Invesco

2024 Long-Term Capital Market Assumptions

Invesco Solutions I United States Dollar (USD) I Q3 Update

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Executive Summary

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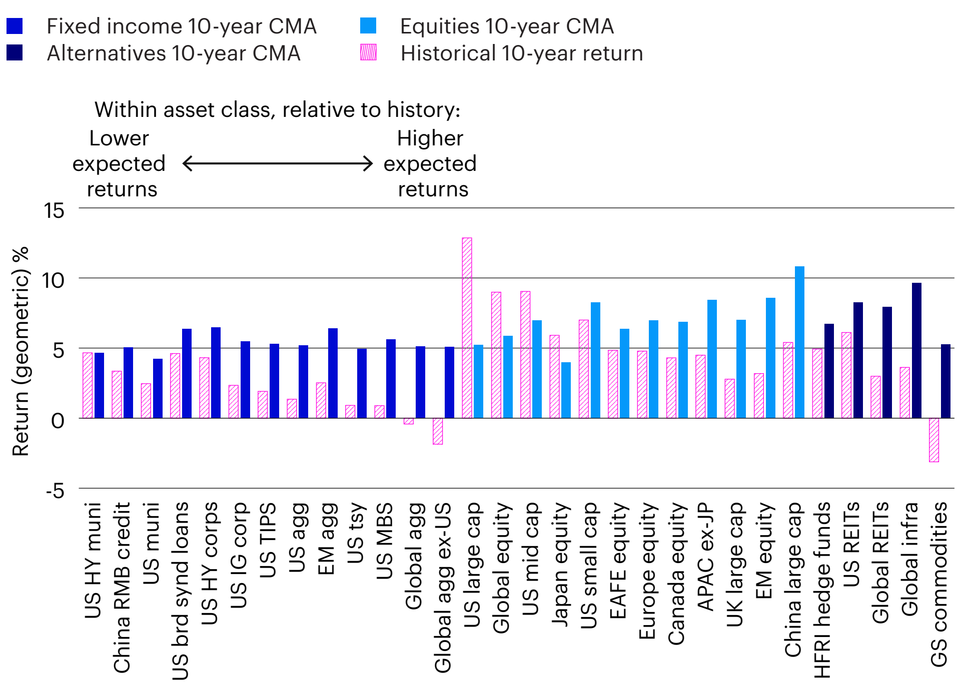
Invesco Solutions provides forecasts for 170+ assets in over 20 currencies, including 10 private assets. For additional CMA data, views, or analysis, please reach out to your Invesco representative.

- Heading into the fourth quarter, we have reached the portion of the business cycle where most major economies outside of Japan have begun to ease monetary policy. The Federal Reserve's (Fed) recent 50 basis point (bps) cut and forecast of significant cuts to come have prepared investors for a period of lower interest rates and signals that the Fed believes their multi-year battle with inflation has come to an end.
- How should investors position for the first easing cycle since 2020? It very much depends on whether those long lags of the recent tightening cycle catch up with the economy and cause a recession. While not our base case, the downside risks of a recession are a possibility and require serious consideration. Further, a policy mistake where inflation is reignited could make central banks pivot and disrupt their plans for the normalization of interest rates.
- For most long-term investors, a diversified portfolio is always the answer when uncertainty is high. Our capital market assumptions (CMAs) are indeed forward-looking and aim to assess the risks for assets, both to the upside and downside, relative to history. Data in future quarters will begin to price these risks and probabilities accordingly. To assist in evaluating the possible impact of lower short-term rates and the easing cycle on markets, we have broken down the various channels that may be affected under the assumption that a soft landing is stuck and a recession is avoided.
- To aid investors in identifying the relative risks between our near-term tactical asset allocation and our longer-term CMAs, we have added a new figure that plots the positioning of the two distinct time horizons for common asset class pairs.

Figure 1: Expectations relative to historical average (USD)



Source: Invesco, estimates as of June 30, 2024. Proxies listed in **Figure 8**. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 11 for information about our CMA methodology. These estimates reflect the views of Invesco Solutions; the views of other investment teams at Invesco may differ from those presented here.

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Asset Allocation Insights

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For further details on our process for defining scenarios and adjustments, please refer to our CMA Methodology paper.

Strategic perspective

Heading into the fourth quarter, we have reached the portion of the business cycle where most major economies outside of Japan have begun to ease monetary policy. The Federal Reserve's (Fed) recent 50 basis point (bps) cut and forecast of significant cuts to come have prepared investors for a period of lower interest rates and signals that the Fed believes their multi-year battle with inflation has come to an end. While their justification was weakening of economic indicators, primarily the employment situation, rarely has the Fed begun to ease so significantly with high equity valuations, a strong economy, and inflation still above their target level.

This preemptive move lowers the probability of a recession and increases the chances of a soft landing for the economy. However, as we saw during the tightening cycle, there is often a significant lag until monetary policy begins to affect the economy. All things considered, equity and credit markets seem unphased by the rising unemployment rate or steepening yield curve and have welcomed this policy shift with record highs and tighter spreads.

How should investors position for the first easing cycle since 2020? It very much depends on if those long lags of the recent tightening cycle catch up with the economy and cause a recession. While not our base case, the downside risks of a recession are a possibility and require serious consideration. Further, a policy mistake where inflation is reignited could make central banks pivot and disrupt their plans for the normalization of interest rates. In prior cycles, equity and credit markets have fared well if inflation has actually been tamed and a recession has been avoided, with 1995 being the last soft landing but not the last recession.

