Fixed Income Asset Class Review

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Executive Summary

- 2021: the worst year for Core bonds in the last 10, and 2022 has begun similarly
- Interest rates remained historically low as the Federal Reserve maintained easy or dovish monetary policy, although rates oscillated during the year
- Low interest rates reflected the oft repeated belief that inflationary impulses were merely “transitory”. Exiting the year, inflation was hitting 40-year highs
- Credit exposure delivered good returns due to improving economic conditions
- Entering 2022, markets now believe the Fed will raise rates 5 times
- If rates are biased higher, bonds will do worse than cash, but other credit may be OK
- Future fixed income returns are likely to be muted, starting with such low yields

(Special thanks to JP Morgan for the selective use of slides from their 1Q/2022 Guide to the Market)

Yields and Inflation over Time

real yield = nominal rate - inflation

Interest rates and inflation

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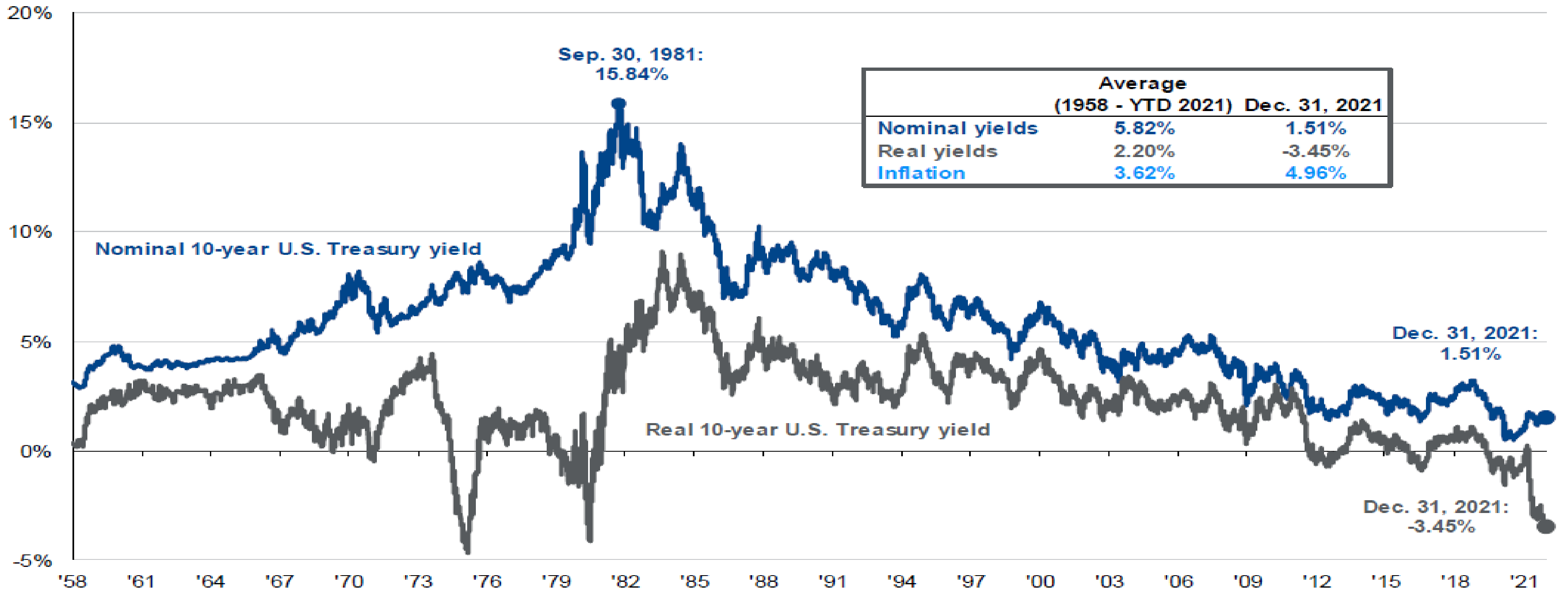
Nominal and real U.S. 10-year Treasury yields



Source: BLS, FactSet, Federal Reserve, J.P. Morgan Asset Management.
Real 10-year Treasury yields are calculated as the daily Treasury yield less year-over-year core CPI inflation for that month. For the current month, we use the prior month's core CPI figures until the latest data is available.
Guide to the Markets – U.S. Data are as of December 31, 2021.

