Agenda

Marin County Employees' Retirement Association (MCERA)
Retirement Board Strategic Workshop

One McInnis Parkway, First Floor
San Rafael, CA
October 17, 2023

This meeting will be held at the address listed above and, absent technological disruption, will be accessible via videoconference and conducted in accordance with Government Code section 54953 and 54954.2 through December 31, 2025.

Instructions for watching the meeting and/or providing public comment, as well as the links for access, are available on the How to Watch Meetings page of MCERA's website. Please visit https://www.mcera.org/retirementboard/agendas-minutes/watchmeetings for more information.

The Board of Retirement encourages a respectful presentation of public views to the Board. The Board, staff and public are expected to be polite and courteous, and refrain from questioning the character or motives of others. Please help create an atmosphere of respect during Board meetings.

Please note that the times certain provided for agenda items herein are estimates only, and that scheduled items may last longer, or shorter, than stated herein. Agendized topics will not commence earlier than as stated on the agenda; however, they may start later than is agendized.

Meeting Chair Todd Werby

9:00 a.m.
Call to Order/Roll Call

CONSIDER ANY BOARD MEMBER REQUESTS TO TELECONFERENCE FOR "JUST CAUSE" OR "EMERGENCY," AS SET FORTH ON THIS AGENDA BELOW

Open Time for Public Expression
Open time for public expression, from three to five minutes per speaker, on items not on the Board Agenda. While members of the public are welcome to address the Board during this time on matters within the Board's jurisdiction, except as otherwise permitted by the Ralph M. Brown Act (Government Code Sections 54950 et seq.), no deliberation or action may be taken by the Board concerning a non-agenda item. Members of the Board may (1) briefly respond to statements made or questions posed by persons addressing the Board, (2) ask a question for clarification, or (3) provide a reference to staff for factual information.

9:00 a.m. – 10:00 a.m.
2023 Experience Study Preview – Economic Assumptions
Graham Schmidt, ASA, FCA, MAAA, EA, Consulting Actuary, Cheiron
Bill Hallmark, ASA, FCA, MAAA, EA, Consulting Actuary, Cheiron

10:00 a.m. – 11:00 a.m.
Fixed Income Allocation Strategy Review
Jim Callahan, President, Callan LLC

11:00 a.m. – 12:00 p.m.
Macroeconomic Impact of Current Real Estate Market
Kristina Hooper CFP®, CAIA, CIMA®, ChFC®, Invesco Chief Global Market Strategist
Brooks Monroe, Invesco Managing Director Portfolio Manager, North America Real Estate
Delia Roges, Invesco Managing Director

12:00 p.m. – 1:15 p.m.
Lunch Break

1:15 p.m. – 2:15 p.m.
What Key Factors Drive Inflation
Mike Bazdarich, Senior Economist, Western Asset
Frances Coombes, Client Service Executive, Western Asset

2:15 p.m. – 3:15 p.m.
Investment Consultant Request for Proposal Overview
Jeff Wickman, MCERA Retirement Administrator

3:15 p.m. – 3:30 p.m.
Closing and Follow-up Items from Today's Agenda

Note on Process: Items designated for information are appropriate for Board action if the Board wishes to take action. Any agenda item from a properly noticed Committee meeting held prior to this Board meeting may be considered by the Board.

Note on Voting: As provided by statute, the Alternate Safety Member votes in the absence of the Elected General or Safety Member, and in the absence of both the Retired and Alternate Retired Members. The Alternate Retired Member votes in the absence of the Elected Retired Member. If both Elected General Members, or the Safety Member and an Elected General Member, are absent, then the Elected Alternate Retired Member may vote in place of one absent Elected General Member.

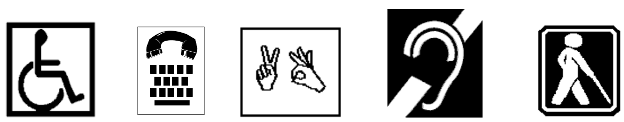
Note on Board Member requests to participate by teleconference under Government Code section 54953, subdiv. (f): At least a quorum of the Board must be present together physically at the meeting to invoke this provision. The provision is limited to "just cause" and "emergency" circumstances, as follows:

> "Just cause" is only: (1) a childcare or caregiving need of a child, parent, grandparent, grandchild, sibling, spouse or domestic partner that requires them to participate remotely; (2) a contagious illness that prevents a member from attending in person; (3) a need related to a physical or mental disability, as defined; or (4) travel while on official business of MCERA or another state or local agency. A Board member invoking "just cause" must provide a general description of the circumstances relating to their need to appear remotely at a given meeting, and it may not be invoked by a Board member for more than two meetings in a calendar year.

"Emergency circumstances" is only: "a physical or family medical emergency that prevents a member from attending in person." The Board member invoking this provision must provide a general description of the basis for the request, which shall not require the member to disclose personal medical information. Unlike with "just cause," the Board must by majority vote affirm that an "emergency circumstance" situation exists.

As to both of the above circumstances, the Board member "shall publicly disclose at the meeting before any action is taken whether any other individuals 18 years of age or older are present in the room at the remote location with the member and the general nature of the member's relationship with any such individuals." Also, the Board member "shall participate through both audio and visual technology," and thus be both audible and visible to those attending. Finally, no Board member may invoke these teleconference rules for more than three consecutive months or 20 percent of the regular meetings of the Board.

Note on teleconference disruption that interrupts the live stream: In the event of a technological or similar disruption, and provided no Board/committee members are attending by teleconference, the meeting will continue in person.



Agenda material is provided upon request. Requests may be submitted by email to MCERABoard@marincounty.org, or by phone at (415) 473-6147.

MCERA is committed to assuring that its public meetings are accessible to persons with disabilities. If you are a person with a disability and require an accommodation to participate in a County program, service, or activity, requests may be made by calling (415) 473-4381 (Voice), Dial 711 for CA Relay, or by email at least five business days in advance of the event. We will do our best to fulfill requests received with less than five business days' notice. Copies of documents are available in alternative formats upon request.

The agenda is available on the Internet at http://www.mcera.org

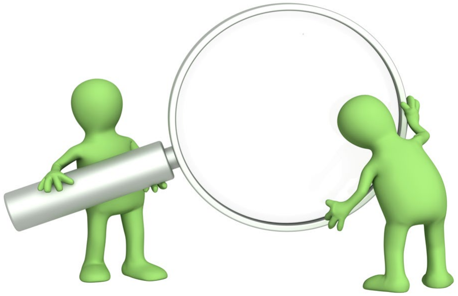
MCERA Strategic Workshop

Classic Values, Innovative Advice

Triennial Experience Study Economic Assumptions

October 17, 2023

Graham Schmidt, ASA, EA, FCA, MAAA



Experience Study Overview

- Assumptions needed to project each member's benefits and calculate the Actuarial Liability
- Ultimate cost of benefits depend on **actual** experience
  - Actual investment returns and participant behavior
  - Actual benefits paid are not affected by actuarial assumptions
- Accurate assumptions produce level costs

Experience Study Overview

- Assumptions impact the ***timing*** of costs

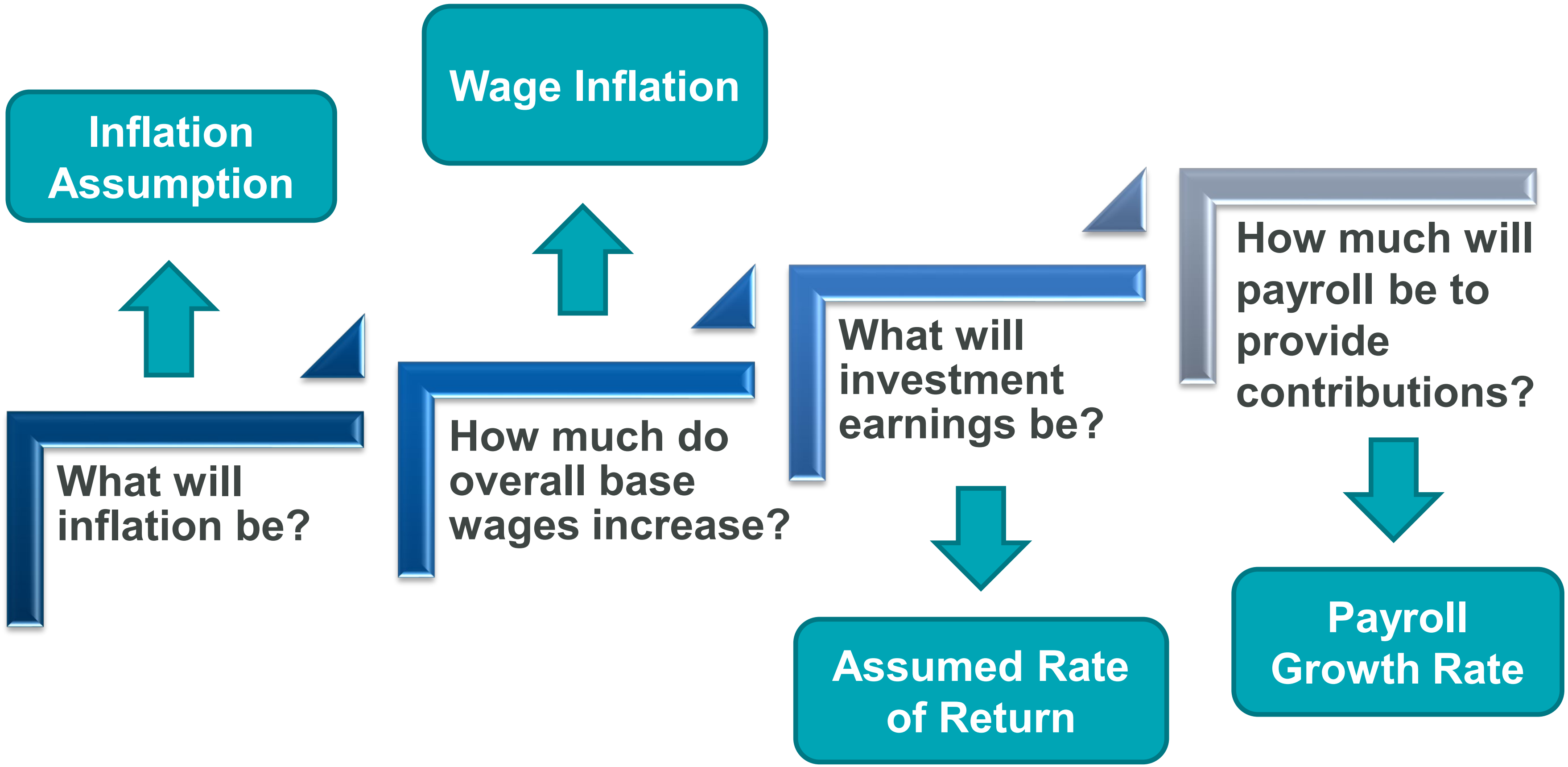
C + I = B + E

- Actuarial process is self-correcting
  - Gains and losses are amortized with every actuarial valuation
  - Periodic experience studies
- Two types of actuarial assumptions
  - Demographic
  - Economic

Experience Study – Process

- How do you set assumptions?
  - Industry trends
  - Historical data
    - Traditionally, good predictor for the demographic assumptions
    - With COVID, some adjustments to standard approach may be needed
  - Expectations for the future
  - Board's risk preference
    - Important for the discount rate

Actuarial Assumptions – Economic



Actuarial Assumptions – Demographic

Does the member reach retirement?

→ **Termination/ Disability Assumptions**

When will the member retire?

→ **Retirement Assumption**

How much is the benefit?

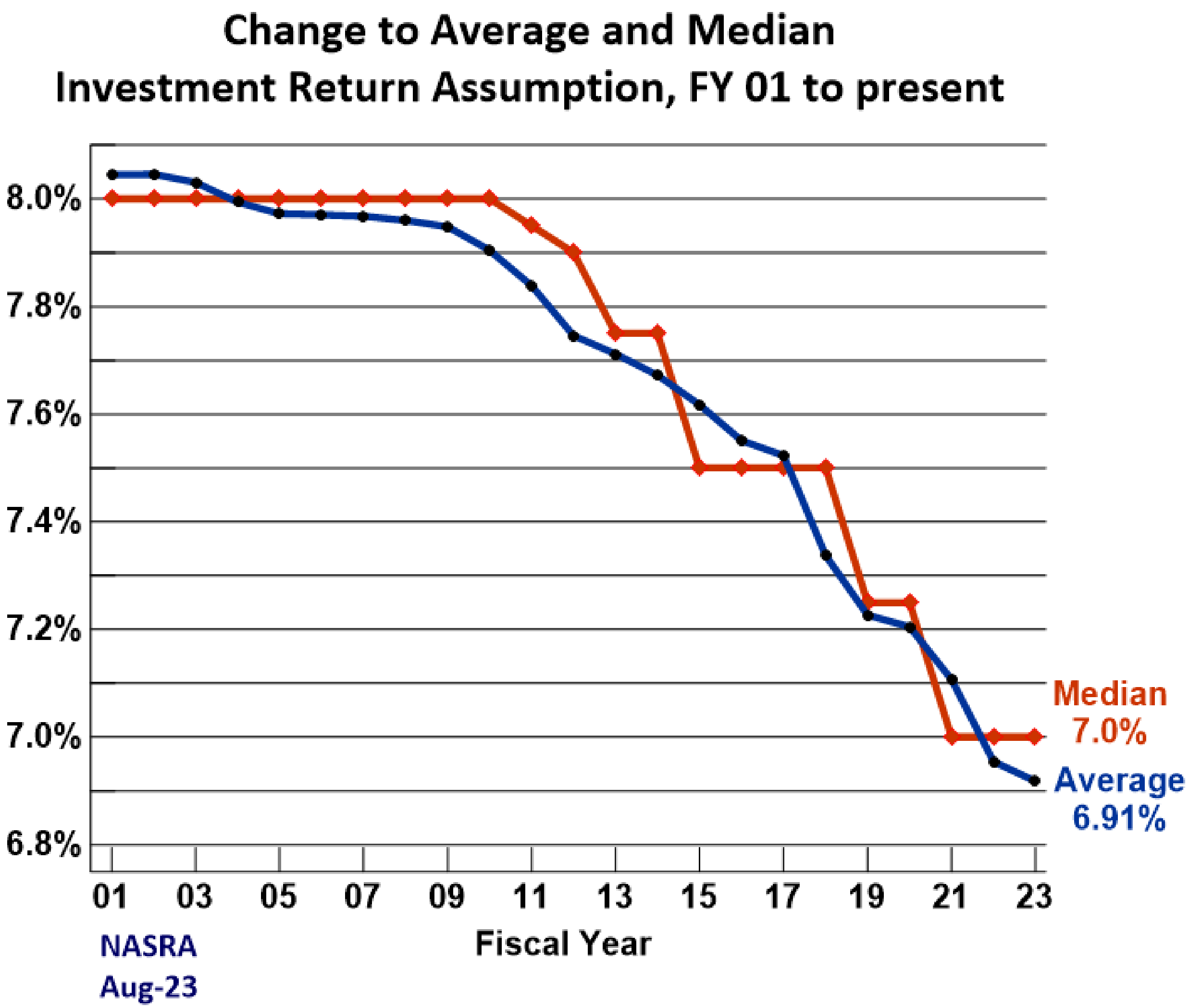
→ **Salary Increase Assumptions**

How long will the benefit be paid?

→ **Mortality Assumption**

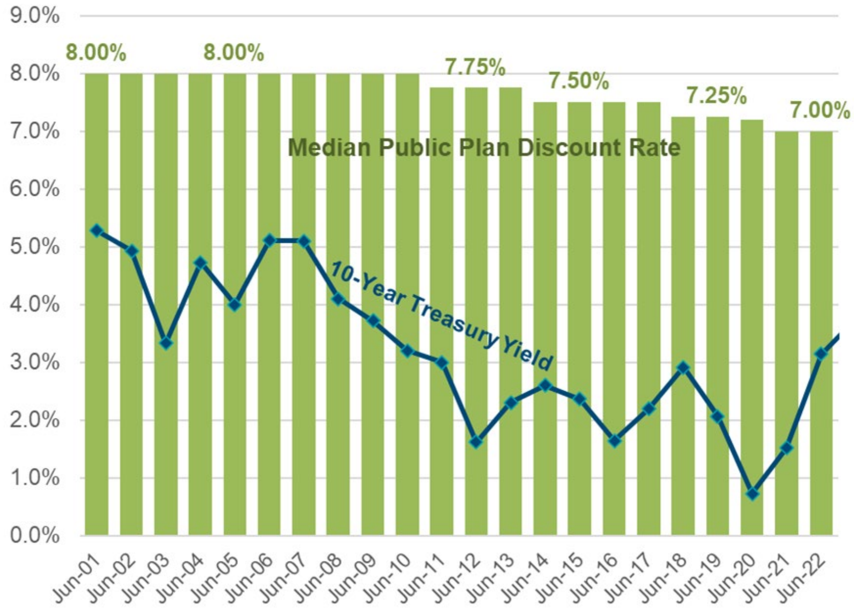
Economic Assumptions

Economic Assumption Trends: Public Plans



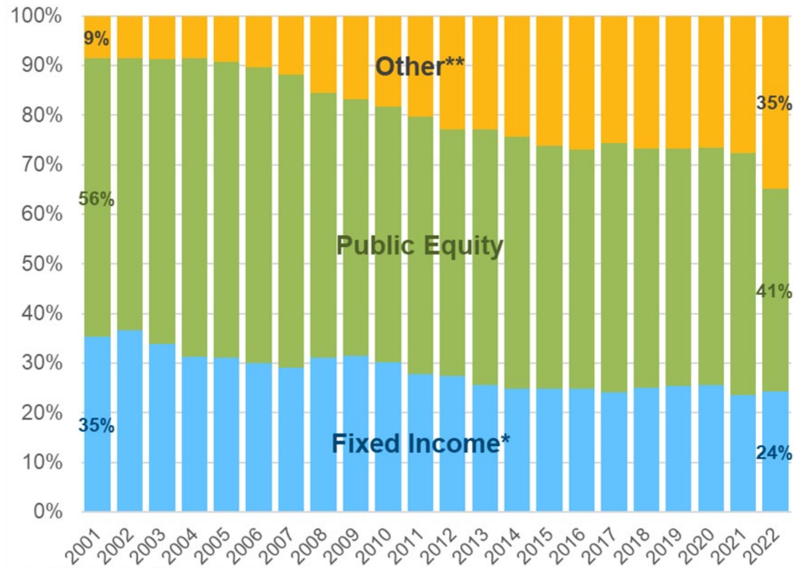
Industry Trends – Discount Rate/Asset Allocation

Interest Rates vs. Public Plan Discount Rates



Public Plan data from www.publicplansdata.org

Average Public Plan Asset Allocation



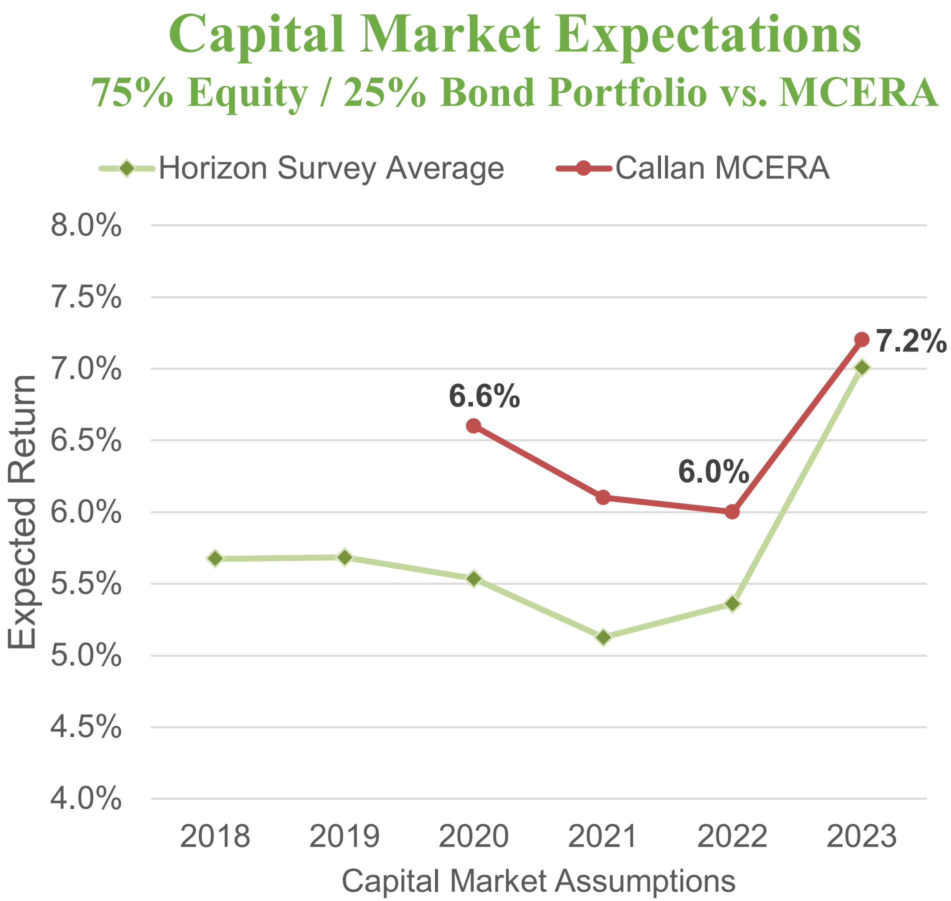
* Fixed Income includes cash

** Other includes hedge funds, private equity, real estate, alternatives and commodities

2022 asset allocation data is incomplete: includes only 60% of plans

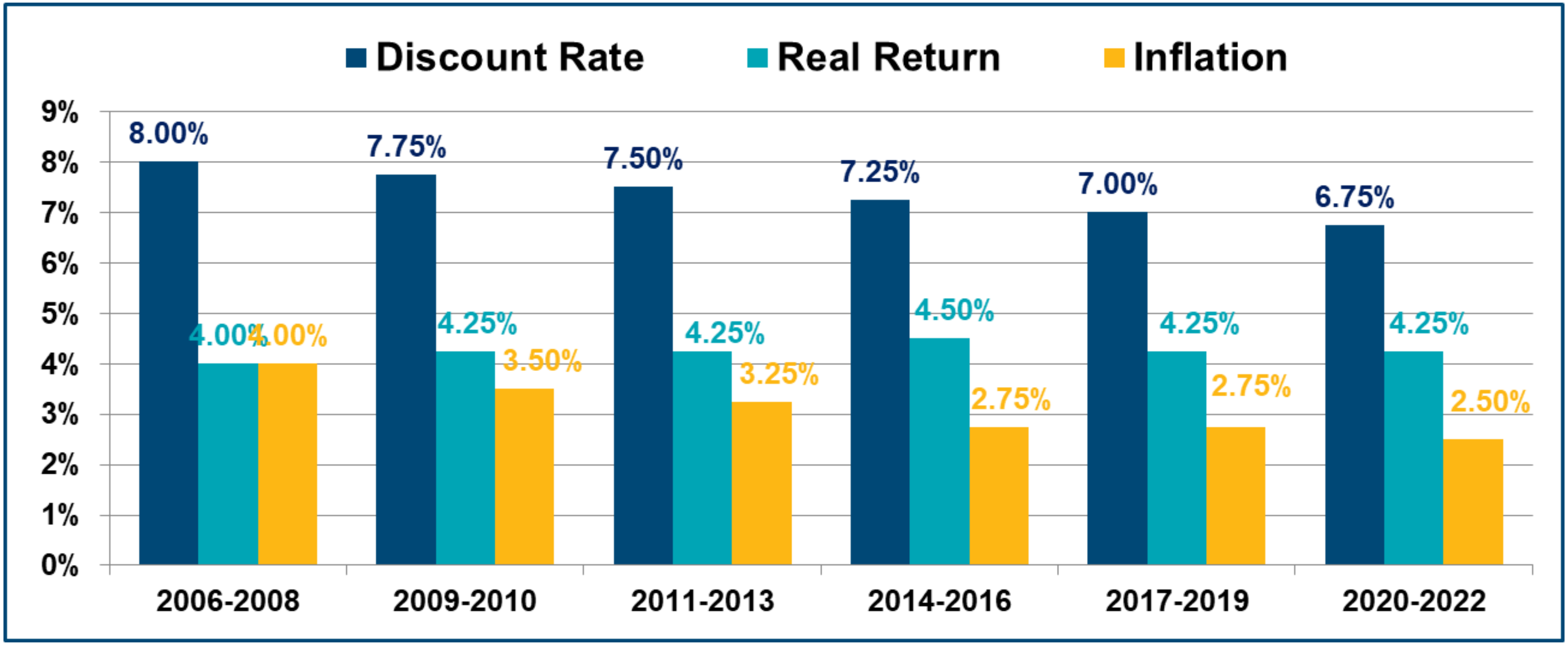
- Declining interest rates have led to lower expected return on investment portfolios
- Public plan trend to reduce discount rates/assumed rates of return
- At the same time, shifts to higher allocations of riskier asset classes in order to achieve expected returns

Expectations for Future Returns



- 2023 expected returns have increased dramatically
  - Significant increases in yields on fixed income securities
  - Equity positions at the end of 2022 had dropped substantially
  - Current MCERA assumption is 6.75%
- Is this a temporary blip or the new norm?

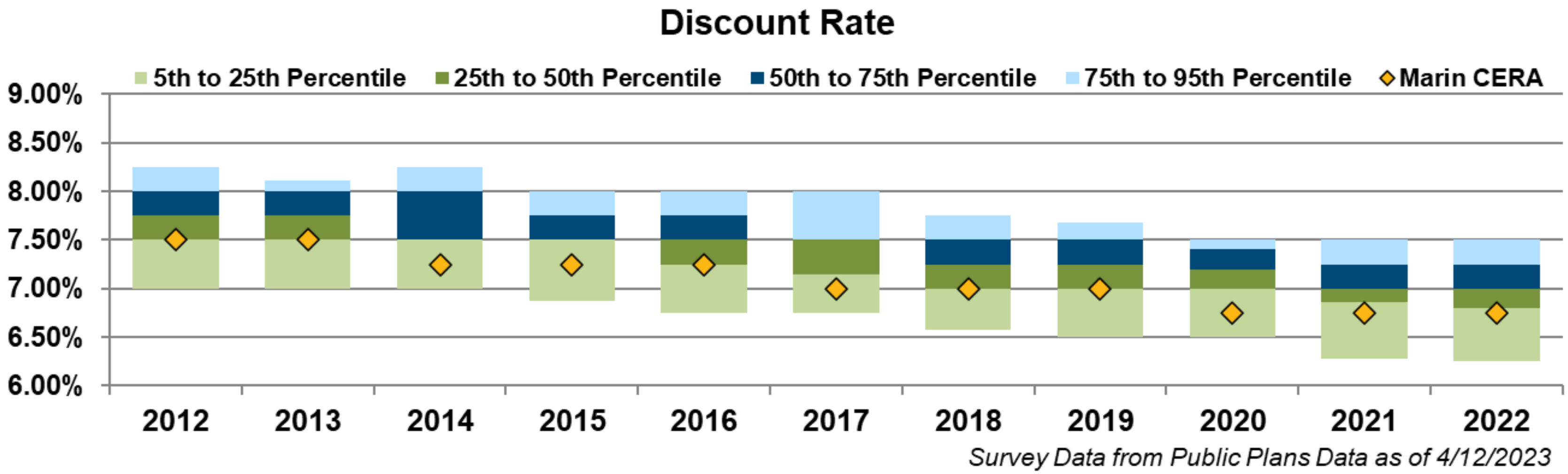
MCERA's Assumption History

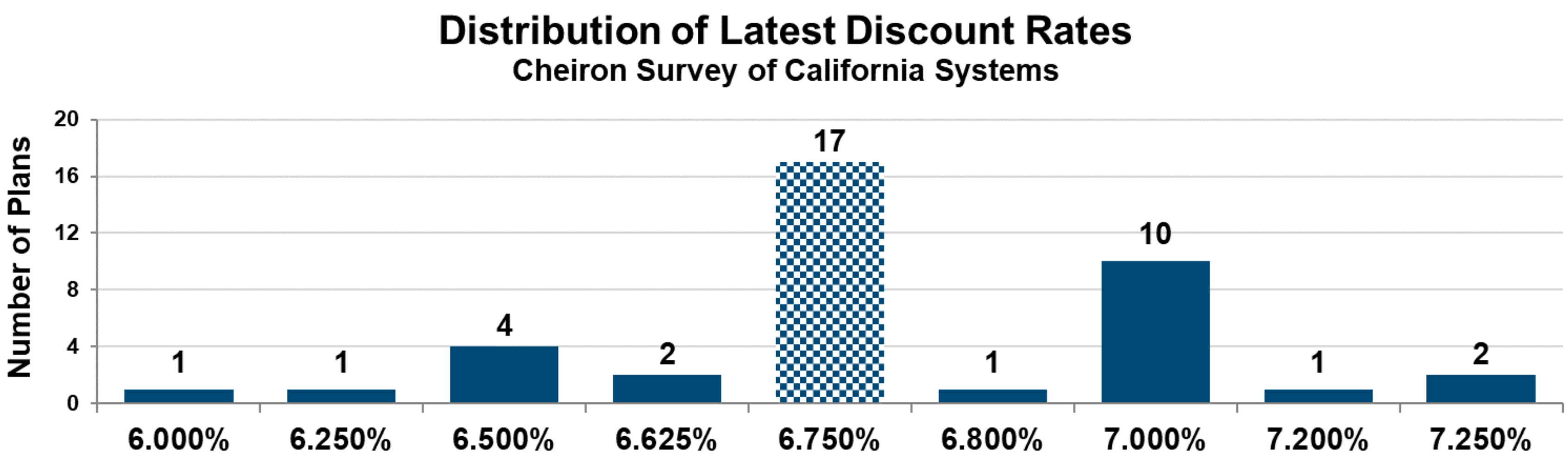


Actual returns on assets (through June 30, 2022)

- **7.4% 5-year average**
- **8.9% 10-year average**
- **5.9% 15-year average**

Industry Trends – Discount Rate





Expectations for Future Returns

Callan 10-year Assumptions (2023)

Asset Category	Target Allocation	Arithmetic Return	Geometric Return	Standard Deviation
US Equity	32.0%	8.8%	7.4%	18.1%
Global Equity	22.0%	9.5%	7.5%	21.3%
US Fixed Income	23.0%	4.3%	4.3%	4.1%
Private Equity	8.0%	12.0%	8.5%	27.6%
Real Assets	15.0%	6.6%	6.2%	11.6%
Total	**100.0%**		**7.2%**	**13.2%**
Real Return			**4.7%**	

- Expected return in 2022 was only 6.0%
- More than 1.0% increase in one year!
- Generally, want to avoid overreacting to sudden changes in market when setting long-term assumptions

Expectations for Future Returns

MCERA Portfolio Return Expectations (reflects 5bp adjustment for investment expenses)				
Consultant	**Nominal**	**Inflation**	**Real**	**Standard Deviation**
Callan (10-year, 2022)	5.95%	2.25%	3.70%	12.99%
Callan (10-year, 2023)	7.20%	2.50%	4.70%	13.20%
Callan 10-year average 2022-23	6.58%	2.38%	4.20%	13.09%
Horizon (Survey, 10-year, 2022)	6.09%	2.47%	3.62%	12.41%
Horizon (Survey, 10-year, 2023)	7.17%	2.56%	4.61%	12.53%
Horizon 10-year average 2022-23	6.63%	2.52%	4.11%	12.47%
Horizon (Survey, 20-year, 2022)	6.76%	2.45%	4.31%	12.41%
Horizon (Survey, 20-year, 2023)	7.49%	2.47%	5.02%	12.53%
Horizon 20-year average 2022-23	7.12%	2.46%	4.66%	12.47%
Overall Average	6.77%	2.45%	4.32%	12.68%
Current Assumption	6.75%	2.50%	4.25%	

- Review expectations of Callan vs. Horizon survey (10- and 20+ year horizons
  - Average 2022 and 2023 expectations, given the significant changes this year

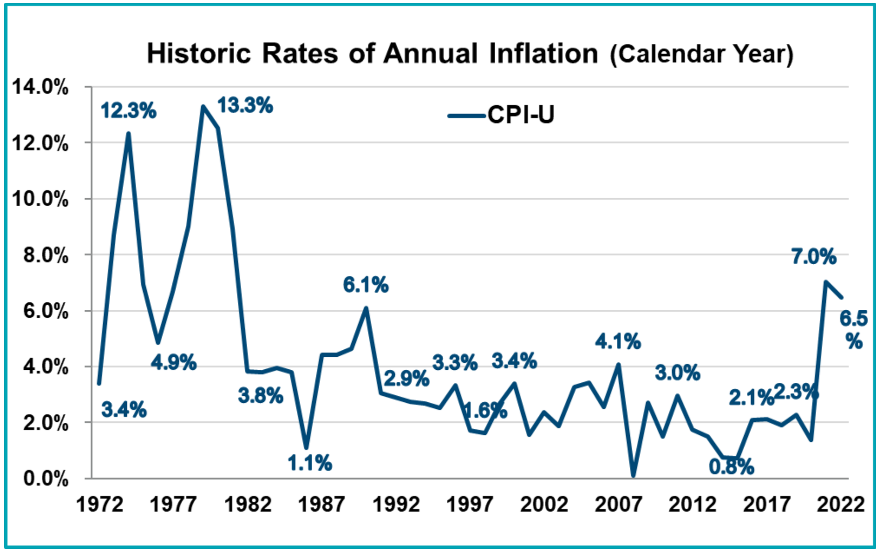
Board's Risk Preference

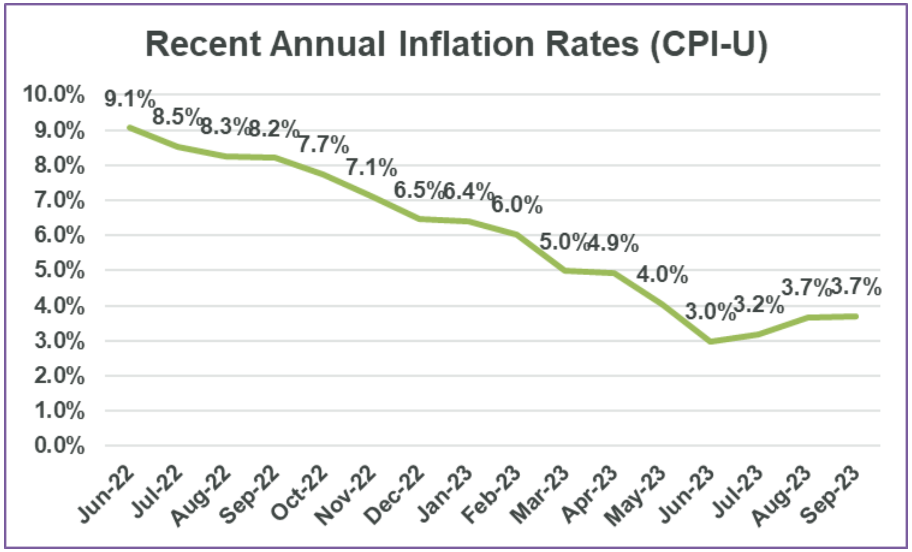
Likelihood of Achieving Average Returns (reflects 5bp adjustment for investment expenses)			
	Nominal		
	6.50%	6.75%	7.00%
Callan (10-yr)	55%	52%	50%

- Current assumption is expected to result in more asset gains than losses
- If actual returns are as forecasted, contribution rate will decrease gradually over time

How can you assume inflation is going to be below 3.0%?