For most long-term investors, a diversified portfolio is always the answer when uncertainty is high. Our capital market assumptions (CMAs) are indeed forward-looking and aim to assess the risks for assets, both to the upside and downside, relative to history. Data in future quarters will begin to price these risks and probabilities accordingly. To assist in evaluating the possible impact of lower short-term rates and the easing cycle on markets, we have broken down the various channels that may be affected under the assumption that a soft landing is stuck and a recession is avoided.

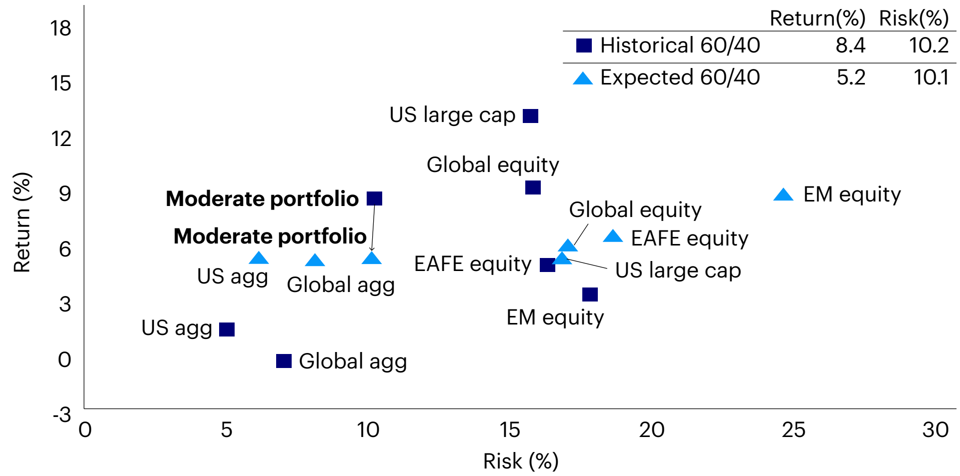
1. **Cash:** Falling short-term rates have a direct, negative impact on the yield of short-term fixed income. After taking liquidity needs into consideration, it may be worthwhile to re-evaluate the role of cash or cash equivalents in a portfolio as the return tradeoff for riskier assets becomes more compelling. Interest rates in the United States are the highest in developed markets, and easing should reduce the relative value of the dollar compared to other currencies.

2. **Government bonds:** The yield curve may experience a steepening where longer-term rates begin to price in the lower probability of a recession and base rates are lowered. Duration is less attractive if there is indeed no recession, but it is still worth considering for those seeking to lock in the elevated rates of longer-dated fixed income.

3. **Credit:** Spreads in the high yield market remain near their cycle lows and yet still offer a compelling risk and return opportunity for those seeking income. A soft landing is likely accompanied by a limited tightening of spreads and limited defaults or credit losses. Floating rate credit, while still attractive relative to most asset classes, will likely lose some of its yield potential as base rates are reduced.

4. **Equities:** A soft landing is very positive for equity markets, as earnings remain strong and valuations continue to expand. The sectors of the market that are more closely tied to the real economy will likely be beneficiaries, particularly cyclical factors such as small size and value. The easing cycle is also a welcome shift for equities outside of the US, which should begin to benefit from improving global growth and a falling dollar.

Figure 2: Comparing historical and expected risk and return for a moderate 60/40 portfolio (USD)



Source: Invesco Solutions, as of June 30, 2024. Proxies listed in **Figure 8**. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 11 for information about our CMA methodology. These estimates reflect the views of Invesco Solutions; the views of other investment teams at Invesco may differ from those presented here. The 60/40 Portfolio is a blend of 60% S&P 500 Index and 40% Bloomberg US Aggregate Index.

3Q24 CMA observations (10Y, USD)

Equities: Our global equity CMA (5.8%) has risen slightly since our last quarterly update (+0.2%) yet remains significantly lower than its historical average for the prior decade (-3.1%) due to the large weighting of US equities in our global benchmark, with high valuations being a large detractor (-1.2%). Our earnings model, which sources long-term growth forecasts from the IMF, has risen for regions outside of the US, notably Europe and emerging markets (EM), as recession risks seem to be fading after a period of challenging growth. Equities outside of the US rose (+0.6%) due to this higher real earnings growth and slightly higher inflation expectations. US equities fell (-0.2%) mostly because of higher valuations following the A.I.-driven rally that occurred in the second quarter. Small caps (8.3%) and EM (8.6%) are both expected to return significantly more than their recent historical returns and large cap, developed markets.

Fixed income: Yields on offer within fixed income are still much higher than in recent history, and thus, our fixed income CMAs are more attractive relative to other asset classes, with global equities only slightly higher than global aggregate bonds (5.1%) despite having significantly higher risk (17% versus 8%). Our CMAs for credit assets, such as high yield and broadly syndicated loans, are in line (6.4%) with the expected yield on loans being much lower than current yields.

Alternatives: Real assets, such as REITs (8.3%) and infrastructure (9.6%), are expected to return more than global equities due to higher dividend yields and a tailwind from valuations. Hedge funds have an attractive expected return of 6.7% and provide one of our highest risk return ratios of 0.9, similar to that of investment grade fixed income.

