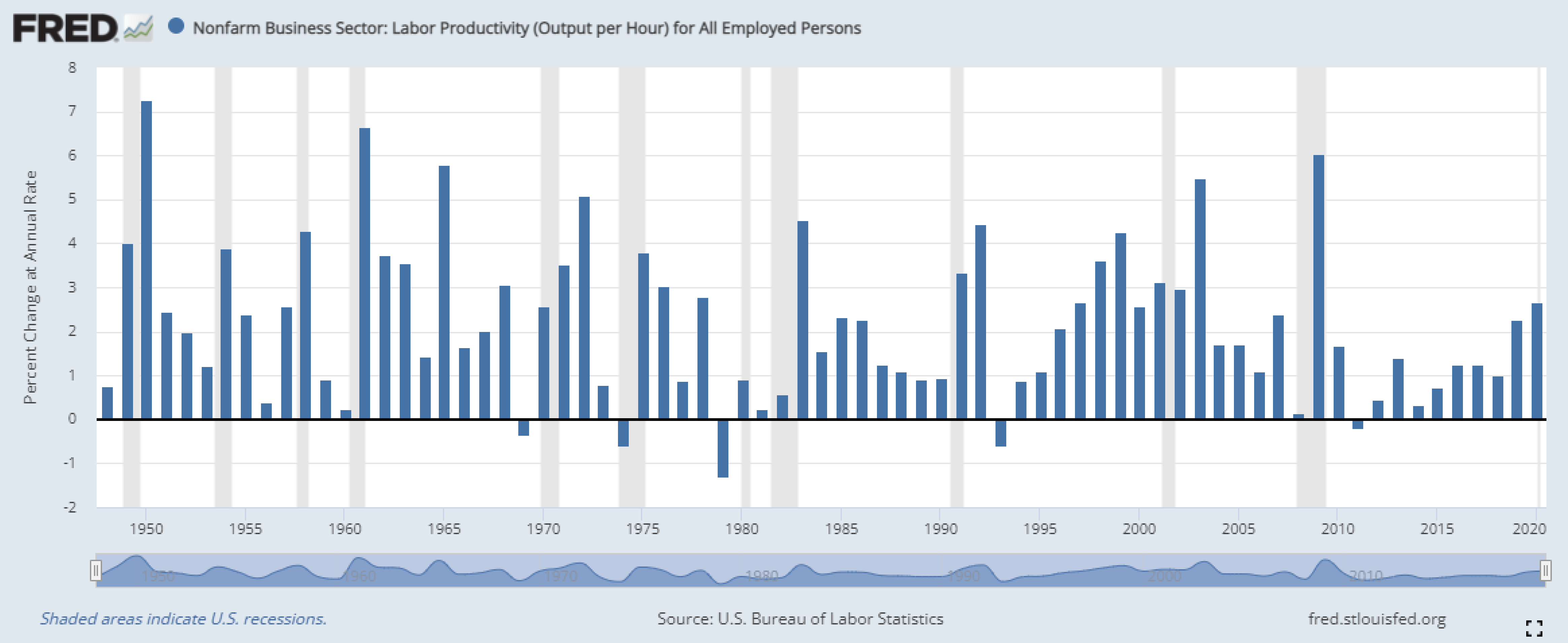


Short Term boost above potential labor force; but still lacking

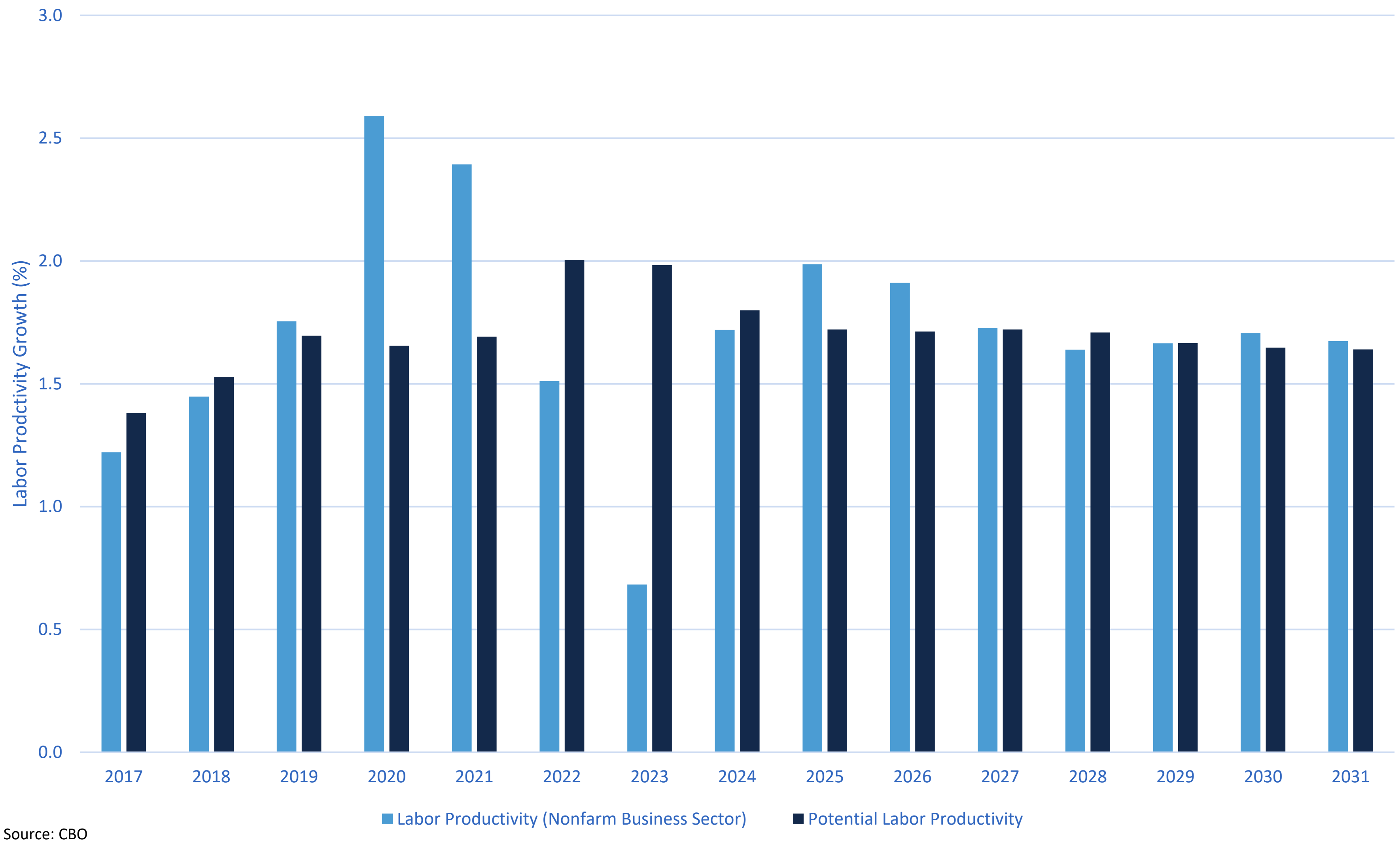


Source: CBO

Productivity is rising, but remains low & may only have a couple of years left in this cycle

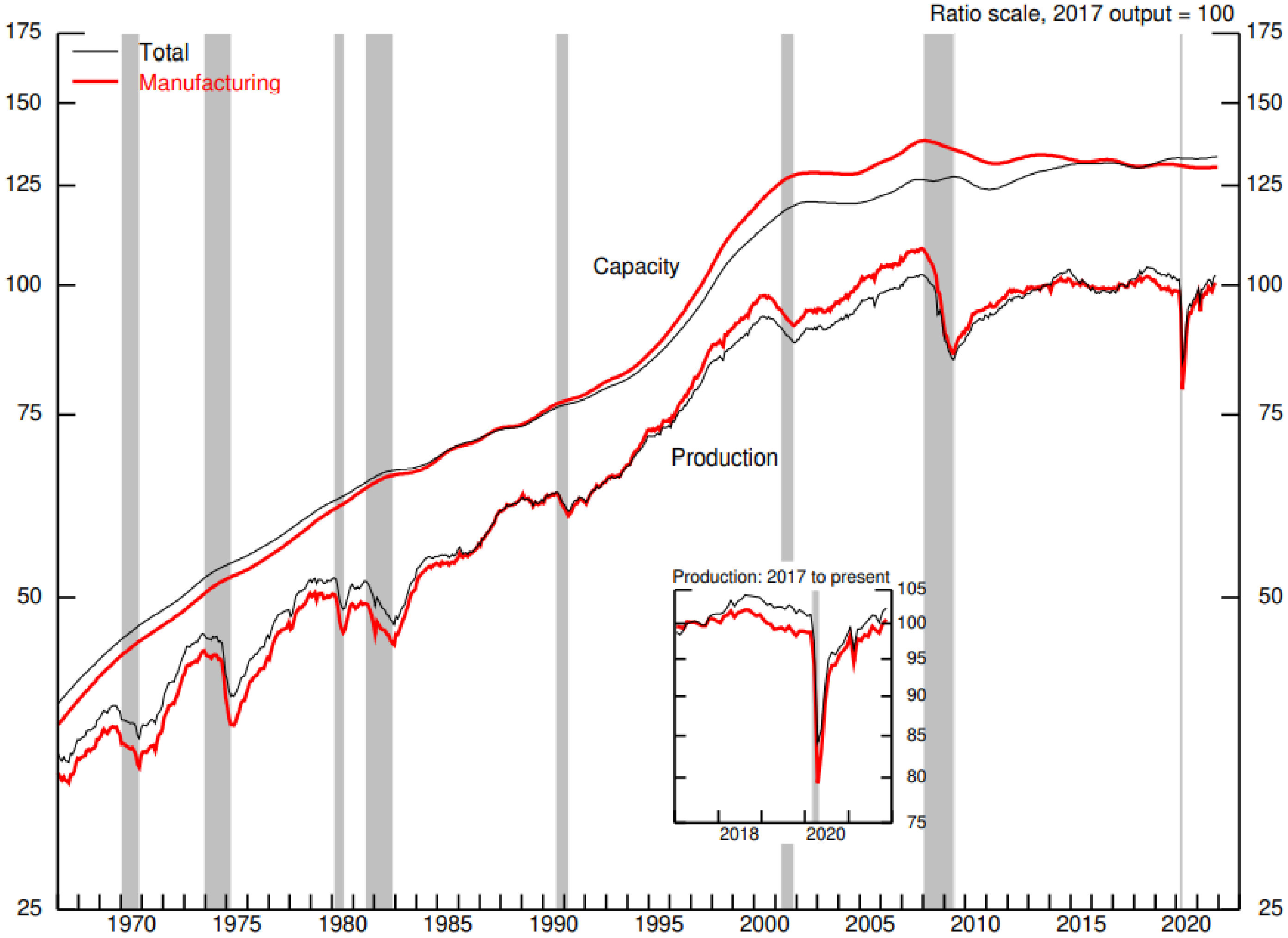


COVID Productivity Bounce Expected to Fade



Source: CBO

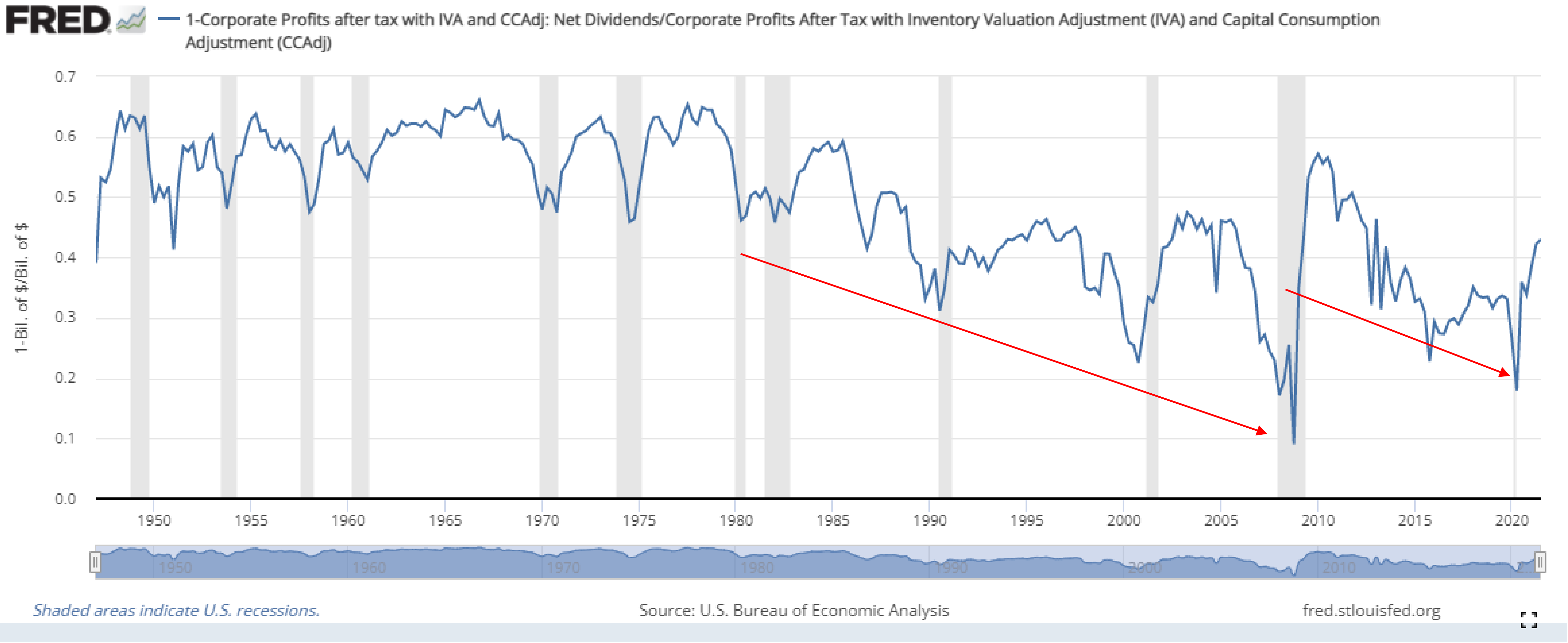
Industrial capacity flat for 20yrs



Source: www.federalreserve.gov/releases/g17/Current/g17.pdf

Infrastructure Investment and Jobs Act (2021) may enhance productive capacity

Decline in Plowback Rates



No Investment in Equipment nor IP

Set a Scale to Quantify Opinions

Crash		Neutral		Boom
-2	**-1**	**0**	**+1**	**+2**
	Correction		Rally	

Output

RGDP

-2	-1	**0**	+1	+2

- Labor Force continues to decline due to demographic trends
- Capital Stock stuck. One hope is federal infrastructure spending.
- Need more investment to bolster productivity

