Invesco

2025 Invesco Capital Market Assumptions

Invesco Solutions I Euro (EUR)

1

Executive Summary

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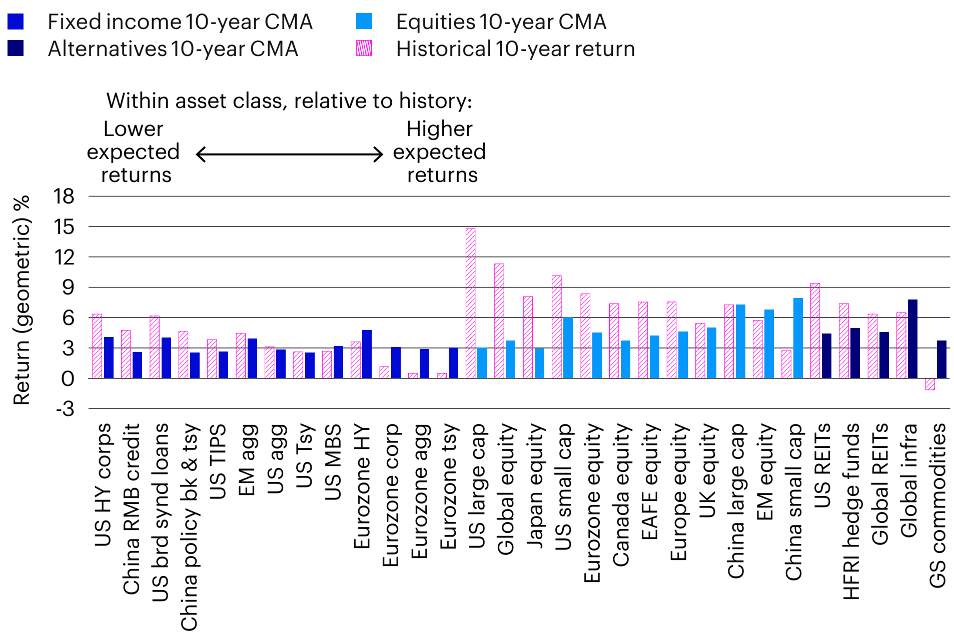
- In our 2025 edition of Invesco Capital Market Assumptions, we aim to address one of the largest challenges for investors globally: How to approach US equities within a multi-asset portfolio.
- Our current estimate of US equity large capitalization expected returns is now below 5% nominal (4.7% USD) and 3% (2.6%) in real terms, the lowest estimate we have released since we began writing these reports in 2017 and the lowest in our model's backtest since January 2004 (4.6%).
- We posit that the major themes affecting US equity markets are an issue not only for US investors, but for global investors alike and we provide a few ideas on how to diversify US large-cap equity exposures within long-term asset allocations.
- Our CMA scoring aligns closely with our latest tactical positioning in a contraction regime, both at the portfolio risk level and when comparing equities to fixed income. From a tactical perspective, we are closely monitoring the possibility of a positive growth shock following the US election, at least for US assets, and will see if our measure of global risk appetite accelerates over the coming months to determine, through our rules-based process, whether a sustainable shift to rising market sentiment is taking place.

Figure 1: Expectations relative to historical average (EUR)



Source: Invesco, estimates as of September 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.

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.

2

Asset Allocation Insights

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

Strategic perspective

In our 2025 edition of the Invesco Capital Market Assumptions, we aim to address one of the largest challenges for investors globally: How to approach US equities within a multi-asset portfolio. Equity markets in the US have reached new heights at the time of this publication, with the S&P 500 crossing the 6,000 milestone in the week of the 2024 US election. With the election in the rearview and the only open question is how large the Republican party's majority will be in the House of Representatives, equities (primarily US equities and digital assets[1]) have continued to rally dramatically (27% and 95% to date, respectively, with bitcoin fast approaching $100,000 per coin) along with medium-term interest rates (the 10-year yield has climbed to 4.4% from a 15-month low of 3.6% in mid-September). Maybe it was the overhanging uncertainty approaching the election dissipating or hopes of favorable tax, regulatory, and fiscal policies. Nonetheless, many of the themes we have written about over the past few quarters, like elevated concentration levels (1Q24), equity valuations (2Q24), and the possibility of a soft landing (3Q24), are all still intact.