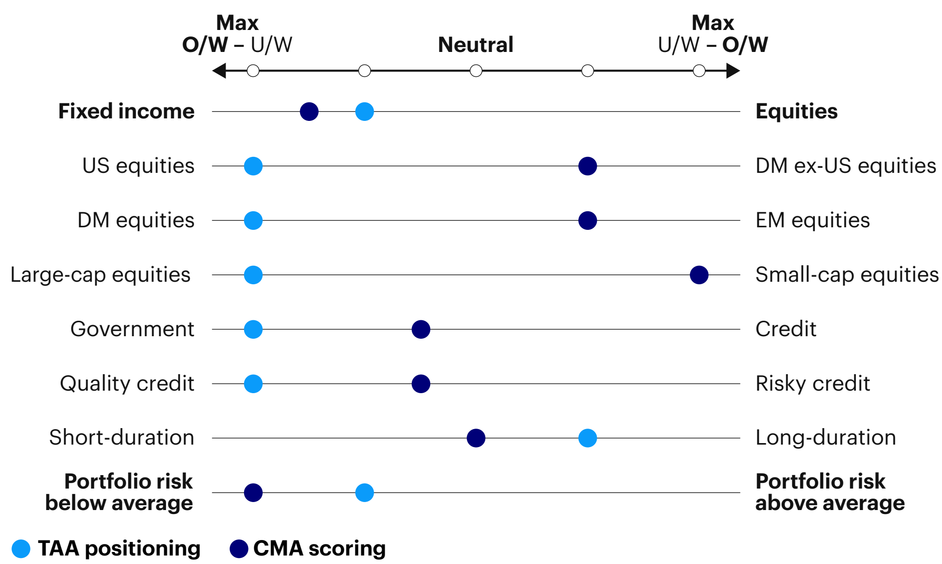
To aid investors in identifying the relative risks between our near-term tactical asset allocation and our longer-term CMAs, we have added a new **Figure 3**, which plots the positioning of the two distinct time horizons for common asset class pairs. These relative CMA signals are calculated by taking the Z-score of the return spread between the CMA pairs, showcasing the relative attractiveness of the signal compared to history and is aimed to be used as a guide for making relative asset class level decisions for a portfolio over a ten-year time horizon. We utilize a separate methodology for tactical asset allocation driven by our macro process, which makes allocation decisions over a time horizon between six months and three years, on average.[1] Our tactical asset allocation positioning is updated monthly, while our CMA signals are updated quarterly.[2]

1. To learn more about our tactical asset allocation process, please refer to our series of white papers “Dynamic Asset Allocation through the Business Cycle” (de Longis, 2019) and “Market Sentiment and the Business Cycle” (de Longis and Ellis, 2019).
2. For the most recent TAA positioning, please refer to our monthly tactical asset allocation blog.

There are many considerations for investors beyond CMA's when it comes to asset allocation decisions. To learn more about our investment process or discuss your own portfolio needs, please reach out to your Invesco Solutions representative.

Our CMA scoring aligns well with our latest tactical positioning within a contraction regime at the portfolio risk level and when comparing equities to fixed income. Presently, both are recommending taking below-average levels of risk and sourcing that risk from fixed income rather than equities, which is intuitive for the CMA signal as the relative return of fixed income compared to equities is elevated. Tactically, downside risks to the economy and markets are higher in a contraction regime. The first major difference between the two time horizons appears when comparing US equities to developed markets outside of the US, as US equities have both high valuations, which tend to be a longer-term headwind for the CMAs, and a large concentration of defensive, high-quality companies that tend to do well during a tactical contraction as they are less tied to the business cycle. This same logic cascades when comparing the two signals for DM to EM equities and large-cap equities to small caps. Long-duration government bonds provide the greatest potential downside protection in a tactical contraction due to their defensive properties and inverse correlation to equities as long interest rates fall, leading to a tactical maximum overweight.

Figure 3: Relative tactical asset allocation (TAA) positioning (Sept. 2024) and CMA scoring (Q3 2024)



Source: Invesco Solutions, Aug. 31, 2024. DM = developed markets. EM = emerging markets. For illustrative purposes only. Portfolios mentioned are hypothetical models. Benchmark is a global, moderate risk portfolio consisting of 60% global equities (MSCI ACWI) and 40% global bonds (BBG global agg).

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Figure 4: 10-year asset class expectations (USD)

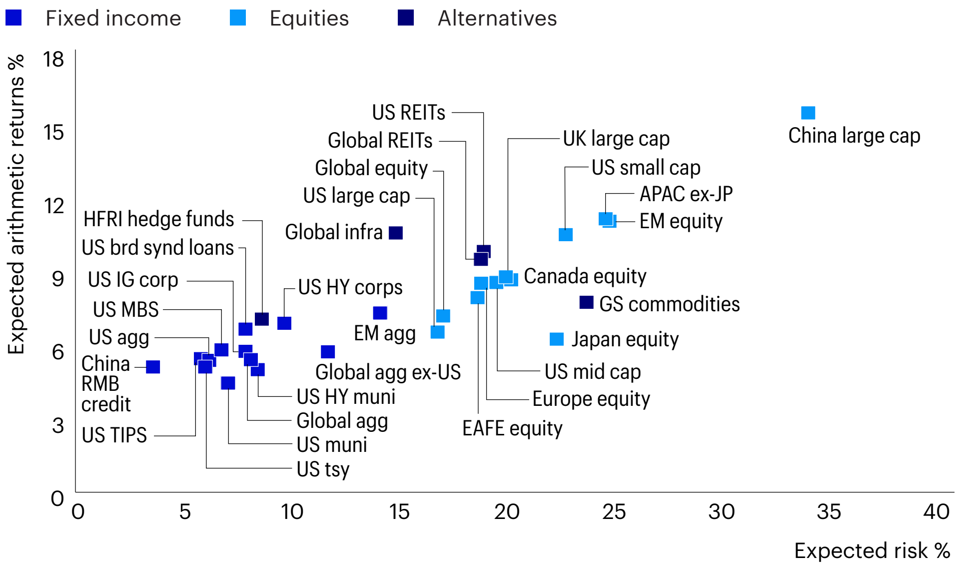

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Figure 5: CMA difference: 5-year minus 10-year assumptions (USD)