Price Inflation – Historical

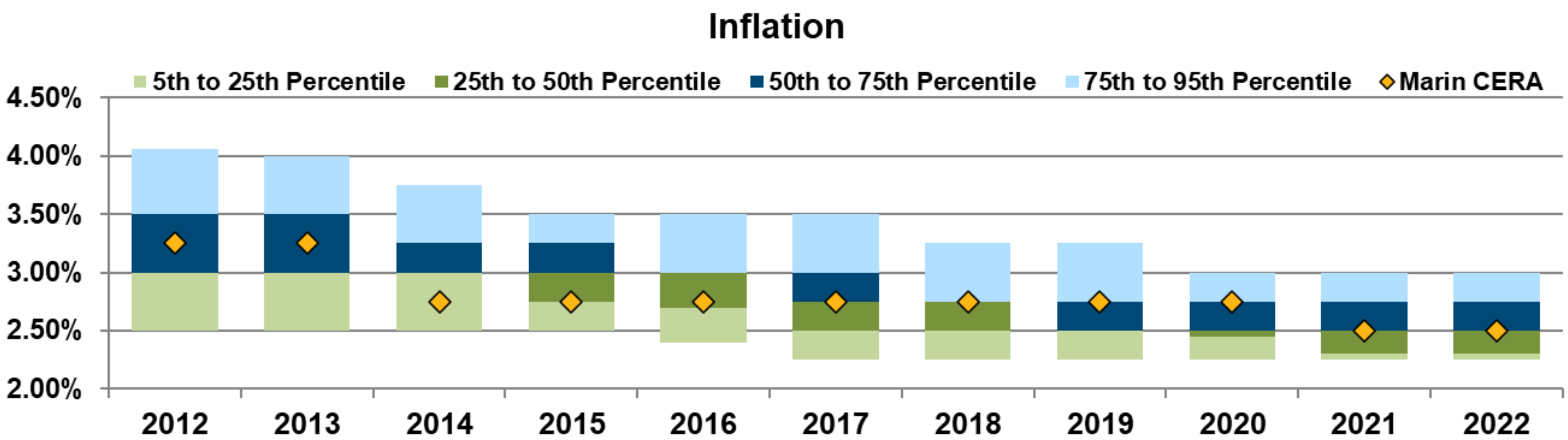




- Inflation has been low since 1992
- As we all know, there has been significant spikes in the last two years

- However, year-over-year inflation has been trending down since it peaked in June 2022

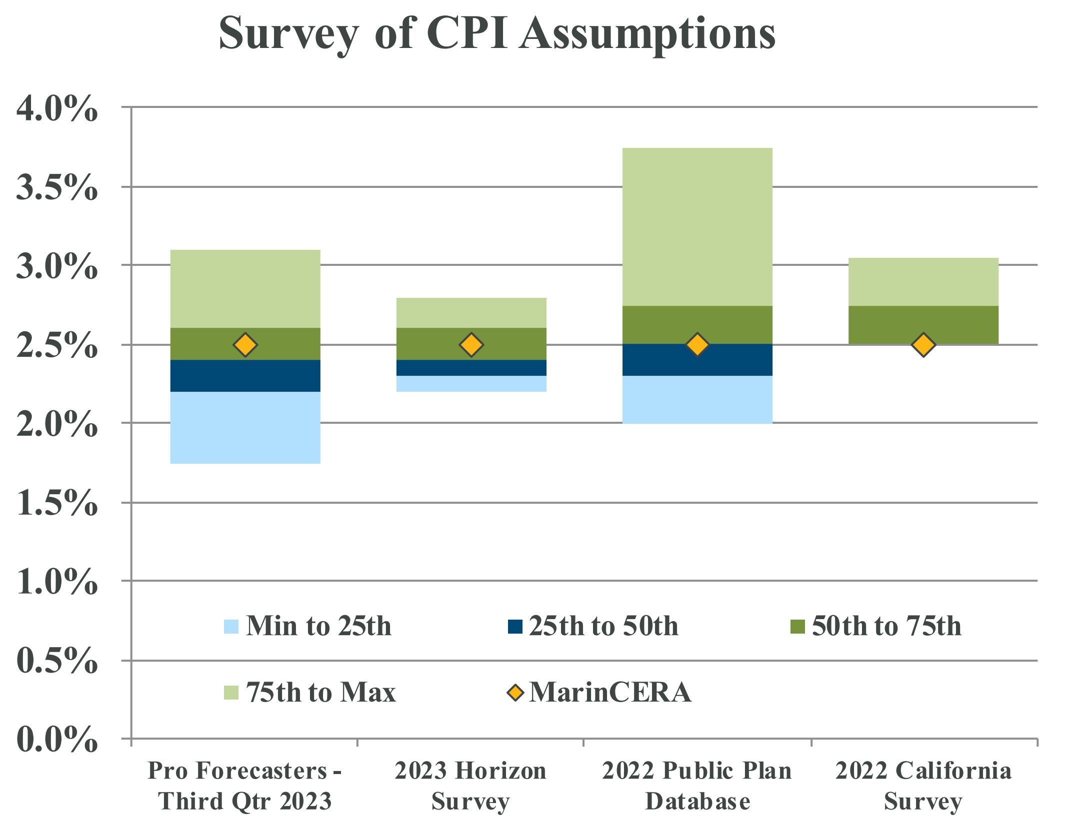
Price Inflation – Industry Trends



Survey Data from Public Plans Data as of 7/26/2023

- Similar to discount rate, lowering inflation has been the trend
- MCERA's inflation assumption has been consistent with peers
  - Current assumption is 2.50%

Price Inflation – Industry Trends



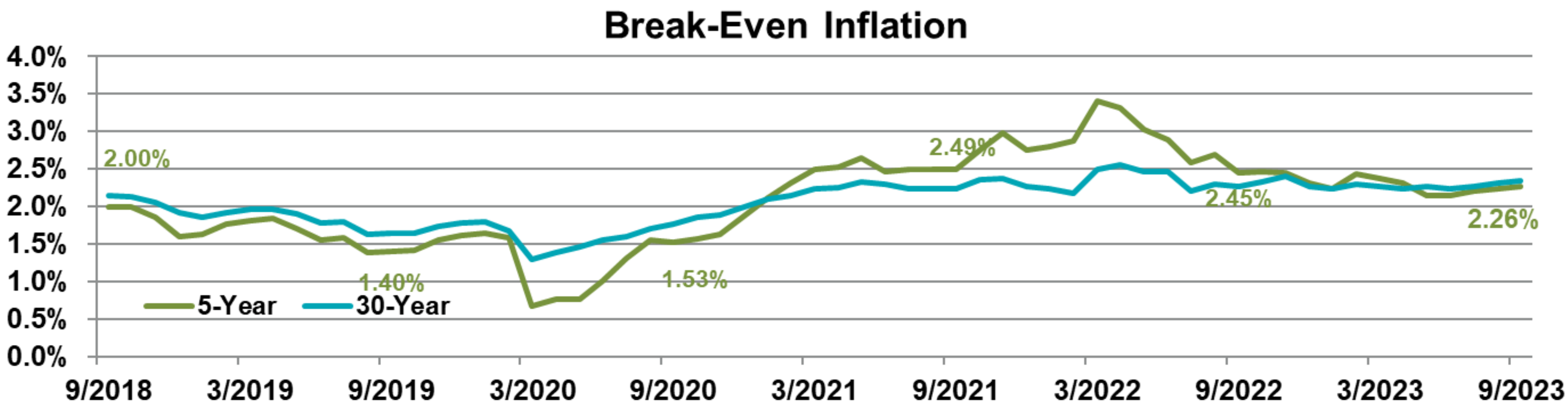
	Pro Forecasters - Third Qtr 2023	2023 Horizon Survey	2022 Public Plan Database	2022 California Survey
Minimum	1.75%	2.20%	2.00%	2.50%
25th	2.20%	2.30%	2.30%	2.50%
50th	2.40%	2.40%	2.50%	2.50%
75th	2.60%	2.60%	2.75%	2.75%
Maximum	3.10%	2.80%	3.75%	3.05%

90 of the 217 public plans in national database have a price inflation assumption of 2.50%

Price Inflation Expectations Sources

- Federal Reserve Board's Federal Open Market Committee (FOMC)
- Congressional Budget Office (CBO)
- Social Security Trustees Report (SSA)
- Federal Reserve Bank of
  - St. Louis
  - Cleveland
  - Philadelphia (used in previous slide)
  - New York

Price Inflation – Market Expectations



- Break-even inflation is the difference in yields between conventional treasury bonds and Treasury Inflation-Protected Securities (TIPS)
- It represents a market estimate of future inflation
- Currently, short-term (five-year) and long-term (30-year) inflation expectations are close, around 2.3%
  - 20-year expectation currently 2.6%

Price Inflation – Summary of Analysis

- Average (and median) expectation of the economic forecasters is 2.4%
- Future market expectations of inflation are around 2.3-2.6%, short and long term
- Current assumption of 2.50% remains reasonable; consistent with expert and market expectations

Wage Growth – Overview

- Pay for members expected to grow by
  - Base wage growth (economic assumption)
  - Plus, individual merit based on longevity (demographic assumption)
- Wage growth
  - Inflation, plus real-wage factor
  - Current assumption: 3.00% with assumed 0.50% real-wage growth above inflation

Wage Growth

- Arguments for a positive real-wage growth assumption
  - Productivity increases
  - Many experts predict return of some level of real wage growth (Social Security projections based on 0.6% – 1.8% assumed real wage growth)
  - Some evidence of local real wage growth
    - Increase in average weekly wages for Marin local government workers of 4.0% from 2012-2022 (BLS Quarterly Census of Employment and Wages)
      - But only 2.3% annual increase in average MCERA active member pay over this period
    - Versus annual CPI-U increase of 3.2% for Bay Area over same time period

Wage Growth

- Arguments for maintaining a modest real wage growth assumption
  - Budgetary environment (short, medium, long term)
  - Crowding out of wages from other areas of compensation (healthcare and pension costs)
    - Both have slowed somewhat in recent years
  - Although evidence shows presence of national historical real wage growth, increase in *mean* real wages higher than *median*

Payroll Growth

- Amortization growth rate currently set lower than wage growth assumption
  - 2.75%, versus 3.00% wage growth
- Reasons for margin
  - Some pay amounts non-pensionable for new hires versus the members they are replacing (including impact of PEPRA wage cap)
  - Increases likelihood that UAL payments decline rather than grow as a percentage of pay

COLA Growth

- Operation of COLA
  - Benefits grow by Bay Area CPI (rounded to 0.5%), subject to 2%, 3%, or 4% cap
  - Bank accumulated if CPI growth exceeds cap
- In prior years, simulation analysis resulted in recommended COLA growth rate lower than inflation assumption, because of cap
  - Example: with 2.50% inflation assumption and 3.00% cap, recommended COLA growth rate = 2.40%
- Analysis will look different this year, at least for retiree population, because of growth in the COLA banks

COLA Growth

- For the current valuation, we recommend incorporating the value of the COLA banks directly in the liability calculations for ***members in pay status***
  - Example: members with 3% COLA cap who retired between 1/1/1985 and 3/31/2023 have a 2.5% COLA bank
  - Based on 2.50% inflation assumption and 3% cap, we recommend these members be assumed to receive a 3% cap for the next five years (drawing down their bank 0.5% per year)
  - After five years, revert to the same assumption as used for active employees (2.40% per year), who have no COLA bank

COLA Growth

- Under this approach, no impact to the COLA assumption for active members (and thus no impact to member rates)
  - Consider the change for members in pay status to be a liability loss (based on changes in COLA banks), *not* an assumption change
  - Can recalibrate liabilities each year, based on changes in COLA banks

Summary

- No proposed changes to economic assumptions
  - Current price inflation, payroll growth and wage growth assumptions at 2.50%, 2.75%, and 3.00%, respectively, remain reasonable based on current market conditions and long-term expectations
  - 6.75% return assumption is slightly more conservative than current capital market expectations, and consistent with average of sample of expectations from 2022 and 2023
  - Recommend valuing recent increases in COLA banks directly for members in pay status
    - Does not require a change in the long-term COLA growth assumption for *future* retirees

Required Disclosures

The purpose of this presentation is to present the preliminary results of the review of economic assumptions for the Marin County Employees' Retirement Association (MCERA). This presentation was prepared exclusively for the MCERA Board for the purpose described herein. Other users of this presentation are not intended users as defined in the Actuarial Standards of Practice, and Cheiron assumes no duty or liability to any other user.

In preparing this presentation, we relied on information, (some oral and some written) supplied by MCERA. This information includes, but is not limited to, the plan provisions, employee data, and financial information. We performed an informal examination of the obvious characteristics of the data for reasonableness and consistency in accordance with Actuarial Standard of Practice No. 23. The actuarial assumptions, data, and methods are those were used in the actuarial valuation report as of June 30, 2022.

This presentation and its contents have been prepared in accordance with generally recognized and accepted actuarial principles and practices and our understanding of the Code of Professional Conduct and applicable Actuarial Standards of Practice set out by the Actuarial Standards Board as well as applicable laws and regulations. Furthermore, as a credentialed actuary, I meet the Qualification Standards of the American Academy of Actuaries to render the opinion contained in this presentation. This presentation does not address any contractual or legal issues. I am not an attorney, and our firm does not provide any legal services or advice.

Future results may differ significantly from the current results and projections shown in this presentation due to such factors as the following: plan experience different from that anticipated by the assumptions; changes in assumptions; and changes in the plan provisions or applicable law.

Graham A. Schmidt, ASA, EA, FCA, MAAA
Consulting Actuary

Callan

October 17, 2023

Fixed Income Allocation Strategy Review

Jim Callahan, CFA
President

Important Disclosures regarding the use of this document are included at the end of this document. These disclosures are an integral part of this document and should be considered by the user.

Overview

At the March meeting, Callan reviewed our 2023 capital markets projections

- Capital markets projections are key elements in helping MCERA set reasonable return and risk expectations for the appropriate time horizon

Summary of Important Changes for 2023 Capital Markets Assumptions

- Cash return raised to 2.75% from 1.2%
- <u>Core fixed income return up 2.5%, from 1.75% to 4.25% - preliminary 2024 assumption expected to be even higher</u>
- Public equity returns up 55-75 bps; equity risk premium over both cash and fixed income narrowed
- Inflation raised 25 bps to 2.5%

We apply our capital markets projections to MCERA's asset allocation to provide projected risk and return outcomes

- The substantial increase in the core fixed income return noted above has been the most impactful on projected returns/risk
  - MCERA's 2022 asset allocation projections: 6.0% / standard deviation: 13.1%
  - MCERA's 2023 asset allocation projections: 7.2% / standard deviation: 13.2%

This brings us to the current topic: what should MCERA do, if anything, with the fixed income allocation?

Fixed Income – Considerations to Increase, Decrease, Stay the Same

Increase

- With higher fixed income yields, incrementally take equity risk off the table and add to fixed income
  - MCERA's expected return will decline modestly, but so will the risk.
  - Provides better protection to portfolio in equity drawdown periods
  - MCERA's higher funded status allows for a more diversified and less risky approach
  - Have observed interest in this approach with other public pension plans

Decrease/Stay the Same

- Alternatively, MCERA could consider maintaining or slightly increasing this risk for a higher potential return.
  - MCERA is an open defined benefit plan with long-term liabilities. As a long-term investor, MCERA is able to look out well beyond these 10 year projections and can withstand the additional volatility for higher returns.
  - MCERA could decrease the fixed income allocation modestly for increased return (and risk) potential.
  - Callan recommends the fixed income allocation be at least 20% to preserve its role as a diversifier, liquidity source, and primary asset class to provide downside protection

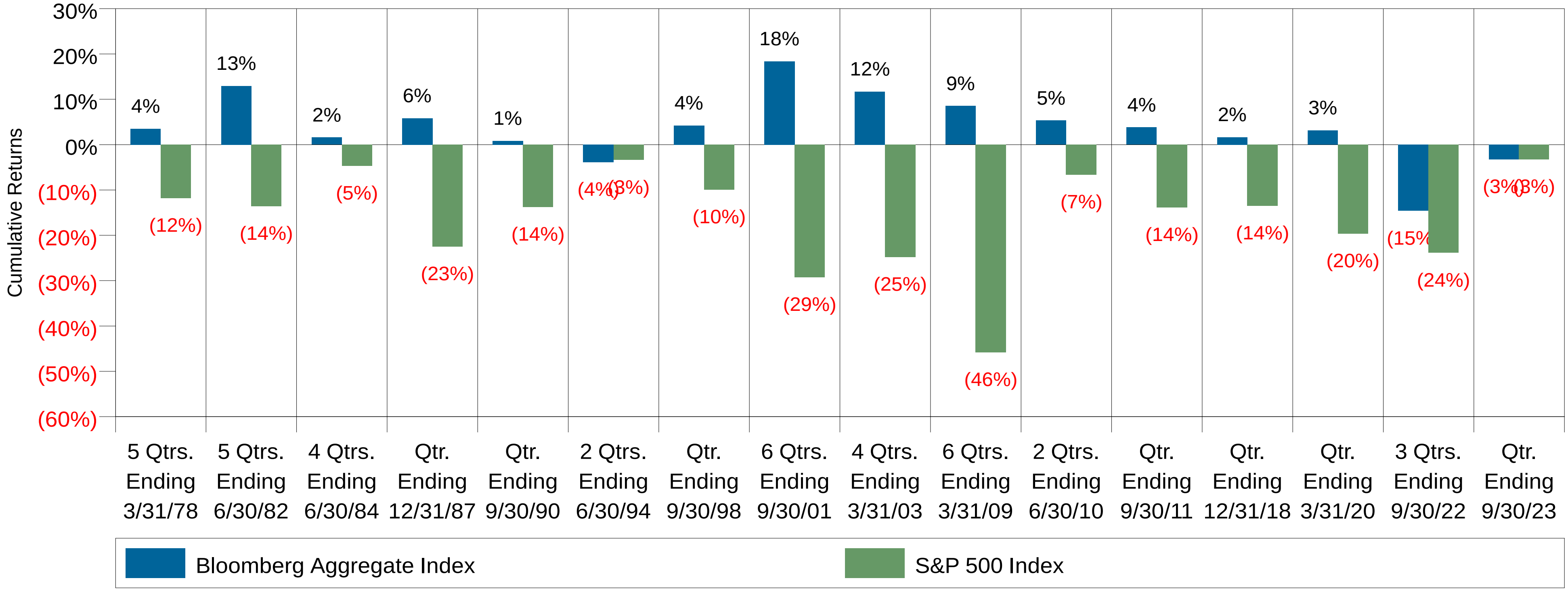
If a change is made, where does it come from or go?

Role of Fixed Income

- Fixed income is typically a low-risk, diversifying asset for the equity allocation rather than a primary source of additional return to a fund
  - Bonds offer protection in the short run
  - Dependable income provides comfort in economic downturns or sudden market corrections
- The fixed income allocation is the primary diversifier for the exposure to equities
- Fixed income can also serve as a very important source of liquidity
- Is the fixed income allocation, at 23% of the total plan (policy target), fulfilling an appropriate role?
- How should fixed income be sized to fulfill competing goals of safety, diversification, liquidity, and returns?
  - Does the allocation reliably provide liquidity and diversification

An Illustration of the Role of Fixed Income

Fixed Income Performance in Declining Equity Environments

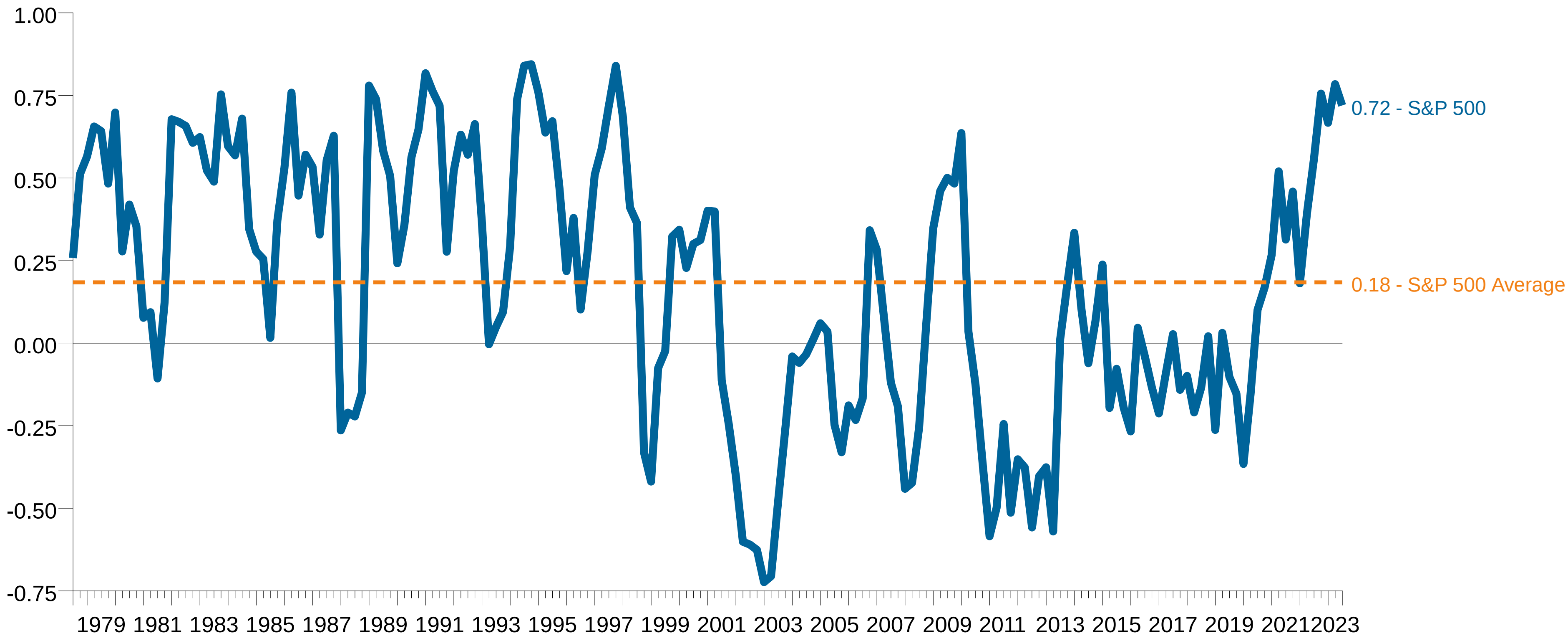


- The U.S. Aggregate index has had positive returns in every S&P 500 declining period for the most recent 35 years except three (first 2 quarters of 1994, first three quarters of 2022, third quarter of this year).

Is the Stock-bond Correlation Shifting to a Higher Level?

Stocks and bonds down together in the first three quarters of 2022; up together in 4Q22 and 1Q23

Rolling 1 Year Correlation of S&P 500 to Bloomberg Aggregate for 45 Years Ended 6/30/23



- Bond returns are now much higher thanks to the rise in interest rates and the resulting higher yields.
- However, the equity risk premium has likely narrowed, and we may be seeing a return to a regime of higher correlation between stocks and bonds, potentially lessening the diversification benefit of bonds to stocks.

Sources: Bloomberg, Callan, S&P Dow Jones Indices

Did Diversification Fail in 2022?

How capital markets interact under stress

S&P 500 was down 4.6% in 1Q22, 16.1% in 2Q, and another 4.9% in 3Q

- Worst year since 2008 (-18.1%) despite strong rebound in 4Q (+7.6%)

Bloomberg Aggregate was down 5.9% in 1Q22, 4.7% in 2Q, and another 4.8% in 3Q; -13.1% for the year

- Worst year ever for bonds

Less decline in local currency around the global markets, but the strong U.S. dollar made things worse for U.S. investors

- MSCI ACWI ex USA down 16.0% in USD, 9.6% in local currency
- Global Aggregate down 16.3% in USD, 11.2% hedged to the U.S. dollar

How often does this happen?

- Stocks and bonds declined together in 10% of all quarters back to 1926.
- In quarters when the stock market declined, bonds declined 33% of the time.

The "curse" of zero correlation

- In a market drawdown, investors want correlation between stocks and bonds to be -1: when stocks go down, bonds are likely to be up.
- In real life, correlation of stocks to bonds is closer to zero.
  - *Zero correlation = when one asset class is down, the probability that the other asset class is up or down is similar; zero means no discernable pattern between the returns of the two asset classes.*

In normal times, correlation close to zero suggests a strong diversification benefit

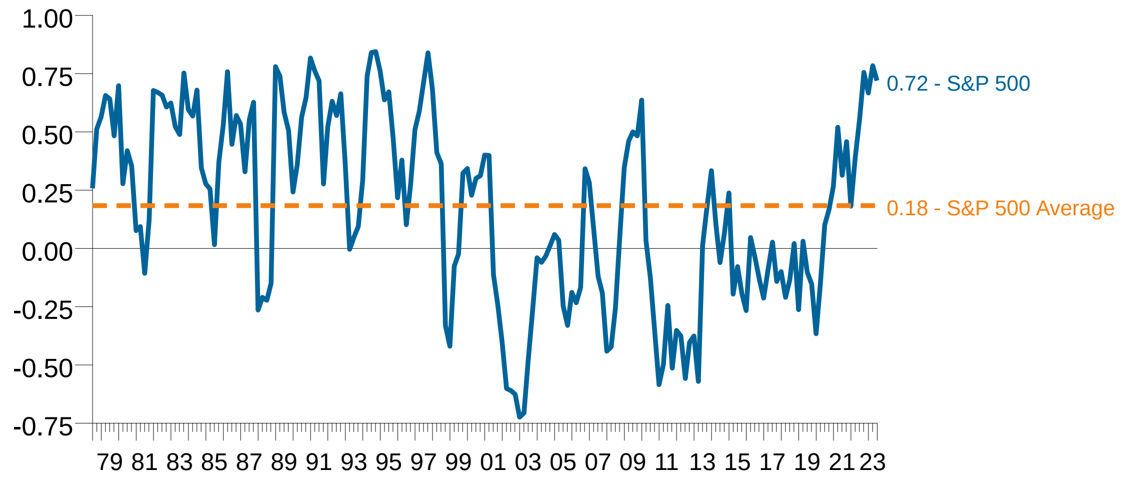
- A diversified portfolio of stocks and bonds will not see negative returns for stocks and bonds together 90% of the time.
- Note that when stocks are down, bonds can also be down about 1/3 of the time.

Correlation Changes With Interest Rate Regimes and Economic Conditions

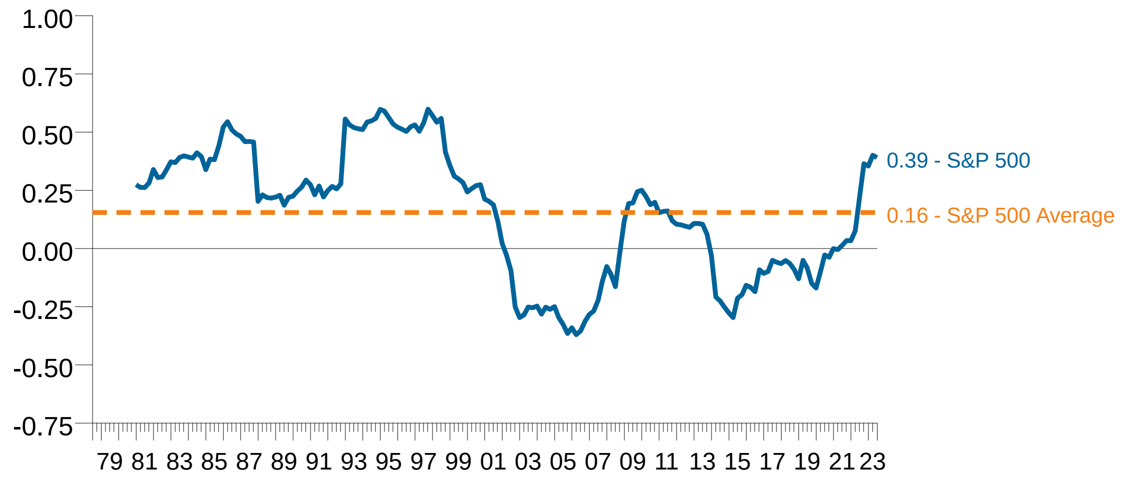
- Rolling one-year correlation spiked in 2021 and 2022.
- Rolling five-year shows how correlation runs in cycles over time.
- Table below examines correlation and the occurrence of negative returns for stocks and bonds together in three interest rate and inflation regimes. Regime 2 shows higher stock/bond correlation and suggests less diversification benefit under rising rates and inflation.