Inflation

RGDP

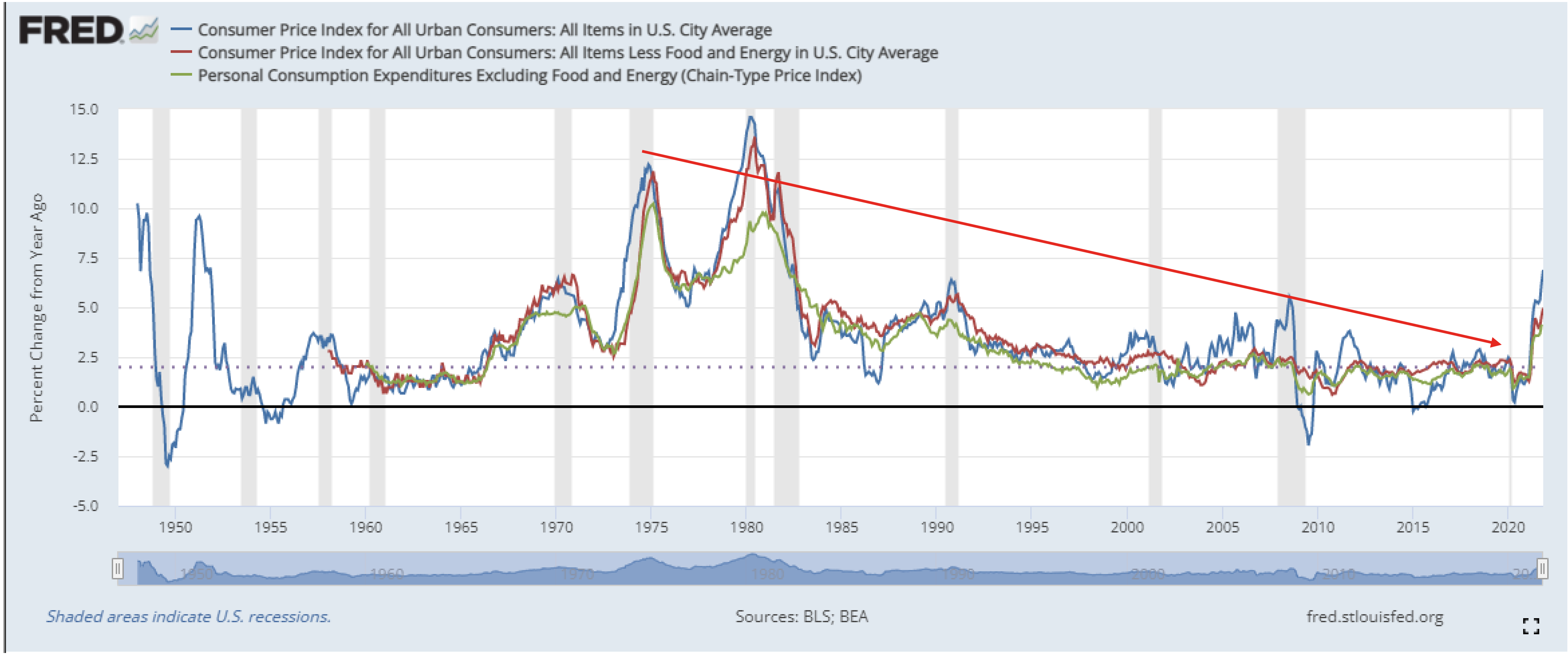
-2	-1	**0**	+1	+2

Inflation

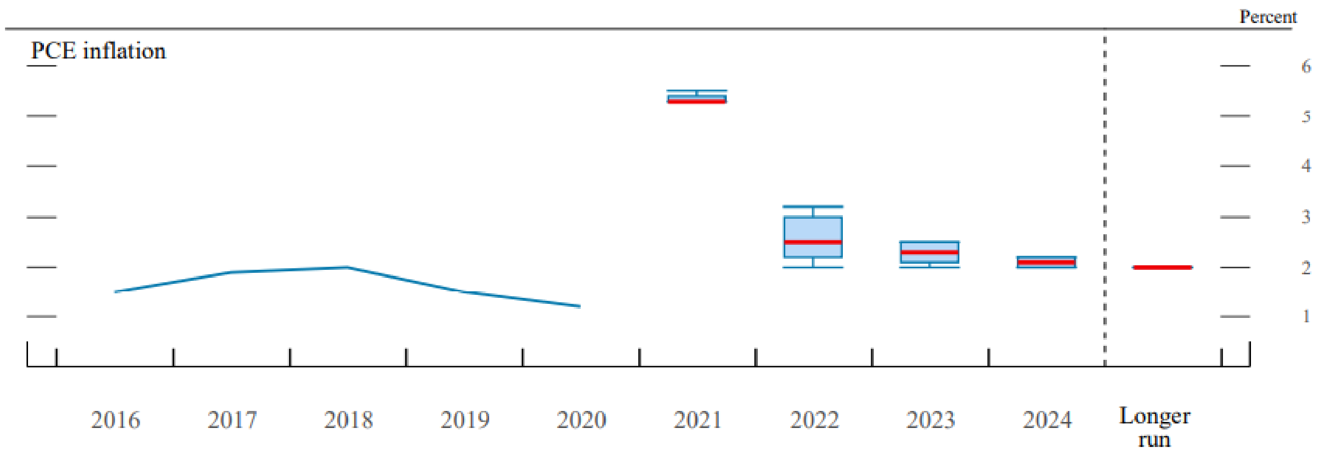
-2	-1	0	**+1**	+2

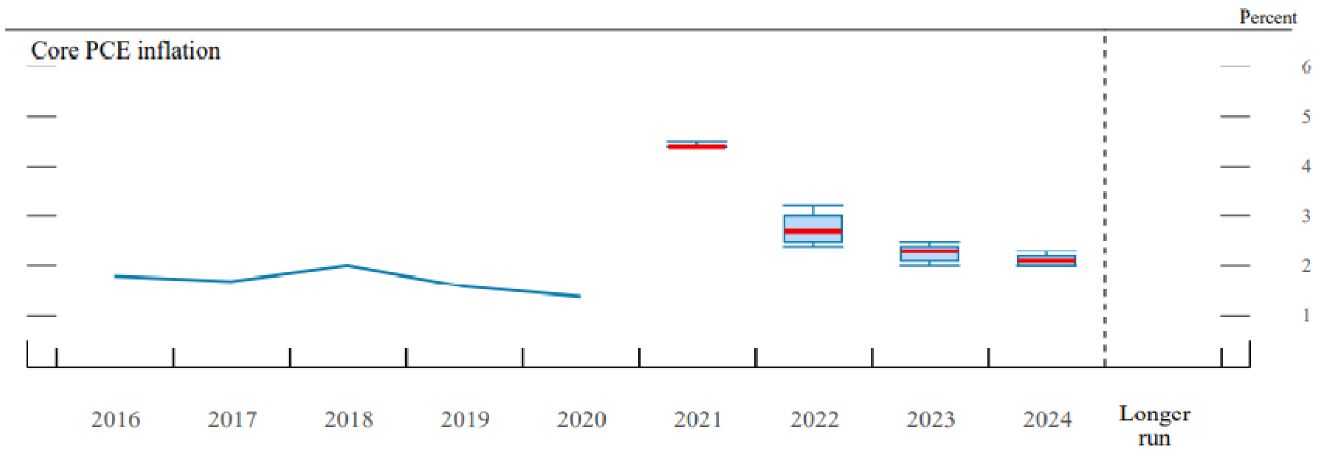
- Fed and CBO expectations for a return to 2% inflation may be overly optimistic
- Amazon Effect and Demographics remain disinflationary forces
- But supply chain disruptions are disrupting globalization’s downward price pressure

Long Era of Disinflation

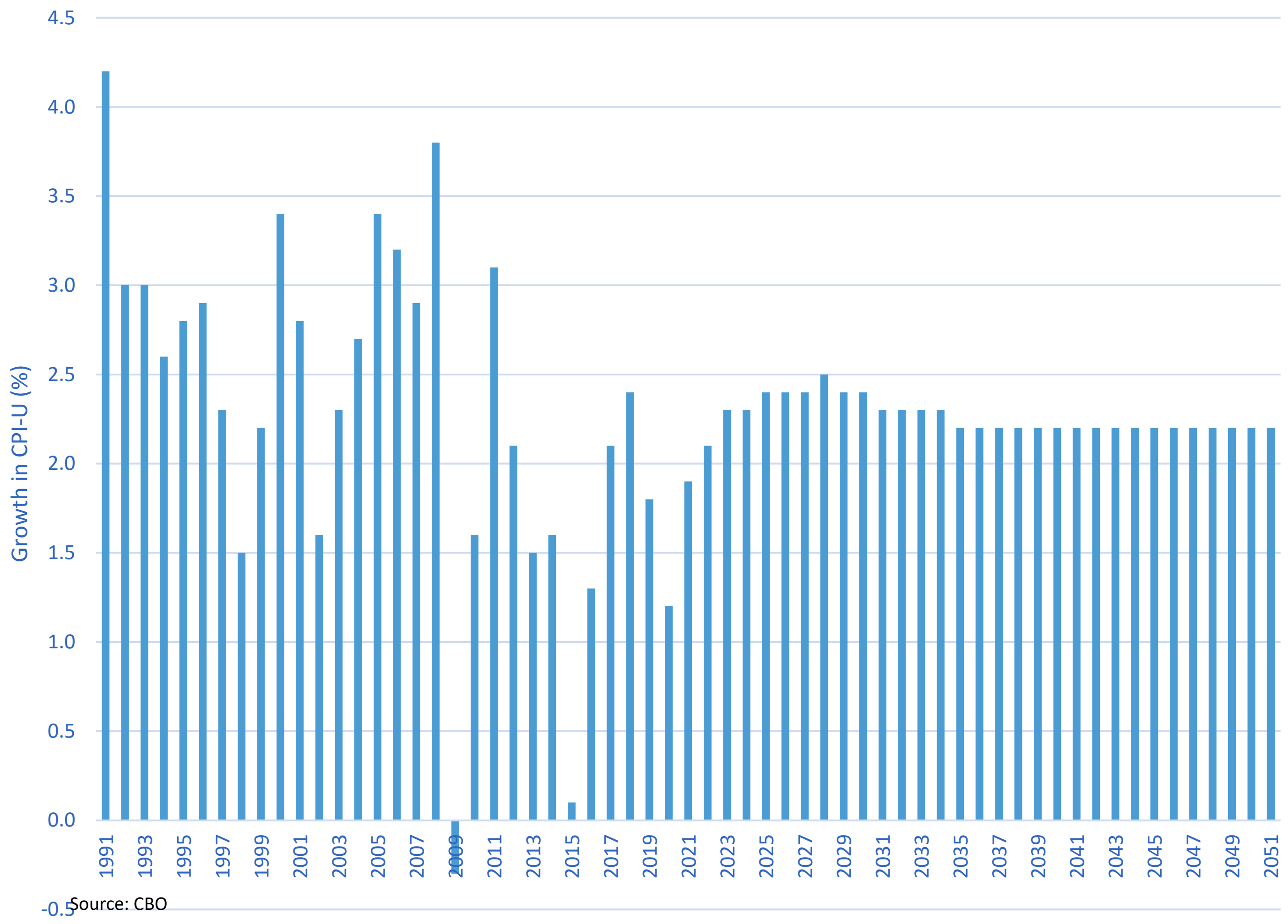


Fed Sees a Return to 2% Target





CBO Sees a Return to ~2% Target



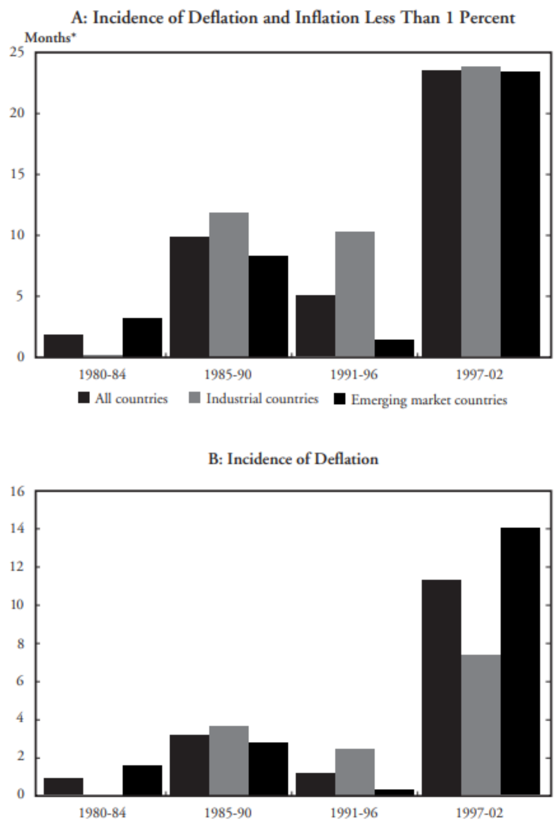
Disinflationary Drivers

1. Amazon Effect – online pricing competition drives prices lower

2. Globalization – increased global competitions throughout the supply chain drive prices lower

3. Demographics – shrinking labor force (growth) depressed aggregate demand, driving prices lower*

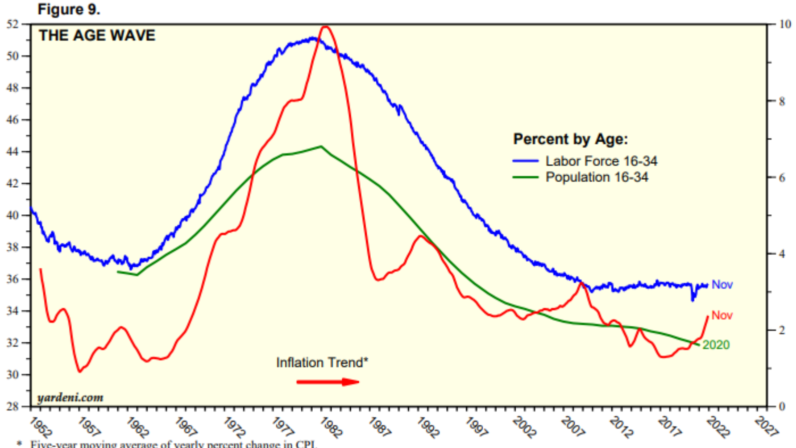
Incidence of Deflation and Low Inflation



Source: Data derived from Kumar and others 2003

*Number of country months with year-on-year inflation less than 1 percent or negative, as a percent of total. Data are based on 35 of the largest industrial and emerging market economies.

Figure 9.



* Five-year moving average of yearly percent change in CPI.
Note: Oldest and youngest Baby Boomers turned 16 in 1962 and 1980, respectively.
Source: Bureau of Labor Statistics.

*Conflicting evidence exists

Supply Chain Disruptions break a Disinflationary Driver

1. Amazon Effect – online pricing competition drives prices lower
2. Globalization – increased global competitions throughout the supply chain drive prices lower
3. Demographics – shrinking labor force (growth) depressed aggregate demand, driving prices lower*

Figure 2. Supply-Chain Disruptions By Sector

In the last week, did this business have domestic supplier delays? (percentage saying yes)

Sources: U.S. Census Bureau; CEA Calculations.