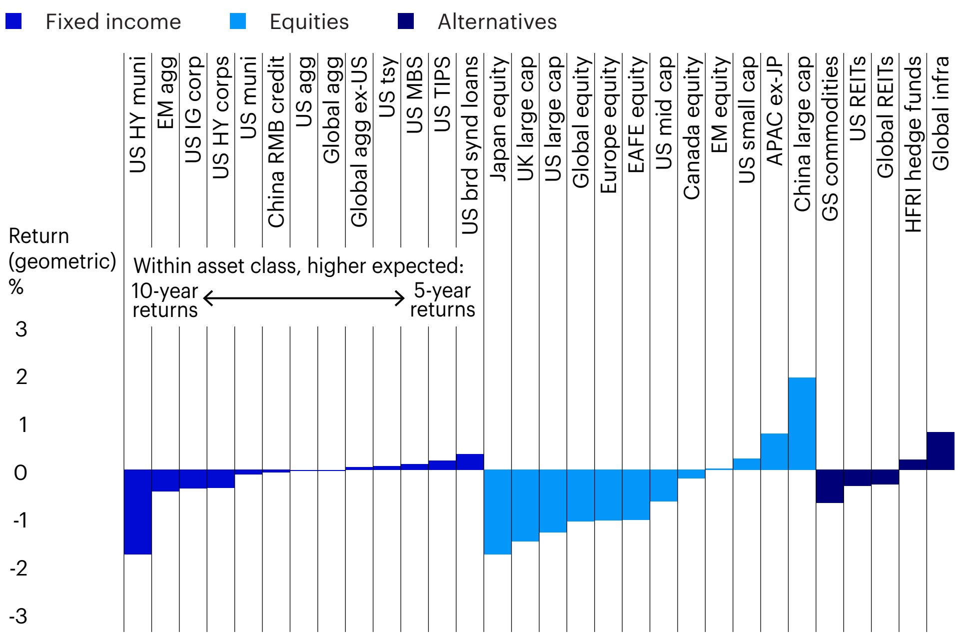

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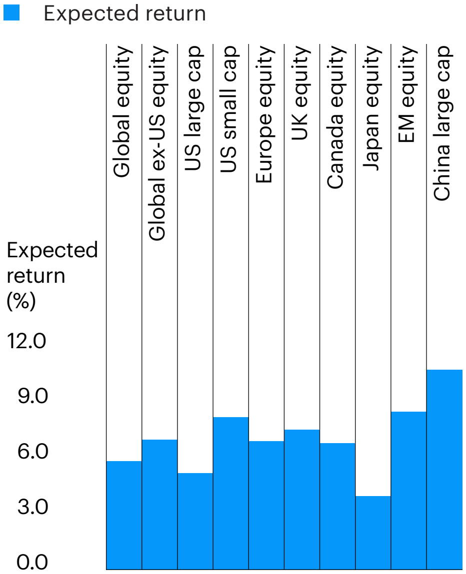
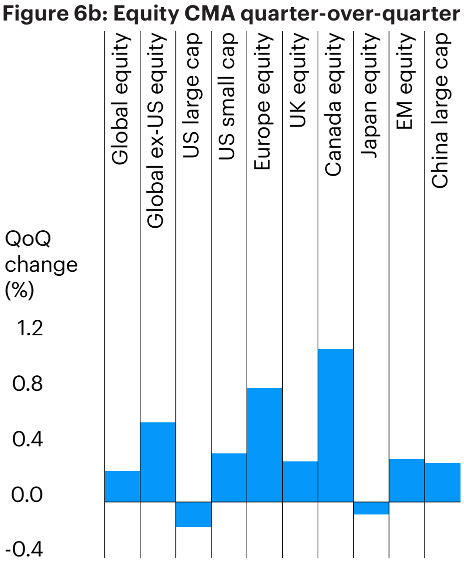
Figure 6a: Equity CMA and building block contribution (USD) (%)



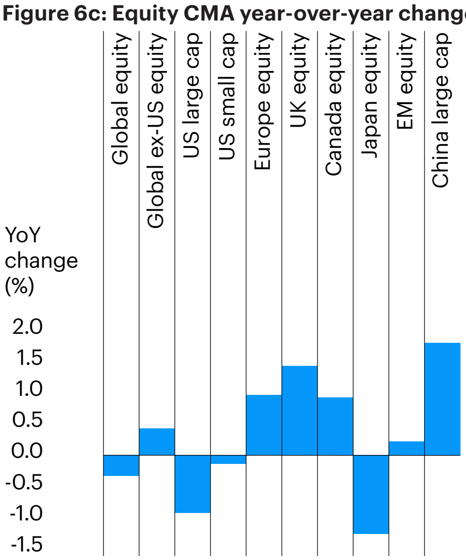
	Dividend yield	Buyback yield	LT earnings growth	Expected inflation	Valuation change	Currency Adj. (IRP)
Global equity	1.85	0.66	2.00	2.12	-1.24	0.45
Global ex-US equity	2.87	0.00	2.01	1.65	-0.78	1.27
US large cap	1.30	1.02	2.00	2.37	-1.48	0.00
US small cap	1.48	0.92	3.37	2.37	0.04	0.00
Europe equity	3.17	0.00	1.51	1.99	-1.27	1.52
UK equity	3.89	0.00	1.78	2.20	-0.55	0.22
Canada equity	2.96	0.00	1.70	2.06	-0.77	0.87
Japan equity	1.96	0.00	0.81	-0.87	-1.22	3.31
EM equity	2.58	0.00	3.42	2.14	0.11	0.24
China large cap	2.81	0.00	3.42	0.29	2.14	2.16

Figure 6b: Equity CMA quarter-over-quarter change and building block contribution (USD) (%)