Our current estimate of US equity large capitalization expected returns is now below 5% nominal (4.7% USD) and 3% (2.6%) in real terms, the lowest estimate we have released since we began writing these reports in 2017 and the lowest in our model's backtest since January 2004 (4.6%). This reading should be no surprise to those who are familiar with our methodology, which has a large negative valuation building block component, and is currently a large (-1.9% annualized) expected headwind due to a P/E of 23.5x, high interest rates, and high inflation. Using the Fed model to estimate the equity risk premium by subtracting the trailing 12-month earnings yield of US equities, which is the inverse of the P/E ratio, by the 10-year Treasury yield,[2] confirms that equities are overvalued relative to fixed income, as the signal has turned negative for the first time since 2002, meaning investors are theoretically compensated less per dollar of earnings from equities than coupons per dollar of fixed income. Not only is the US overvalued on a standalone basis, but it is also roughly 65% of the $75T global equity market,[3] making passive global investors significantly exposed to a single, highly overvalued country that is simultaneously highly concentrated in just a few individual stocks in the technology and consumer discretionary sectors. The weight of US equities in the global index contrasts starkly with the level of US contribution to global gross domestic product, a much smaller 26%. Japan, the second-largest country weight, is only 5% of the global index, 1/13th the relative size of the US. After the US is removed from global equity markets, the global ex-US weight in the technology sector decreases from 25% to a more reasonable 13%, making it the third-largest sector instead of the first.

Now that we have established these themes are an issue not only for US investors, but for global investors alike, we hope to provide a few ideas on how to diversify US large-cap equity exposures within long-term asset allocations:

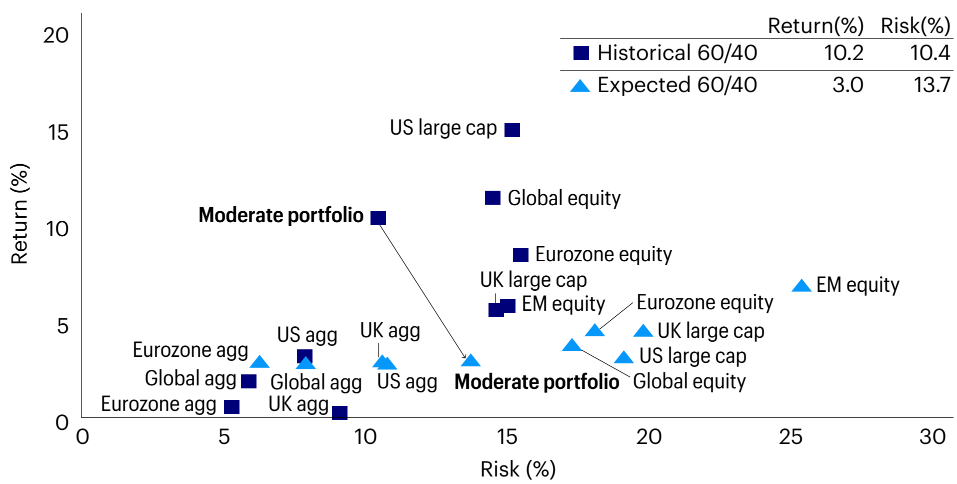
1. **Fixed income:** As discussed within the Fed model, fixed income is now more attractive than equities from a simple valuation measure. From a CMA perspective, aggregate US fixed income is only expected to return slightly less than US large-cap equities over the next decade. When risk adjusted, which is useful when making relative portfolio decisions, fixed income is significantly more attractive. Yields have proven to be a very strong predictor of future returns,[4] and a 4+ % yield for government bonds not only bests inflation expectations but adds a layer of diversification within portfolios as a ballast due to low expected risk and correlations to risk assets. Assuming interest rates are not going to climb much higher this business cycle, fixed income can be an excellent diversifier to equities, especially in times of crisis. While we are not predicting a recession, the hedge that longer-duration fixed income can provide within recessionary conditions is incredibly valuable for a multi-asset portfolio. If we do indeed manage to avoid a recession, as is our base case, risky credit assets, such as high yield and broadly syndicated loans, are particularly attractive given their high levels of total income, despite tight credit spreads and accounting for average levels of credit losses. It may be time to consider increasing fixed income exposures at the expense of US large-cap equities.