In an effect to bolster supply chains, “Supply Protection” and “Reshoring” may create a pricing wedge, resulting in steady state > 2% inflation

*Conflicting evidence exists

RGDP

-2	-1	**0**	+1	+2

Inflation

-2	-1	0	**+1**	+2

Inflation

- Fed and CBO expectations for a return to 2% inflation may be overly optimistic
- Amazon Effect and Demographics remain disinflationary forces
- But supply chain disruptions are disrupting globalization’s downward price pressure

NGDP

RGDP

-2	-1	**0**	+1	+2

Inflation

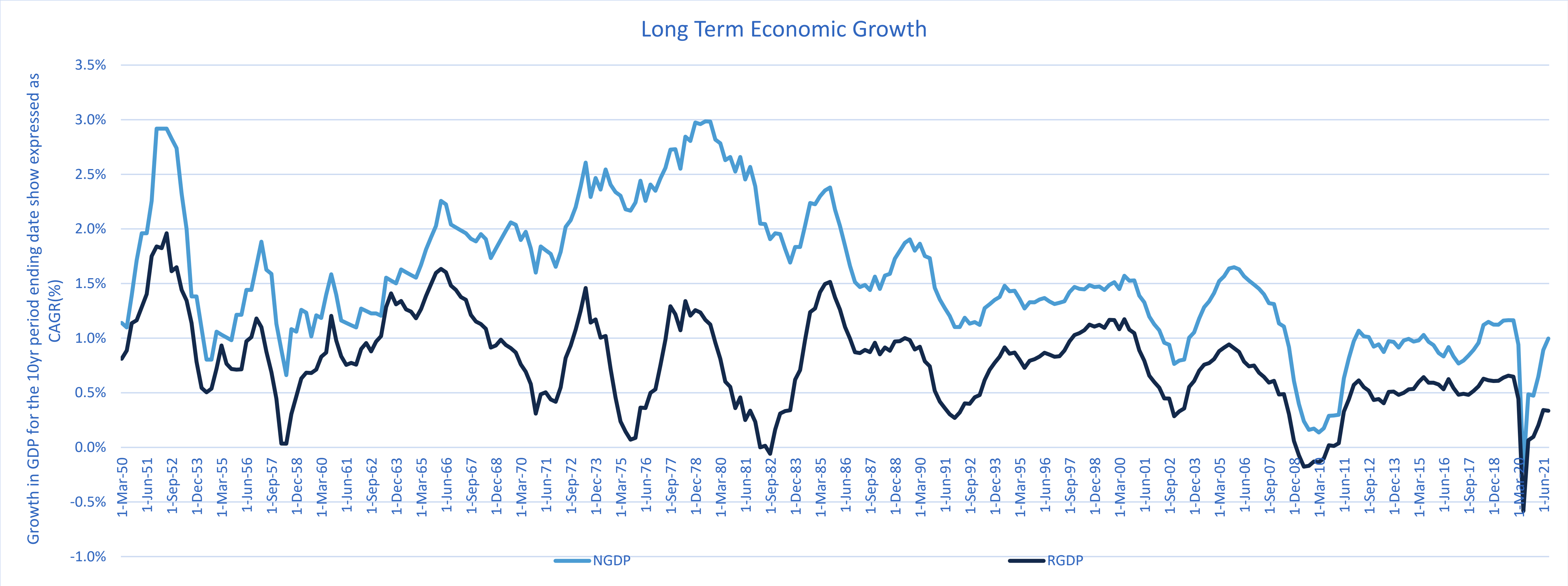
-2	-1	0	**+1**	+2

NGDP

-2	-1	0	**+1**	+2

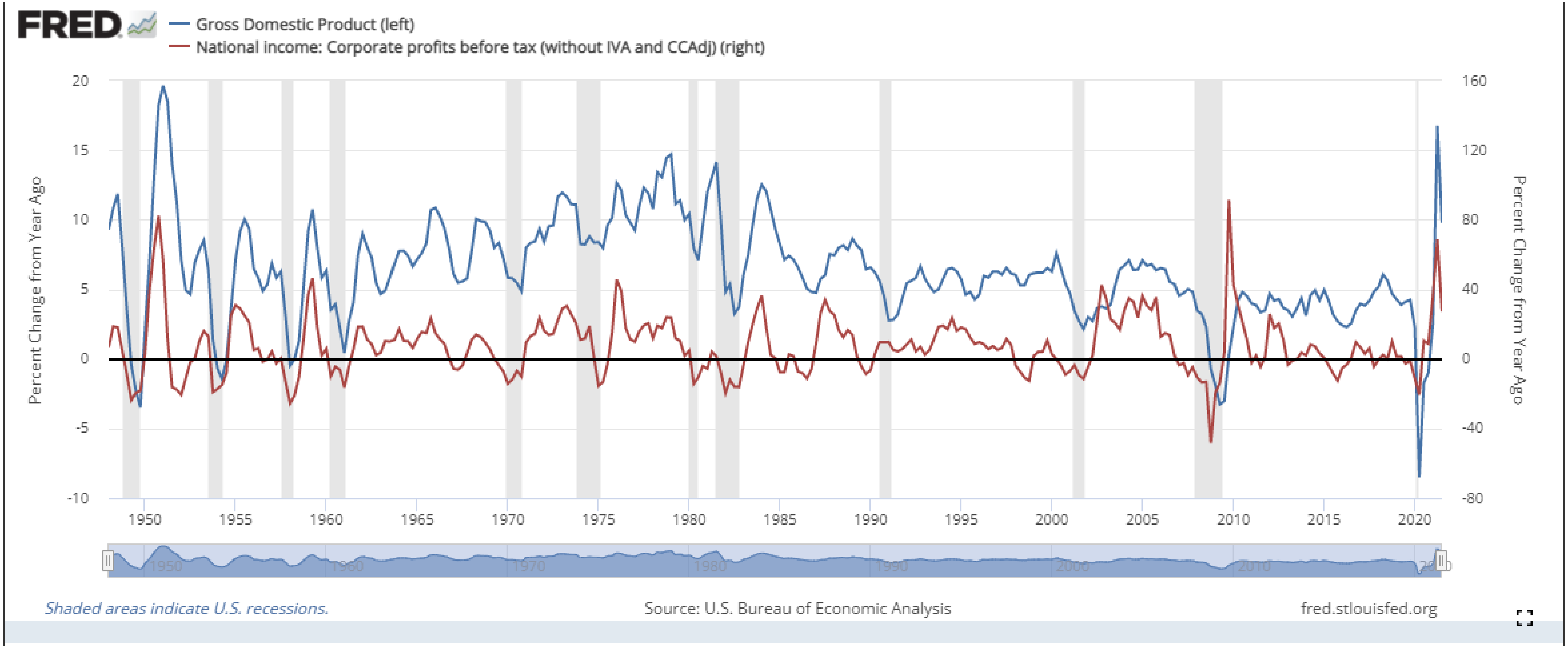
- Despite low potential RGDP growth,…
- …higher inflation has the potential to put a floor under NGDP,…
- …which is decent news for earnings

NGDP could rise amid higher inflation even if RGDP falters



Source: multpl.com and author calculations

NGDP sets the stage for earnings…



Interest Rates

RGDP

-2	-1	**0**	+1	+2

Inflation

-2	-1	0	**+1**	+2

NGDP

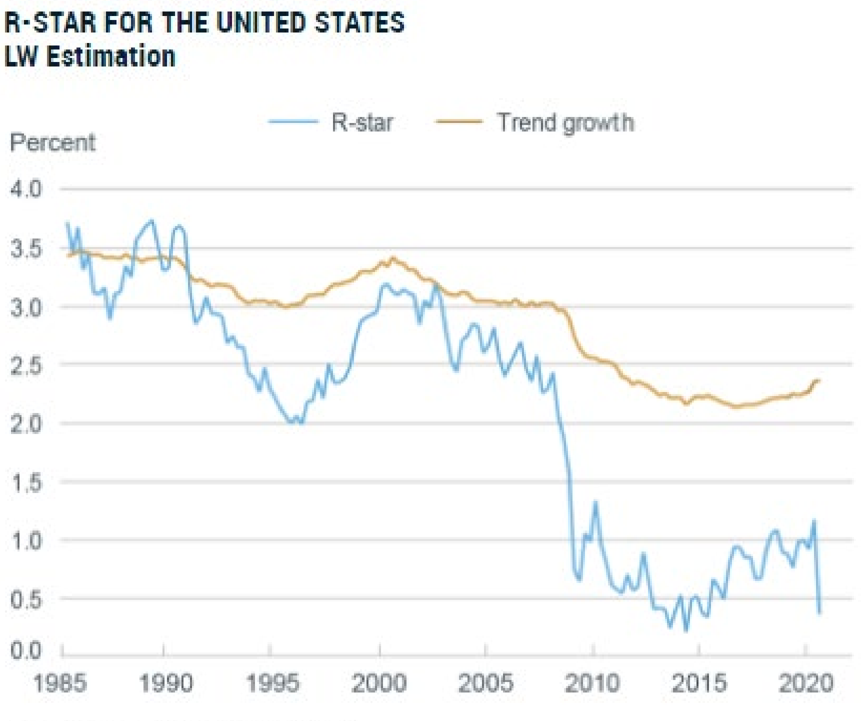
-2	-1	0	**+1**	+2

Nominal Long Rates

-2	-1	0	**+1**	+2

- Short term rates are anchored at a low r*
- Higher than 2% inflation may raise nominal short rates,…
- ..and may reverse some of the downturn in the term premium
- Coupled with fiscal largesse and expected risk asset volatility, the term premium may rise,…
- ..leading long rates to rest near 5% in a >10yr time frame

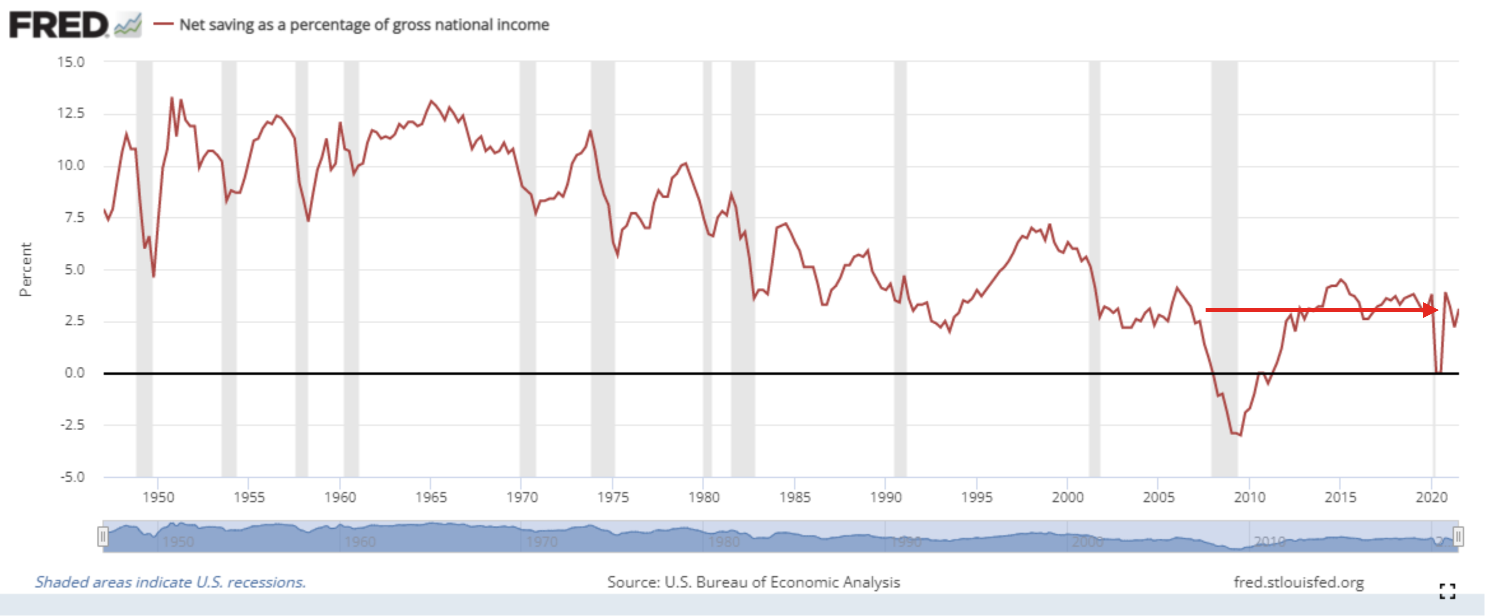
Real Short Rates to Remain Low



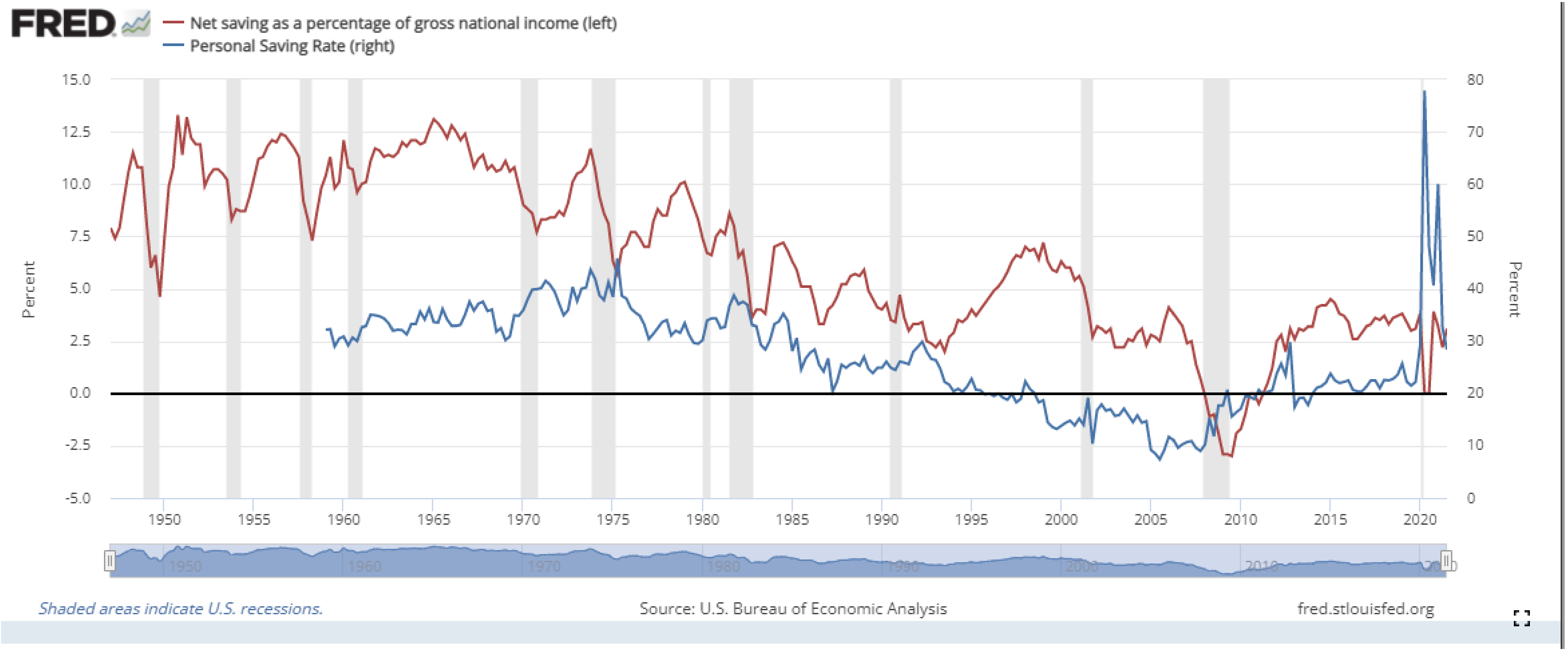
Source: Laubach and Williams (2003).
Note: We plot estimates of the natural rate of interest (r-star) along with those for the trend growth rate of the U.S. economy, a source of change driving r-star.