Period	Regime Description	Negative Return Frequency	Stock/ Bond Correlation
Regime 1 1926–1965	Low, stable interest rates	7%	0.13
Regime 2 1966–1981	Secular rate rise	26%	0.48
Regime 3 1982–present	Secular rate decline	6%	0.05

Rolling 1 Year Correlation of S&P 500 to Bloomberg Aggregate



Rolling 5 Year Correlation of S&P 500 to Bloomberg Aggregate



Sources: Bloomberg, Callan, S&P Dow Jones Indices

2023 vs. 2022 Risk and Returns Assumptions

Summary of Callan's Long-Term Capital Markets Assumptions (2023–2032)

Asset Class	Index	Projected Return		Real	Projected Risk	2022–2031			vs. 2022	
		1-Year Arithmetic	10-Year Geometric*		Standard Deviation	1-Year Arithmetic	10-Year Geometric*	Standard Deviation	Geometric* Delta	Std Dev Delta
Equities										
Broad U.S. Equity	Russell 3000	8.75%	7.35%	4.85%	18.05%	8.00%	6.60%	17.95%	0.75%	0.10%
Large Cap U.S. Equity	S&P 500	8.60%	7.25%	4.75%	17.75%	7.85%	6.50%	17.70%	0.75%	0.05%
Smid Cap U.S. Equity	Russell 2500	9.60%	7.45%	4.95%	22.15%	8.75%	6.70%	21.30%	0.75%	0.85%
Global ex-U.S. Equity	MSCI ACWI ex USA	9.45%	7.45%	4.95%	21.25%	8.70%	6.80%	20.70%	0.65%	0.55%
Developed ex-U.S. Equity	MSCI World ex USA	9.00%	7.25%	4.75%	20.15%	8.25%	6.50%	19.90%	0.75%	0.25%
Emerging Market Equity	MSCI Emerging Markets	10.45%	7.45%	4.95%	25.70%	9.80%	6.90%	25.15%	0.55%	0.55%
Fixed Income										
Short Duration Gov/Credit	Bloomberg 1-3 Year Gov/Credit	3.75%	3.80%	1.30%	2.30%	1.50%	1.50%	2.00%	2.30%	0.30%
Core U.S. Fixed	Bloomberg Aggregate	4.25%	4.25%	1.75%	4.10%	1.80%	1.75%	3.75%	2.50%	0.35%
Long Government	Bloomberg Long Gov	4.55%	3.70%	1.20%	13.50%	1.85%	1.10%	12.50%	2.60%	1.00%
Long Credit	Bloomberg Long Credit	5.75%	5.20%	2.70%	11.75%	2.60%	2.10%	10.50%	3.10%	1.25%
Long Government/Credit	Bloomberg Long Gov/Credit	5.25%	4.75%	2.25%	11.35%	2.30%	1.80%	10.40%	2.95%	0.95%
TIPS	Bloomberg TIPS	4.10%	4.00%	1.50%	5.30%	1.35%	1.25%	5.05%	2.75%	0.25%
High Yield	Bloomberg High Yield	6.75%	6.25%	3.75%	11.75%	4.40%	3.90%	10.75%	2.35%	1.00%
Global ex-U.S. Fixed	Bloomberg Global Agg ex US	2.70%	2.25%	-0.25%	9.80%	1.20%	0.80%	9.20%	1.45%	0.60%
Emerging Market Sov Debt	EMBI Global Diversified	6.25%	5.85%	3.35%	10.65%	4.00%	3.60%	9.50%	2.25%	1.15%
Alternatives										
Core Real Estate	NCREIF ODCE	6.60%	5.75%	3.25%	14.20%	6.60%	5.75%	14.20%	0.00%	0.00%
Private Infrastructure	MSCI GI Infra/FTSE Dev Core 50/50	7.15%	6.15%	3.65%	15.45%	7.10%	6.10%	15.45%	0.05%	0.00%
Private Equity	Cambridge Private Equity	11.95%	8.50%	6.00%	27.60%	11.45%	8.00%	27.60%	0.50%	0.00%
Private Credit	N/A	8.00%	7.00%	4.50%	15.50%	6.40%	5.50%	14.60%	1.50%	0.90%
Hedge Funds	Callan Hedge FOF Database	5.80%	5.55%	3.05%	8.45%	4.35%	4.10%	8.20%	1.45%	0.25%
Commodities	Bloomberg Commodity	5.05%	3.50%	1.00%	18.00%	4.05%	2.50%	18.00%	1.00%	0.00%
Cash Equivalents	90-Day T-Bill	2.75%	2.75%	0.25%	0.90%	1.20%	1.20%	0.90%	1.55%	0.00%
Inflation	CPI-U		2.50%		1.60%		2.25%	1.60%	0.25%	0.00%

* Geometric returns are derived from arithmetic returns and the associated risk (standard deviation).

Source: Callan

2023–2032 Callan Capital Markets Assumptions Correlations

	Large Cap	Smid Cap	Dev	Em Mkts	Short Dur	Core Fixed	Long Gov	Long Credit	TIPS	High Yield	Global ex-US Fixed	EM	Core Real Estate	Private Infra	Private Equity	Private Credit	Hedge Funds	Comm	Cash Equiv	Inflation
Large Cap U.S. Equity	**1.00**																			
Smid Cap U.S. Equity	0.88	**1.00**																		
Dev ex-U.S. Equity	0.73	0.79	**1.00**																	
Em Market Equity	0.79	0.83	0.89	**1.00**																
Short Dur Gov/Credit	0.05	0.01	0.04	-0.01	**1.00**															
Core U.S. Fixed	0.02	-0.02	0.00	-0.04	0.80	**1.00**														
Long Government	-0.05	-0.06	-0.03	-0.06	0.67	0.83	**1.00**													
Long Credit	0.45	0.40	0.40	0.40	0.64	0.80	0.65	**1.00**												
TIPS	-0.07	-0.08	-0.09	-0.11	0.56	0.70	0.50	0.52	**1.00**											
High Yield	0.75	0.74	0.73	0.75	0.10	0.09	0.00	0.45	0.02	**1.00**										
Global ex-U.S. Fixed	0.10	0.07	0.13	0.12	0.50	0.60	0.50	0.55	0.45	0.18	**1.00**									
EM Sovereign Debt	0.65	0.65	0.65	0.69	0.16	0.19	0.10	0.47	0.08	0.62	0.21	**1.00**								
Core Real Estate	0.44	0.42	0.42	0.41	0.16	0.14	0.05	0.30	0.09	0.31	0.16	0.29	**1.00**							
Private Infrastructure	0.48	0.47	0.46	0.46	0.14	0.15	0.10	0.33	0.08	0.34	0.18	0.32	0.76	**1.00**						
Private Equity	0.79	0.77	0.76	0.75	-0.01	-0.09	-0.13	0.30	-0.11	0.61	0.08	0.51	0.55	0.60	**1.00**					
Private Credit	0.69	0.68	0.65	0.68	0.11	0.00	-0.05	0.33	-0.12	0.63	0.12	0.50	0.25	0.27	0.67	**1.00**				
Hedge Funds	0.67	0.63	0.63	0.63	0.23	0.29	0.20	0.55	0.20	0.60	0.25	0.54	0.28	0.30	0.48	0.51	**1.00**			
Commodities	0.20	0.20	0.20	0.20	-0.05	-0.04	-0.10	0.05	0.00	0.20	0.10	0.15	0.18	0.15	0.20	0.17	0.23	**1.00**		
Cash Equivalents	-0.06	-0.08	-0.10	-0.10	0.30	0.15	0.12	0.00	0.12	-0.09	0.05	-0.06	0.00	-0.04	0.00	-0.04	-0.04	-0.02	**1.00**	
Inflation	-0.02	0.02	0.00	0.03	-0.21	-0.23	-0.30	-0.20	0.25	0.00	-0.15	-0.04	0.20	0.10	0.06	-0.05	0.05	0.35	0.05	**1.00**

Source: Callan

MCERA Asset Classes - Return and Risk

Asset Class	10-Year Compound Return	Projected Standard Deviation	Real Return
Broad Domestic Equity	7.35%	18.05%	4.85%
Global ex-US Equity	7.45%	21.25%	4.95%
Domestic Fixed Income	4.25%	4.10%	1.75%
Private Equity	8.50%	27.60%	6.00%
Real Assets	**6.20%**	**11.55%**	**3.70%**
Cash Equivalents	2.75%	0.90%	0.25%
Inflation	2.50%	1.60%	

- Total Real Assets portfolio:
  - 8% private real estate, 7% public real assets
  - Public real assets = 25% TIPS, 25% Commodities, 25% REITs, 25% Natural Resource Equity

- The Opportunistic allocation has a 0% target, so it is not included in these projections.

Source: Callan

MCERA Asset Classes - Correlation

	Broad Domestic Equity	Global Ex-U.S. Equity	Domestic Fixed	Private Equity	Real Assets	Cash Equivalents	Inflation
Broad Domestic Equity	1.00						
Global Ex-U.S. Equity	0.80	1.00					
Domestic Fixed	0.02	-0.01	1.00				
Private Equity	0.80	0.78	-0.09	1.00			
Real Assets	0.66	0.65	0.12	0.72	1.00		
Cash Equivalents	-0.06	-0.10	0.15	0.00	-0.01	1.00	
Inflation	-0.01	0.01	-0.23	0.06	0.28	0.05	1.00

- Total Real Assets portfolio:
  - 8% private real estate, 7% public real assets
  - Public real assets = 25% TIPS, 25% Commodities, 25% REITs, 25% Natural Resource Equity

Source: Callan

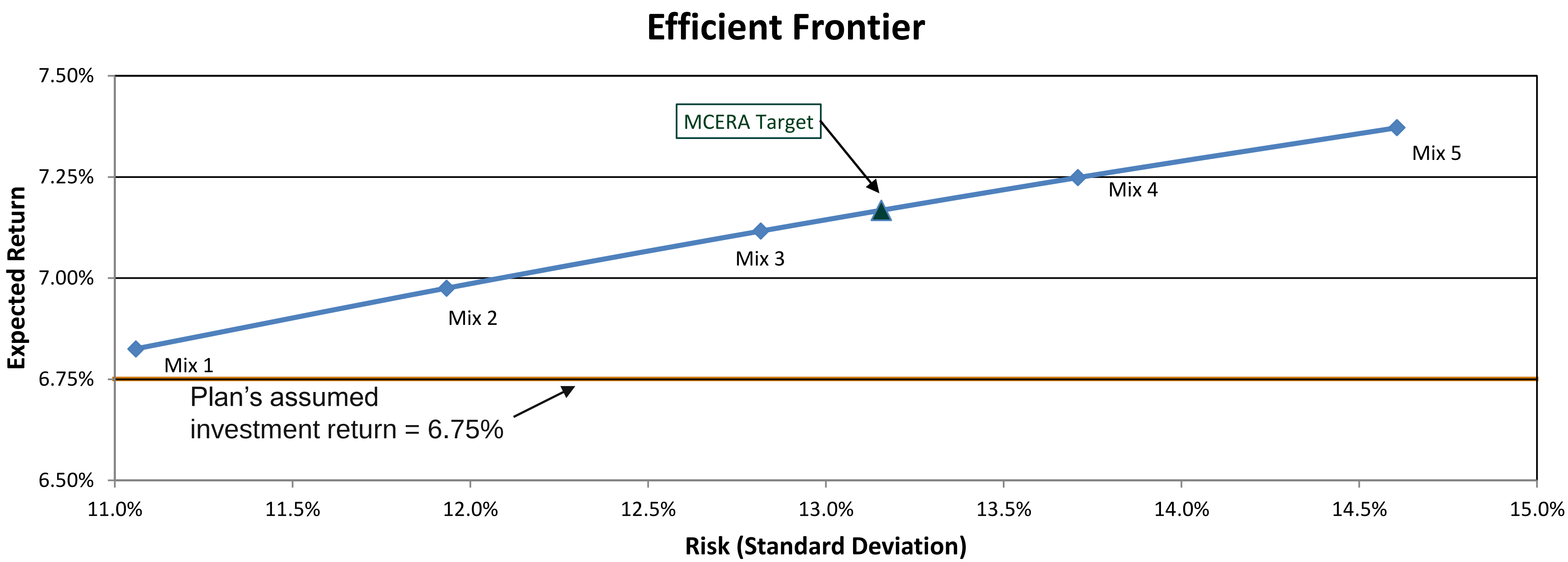
Alternative Asset Mixes

Asset Class	MCERA Target	Min Alloc	Max Alloc	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
				Alternative Asset Mixes				
Broad US Equity	32%	0%	100%	24%	27%	30%	33%	36%
Broad International Equity	22%	0%	100%	18%	20%	22%	24%	26%
Broad US Fixed Income	23%	0%	100%	35%	30%	25%	20%	15%
Real Assets	15%	15%	15%	15%	15%	15%	15%	15%
Private Equity	8%	0%	8%	8%	8%	8%	8%	8%
Totals	**100%**			**100%**	**100%**	**100%**	**100%**	**100%**
Expected Return	7.2%			6.8%	7.0%	7.1%	7.2%	7.4%
Real Return	4.7%			4.3%	4.5%	4.6%	4.7%	4.9%
Risk (Standard Deviation)	13.2%			11.1%	11.9%	12.8%	13.7%	14.6%
Sharpe Ratio	0.34			0.37	0.35	0.34	0.33	0.32
% equity	62%			50%	55%	60%	65%	70%
% fixed income	23%			35%	30%	25%	20%	15%
% real assets	15%			15%	15%	15%	15%	15%
% illiquid	16%			16%	16%	16%	16%	16%

- Fixed income allocations are adjusted in 5% increments
- Mixes are constrained to hold 15% real assets (current target)
- Private equity limited to a maximum of 8% (current target)
- Private equity allocations above 8% are reallocated to public equity
- The resulting impact on total portfolio return is modest, risk fluctuates a bit more

MCERA - 2023 Efficient Frontier – Nominal Return

Maximum Private Equity Allocation = 8%

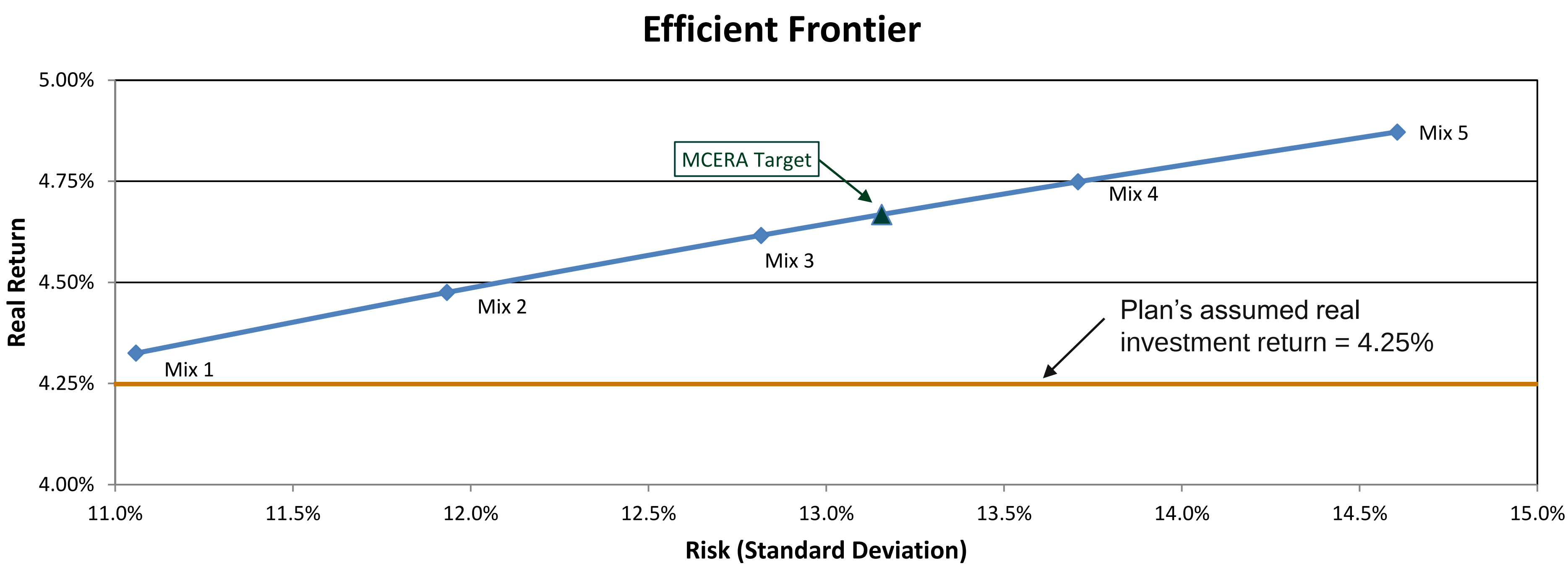


- MCERA's asset allocation target is an optimal allocation, since it lies on the efficient frontier depicting risk and return.
- Current target is a well-diversified portfolio that includes fixed income, public equity, private equity and real assets, including private real estate.
- All of the alternative mixes would meet the 6.75% plan return target in the expected case.

Source: Callan LLC

MCERA - 2023 Efficient Frontier – Real Return

Maximum Private Equity Allocation = 8%

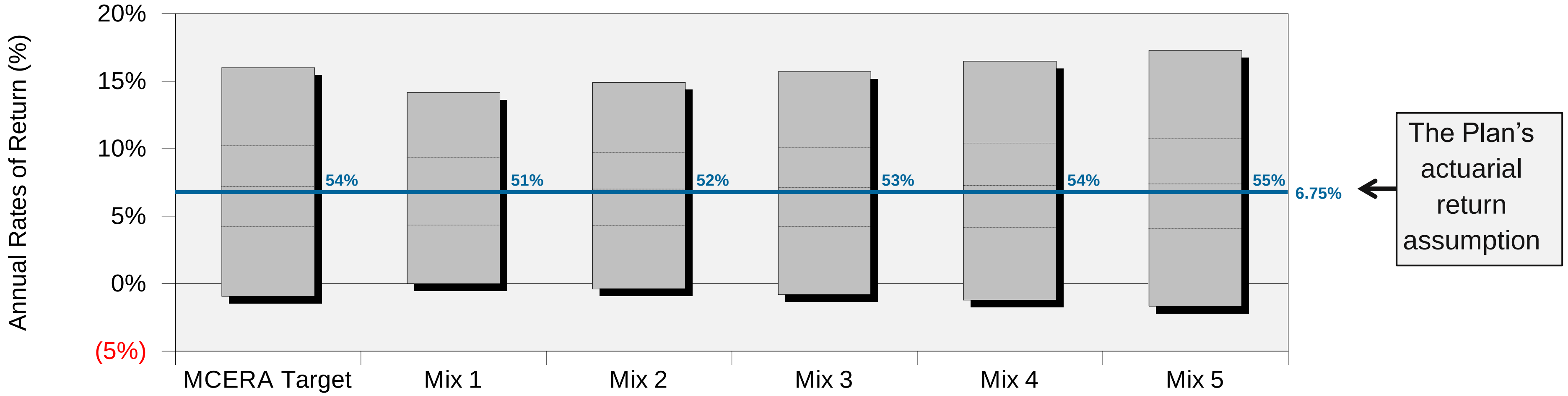


- MCERA's long term nominal return assumption of 6.75% and inflation assumption of 2.5% suggest a long term real return target of 4.25%.
- Callan's 10-year return expectation for the target asset allocation is 7.2%, and combined with our inflation assumption of 2.5%, yields a real return expectation of 4.7%, higher than the 4.25% assumed in the actuarial valuation.

Source: Callan LLC

Projected Rates of Return (10 Years)

Range of Projected Rates of Return
Projection Period: 10 Years
Optimization Set: 2023 PE Max 8



	MCERA Target	Mix 1	Mix 2	Mix 3	Mix 4	Mix 5
2.5th Percentile	16.0%	14.2%	14.9%	15.7%	16.5%	17.3%
25th Percentile	10.2%	9.3%	9.7%	10.0%	10.4%	10.7%
Median	7.2%	6.8%	7.0%	7.1%	7.3%	7.4%
75th Percentile	4.2%	4.3%	4.3%	4.2%	4.2%	4.1%
97.5th Percentile	(0.9%)	0.0%	(0.4%)	(0.8%)	(1.2%)	(1.7%)
Prob > 6.75%	54%	51%	52%	53%	54%	55%

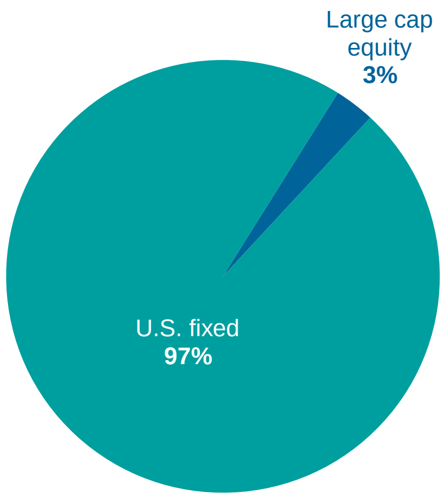
- Chart reflects annualized return distribution over the next ten years
- Bar heights proportional to return volatility
  - Higher expected (median) returns associated with higher volatilities
  - Increased volatility leads to lower worse-case (97.5th percentile) returns
- The target has a reasonable chance (>54%) of earning 6.75% or better over the next 10 years

Looking Forward: Where Are We Heading With 2024 Capital Market Assumptions?

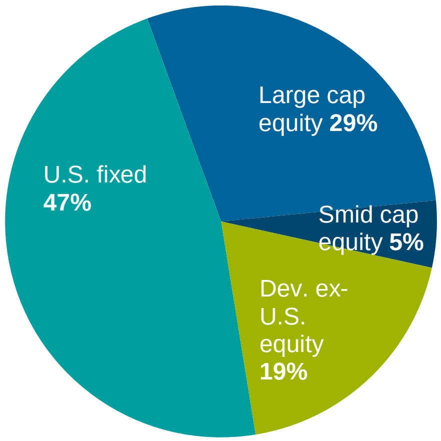
- Inflation is clearly waning, but currently above our long-term projection of 2.5%. We believe long term inflation expectations will remain anchored around 2.5%.
- Interest rates are near our expectation for long-term equilibrium, and close to where we were one year ago, when we set the 2023 capital market assumptions.
  - Bond returns will be comparable or slightly higher than the current assumption of 4.25%.
  - Search for yield to augment investment grade bonds has abated. However, higher yields remain attractive for below investment grade and private credit, which may now be funded as an equity substitute.
- Equity returns have rebounded sharply from the 2022 decline but are about flat over the past six quarters.
  - Equity valuations reaching back toward the rich levels at the start of 2022.
- Private markets remain attractive to investors as an alternative source of higher return over public markets.
  - Equity
  - Credit
  - Real assets
- Private markets offer differentiated sources of return, however:
  - Private markets are still integral components of the greater capital market universe and cannot fight the gravity of expected return for public equity and debt.
  - Massive inflows will keep expected returns going forward in check.

7% Expected Returns Over Past 30 Years

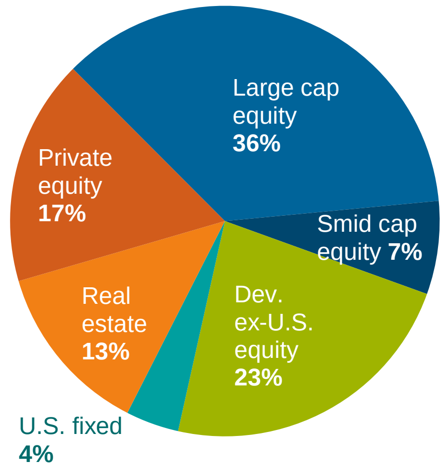
Increasing Complexity



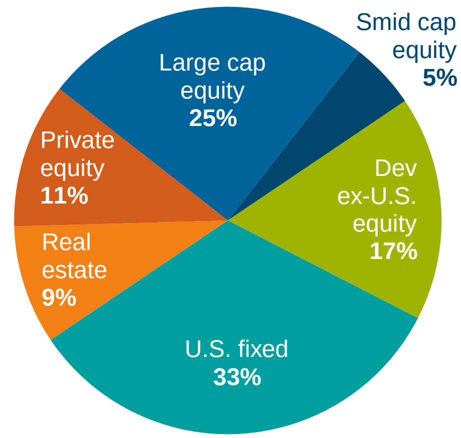
1993
Return: 7.0%
Risk: 6.2%



2008
Return: 7.0%
Risk: 9.4%



2022
Return: 7.0%
Risk: 16.8%



2023
Return: 7.0%
Risk: 11.8%

Increasing Risk

In 1993, our return expectation for broad U.S. fixed income was 6.85%.

Just 3% in return-seeking assets was required to earn a 7% projected return.

15 years later, an investor would have needed over half of the portfolio in public equities to achieve a 7% projected return.

In 2022 an investor was required to include 96% in return-seeking assets (including 30% in private market investments) to earn a 7% projected return at almost 3x the volatility compared to 1993.

Today's 7% expected return portfolio is much more reasonable than it was just a year ago. The allocation to fixed income jumps to 33%, while risk drops by 30%. Illiquid alternatives (PE and private RE) also drop by 1/3.

Conclusion

- MCERA to decide on the sizing of the fixed income allocation:
  - Increase it from 23%
  - Decrease it from 23%
  - Keep it the same

- Callan is comfortable with all three options, but would not decrease it (much) below 20%
  - MCERA's current range around its target are +/- 3% for fixed income.

- If changes are made, where do the assets come from or go?

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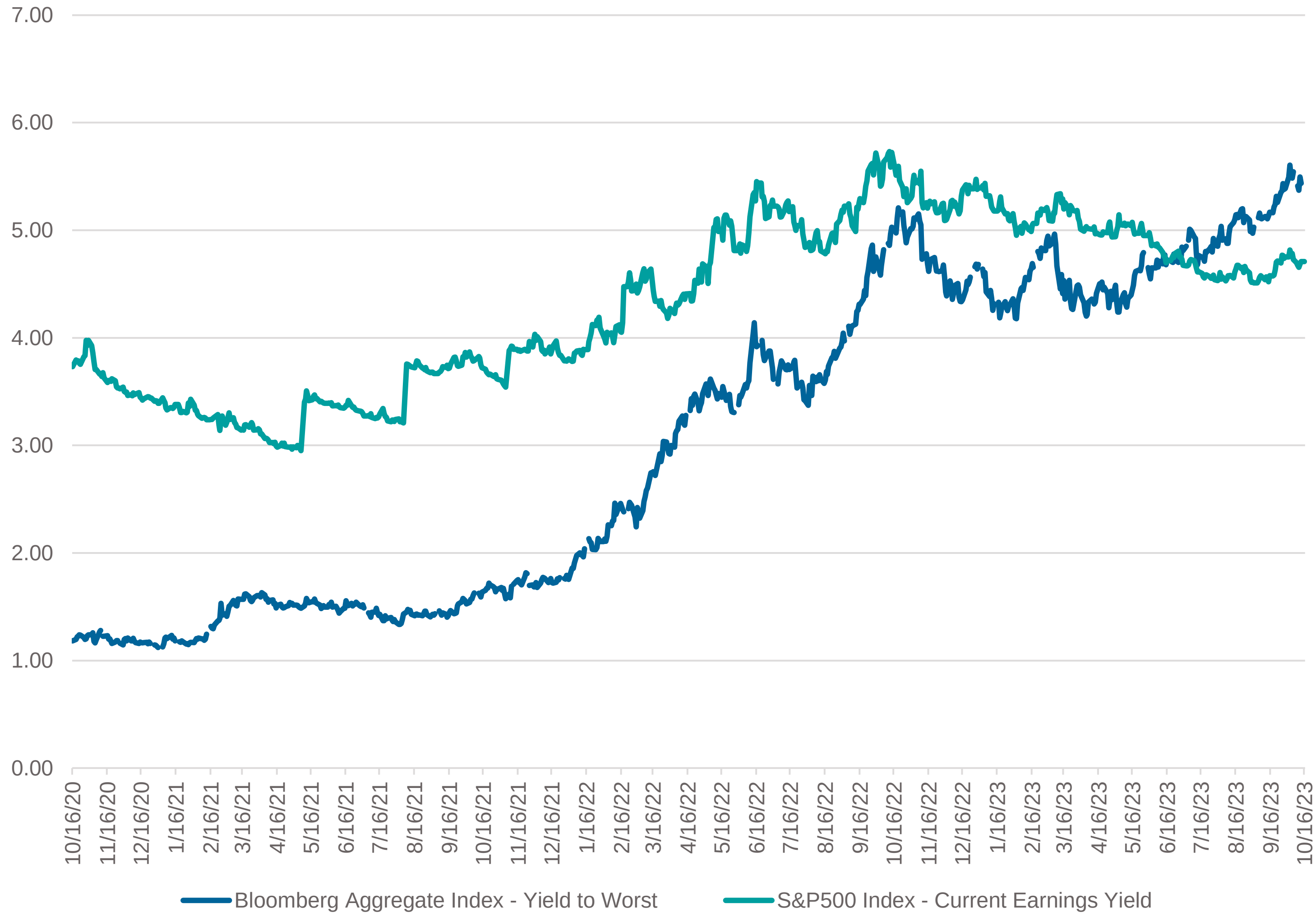
Bond Yields vs. Equity Earnings Yields



Invesco

Real Estate Downturns & the US Economy

September 2023

Kristina Hooper
Chief Global Market Strategist

Brooks Monroe
Managing Director, Invesco Real Estate

Agenda

1. The state of real estate
   a. real estate fundamentals
   b. real estate capital markets
2. How do real estate downturns affect the economy?
   a. real estate investment
   b. the “wealth effect”
   c. credit conditions
3. Case Study: The 1990s Real Estate Bust
4. Case Study: The Global Financial Crisis Real Estate Bust
5. The Relationship between monetary policy, banks and real estate
6. Summary and Outlook

1. The State of Real Estate

US real estate conditions

Inflation is moderating, but interest rates remain elevated:
Fed tightening appears to be curbing inflation. Fed expected to keep rates elevated for a time to prevent an inflation resurgence.

Expect capital markets to remain pressured thru 2024:
The banking crisis of this past spring seems to have eased, but CRE lending remains stalled. Transaction activity remains muted and asset repricing continues to decline amid elevated interest rates and tighter underwriting.

Fed policy's impact on fundamentals has lagged capital markets:
Except for office, vacancy rates for most sectors have been near or below pre-COVID levels but have widened in recent months.

Expect slower leasing to impair fundamentals in the short term:
Economic slowing or recession are expected in H1-2024. Expect the impact on leasing to play out unevenly across sectors, with sectors exposed to high levels of new supply to be more adversely affected.

Trough values in 2024 would start a new vintage period:
Historically, forward investment returns have been strongest for vintage years occurring at a market trough. Attractive opportunities are expected for those with the ability to execute, but outsized levels of dry powder suggest the optimal buying window may be short.

Source: Invesco Real Estate as of October 2023.
IRE has permission to use the image shown.

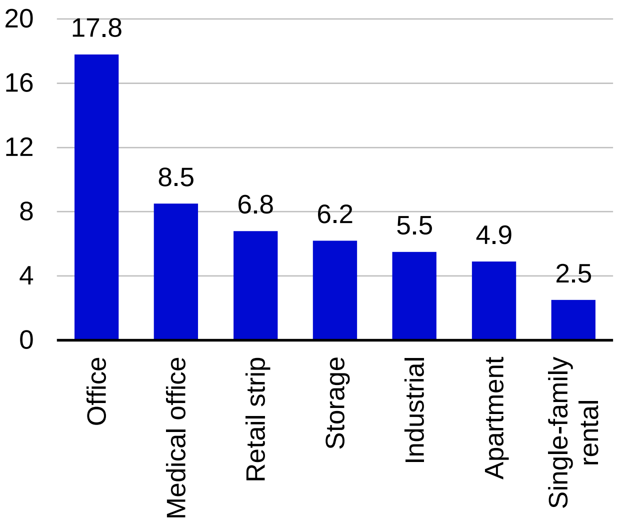
1.a. Real Estate Fundamentals

Sector vacancy rates

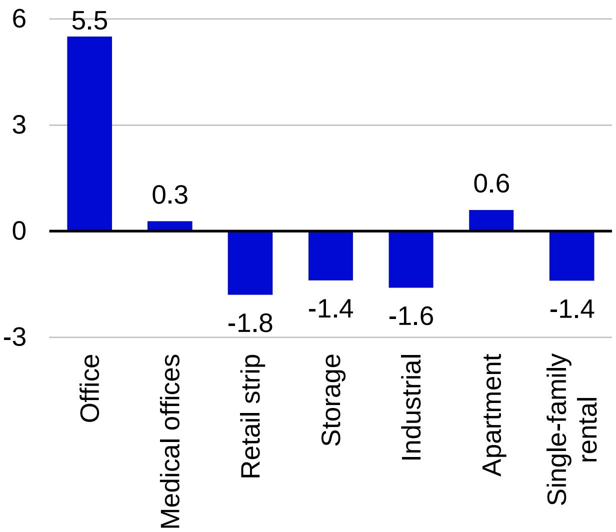
Near or below pre-COVID levels except for office; vacancy has started to widen

While vacancies have risen significantly in offices since the pandemic, other sectors, such as retail strip malls, storage, and single-family rentals, have experienced declines in vacancies.