1. Source: Bloomberg L.P., as of Nov. 16, 2024. US equities and digital assets represented by the S&P 500 Index and Bloomberg Galaxy Digital Assets Index, respectively.
2. Source: Shiller, as of Oct. 31, 2024. The Fed model is a highly debated measure of determining equity valuations (see Asness, "Fight the Fed Model", JPM 2003) and has struggled to predict forward equity returns.
3. Source: MSCI ACWI as of Oct. 31, 2024.
4. Source: Invesco CMA methodology, 2021.

2. **Equities:** We empathize that diversifying outside of US large-cap equities is particularly tricky in today's market as it has been one of the few bright spots within equity markets globally since the global financial crisis of 2008. As we tend to preach in the CMAs, past performance does not guarantee future results. Said another way, your forward returns are not necessarily based on historical returns. However, we do use history as a guide to attempt to understand the drivers of expected return, which we showcase in our building block methodology. Global equities outside of the US are more attractive on a forward basis than within the US due to higher expected dividend yields, significantly lower valuations (despite being slightly overvalued themselves based on current high levels of interest rates and inflation), and the potential for a currency tailwind from an overvalued US dollar. When gauging relative opportunities outside of the US, emerging markets (EM) stand out due to a compelling expected earnings growth rate and a slightly positive tailwind from valuations. Within the US, small-cap equities are more attractive than their larger counterparts as they have higher expected earnings growth rates and are near fair value.

3. **Alternatives:** Global REITs, infrastructure, hedge funds, and commodities are all attractive relative to traditional assets as they are all expected to outperform US equities on a forward basis. Relative to public equities, listed real assets are still recovering following the increase in interest rates and have a more attractive valuations building block component. Further, they provide impressive dividend yields and are valuable diversifiers with low correlations to both equities and fixed income. From a risk-adjusted perspective, all major alternative assets that we cover have expected return-to-risk ratios near double that of US equities, with global infrastructure (0.7) and hedge funds (0.8) standing out.

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



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4Q24 CMA observations (10Y, USD)

Equities: Our CMA return for global equities is 5.4%, slightly higher than that of US equities and dragged down due to the large overweight in the index towards overvalued US large-cap equities. Quarter over quarter, all major equity CMAs have declined mostly due to higher valuations (-0.5% globally) outside of Japan, whose fundamentals (as measured by the price-to-book ratio) have returned to their long-term average. The change in the valuation component of China, in particular, stands out at -1.9%, with the price of the index rising considerably this past quarter in hopes of a yet-to-be-delivered stimulus package.

There are many considerations for investors beyond CMAs 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.

Fixed income: CMA returns for fixed income have dropped as well over the quarter, with current yields falling below their expected future yields, creating a negative valuation change as yields shift upward as they mature. Global aggregate bonds are expected to return 4.5% over the next decade, around 0.6% less than last quarter and 1% less than we anticipated last year. Credit assets are still expected to outperform government bonds, with broadly syndicated loans and high yield, both expected to return 5.7%, 0.7% less than last quarter.