R-star and COVID-19
Owing to the extraordinary volatility in GDP related to the COVID-19 pandemic, we are suspending until further notice the posting of regular updates of the LW and HLW model estimates. *(November 30, 2020)*

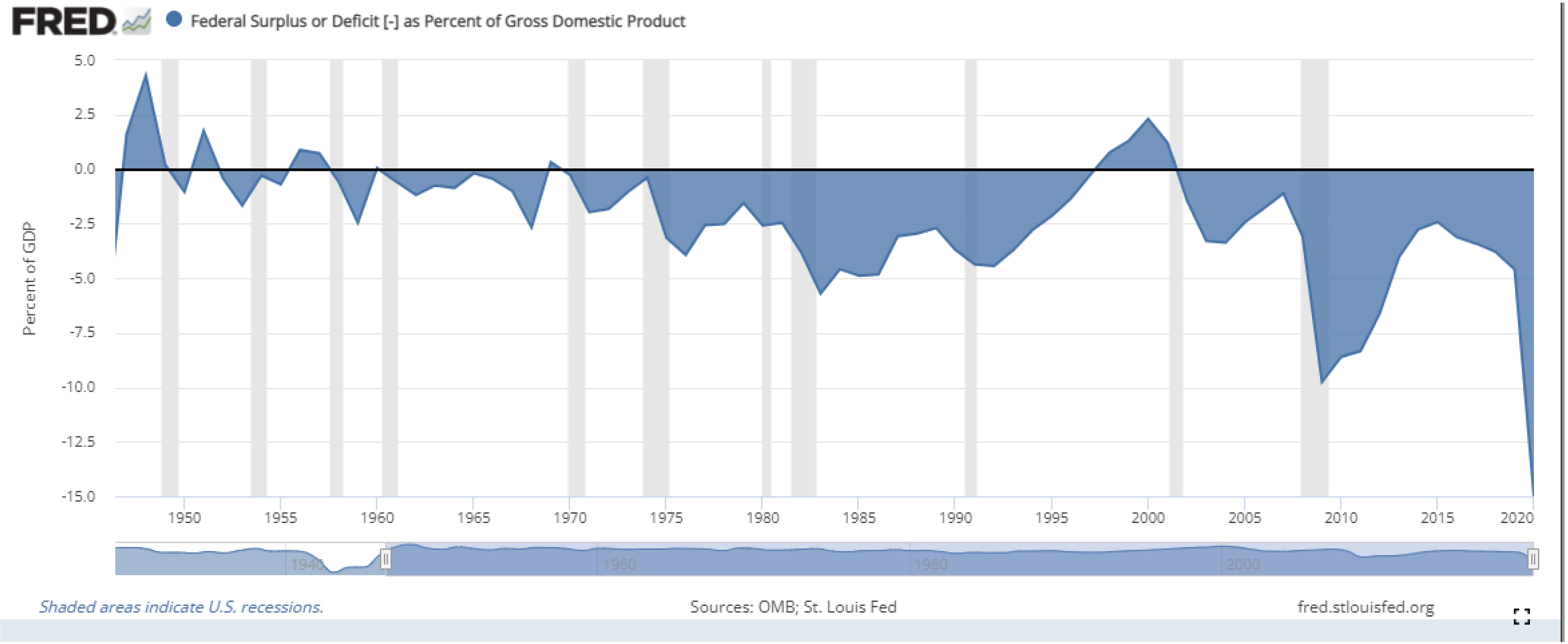
Low Potential RGDP + Low National Savings = Low Real Short Rates



Personal Savings Rise Abated Long Term Decline in National Savings

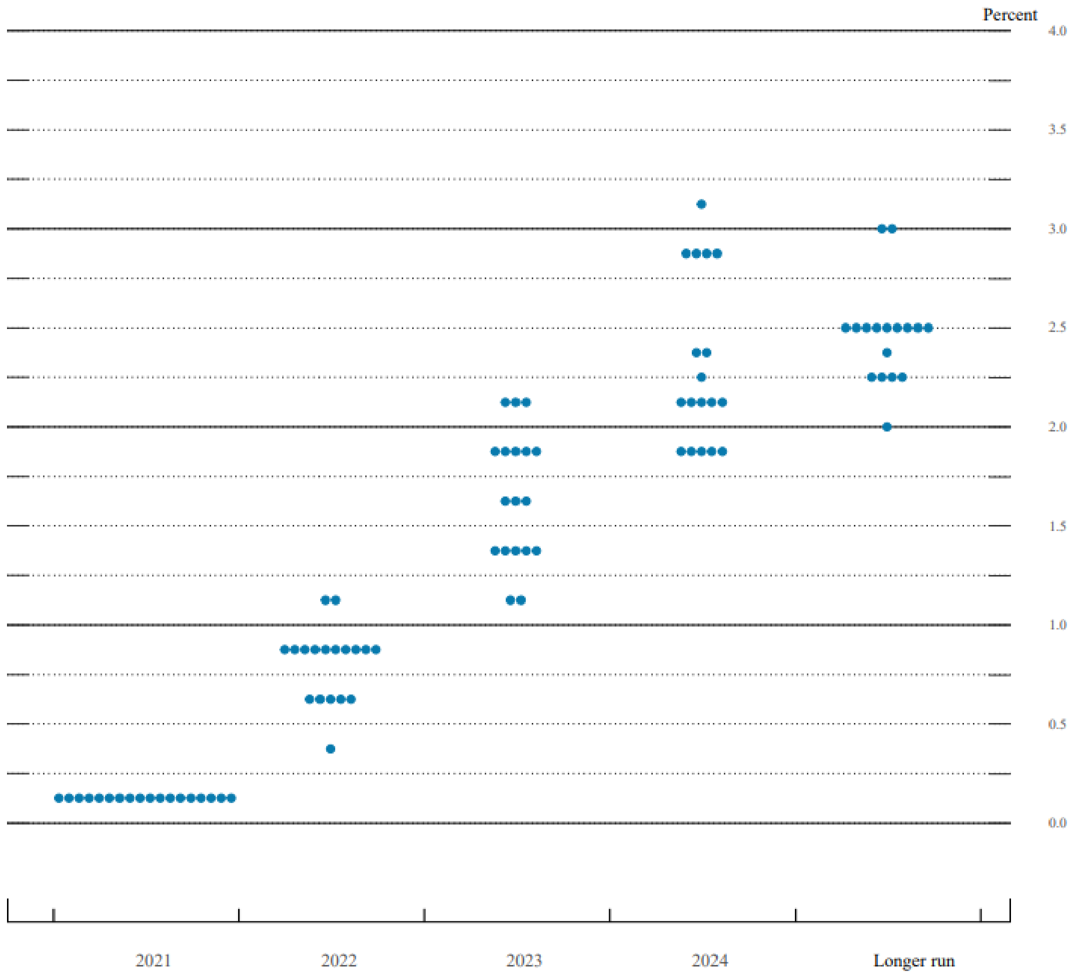


Deficit Spending Keeps National Savings Low



Fed Projects 2.5% Short Rate

Figure 2. FOMC participants' assessments of appropriate monetary policy: Midpoint of target range or target level for the federal funds rate



Fed’s Long Run Forecasts of 2.5% Short Rate hasn’t been altered by the Pandemic

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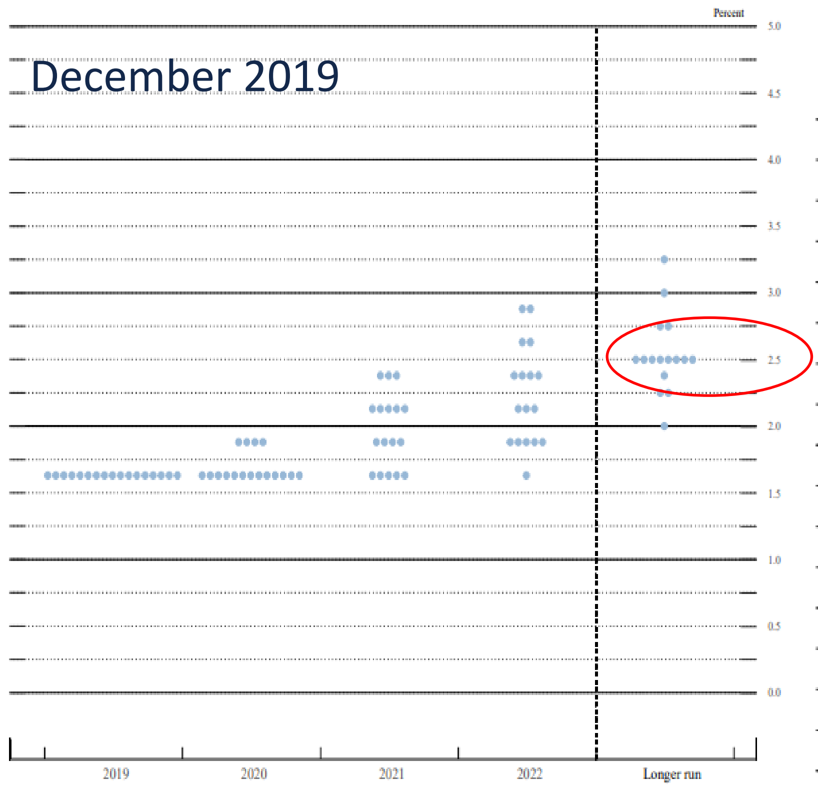

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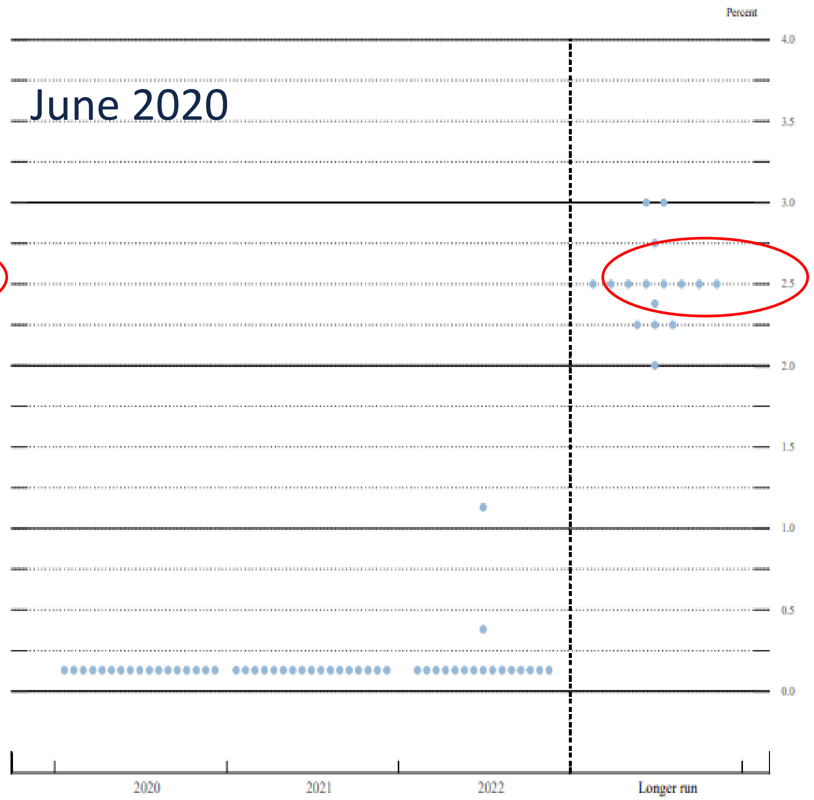

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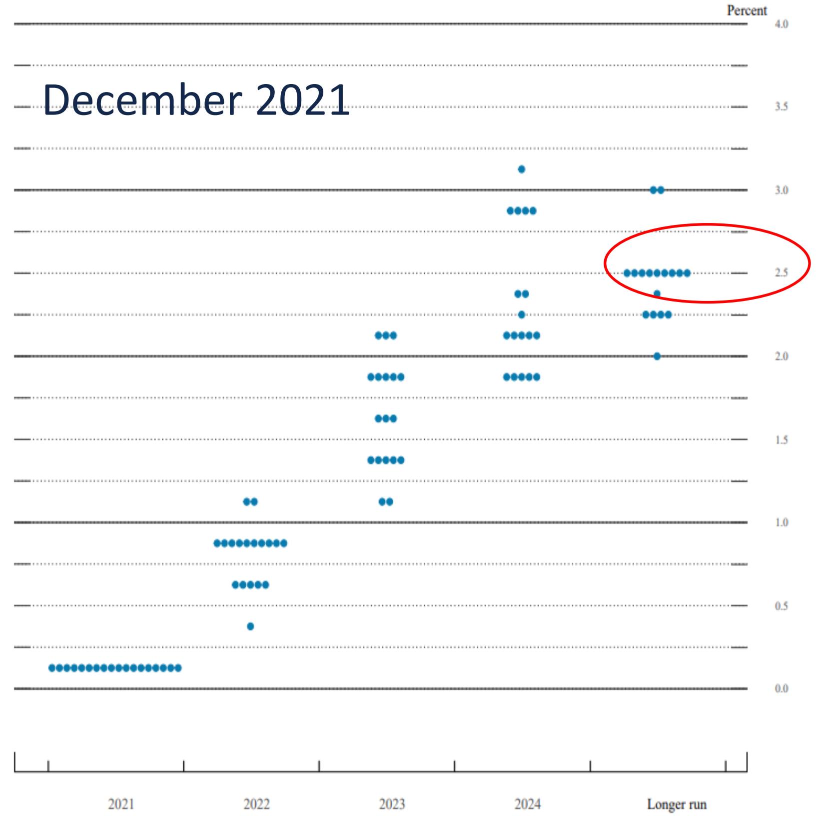


