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Capital market assumptions

Nuveen's Target Date Multi-Asset Team generates a series of capital market assumptions (CMAs) for each major asset and sub-asset class, including expected returns, expected volatility and cross asset-class correlations. These assumptions are based on our capital market premia framework. This framework combines the near-term investment views of Asset Allocation Committee and Nuveen's Global Investment Committee (GIC) with the team's longer-term views on the economy and financial markets, as well as industry consensus and survey data. Importantly, the framework maintains cross-asset relationships that are consistent with historical financial market relationships (e.g inflation, bond yield, earnings yield, risk premia, earnings growth and earnings payout ratio).

Due to the range of investment objectives of our clients, the team produces return estimates for various time horizons, including one-year, five-years, 10-years, extending to 75-years. Exhibit 1 shows the 10-year returns and volatility estimates for approximately 25 asset classes as of 30 Jun 2026.

Exhibit 1: 10-year asset class returns and volatility estimates (as of 30 Jun 2026)

Asset class	10-year estimated total return (%)	10-year estimated volatility (%)
Cash	3.68	0.24
2 Year Govt Bond	4.63	1.71
10 Year Govt Bond	4.63	7.63
30 Year Govt Bond	4.99	14.02
Short Term Bond	4.28	1.69
US Bond (Bloomberg Agg)	4.69	5.03
Inflation-linked Bond	4.35	5.02
Corporate IG Bond	4.96	6.90
High Yield (BB-B) Bond	6.00	8.64
Corporate HY Bond	5.75	8.84
Muni Bond	3.55	5.14
Preferred	6.05	10.77
Leveraged Loan	5.82	7.93
International Agg Bond	4.60	3.30
Emerging Market debt	5.56	9.30
US Equity	7.47	16.09
International Equity	7.40	16.91
Emerging Market Equity	7.93	20.55
Real Estate	6.08	11.14
US LC Growth	7.63	17.93
US LC Value	7.26	15.32
US Small Cap	8.08	20.42
Canada Equity	7.99	19.27
Intl Small Cap	7.66	17.97
S&P US REIT	5.16	19.72

METHODOLOGY OF CAPITAL MARKET ASSUMPTIONS

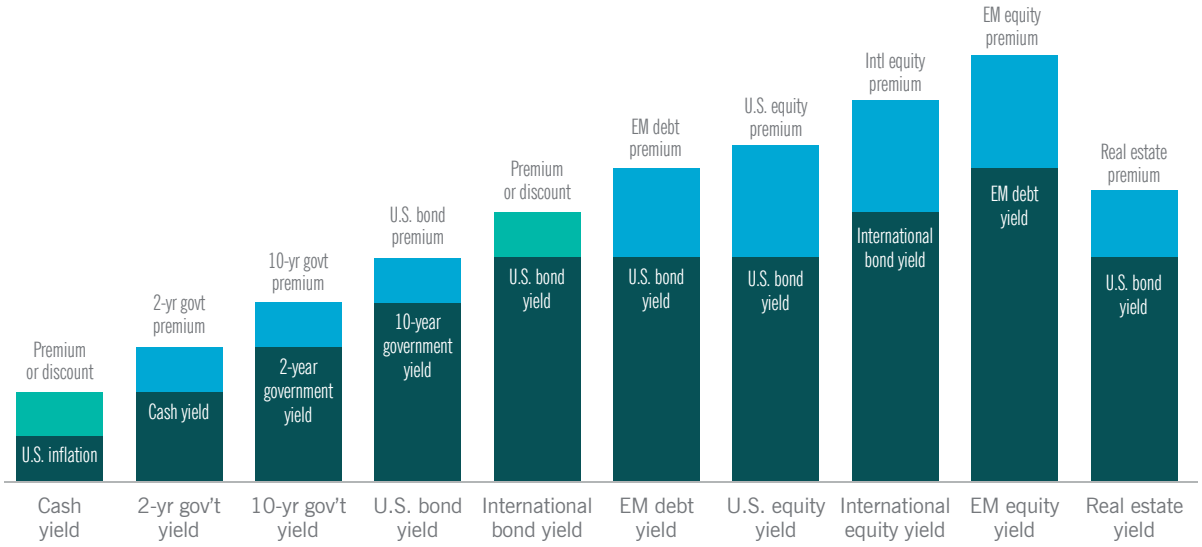
Drawing upon the Nuveen Global Investment Committee's quarterly investment outlook and asset class views as key inputs, the Target Date Multi-Asset Team assesses cross-asset risk-adjusted return potential for the next 12 months. These forward-looking views help drive near-term (one-year) CMAs, as well as tactical positioning within diversified portfolios designed for various client outcomes.