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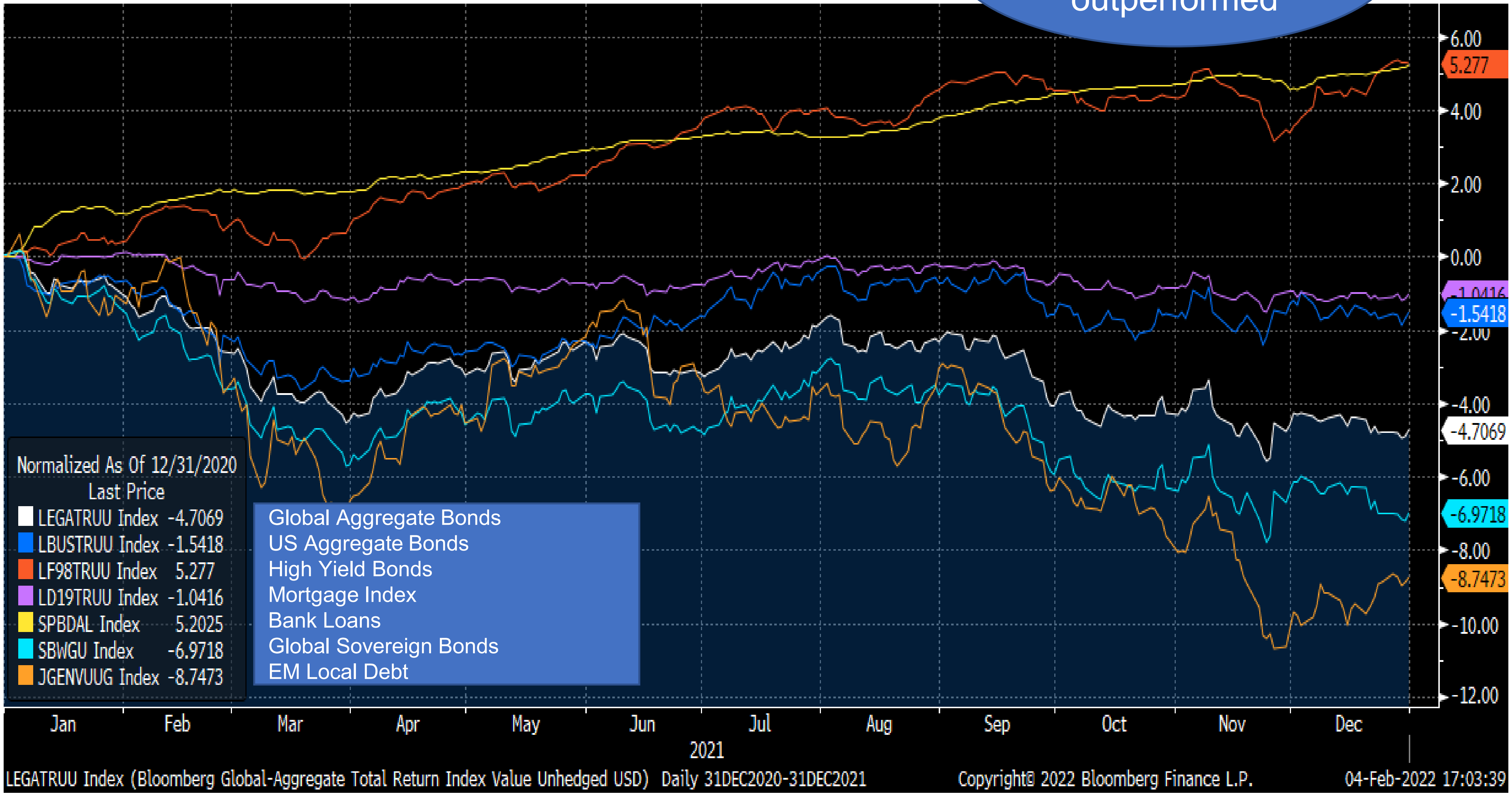
FCERA Fixed Income Benchmarks

High Yield Bonds and Bank Loans outperformed



US Fixed Income Returns

US Government Bond returns were low/negative

Fixed income market dynamics

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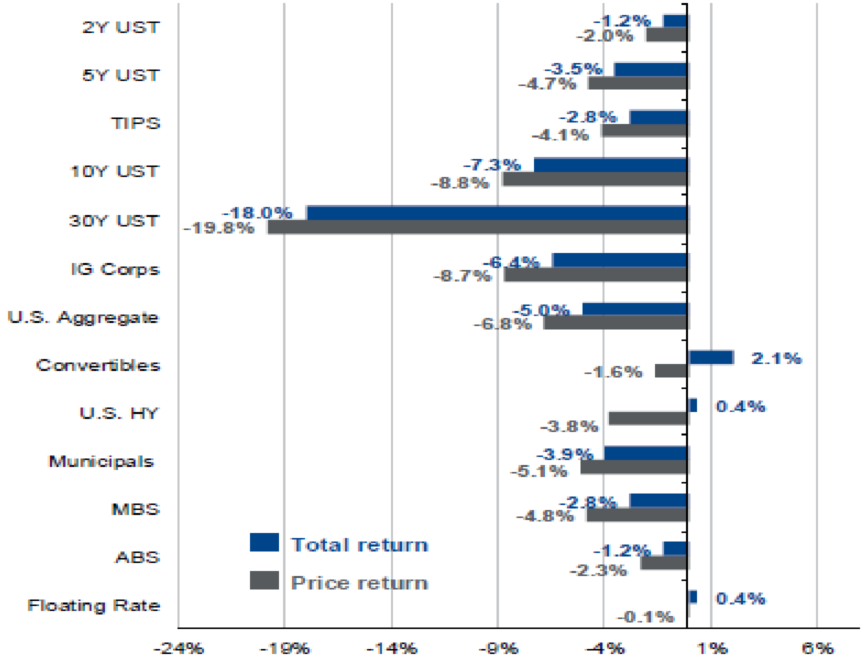
U.S. Treasuries	Yield 12/31/2021	Yield 12/31/2020	Return 2021 YTD	Avg. Maturity	Correlation to 10-year	Correlation to S&P 500
2-Year	0.73%	0.13%	-0.57%	2 years	0.67	-0.41
5-Year	1.26%	0.36%	-2.80%	5	0.92	-0.36
TIPS	-1.04%	-1.06%	5.96%	10	0.57	0.20
10-Year	1.52%	0.93%	-3.60%	10	1.00	-0.33
30-Year	1.90%	1.65%	-4.62%	30	0.93	-0.31
Sector						
IG Corps	2.33%	1.74%	-1.04%	12.3	0.42	0.38
U.S. Aggregate	1.75%	1.12%	-1.54%	8.7	0.85	0.02
Convertibles	3.66%	4.91%	4.49%	-	-0.29	0.87
U.S. HY	4.21%	4.18%	5.28%	6.5	-0.25	0.72
Municipals	1.11%	1.07%	1.52%	13.1	0.37	0.09
MBS	1.98%	1.25%	-1.04%	6.1	0.81	-0.16
ABS	1.96%	2.87%	1.11%	2.4	-0.04	0.10
Floating Rate	0.48%	0.54%	0.52%	2.0	-0.22	0.44

Impact of a 1% rise in interest rates

Assumes a parallel shift in the yield curve



Source: Bloomberg, FactSet, Standard & Poor's, U.S. Treasury, J.P. Morgan Asset Management. Sectors shown above are provided by Bloomberg unless otherwise noted and are represented by – U.S. Aggregate; MBS: U.S. Aggregate Securitized - MBS; ABS: J.P. Morgan ABS Index; Corporates: U.S. Corporates; Municipals: Muni Bond; High Yield: Corporate High Yield; TIPS: Treasury Inflation-Protected Securities (TIPS); U.S. Floating rate index; Convertibles: U.S. Convertibles Composite. Convertibles yield is as of November 2021 due to data availability. Yield and return information based on bellwethers for Treasury securities. Sector yields reflect yield-to-worst. Convertibles yield is based on U.S. portion of Bloomberg Global Convertibles. Correlations are based on 15-years of monthly returns for all sectors. Past performance is not indicative of future results.