	Dividend yield	Buyback yield	LT earnings growth	Expected inflation	Valuation change	Currency Adj. (IRP)
Global equity	-0.02	-0.02	0.24	0.16	-0.12	-0.03
Global ex-US equity	0.02	0.00	0.31	0.14	0.13	-0.05
US large cap	-0.01	-0.05	-0.02	0.16	-0.26	0.00
US small cap	0.07	0.12	-0.06	0.16	0.04	0.00
Europe equity	0.06	0.00	0.34	0.17	0.26	-0.02
UK equity	0.02	0.00	0.33	0.09	-0.12	-0.04
Canada equity	0.05	0.00	0.36	0.19	0.35	0.14
Japan equity	0.04	0.00	-0.36	-0.06	0.46	-0.17
EM equity	-0.07	0.00	0.50	0.11	-0.30	0.05
China large cap	0.14	0.00	-0.69	-0.10	0.67	0.27

Figure 6c: Equity CMA year-over-year change and building block contribution (USD) (%)



	Dividend yield	Buyback yield	LT earnings growth	Expected inflation	Valuation change	Currency Adj. (IRP)
Global equity	-0.25	-0.11	0.24	0.65	-0.96	0.10
Global ex-US equity	-0.28	0.00	0.31	0.50	-0.46	0.34
US large cap	-0.18	-0.22	-0.02	0.71	-1.24	0.00
US small cap	-0.08	0.13	0.09	0.71	-1.00	0.00
Europe equity	-0.12	0.00	0.34	0.71	-0.54	0.57
UK equity	-0.22	0.00	0.33	0.76	-0.27	0.82
Canada equity	-0.06	0.00	0.36	0.70	-0.42	0.32
Japan equity	-0.27	0.00	-0.36	-0.21	-0.33	-0.11
EM equity	-0.54	0.00	0.50	0.44	-0.48	0.28
China large cap	0.32	0.00	-0.69	-0.27	1.47	1.00

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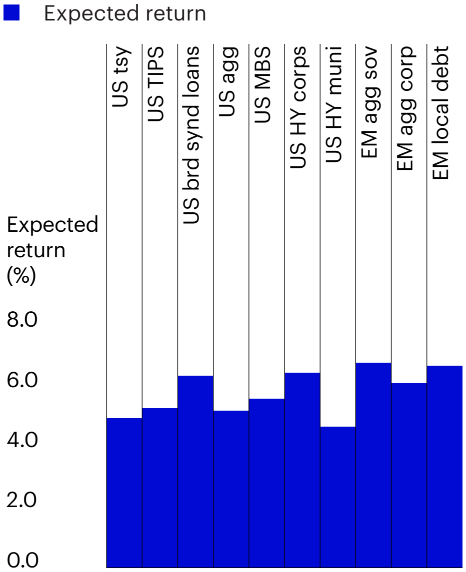
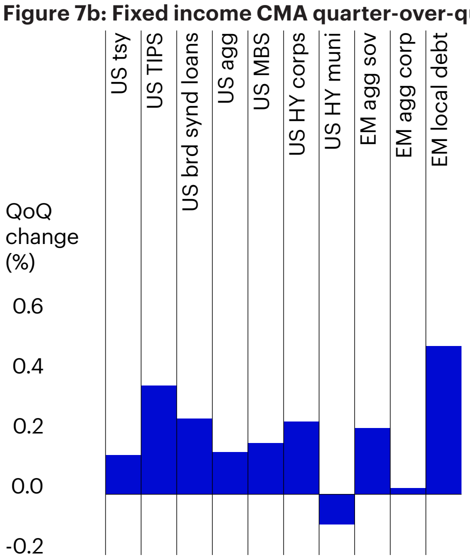
Figure 7a: Fixed income CMA and building block contribution (USD) (%)



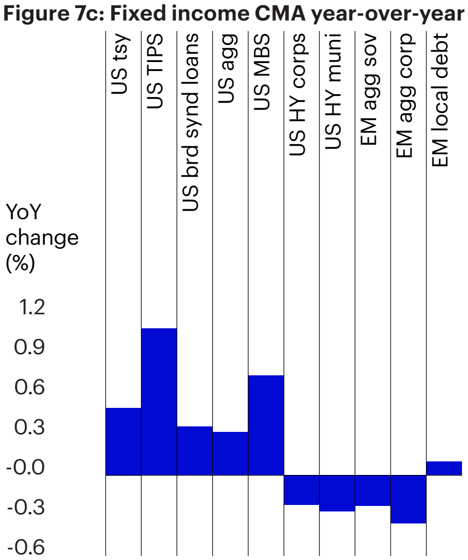
	Average yield	Roll return	Valuation change (yield curve)	Valuation change (OAS)	Credit loss	Currency Adj. (IRP)
US tsy	4.39	0.34	0.21	0.00	0.00	0.00
US TIPS	4.62	0.33	0.34	0.00	0.00	0.00
US brd synd loans	7.49	0.00	0.00	-0.20	-0.92	0.00
US agg	4.91	0.34	0.21	-0.11	-0.16	0.00
US MBS	5.01	0.34	0.21	0.04	0.00	0.00
US HY corps	8.52	-0.06	0.25	-0.56	-1.68	0.00
US HY muni	6.62	0.24	0.11	-1.88	-0.42	0.00
EM agg sov	7.59	0.44	0.16	-0.24	-1.16	0.00
EM agg corp	7.36	0.27	0.24	-0.93	-0.84	0.00
EM local debt	6.56	0.49	0.04	0.00	0.00	-0.39

Figure 7b: Fixed income CMA quarter-over-quarter change and building block contribution (USD) (%)



