

# CAPITAL MARKET ASSUMPTIONS

Prepared by the CAPTRUST Investment Group

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# Capital Market Assumptions: Overview

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- CAPTRUST develops capital market assumptions (CMAs) that form the basis of long-term strategic planning and can be applied across a wide range of clients as we seek to build efficient, diversified, and durable portfolios.
- We review our CMAs regularly, with additional review when warranted by changes to the market environment.
- We last revised our CMAs in September 2021. Since then, changes have occurred within the macroeconomic and policy environment.

## CMAs are:

- Intended to reflect a long-term time horizon (10 years), capturing periods of slowdown, recession, recovery, and expansion;
- Strategic in nature;
- Expected risk and return midpoints over a full market cycle, within a wide range of potential outcomes.

## CMAs are not:

- Intended to be short-term or tactical in nature or prescriptive for any individual year;
- Return forecasts for a specific period;
- Intended to be precisely accurate, but rather reflect an average of a range of possible risk and return outcomes.

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# Capital Market Assumptions: Our Approach

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- Our CMAs include three components:
  - Expected return
  - Expected risk (standard deviation of return)
  - Asset class correlations
- Our process incorporates:
  - Bottom-up analysis of return drivers by asset class
  - A contemporary view of those drivers given current market conditions and valuation measures
  - Historical data and long-term trends
  - Comparison to prior assumptions and contemporary peer assumptions
  - Judgment and forward-looking expectations
- Changes tend to be incremental to maintain a long-term perspective.

**Our CMAs reflect and incorporate changes within the environment but are not constructed in reaction to them.**

# Capital Market Assumptions: 2022 Summary of Changes

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The economic underpinnings of our 2022 CMA update reflect the expectation of slowing economic growth and elevated but moderating inflation for the next several years, before returning to normalized growth trends in both gross domestic product (GDP) and inflation.

Return assumptions (by category):

- **Equities:** While equity valuations have improved meaningfully compared to 2021, the post-pandemic economic recovery has faded and transitioned to a tighter policy environment. We believe slower economic growth will present a headwind to future earnings growth. Consequently, our 2022 return assumptions remain unchanged for U.S. equities and have been slightly lowered for international equities where growth appears even more challenged.
- **Fixed income:** Interest rates are significantly higher than a year ago, and this has increased our return expectations for fixed income. We raised our return expectations across all fixed income asset classes by approximately 1.5 percent on average, including a 170-basis point increase to our core fixed income expected return.
- **Real assets:** Higher interest rate and inflation expectations have also increased our future return assumptions for public and private real estate, commodities, and core private real assets.
- **Alternatives:** We have added additional detail within our assumptions for alternatives by dividing both private equity and hedged strategies into two separate classifications within each.

Risk assumptions begin with a historical (up to the past 30 years) quantitative calculation and are adjusted to reflect forward-looking qualitative assumptions.

Asset class correlations have been updated to reflect data for up to the past 20 years.

# 2022 Capital Market Assumptions

	2021	2022	Change	2021	2022	Change
U.S. ECONOMY	Return	Return	Return	Risk	Risk	Risk
U.S. Economic Growth (Nominal GDP)	4.50%	4.70%	0.20%	2.50%	2.70%	0.20%
U.S. Economic Growth (Real GDP)	2.20%	2.10%	-0.10%	2.50%	2.70%	0.20%
U.S. Inflation (CPI)	2.30%	2.60%	0.30%	1.00%	1.25%	0.25%
EQUITY MARKETS	Return	Return	Return	Risk	Risk	Risk
U.S. Large-Cap Equity	7.25%	7.25%	-	15.50%	15.50%	-
U.S. Mid-Cap Equity	7.50%	7.50%	-	17.80%	17.80%	-
U.S. Small-Cap Equity	7.50%	7.50%	-	19.80%	19.80%	-
International Stocks-Developed Markets	6.75%	6.25%	-0.50%	17.00%	17.00%	-
International Stocks-Emerging Markets	7.75%	7.25%	-0.50%	22.00%	22.00%	-
FIXED INCOME	Return	Return	Return	Risk	Risk	Risk
U.S. Short-Term T-Bills (Cash)	1.60%	2.30%	0.70%	0.60%	1.00%	0.40%
U.S. Short-Term Govt/Credit		3.00%			1.50%	
U.S. Intermediate-Term Govt/Credit		3.30%			3.10%	
U.S. Core Fixed Income	2.00%	3.70%	1.70%	3.60%	3.70%	0.10%
U.S. Intermediate-Term Treasury Bonds	1.70%	3.20%	1.50%	3.00%	3.00%	0.00%
U.S. Long-Term Treasury Bonds	1.90%	3.90%	2.00%	12.10%	12.30%	0.20%
U.S. Investment Grade Corporate Bonds	2.30%	4.10%	1.80%	5.40%	5.60%	0.20%
U.S. Long-Term Corporate Bonds	3.10%	4.90%	1.80%	8.90%	9.30%	0.40%
U.S. High Yield Corporate Bonds	3.10%	5.70%	2.60%	8.30%	8.40%	0.10%
U.S. Municipal Bonds	1.90%	3.50%	1.60%	4.20%	4.40%	0.20%
Global Bonds	1.50%	2.90%	1.40%	5.30%	5.40%	0.10%
Treasury Inflated-Protected (TIPS)	2.00%	3.50%	1.50%	5.80%	5.40%	-0.40%
Floating Rate Bonds	3.10%	4.10%	1.00%	6.20%	6.10%	-0.10%
REAL ASSETS	Return	Return	Return	Risk	Risk	Risk
U.S. Public Real Estate	5.75%	6.50%	0.75%	18.40%	18.60%	0.20%
Core Private Real Estate	5.75%	6.00%	0.25%	9.20%	11.00%	1.80%
Private Real Estate – Opportunistic/Value-add		8.50%			22.30%	
Commodities	2.30%	2.60%	0.30%	14.60%	15.00%	0.40%
Core Private Real Assets	5.00%	6.50%	1.50%	6.65%	13.40%	6.75%
OTHER ALTERNATIVES	Return	Return	Return	Risk	Risk	Risk
Private Equity – Fund of Funds		8.75%			15.50%	
Private Equity – Direct		10.25%			18.60%	
Hedged Strategies – Low Volatility		4.00%			5.20%	
Hedged Strategies – Hedged Equity		5.40%			11.60%	
Core Private Credit	7.00%	7.10%	0.10%	7.40%	10.00%	2.60%

# Risk Assumptions

- Our risk assumptions are formulated by calculating standard deviations using historical monthly data (or quarterly, if no monthly data is available) going back approximately 30 years.
- We maintained a modestly higher risk assumption for equities to account for continued economic uncertainty which often coincides with higher equity market volatility.
- Within inflation and T-bills, we raised our risk assumption to coincide with a wider range of potential outcomes given the uncertainty surrounding the actions of the Federal Reserve to dampen inflation by lifting short-term interest rates.

	2021	2022	Change
<b>U.S. ECONOMY</b>	<b>Risk</b>	<b>Risk</b>	<b>Risk</b>
U.S. Economic Growth (Real GDP)	2.50%	2.70%	0.20%
U.S. Inflation (CPI)	1.00%	1.25%	0.25%
<b>EQUITY MARKETS</b>	<b>Risk</b>	<b>Risk</b>	<b>Risk</b>
U.S. Large-Cap Equity	15.50%	15.50%	-
U.S. Mid-Cap Equity	17.80%	17.80%	-
U.S. Small-Cap Equity	19.80%	19.80%	-
International Stocks-Developed Markets	17.00%	17.00%	-
International Stocks-Emerging Markets	22.00%	22.00%	-
<b>FIXED INCOME</b>	<b>Risk</b>	<b>Risk</b>	<b>Risk</b>
U.S. Short-Term T-Bills (Cash)	0.60%	1.00%	0.40%
U.S. Short-Term Govt/Credit		1.50%	
U.S. Intermediate-Term Govt/Credit		3.10%	
U.S. Core Fixed Income	3.60%	3.70%	0.10%
U.S. Intermediate-Term Treasury Bonds	3.00%	3.00%	0.00%
U.S. Long-Term Treasury Bonds	12.10%	12.30%	0.20%
U.S. Investment Grade Corporate Bonds	5.40%	5.60%	0.20%
U.S. Long-Term Corporate Bonds	8.90%	9.30%	0.40%
U.S. High Yield Corporate Bonds	8.30%	8.40%	0.10%
U.S. Municipal Bonds	4.20%	4.40%	0.20%
Global Bonds	5.30%	5.40%	0.10%
Treasury Inflated-Protected (TIPS)	5.80%	5.40%	-0.40%
Floating Rate Bonds	6.20%	6.10%	-0.10%
<b>REAL ASSETS</b>	<b>Risk</b>	<b>Risk</b>	<b>Risk</b>
U.S. Public Real Estate	18.40%	18.60%	0.20%
Core Private Real Estate	9.20%	11.00%	1.80%
Private Real Estate – Opportunistic/Value-add		22.30%	
Commodities	14.60%	15.00%	0.40%
Core Private Real Assets	6.65%	13.40%	6.75%
<b>OTHER ALTERNATIVES</b>	<b>Risk</b>	<b>Risk</b>	<b>Risk</b>
Private Equity – Fund of Funds		15.50%	
Private Equity – Direct		18.60%	
Hedged Strategies – Low Volatility		5.20%	
Hedged Strategies – Hedged Equity		11.60%	
Core Private Credit	7.40%	10.00%	2.60%