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Global Fixed Income Returns

A truly lousy year for bonds

Global fixed income

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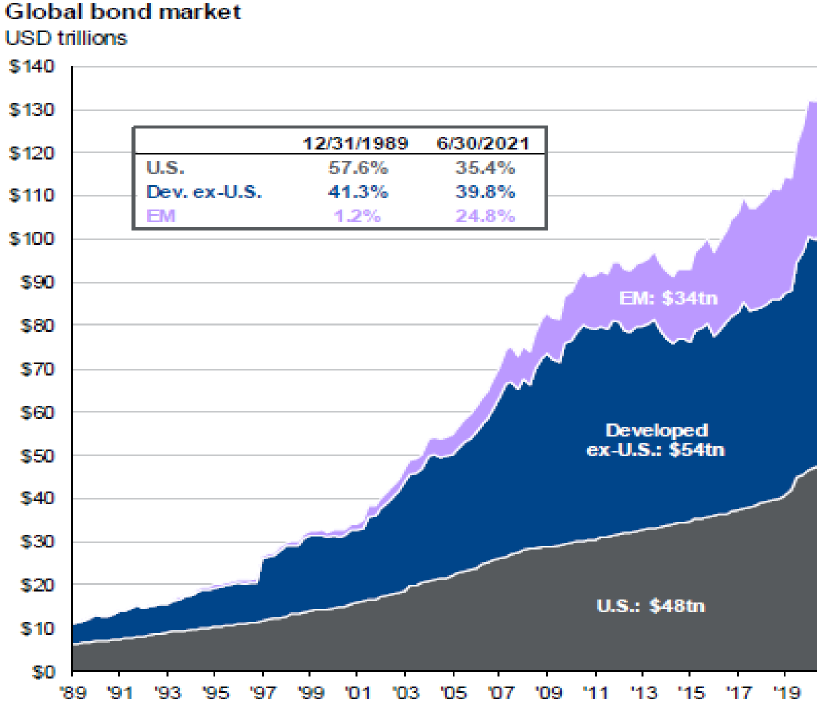
Aggregates	Yield 12/31/2021	Yield 12/31/2020	2021 Return Local	2021 Return USD	Duration	Correlation to 10-year
U.S.	1.75%	1.12%	-1.54%	-1.54%	6.8 years	0.89
Gbl. ex-U.S.	1.07%	0.68%	-	-6.41%	8.00	0.37
Japan	0.18%	0.11%	0.14%	-10.22%	9.60	0.53
Germany	0.05%	-0.28%	-1.64%	-8.59%	7.30	0.17
UK	1.18%	0.60%	-4.54%	-5.41%	11.00	0.26
Italy	0.76%	0.32%	-2.55%	-9.42%	7.30	0.01
Spain	0.32%	0.00%	-2.39%	-9.27%	7.50	0.02
Sector						
Euro Corp.	0.52%	0.24%	-0.97%	-7.95%	5.2 years	0.17
Euro HY	3.55%	3.40%	4.21%	-3.15%	3.90	-0.22
EMD ($)	5.27%	4.91%	-	-1.80%	7.60	-0.07
EMD (LCL)	5.72%	5.22%	-2.92%	-8.75%	5.20	-0.08
EM Corp.	4.11%	4.51%	-	0.91%	5.90	-0.07

Global Bond Returns low, esp unhedged



Source: J.P. Morgan Asset Management; (Left) Bloomberg, FactSet; (Right) BIS.
Fixed income sectors shown above are provided by Bloomberg and are represented by the global aggregate for each country except where noted. EMD sectors are represented by the J.P. Morgan EMBIG Diversified Index (USD), the J.P. Morgan GBI EM Global Diversified Index (LCL) and the J.P. Morgan CEMBI Broad Diversified Index (Corp). European Corporates are represented by the Bloomberg Euro Aggregate Corporate Index and the Bloomberg Pan-European High Yield Index. Sector yields reflect yield-to-worst. Correlations are based on 10-years of monthly returns for all sectors. Past performance is not indicative of future results. Global bond market regional breakdown may not sum to 100% due to rounding.
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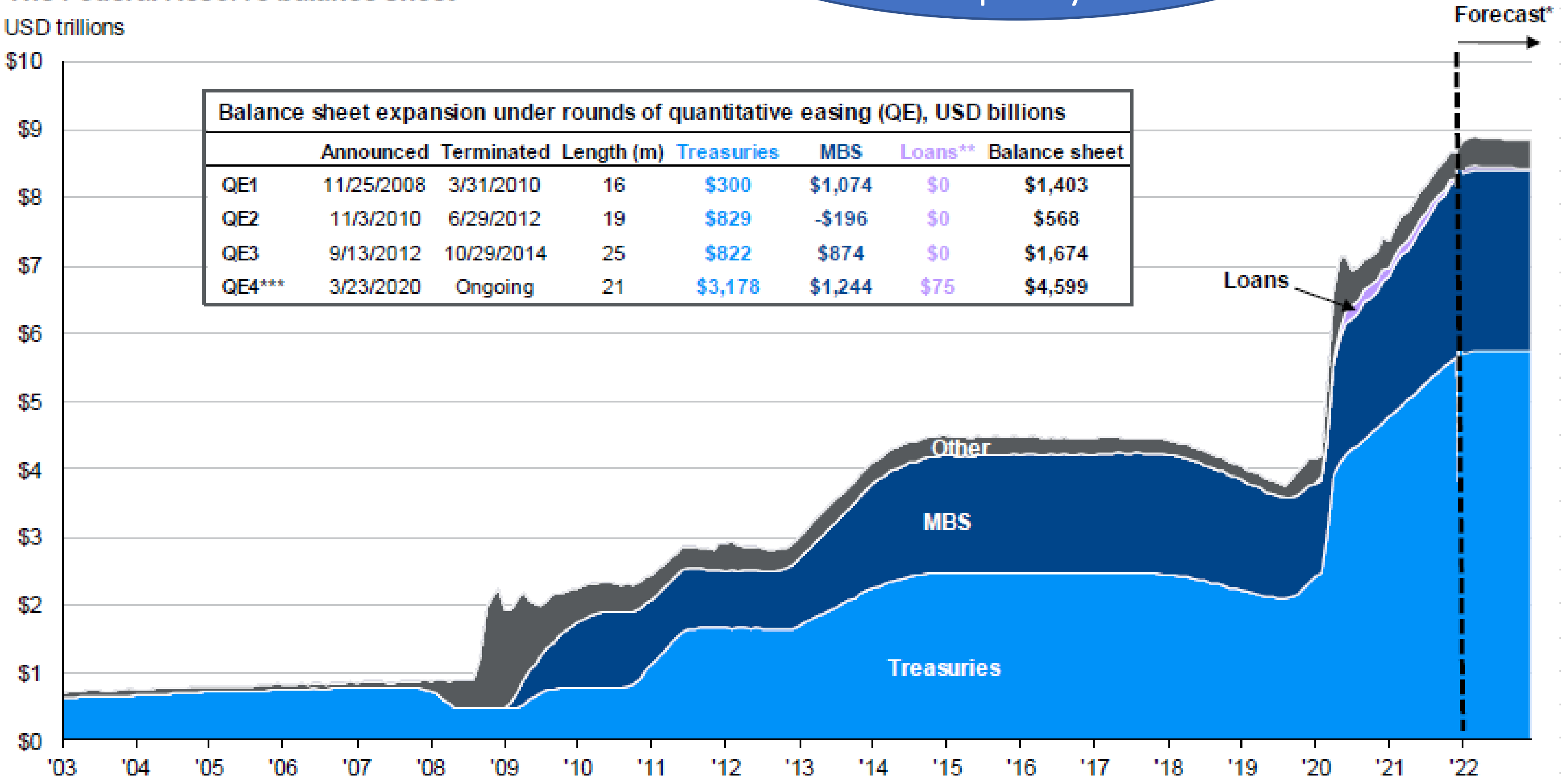
The Federal Reserve balance sheet