Property sector vacancy rates (%)



Change in property sector vacancy rates (%)
Q12020 to Q12023



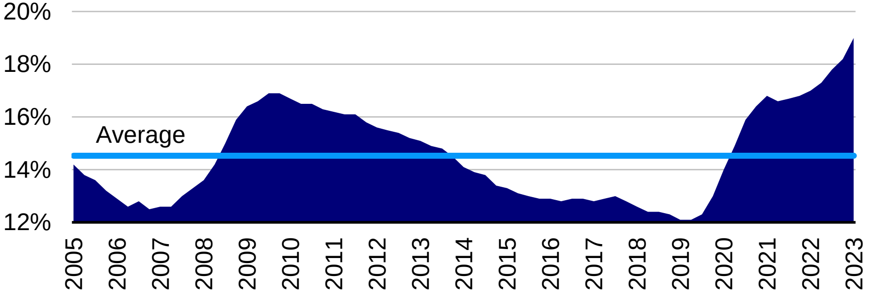
Source: Invesco Real Estate using data from CBRE-EA, Revista, and company financial reports as of June 2023. Based on CBRE-EA's sum of markets series for primary sectors; data for industrial and retail strip represent availabilities; storage and single-family rental data represents aggregation of REIT data; medical office buildings data from Revista.

Offices still feeling negative effects of pandemic shutdowns

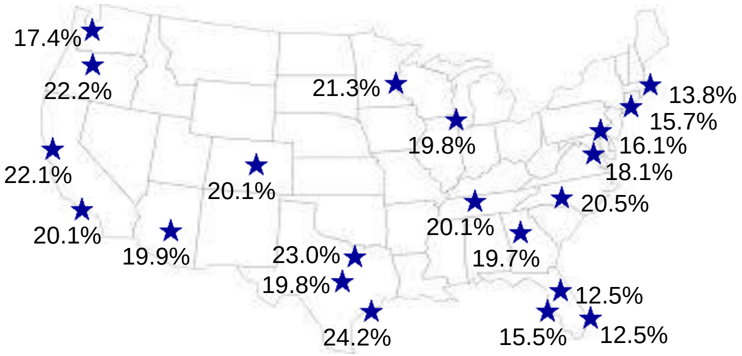
The national office vacancy rate is at a 30-year high and approaching the 20% mark. None of the major metropolitan areas are unscathed.

Fortunately, we don’t believe that the stress in the office space is systemic to the rest of the commercial real estate market or the banking system. Among the large banks, offices are a relatively small portion of their overall book of business.

Office real estate vacancy percentage metro total



Office real estate vacancy rate by metro area

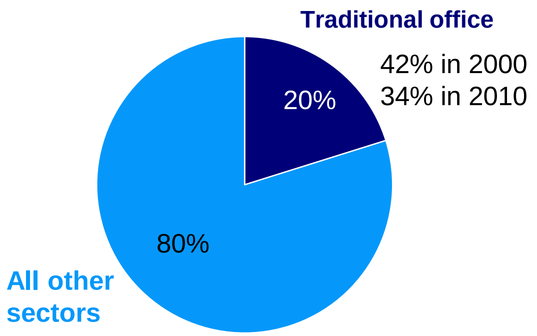


Sources: CBRE and Federal Deposit Insurance Corporation, 6/30/23.

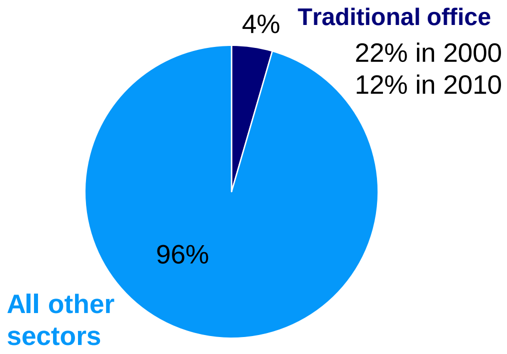
Traditional office: Now a much smaller component of real estate markets

The role of offices in the public and private commercial real estate market declined significantly during the past two decades.

Private real estate value composition (% share)
Based on the NCREIF Property Index



Public real estate value composition (% share)
Based on FTSE-NAREIT All Equity REIT Index



Sources: National Council of Real Estate Investment Fiduciaries (NCREIF), Mar. 2023, based on market value within the NCREIF Property Index; National Association of Real Estate Investment Trusts, Apr. 2023, based on market value within the FTSE-NAREIT All Equity REIT Index. For purposes of this presentation, traditional office is defined as office buildings designed and built for general business use, which excludes buildings predominantly for life science or medical services use.

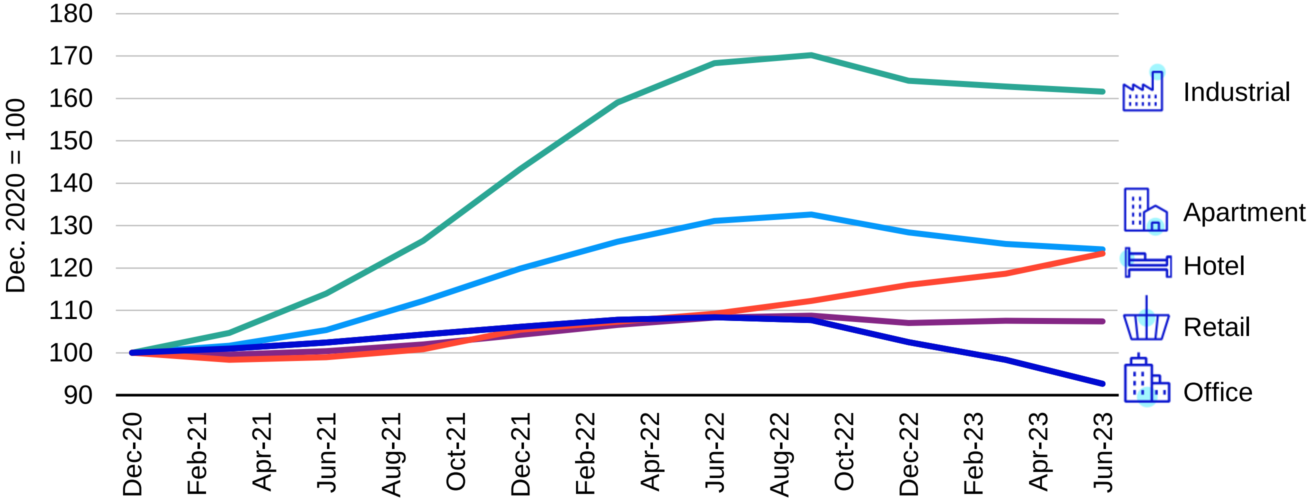
Other real estate sectors posted positive returns since end of 2020

Office sector performance has been challenged in the aftermath of the pandemic.

Other commercial real estate sectors — such as industrial, apartment, and hotel — had positive returns.

NCREIF Property Index

Sector performance: Total return since Dec. 31, 2020

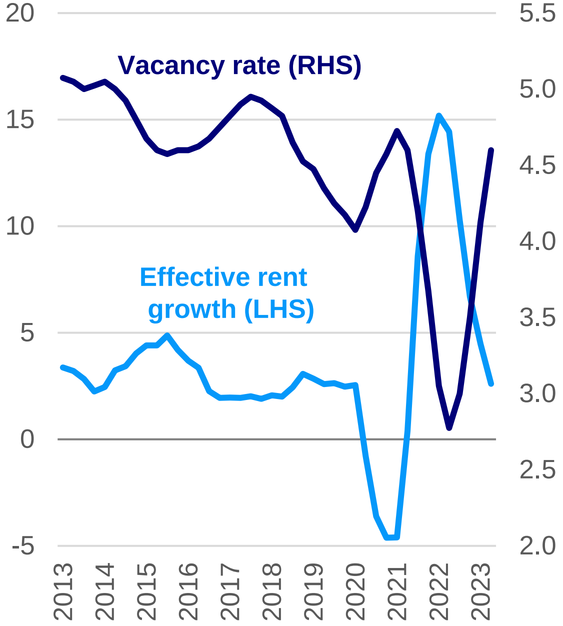


Source: National Council of Real Estate Investment Fiduciaries, 6/30/23. Indexes cannot be purchased directly by investors. **Past performance does not guarantee future results.**

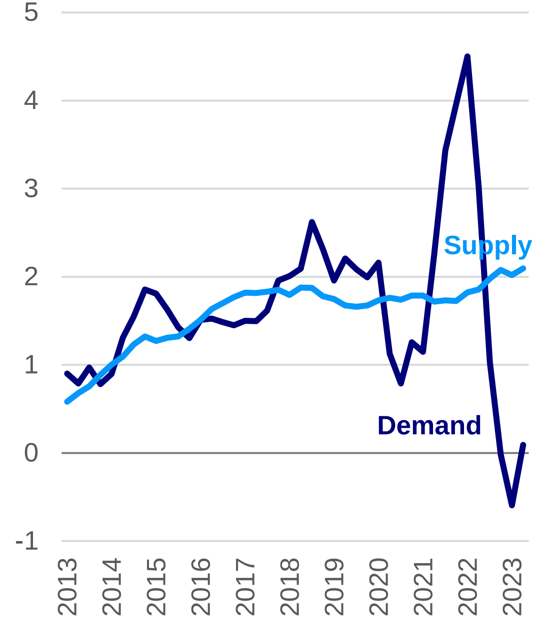
Apartment fundamentals

Demand pulled-forward during pandemic; supply remains a near-term challenge

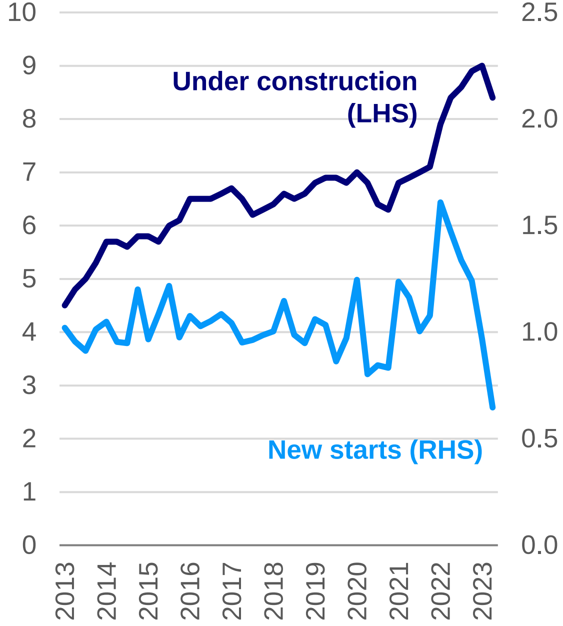
Vacancy rate and rent growth
(YY, %)



Demand and supply
(Trailing 1Y as % of stock)



Under construction and starts
(% of stock)



Invesco

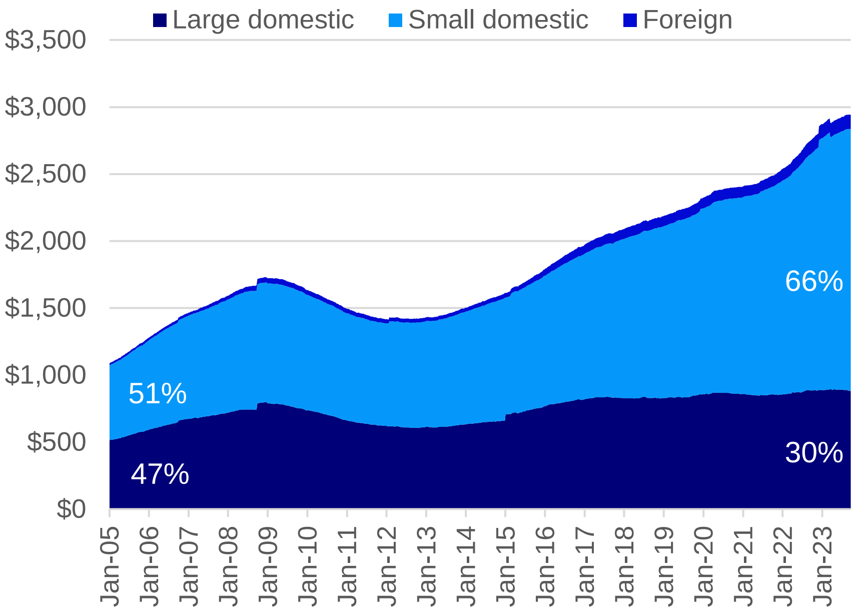
Sources: Invesco Real Estate using data from CBRE-EA and CoStar as of September 2023

1.b. Real Estate Capital Markets

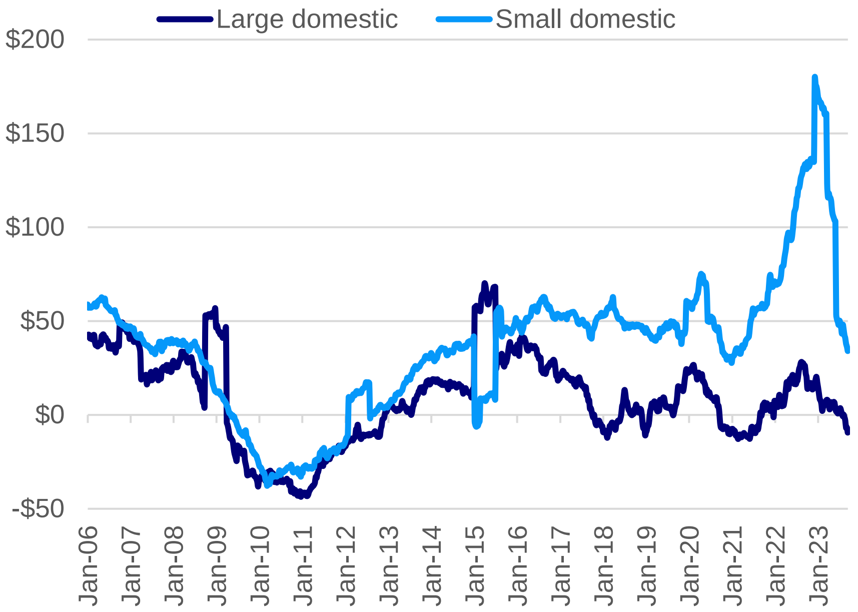
Small domestic banks have been the focus of CRE loan growth

CRE origination activity has slowed dramatically over the last nine months

Bank CRE exposure ($Bil)



Growth in CRE loan exposure (rolling 6M change, %)



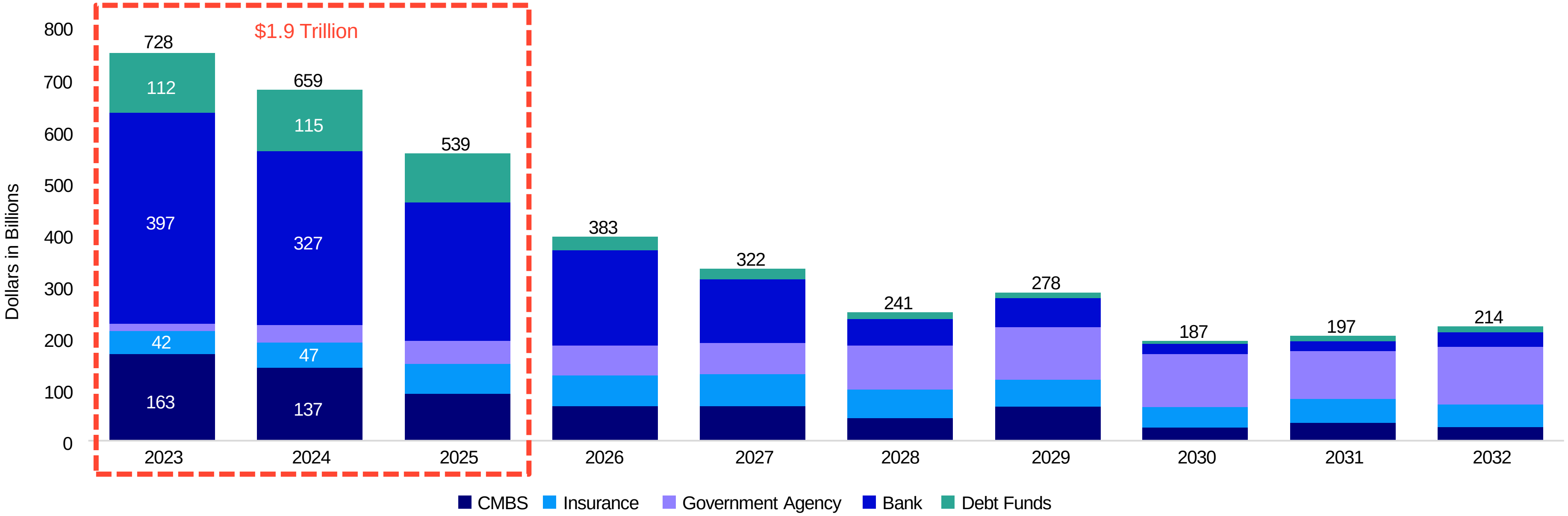
Large banks = banks with assets >$100 billion; small banks = banks with assets <$100 billion

Source: Invesco Real Estate using data from the Federal Reserve as October 2023

The Market Faces Record Maturities

Bank, CMBS/CRE CLO and debt fund maturities are particularly heavily front-loaded over the next 18 months.

Commercial Mortgage Maturities

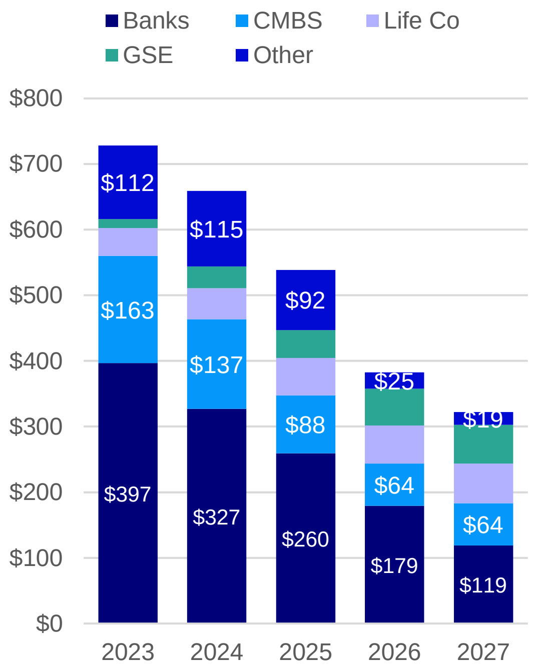


Source: MBA, Newmark Research

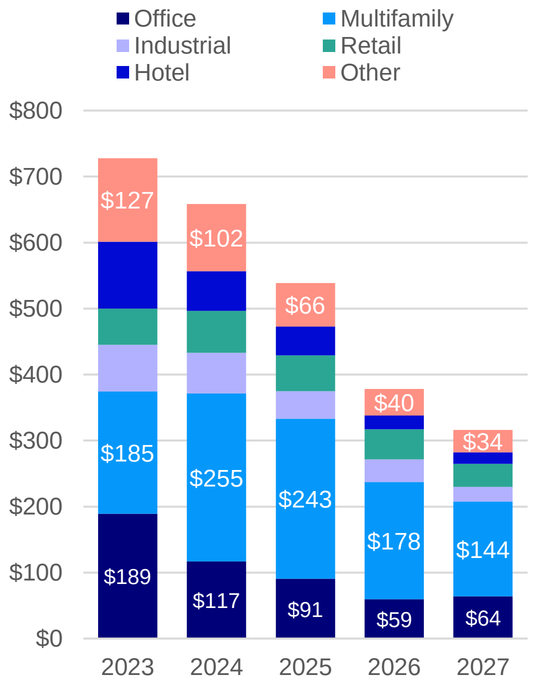
CRE loan maturities: Challenging near-term period for maturing debt

Approximately 30% of CRE debt outstanding scheduled to mature by YE 2024

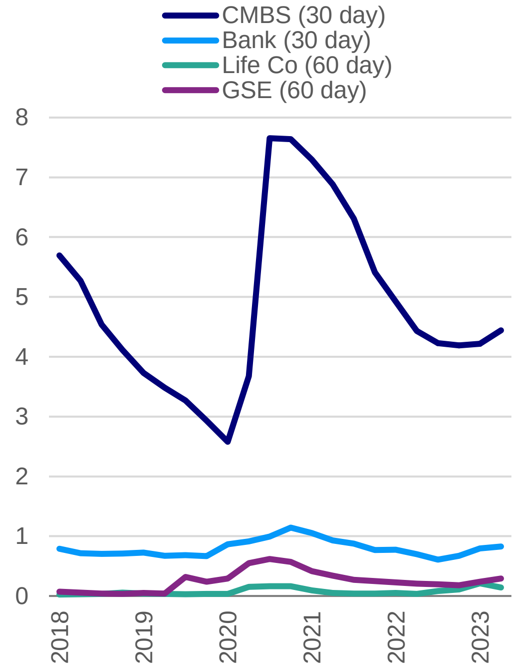
CRE maturities by lender type ($Bil)



CRE maturities by property type ($Bil)



Delinquency rates (% debt outstanding)

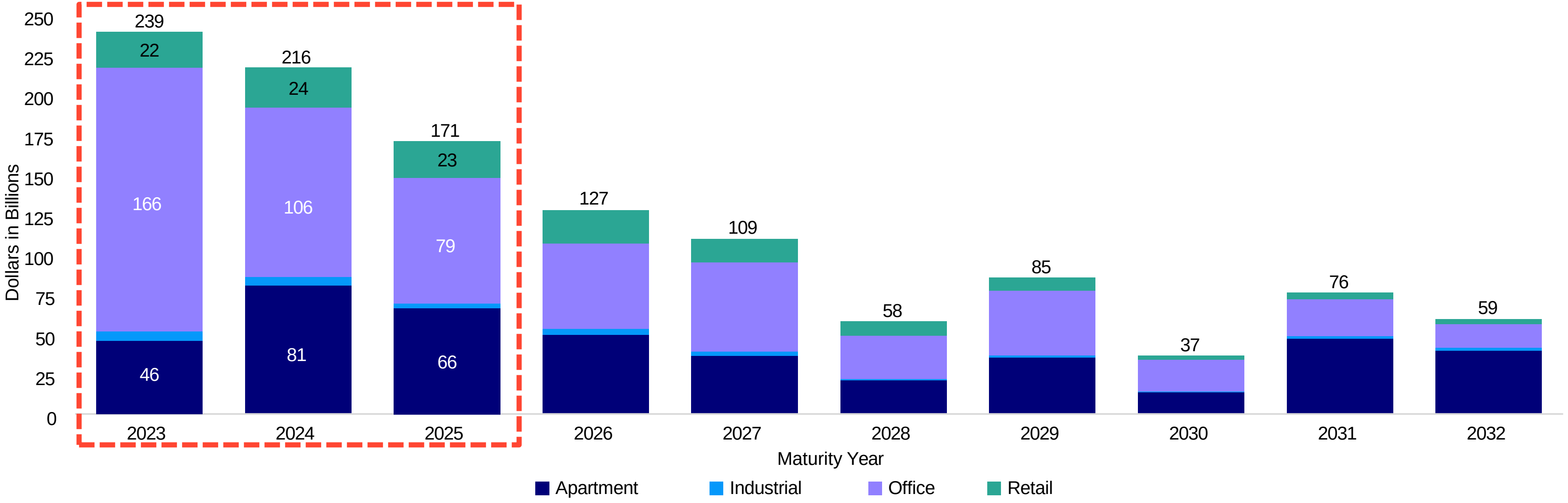


Invesco Source: Invesco Real Estate using data from MBA as of October 2023

$1.2T of Outstanding CRE Debt is Potentially Troubled, $626B Maturing in '23-'25

Newmark combined analysis of mark-to-market LTVs with the structure of debt maturities to estimate the volume of debt that currently is potentially troubled.* Office and multifamily loans constitute most potentially troubled loans, particularly in the 2023 to 2025 period. The distribution of LTV ratios for multifamily are more favorable overall, but the greater size of the multifamily market and the concentration of lending during the recent liquidity bubble drive high nominal exposure.

Potentially Troubled Loans by Maturity Year*

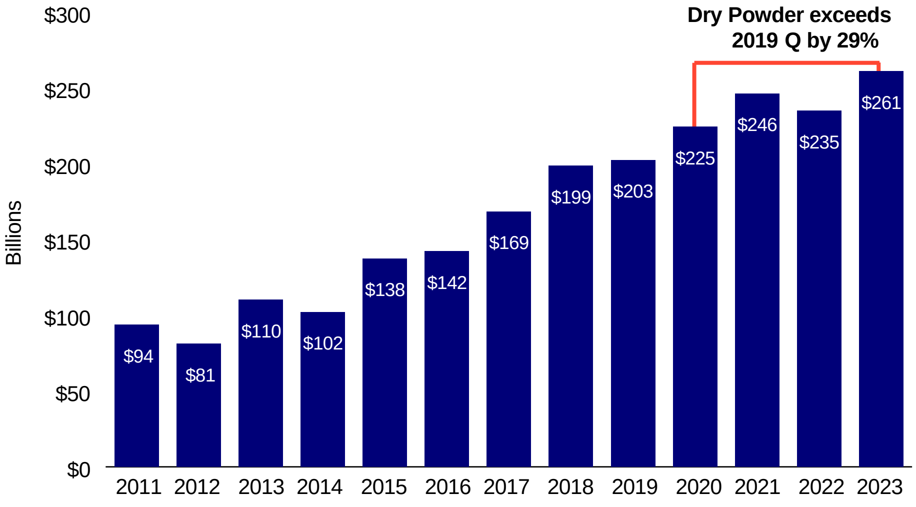


Source: Green Street, NCREIF, RCA, Trepp, MBA, Newmark Research
Note*: *oans with an estimated senior debt LTV of 80% or greater are potentially troubled. The loans are marked-to-market using an average of cumulative changes in the Dow Jones REIT sector price indices, REIT sector enterprise value indices and Green Street sector CPPI.

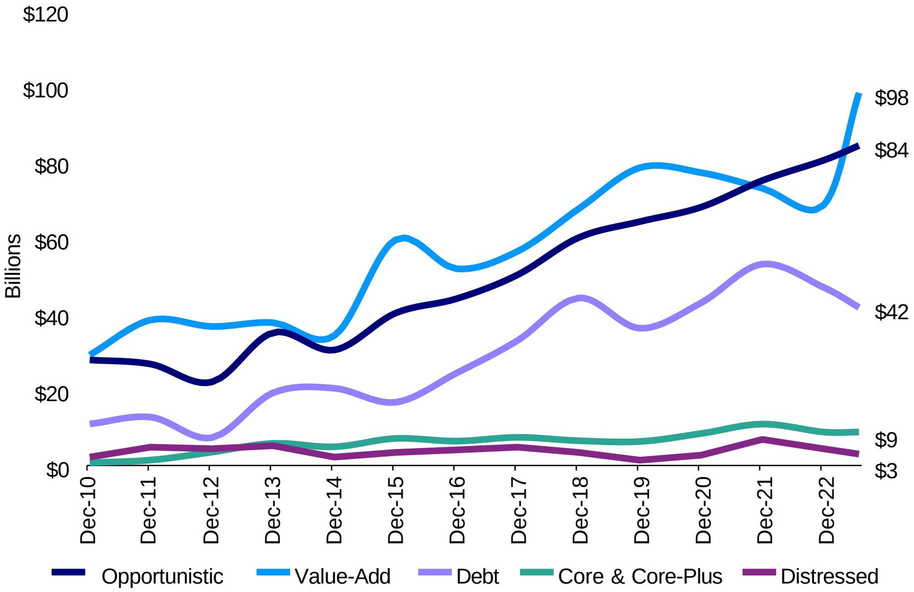
Private Equity Dry Powder Set New Record in 2023

Dry powder at closed-end funds has increased by 11% since the start of the year. The increase is due to continued growth in value-add funds and a sharp increase in dry powder at opportunistic vehicles. Record fundraising by opportunistic funds in the second quarter of 2023 appears to have driven the increase as investors gear up to take advantage of asset repricing.

Dry Powder – Closed-End Funds



Dry Powder by Strategy*

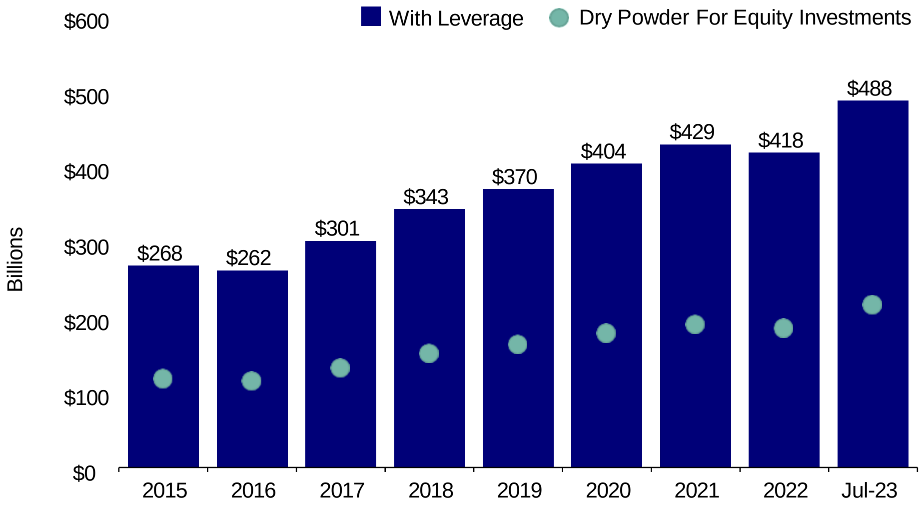


Source: Newmark Research, Preqin as of 7/26/2024
*Not shown: Fund of funds, co-investments, and secondaries strategies

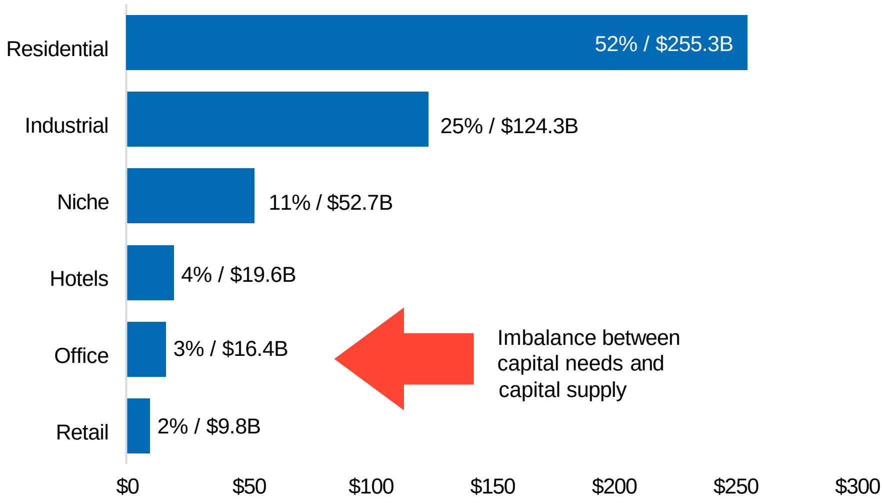
Dry Powder Heavily Biased towards Residential, Industrial Investment

The $219 billion in dry powder raised for equity investments, not including dry powder raised for debt strategies, equates to a leveraged purchasing power of $488 billion, using a 55% loan-to-value ratio.

Dry Powder at 55% Leverage



Leveraged Dry Powder By Property Type*



Source: Newmark Research, Preqin as of 7/26/2023
Note*: Newmark looked at the percent called by vintage year and applied this to the total amount fundraised in each year to calculate the amount of uncalled capital (i.e., dry powder), broken out by main property type. Roughly half the dry powder was at diversified funds. This was allocated to the various property types in proportion to their share of total dry powder, excluding diversified funds. Finally, Newmark grossed up the dry powder assuming 55% leverage would be used.