# Correlation Assumptions

Correlation Table	U.S. Large Cap Equity	U.S. Mid Cap Equity	U.S. Small Cap Equity	Intl. Developed Equity	Emerging Markets	U.S. T-Bills (Cash)	U.S. Short-Term Govt/Credit	U.S. Interim. Govt/Credit	U.S. Core Fixed Income	U.S. Interim. Treasury Bonds	U.S. Long Treasury Bonds	U.S. I.G. Bonds	U.S. Long Corporate Bonds	U.S. High-Yield	U.S. Municipal Bonds	Global Bonds	TIPS	Floating Rate Bonds	U.S. Public Real Estate	Core Private Real Estate	Private Real Estate O/V/A	Commodities	Core Private Real Assets	Private Equity	Hedged Strat. - Low Vol.	Hedged Strat. - H.E.	Core Private Credit	U.S. Inflation	U.S. Nominal GDP
U.S. Large Cap Equity	1.00																												
U.S. Mid Cap Equity	0.96	1.00																											
U.S. Small Cap Equity	0.91	0.96	1.00																										
Intl. Developed Equity	0.88	0.91	0.87	1.00																									
Emerging Markets	0.78	0.84	0.77	0.89	1.00																								
U.S. T-Bills (Cash)	-0.14	-0.13	-0.13	-0.01	0.10	1.00																							
U.S. Short-Term Govt/Credit	-0.33	-0.29	-0.29	-0.17	-0.05	0.43	1.00																						
U.S. Interim. Govt/Credit	-0.27	-0.24	-0.28	-0.14	-0.06	0.15	0.87	1.00																					
U.S. Core Fixed Income	-0.26	-0.24	-0.29	-0.17	-0.08	0.11	0.77	0.96	1.00																				
U.S. Interim. Treasury Bonds	-0.58	-0.59	-0.57	-0.50	-0.41	0.24	0.81	0.87	0.85	1.00																			
U.S. Long Treasury Bonds	-0.52	-0.55	-0.56	-0.51	-0.48	0.05	0.47	0.70	0.78	0.83	1.00																		
U.S. I.G. Corp. Bonds	0.30	0.34	0.23	0.38	0.41	-0.10	0.48	0.73	0.74	0.32	0.34	1.00																	
U.S. Long Corporate Bonds	0.25	0.27	0.18	0.29	0.31	-0.11	0.40	0.70	0.76	0.35	0.50	0.96	1.00																
U.S. High-Yield	0.77	0.82	0.74	0.77	0.80	-0.14	-0.10	-0.02	-0.02	-0.45	-0.49	0.54	0.42	1.00															
U.S. Municipal Bonds	-0.01	0.04	-0.07	0.09	0.17	-0.06	0.43	0.69	0.73	0.45	0.42	0.72	0.69	0.28	1.00														
Global Bonds	0.03	0.06	0.01	0.25	0.25	0.11	0.63	0.72	0.69	0.53	0.37	0.66	0.61	0.18	0.55	1.00													
TIPS	-0.10	-0.04	-0.14	-0.03	0.11	0.04	0.51	0.67	0.69	0.52	0.35	0.55	0.48	0.21	0.68	0.56	1.00												
Floating Rate Bonds	0.66	0.73	0.64	0.67	0.69	-0.15	-0.23	-0.19	-0.17	-0.58	-0.61	0.37	0.23	0.90	0.23	0.02	0.18	1.00											
U.S. Public Real Estate	0.73	0.76	0.74	0.70	0.60	-0.08	-0.11	0.00	0.03	-0.30	-0.27	0.42	0.37	0.69	0.24	0.21	0.13	0.61	1.00										
Core Private Real Estate	0.14	0.09	0.08	0.09	-0.03	0.17	-0.29	-0.22	-0.19	-0.10	0.00	-0.24	-0.18	-0.15	-0.23	-0.12	-0.05	-0.12	0.19	1.00									
Private Real Estate O/VA	0.00	-0.05	-0.04	-0.02	-0.09	0.32	-0.17	-0.16	-0.14	0.03	0.07	-0.31	-0.26	-0.34	-0.18	-0.12	-0.02	-0.29	-0.07	0.80	1.00								
Commodities	0.45	0.52	0.44	0.54	0.57	0.05	-0.08	-0.10	-0.13	-0.36	-0.43	0.24	0.14	0.57	0.07	0.21	0.31	0.58	0.40	0.17	0.09	1.00							
Core Private Real Assets	0.45	0.49	0.48	0.46	0.48	0.14	-0.10	-0.09	-0.08	-0.23	-0.22	0.14	0.14	0.39	0.06	0.10	0.07	0.31	0.39	0.18	0.11	0.30	1.00						
Private Equity	0.58	0.57	0.55	0.59	0.52	0.02	-0.19	-0.15	-0.16	-0.37	-0.34	0.22	0.18	0.47	-0.02	0.10	0.03	0.42	0.44	0.18	0.09	0.43	0.48	1.00					
Hedged Strat. - Low Vol.	0.82	0.89	0.83	0.90	0.86	-0.01	-0.23	-0.21	-0.24	-0.61	-0.61	0.37	0.23	0.81	0.19	0.07	0.07	0.79	0.58	0.04	-0.01	0.68	0.44	0.58	1.00				
Hedged Strat. - H.E.	0.87	0.93	0.89	0.92	0.89	-0.06	-0.22	-0.22	-0.25	-0.58	-0.61	0.33	0.22	0.80	0.07	0.09	0.01	0.75	0.62	0.03	-0.05	0.63	0.44	0.59	0.96	1.00			
Core Private Credit	0.70	0.75	0.67	0.66	0.64	-0.07	-0.39	-0.31	-0.29	-0.61	-0.60	0.20	0.09	0.75	0.11	-0.09	0.13	0.78	0.58	0.30	0.16	0.65	0.43	0.55	0.79	0.72	1.00		
U.S. Inflation	0.22	0.23	0.16	0.22	0.21	0.11	-0.31	-0.36	-0.32	-0.39	-0.42	-0.18	-0.23	0.28	-0.10	-0.09	0.20	0.44	0.27	0.35	0.20	0.61	0.15	0.19	0.38	0.28	0.51	1.00	
U.S. Nominal GDP	0.07	0.04	0.02	0.08	0.07	0.04	-0.28	-0.27	-0.25	-0.19	-0.13	-0.26	-0.20	0.00	-0.11	-0.10	-0.04	0.02	0.12	0.36	0.21	0.23	0.06	0.11	0.07	0.27	0.42	1.00	

Sources: Bloomberg, Pitchbook, CAPTRUST Research; Data from 12/2001 – 12/2021 (where available).

Capital Market Assumptions 2022

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# Assumption Methodology



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# Methodology: Inflation

<b>Full-period return assumption:</b>	2.60%
<b>Change from prior year's assumption:</b>	0.30%

## Assumption Methodology:

- We expect that inflation will continue to run above trend for some time as the Federal Reserve seeks to reverse the effects of pandemic-era accommodative monetary and fiscal policies and global supply chain disruptions.
- We anticipate this period of higher inflation will be followed by a gradual normalization to the Federal Reserve's 2 percent long-term target rate. We believe the Fed has both the tools and resolve to bring inflation back to target .
- The 30-bps increase in the year-over-year inflation assumption is driven by the expectation of still elevated but gradually falling inflation until the end of 2024. After 2024, we expect inflation to land between 2.0 and 2.5 percent.
- For the period from 2001 to 2021, inflation averaged 2.3 percent annually.

Year	Inflation
Y+1	5.9%
Y+2	3.1%
Y+3	2.2%
Y+4	2.2%
Y+5	2.1%
Y+6	2.1%
Y+7	2.1%
Y+8	2.1%
Y+9	2.1%
Y+10	2.1%
<b>Average</b>	<b>2.6%</b>

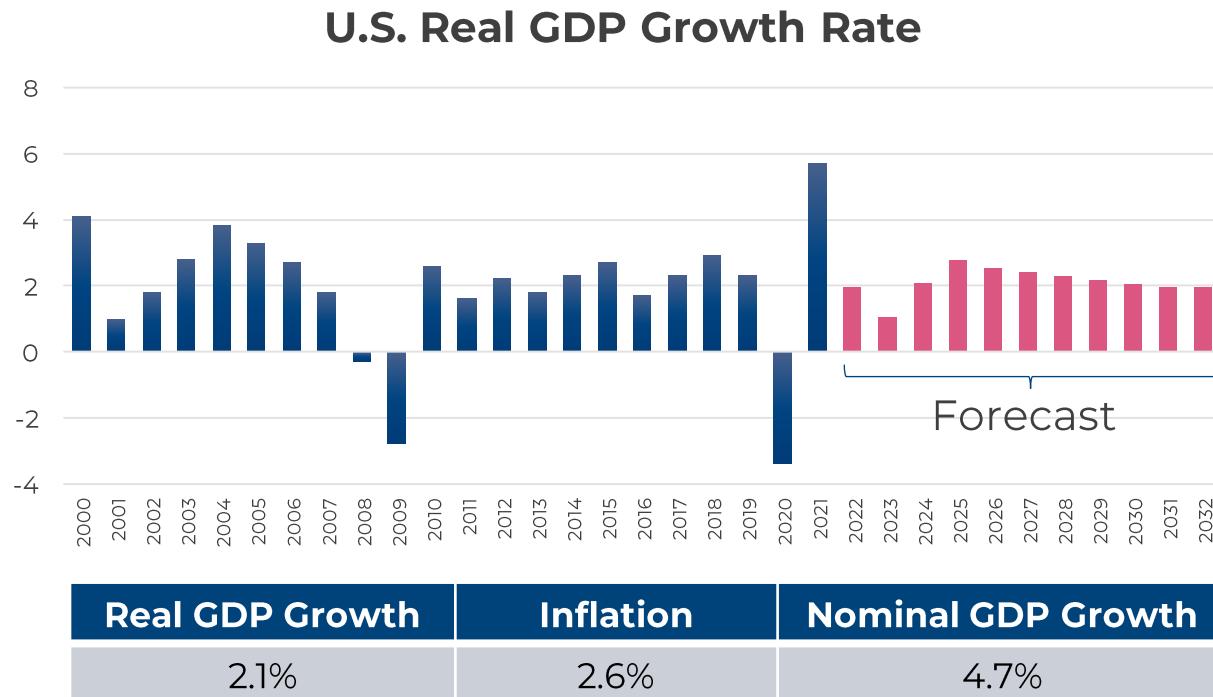
Sources: Bloomberg; CAPTRUST Research

# Methodology: Real GDP Growth

**Full-period return assumption:** 2.10%  
**Change from prior year's assumption:** -0.10%

## Assumption Methodology:

- Using the same approach as inflation, we expect real gross domestic product (GDP) will be impacted by headwinds from higher interest rates and inflation through 2024, before picking back up to resume post-2000 average growth rates between 2.0 and 2.5 percent.