Higher Inflation = Higher Short Rates

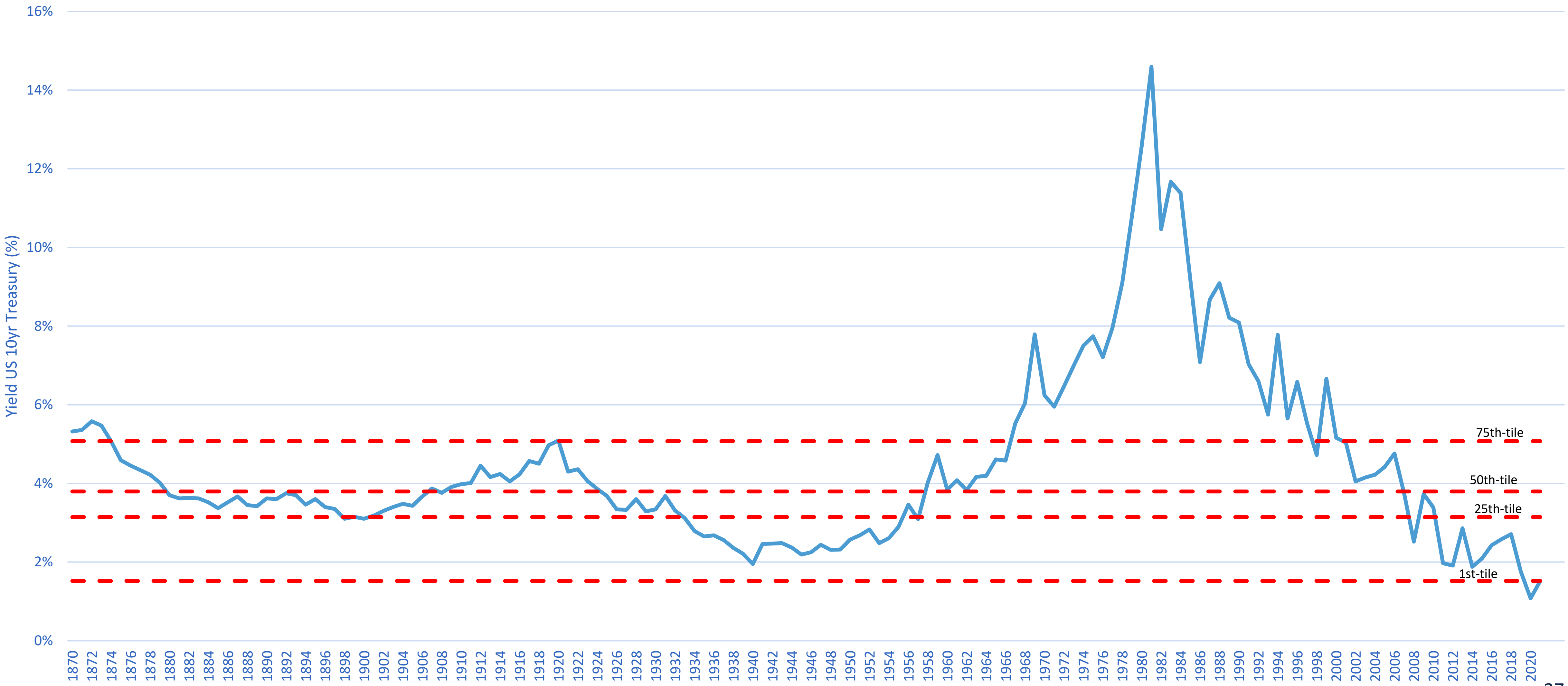
The Fed's 2.5% Long Run Target can be decomposed

.5%	2%	2.5%

But if steady state inflation is higher, we could get higher nominal short rates

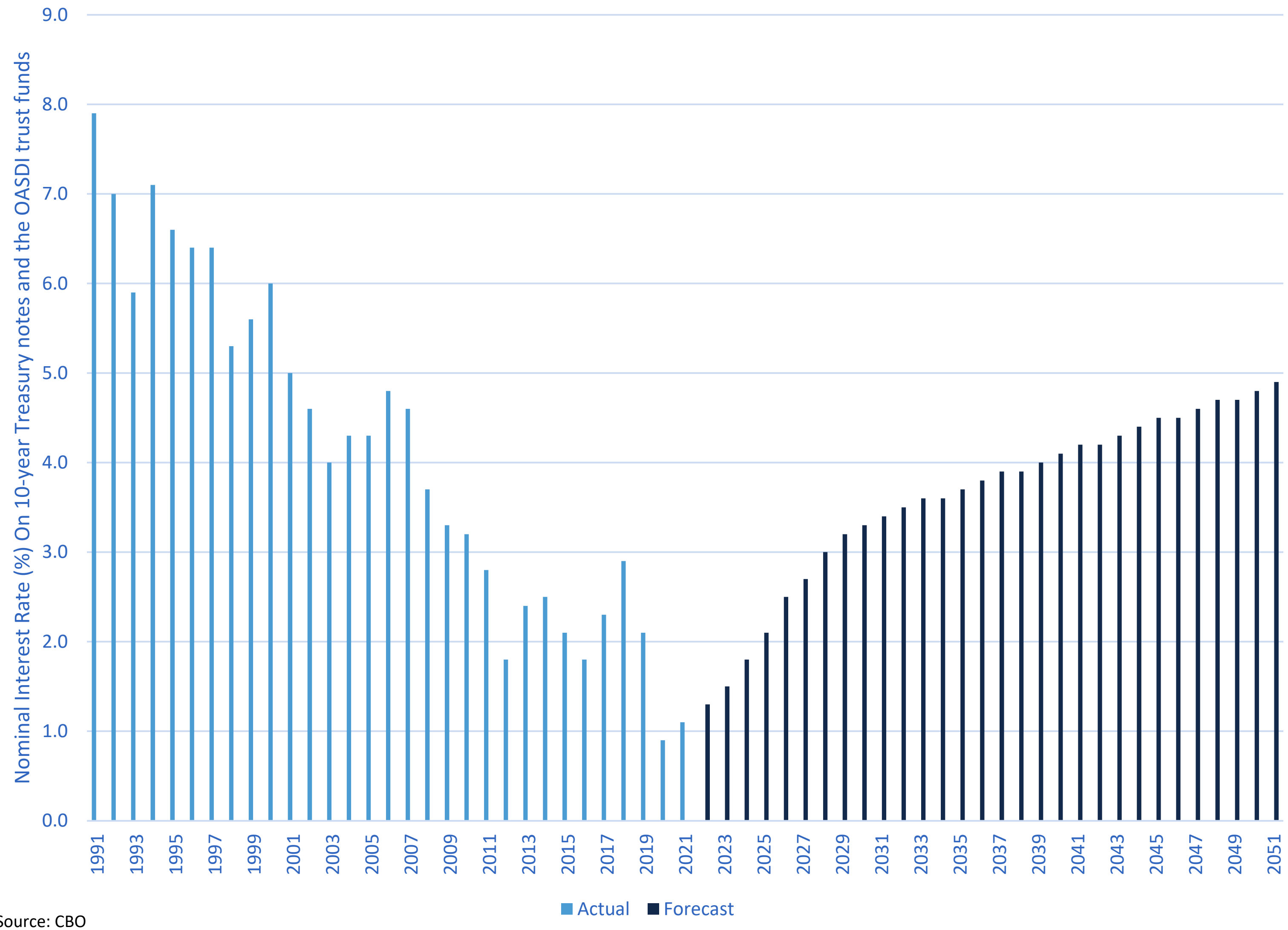
.5%	3%	3.5%

Long Rates At Extreme Lows



Source: multpl.com and author calculations

Long Rates Are Expected to Rise



Source: CBO

Long Rate Drivers

The CBO's Long Rate forecasts are consistent with a term premium of 1.5%->2.5%

Expected Short Rate + Term Premium = Long Rate

2.5% 1.5%->2.5% 4%->5%

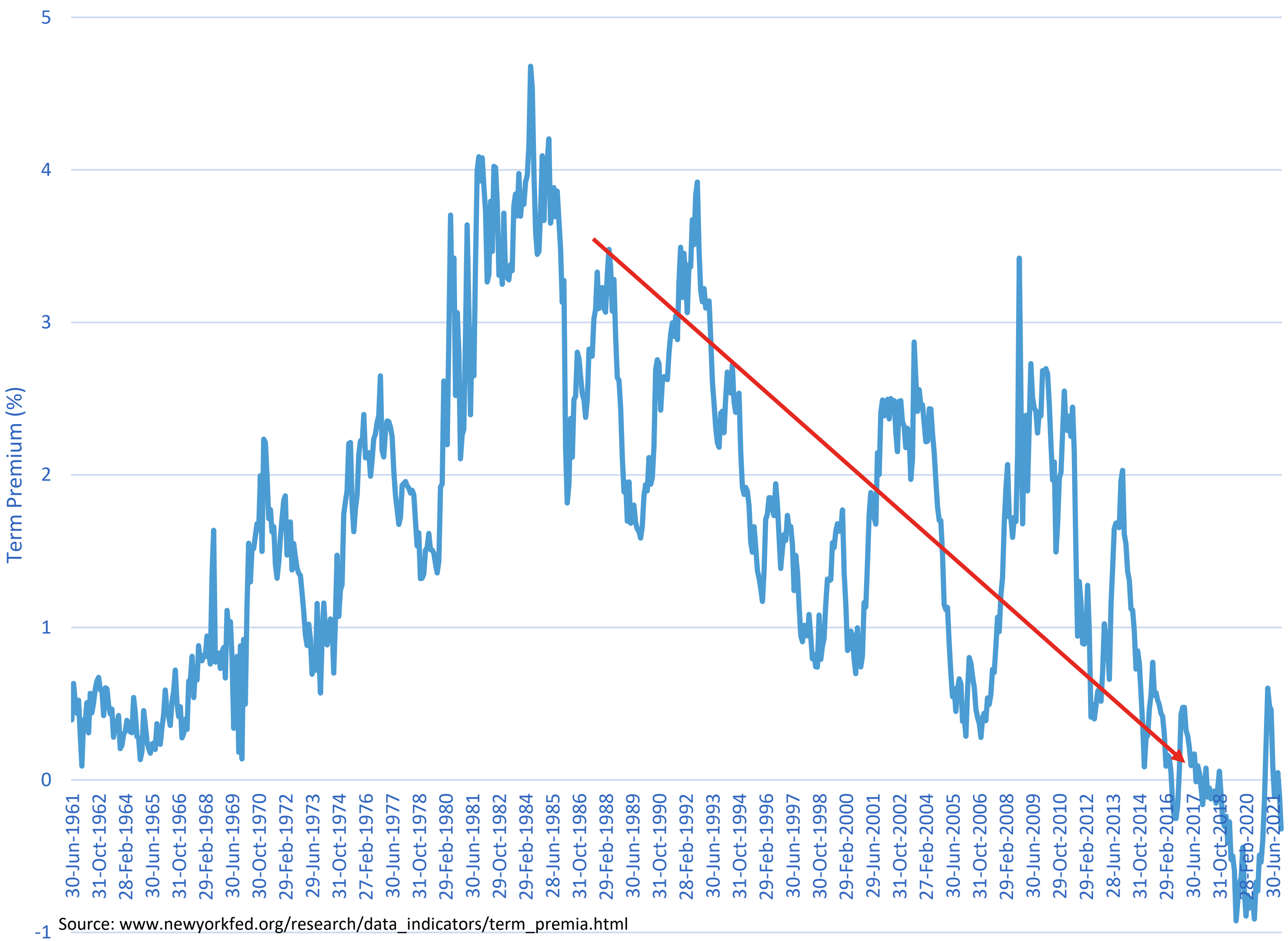
But if the Short Rate is higher, it would require a much smaller Term Premium