Beyond the one-year CMAs, the Target Date Multi-Asset Team utilizes a building block approach in developing its CMAs, taking into consideration current and historical yields and risk premia of the various asset classes. This building block/premium approach allows for all asset classes to be analyzed under a consistent framework which utilizes assumptions that are aligned with time-tested financial market theory (e.g. long-term equity forward earnings yield should be higher than long-term bond yields).

Premia and yields

The fundamental elements in the process are the premia (or discounts) of assets, defined as the "excess yield" needed to compensate an investor for taking on the additional perceived risk of that asset class. Exhibit 2 below illustrates the relationship between premia and yields. For example, cash premium (or discount) is defined as the differential between cash yield and inflation; short term bond premium is measured as the differential between short-term bond yield and 2-year government yield; and premium of emerging market equity (EM Equity) is defined as the difference between emerging market equity forward earnings yield and emerging market debt yield, etc.

Exhibit 2: Illustrative example of the relationship between premia and yields



As noted earlier, the premia and yields are determined by combining Asset Allocation Committee and Nuveen GIC market views for the forward one-year period with analysis of longer-term consensus and industry survey investment views. The team sets short-term valuation targets for the various asset classes. Inputs for fixed income return estimates include inflation, yields, spreads, duration and default/recovery rate, while earnings yield, earnings growth and payout ratios are used for equity return estimates.

For longer-term periods, the premium of each asset is assumed to follow a mean-reversion process, in which the premium moves from the short-term valuation target towards the long-term estimated target. By analyzing the longest historical monthly data stream available for each asset class, we determine the long-term average risk premia for each asset class, as well as establish the length of time typically taken for that risk premia to revert back to its mean. Each asset class has its own distinct reversion rate (pace at which premia tends to move back to long-term equilibrium).

Once we determine the path of all asset premia, their yields between the near-term and the long-term can be derived from the calculated premia. For any period, fixed income asset returns are computed based off yield data, while equity and real estate returns are computed based on earnings yield and earnings growth data.

Volatility and correlation

In addition to our expected return estimates, our process generates expected volatility and correlations among assets. The forecasted volatility and correlations among assets are based on historical data for assets from 1995, with more emphasis on the past few years. The most recent estimates are shown in Exhibit 4.

Exhibit 3: asset class benchmarks

Categories	Benchmark
Cash (T-bill)	IA SBBI US 30 Day TBill
2-year government bond	2 Year Government Bond
10-year government bond	10 Year Government Bond
30-year government bond	30 Year Government Bond
U.S. Corporate bond - IG	Bloomberg Investment Grade Corporate Index
Short-term bond	Bloomberg U.S. 1-3 Year Government/Credit Index
U.S. bond	Bloomberg U.S. Aggregate Bond Index
Inflation-linked bond	Bloomberg U.S. Treasury Inflation Notes 1-10Y Index
High yield bond (BB-B)	ICE BofA BB-B U.S. Cash Pay High Yield Constrained Index
High yield bond	Bloomberg U.S. High Yield Corporate Index
Muni bond	Bloomberg Municipal Bond Index
Preferred	ICE BofA Fixed Rate Preferred Security Index
Leveraged loans	S&P/LSTA Leveraged Loan 100 Index
Non-U.S. bond	Bloomberg Global Aggregate ex-USD Index (Hedged)
Emerging market debt	JP Morgan EMBI Global Diversified Index
U.S. equity	Russell 3000 Index
Developed non-U.S. equity	MSCI EAFE Index
Emerging market equity	MSCI Emerging Markets Index
Real estate	NCREIF Property Index - Open End Funds
Canada equity	MSCI Canada Index
Int'l small	MSCI ACWI Ex USA Small Index