	Average yield	Roll return	Valuation change (yield curve)	Valuation change (OAS)	Credit loss	Currency Adj. (IRP)
US tsy	0.16	-0.01	-0.02	0.00	0.00	0.00
US TIPS	0.32	-0.04	0.08	0.00	0.00	0.00
US brd synd loans	0.29	0.00	0.00	-0.05	0.00	0.00
US agg	0.16	-0.01	-0.02	0.00	0.00	0.00
US MBS	0.20	-0.01	-0.02	-0.01	0.00	0.00
US HY corps	0.21	0.01	-0.02	0.04	0.00	0.00
US HY muni	0.03	-0.08	0.02	-0.17	0.10	0.00
EM agg sov	0.18	0.04	-0.01	0.03	-0.01	0.00
EM agg corp	0.04	0.01	-0.02	-0.09	0.08	0.00
EM local debt	0.25	-0.04	0.08	0.00	0.00	0.19

Figure 7c: Fixed income CMA year-over-year change and building block contribution (USD) (%)



	Average yield	Roll return	Valuation change (yield curve)	Valuation change (OAS)	Credit loss	Currency Adj. (IRP)
US tsy	0.46	0.34	-0.31	0.00	0.00	0.00
US TIPS	0.80	0.36	-0.07	0.00	0.00	0.00
US brd synd loans	0.63	0.00	0.00	-0.27	0.00	0.00
US agg	0.37	0.18	-0.22	-0.05	0.04	0.00
US MBS	0.73	0.34	-0.31	-0.03	0.00	0.00
US HY corps	0.20	0.02	-0.34	-0.11	0.01	0.00
US HY muni	0.22	-0.09	-0.33	-0.41	0.34	0.00
EM agg sov	0.20	0.09	-0.17	-0.36	0.00	0.00
EM agg corp	-0.16	0.26	-0.34	-0.65	0.53	0.00
EM local debt	0.38	-0.10	-0.10	0.00	0.00	-0.08

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Figure 8: 10-year asset class expected returns, risk, and return risk (USD)

	Asset class	Index	Expected geometric return %	Expected arithmetic return %	Total yield %	Expected risk %	Arithmetic return to risk ratio
Fixed income	US tsy short	BBG US tsy short	3.8	3.8	5.3	1.5	2.56
	US tsy IM	BBG US tsy IM	4.4	4.5	4.6	4.6	0.98
	US tsy long	BBG US tsy long	5.2	5.9	4.6	12.2	0.48
	US TIPS	BBG US TIPS	5.3	5.4	4.9	5.7	0.95
	US brd synd loans	CSFB leverage loan	6.4	6.7	8.8	7.8	0.85
	US agg	BBG US agg	5.2	5.4	5.0	6.1	0.88
	US IG corp	BBG US IG	5.5	5.8	5.5	7.8	0.74
	US MBS	BBG US MBS	5.6	5.8	5.2	6.7	0.87
	US preferred stocks	BOA ML fixed rate pref securities	5.1	5.7	6.5	11.6	0.49
	US HY corps	BBG US HY	6.5	6.9	7.9	9.6	0.72
	US muni	BOA ML US muni	4.2	4.4	3.8	7.0	0.64
	US muni (taxable)	ICE BOA US taxable muni securities plus	5.4	5.7	5.3	8.0	0.71
	US HY muni	BBG muni bond HY	4.7	5.0	5.4	8.4	0.60
	Global agg	BBG global agg	5.1	5.4	4.8	8.1	0.67
	Global agg ex-US	BBG global agg ex-US	5.1	5.7	4.8	11.6	0.49
	Global tsy	BBG global tsy	5.1	5.5	4.6	9.6	0.58
	Global sov	BBG global sov	5.2	5.6	5.2	9.0	0.62
	Global corp	BBG global corp	5.5	5.9	5.6	8.9	0.66
	Global IG	BBG global corp IG	5.5	5.9	5.6	9.1	0.65
	Eurozone corp	BBG euro agg credit corp	5.3	6.4	5.7	14.9	0.43
	Eurozone tsy	BBG euro agg gov tsy	5.5	6.4	5.1	14.2	0.45
	Asian dollar IG	BOA ML AC IG	5.4	5.8	5.5	8.9	0.65
	EM agg	BBG EM agg	6.4	7.3	7.2	14.1	0.52
	EM agg IG	BBG EM USD agg IG	5.4	5.9	5.6	9.6	0.61
	China policy bk & tsy	BBG China PB tsy TR	4.5	4.6	4.2	4.0	1.15
	China RMB credit	BBG China corporate	5.1	5.1	4.8	3.5	1.46
Equities	Global equity	MSCI ACWI	5.9	7.2	3.0	17.0	0.42
	Global ex-US equity	MSCI ACWI ex-US	7.0	8.6	4.1	18.8	0.46
	US broad market	Russell 3000	4.9	6.3	2.5	17.5	0.36
	US large cap	S&P 500	5.2	6.5	2.3	16.8	0.39
	US mid cap	Russell midcap	7.0	8.7	3.0	19.5	0.45
	US small cap	Russell 2000	8.3	10.5	2.4	22.7	0.46
	EAFE equity	MSCI EAFE	6.4	8.0	4.8	18.6	0.43
	Europe equity	MSCI Europe	7.0	8.5	4.7	18.8	0.46
	Eurozone equity	MSCI euro ex-UK	6.8	8.5	4.9	19.8	0.43
	UK large cap	FTSE 100	7.0	8.8	4.1	19.9	0.44
	UK small cap	FTSE small cap UK	8.8	11.6	4.5	25.5	0.45
	Canada equity	S&P TSX	6.9	8.7	3.8	20.2	0.43
	Japan equity	MSCI JP	4.0	6.3	5.3	22.3	0.28
	EM equity	MSCI EM	8.6	11.2	2.8	24.6	0.45
	APAC ex-JP	MSCI APXJ	8.4	11.1	3.0	24.8	0.45
	China large cap	CSI 300	10.8	15.5	5.0	34.0	0.46
Alternatives	Global infra	DJ Brookfield global infra	9.6	10.6	4.6	14.8	0.72
	Global REITs	FTSE EPRA/NAREIT developed	7.9	9.5	4.7	18.8	0.51
	HFRI hedge funds	HFRI HF	6.7	7.1	-	8.6	0.83
	GS commodities	S&P GSCI	5.2	7.8	-	23.7	0.33
	Agriculture	S&P GSCI agriculture	5.1	7.1	-	21.2	0.34
	Energy	S&P GSCI energy	6.6	12.2	-	36.8	0.33
	Industrial metals	S&P GSCI industrial metals	4.4	6.9	-	23.9	0.29
	Precious metals	S&P GSCI precious metals	-1.8	-0.2	-	18.3	-0.01