Year	Real GDP
Y+1	1.5%
Y+2	1.6%
Y+3	2.4%
Y+4	2.6%
Y+5	2.5%
Y+6	2.4%
Y+7	2.2%
Y+8	2.1%
Y+9	2.0%
Y+10	2.0%
<b>Average</b>	<b>2.1%</b>

# Equity Markets Assumption Summary

	2021	2022	Change	2021	2022	Change
EQUITY MARKETS	Return			Risk		
U.S. Large-Cap Equity	7.25%	7.25%	-	15.5%	15.5%	-
U.S. Mid-Cap Equity	7.50%	7.50%	-	17.8%	17.8%	-
U.S. Small-Cap Equity	7.50%	7.50%	-	19.8%	19.8%	-
International Stocks-Developed Markets	6.75%	6.25%	-0.5%	17.0%	17.0%	-
International Stocks-Emerging Markets	7.75%	7.25%	-0.5%	22.0%	22.0%	-

# Methodology: U.S. Large-Cap Equities

<b>Full-period return assumption:</b>	7.25%
<b>Change from prior year's assumption:</b>	0.00%

## Assumption Methodology:

- We start by examining the implied forward rate of return for the S&P 500 Index using a version of the Gordon dividend discount model to make assumptions for the average earnings growth rate over the next 10 years.
- The dividend payout ratio (including repurchases) has historically averaged approximately 45 percent.
- Implied Required Rate of Return =  $(\text{Forward EPS} \times \text{Dividend Payout Ratio}) + (\text{S&P 500 Index Value} \times \text{Earnings Growth Rate}) / \text{S&P 500 Index Value}$

S&P 500 Index Value (as of 6.30.2022)	3785
Forward EPS Estimate	228
Forward Long-Term Earnings Growth Rate	4.7% ←
Dividend Payout Ratio (including repurchases)	45.0%
<b>Implied Required Rate of Return</b>	<b>7.4%</b>

Year	Earnings Growth Rate
Y+1	7.4%
Y+2	4.3%
Y+3	4.5%
Y+4	4.9%
Y+5	4.7%
Y+6	4.6%
Y+7	4.5%
Y+8	4.4%
Y+9	4.2%
Y+10	4.2%
<b>Average</b>	<b>~4.7%</b>

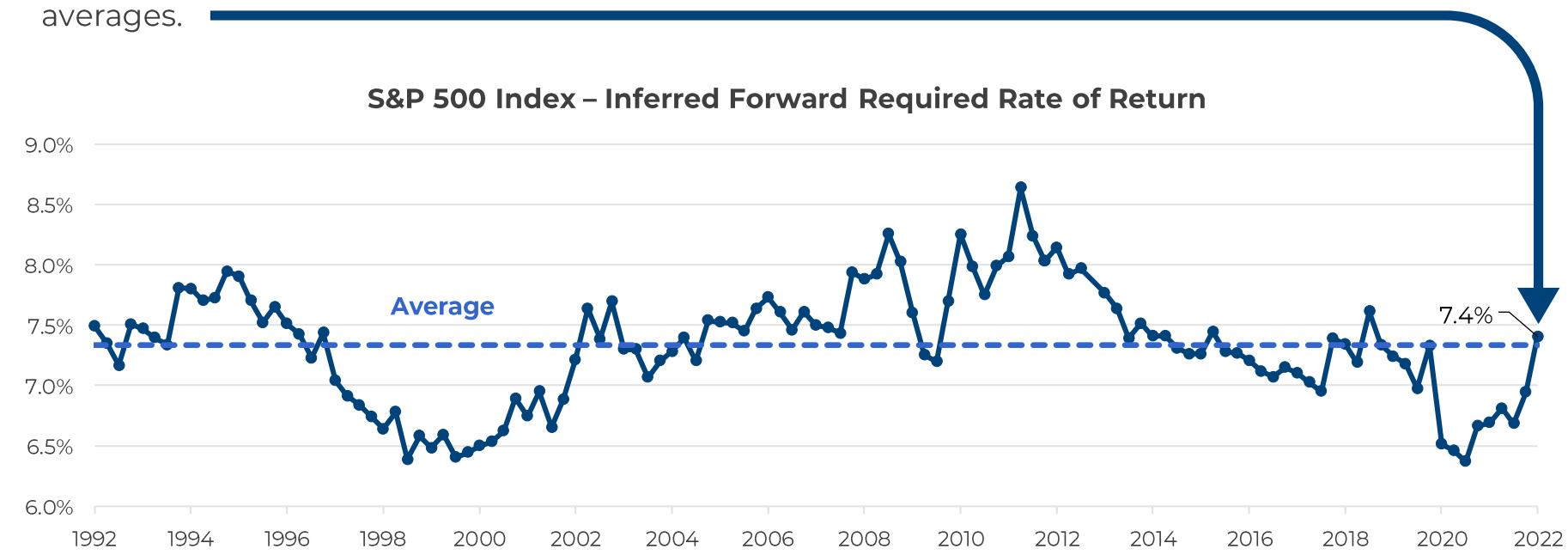
Data as of 6.30.2022

Forward EPS data and index value source: Bloomberg  
Other sources include: Clifftwater and Oxford Economics

# Methodology: U.S. Large-Cap Equities

## Historical look at the S&P 500 Index Discount Model from 6.30.1992 to 6.30.2022

- Model-inferred average return expectation was 7.3 percent; actual total return was 9.8 percent.
  - Over this timeframe, the forward P/E multiple expanded slightly from 16x to 17x and ranged from 11x to 27x.
  - The model assumes a growth rate of 4.7 and a 45 percent dividend payout ratio (including share repurchases).
  - Based on forward P/E ratio, the S&P 500 ended 6.30.2022 approximately 6 percent undervalued, relative to the last 30 years.
- Currently, the S&P 500 Index Discount Model is inferring expected returns in line with long-term averages.



Sources: Bloomberg, CAPTRUST Research

# Methodology: U.S. Small-Cap and Mid-Cap Equities

<b>Full-period return assumption:</b>	7.50%
<b>Change from prior year's assumption:</b>	0.00%

## Assumption Methodology:

- Mid-cap and small-cap stocks, in combination, have demonstrated higher returns over longer time frames. However, the premium can be volatile.
- We are maintaining a small 25-basis-point premium for U.S. mid- and small-cap stocks versus large-cap stocks.

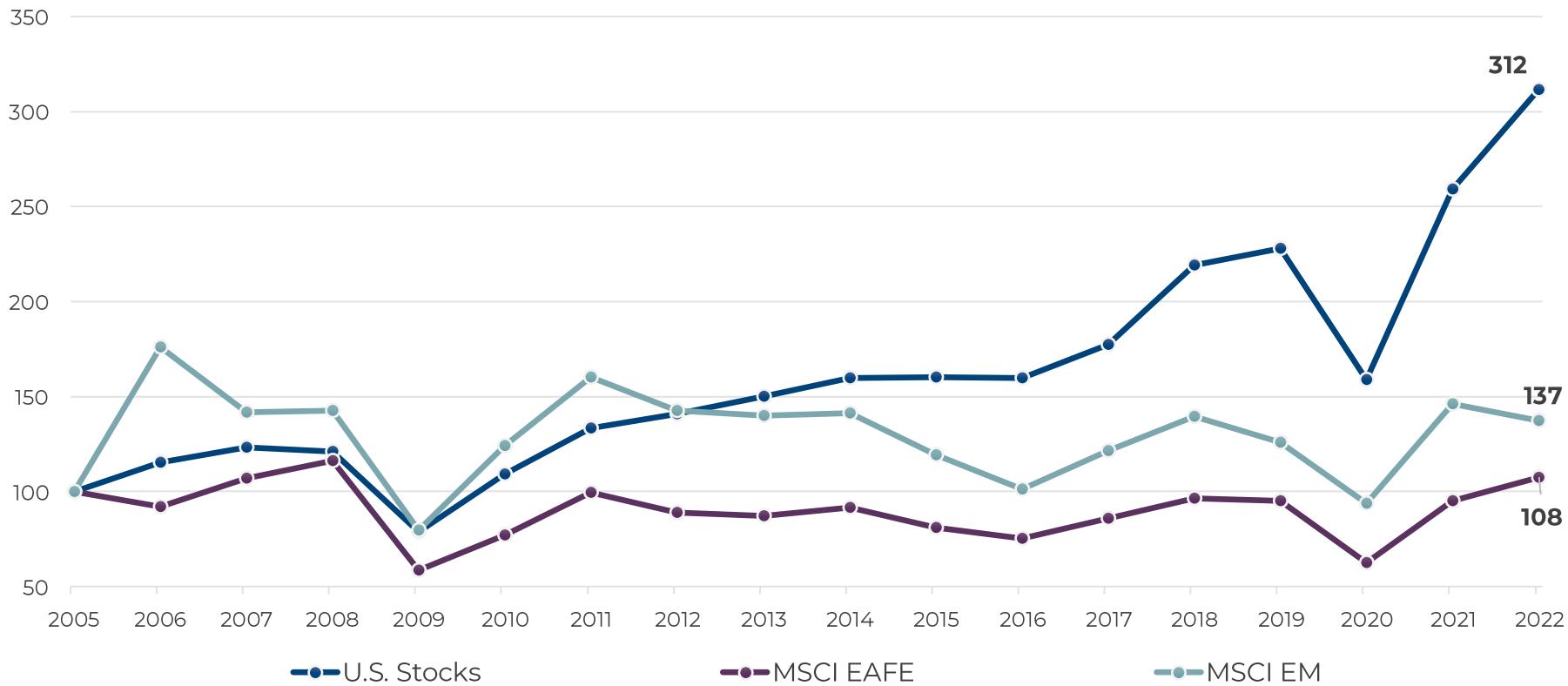
## Index Returns and Risk: 6.30.1992–6.30.2022