Fed purchases of securities were done to create or add to "liquidity"

The Federal Reserve balance sheet

USD trillions



Balance sheet expansion under rounds of quantitative easing (QE), USD billions

	Announced	Terminated	Length (m)	Treasuries	MBS	Loans**	Balance sheet
QE1	11/25/2008	3/31/2010	16	$300	$1,074	$0	$1,403
QE2	11/3/2010	6/29/2012	19	$829	-$196	$0	$568
QE3	9/13/2012	10/29/2014	25	$822	$874	$0	$1,674
QE4***	3/23/2020	Ongoing	21	$3,178	$1,244	$75	$4,599

Source: FactSet, Federal Reserve, J.P. Morgan Investment Bank, J.P. Morgan Asset Management.
Currently, the balance sheet contains $5.7tn in Treasuries and $2.6tn in MBS. *The end balance sheet forecast assumes the Federal Reserve reduces the pace of purchases of Treasuries and MBS by $30bn per month, beginning January through mid-March, as suggested in the December 2021 FOMC meeting. **Loans include liquidity and credit extended through corporate credit facilities established in March 2020. Other includes primary, secondary and seasonal loans, repurchase agreements, foreign currency reserves and maiden lane securities. ***QE4 is ongoing and the expansion figures are as of the most recent Wednesday close as reported by the Federal Reserve. Forecasts are not a reliable indicator of future performance. Forecasts, projections and other forward-looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecasts, projections or other forward-looking statements, actual events, results or performance may differ materially from those reflected or contemplated.
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Inflation, still think it is transitory?

Inflation

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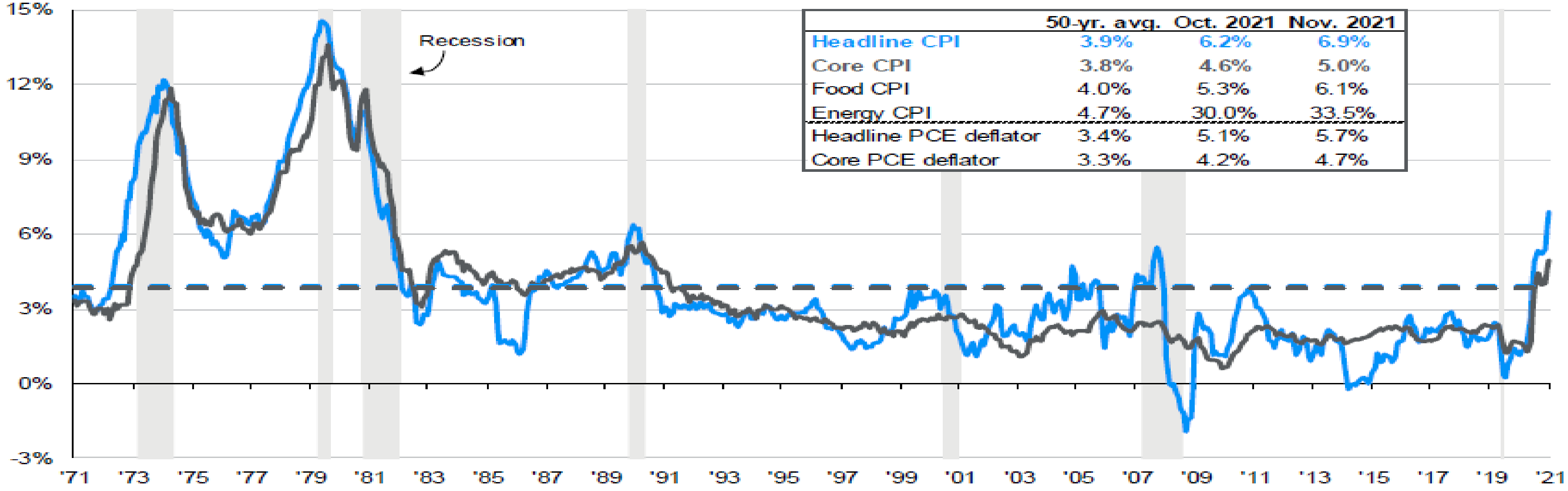
CPI and core CPI