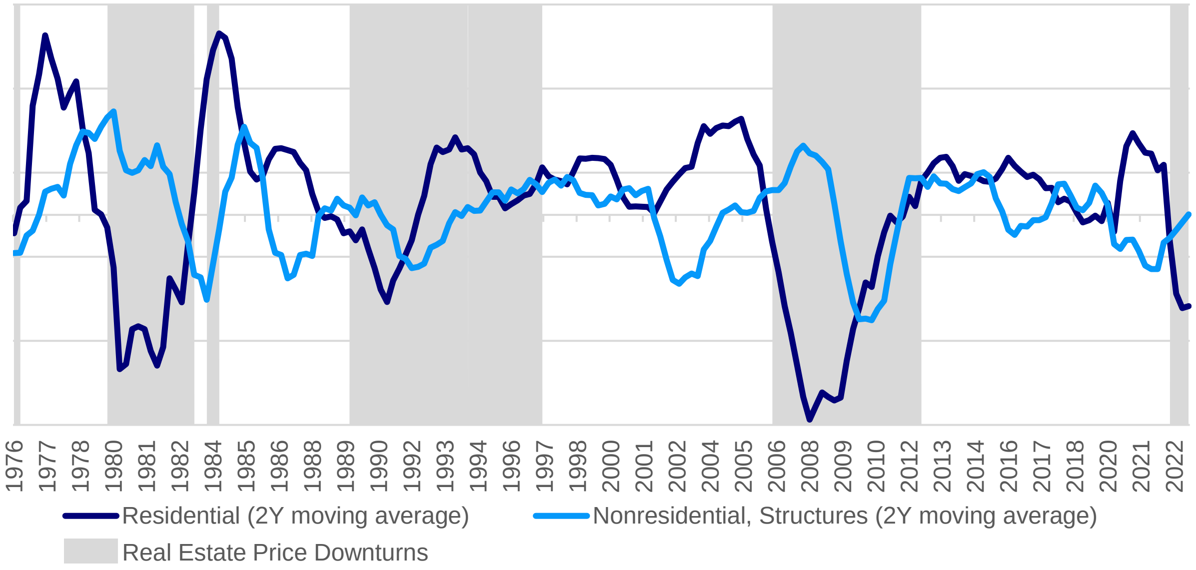
Loan Maturity Resolutions

1	Restructure & extend → often with paydown
2	Sell and pay-off → above or below loan amount
3	Refinance with new capital → debt and equity
4	Foreclose → hold or sell
5	Bank failure → government loan sales

2.a. Real Estate Downturns' Impact on Economy: Real Estate Investment

Real estate downturns have historically led to weaker real estate investment

Residential and Non-residential investment contribution to quarterly GDP growth (%)



- Shortly after significant economic downturns – like in the 80s, 90s, and GFC – residential construction investment has fallen.
- Non-residential construction investment has typically fallen when residential construction has fallen, with a ~2y lag.
- However, during periods of minor economic downturns, like 2001 and 2015, we note that non-residential investment falls independently of residential investment. This suggests a unidirectional relationship.
- Today, non-residential investment remains high and has ticked upward. However, residential investment has been in a significant decline.

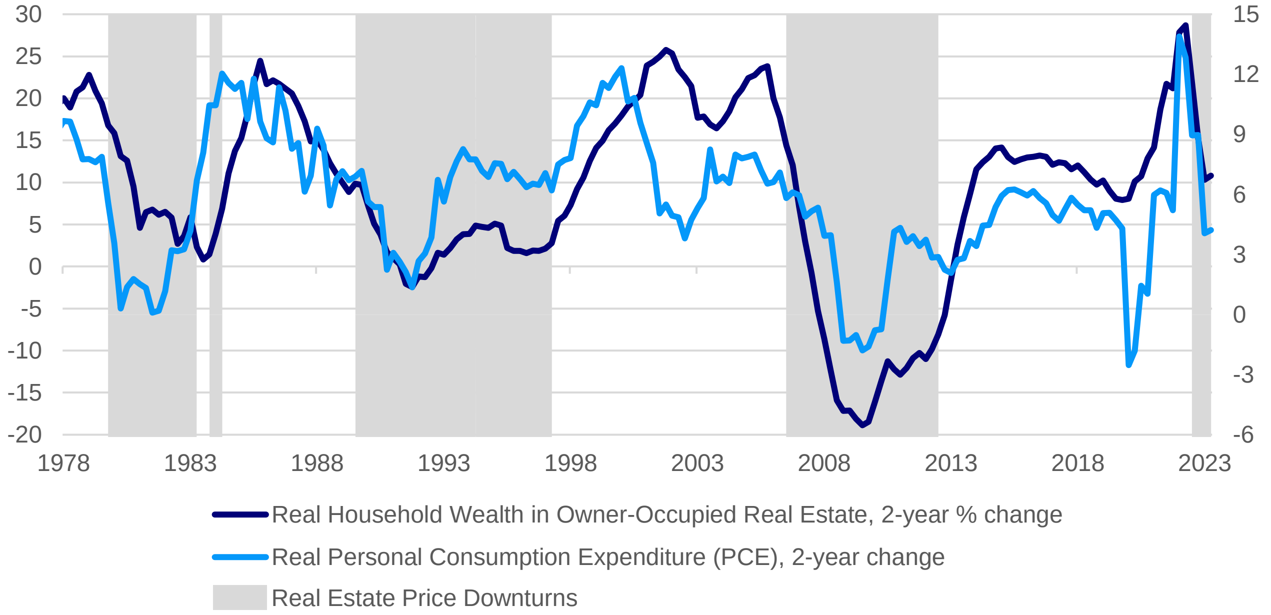
Source: Invesco and Macrobond. Real Estate Price Downturns = Periods where the year-over-year real change of residential real estate value goes below zero, as measured by the S&P Case-Shiller National Home Price Index deflated by the US consumer price index.

2.b. Real Estate Downturns’ Impact on Economy: The Wealth Effect

The Wealth Effect? Real estate values tend to drop after consumption

Contrary to expectations, consumption appears to lead drops in home-related wealth

Flow of Funds: Owner-occupied real estate (lhs, deflated) and PCE (rhs, deflated)



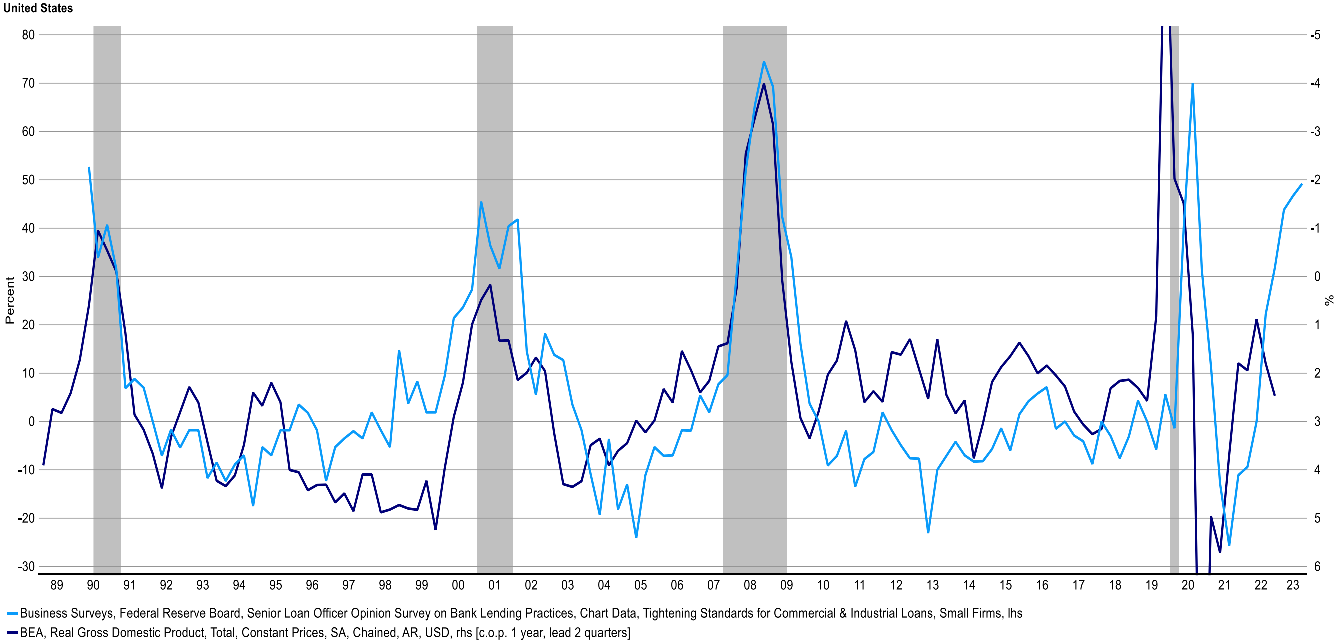
Housing does not seem to have had a significant impact on consumers' perceptions of wealth, as evidenced by consumer spending.

Sources: Invesco and Macrobond, as of 21 September 2023. Real Estate Price Downturns = Periods where the year-over-year real change of residential real estate value goes below zero, as measured by the S&P Case-Shiller National Home Price Index deflated by the US consumer price index.

2.c. Real Estate Downturns' Impact on Economy: Credit Conditions

Tightening lending standards tend to have a broader macro effect

US Senior Loan Officer Opinion Survey vs. Recessions



Recent recessions have been preceded by a tightening in credit conditions. This suggests that lending conditions have a significant impact on the broad economy, which makes sense given they affect every sector.

Sources: Invesco, Macrobond, and the Federal Reserve, as of 21 September 2023. Real Estate Downturns = Periods where the two-year moving average of residential real estate contributions to US GDP growth are negative.

3. Case Study: The 1990s Real Estate Bust

The 1990s Real Estate Bust

Policy fueled a speculative commercial real estate boom that led to a bust

- Economic Recovery Act of 1981 greatly enhanced the after-tax returns on real estate investment
- The Garn – St. Germain Act of 1982 expanded the nonresidential lending powers of savings associations

Quality of appraisals became less rigorous, credit conditions loosened throughout the 1980s

Loan portfolio expansion in the 1980s

Fed funds rate rose from 5.4% in December 1989 to 7.8% in June 1992

Many of the banks that failed during the 1980s and early 1990s were active participants in the regional real estate market booms, especially in commercial real estate

High concentrations in the volatile commercial real estate market contributed to bank failures

Source: FDIC, An Examination of the Banking Crises of the 1980s and Early 1990s

1990s Real Estate Bust

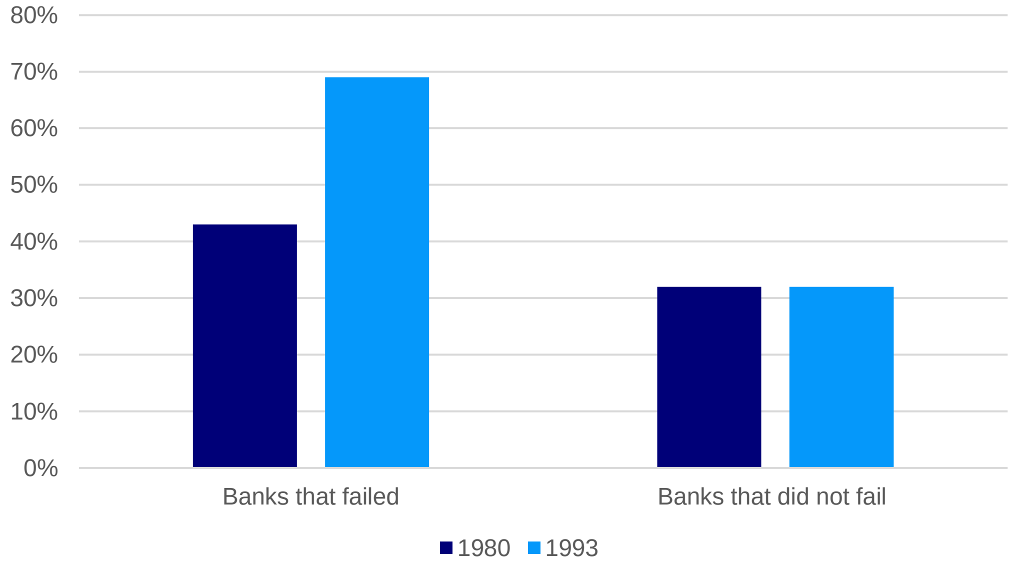
Nonperforming real estate loans as a percentage of total loans versus the fed funds rate

Nonperforming real estate loans spiked significantly as the fed funds rate rose. The loss experience for commercial real estate loans was substantially higher than the loss experience for overall real estate loans.

Source: FDIC and St. Louis Fed Research Department.

1990s Real Estate Bust

Commercial real estate exposure of banks that subsequently failed versus banks that did not subsequently fail



Source: FDIC and St. Louis Fed Research Department.

Commercial real estate loans have historically been more volatile, as commercial real estate has been characterized by very pronounced boom-bust cycles.

Banks that substantially increased their exposure to commercial real estate during the boom period were much more likely to fail in the bust period.

4. Case Study: Global Financial Crisis Real Estate Bust

The Global Financial Crisis

Residential housing was the epicenter of the GFC in the US

Policy helped fuel the speculative real estate boom in the 2000s

- Community Reinvestment Act sought to boost home ownership, with subprime lending increasing significantly

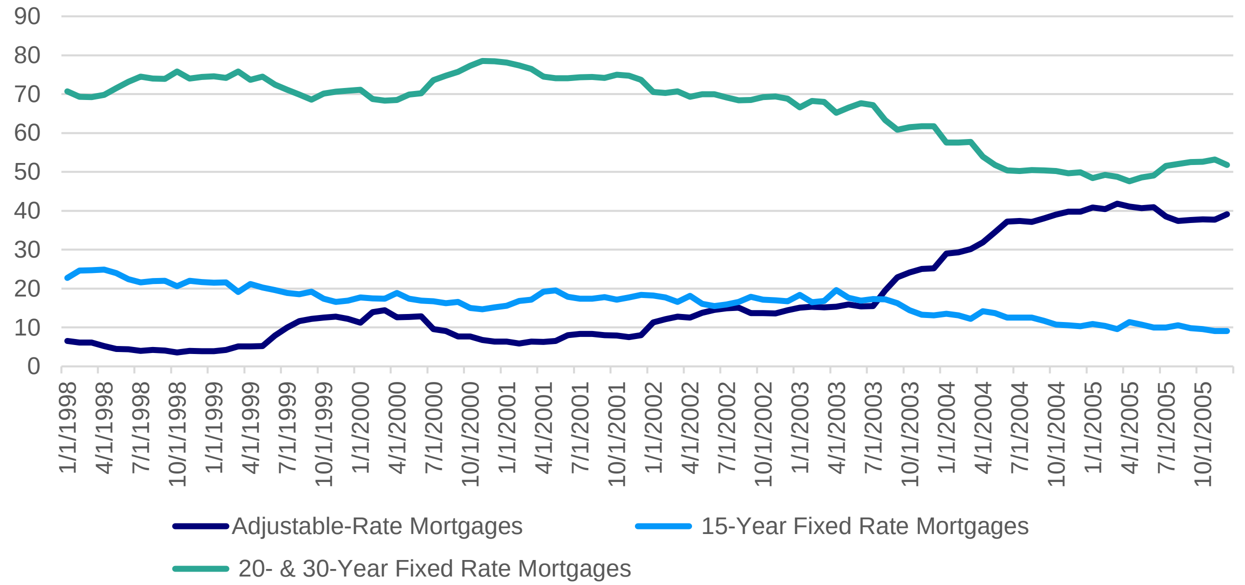
Credit standards loosened

Residential affordability declined significantly

The rise in adjustable rate mortgages and the rise in rates led to the dramatic rise in residential mortgage delinquencies

Dramatic rise in variable rate mortgages, and a significant rise in rates

Percentages of types of US mortgages over time

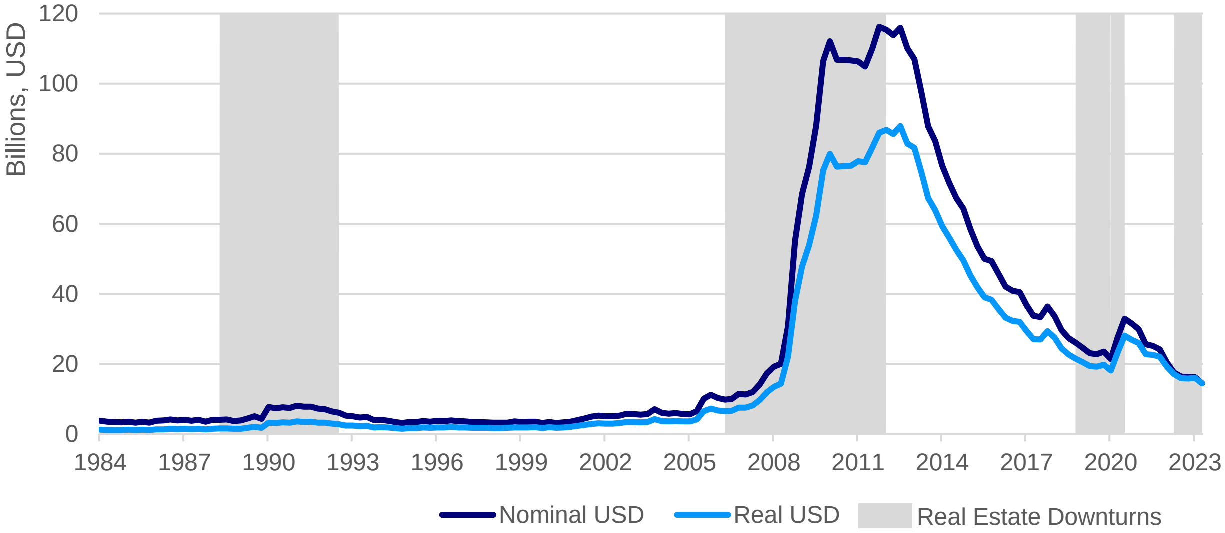


- The Great Financial Crisis of 2007/08 was precipitated by a dramatic rise in adjustable rate mortgages. As the percentage of adjustable rate mortgages rose, so did the effective fed funds rate, rising from 3.9% in December of 2000 to 5.3% by January of 2005. This was a perfect storm that led to a significant rise in delinquencies and ultimately foreclosures.

Source: Invesco and Macrobond, as of 21 September 2023. Real Estate Downturns = Periods where the two-year moving average of residential real estate contributions to US GDP growth are negative. Real USD uses today’s dollars, deflated by the consumer price index.

Beginning in 2005, there was a dramatic increase in delinquencies

Value of Real Estate Loans 90 Days or More Past Due



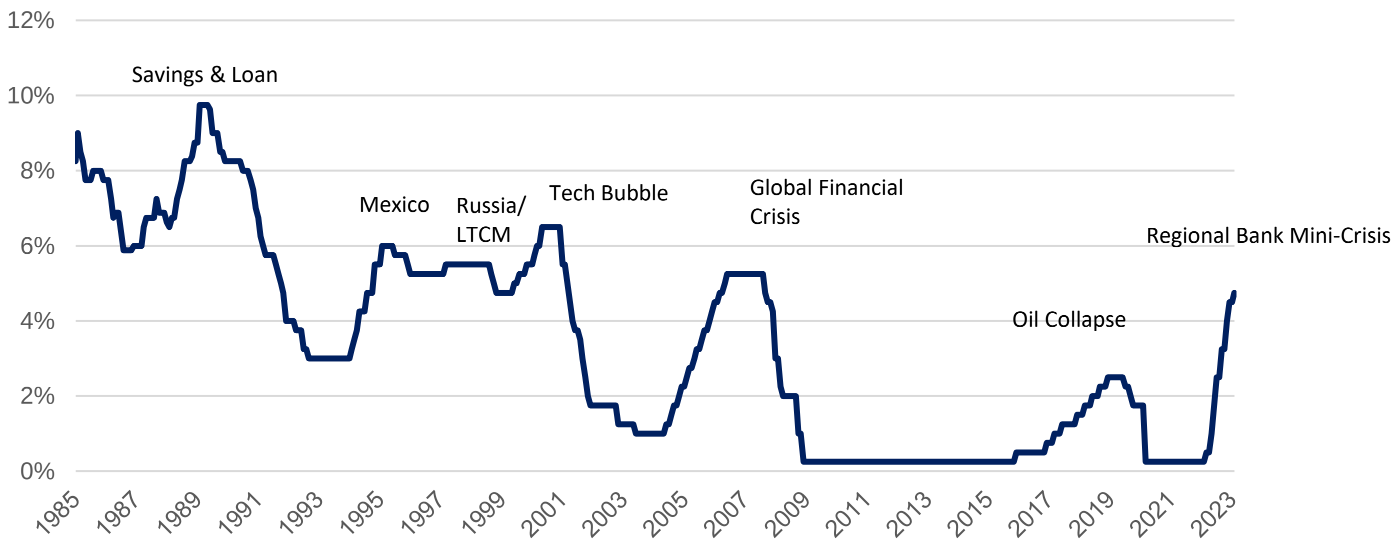
- The Great Financial Crisis of 2007/08 stands out as a unique compared to other downturns in real estate investment.
- The ‘perfect storm’ of a large increase in adjustable rate mortgages, a very substantial easing in landing standards and then a rise in rates combined to create a high level of delinquencies.

Source: Invesco and Macrobond, as of 21 September 2023. Real Estate Downturns = Periods where the two-year moving average of residential real estate contributions to US GDP growth are negative. Real USD uses today’s dollars, deflated by the consumer price index.

5. The Relationship Between Monetary Policy, Banks and Real Estate

Monetary Policy Tightening and Financial Crises

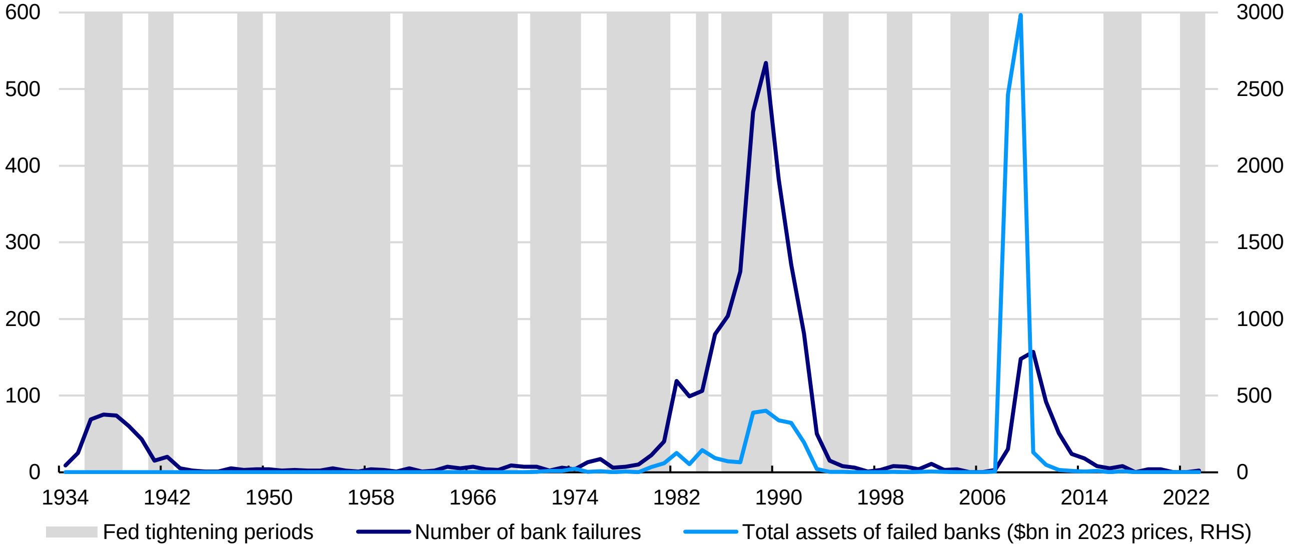
Fed Funds Rate



Source: Bloomberg, US Federal Reserve, 2/28/23.

Historical Perspective on US Bank Failures

Bank failures in the US and Federal Reserve monetary tightening periods since 1934

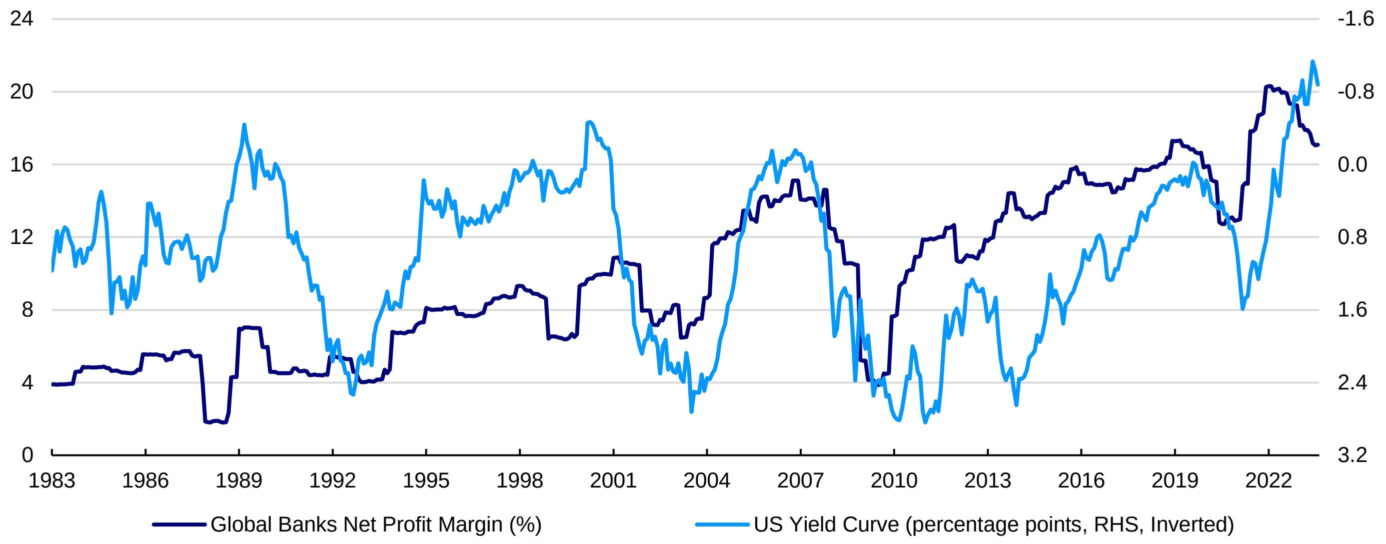


- Monetary tightening does not automatically lead to financial crises; it is necessary, but not sufficient.
- There were only three periods between 1934 and 2022 when rate rises were followed by systemic financial crises.
- The large number of bank failures in the 1930s and 1980s were manageable due to their relatively small size in terms of total assets. What made the GFC in 2008 so dangerous was not the number of banks that experienced difficulties, but their importance to the functioning of financial markets.

Note: Data as of 21st March 2023. The chart shows the total number of bank failures per year since 1934 in the United States based on Federal Deposit Insurance Corporation data and the total assets of those banks. Total assets are expressed in 2023 prices by deflating with the US consumer price index. Shaded areas indicate years during which the US Federal Reserve raised its target rates or their equivalents.
Source: Federal Deposit Insurance Corporation, Global Financial Data, Refinitiv Datastream, Invesco

Bank Profitability

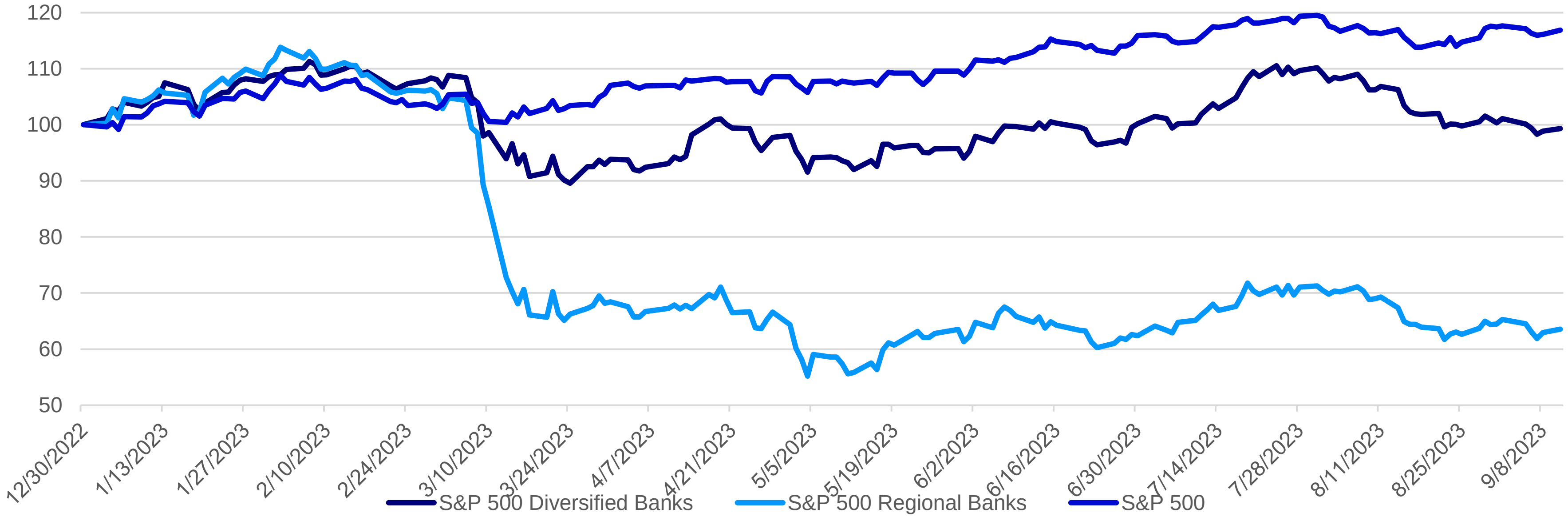
Global banks sector net profit margin vs US yield curve



Notes: Data as of August 31, 2023. **Past performance is no guarantee of future results.** We use the Datastream World Banks Index to represent the global banks sector. The yield curve is calculated using the redemption yield on the 10-year minus the 2-year Datastream United States Treasury Benchmark Bond.
Source: Refinitiv Datastream and Invesco

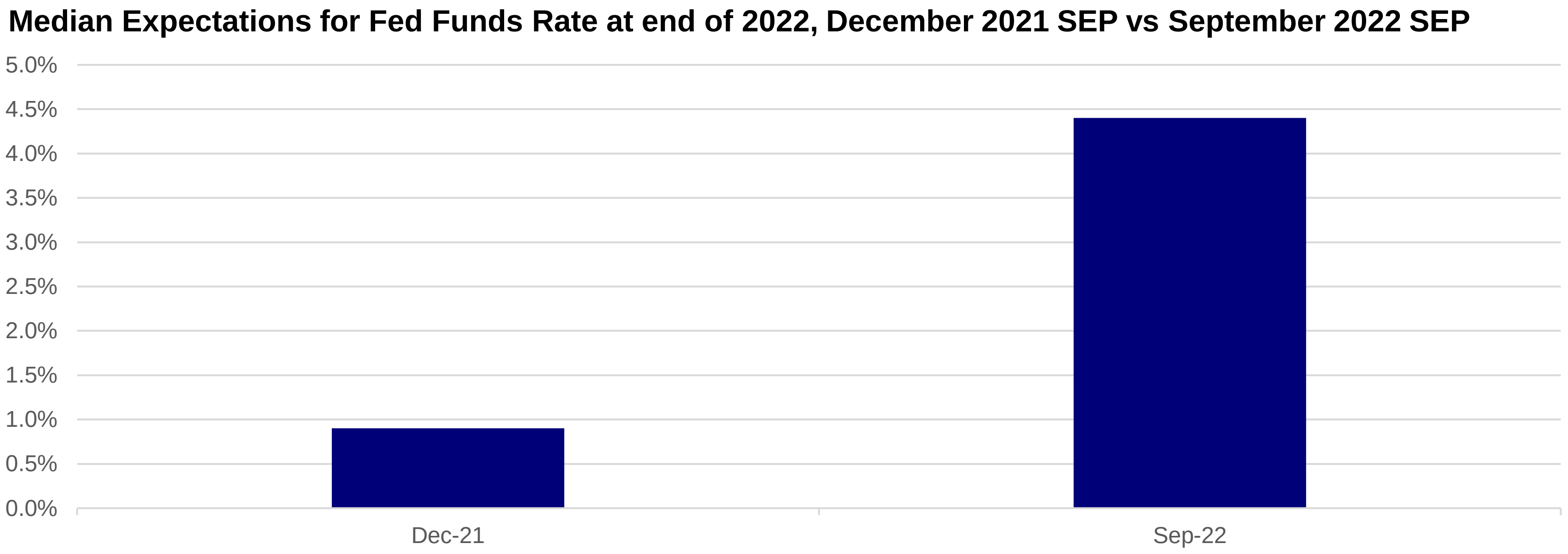
US bank share price weakness confined largely to regional banks

US bank share price performance during 2023



Note: **Past performance is no guide to future results**. Daily data from 30 December 2022 to 11 September 2023.
Sources: Bloomberg and Invesco Global Market Strategy Office.