Index	Asset Class	Annualized Return	Standard Deviation	Sharpe Ratio
S&P 500	U.S. Large-Cap	9.8%	14.7%	0.51
Russell Midcap®	U.S. Mid-Cap	10.8%	16.4%	0.52
Russell 2000®	U.S. Small-Cap	9.1%	19.2%	0.35
		Large-Cap	Mid-Cap	Small-Cap
Return Assumption		7.25%	7.5%	7.5%

Sources: Bloomberg; CAPTRUST Research

# Forward Earnings Growth Comparisons

## Comparative Earnings Growth Since 2005



**Forward earnings growth has been stronger for U.S. versus non-U.S. equities.**

Sources: Bloomberg; CAPTRUST Research

# Methodology: International Developed Equities

<b>Full-period return assumption:</b>	6.25%
<b>Change from prior year's assumption:</b>	-0.50%

## Assumption Methodology:

- Over the past 30 years, international developed equity markets have underperformed U.S. equity markets.
- Our expectation is this trend will continue based on the impact of significantly higher energy prices caused by Russia's invasion of Ukraine, structural and demographic challenges, less dynamic economies, and weaker banking systems outside of the U.S.
- While valuations are more attractive outside the U.S., we feel the discounted valuation is warranted given the potential longer-term growth headwinds.
- Given these challenges, we are lowering return expectations 50-basis points from 6.75% to 6.25%.
- We apply a 100-basis point discount to developed international equities relative to U.S. large-cap stocks.

## Index Returns and Risk: 6.30.1992–6.30.2022

Index	Asset Class	Annualized Return	Standard Deviation
S&P 500	U.S. Large-Cap	9.8%	14.7%
MSCI EAFE	International Equity - Developed Markets	5.7%	16.1%

Sources: Bloomberg; CAPTRUST Research

# Methodology: Emerging Market Equities

**Full-period return assumption:**

7.25%

**Change from prior year's assumption:**

-0.50%

## Assumption Methodology:

- Emerging equity markets have also underperformed U.S. equity markets over the past 30 years.
- A strengthening U.S. dollar has been a significant detractor from emerging market results.
- While we anticipate that those currency headwinds may eventually calm, allowing emerging markets to potentially benefit from elevated economic growth projections and more favorable demographics, significant challenges remain:
  - Increasing uncertainty surrounding policy decisions in China and the trend towards de-globalization.
  - While valuations for many emerging markets remain attractive relative to their developed-market counterparts, earnings growth has been flat since 2012 and near-term future earnings growth prospects have been dampened by increased geopolitical risks.
- We are lowering our return expectation by 50-bps from 7.75% to 7.25%.
- We no longer apply a premium for emerging market equities relative to U.S. large-cap stocks.

## Index Returns and Risk: 6.30.1992–6.30.2022

Index	Asset Class	Annualized Return	Standard Deviation
S&P 500	U.S. Large Cap Equity	9.8%	14.7%
MSCI EM	International Equity - Emerging Markets	6.7%	21.7%

Sources: Bloomberg; CAPTRUST Research

# Fixed Income Assumption Summary

	2021	2022	Change	2021	2022	Change
FIXED INCOME	Return			Risk		
U.S. Short-Term T-Bills (Cash)	1.6%	2.3%	0.7%	0.6%	1.0%	0.4%
U.S. Short-Term Govt/Credit		3.0%			1.5%	
U.S. Intermediate-Term Govt/Credit		3.3%			3.1%	
U.S. Core Fixed Income	2.0%	3.7%	1.7%	3.6%	3.7%	0.1%
U.S. Intermediate-Term Treasury Bonds	1.7%	3.2%	1.5%	3.0%	3.0%	0.0%
U.S. Long-Term Treasury Bonds	1.9%	3.9%	2.0%	12.1%	12.3%	0.2%
U.S. Investment Grade Corporate Bonds	2.3%	4.1%	1.8%	5.4%	5.6%	0.2%
U.S. Long-Term Corporate Bonds	3.1%	4.9%	1.8%	8.9%	9.3%	0.4%
U.S. High Yield Corporate Bonds	3.1%	5.7%	2.6%	8.3%	8.4%	0.1%
U.S. Municipal Bonds	1.9%	3.5%	1.6%	4.2%	4.4%	0.2%
Global Bonds	1.5%	2.9%	1.4%	5.3%	5.4%	0.1%
Treasury Inflated-Protected (TIPS)	2.0%	3.5%	1.5%	5.8%	5.4%	-0.4%
Floating Rate Bonds	3.1%	4.1%	1.0%	6.2%	6.1%	-0.1%

# Methodology: Fixed Income

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## Assumption Methodology:

- For fixed income asset classes, we integrate several factors, if applicable, into our assumptions. These include:
  - Expectation for future short-term interest rates
  - Default assumptions based on the credit profile of the asset class
  - The shift in the yield curve as interest rates change
  - Current yields, duration, and yield-to-maturity
  - Current and historical yield spreads

## Fixed Income Asset Classes:

- Short-Term Government/Credit
- Intermediate-Term Government/Credit
- Intermediate-Term Treasury Bonds
- Long-Term Treasury Bonds
- Investment Grade Corporate Bonds
- Long-Term Corporate Bonds
- High-Yield Corporate Bonds
- Municipal Bonds
- Global Aggregate Bonds
- TIPS
- Floating Rate Bonds

Based on these factors, we constructed a discounted cash flow worksheet for each fixed income asset class. Slide 21 walks through an example of our calculation for core fixed income. Schedules for the following fixed income asset classes can be found in the Appendix.

# Methodology: Fixed Income

## Core Fixed Income

Average Yield Spread to T-bill	1.27%	INPUT
Average Years to Maturity	8.6	INPUT
Beginning Interest Rate	2.5%	INPUT
Beginning Value	\$1,000.00	INPUT
Periods	10	INPUT
Ending Value	\$1,466.72	←
Ten-Year Expected HPR	46.67%	
Annual Yield Roll Down	0.00%	INPUT
Credit Loss Impairment Estimate	0.20%	INPUT
<b>Annualized Return Assumption</b>	<b>3.7%</b>	

Future Rate Expectations	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Rate - Beg of Year	2.51%	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%
Interest Rate Change	0.53%	-0.07%	-0.17%	-0.12%	-0.06%	-0.02%	-0.02%	0.01%	0.00%	0.01%
Interest Rate - End of Year	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%	2.59%
Yield Spread to T-bill	1.27%	1.27%	1.27%	1.27%	1.27%	1.27%	1.27%	1.27%	1.27%	1.27%
Yield Spread Compression	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Resulting Yield Spread	1.27%	1.27%	1.27%	1.27%	1.27%	1.27%	1.27%	1.27%	1.27%	1.27%
Estimated Bond Yield - Beg	3.78%	4.30%	4.23%	4.06%	3.94%	3.88%	3.86%	3.84%	3.85%	3.85%
Estimated Bond Yield - End	4.30%	4.23%	4.06%	3.94%	3.88%	3.86%	3.84%	3.85%	3.85%	3.86%

Cash Flow Worksheet	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Bond Value	1000	1,004.07	1,051.79	1,108.04	1,161.53	1,211.98	1,260.66	1,311.03	1,360.71	1,413.07
Interest Rate Beg.	3.78%	4.30%	4.23%	4.06%	3.94%	3.88%	3.86%	3.84%	3.85%	3.85%
Interest Inflow	37.77	43.22	44.54	45.00	45.80	47.04	48.67	50.34	52.36	54.37
Bond Sale Inflow	\$966.30	\$1,008.57	\$1,063.50	\$1,116.53	\$1,166.18	\$1,213.61	\$1,262.36	\$1,310.37	\$1,360.71	\$1,412.35
Yield Curve Roll Down	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Interest Rate End	4.30%	4.23%	4.06%	3.94%	3.88%	3.86%	3.84%	3.85%	3.85%	3.86%
Total Economic Value	1,004.07	1,051.79	1,108.04	1,161.53	1,211.98	1,260.66	1,311.03	1,360.71	1,413.07	1,466.72
Total Annual Cash Flow	\$4.07	\$47.72	\$56.25	\$53.50	\$50.45	\$48.68	\$50.37	\$49.68	\$52.36	\$1,053.66

# Real Estate Strategies Assumption Summary

Real Estate Strategy Comparisons	Public Real Estate	Core Private Real Estate	Private Real Estate Opportunistic & Value-add
Liquidity	High	Low	Low
Property Type Concentration Risk	Low	Moderate	High
Leverage	Moderately High	Moderate	High
Correlation to Stock Market	High	Moderate	Moderate
Return Expectation	Moderate	Moderate	Moderately High
Comprehensive Risk Estimate	High	Moderate	Very High
<b>Expected Risk</b>	<b>18.6%</b>	<b>11.0%</b>	<b>22.3%</b>
<b>Expected Return</b>	<b>6.5%</b>	<b>6.0%</b>	<b>8.5%</b>

**Investors should consider the trade-offs in allocating capital amongst these various real estate strategies.**

# Methodology: Public Real Estate

**Full-period return assumption:**

6.50%

**Change from prior year's assumption:**

0.75%

**Investment Characteristics:**

- Ability to invest in a wide array of property types for both income and growth
- Shares traded on public exchanges, providing daily liquidity
- Asset class exhibits stock-market-like volatility
- Valuations can fluctuate below or above Net Asset Value (NAV)

## Assumption Methodology:

- Valuation Method 1: As real estate investment trusts (REITs) are required to pay a substantial amount of their earnings as dividends to maintain corporate tax exemption, they should exhibit subdued earnings growth. Long-term expected return should reflect the dividend yield plus expected inflation:

Dividend Yield	+	Expected Inflation	=	Expected Return
3.0%		2.6%		5.6%

- Valuation Method 2: Over the past 25 years, the return premium for public and private core real estate has been approximately 4 percent higher than core fixed income. Our forward expectation for core fixed income is 3.7 percent.