% change vs. prior year, seasonally adjusted



	50-yr. avg.	Oct. 2021	Nov. 2021
Headline CPI	3.9%	6.2%	6.9%
Core CPI	3.8%	4.6%	5.0%
Food CPI	4.0%	5.3%	6.1%
Energy CPI	4.7%	30.0%	33.5%
Headline PCE deflator	3.4%	5.1%	5.7%
Core PCE deflator	3.3%	4.2%	4.7%

Source: BLS, FactSet, J.P. Morgan Asset Management.
CPI used is CPI-U and values shown are % change vs. one year ago. Core CPI is defined as CPI excluding food and energy prices. The Personal Consumption Expenditure (PCE) deflator employs an evolving chain-weighted basket of consumer expenditures instead of the fixed-weight basket used in CPI calculations.
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Perhaps now the regime of monetary repression is ending

(Repression meaning artificially depressing rates)

The Fed and interest rates

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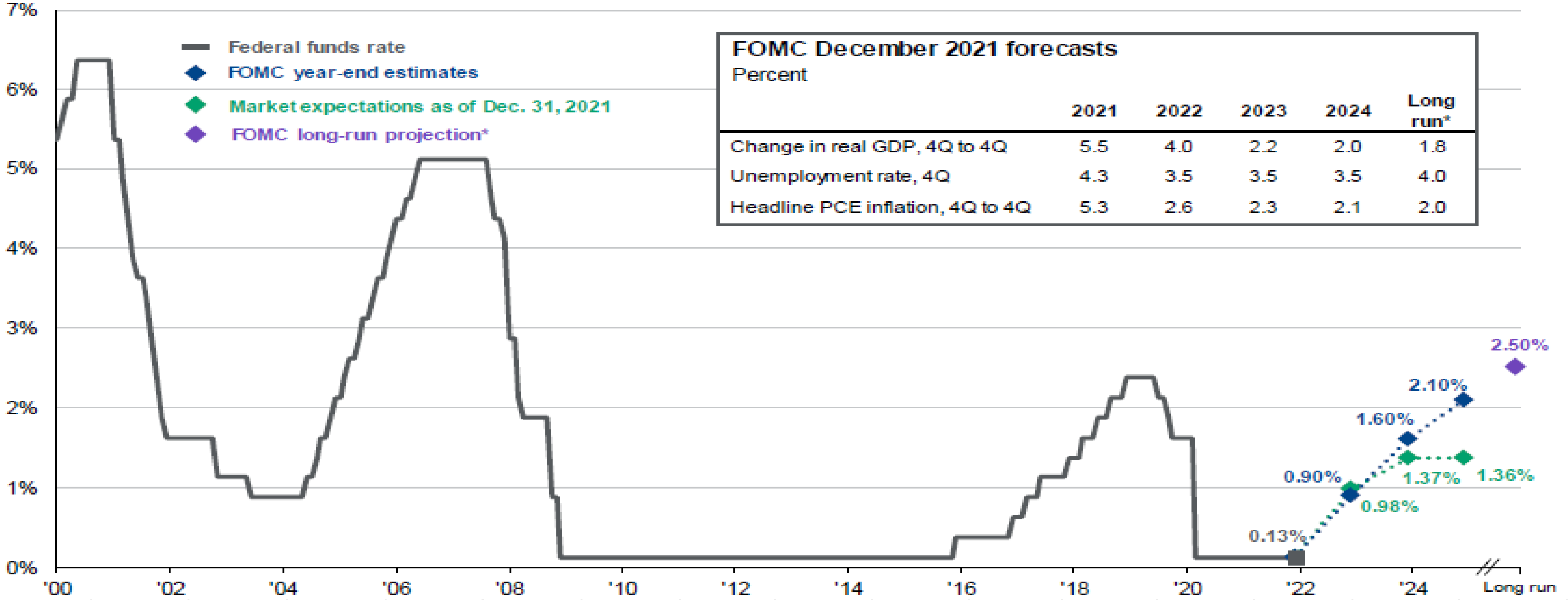
Federal funds rate expectations

FOMC and market expectations for the federal funds rate



FOMC December 2021 forecasts
Percent

	2021	2022	2023	2024	Long run*
Change in real GDP, 4Q to 4Q	5.5	4.0	2.2	2.0	1.8
Unemployment rate, 4Q	4.3	3.5	3.5	3.5	4.0
Headline PCE inflation, 4Q to 4Q	5.3	2.6	2.3	2.1	2.0