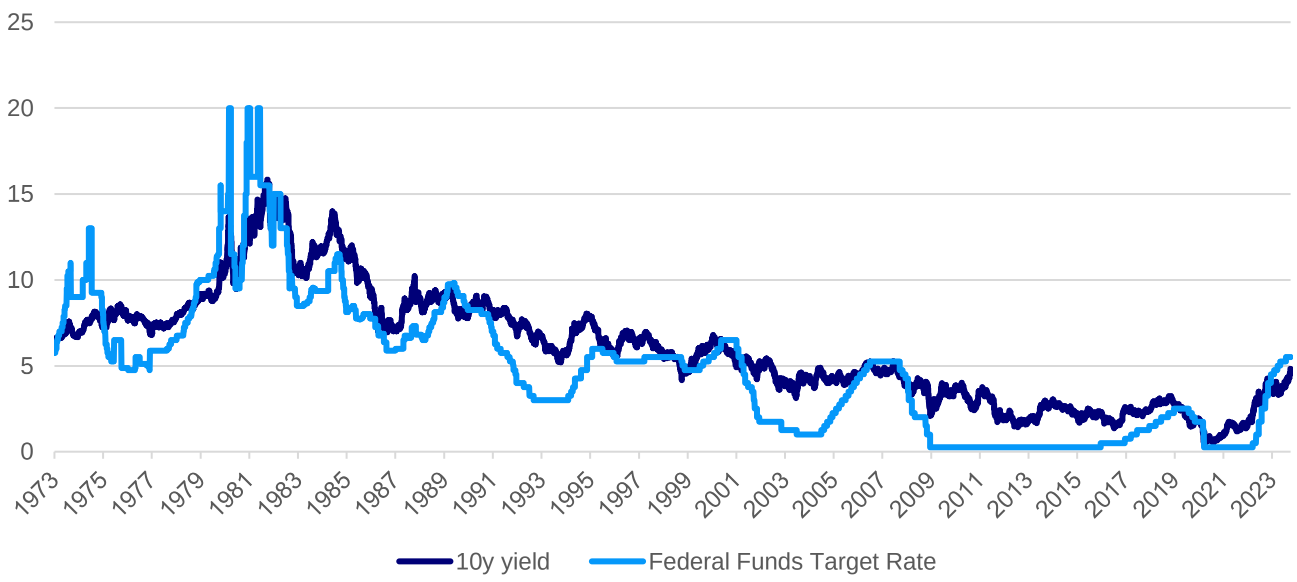
Are we sure it will be higher for longer? A reminder about the folly of placing too much importance on the ‘dot plot’



Source: Federal Reserve Board of Governors, as of 15 December 2021 and 21 September 2022.

A historical perspective on the 10-year US Treasury yield and the fed funds rate

Fed funds rate vs 10-year US Treasury yield

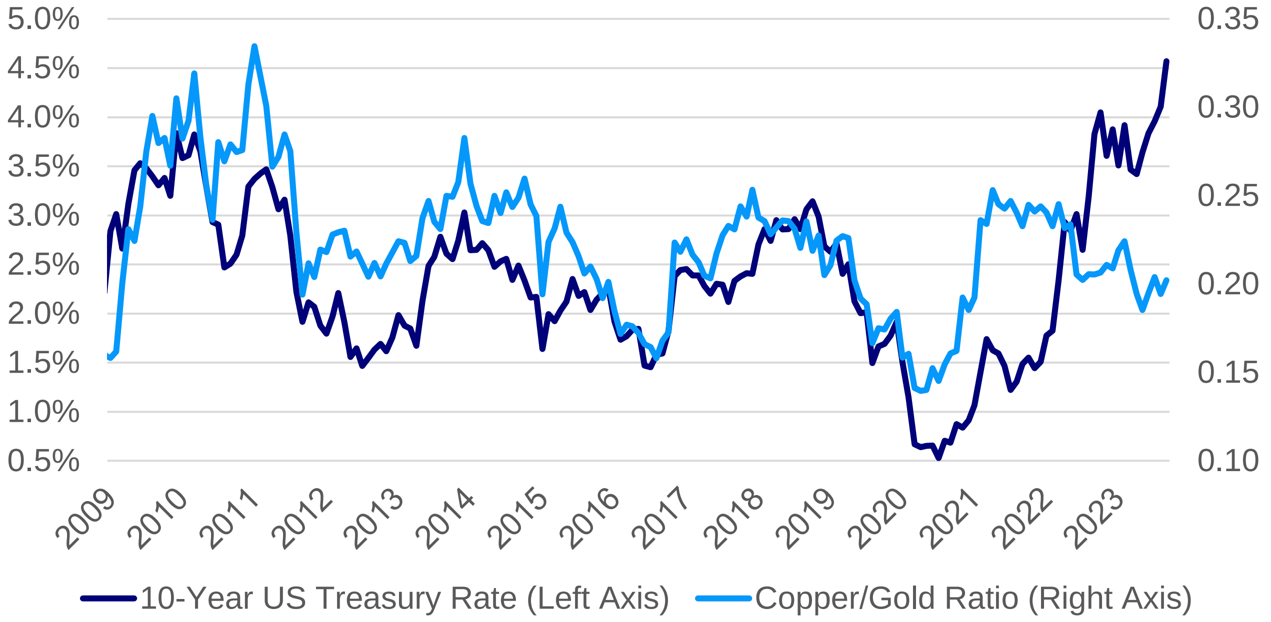


Source: Bloomberg, as of 5 October 2023

- Fear is growing that the 10-year US Treasury yield has farther to rise and could reach well above 5% . One argument being made is that historically the 10-year US Treasury yield has risen to the level of the peak fed funds rate for its respective tightening cycle.
- However, that has not always been the case, as can be seen in this chart. What's more, often the 10-year yield has quickly eased following the end the tightening cycle.
- This chart suggests that, even if the yield on the 10-year US Treasury moves higher, it is unlikely to remain there for long.

Moderating US growth suggests that the spike in US rates may be overdone

10-Year US Treasury Rate and Copper/Gold Ratio



- Historically, there has been a strong relationship between the 10-Year US Treasury Rate and the Copper/Gold ratio. Interest rates and the copper/gold ratio have tended to rise in tandem and vice versa.
- A divergence has emerged. The copper/gold ratio has generally been declining, likely in expectation of upcoming weaker economic growth. Rates, on the other hand have spiked.
- The trend of the copper/gold ratio may be suggesting that interest rates may soon be nearing a peak.

Source: Bloomberg, ‘5 October, 2023.

6. Summary and Outlook

Key Takeaways

This is not the real estate bust of the 1990s or the real estate bust of the 2000s

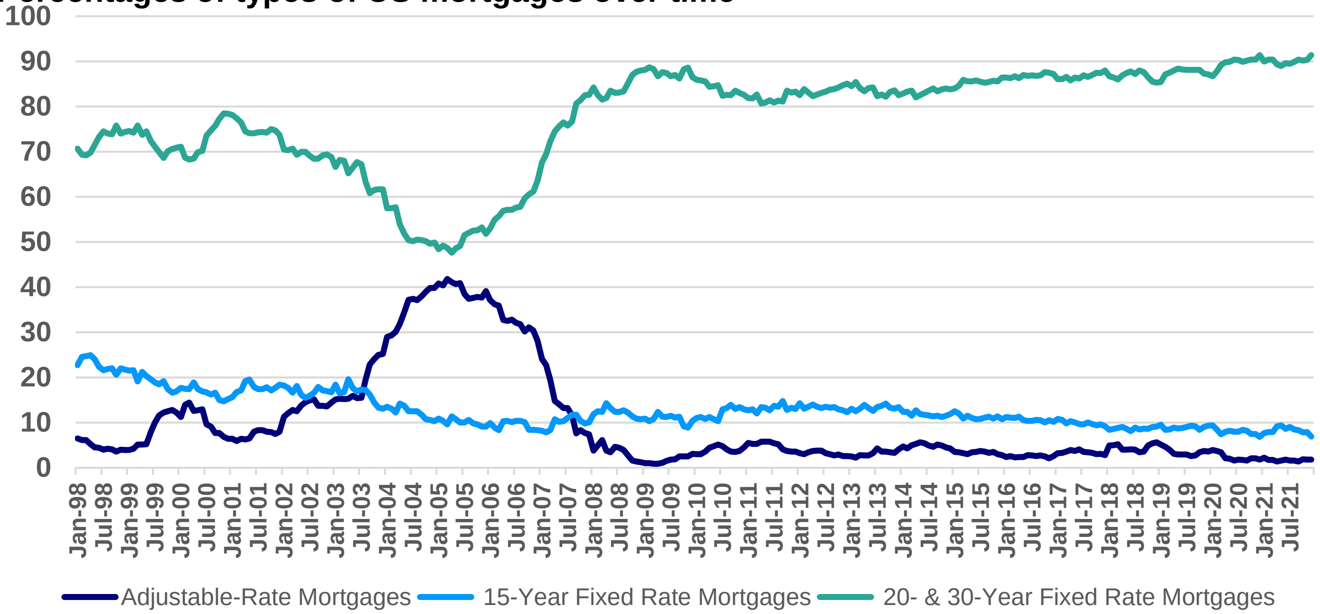
Not a speculative real estate boom

Credit standards have been tightening

Residential housing prices have remained strong with little vulnerability to higher rates because of the high percentage of long-term fixed rate mortgages

In lending, this is not 2007-2008

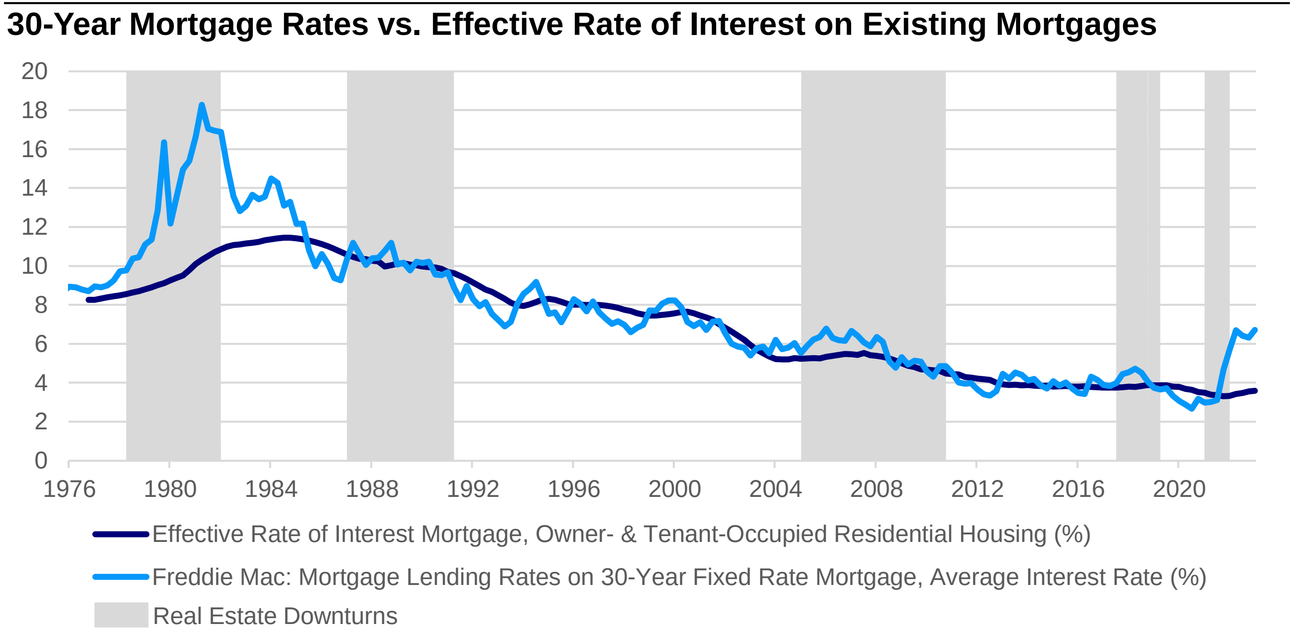
Percentages of types of US mortgages over time



- The Great Financial Crisis of 2007/08 stands out as a unique compared to other downturns in real estate investment.
- Today, real estate loans that are past due remain low. In fact, they have been falling since mid-2020.

Source: Invesco and Macrobond, as of 21 September 2023. Real Estate Downturns = Periods where the two-year moving average of residential real estate contributions to US GDP growth are negative. Real USD uses today's dollars, deflated by the consumer price index.

Higher rates have not filtered through to most mortgages

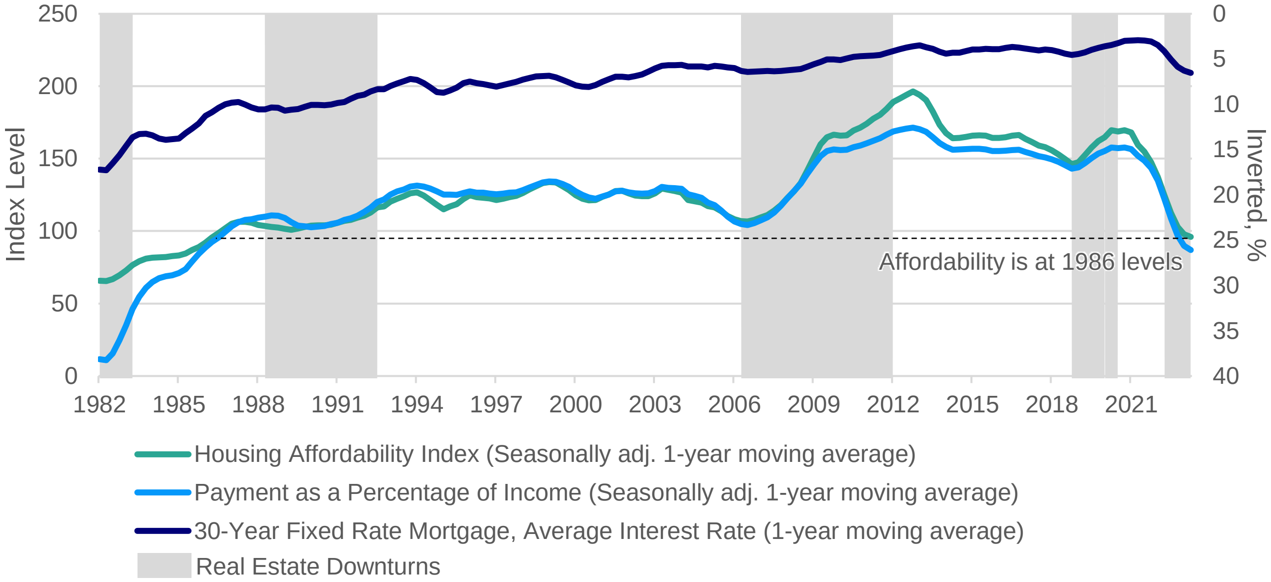


Because of the high percentage of long-term fixed rate residential mortgages, rising rates have had very little impact on the borrowing costs of existing residential homeowners.

Sources: Invesco, Macrobond, and Federal Home Loan Mortgage Corporation (Freddie Mac), as of 21 September 2023. Real Estate Downturns = Periods where the two-year moving average of residential real estate contributions to US GDP growth are negative.

Residential housing affordability is nearly at 40-year lows

Housing Affordability



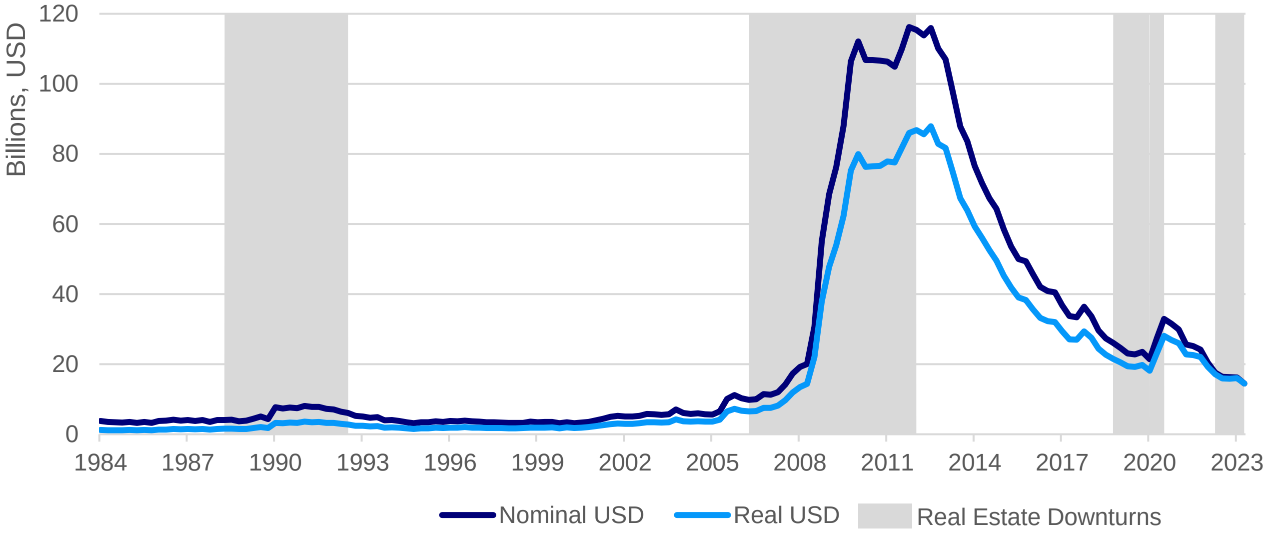
- Housing affordability is approaching a 40-year low.
- Dips in housing affordability appear to coincide with declines in residential construction investment.
- Mortgage payments currently comprise a greater % of income than in the GFC. Yet the value of real estate loans 90 days or more past due has been trending downwards.
- While affordability is low and payments are high, we believe that a uniquely affordable era for housing means most home-owners have secured favourable rates. Unless circumstances change significantly, we believe homeowners are likely to continue to meet their obligations.

Source: Invesco, Macrobond, and National Association of Realtors, as of 21 September 2023. For more information on the affordability index and its methodology, please refer to: https://www.nar.realtor/research-and-statistics/housing-statistics/housing-affordability-index/methodology. Real Estate Downturns = Periods where the two-year moving average of residential real estate contributions to US GDP growth are negative.

In lending, this is not 2007-2008

Real estate loans that are past due are falling

Value of Real Estate Loans 90 Days or More Past Due



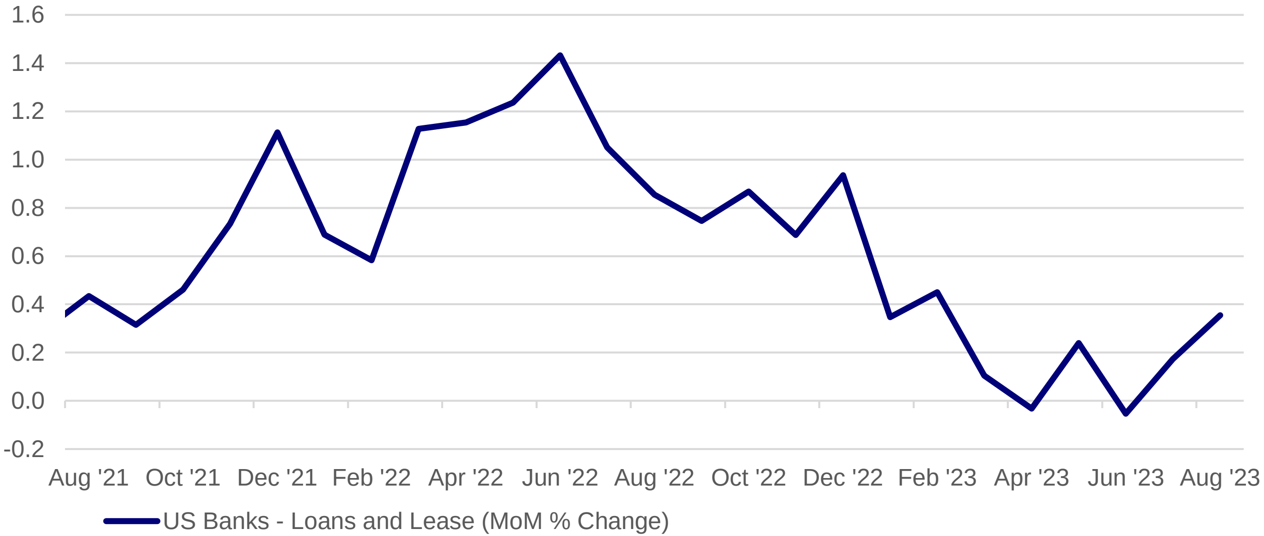
- The Great Financial Crisis of 2007/08 stands out as a unique compared to other downturns in real estate investment.
- Today, like in the 80s, 90s, and the pandemic, real estate loans that are past due remain low. In fact, they have been falling since mid-2020.

Source: Invesco and Macrobond, as of 21 September 2023. Real Estate Downturns = Periods where the two-year moving average of residential real estate contributions to US GDP growth are negative. Real USD uses today's dollars, deflated by the consumer price index.

Invesco

Bank lending has recently improved

US Banks: Loans and Leases in Bank Credit (August 2021 – August 2023)

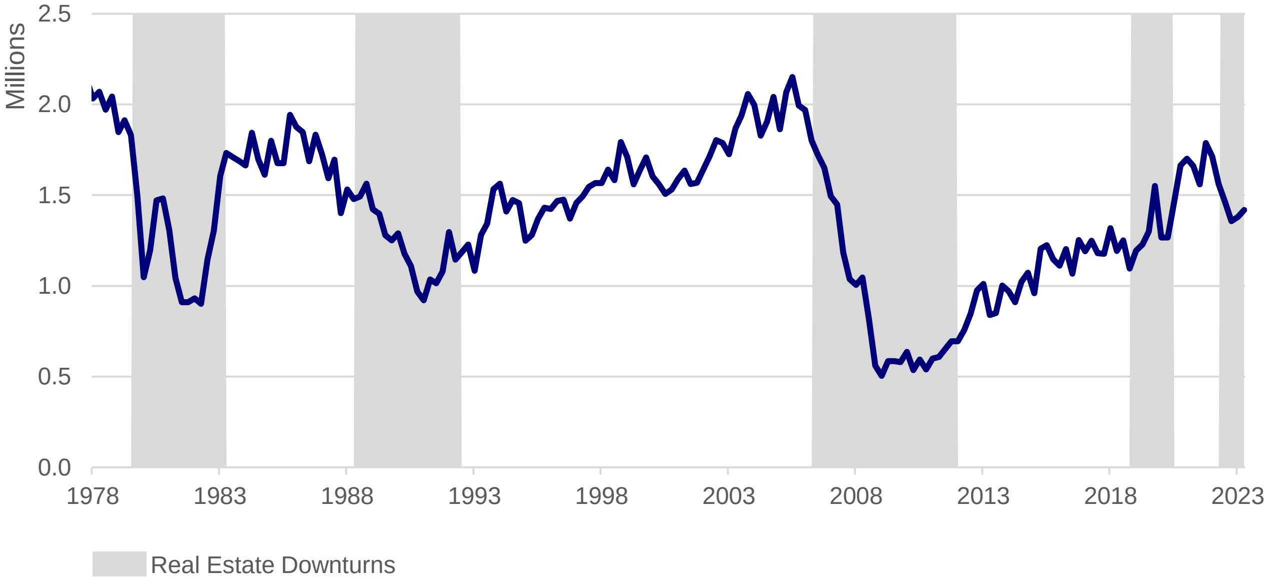


Sources: Invesco and Macrobond, as of 2 October 2023.

In past downturns, housing starts have fallen harder and faster

Today's environment suggests less pain in construction

New housing starts (privately-owned)

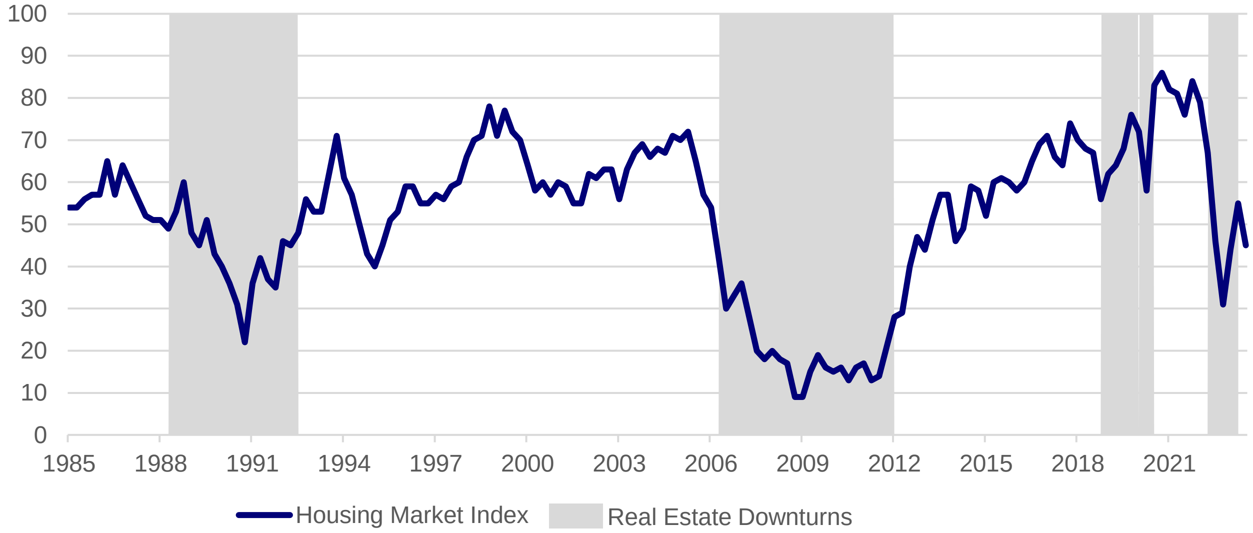


Source: Invesco and Macrobond, as of 21 September 2023. Real Estate Downturns = Periods where the two-year moving average of residential real estate contributions to US GDP growth are negative.

Invesco

Homebuilder sentiment appears to be rebounding

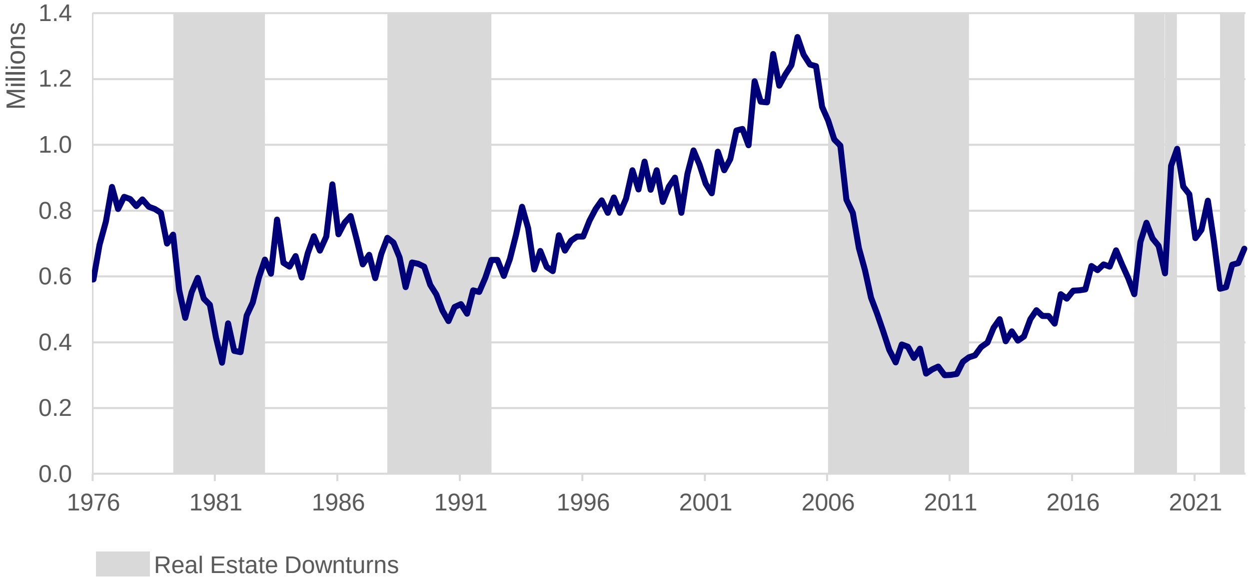
National Association of Home Builders, Housing Market Index



Source: Invesco and Macrobond, as of 22 September 2023. Real Estate Downturns = Periods where the two-year moving average of residential real estate contributions to US GDP growth are negative.

New home sales are already climbing
Rising home sales suggests a milder weak patch in housing

New home sales, annualized rate

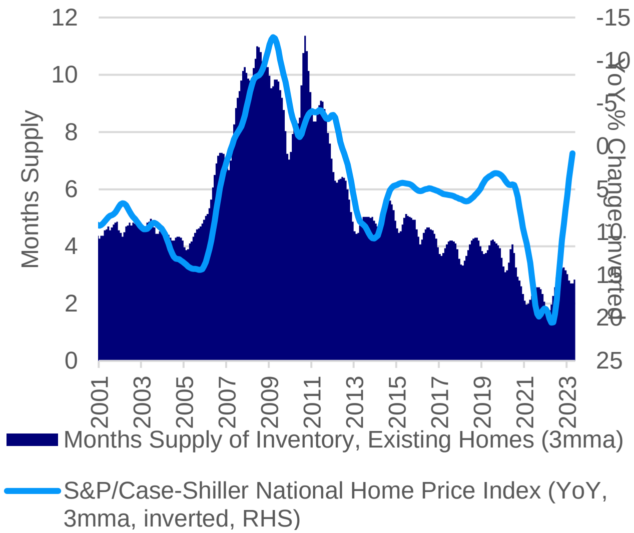


Source: Invesco and Macrobond, as of 21 September 2023. Real Estate Downturns = Periods where the two-year moving average of residential real estate contributions to US GDP growth are negative.