CMA signals relative to tactical asset allocation (TAA) positioning

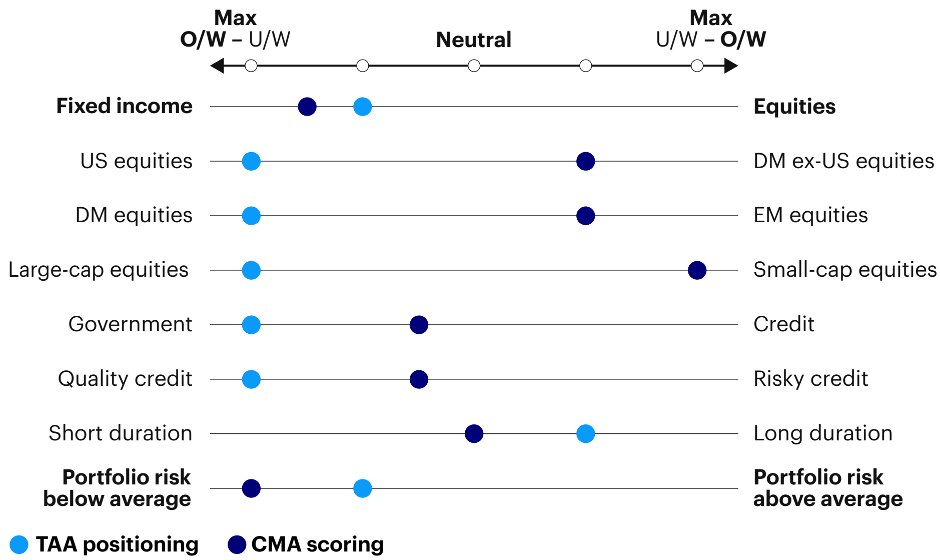
Our CMA scoring aligns closely with our latest tactical positioning in a contraction regime, both at the portfolio risk level and when comparing equities to fixed income. From a tactical perspective, we are closely monitoring the possibility of a positive growth shock following the US election, at least for US assets, and will see if our measure of global risk appetite accelerates over the coming months to determine, through our rules-based process, whether a sustainable shift to rising market sentiment is taking place. Presently, however, both time horizons recommend taking below-average levels of risk, with a preference for sourcing that risk from fixed income rather than equities. This is intuitive, as the relative expected return of fixed income compared to equities is elevated. Further, the possibility of downside risks to the economy and markets is heightened in a contraction regime.

The first major divergence between the two time horizons appears when comparing US equities to developed markets outside the US. US equities, despite their high valuations — which pose a longer-term headwind for CMAs — benefit from a large concentration of defensive, high-quality companies. These companies tend to perform well during a tactical contraction as they are less tied to the business cycle.

This logic extends to comparisons between developed market (DM) and emerging market (EM) equities, as well as large-cap versus small-cap equities. Long-duration government bonds offer the greatest potential risk mitigation 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 position.

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 are aimed to be used as a guide for making relative asset class level decisions for a portfolio over a 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]

Figure 3: Relative tactical asset allocation (TAA) positioning (Nov. 2024) and CMA scoring (Q4 2024)



Source: Invesco Solutions, Oct. 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).

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.