Source: Invesco, estimates as of June 30, 2024. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 11 for information about our CMA methodology. These estimates reflect the views of Invesco Solutions; the views of other investment teams at Invesco may differ from those presented here. Agg = Aggregate, Infra = Infrastructure, Corp = Corporate, DJ = Dow Jones, HY = High Yield, Muni = Municipals, Tsy = Treasury, IM = Intermediate, ML = Merrill Lynch, Sov = Sovereign, EM = Emerging Markets, IG = Investment Grade, APAC = Asia Pacific, Gov = Government, MBS = Mortgage-Backed Securities, TIPS = Treasury Inflation-Protected Securities.

Figure 9: 10-year correlations (USD)

- Greater than 0.70
- 0.30 to 0.70
- Less than 0.30

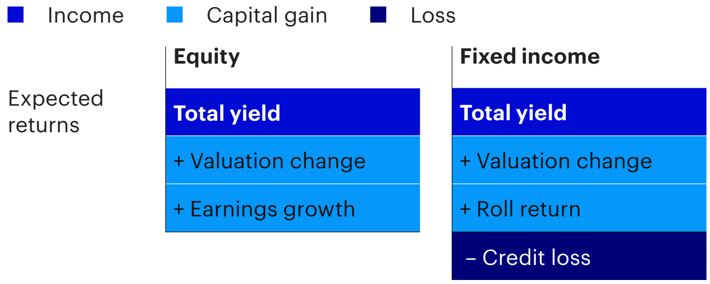
		Fixed income												Equities										Alternatives			
	Asset class	US tsy IM	US TIPS	US brd synd loans	US agg	US IG corp	US HY corps	US muni	US HY muni	Global agg	Global agg ex-US	EM agg	China RMB credit	Global equity	China large cap	US large cap	US mid cap	US small cap	EAFE equity	UK large cap	Canada equity	Japan equity	EM equity	Global REITs	Global infra	GS commodities	HFRI hedge funds
Fixed income	US tsy IM	1.00																									
	US TIPS	0.69	1.00																								
	US brd synd loans	-0.26	0.27	1.00																							
	US agg	0.88	0.79	0.10	1.00																						
	US IG corp	0.63	0.76	0.43	0.89	1.00																					
	US HY corps	0.07	0.53	0.81	0.43	0.69	1.00																				
	US muni	0.60	0.63	0.29	0.79	0.77	0.51	1.00																			
	US HY muni	0.37	0.56	0.53	0.61	0.68	0.59	0.85	1.00																		
	Global agg	0.72	0.76	0.18	0.86	0.83	0.53	0.68	0.55	1.00																	
	Global agg ex-US	0.60	0.68	0.20	0.73	0.73	0.52	0.59	0.48	0.98	1.00																
	EM agg	0.35	0.66	0.62	0.65	0.82	0.82	0.65	0.67	0.72	0.68	1.00															
	China RMB credit	0.31	0.31	0.09	0.39	0.35	0.21	0.32	0.28	0.49	0.50	0.32	1.00														
Equities	Global equity	0.03	0.42	0.63	0.35	0.57	0.81	0.38	0.45	0.53	0.55	0.71	0.29	1.00													
	China large cap	-0.01	0.14	0.27	0.15	0.27	0.33	0.14	0.22	0.26	0.28	0.36	0.32	0.43	1.00												
	US large cap	0.02	0.40	0.58	0.32	0.52	0.76	0.34	0.41	0.45	0.46	0.63	0.23	0.97	0.35	1.00											
	US mid cap	-0.03	0.39	0.66	0.31	0.54	0.82	0.36	0.44	0.44	0.45	0.66	0.24	0.95	0.37	0.95	1.00										
	US small cap	-0.07	0.29	0.60	0.23	0.44	0.74	0.27	0.35	0.35	0.37	0.56	0.21	0.87	0.35	0.88	0.95	1.00									
	EAFE equity	0.04	0.40	0.59	0.35	0.56	0.78	0.38	0.44	0.55	0.59	0.72	0.30	0.96	0.42	0.87	0.87	0.80	1.00								
	UK large cap	-0.05	0.33	0.61	0.24	0.47	0.74	0.31	0.41	0.46	0.51	0.64	0.28	0.89	0.40	0.81	0.81	0.74	0.95	1.00							
	Canada equity	-0.03	0.41	0.66	0.29	0.53	0.78	0.32	0.44	0.48	0.51	0.68	0.26	0.89	0.41	0.83	0.87	0.80	0.86	0.86	1.00						
	Japan equity	0.07	0.34	0.48	0.33	0.50	0.65	0.35	0.36	0.45	0.46	0.60	0.29	0.81	0.34	0.74	0.73	0.68	0.85	0.72	0.67	1.00					
	EM equity	0.03	0.38	0.57	0.32	0.53	0.72	0.36	0.45	0.54	0.58	0.74	0.38	0.84	0.57	0.72	0.74	0.68	0.84	0.78	0.80	0.69	1.00				
Alternatives	Global REITs	0.14	0.51	0.62	0.46	0.65	0.80	0.46	0.54	0.58	0.58	0.74	0.29	0.86	0.32	0.82	0.86	0.79	0.84	0.79	0.80	0.68	0.73	1.00			
	Global infra	0.16	0.52	0.56	0.45	0.63	0.75	0.48	0.52	0.58	0.59	0.71	0.27	0.83	0.33	0.79	0.80	0.69	0.83	0.80	0.82	0.64	0.72	0.85	1.00		
	GS commodities	-0.29	0.12	0.52	-0.13	0.09	0.46	-0.02	0.20	0.10	0.18	0.31	0.09	0.49	0.17	0.42	0.46	0.43	0.50	0.59	0.62	0.35	0.47	0.38	0.45	1.00	
	HFRI hedge funds	-0.13	0.33	0.72	0.21	0.50	0.78	0.29	0.46	0.39	0.42	0.66	0.26	0.89	0.46	0.83	0.89	0.85	0.86	0.83	0.88	0.72	0.81	0.77	0.73	0.60	1.00