Source: Bloomberg, FactSet, Federal Reserve, J.P. Morgan Asset Management.
Market expectations are based off of the USD Overnight Index Forward Swap rates. *Long-run projections are the rates of growth, unemployment and inflation to which a policymaker expects the economy to converge over the next five to six years in absence of further shocks and under appropriate monetary policy. Forecasts are not a reliable indicator of future performance. Forecasts, projections and other forward-looking statements are based upon current beliefs and expectations. They are for illustrative purposes only and serve as an indication of what may occur. Given the inherent uncertainties and risks associated with forecasts, projections or other forward-looking statements, actual events, results or performance may differ materially from those reflected or contemplated.
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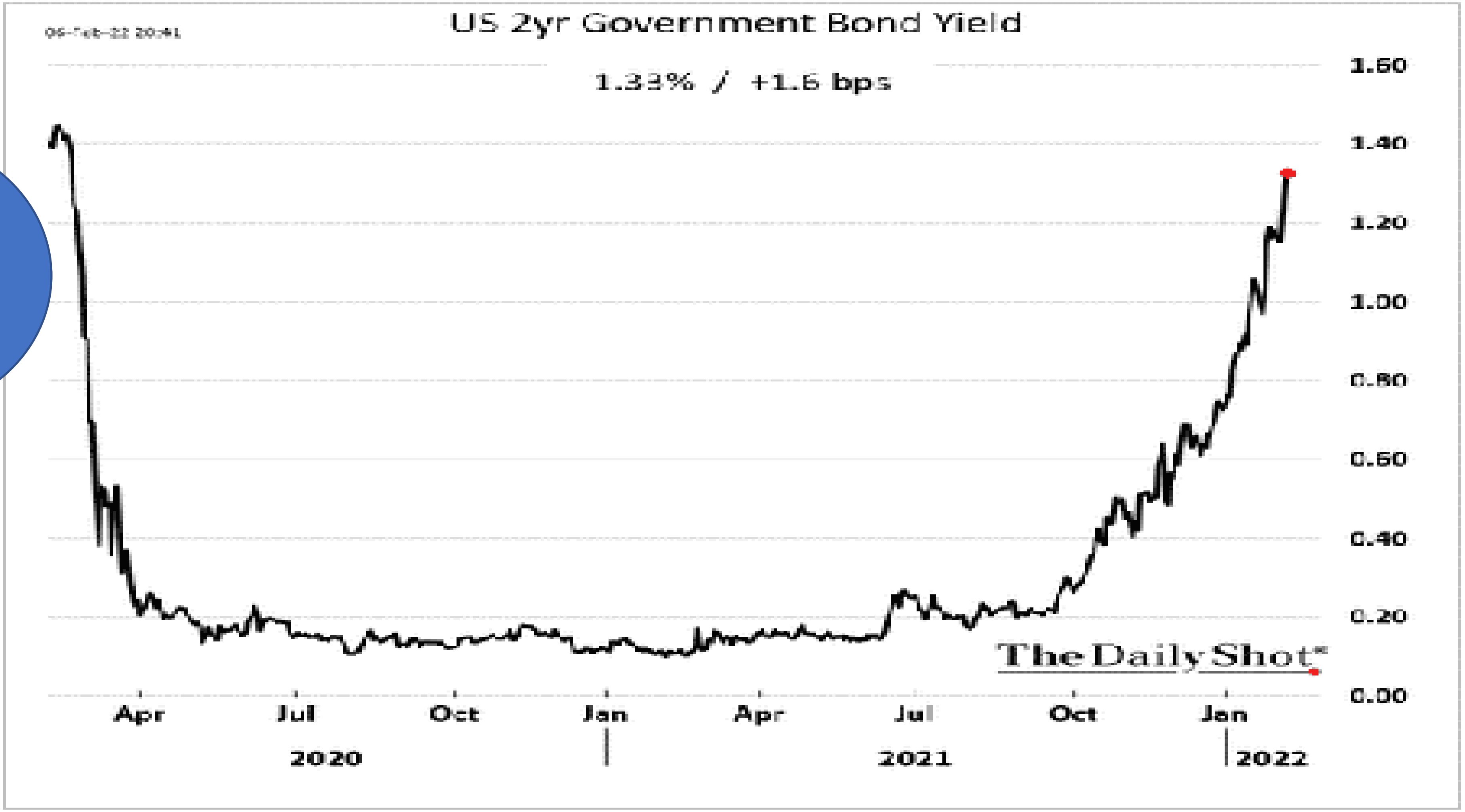
Short Rates have reacted strongly to changing conditions

With the onset of pandemic, the Fed took rates to zero



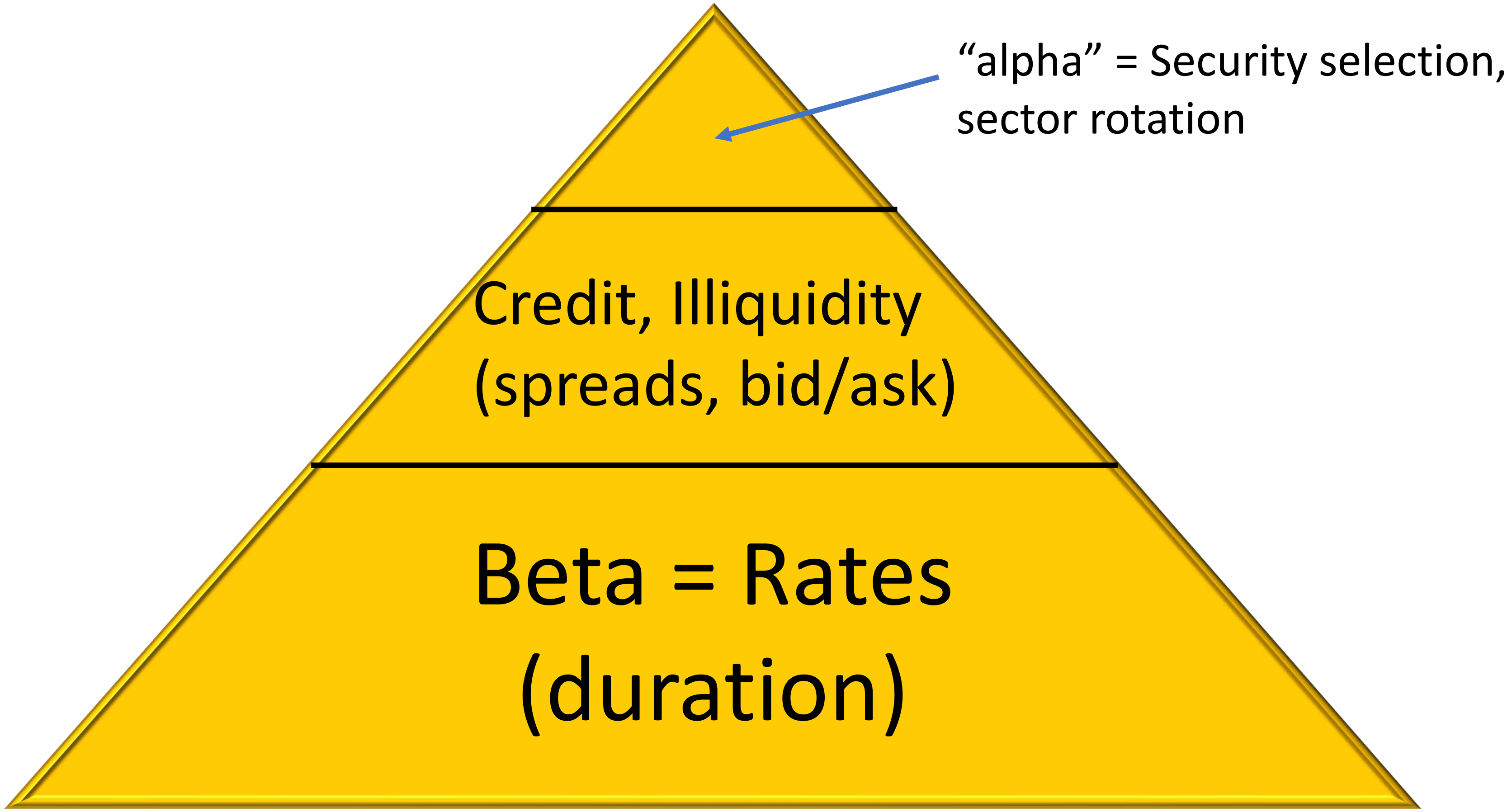
30yr mortgage rates are reacting quickly as well