Exhibit 4: correlation estimates as of 30 Jun 2026

	Cash	2-Year Govt Bond	10-Year Govt Bond	30-Year Govt Bond	Short-Term Bond	U.S. Bond	Inflation-linked Bond	Corporate IG Bond	High Yield (BB-B) Bond	Corporate HY Bond	Muni Bond	Preferred	Leveraged Loan	International Agg Bond	Emerging Market debt	U.S. Equity	International Equity	Emerging Market Equity	Real Estate	U.S. LC Growth	U.S. LC Value	U.S. Small Cap	Canada Equity	Intl Small Cap	S&P US REIT
Cash	1.00																								
2 Year Govt Bond	0.20	1.00																							
10 Year Govt Bond	0.14	0.79	1.00																						
30 Year Govt Bond	0.11	0.65	0.95	1.00																					
Short Term Bond	0.18	0.88	0.59	0.43	1.00																				
US Bond (Barclays Agg)	0.13	0.77	0.86	0.76	0.79	1.00																			
Inflation-linked Bond	0.18	0.64	0.83	0.76	0.56	0.80	1.00																		
Corporate IG Bond	0.07	0.43	0.55	0.47	0.64	0.80	0.65	1.00																	
High Yield (BB-B) Bond	-0.02	-0.02	0.03	-0.03	0.30	0.40	0.34	0.71	1.00																
Corporate HY Bond	-0.02	-0.06	-0.03	-0.07	0.26	0.35	0.27	0.67	0.98	1.00															
Muni Bond	0.09	0.49	0.63	0.56	0.56	0.75	0.64	0.76	0.48	0.44	1.00														
Preferred	0.06	0.29	0.52	0.51	0.28	0.52	0.62	0.52	0.44	0.41	0.51	1.00													
Leveraged Loan	-0.04	-0.18	-0.15	-0.18	0.15	0.17	0.15	0.55	0.80	0.80	0.27	0.21	1.00												
International Agg Bond	0.08	0.56	0.69	0.65	0.59	0.78	0.67	0.68	0.38	0.34	0.67	0.54	0.26	1.00											
Emerging Market debt	0.03	0.14	0.25	0.21	0.37	0.52	0.42	0.76	0.76	0.75	0.60	0.44	0.65	0.47	1.00										
US Equity	-0.01	-0.12	-0.08	-0.10	0.12	0.20	0.21	0.47	0.76	0.76	0.31	0.57	0.60	0.25	0.64	1.00									
International Equity	-0.02	-0.05	-0.04	-0.08	0.22	0.28	0.23	0.54	0.75	0.75	0.34	0.45	0.58	0.24	0.70	0.85	1.00								
Emerging Market Equity	-0.02	-0.07	-0.06	-0.08	0.19	0.25	0.19	0.50	0.68	0.69	0.31	0.36	0.57	0.20	0.70	0.73	0.85	1.00							
Real Estate	0.10	-0.31	-0.27	-0.25	-0.24	-0.23	-0.12	-0.08	0.17	0.18	-0.09	-0.01	0.18	-0.15	0.07	0.19	0.14	0.15	1.00						
US LC Growth	-0.01	-0.12	-0.08	-0.10	0.12	0.20	0.20	0.45	0.74	0.74	0.30	0.55	0.58	0.24	0.62	0.96	0.82	0.71	0.18	1.00					
US LC Value	-0.01	-0.11	-0.08	-0.09	0.11	0.19	0.20	0.44	0.72	0.72	0.29	0.54	0.57	0.23	0.61	0.95	0.81	0.69	0.18	0.91	1.00				
US Small Cap	-0.01	-0.11	-0.08	-0.09	0.11	0.18	0.19	0.42	0.68	0.68	0.28	0.51	0.54	0.22	0.57	0.90	0.76	0.66	0.17	0.86	0.85	1.00			
Canada Equity	-0.01	-0.08	-0.08	-0.11	0.17	0.22	0.18	0.47	0.70	0.70	0.28	0.42	0.56	0.19	0.64	0.83	0.82	0.81	0.15	0.80	0.79	0.75	1.00		
Intl Small Cap	-0.02	-0.05	-0.04	-0.08	0.21	0.27	0.21	0.52	0.71	0.71	0.32	0.40	0.56	0.22	0.69	0.78	0.92	0.89	0.14	0.76	0.74	0.70	0.80	1.00	
S&P US REIT	0.00	-0.01	0.09	0.07	0.18	0.33	0.30	0.52	0.74	0.75	0.38	0.53	0.57	0.35	0.63	0.79	0.69	0.59	0.16	0.77	0.75	0.71	0.66	0.64	1.00

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