Historic Premium	+	Core Fixed Income	=	Expected Return
4.0%		3.7%		7.7%

- We arrive at our return assumption by combining the two valuation methodologies above.

# Methodology: Core Private Real Estate

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<b>Full-period return assumption:</b>	6.00%
<b>Change from prior year's assumption:</b>	0.25%

## Investment Characteristics:

- Core private real estate may be an attractive complement and/or alternative to public real estate for investors looking for more insulation from market volatility.
- Return is largely generated from current income, with minimal asset appreciation.
- Characteristics include:
  - Less volatile than public real estate and equity markets
  - Less liquidity than public real estate
  - Low to moderate levels of leverage
  - Opportunity to collect current income even with less liquidity
  - Focus on core assets: industrial, commercial, residential, and retail

## Assumption Methodology:

- While we would expect private real estate to benefit from an illiquidity premium (versus public real estate), private real estate investments generally utilize lower leverage. This may offset the illiquidity premium.
- Lower leverage combined with higher cost structures for private real estate reduces our expectation by 50-basis points, relative to public real estate.

# Methodology: Private Real Estate-Opportunistic/Value-Add

<b>Full-period return assumption:</b>	8.50%
<b>Change from prior year's assumption:</b>	N/A

## Investment Characteristics:

- Return is largely driven by equity-like appreciation, with minimal current income
- Focus on non-core assets: distressed assets or real estate development, for example
- Less initial cash flow generation
- Higher use of leverage – often between 60 and 75 percent
- Acquired properties may have ongoing challenges, including:
  - Occupancy issues
  - Management problems
  - Operational inefficiency
  - Deferred maintenance
  - Outdated design
- Potential for higher return on investment (ROI) when the properties can be improved to correct the deficiencies that are present at the time of acquisition

## Assumption Methodology:

- Within private real estate, opportunistic/value-add strategies exhibit the highest anticipated risk as well as the most upside potential. Our assumptions incorporate the higher risk-profile.

# Methodology: Commodities

<b>Full-period return assumption:</b>	2.60%
<b>Change from prior year's assumption:</b>	0.30%

## Assumption Methodology:

- Over the past several decades, commodity prices have been volatile and overall returns have been low.
  - Commodities have appreciated by 3.1 percent versus inflation of 2.5 percent from 1992 to 2022.
  - One challenge with investing in commodities is the difficulty for investors to invest directly in a broad commodity basket. The more common way is via commodity futures. During a normal, upward-sloping price curve, the ongoing roll yield can be a drag on performance.
  - Our correlation research shows that commodities are moderately positively correlated with inflation and moderately negatively correlated with longer-duration U.S. Treasury bonds.
  - Commodities tend to perform strongly during times of higher inflation but then produce low or negative returns when inflation is lower.



**In summary, we expect the return for commodities to perform in line with inflation over a full market cycle, with an expectation that volatility will remain high.**

# Methodology: Core Private Real Assets

**Full-period return assumption:**  
**Change from prior year's assumption:**

6.50%  
1.50%

## Investment Characteristics:

- Assets may include:
  - Transportation
  - Energy
  - Utilities
  - Water
  - Farmland
  - Timberland
  - Communications
  - Social (hospitals and schools)
- Often secured by hard asset cash flows
- Exhibit a longer-duration profile
- Tend to prioritize stability of income over future growth
- Investments can be made in both public and private vehicles
- Equity and fixed income investors alike may benefit from the diversification of adding this asset class to their portfolio



# Methodology: Alternatives-Private Equity

- Investors expect a premium over public equities given:
  - Less liquidity
  - Less transparency
  - More complexity
- We have divided private equity assumptions into two separate categories:
  - Fund of Funds
  - Direct

Private Equity Comparisons	Fund of Funds	Direct
Concentration Risk*	Moderate	High
Liquidity	Low	Low
Volatility of Returns	Moderately High	High
Return Expectation	Moderately High	High
Comprehensive Risk Estimate	Similar to S&P 500 Index	Greater than S&P 500 Index
Expected Return vs. S&P 500 Index	+150 BPS	+300 BPS
<b>Expected Risk</b>	<b>15.5%</b>	<b>18.6%</b>
<b>Expected Return</b>	<b>8.75%</b>	<b>10.25%</b>

\*Defined as Manager and Vintage Year



# Methodology: Alternatives-Hedged Strategies

- Investors in hedged strategies often seek to diversify their beta investment exposure by allocating to alpha investments that seek to generate returns via less traditional risk premia.
- In practice, many hedged strategies have both an alpha and a beta component.
- We divide hedged strategies into two categories.
  - Low Volatility: fixed income-like risk/return profile
  - Hedged Equity: equity-like risk/return profile
- The following is a breakdown of our expected component returns:

	Low Volatility	Hedged Equity
Equity beta	1.5%	3.5%
+ T-bill beta	1.8%	1.2%
+ Alpha component	0.7%	0.7%
= Expected Return	4.0%	5.4%



# Methodology: Alternatives-Core Private Credit

<b>Full-period return assumption:</b>	7.10%
<b>Change from prior year's assumption:</b>	0.10%

## Assumption Methodology:

- While total returns and high current yield are attractive features of this asset class, we remain both constructive and cautious:
  - Direct originated loans are a growing asset class, attracting institutional investment
  - Spreads in other credit-focused fixed income asset classes have been trending higher
  - The search for yield during recent years may have facilitated less stringent underwriting standards
  - In a recessionary environment, private credit may experience fair value reductions or even net credit losses



# CAPTRUST Capital Market Assumptions

<b>U.S. ECONOMY</b>	<b>Return</b>	<b>Risk</b>
U.S. Economic Growth (Nominal GDP)	4.70%	2.70%
U.S. Economic Growth (Real GDP)	2.10%	2.70%
U.S. Inflation (CPI)	2.60%	1.250
<b>EQUITY MARKETS</b>	<b>Return</b>	<b>Risk</b>
U.S. Large-Cap Equity	7.25%	15.50%
U.S. Mid-Cap Equity	7.50%	17.80%
U.S. Small-Cap Equity	7.50%	19.80%
International Stocks-Developed Markets	6.25%	17.00%
International Stocks-Emerging Markets	7.25%	22.00%
<b>FIXED INCOME</b>	<b>Return</b>	<b>Risk</b>
U.S. Short-Term T-Bills (Cash)	2.30%	1.00%
U.S. Short-Term Govt/Credit	3.00%	1.50%
U.S. Intermediate-Term Govt/Credit	3.30%	3.10%
U.S. Core Fixed Income	3.70%	3.70%
U.S. Intermediate-Term Treasury Bonds	3.20%	3.00%
U.S. Long-Term Treasury Bonds	3.90%	12.30%
U.S. Investment Grade Corporate Bonds	4.10%	5.60%
U.S. Long-Term Corporate Bonds	4.90%	9.30%
U.S. High Yield Corporate Bonds	5.70%	8.40%
U.S. Municipal Bonds	3.50%	4.40%
Global Bonds	2.90%	5.40%
Treasury Inflated-Protected (TIPS)	3.50%	5.40%
Floating Rate Bonds	4.10%	6.10%
<b>REAL ASSETS</b>	<b>Return</b>	<b>Risk</b>
U.S. Public Real Estate	6.50%	18.60%
Core Private Real Estate	6.00%	11.00%
Private Real Estate – Opportunistic/Value-add	8.50%	22.30%
Commodities	2.60%	15.00%
Core Private Real Assets	6.50%	13.40%
<b>OTHER ALTERNATIVES</b>	<b>Return</b>	<b>Risk</b>
Private Equity – Fund of Funds	8.75%	15.50%
Private Equity – Direct	10.25%	18.60%
Hedged Strategies – Low Volatility	4.00%	5.20%
Hedged Strategies – Hedged Equity	5.40%	11.60%
Core Private Credit	7.10%	10.00%

Formulating risk and return assumptions for asset classes offers investors a guide to the probable range of investment performance. These assumptions can guide the asset allocation process to meet your investment goals.

At CAPTRUST, we believe setting realistic capital market assumptions helps manage expectations and better frame conversations for successful investment strategies.