Fixed Income Risks

"Bonds have more Fun"

- Rates/duration: sensitivity to interest rate changes
  - a rising rate environment is bad for rate risk
- Credit: risk of default or downgrade
  - Deteriorating business conditions are bad for credit
- Illiquidity: yield premium required for our inability to sell
  - Market stress magnifies our inability to sell

Fixed Income Factors



The Yield Curve represents the Term Premium or Tenor Premium; incremental yield for loaning money for longer, almost always positive or upward sloping

- Duration represents interest RATES sensitivity, where longer duration bonds have greater duration and rate sensitivity
  - Generally, 1% chg in rates = Duration * % change in price
  - Ex. With duration of 7, a 1% change in rates cuts prices 7%
- Credit Spreads: the higher yield or “spread” over US Treasuries represents the degree of default risk in the bond

Yield Curves: then and now

a low and flat yield curve represents interest rate risk
if interest rates rise, bond prices fall

Yield curve

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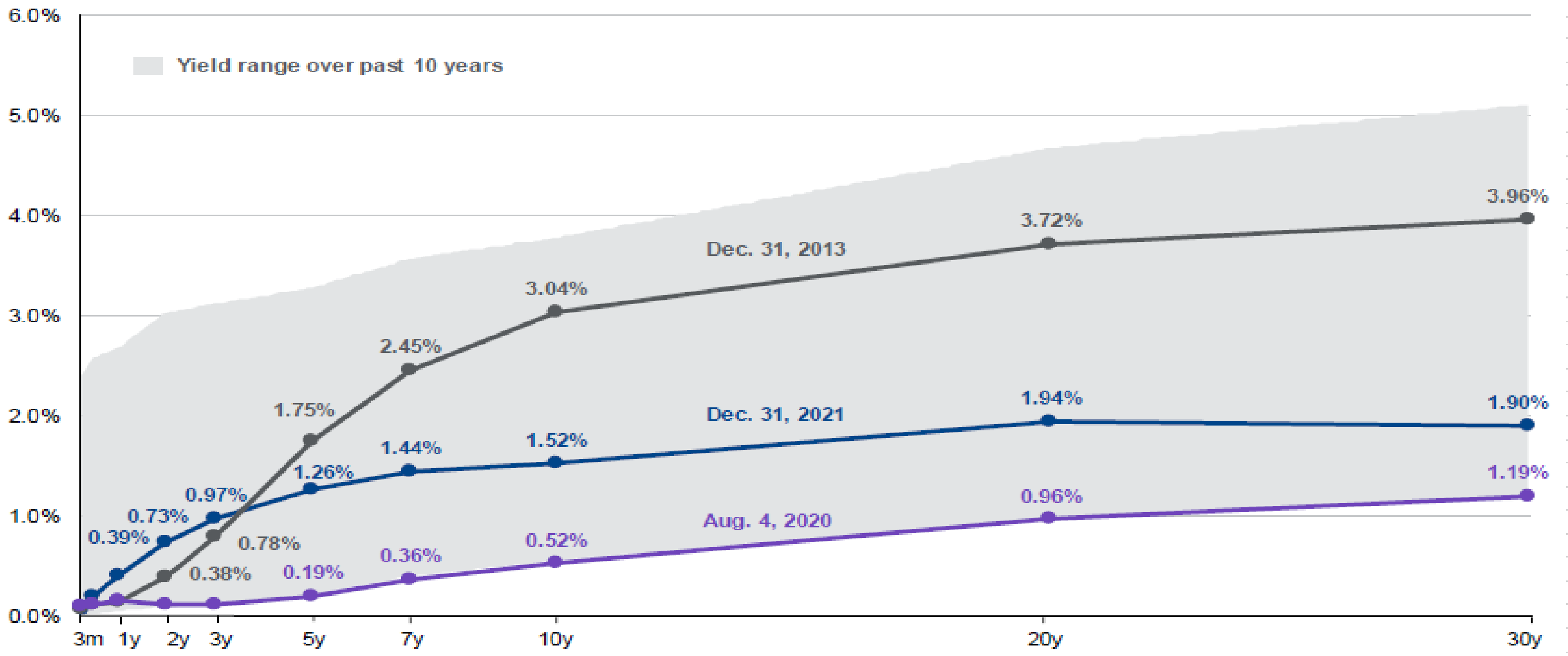
U.S. Treasury yield curve



Source: FactSet, Federal Reserve, J.P. Morgan Asset Management. 12/31/2013 is the date the yield curve reached one of its steepest levels in reaction to the Fed announcing it would begin paring down its bond-buying program. 08/04/2020 is the date of a record low on the 10-year, driven by safe haven demand and pessimism around the U.S. pandemic recovery.
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A flatter curve means we are not being paid as much to extend maturities