3

2025 Capital Market Assumptions

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

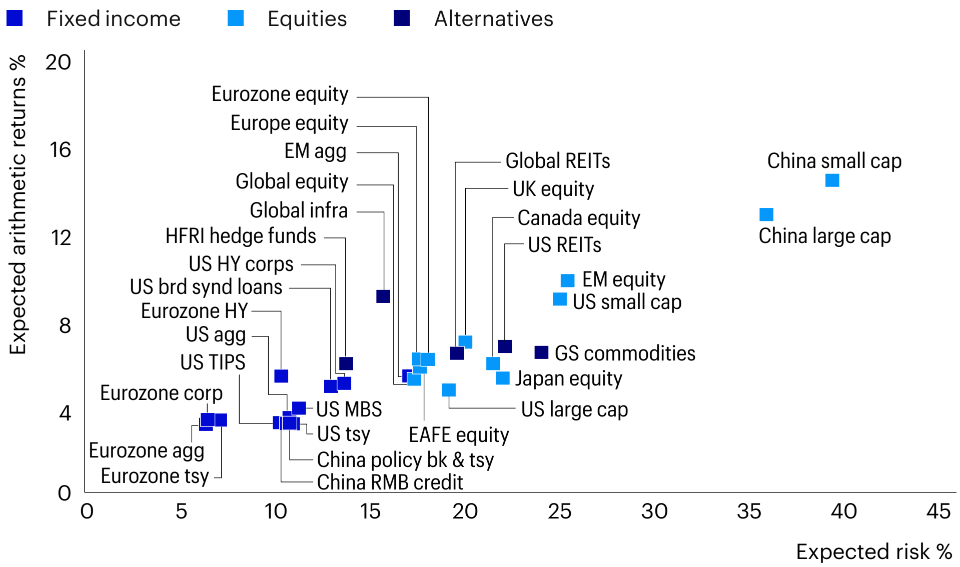


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Figure 5: CMA difference: 5-year minus 10-year assumptions (EUR)