Source: Invesco, estimates as of June 30, 2024. Proxies listed in **Figure 8.** These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 11 for information about our CMA methodology. These estimates reflect the views of Invesco Solutions; the views of other investment teams at Invesco may differ from those presented here.

About our capital market assumptions methodology

We employ a fundamentally based "building block" approach to estimating asset class returns. Estimates for income and capital gain components of returns for each asset class are informed by fundamental and historical data. Components are then combined to establish estimated returns (Figure 10). Here, we provide a summary of key elements of the methodology used to produce our long-term (10-year) estimates. Five-year assumptions are also available upon request. Please see Invesco's Capital Market Assumptions: Methodology update whitepaper for more details.

Figure 10: Our building block approach to estimating returns



For illustrative purposes only.

Fixed income returns are composed of:

- **Average yield:** The average of the starting (initial) yield and the expected yield for bonds.
- **Valuation change (yield curve):** Estimated changes in valuation given changes in the Treasury yield curve.
- **Roll return:** Reflects the impact on the price of bonds that are held over time. Given a positively sloped yield curve, a bond's price will be positively impacted as interest payments remain fixed, but time to maturity decreases.
- **Credit adjustment:** Estimated potential impact on returns from credit rating downgrades and defaults.

Equity returns are composed of:

- **Dividend yield:** Dividend per share divided by price per share.
- **Buyback yield:** Percentage change in shares outstanding resulting from companies buying back or issuing shares.
- **Valuation change:** The expected change in value given the current price/earnings (P/E) ratio and the assumption of reversion to the long-term average P/E ratio.
- **Long-term (LT) earnings growth:** The estimated rate of the growth of earnings based on the long-term average real GDP per capita and inflation.

Currency adjustments are based on the theory of interest rate parity (IRP), which suggests a strong relationship between interest rates and the spot and forward exchange rates between two given currencies. Interest rate parity theory assumes that no arbitrage opportunities exist in foreign exchange markets. It is based on the notion that, over the long term, investors will be indifferent between varying rates of returns on deposits in different currencies because any excess return on deposits will be offset by changes in the relative value of currencies.

For volatility estimates for the different asset classes, we use rolling historical quarterly returns of various market benchmarks. Given that benchmarks have differing histories within and across asset classes, we normalize the volatility estimates of shorter-lived benchmarks to ensure that all series are measured over similar time periods.

Correlation estimates are calculated using trailing 20 years of monthly returns. Given that recent asset class correlations could have a more meaningful effect on future observations, we place greater weight on more recent observations by applying a 10-year half-life to the time series in our calculation.

Arithmetic versus geometric returns. Our building block methodology produces estimates of geometric (compound) asset class returns. However, standard mean-variance portfolio optimization requires return inputs to be provided in arithmetic rather than in geometric terms. This is because the arithmetic mean of a weighted sum (e.g., a portfolio) is the weighted sum of the arithmetic means (of portfolio constituents). This does not hold for geometric returns. Accordingly, we translate geometric estimates into arithmetic terms. We provide both arithmetic returns and geometric returns, given that the former informs the optimization process regarding expected outcomes, while the latter informs the investor about the rate at which asset classes might be expected to grow wealth over the long run.

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Invesco Solutions

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- We help support better investment outcomes by delivering insightful and thorough analytics.
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The foundation of the team's process is the development of capital market assumptions — long-term forecasts for the behavior of different asset classes. Their expectations for returns, volatility, and correlation serve as guidelines for long-term, strategic asset allocation decisions.

Assisting clients in North America, Europe, and Asia, Invesco's Solutions team consists of over 75 professionals with 20+ years of experience across the leadership team. The team benefits from Invesco's on-the-ground presence in 25 countries worldwide, with over 150 professionals to support investment selection and ongoing monitoring.

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The value of investments and any income will fluctuate (this may partly be the result of exchange rate fluctuations), and investors may not get back the full amount invested.

Invesco Solutions develops CMAs that provide long-term estimates for the behavior of major asset classes globally. The team is dedicated to designing outcome-oriented, multi-asset portfolios that meet the specific goals of investors. The assumptions, which are based on 5- and 10-year investment time horizons, are intended to guide these strategic asset class allocations. For each selected asset class, we develop assumptions for estimated return, estimated standard deviation of return (volatility), and estimated correlation with other asset classes. This information is not intended as a recommendation to invest in a specific asset class or strategy, or as a promise of future performance. Estimated returns are subject to uncertainty and error, and can be conditional on economic scenarios. In the event a particular scenario comes to pass, actual returns could be significantly higher or lower than these estimates.

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