Source: CAPTRUST Research as of September 2022

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Capital Market Assumptions 2022

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# Appendix



CAPTRUST

# Fixed Income Methodology

## Short-Term Government/Credit

Average Yield Spread to T-bill	0.52%	INPUT
Average Years to Maturity	2.0	INPUT
Beginning Interest Rate	2.5%	INPUT
Beginning Value	\$1,000.00	INPUT
Periods	10	INPUT
Ending Value	\$1,370.49	
Ten-Year Expected HPR	37.05%	
Annual Yield Roll Down	0.00%	INPUT
Credit Loss Impairment Estimate	0.20%	INPUT
<b>Annualized Return Assumption</b>	<b>3.0%</b>	

Future Rate Expectations	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Rate - Beg of Year	2.51%	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%
Interest Rate Change	0.53%	-0.07%	-0.17%	-0.12%	-0.06%	-0.02%	-0.02%	0.01%	0.00%	0.01%
Interest Rate - End of Year	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%	2.59%
Yield Spread to T-bill	0.52%	0.52%	0.52%	0.52%	0.52%	0.52%	0.52%	0.52%	0.52%	0.52%
Yield Spread Compression	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Resulting Yield Spread	0.52%	0.52%	0.52%	0.52%	0.52%	0.52%	0.52%	0.52%	0.52%	0.52%
Estimated Bond Yield - Beg	3.03%	3.55%	3.48%	3.31%	3.19%	3.13%	3.11%	3.09%	3.10%	3.10%
Estimated Bond Yield - End	3.55%	3.48%	3.31%	3.19%	3.13%	3.11%	3.09%	3.10%	3.10%	3.11%

Cash Flow Worksheet	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Bond Value	1000	1,025.22	1,062.34	1,101.12	1,138.83	1,175.87	1,212.93	1,250.90	1,289.46	1,329.40
Interest Rate Beg.	3.03%	3.55%	3.48%	3.31%	3.19%	3.13%	3.11%	3.09%	3.10%	3.10%
Interest Inflow	30.27	36.44	37.01	36.46	36.36	36.82	37.73	38.65	39.94	41.18
Bond Sale Inflow	\$994.95	\$1,025.91	\$1,064.10	\$1,102.37	\$1,139.51	\$1,176.10	\$1,213.17	\$1,250.81	\$1,289.46	\$1,329.30
Yield Curve Roll Down	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Interest Rate End	3.55%	3.48%	3.31%	3.19%	3.13%	3.11%	3.09%	3.10%	3.10%	3.11%
Bond Roll Purchase Outflow	1,025.22	1,062.34	1,101.12	1,138.83	1,175.87	1,212.93	1,250.90	1,289.46	1,329.40	1,370.49
Total Annual Cash Flow	\$25.22	\$37.13	\$38.77	\$37.71	\$37.04	\$37.06	\$37.97	\$38.56	\$39.94	\$1,041.08

# Fixed Income Methodology

## Intermediate-Term Government/Credit

Average Yield Spread to T-bill	0.88%	INPUT
Average Years to Maturity	4.3	INPUT
Beginning Interest Rate	2.5%	INPUT
Beginning Value	\$1,000.00	INPUT
Periods	10	INPUT
Ending Value	\$1,416.62	
Ten-Year Expected HPR	41.66%	
Annual Yield Roll Down	0.00%	INPUT
Credit Loss Impairment Estimate	0.20%	INPUT
<b>Annualized Return Assumption</b>	<b>3.3%</b>	

Future Rate Expectations	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Rate - Beg of Year	2.51%	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%
Interest Rate Change	0.53%	-0.07%	-0.17%	-0.12%	-0.06%	-0.02%	-0.02%	0.01%	0.00%	0.01%
Interest Rate - End of Year	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%	2.59%
Yield Spread to T-bill	0.88%	0.88%	0.88%	0.88%	0.88%	0.88%	0.88%	0.88%	0.88%	0.88%
Yield Spread Compression	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Resulting Yield Spread	0.88%	0.88%	0.88%	0.88%	0.88%	0.88%	0.88%	0.88%	0.88%	0.88%
Estimated Bond Yield - Beg	3.39%	3.91%	3.84%	3.67%	3.55%	3.49%	3.47%	3.45%	3.46%	3.46%
Estimated Bond Yield - End	3.91%	3.84%	3.67%	3.55%	3.49%	3.47%	3.45%	3.46%	3.46%	3.47%

Cash Flow Worksheet	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Bond Value	1000	1,017.68	1,059.70	1,106.08	1,150.74	1,193.82	1,236.27	1,279.97	1,323.82	1,369.59
Interest Rate Beg.	3.39%	3.91%	3.84%	3.67%	3.55%	3.49%	3.47%	3.45%	3.46%	3.46%
Interest Inflow	33.87	39.83	40.74	40.61	40.89	41.68	42.91	44.16	45.77	47.36
Bond Sale Inflow	\$983.81	\$1,019.87	\$1,065.34	\$1,110.13	\$1,152.93	\$1,194.58	\$1,237.06	\$1,279.66	\$1,323.82	\$1,369.26
Yield Curve Roll Down	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Interest Rate End	3.91%	3.84%	3.67%	3.55%	3.49%	3.47%	3.45%	3.46%	3.46%	3.47%
Bond Roll Purchase Outflow	1,017.68	1,059.70	1,106.08	1,150.74	1,193.82	1,236.27	1,279.97	1,323.82	1,369.59	1,416.62
Total Annual Cash Flow	\$17.68	\$42.02	\$46.38	\$44.65	\$43.08	\$42.45	\$43.70	\$43.85	\$45.77	\$1,047.03

# Fixed Income Methodology

## Intermediate-Term Treasury Bonds

Average Yield Spread to T-bill	0.54%	INPUT
Average Years to Maturity	4.1	INPUT
Beginning Interest Rate	2.5%	INPUT
Beginning Value	\$1,000.00	INPUT
Periods	10	INPUT
Ending Value	\$1,370.99	
Ten-Year Expected HPR	37.10%	
Annual Yield Roll Down	0.00%	INPUT
Credit Loss Impairment Estimate	0.00%	INPUT
<b>Annualized Return</b>	<b>3.2%</b>	

Future Rate Expectations	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Rate - Beg of Year	2.51%	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%
Interest Rate Change	0.53%	-0.07%	-0.17%	-0.12%	-0.06%	-0.02%	-0.02%	0.01%	0.00%	0.01%
Interest Rate - End of Year	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%	2.59%
Yield Spread to T-bill	0.54%	0.54%	0.54%	0.54%	0.54%	0.54%	0.54%	0.54%	0.54%	0.54%
Yield Spread Compression	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Resulting Yield Spread	0.54%	0.54%	0.54%	0.54%	0.54%	0.54%	0.54%	0.54%	0.54%	0.54%
Estimated Bond Yield - Beg	3.05%	3.57%	3.50%	3.33%	3.21%	3.15%	3.13%	3.11%	3.12%	3.12%
Estimated Bond Yield - End	3.57%	3.50%	3.33%	3.21%	3.15%	3.13%	3.11%	3.12%	3.12%	3.13%

Cash Flow Worksheet	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Bond Value	1000	1,015.24	1,053.58	1,095.77	1,136.05	1,174.59	1,212.31	1,251.00	1,289.62	1,329.83
Interest Rate Beg.	3.05%	3.57%	3.50%	3.33%	3.21%	3.15%	3.13%	3.11%	3.12%	3.12%
Interest Inflow	30.47	36.29	36.92	36.51	36.50	37.02	37.95	38.91	40.21	41.46
Bond Sale Inflow	\$984.77	\$1,017.29	\$1,058.85	\$1,099.54	\$1,138.09	\$1,175.30	\$1,213.05	\$1,250.72	\$1,289.62	\$1,329.53
Yield Curve Roll Down	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Interest Rate End	3.57%	3.50%	3.33%	3.21%	3.15%	3.13%	3.11%	3.12%	3.12%	3.13%
Bond Roll Purchase Outflow	1,015.24	1,053.58	1,095.77	1,136.05	1,174.59	1,212.31	1,251.00	1,289.62	1,329.83	1,370.99
Total Annual Cash Flow	\$15.24	\$38.34	\$42.20	\$40.27	\$38.54	\$37.73	\$38.69	\$38.62	\$40.21	\$1,041.16

# Fixed Income Methodology

## Long-Term Treasury Bonds

Average Yield Spread to T-bill	1.35%	INPUT
Average Years to Maturity	27.7	INPUT
Beginning Interest Rate	2.5%	INPUT
Beginning Value	\$1,000.00	INPUT
Periods	10	INPUT
Ending Value	\$1,465.42	
Ten-Year Expected HPR	46.54%	
Annual Yield Roll Down	0.00%	INPUT
Credit Loss Impairment Estimate	0.00%	INPUT
<b>Annualized Return</b>	<b>3.9%</b>	

Future Rate Expectations	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Rate - Beg of Year	2.51%	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%
Interest Rate Change	0.53%	-0.07%	-0.17%	-0.12%	-0.06%	-0.02%	-0.02%	0.01%	0.00%	0.01%
Interest Rate - End of Year	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%	2.59%
Yield Spread to T-bill	1.35%	1.35%	1.35%	1.35%	1.35%	1.35%	1.35%	1.35%	1.35%	1.35%
Yield Spread Compression	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Resulting Yield Spread	1.35%	1.35%	1.35%	1.35%	1.35%	1.35%	1.35%	1.35%	1.35%	1.35%
Estimated Bond Yield - Beg	3.86%	4.38%	4.31%	4.14%	4.02%	3.96%	3.94%	3.92%	3.93%	3.93%
Estimated Bond Yield - End	4.38%	4.31%	4.14%	4.02%	3.96%	3.94%	3.92%	3.93%	3.93%	3.94%