3.5% 0.5%->1.5% 4%->5%

Or, Long Rates could stabilize at a higher level

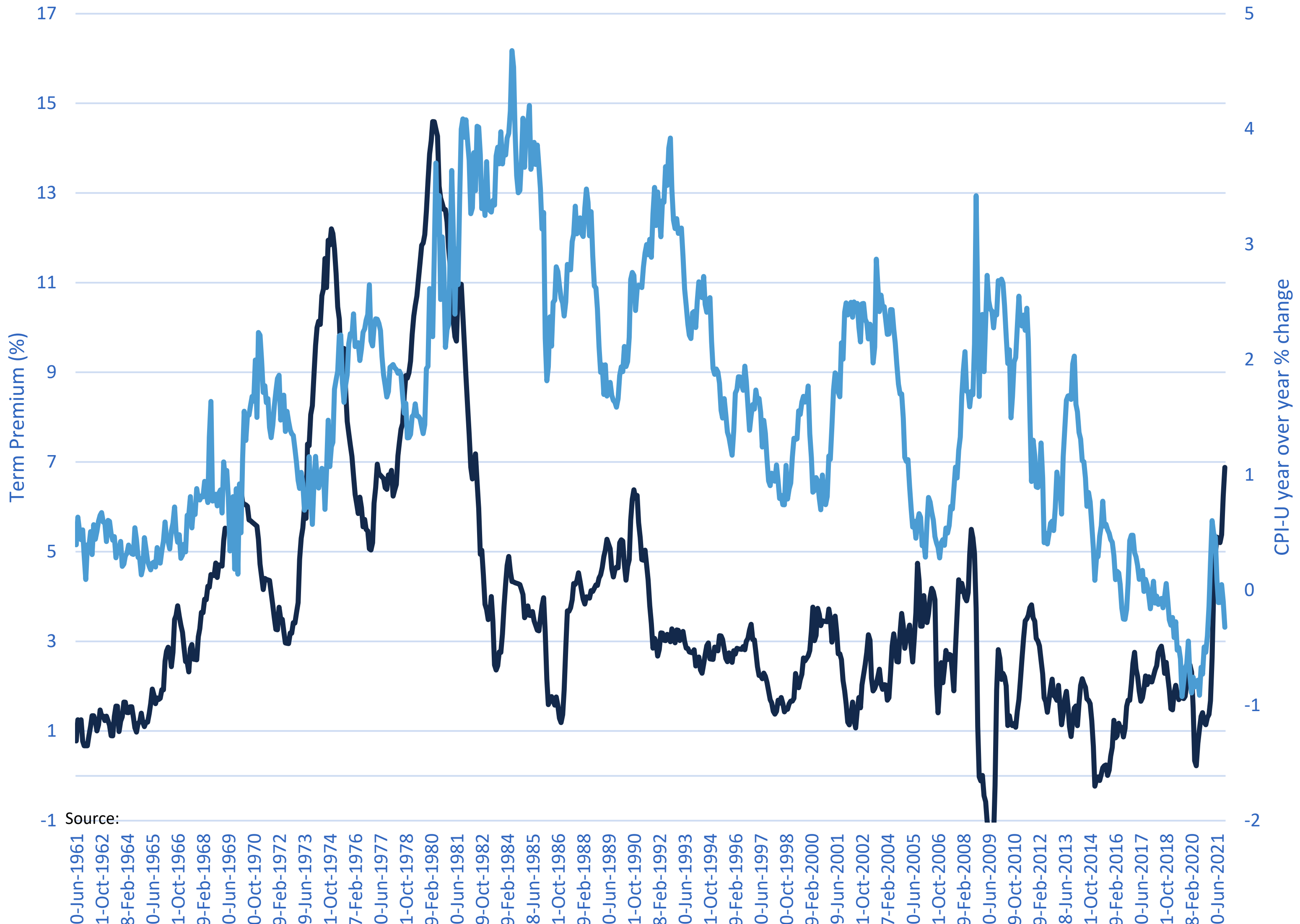
3.5% 1.5%->2.5% 5%->6%

Term Premium in a Structural Decline

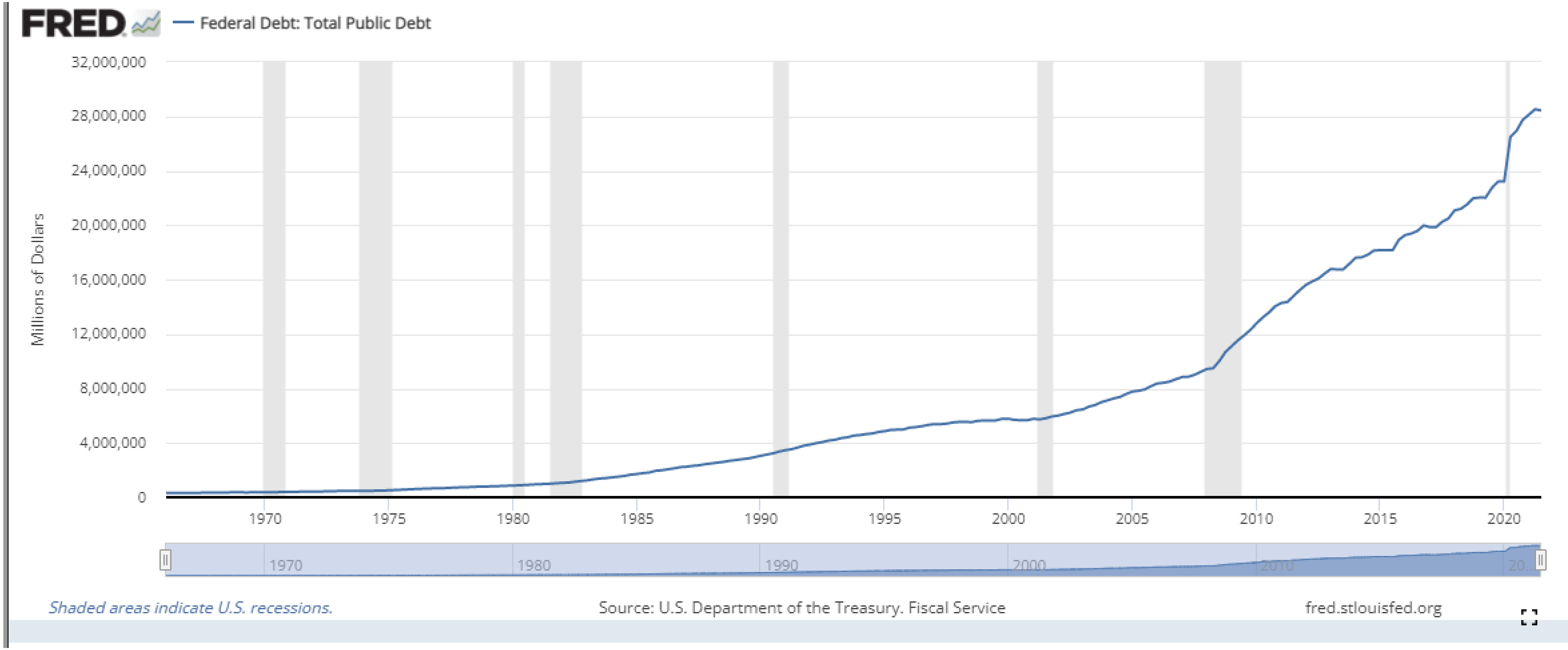


Source: www.newyorkfed.org/research/data_indicators/term_premia.html

Term Premium Decline might Abate with Higher Inflation



Impact of Debt May Have Lasting Effect on Term Premium



Interest Rates

RGDP

-2	-1	**0**	+1	+2

Inflation

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NGDP

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Nominal Long Rates

-2	-1	0	**+1**	+2

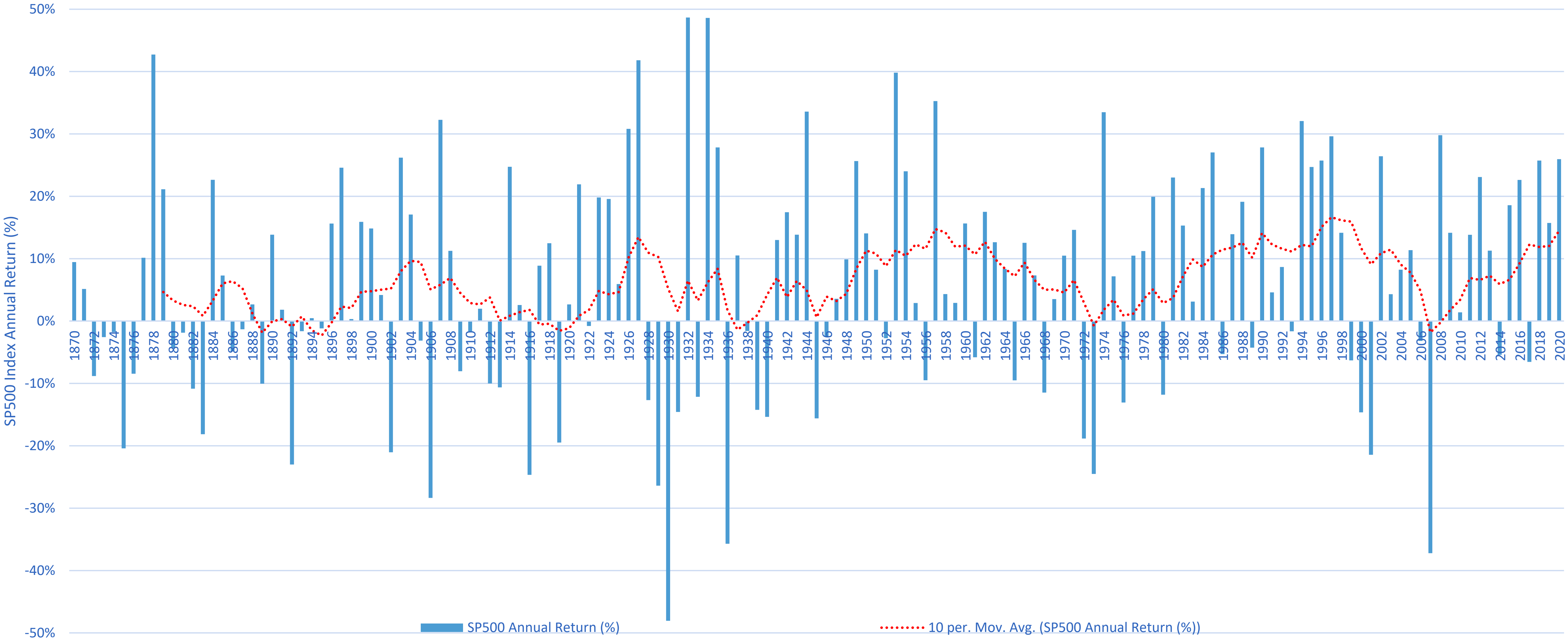
Equities

-2	**-1**	0	+1	+2

Equities

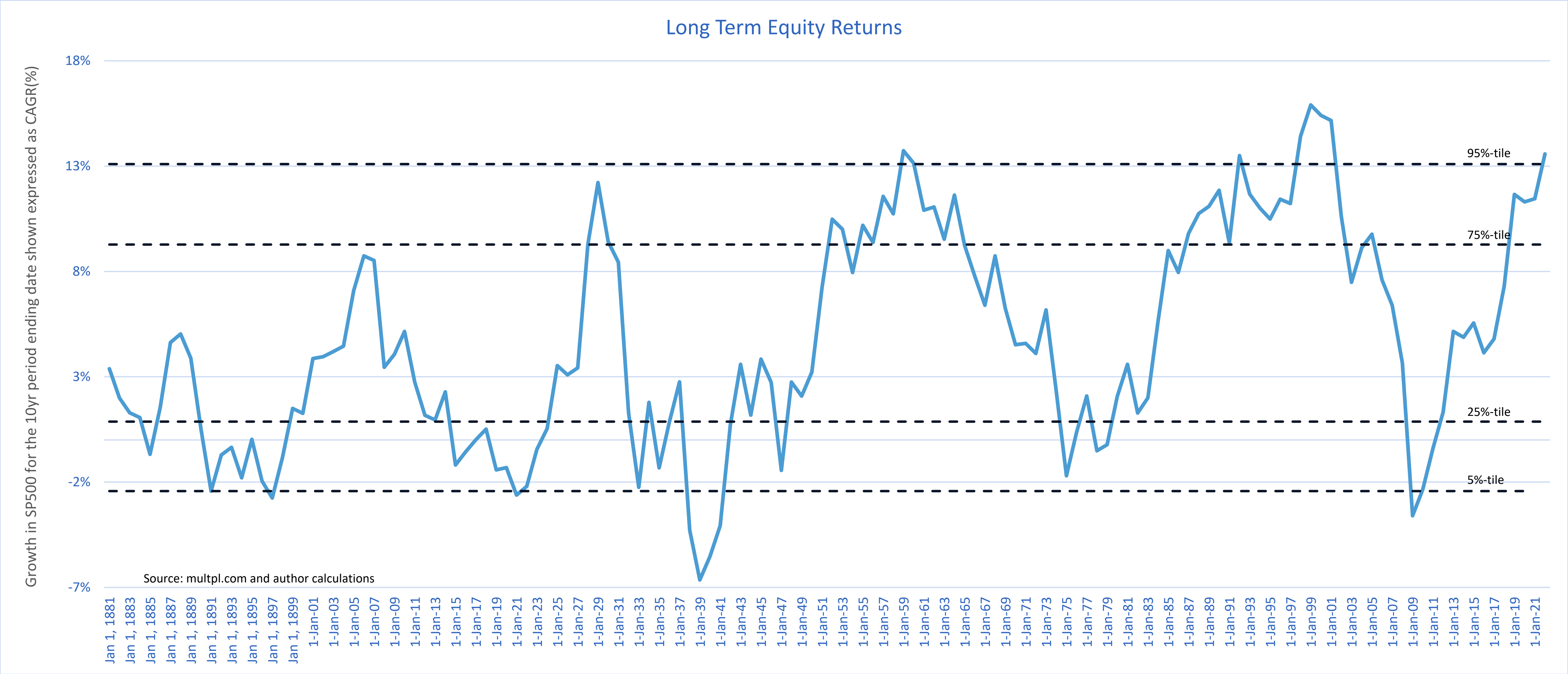
- Modest NGDP growth
- Alongside modest rate increases
- Implies modest equity gains

Recent Equity Long Term Performance Was Stellar

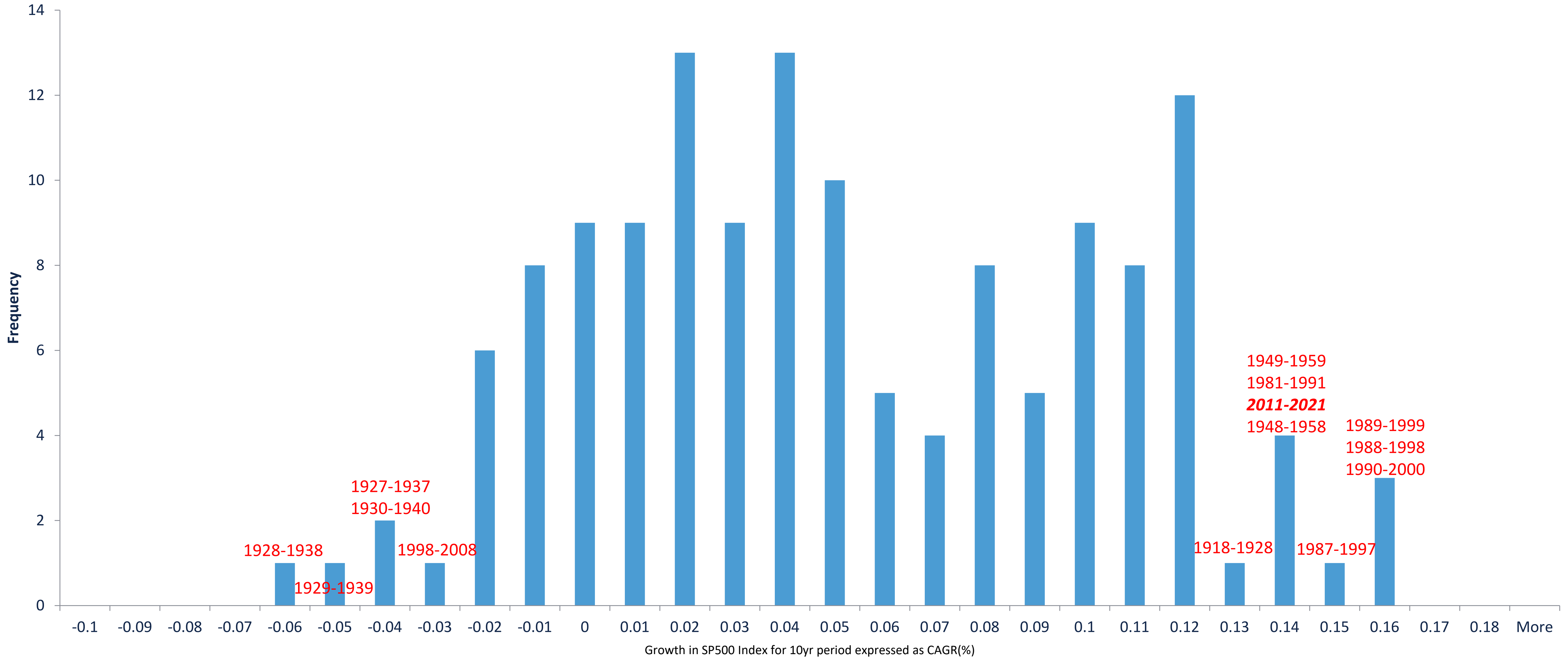


Source: multpl.com & author calculations | Mike Aguilar | www.linkedin.com/in/mike-aguilar-econ/