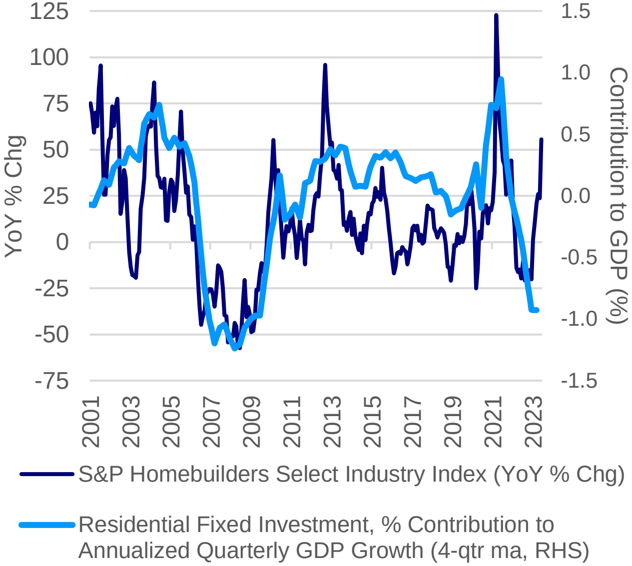
Invesco

Lack of Housing Inventory May Help Boost US Growth
Tight supply should support home prices and homebuilding

US Housing Supply vs. Home Prices



Homebuilder Stocks vs. GDP Contribution

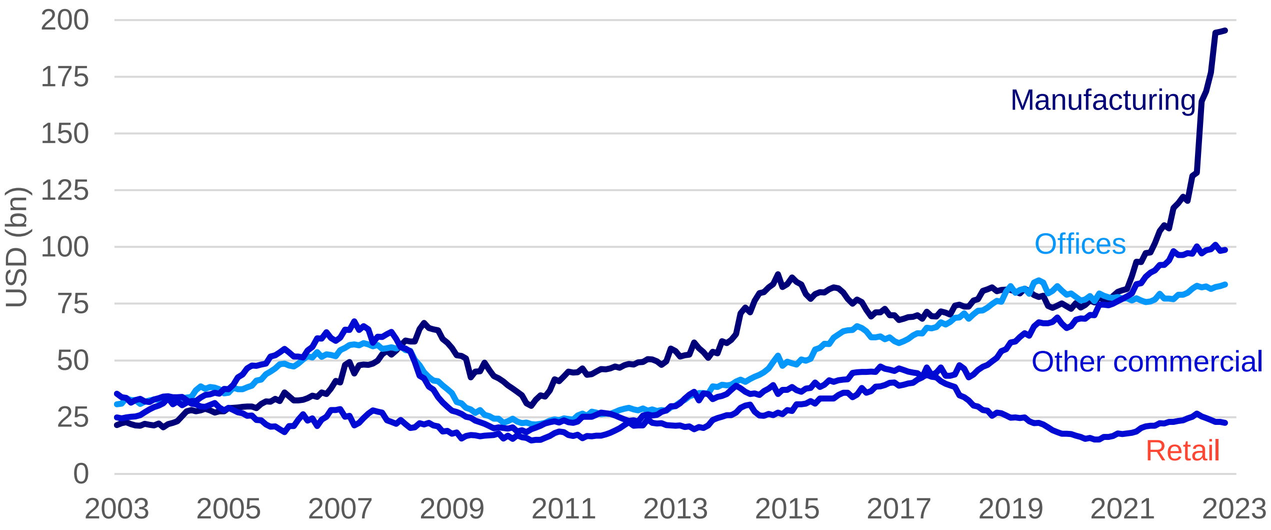


- Homebuilder stocks have been reaccelerating as soft indicators point to a continued revival in housing—and supply remains extraordinarily tight, as confirmed in the latest Beige Book survey from the Federal Reserve that cited “limited inventory” in housing that has helped prop up prices and homebuilding activity.
- Indeed, much of the recent re-acceleration in housing is likely attributable to tight housing supply mixed with surprisingly resilient demand. If sustained, the rise in homebuilding activity should help economic growth
- Despite residential investment making up just 3-5% of the economy, it regularly has added around 0.4% to quarterly GDP growth. This could be good news for an economy on weak legs.

Left: Sources: National Association of Realtors, S&P Global, and Invesco. Latest monthly data available as at 14 July 2023. 3mma = three-month moving average. Right: Sources: Bloomberg, US Bureau of Economic Analysis, Macrobond, and Invesco. Latest data available as at 14 July 2023. 4-qtr ma = four-quarter moving average.

Powerful force for non-residential investment and the overall economy: US re-industrialization

US construction spending in nonresidential structures (SAAR)



- The CHIPS and Science Act has seen a surge in building in the manufacturing sector in the US accounting for most of the growth in non-residential structures over the last year.
- This is ahead of the full impact of the Inflation Reduction Act which has just had its first anniversary, and which should support further growth in the sector.
- These fiscal programs have further potential consequences: less FDI from the US; and attracting firms to move operations to the US.

Sources: DataStream, monthly data as at 25 August 2023. Retail is the sum of: multi-retail; shopping centers and shopping malls. Other commercial is commercial less retail.

Marin County Employees' Retirement Association

Inflation Overview

October 17, 2023

Michael J. Bazdarich, PhD
Frances L. Coombes

Western Asset

Biographies

MICHAEL J. BAZDARICH

46 Years' Experience

- *Western Asset Management Company, LLC, 2005-, Product Specialist/Economist*
- *MB Economics, 1986-2005, Consulting Economist*
- *UCLA Anderson Forecast, 2003-2005, Senior Economist*
- *UCR Forecasting Center, 1993-2003, Director*
- *Claremont Economics Institute, 1981-1986, Vice President, Forecasting/Advisory Services*
- *United California Bank, 1980-1981, Vice President, Deputy Director of Research*
- *Federal Reserve Bank of San Francisco, 1977-1980, Economist*
- *University of Chicago, PhD Economics*
- *University of Santa Clara, B.A.*

FRANCES L. COOMBES

25 Years' Experience

- *Western Asset Management Company, LLC, 1998-, Client Service Executive*
- *Columbia University, School of International and Public Affairs, M.P.P.*
- *University of California, Berkeley, B.A., magna cum laude*

Western Asset experience reflects current position title and hire date.

Table of Contents

About Western Asset

About Western Asset

Western Asset is a globally integrated fixed-income manager, sourcing ideas and investment solutions worldwide.

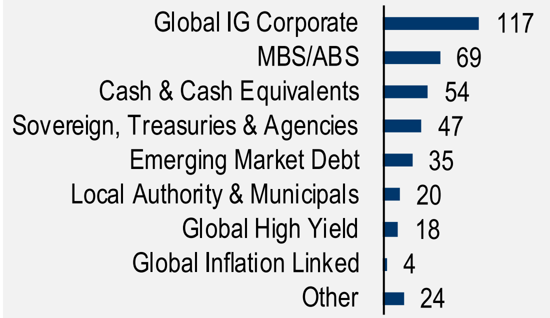
Western Asset At a Glance

- Founded in 1971. Specialist Investment Manager of Franklin Resources, Inc. since July 31, 2020
- Fixed-income value investors
- $388.0 billion (USD) AUM
  - $333.7 billion (USD) long-term assets
  - $54.4 billion (USD) cash and cash equivalent assets
- 727 employees

Organizational Pillars

- Clients first
- Globally integrated
- Team-based
- Active fixed-income
- Integrated risk management

AUM by Sector – Total $388.0 billion (USD)



Western Asset's Deep Global Integration Allows Us to Source Investment Ideas and Investment Solutions Across Regions

Investment Management

- 130 investment professionals on five continents and in seven offices
- 25 years average experience
- 38 portfolio and quantitative analysts in portfolio operations

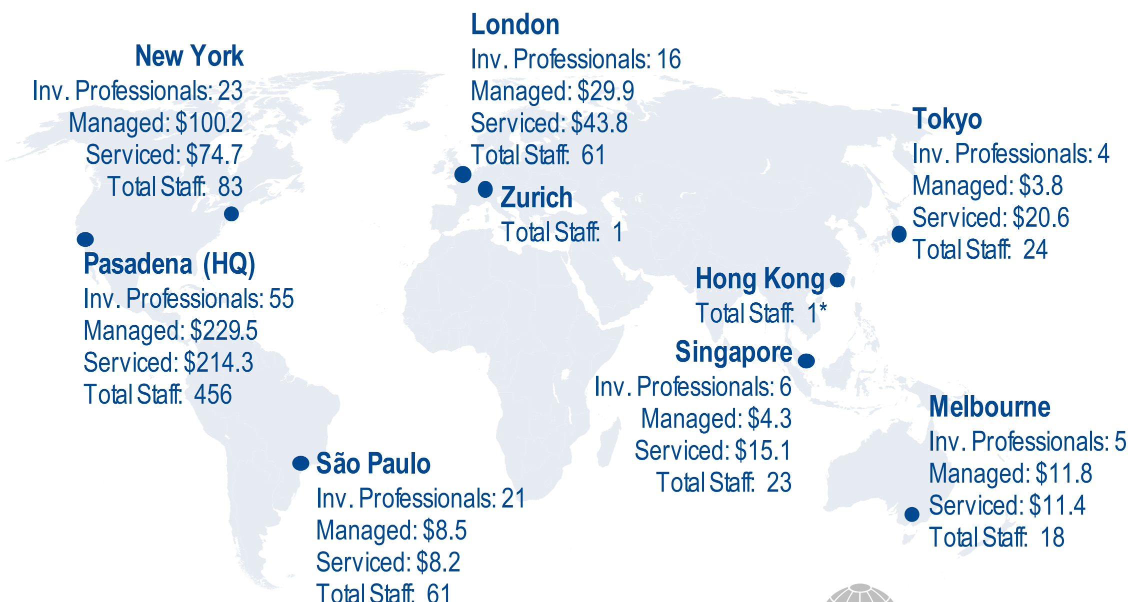
Client Service & Marketing

- 164 staff dedicated to client service
- Specialized teams to meet individual client needs

Risk Management & Operations

- Independent risk management function with 34 professionals including 12 PhDs
- 284 staff dedicated to globally integrated operations

Global Footprint (AUM in USD billions)



Source: Western Asset. As of 30 Jun 23

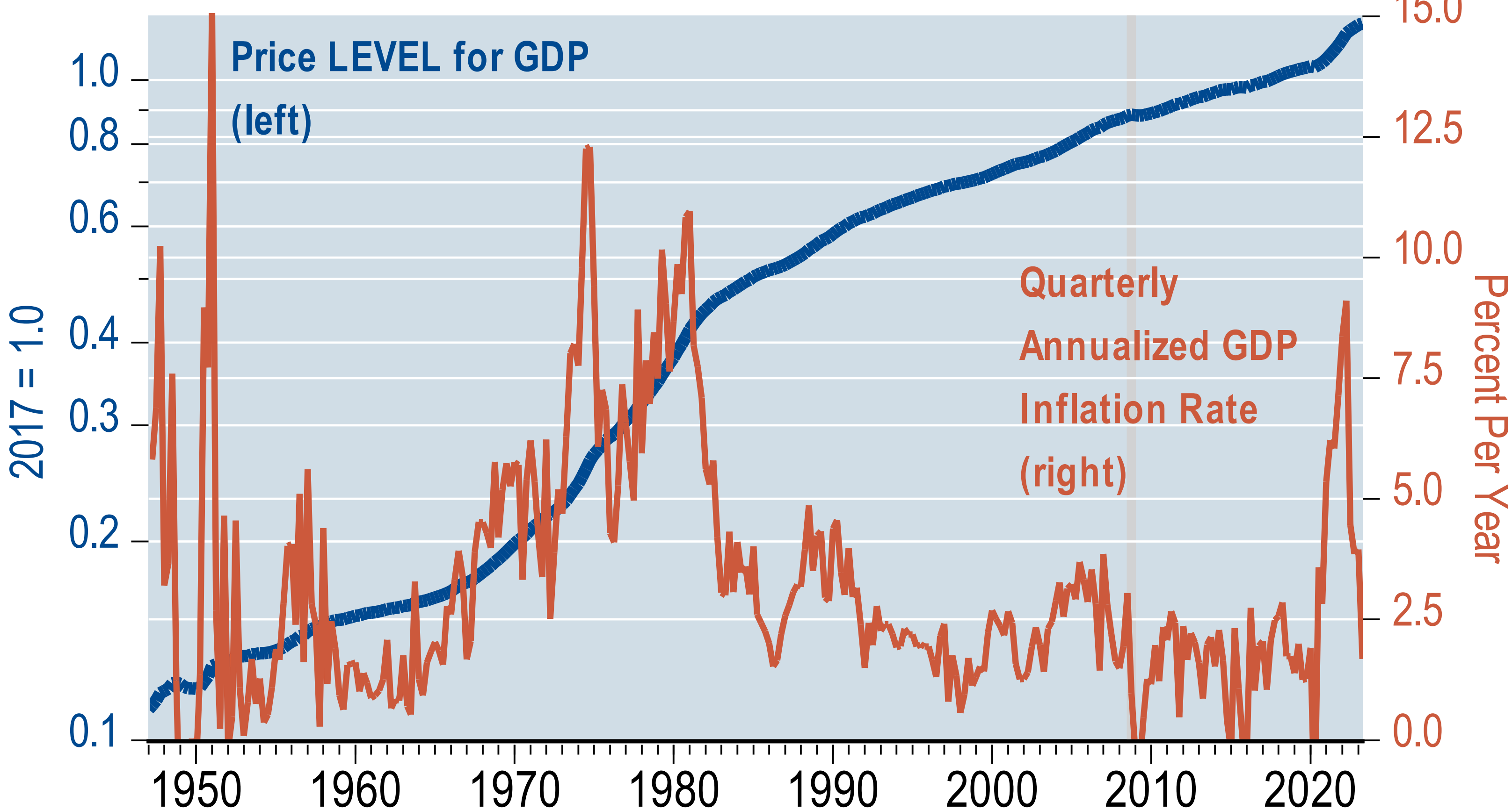
**Splits time between Hong Kong and Singapore offices*

Inflation Overview

Understanding Inflation

- Inflation is NOT high prices, it is rising prices
- For better or worse, the Fed is NOT trying to reverse the price increases of the past two years, but it IS trying to arrest the increases
- It actually has been pretty successful at this

GDP Price Level and GDP Inflation

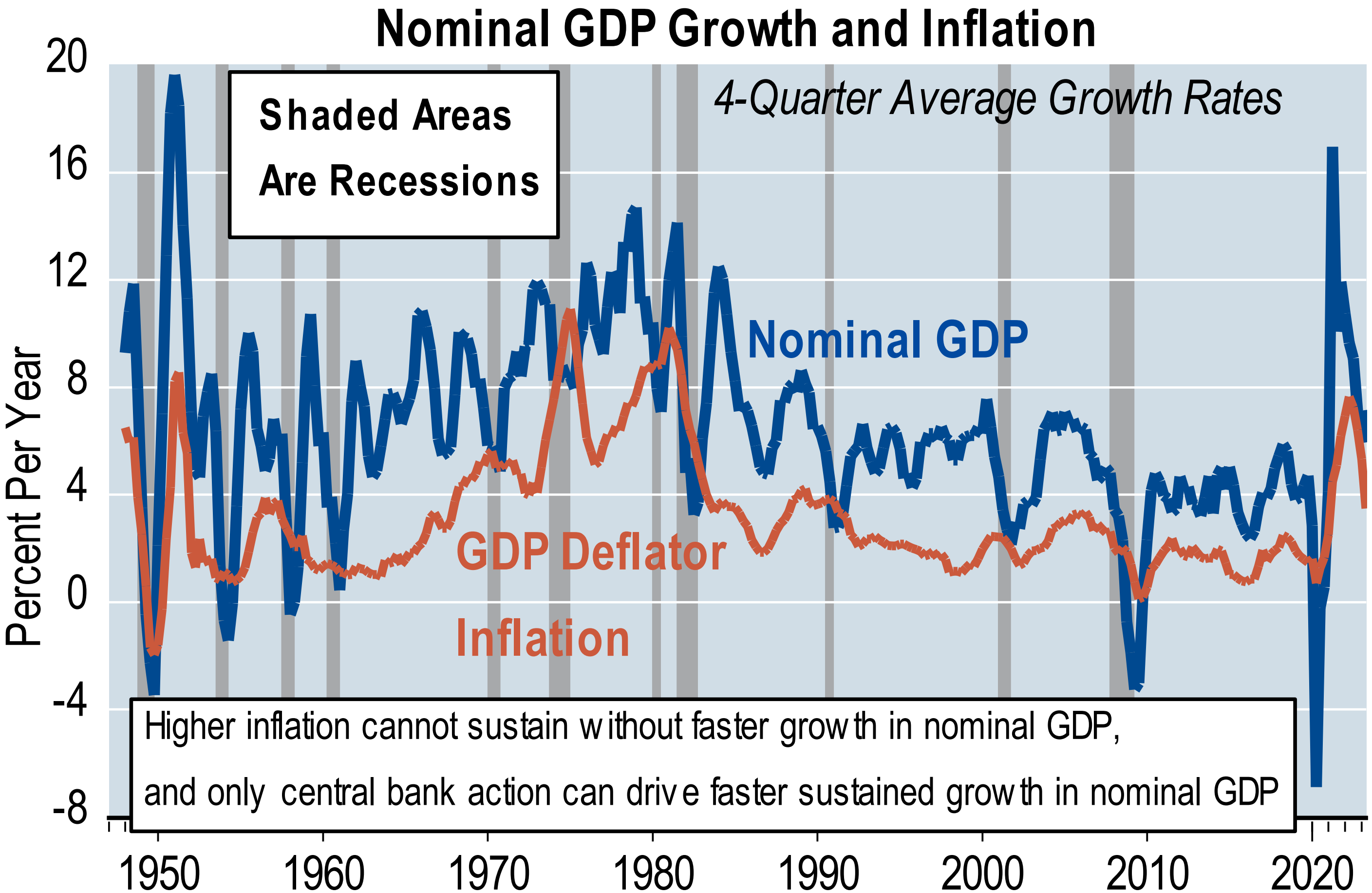


Source: Bureau of Economic Analysis. As of 30 Jun 23

WESTERN ASSET

Inflation Is a MACRO Phenomenon, Not a MICRO One

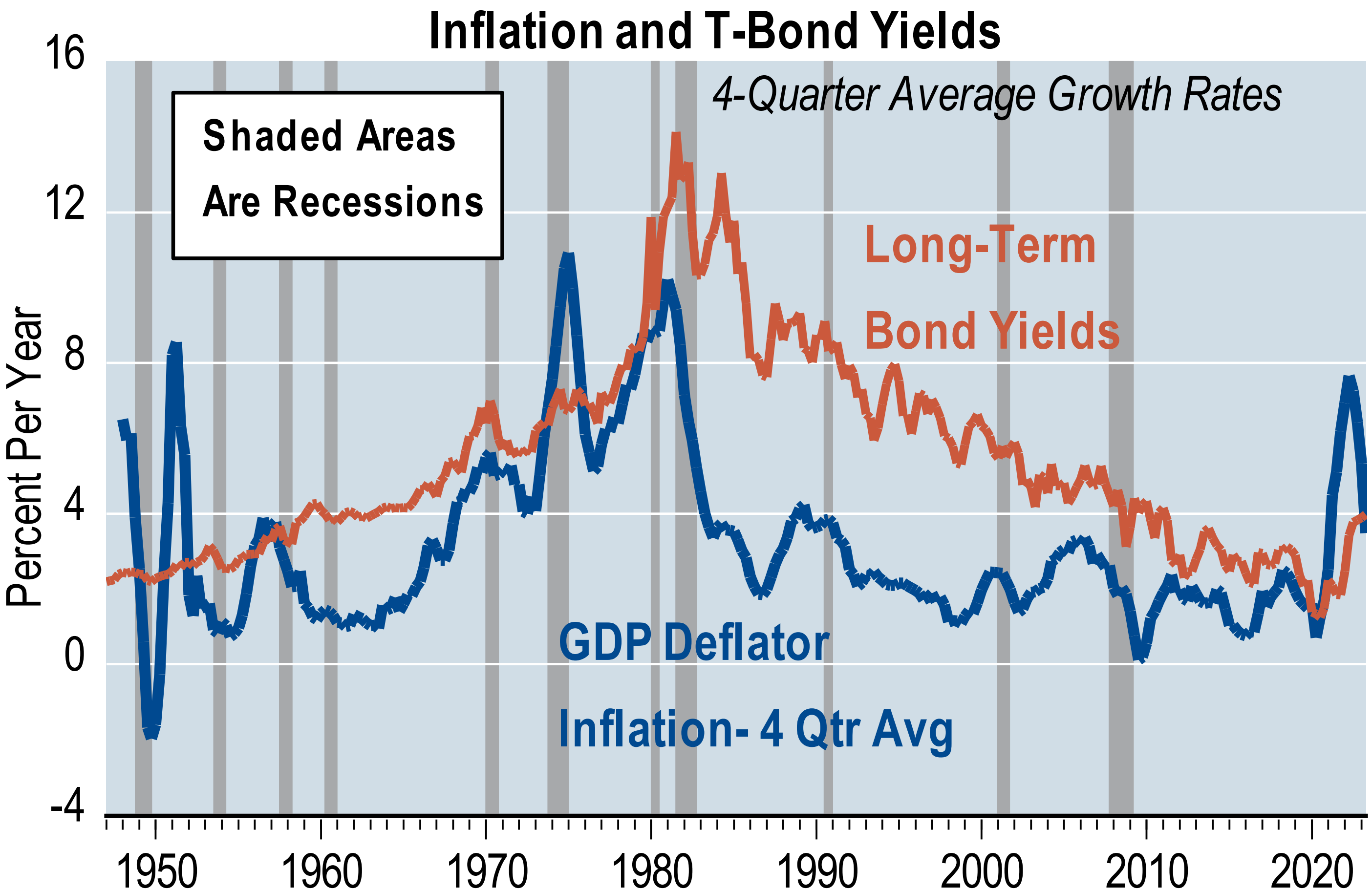
- In other words, inflation does not occur because some workers get a raise or because supply is constrained in a particular market or because OPEC raises prices
- Such factors push prices up in one sector, leading to downward price pressure in other sectors
- In order for such factors to lead to higher prices ACROSS the economy, spending growth across the economy has to be growing rapidly enough for all prices to rise without putting downward pressure on output



Source: Bureau of Economic Analysis. As of 30 Jun 23

Inflation Is The Major Influence on Interest Rates

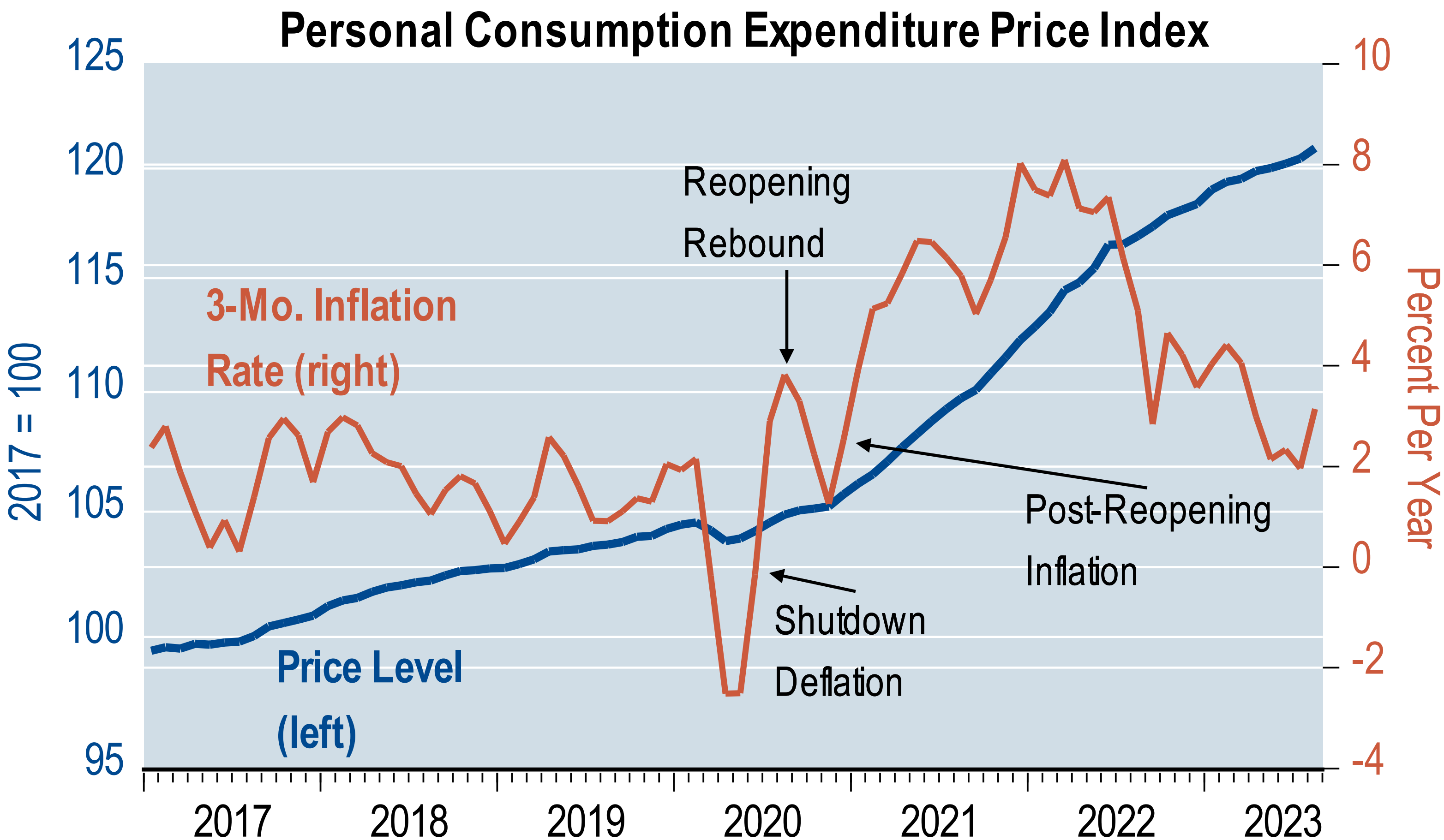
- Up- and down-trends in yields coincide with up- and down-trends in inflation
- There are lags in play, and other factors can have short-term effects on yields…
- …but historically, having a good handle on inflation trends provides a good take on interest rate trends



Source: Bureau of Economic Analysis. As of 30 Jun 23

COVID Changed Everything!

- Shutting down the economy disrupted economic activity unlike anything anyone has ever seen before
- A health economy suddenly lurched into the sharpest decline in US history
- Prices declined during the shutdown, rebounded during the reopening, and then lurched higher on net in late-2021 and after, as hamstrung supply lines were strained and as excessive government stimulus flowed through the economy
- Conditions have been normalizing since then



Source: Bureau of Econpomic Analysis. As of 31 Aug 23

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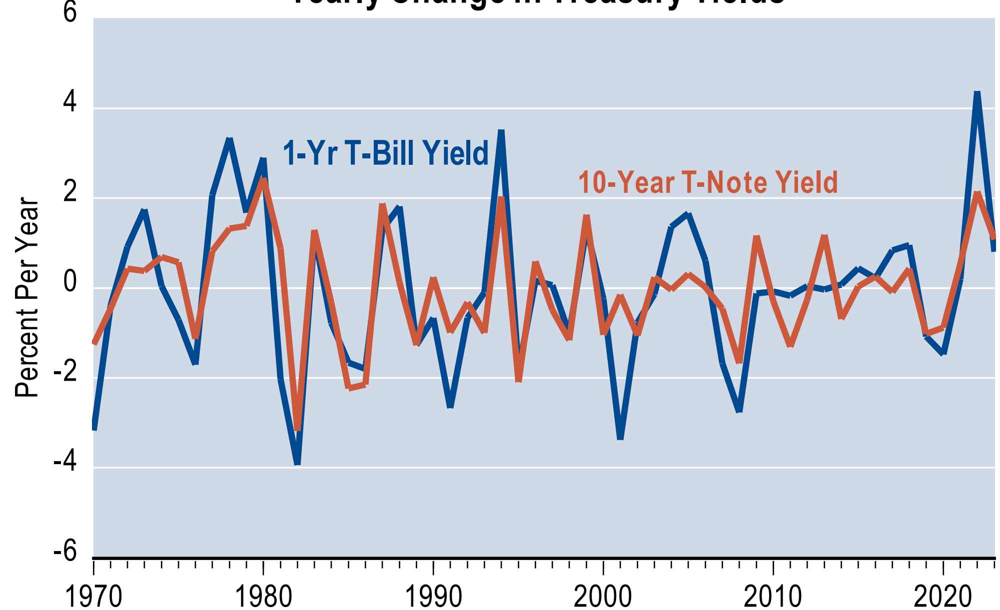
Policy Has Changed Back

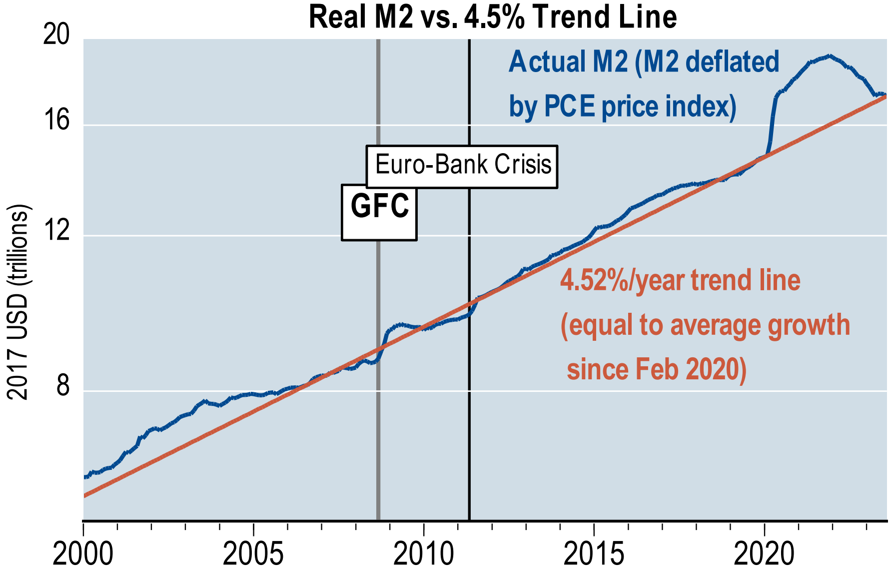
- Interest rates in 2022 showed their sharpest increase in 60 years and have risen further in 2023
- The money stock soared in 202-21. It has since fallen all the way back to the trend path it was on prior to Covid