Cash Flow Worksheet	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Bond Value	1000	956.48	1,008.90	1,080.28	1,145.71	1,203.31	1,255.05	1,308.78	1,358.41	1,411.77
Interest Rate Beg.	3.86%	4.38%	4.31%	4.14%	4.02%	3.96%	3.94%	3.92%	3.93%	3.93%
Interest Inflow	38.57	41.93	43.53	44.74	46.09	47.67	49.46	51.30	53.36	55.45
Bond Sale Inflow	\$917.91	\$966.97	\$1,036.75	\$1,100.97	\$1,157.21	\$1,207.39	\$1,259.32	\$1,307.11	\$1,358.41	\$1,409.97
Yield Curve Roll Down	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Interest Rate End	4.38%	4.31%	4.14%	4.02%	3.96%	3.94%	3.92%	3.93%	3.93%	3.94%
Bond Roll Purchase Outflow	956.48	1,008.90	1,080.28	1,145.71	1,203.31	1,255.05	1,308.78	1,358.41	1,411.77	1,465.42
Total Annual Cash Flow	(\$43.52)	\$52.43	\$71.37	\$65.43	\$57.60	\$51.75	\$53.72	\$49.63	\$53.36	\$1,053.65

# Fixed Income Methodology

## Investment-Grade Corporate Bonds

Average Yield Spread to T-bill	1.98%	INPUT
Average Years to Maturity	11.4	INPUT
Beginning Interest Rate	2.5%	INPUT
Beginning Value	\$1,000.00	INPUT
Periods	10	INPUT
Ending Value	\$1,567.89	
Ten-Year Expected HPR	56.79%	
Annual Yield Roll Down	0.00%	INPUT
Credit Loss Impairment Estimate	0.50%	INPUT
<b>Annualized Return</b>	<b>4.1%</b>	

Future Rate Expectations	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Rate - Beg of Year	2.51%	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%
Interest Rate Change	0.53%	-0.07%	-0.17%	-0.12%	-0.06%	-0.02%	-0.02%	0.01%	0.00%	0.01%
Interest Rate - End of Year	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%	2.59%
Yield Spread to T-bill	1.98%	1.98%	1.98%	1.98%	1.98%	1.98%	1.98%	1.98%	1.98%	1.98%
Yield Spread Compression	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Resulting Yield Spread	1.98%	1.98%	1.98%	1.98%	1.98%	1.98%	1.98%	1.98%	1.98%	1.98%
Estimated Bond Yield - Beg	4.49%	5.01%	4.94%	4.77%	4.65%	4.59%	4.57%	4.55%	4.56%	4.56%
Estimated Bond Yield - End	5.01%	4.94%	4.77%	4.65%	4.59%	4.57%	4.55%	4.56%	4.56%	4.57%

Cash Flow Worksheet	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Bond Value	1000	1,002.77	1,058.67	1,125.78	1,190.32	1,251.69	1,311.28	1,373.43	1,435.05	1,500.46
Interest Rate Beg.	4.49%	5.01%	4.94%	4.77%	4.65%	4.59%	4.57%	4.55%	4.56%	4.56%
Interest Inflow	44.87	50.28	52.34	53.72	55.39	57.47	59.94	62.49	65.41	68.39
Bond Sale Inflow	\$957.90	\$1,008.39	\$1,073.44	\$1,136.61	\$1,196.30	\$1,253.80	\$1,313.50	\$1,372.56	\$1,435.05	\$1,499.50
Yield Curve Roll Down	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Interest Rate End	5.01%	4.94%	4.77%	4.65%	4.59%	4.57%	4.55%	4.56%	4.56%	4.57%
Bond Roll Purchase Outflow	1,002.77	1,058.67	1,125.78	1,190.32	1,251.69	1,311.28	1,373.43	1,435.05	1,500.46	<b>1,567.89</b>
Total Annual Cash Flow	\$2.77	\$55.90	\$67.11	\$64.54	\$61.36	\$59.59	\$62.16	\$61.62	\$65.41	\$1,067.43

# Fixed Income Methodology

## Long-Term Corporate Bonds

Average Yield Spread to T-bill	2.81%	INPUT
Average Years to Maturity	23.3	INPUT
Beginning Interest Rate	2.5%	INPUT
Beginning Value	\$1,000.00	INPUT
Periods	10	INPUT
Ending Value	\$1,690.37	
Ten-Year Expected HPR	69.04%	
Annual Yield Roll Down	0.00%	INPUT
Credit Loss Impairment Estimate	0.50%	INPUT
<b>Annualized Return</b>	<b>4.9%</b>	

Future Rate Expectations	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Rate - Beg of Year	2.51%	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%
Interest Rate Change	0.53%	-0.07%	-0.17%	-0.12%	-0.06%	-0.02%	-0.02%	0.01%	0.00%	0.01%
Interest Rate - End of Year	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%	2.59%
Yield Spread to T-bill	2.81%	2.81%	2.81%	2.81%	2.81%	2.81%	2.81%	2.81%	2.81%	2.81%
Yield Spread Compression	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Resulting Yield Spread	2.81%	2.81%	2.81%	2.81%	2.81%	2.81%	2.81%	2.81%	2.81%	2.81%
Estimated Bond Yield - Beg	5.32%	5.84%	5.77%	5.60%	5.48%	5.42%	5.40%	5.38%	5.39%	5.39%
Estimated Bond Yield - End	5.84%	5.77%	5.60%	5.48%	5.42%	5.40%	5.38%	5.39%	5.39%	5.40%

Cash Flow Worksheet	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Bond Value	1000	988.31	1,054.63	1,138.40	1,219.27	1,295.71	1,369.40	1,447.00	1,523.40	1,605.48
Interest Rate Beg.	5.32%	5.84%	5.77%	5.60%	5.48%	5.42%	5.40%	5.38%	5.39%	5.39%
Interest Inflow	53.17	57.76	60.90	63.77	66.85	70.25	73.96	77.85	82.08	86.50
Bond Sale Inflow	\$935.15	\$996.87	\$1,077.51	\$1,155.50	\$1,228.86	\$1,299.15	\$1,373.04	\$1,445.55	\$1,523.40	\$1,603.87
Yield Curve Roll Down	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Interest Rate End	5.84%	5.77%	5.60%	5.48%	5.42%	5.40%	5.38%	5.39%	5.39%	5.40%
Bond Roll Purchase Outflow	988.31	1,054.63	1,138.40	1,219.27	1,295.71	1,369.40	1,447.00	1,523.40	1,605.48	1,690.37
Total Annual Cash Flow	(\$11.69)	\$66.31	\$83.78	\$80.87	\$76.44	\$73.69	\$77.60	\$76.40	\$82.08	\$1,084.90

# Fixed Income Methodology

## High Yield Corporate Bonds

Average Yield Spread to T-bill	4.80%	INPUT
Average Years to Maturity	5.9	INPUT
Beginning Interest Rate	2.5%	INPUT
Beginning Value	\$1,000.00	INPUT
Periods	10	INPUT
Ending Value	\$2,052.69	
Ten-Year Expected HPR	105.27%	
Annual Yield Roll Down	0.00%	INPUT
Credit Loss Impairment Estimate	1.80%	INPUT
<b>Annualized Return</b>	<b>5.7%</b>	

Future Rate Expectations	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Rate - Beg of Year	2.51%	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%
Interest Rate Change	0.53%	-0.07%	-0.17%	-0.12%	-0.06%	-0.02%	-0.02%	0.01%	0.00%	0.01%
Interest Rate - End of Year	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%	2.59%
Yield Spread to T-bill	4.80%	4.80%	4.80%	4.80%	4.80%	4.80%	4.80%	4.80%	4.80%	4.80%
Yield Spread Compression	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Resulting Yield Spread	4.80%	4.80%	4.80%	4.80%	4.80%	4.80%	4.80%	4.80%	4.80%	4.80%
Estimated Bond Yield - Beg	7.31%	7.83%	7.76%	7.59%	7.47%	7.41%	7.39%	7.37%	7.38%	7.38%
Estimated Bond Yield - End	7.83%	7.76%	7.59%	7.47%	7.41%	7.39%	7.37%	7.38%	7.38%	7.39%

Cash Flow Worksheet	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Bond Value	1000	1,052.12	1,137.48	1,233.64	1,333.14	1,436.07	1,543.70	1,659.07	1,780.83	1,912.21
Interest Rate Beg.	7.31%	7.83%	7.76%	7.59%	7.47%	7.41%	7.39%	7.37%	7.38%	7.38%
Interest Inflow	73.07	82.43	88.32	93.65	99.63	106.43	114.09	122.27	131.39	141.08
Bond Sale Inflow	\$979.06	\$1,055.05	\$1,145.33	\$1,239.49	\$1,336.44	\$1,437.26	\$1,544.98	\$1,658.55	\$1,780.83	\$1,911.61
Yield Curve Roll Down	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Interest Rate End	7.83%	7.76%	7.59%	7.47%	7.41%	7.39%	7.37%	7.38%	7.38%	7.39%
Bond Roll Purchase Outflow	1,052.12	1,137.48	1,233.64	1,333.14	1,436.07	1,543.70	1,659.07	1,780.83	1,912.21	2,052.69
Total Annual Cash Flow	\$52.12	\$85.35	\$96.17	\$99.50	\$102.92	\$107.63	\$115.38	\$121.75	\$131.39	\$1,140.48

# Fixed Income Methodology

## Municipal Bonds

Average Yield Spread to T-bill	0.92%	INPUT
Average Years to Maturity	12.8	INPUT
Beginning Interest Rate	2.5%	INPUT
Beginning Value	\$1,000.00	INPUT
Periods	10	INPUT
Ending Value	\$1,414.34	
Ten-Year Expected HPR	41.43%	
Annual Yield Roll Down	0.00%	INPUT
Credit Loss Impairment Estimate	0.02%	INPUT
<b>Annualized Return</b>	<b>3.5%</b>	