Long Term Equity Returns near historical peak

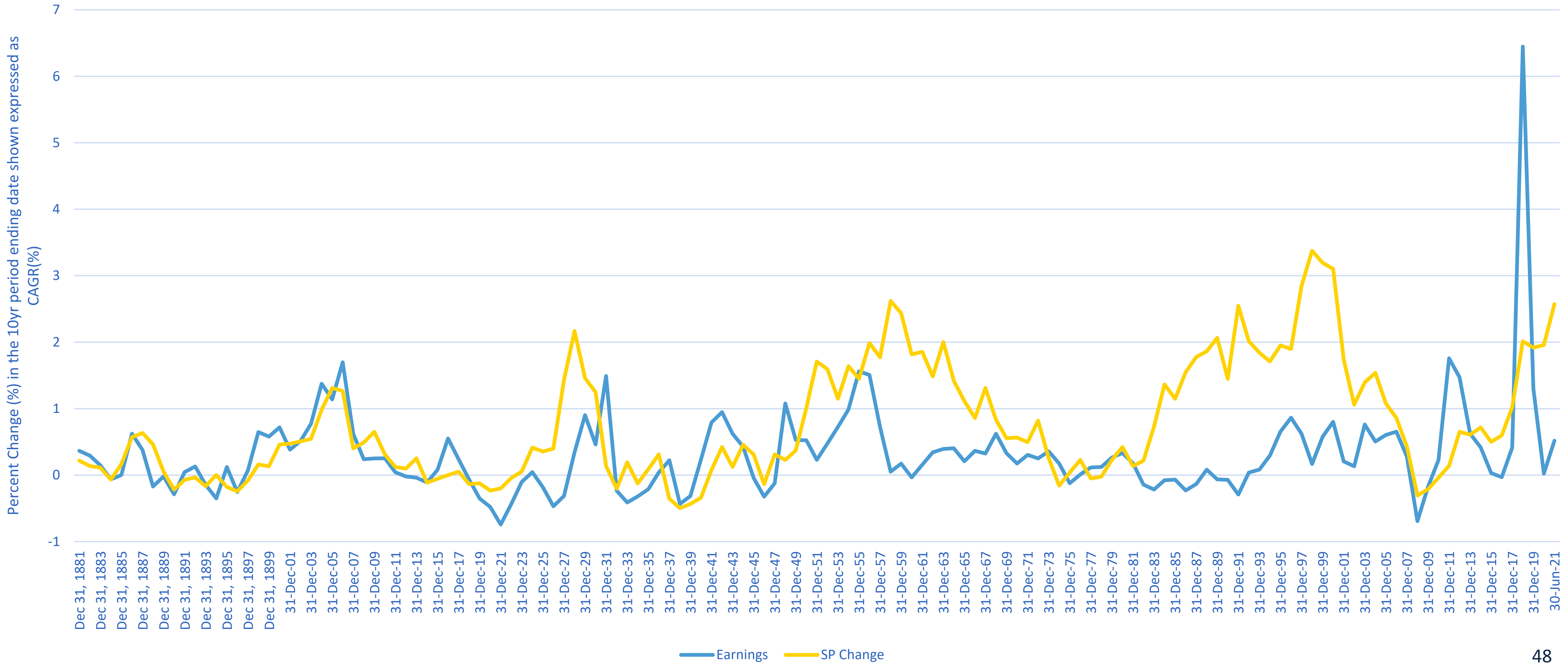


Long Term Equity Returns near extreme levels

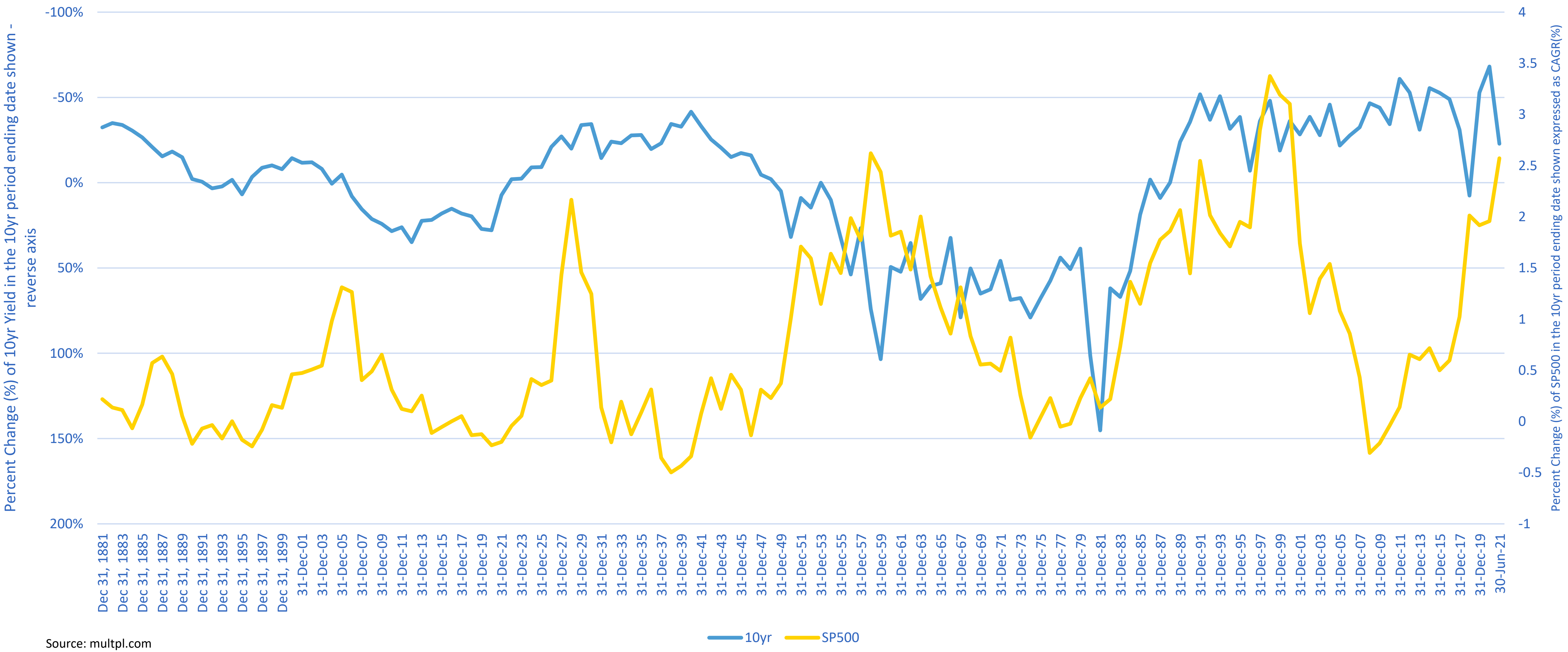


Source: multpl.com and author calculations

But Slow Earnings = Low Returns

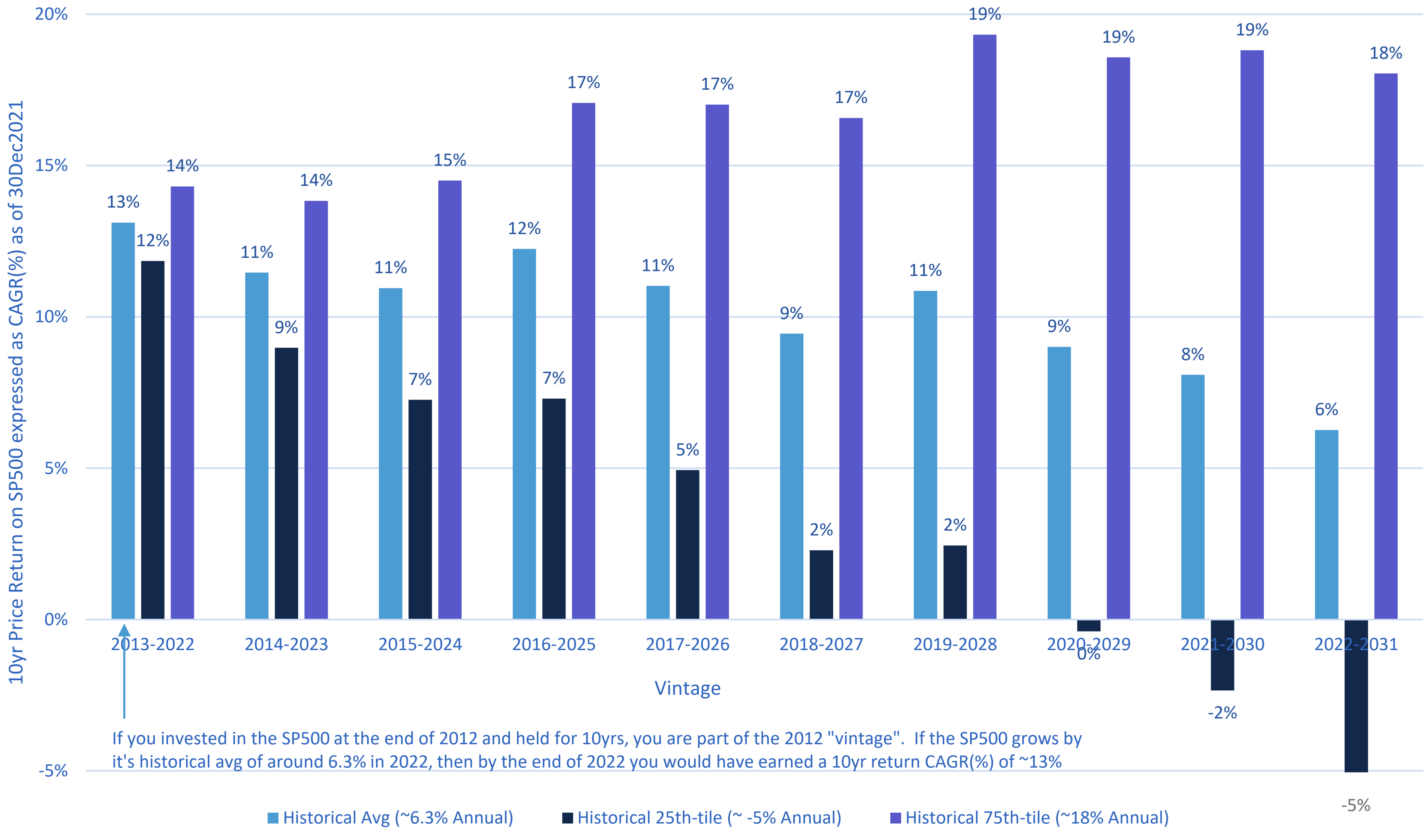


Rising Rates = Low Returns



Source: multpl.com

Prior Gains Could keep Long Term Investors in the Green for Some Time



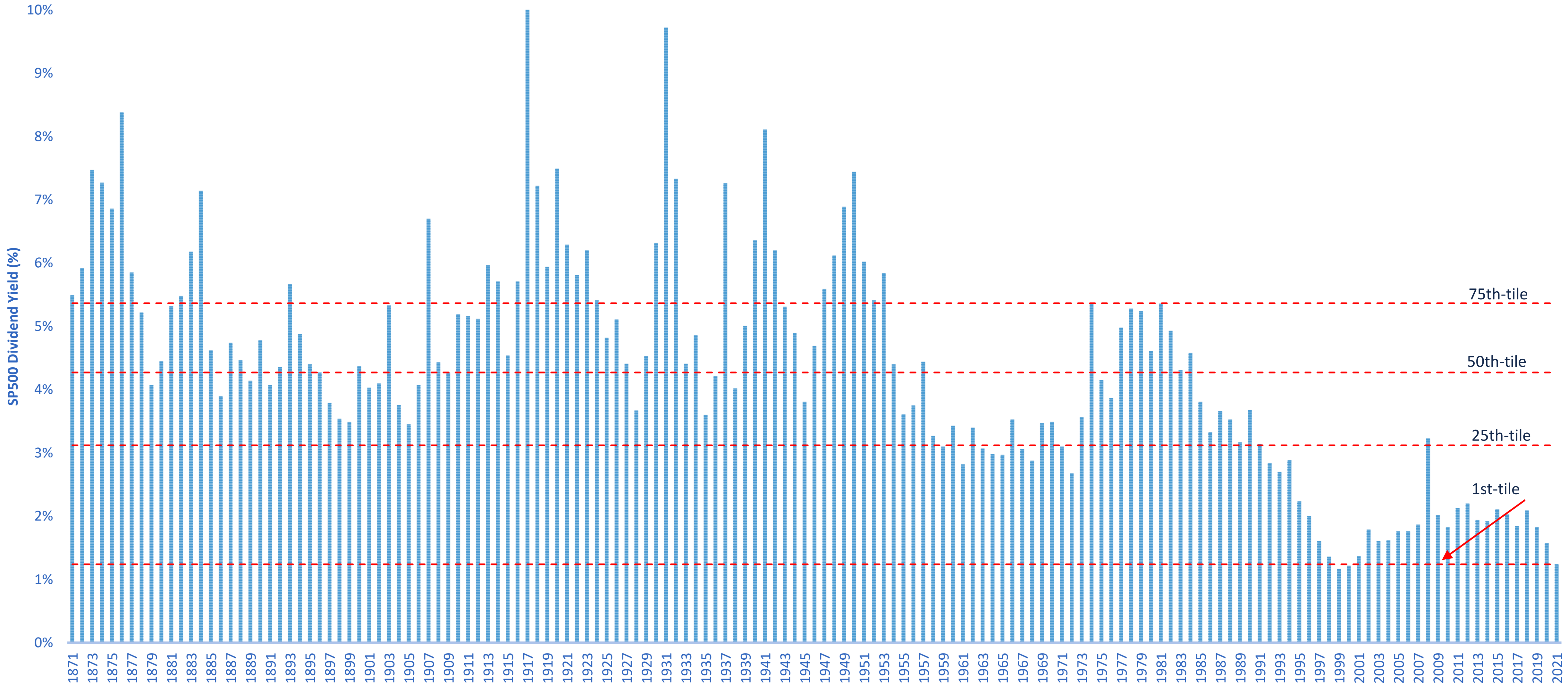
Let's say you started investing 5yrs ago (i.e. you are a 2017-2026 vintage) for a 10yr goal (e.g. child starts college in 2027).

If the SP500 returns its avg. 6% in 2022, 2023,…2026, then your 10yr return CAGR would be ~11%.

If the SP500 fall -5% in each year 2022,2023,….2026, then your 10yr return CAGR would still be about 5%.