Yearly Change in Treasury Yields



Source: Federal Reserve Board. As of 30 Sep 23

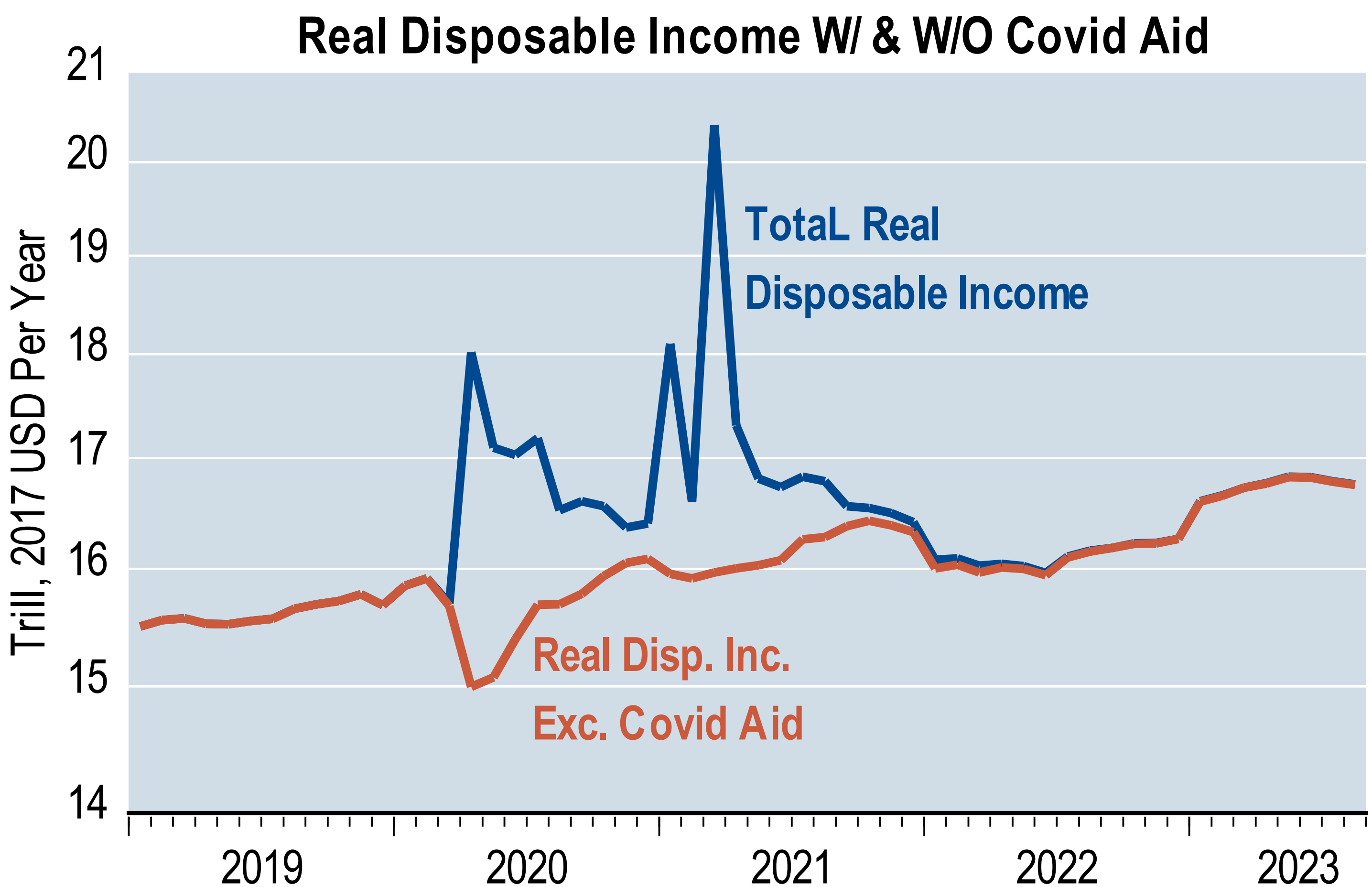
Real M2 vs. 4.5% Trend Line



Source: Federal Reserve Board, Bureau of Economic Analysis. As of 31 Aug 23

Policy Has Changed Back

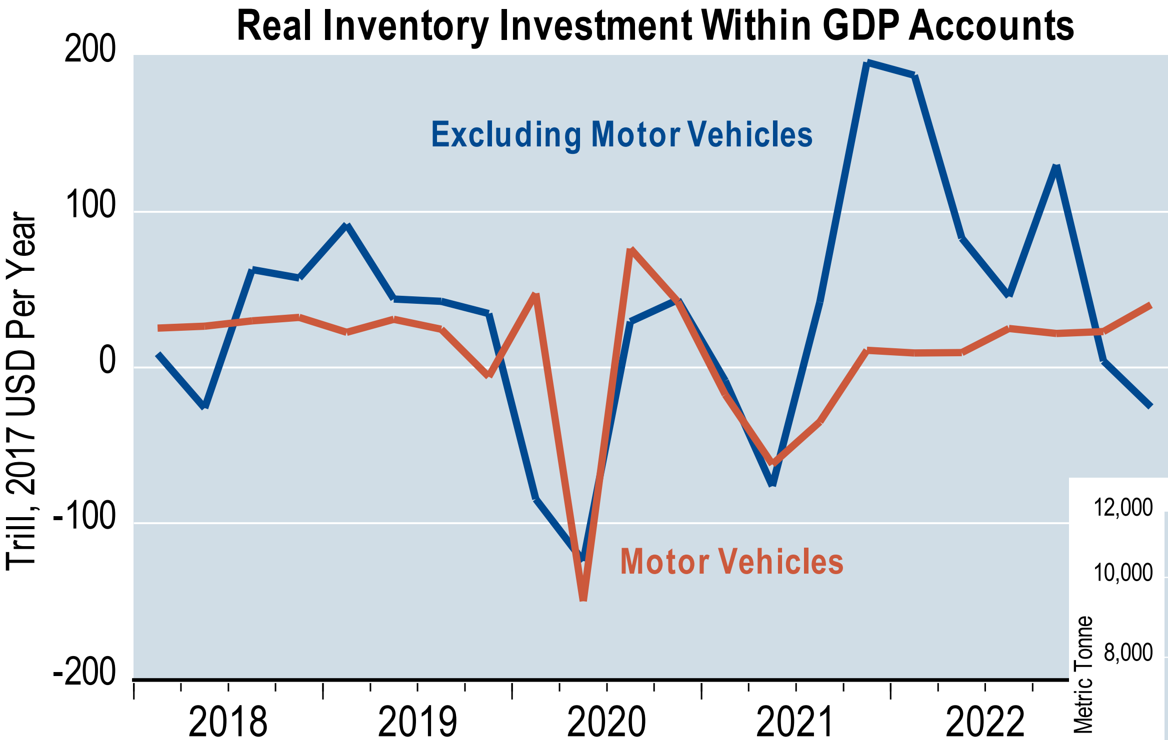
- Federal aid to households to counter the pandemic was FOUR times larger than the losses suffered by households from the pandemic. That aid has now dried up



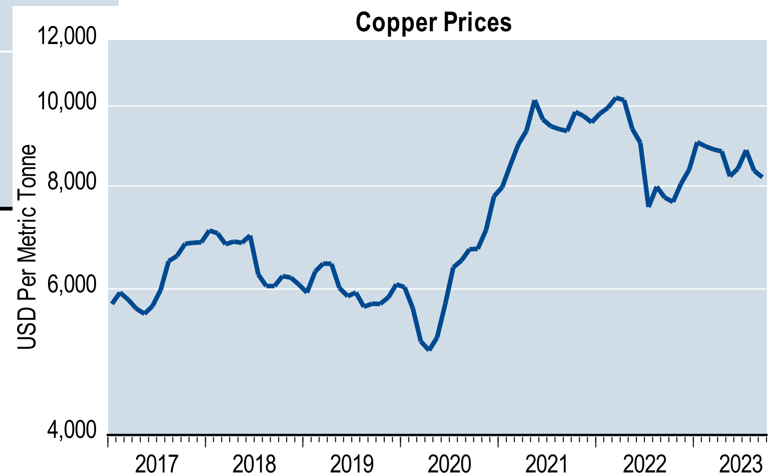
Source: Bureau of Economic Analysis, Western Asset. As of 31 Aug 23

Supply Chains Easing

- In 2021, as demand rebounded and supply chains were still clogged, inventories were run down, and commodity prices soared
- As supply chains have normalized, merchants got stuck with EXCESSIVE inventories and have been liquidating them more recently
- In line with this, commodity prices have generally pulled back (oil being the glaring exception)



Source: Bureau of Economic Analysis. As of 30 Jun 23



Source: Index Mundi, Trading Economics. As 29 Sep 23

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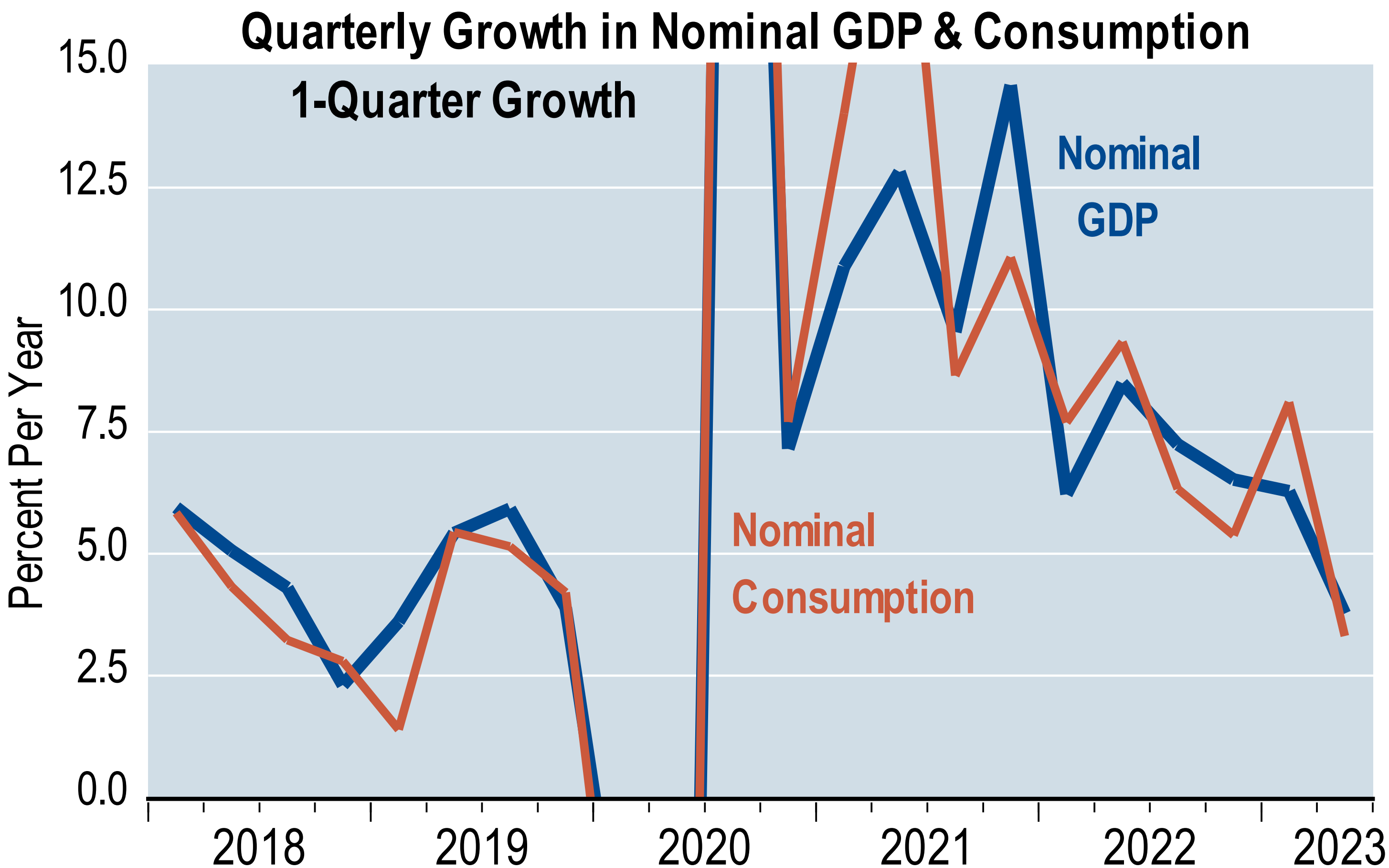
Nominal Spending Growth Has Slowed to Pre-Pandemic Rates

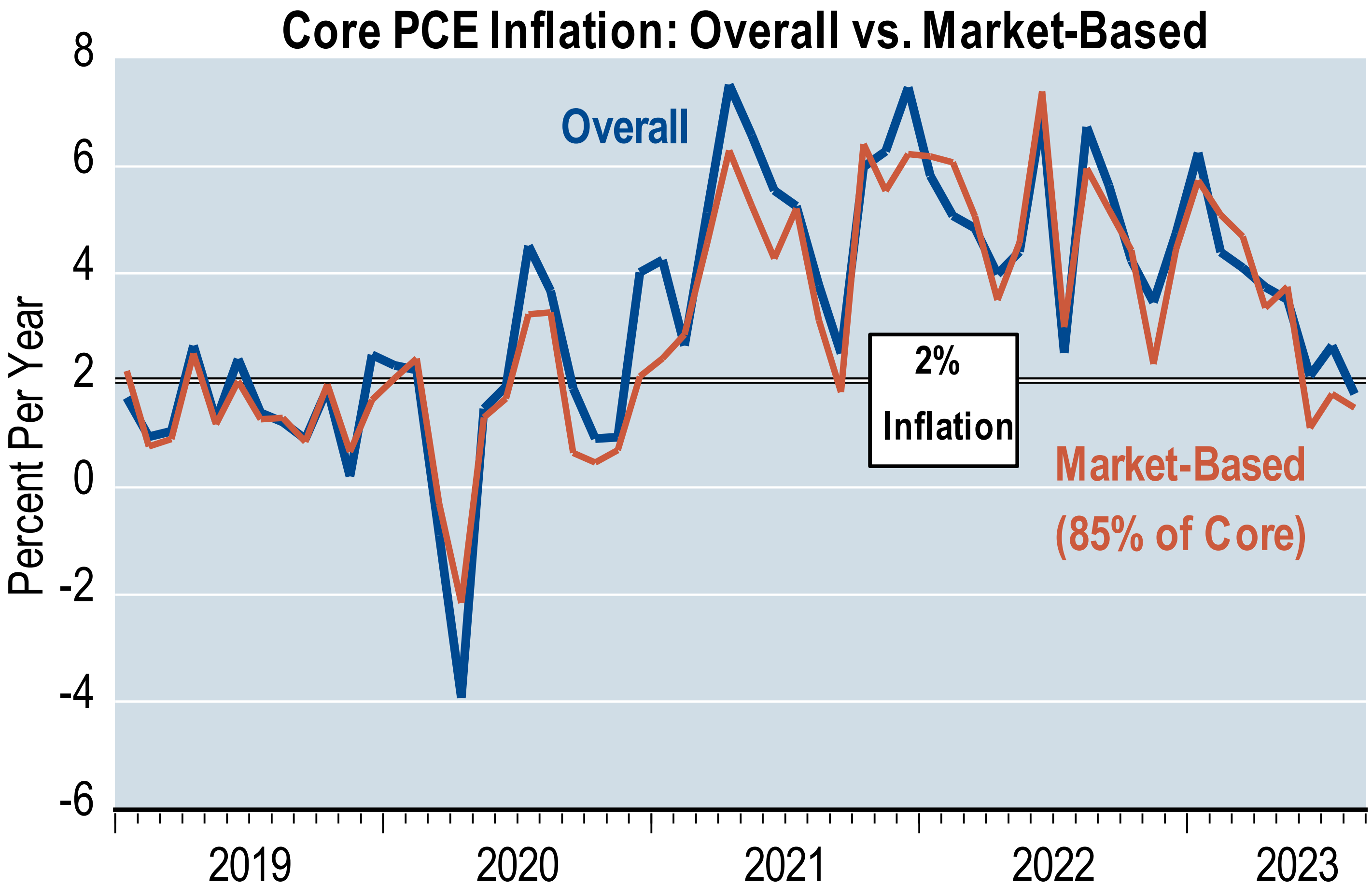
- Regardless of whether you attribute the 2021-23 inflation to Fed policy, to fiscal policy, or to supply issues, all of these have reconciled, and, nominal spending growth has slowed to or through the rates seen prior to the shutdown
- At these slow rates of growth, there simply is not enough “fuel” to drive the inflation “fire”



Source: Bureau of Economic Analysis. As of 30 Jun 23

Recent Monthly Inflation Rates Have Been AT the Fed's Targets

- ***The Fed targets core PCE inflation, and it has set a target level of 2%***
- Measured core PCE inflation has fallen to rates right around 2% in each of the last three months
- Furthermore, this measure include components that are "estimated" by BEA, that is, NOT based on observable market prices
- Looking only at market-based prices, core inflation has been only 1.5% for the last three months
- Inflation needs to be sustained at these rates a while longer to satisfy the Fed, but we are likely a lot closer to that point than some market analysts realize

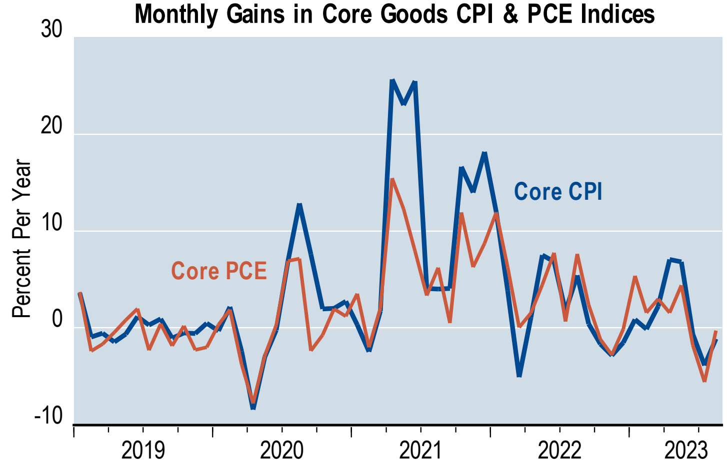


Source: Bureau of Labor Statistics, Bureau of Economic Analysis. As of 31 Aug 23

Core? Supercore? Housing In or Out?

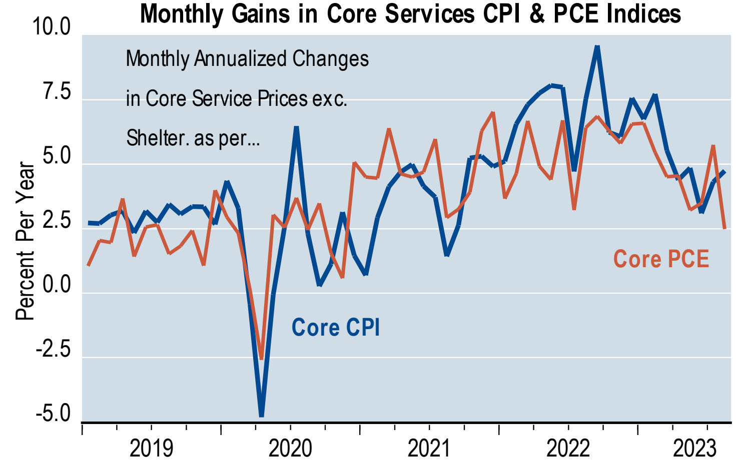
- Goods prices typically rise more slowly than services prices. So, early this year Fed Chair Powell said that he was focusing on services prices, as goods prices were already under control
- A problem was that while home prices nationwide had been falling since mid-2022, housing costs as per the PCE price index was still rising at a double-digit rate. So, he suggested looking at services prices other than housing, which the markets dubbed “supercore” inflation. This measure too has some anomalies, as the 3rd chart below makes clear
- Despite the short-term noise, all these measures are decelerating, and even reported shelter costs will soon be near zero change

Monthly Gains in Core Goods CPI & PCE Indices



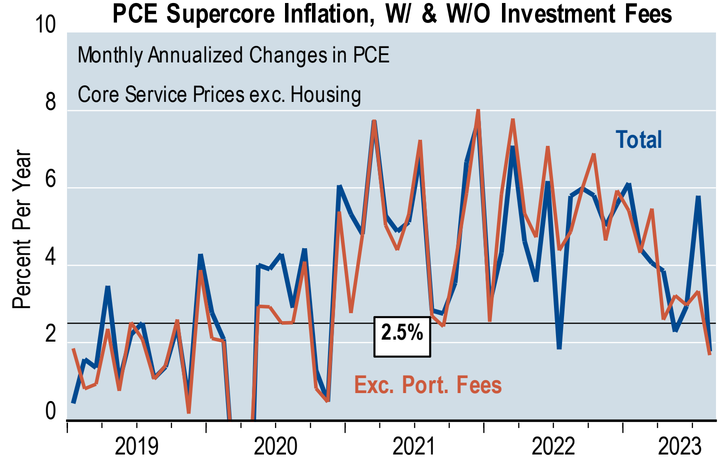
Source: Bureau of Labor Statistics, Bureau of Economic Analysis. As of 31 Aug 23

Monthly Gains in Core Services CPI & PCE Indices



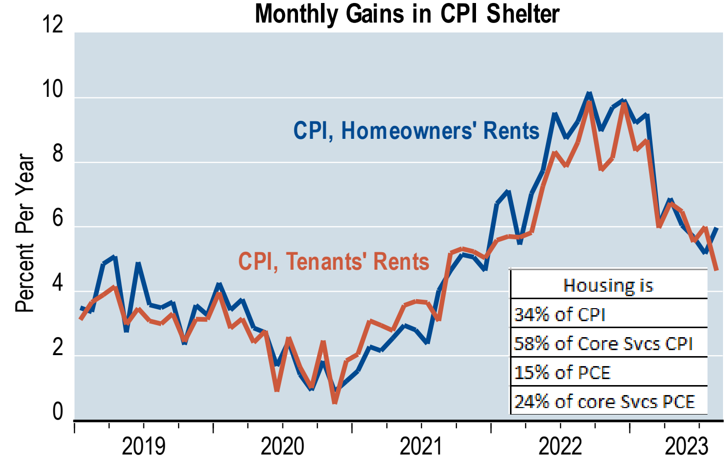
Source: Bureau of Labor Statistics, Bureau of Economic Analysis, Western Asset. As of 31 Aug 23

PCE Supercore Inflation, W/ & W/O Investment Fees



Source: Bureau of Labor Statistics, Bureau of Economic Analysis. As of 31 Aug 23

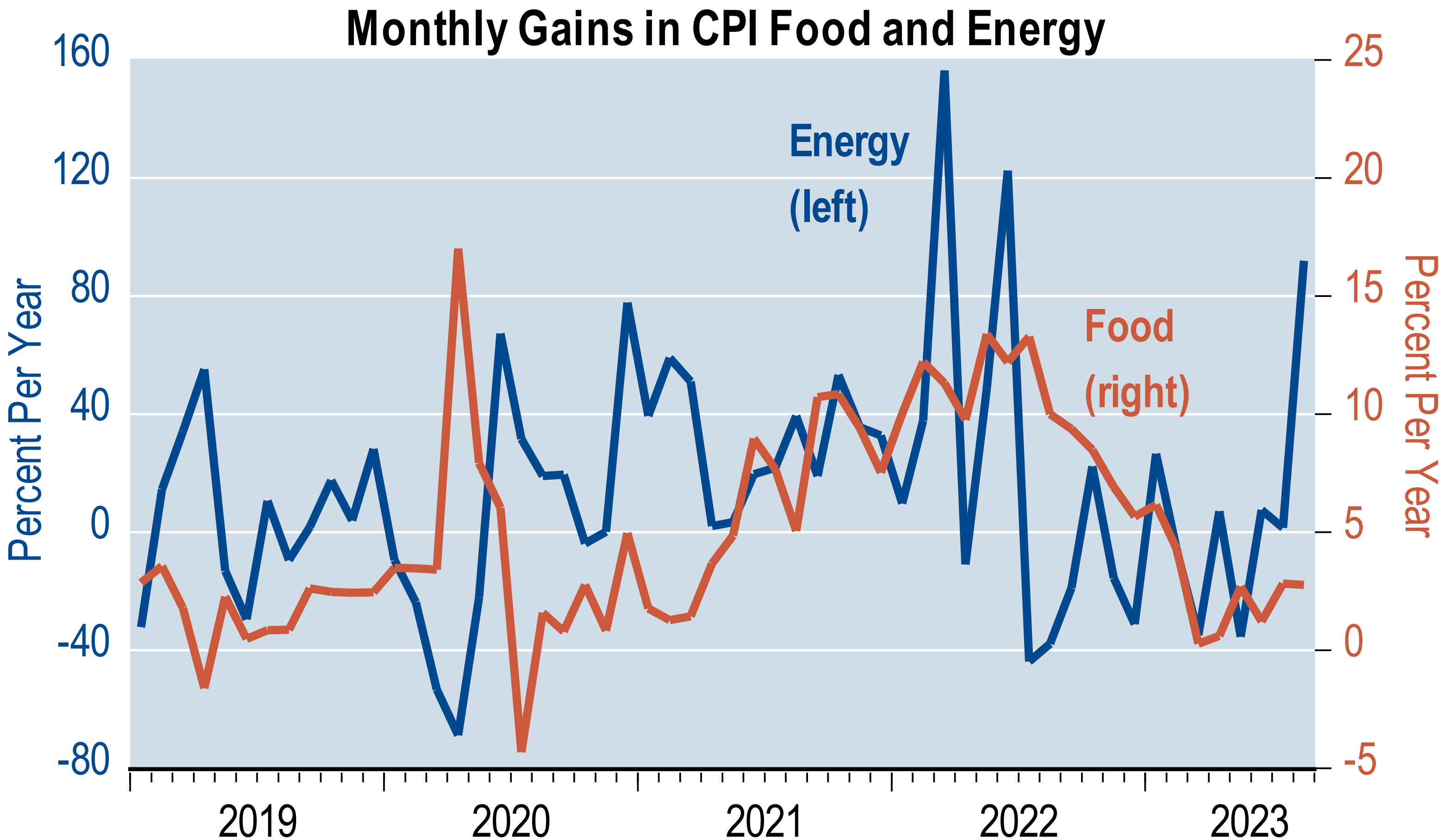
Monthly Gains in CPI Shelter



Source: Bureau of Labor Statistics, Bureau of Economic Analysis. As of 31 Aug 23

Food and Energy Prices Volatile, But…

- Yes, oil prices have soared lately. It is not clear that this is due to US developments and even less clear that the Fed should inflict even more pain on the economy because of the pain already imposed at the pump
- The Fed's core measure excludes food and energy prices. For better or for worse, core prices are lately behaving much better than oil
- Meanwhile, food prices have slowed to a crawl. No, they are not DECLINING, but the inflation there is gone. As emphasized earlier, the Fed's goal is to restrain/prevent FUTURE price increases, NOT to reverse past ones



Source: Bureau of Labor Statistics. As of 31 Aug 23

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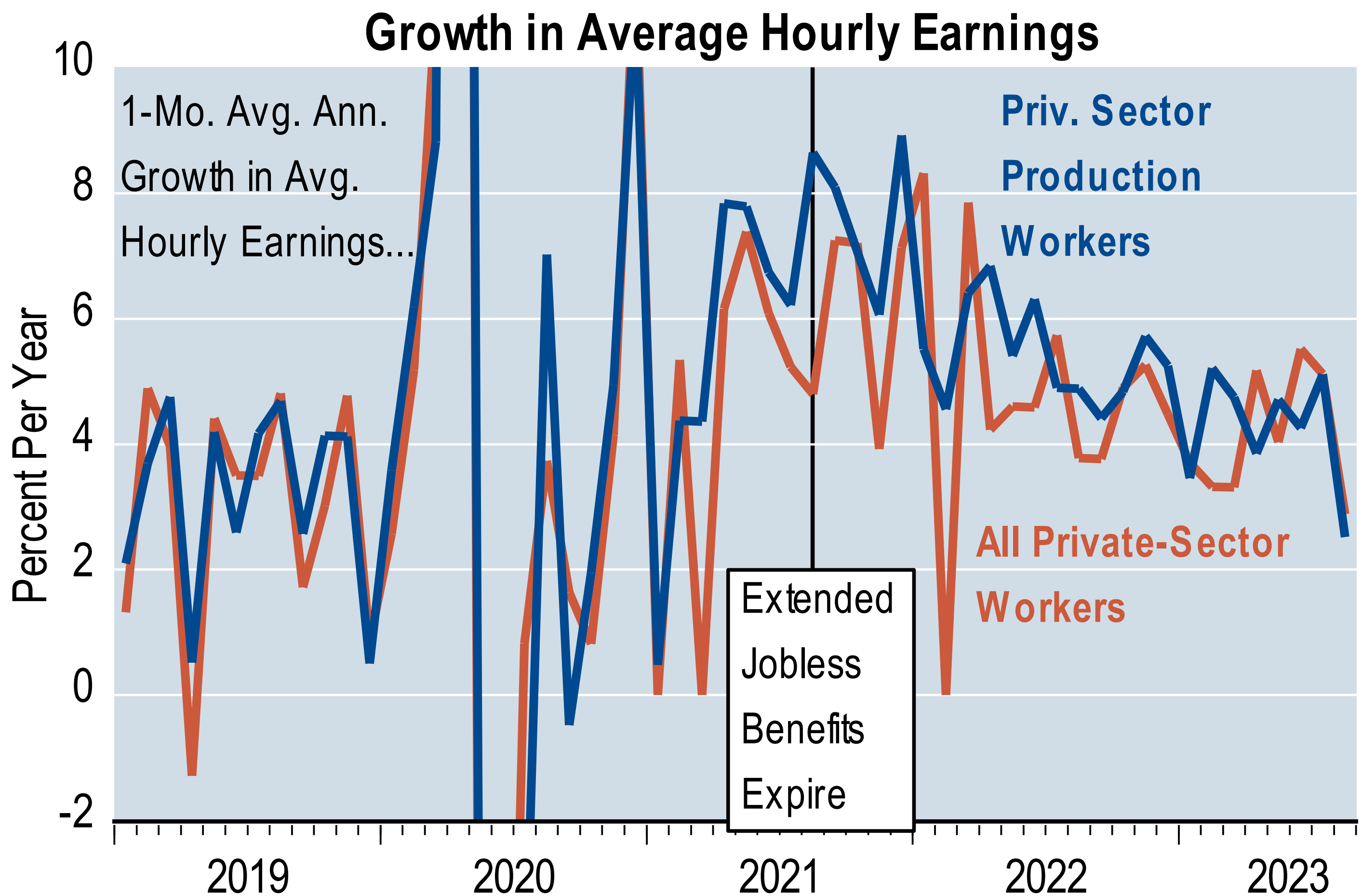
Wages Rising, But at Ever-Slower Rates

- To this point, I haven't mentioned wages within the inflation story
- My view is that wages are a symptom of the inflation process, not a driver of it
- To be consistent with 2% inflation, wages will eventually have to settle at a growth rate of about 3.5%
- While wage growth has been decelerating, it has been above the 3.5% threshold to date
- This has NOT prevented inflation from falling to the 2% range, and given the still-present Covid realities of the economy at present, there is reason to believe inflation will stay at recent rates until wage growth finally settles around 3.5%



Source: Bureau of Labor Statistics. As of 31 Aug 23

WESTERN ASSET

Appendix

Risk Disclosure

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Marin County Employees' Retirement Association

Investment Consultant Request For Proposal Overview

Board of Retirement Strategic Workshop
October 17, 2023

Jeff Wickman, Retirement Administrator

AGENDA

- Request for Proposal (RFP) Background
- Prior MCERA Investment Consultant RFPs
- RFP Structure
- RFP Evaluation
  - Questions
  - Fees
- RFP Timeline
- Questions

REQUEST FOR PROPOSAL BACKGROUND

- A Request for Proposal (RFP) is issued by an organization seeking proposals from qualified companies who can provide a specific service through a contractual relationship.
- The RFP is widely distributed to ensure that qualified companies can consider whether to bid on the proposal. The RFP will be posted on MCERA's web site, published in national publications, and sent directly to companies known to provide the desired service.
- The keys to a successful RFP are:
  - Adhering to the processes and timelines specified in the RFP for the delivery of responses, questions and evaluations;
  - Being clear about the services that are expected including when and how the services are delivered;
  - Providing the criteria and weighting that will be used to evaluate responses;
  - Including specific questions to allow the evaluation committee to make apples to apples comparisons of responses;
  - Providing a comprehensive explanation of the fee proposal and its weighting in the evaluation.

PRIOR MCERA INVESTMENT CONSULTANT RFPs

- In 2000 an RFP for investment consulting was issued. The evaluation of responses resulted in hiring Callan Associates.
- In 2014 an RFP for investment consulting was issued.
  - The Evaluation Committee was comprised of four trustees and one staff member.
  - Nine companies responded to the RFP.
  - Top six companies based on the Evaluation Committee ranking were selected for in-person interviews.
  - Callan selected as finalist. Conducted on site visit with their Executive Leadership.
  - Contract signed with Callan.

RFP STRUCTURE

- The RFP is organized in the following sections:
  - General Information (purpose, timelines, submission proposal)
  - Background and Nature of Services Requested (description of MCERA, its investment program/managers and expected services)
  - Proposal Procedures (minimum qualifications, submission requirements, questions, evaluation criteria)
  - Information to be provided (68 questions, philosophy and additional material)
  - Fees
  - Model Contract

RFP EVALUATION

- Weighted factors for evaluating responses:
  - 25% Experience and capabilities
  - 25% Company staffing
  - 30% Methodology
  - 5% Philosophy and approach to consulting
  - 5% Additional materials and documents
  - 10% Fee proposal

RFP EVALUATION - QUESTIONS

- Question topics include:
  - Company contact, organization, ownership and history
  - Services and revenues
  - Independence and objectivity
  - Institutional clients
  - Litigation and insurance
  - Professional staff
  - Asset allocation process
  - Manager search process
  - Monitoring and oversight of investments
  - Research and education

RFP EVALUATION - FEES

- Using the Scope of Services defined in the RFP, respondents are asked to provide the following:
  - All inclusive fee for years 1-3 of the contract
  - All inclusive fee for optional years 4 & 5 of the contract
  - Additional fees for customized services/expenses

RFP SAMPLE TIMELINE

December 4, 2023	RFP posted to MCERA website and sent to companies
December 18, 2023	Deadline for submission of questions concerning the RFP
December 28, 2023	Questions and responses posted to MCERA website
January 2, 2024	Deadline for submission of proposals
January 3, 2024	RFP Responses are validated
January 9, 2024	Initial Proposal review with Ad Hoc Committee
February 5, 2024	Proposal evaluations complete and finalist companies selected
February 20, 2024	Finalist interviews with Ad Hoc Committee
March 4, 2024	Site visits to finalist companies, if necessary
March 13, 2024	Board review of Ad Hoc Committee recommendation
April 10, 2024	Contract negotiations complete
May 1, 2024	Services begin

QUESTIONS