Fixed Income Performance 2021 (preliminary) by manager and by factor

Credit tilts were additive in 2021, EM was not

	12/31/2020	Cash Flows	12/31/2021	Change YTD	Benchmark	Active Contribution	Factor Contrib
Total Fixed	1,486,243,607	39,626,886	1,505,406,675	-1.6%	-4.7%	3,613,333	38,013,706
Overlay (Futures)	172,971,140	(75,000,000)	98,557,971	0.3%			
WAMCO IG		-			-1.1%	-	-
WAMCO UST			-			-	-
WAMCO Core	383,359,125	385,000,000	764,508,792	-1.0%	-1.5%	2,060,272	12,293,886
RBC	59,019,602	-	58,108,890	-1.5%	-1.0%	(295,087)	2,187,026
Loomis Sayles	186,414,572	-	195,066,756	4.6%	5.3%	(1,185,160)	18,689,572
Eaton Vance	193,513,401	-	201,372,870	4.1%	5.2%	(2,208,007)	19,256,805
		-					
Brandywine	283,705,847	(266,372,469)	1,376,051	-5.6%	-7.0%	3,822,062	(6,307,112)
PIMCO EMD	202,729,536	-	186,415,345	-8.0%	-8.7%	1,419,253	(8,106,471)
TCW TALF	4,000,645	(4,000,645)	-	0.0%			

Credit Spreads

smaller numbers mean we being paid less to take the risk, investors are willing to take more credit risk at lower returns

Credit Spreads are very tight

Fixed income valuations

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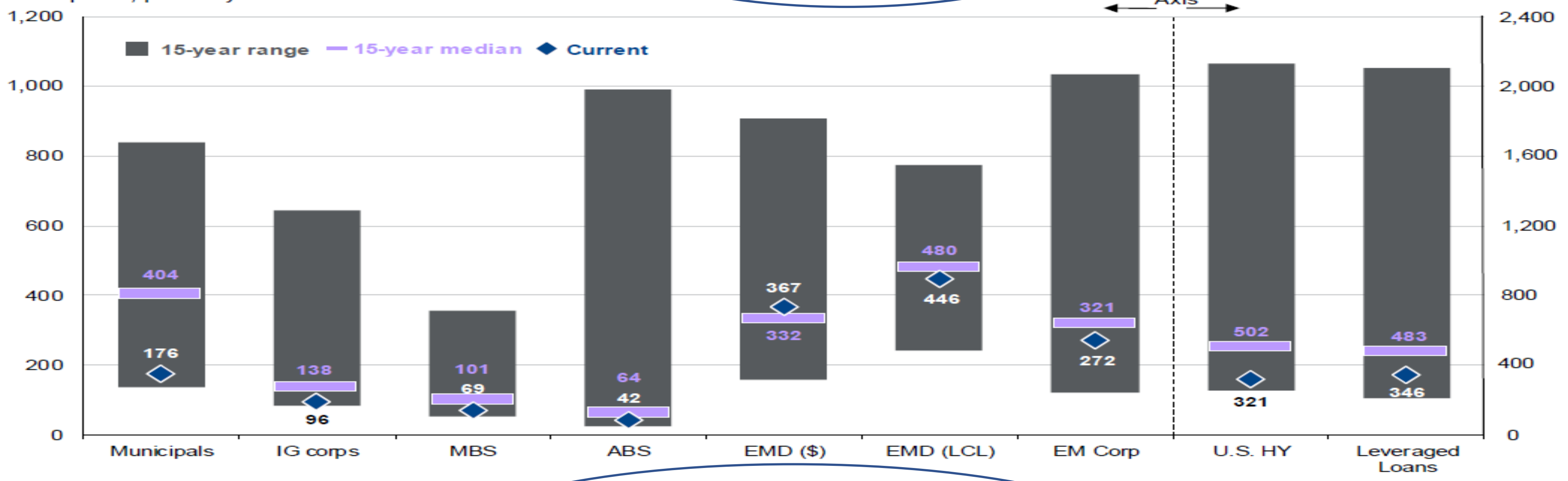
Spread-to-worst across fixed income sectors
Basis points, past 15 years



Source: Bloomberg, FactSet, J.P. Morgan Credit Research, J.P. Morgan Asset Management. Indices used are Bloomberg except for emerging market debt and leveraged loans: EMD ($): J.P. Morgan EMIGLOBAL Diversified Index; EMD (LCL): J.P. Morgan GBI-EM Global Diversified Index; EM Corp: J.P. Morgan CEMBI Broad Diversified; Leveraged loans: JPM Leveraged Loan Index. Spread-to-worst indicated is the difference between the yield-to-worst of a bond and yield-to-worst of a U.S. Treasury security with a similar duration. All sectors shown are spread-to-worst except for Municipals, which is based on the tax-equivalent yield-to-worst, and Leveraged loans, which are based on spread to 3Y takeout. EM (LCL) spread-to-worst is calculated using the index yield less the YTM on the 5-year U.S. Treasury bellwether index.
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Spreads widen when credit conditions begin to soften, and bond prices fall

2021 Initial Fixed Income Performance Conclusions

- The Federal Reserve continued extraordinary accommodation because it focused on jobs lost during the pandemic
- Monetary and Fiscal stimulus were applied at unprecedented rates
- Fixed Income markets struggled between that monetary accommodation and increasing evidence of inflationary intervention
- Credit conditions remained benign, and spreads narrowed
- Corporations issued spectacular amounts of debt due to favorable rates and high demand from investors
- The Fixed Income markets are now anticipating varying degrees of rate increases
- Credit conditions still appear favorable entering 2022

Summary

- Fixed Income remains an important source of Plan stability & diversification, but return outcomes may be asymmetrical
- Due to choppy rates throughout 2021, Core bonds had a bad year
- Expected fixed income returns are very low, challenged by macro policies, once again pointing to asymmetrical outcomes
- The Monetary Policy regime is changing, to some unknown degree
- At present, credit conditions remain favorable
- *If Rate moves are asymmetric, is Cash a better option?*
- Trustees are reminded of the migration from specific sleeves to multi-sector, with the opportunity for value added there
- Keep in mind that markets are constantly calculating forward changes in inflation, rates, credit quality