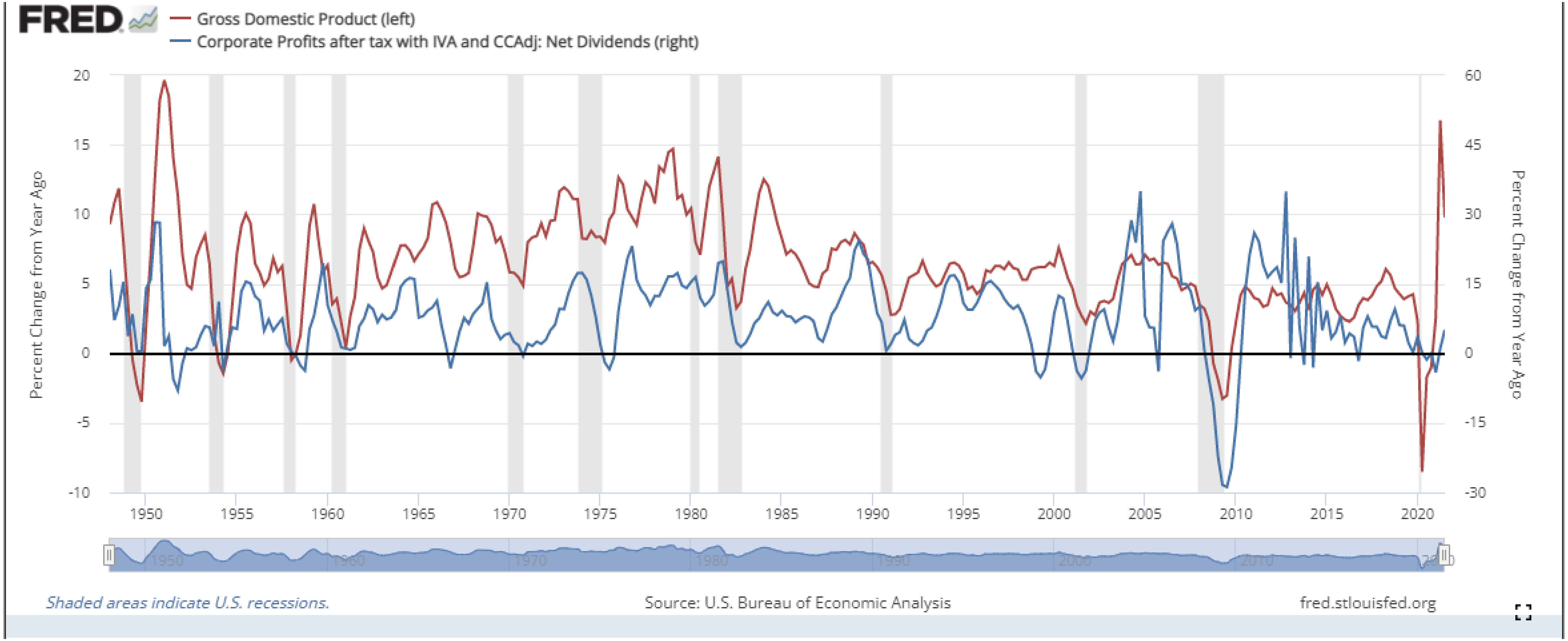
Source: multpl.com & author calculations

Dividend Yields at Historic Lows

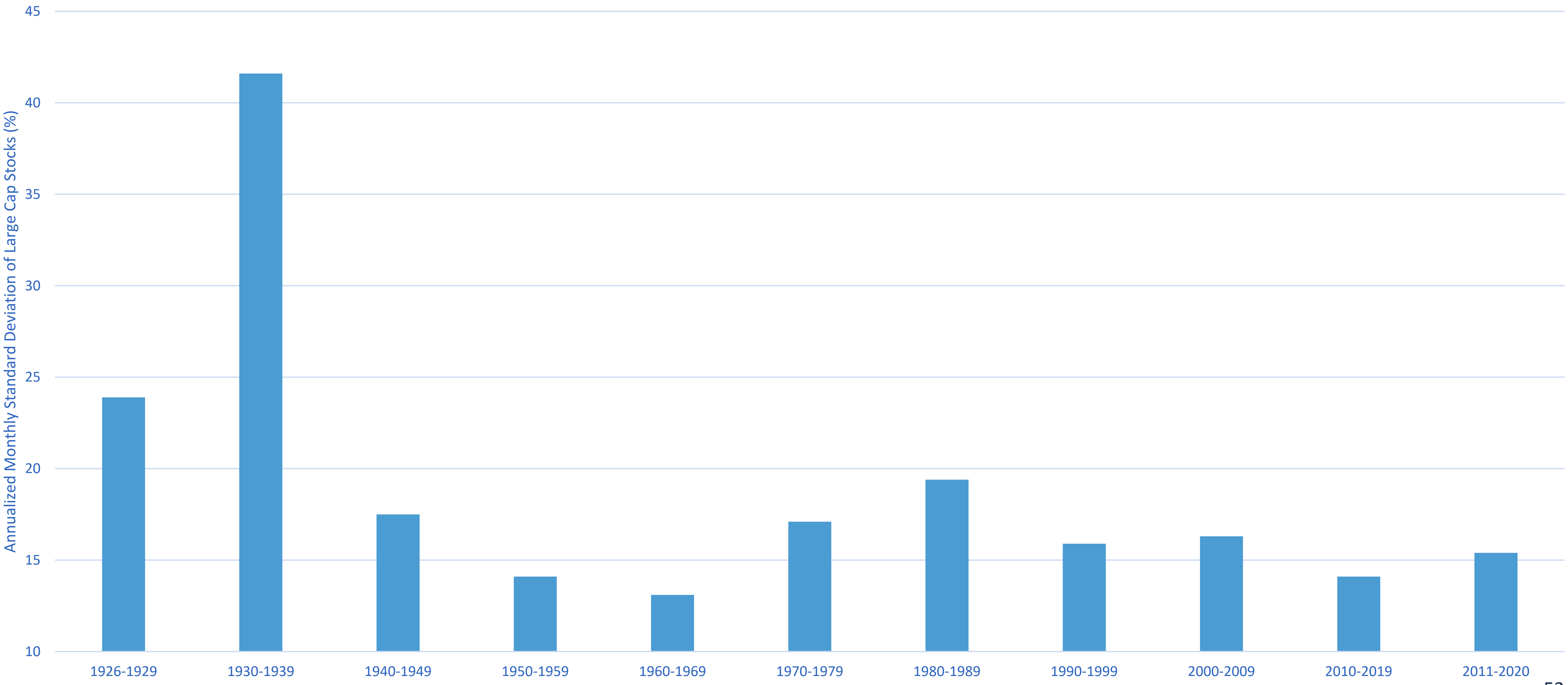


Source: multpl.com & author calculations

Modest NGDP can spark Div. Growth

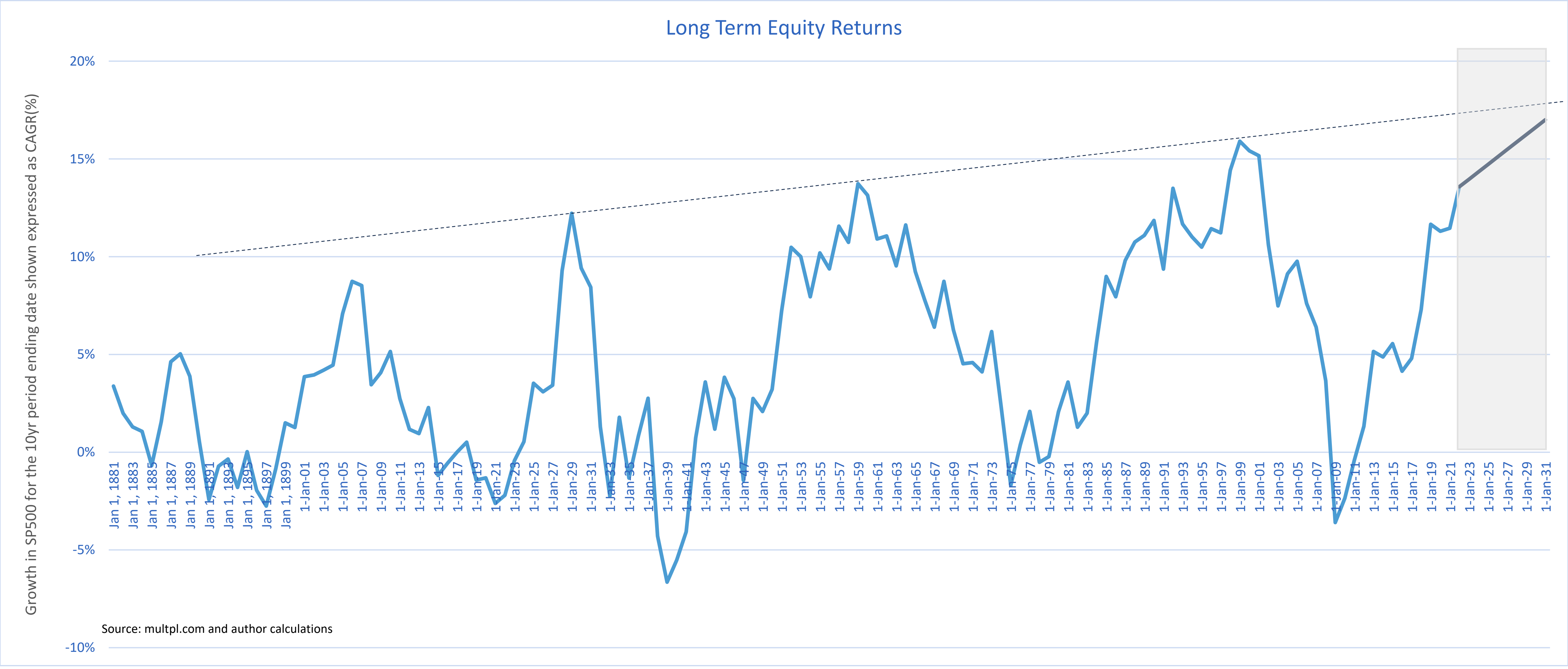


StDev Risk Consistently Near 15%



Source: SBBI

Long term cycles last ~25-35yrs, implying more room to run?



Equities

RGDP

-2	-1	**0**	+1	+2

Inflation

-2	-1	0	**+1**	+2

NGDP

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Nominal Long Rates

-2	-1	0	**+1**	+2

Equities

-2	**-1**	0	+1	+2

- Modest NGDP growth alongside modest rate increases implies modest equity gains
- Monetary and Geopolitical concerns will excite risk

Bear Case
SP500 1.5% | 10Yr 5% | Probability 35%

- Inflation (expectations) become unanchored accompanied by high inflation volatility.
- RGDP suffers amid languishing, and possibly worsening, labor force growth. Capital stock remains at current levels, with fiscal stimulus failing to invigorate. Advances in tech are too nascent to generate widespread productivity advances.
- Rates rise to the 5%-5.5% range as Fed normalizes and then tightens. Treasury supply dwarfs demand amid inflation.
- Equity response to unexpected inflation and inflation volatility is consistent with a 7% drop. Rates hiking cycles usually last about 2yrs. Equity duration estimates suggest a ~20% drop. Return reversals around major spikes also suggestive of below avg. returns.

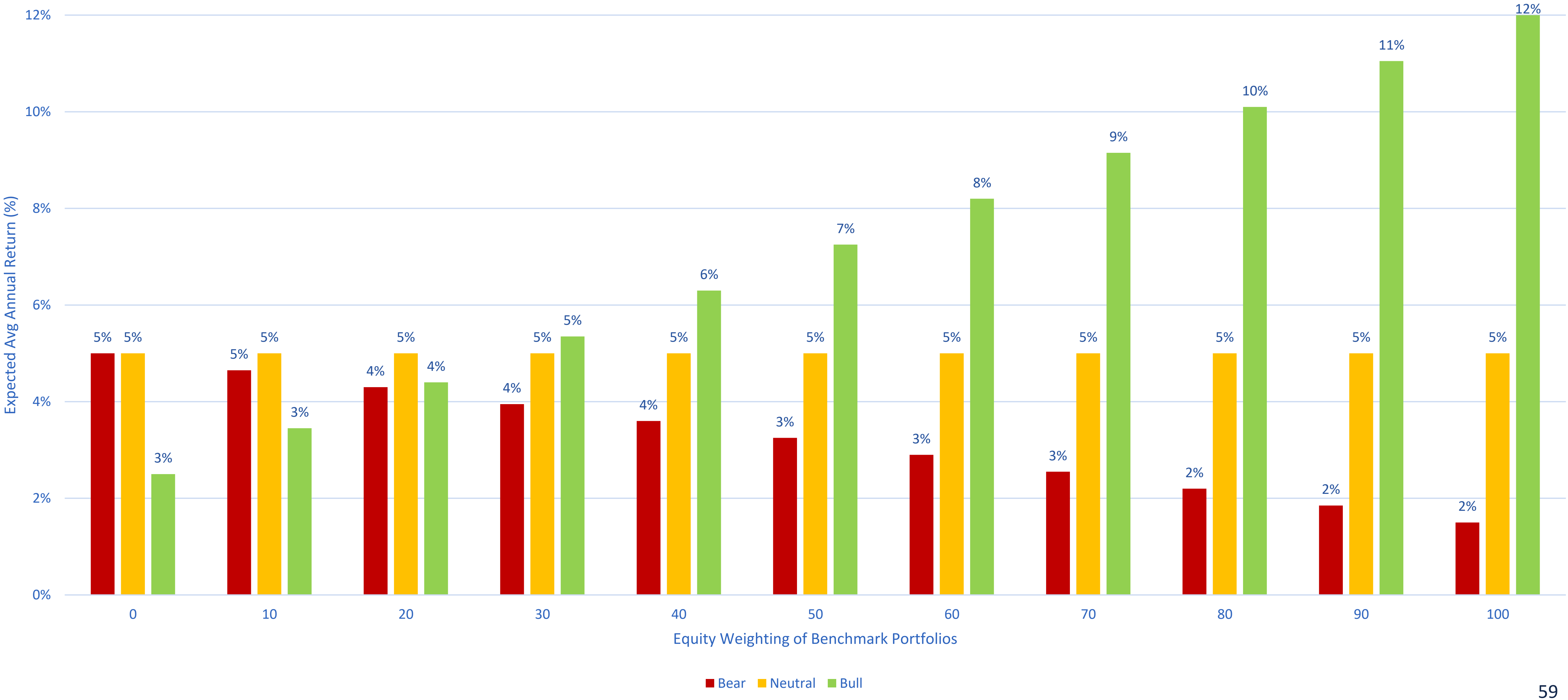
Neutral Case
SP500 5% | 10Yr 5% | Probability 45%

- Inflation stabilizes near 3%, but with increased dispersion amid reshoring and green energy transition.
- RGDP remains low. Fiscal policy helps to increase capital modestly above replacement rate. Labor force continue its slow growth, while near term productivity boost reverts to slower pace. Nonetheless, slightly higher inflation translate meager real growth into moderate nominal GDP and thus earnings.
- Rates remain sub 5% for much of horizon. Built upon at least one rate hiking cycle. With inflation anchored and moderate treasury supply.
- Equities experience subpar growth of 5%, consistent with roughly 40th quantile. Rising profits are only modestly offset by rising rates

Bull Case
SP500 12% | 10Yr 2.5% | Probability 20%

- Inflation quickly settles near 2% Target
- NGDP is robust on the back of at least 2 of the following
  - Build Back Better reinvigorates US capital stock
  - Immigration policy is relaxed, providing more highly skilled workers to counter labor force growth
  - AI/BlockChain advances spark productivity boom
- Rates rise amid modestly higher inflation, but stabilize near 3%-3.5%, which is about 25% quantile. Treasury supply does not swamp demand from safe haven demand at home and abroad.
- Equities continue to rally, though not as quite as fast a pace (compressed by rate increase). LT cycles usually last about 25-35yrs. We have about 10yrs left, requiring about 12%-15%/yr

Long-Term Expected Return on Benchmark Portfolios



Developing Long Term Capital Market Assumptions

- There are scant "textbook" treatments outlining how to develop long term capital market assumptions. I recommend highly the annual updates from BlackRock, JP Morgan, etc…
- My presentation here is only one of many possible approaches.
- Tips:
    - Set your horizon
    - Have a process
    - Quantify and track your opinions
    - Identify possible outcomes and assign probabilities