Future Rate Expectations	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Rate - Beg of Year	2.51%	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%
Interest Rate Change	0.53%	-0.07%	-0.17%	-0.12%	-0.06%	-0.02%	-0.02%	0.01%	0.00%	0.01%
Interest Rate - End of Year	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%	2.59%
Yield Spread to T-bill	0.92%	0.92%	0.92%	0.92%	0.92%	0.92%	0.92%	0.92%	0.92%	0.92%
Yield Spread Compression	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Resulting Yield Spread	0.92%	0.92%	0.92%	0.92%	0.92%	0.92%	0.92%	0.92%	0.92%	0.92%
Estimated Bond Yield - Beg	3.43%	3.95%	3.88%	3.71%	3.59%	3.53%	3.51%	3.49%	3.50%	3.50%
Estimated Bond Yield - End	3.95%	3.88%	3.71%	3.59%	3.53%	3.51%	3.49%	3.50%	3.50%	3.51%

Cash Flow Worksheet	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Bond Value	1000	985.37	1,030.75	1,087.52	1,140.06	1,187.69	1,231.97	1,277.66	1,321.30	1,367.52
Interest Rate Beg.	3.43%	3.95%	3.88%	3.71%	3.59%	3.53%	3.51%	3.49%	3.50%	3.50%
Interest Inflow	34.27	38.96	40.04	40.36	40.96	41.94	43.25	44.59	46.22	47.83
Bond Sale Inflow	\$951.10	\$991.78	\$1,047.48	\$1,099.69	\$1,146.72	\$1,190.03	\$1,234.41	\$1,276.71	\$1,321.30	\$1,366.50
Yield Curve Roll Down	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Interest Rate End	3.95%	3.88%	3.71%	3.59%	3.53%	3.51%	3.49%	3.50%	3.50%	3.51%
Bond Roll Purchase Outflow	985.37	1,030.75	1,087.52	1,140.06	1,187.69	1,231.97	1,277.66	1,321.30	1,367.52	1,414.34
Total Annual Cash Flow	(\$14.63)	\$45.38	\$56.77	\$52.54	\$47.63	\$44.29	\$45.68	\$43.64	\$46.22	\$1,046.82

# Fixed Income Methodology

## Global Aggregate Bonds

Average Yield Spread to T-bill	0.48%	INPUT
Average Years to Maturity	8.8	INPUT
Beginning Interest Rate	2.5%	INPUT
Beginning Value	\$1,000.00	INPUT
Periods	10	INPUT
Ending Value	\$1,358.55	
Ten-Year Expected HPR	35.86%	
Annual Yield Roll Down	0.00%	INPUT
Credit Loss Impairment Estimate	0.20%	INPUT
<b>Annualized Return</b>	<b>2.9%</b>	

Future Rate Expectations	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Rate - Beg of Year	2.51%	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%
Interest Rate Change	0.53%	-0.07%	-0.17%	-0.12%	-0.06%	-0.02%	-0.02%	0.01%	0.00%	0.01%
Interest Rate - End of Year	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%	2.59%
Yield Spread to T-bill	0.48%	0.48%	0.48%	0.48%	0.48%	0.48%	0.48%	0.48%	0.48%	0.48%
Yield Spread Compression	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Resulting Yield Spread	0.48%	0.48%	0.48%	0.48%	0.48%	0.48%	0.48%	0.48%	0.48%	0.48%
Estimated Bond Yield - Beg	2.99%	3.51%	3.44%	3.27%	3.15%	3.09%	3.07%	3.05%	3.06%	3.06%
Estimated Bond Yield - End	3.51%	3.44%	3.27%	3.15%	3.09%	3.07%	3.05%	3.06%	3.06%	3.07%

Cash Flow Worksheet	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Bond Value	1000	994.52	1,034.15	1,081.85	1,125.95	1,166.18	1,203.88	1,242.55	1,279.79	1,318.92
Interest Rate Beg.	2.99%	3.51%	3.44%	3.27%	3.15%	3.09%	3.07%	3.05%	3.06%	3.06%
Interest Inflow	29.87	34.95	35.62	35.39	35.50	36.05	36.97	37.90	39.13	40.33
Bond Sale Inflow	\$964.66	\$999.20	\$1,046.23	\$1,090.55	\$1,130.67	\$1,167.83	\$1,205.58	\$1,241.89	\$1,279.79	\$1,318.22
Yield Curve Roll Down	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Interest Rate End	3.51%	3.44%	3.27%	3.15%	3.09%	3.07%	3.05%	3.06%	3.06%	3.07%
Bond Roll Purchase Outflow	994.52	1,034.15	1,081.85	1,125.95	1,166.18	1,203.88	1,242.55	1,279.79	1,318.92	1,358.55
Total Annual Cash Flow	(\$5.48)	\$39.62	\$47.70	\$44.09	\$40.23	\$37.70	\$38.67	\$37.24	\$39.13	\$1,039.63

# Fixed Income Methodology

## TIPS

Average Yield Spread to T-bill	0.89%	INPUT
Average Years to Maturity	7.4	INPUT
Beginning Interest Rate	2.5%	INPUT
Beginning Value	\$1,000.00	INPUT
Periods	10	INPUT
Ending Value	\$1,414.99	
Ten-Year Expected HPR	41.50%	
Annual Yield Roll Down	0.00%	INPUT
Credit Loss Impairment Estimate	0.00%	INPUT
Annualized Return	3.5%	

Future Rate Expectations	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Rate - Beg of Year	2.51%	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%
Interest Rate Change	0.53%	-0.07%	-0.17%	-0.12%	-0.06%	-0.02%	-0.02%	0.01%	0.00%	0.01%
Interest Rate - End of Year	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%	2.59%
Yield Spread to T-bill	0.89%	0.89%	0.89%	0.89%	0.89%	0.89%	0.89%	0.89%	0.89%	0.89%
Yield Spread Compression	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Resulting Yield Spread	0.89%	0.89%	0.89%	0.89%	0.89%	0.89%	0.89%	0.89%	0.89%	0.89%
Estimated Bond Yield - Beg	3.40%	3.92%	3.85%	3.68%	3.56%	3.50%	3.48%	3.46%	3.47%	3.47%
Estimated Bond Yield - End	3.92%	3.85%	3.68%	3.56%	3.50%	3.48%	3.46%	3.47%	3.47%	3.48%

Cash Flow Worksheet	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Bond Value	1000	1,004.68	1,048.02	1,098.55	1,146.29	1,191.11	1,234.21	1,278.62	1,322.29	1,368.15
Interest Rate Beg.	3.40%	3.92%	3.85%	3.68%	3.56%	3.50%	3.48%	3.46%	3.47%	3.47%
Interest Inflow	33.97	39.43	40.39	40.44	40.84	41.71	42.96	44.24	45.85	47.44
Bond Sale Inflow	\$970.72	\$1,008.59	\$1,058.15	\$1,105.85	\$1,150.27	\$1,192.50	\$1,235.66	\$1,278.05	\$1,322.29	\$1,367.55
Yield Curve Roll Down	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Interest Rate End	3.92%	3.85%	3.68%	3.56%	3.50%	3.48%	3.46%	3.47%	3.47%	3.48%
Bond Roll Purchase Outflow	1,004.68	1,048.02	1,098.55	1,146.29	1,191.11	1,234.21	1,278.62	1,322.29	1,368.15	1,414.99
Total Annual Cash Flow	\$4.68	\$43.34	\$50.52	\$47.75	\$44.82	\$43.10	\$44.40	\$43.68	\$45.85	\$1,046.84

# Fixed Income Methodology

## Floating Rate Bonds

Average Yield Spread to T-bill	2.90%	INPUT
Average Years to Maturity	0.5	INPUT
Beginning Interest Rate	2.5%	INPUT
Beginning Value	\$1,000.00	INPUT
Periods	10	INPUT
Ending Value	\$1,723.35	
Ten-Year Expected HPR	72.33%	
Annual Yield Roll Down	0.00%	INPUT
Credit Loss Impairment Estimate	1.50%	INPUT
<b>Annualized Return</b>	<b>4.1%</b>	

Future Rate Expectations	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Interest Rate - Beg of Year	2.51%	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%
Interest Rate Change	0.53%	-0.07%	-0.17%	-0.12%	-0.06%	-0.02%	-0.02%	0.01%	0.00%	0.01%
Interest Rate - End of Year	3.03%	2.96%	2.79%	2.67%	2.61%	2.59%	2.57%	2.58%	2.58%	2.59%
Yield Spread to T-bill	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%
Yield Spread Compression	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Resulting Yield Spread	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%	2.90%
Estimated Bond Yield - Beg	5.41%	5.93%	5.86%	5.69%	5.57%	5.51%	5.49%	5.47%	5.48%	5.48%
Estimated Bond Yield - End	5.93%	5.86%	5.69%	5.57%	5.51%	5.49%	5.47%	5.48%	5.48%	5.49%

Cash Flow Worksheet	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10
Beginning Bond Value	1000	1,056.67	1,119.01	1,183.67	1,250.35	1,319.65	1,392.25	1,468.55	1,548.94	1,633.79
Interest Rate Beg.	5.41%	5.93%	5.86%	5.69%	5.57%	5.51%	5.49%	5.47%	5.48%	5.48%
Interest Inflow	54.07	62.70	65.62	67.37	69.68	72.73	76.45	80.33	84.85	89.50
Bond Sale Inflow	\$1,002.60	\$1,056.30	\$1,118.05	\$1,182.98	\$1,249.97	\$1,319.52	\$1,392.11	\$1,468.61	\$1,548.94	\$1,633.85
Yield Curve Roll Down	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Interest Rate End	5.93%	5.86%	5.69%	5.57%	5.51%	5.49%	5.47%	5.48%	5.48%	5.49%
Bond Roll Purchase Outflow	1,056.67	1,119.01	1,183.67	1,250.35	1,319.65	1,392.25	1,468.55	1,548.94	1,633.79	1,723.35
Total Annual Cash Flow	\$56.67	\$62.34	\$64.67	\$66.68	\$69.30	\$72.60	\$76.30	\$80.39	\$84.85	\$1,089.56