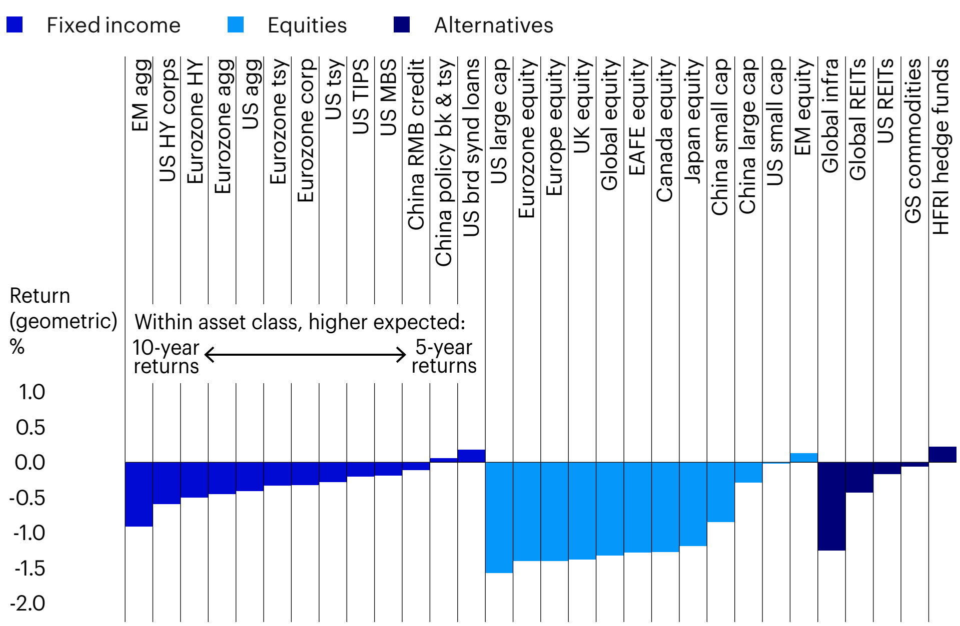

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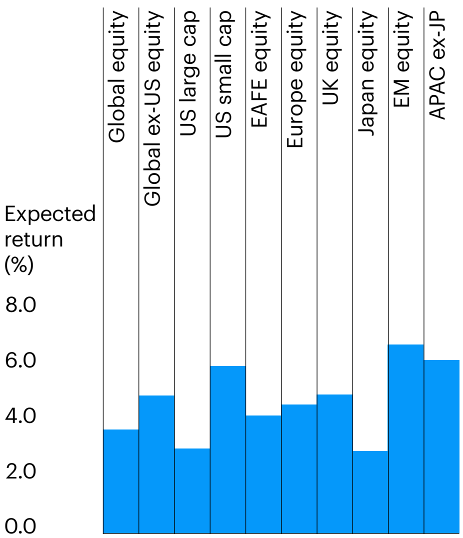
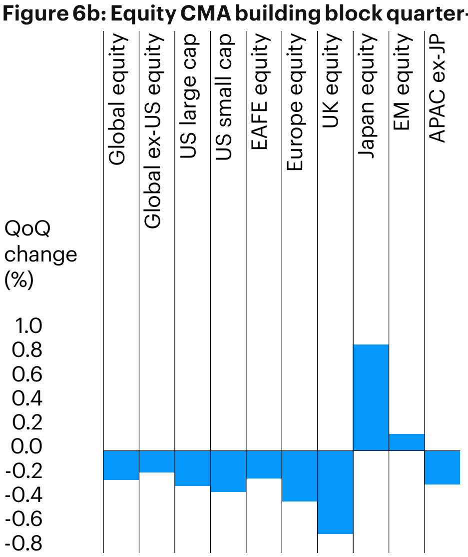
Figure 6a: Equity CMA building block contribution (EUR) (%)



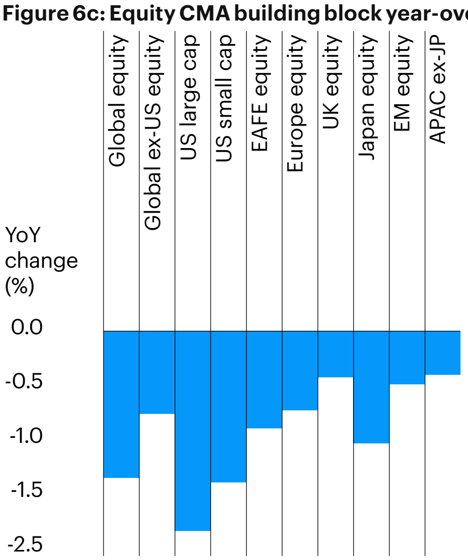
	Dividend yield	Buyback yield	LT earnings growth	Expected inflation	Valuation change	Currency Adj. (IRP)
Global equity	1.82	0.64	2.15	1.91	-1.53	-1.29
Global ex-US equity	2.84	0.00	2.09	1.53	-0.90	-0.61
US large cap	1.25	0.99	2.19	2.12	-1.87	-1.67
US small cap	1.36	0.93	3.47	2.12	-0.27	-1.67
EAFE equity	3.03	0.00	1.44	1.18	-1.22	-0.17
Europe equity	3.20	0.00	1.52	1.74	-1.41	-0.42
UK equity	3.83	0.00	1.69	1.93	-0.59	-1.88
Japan equity	2.17	0.00	0.86	-0.96	-0.35	1.26
EM equity	2.48	0.00	3.56	2.19	-0.01	-1.50
APAC ex-JP	2.26	0.00	3.13	2.17	0.13	-1.49

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



	Dividend yield	Buyback yield	LT earnings growth	Expected inflation	Valuation change	Currency Adj. (IRP)
Global equity	-0.03	-0.02	0.15	-0.21	-0.29	0.16
Global ex-US equity	-0.02	0.00	0.07	-0.12	-0.12	0.02
US large cap	-0.05	-0.03	0.19	-0.25	-0.39	0.24
US small cap	-0.12	0.01	0.10	-0.25	-0.31	0.24
EAFE equity	0.04	0.00	0.03	-0.20	-0.03	-0.05
Europe equity	0.03	0.00	0.00	-0.25	-0.14	-0.04
UK equity	-0.06	0.00	-0.09	-0.27	-0.05	-0.20
Japan equity	0.21	0.00	0.06	-0.09	0.87	-0.15
EM equity	-0.10	0.00	0.14	0.05	-0.12	0.16
APAC ex-JP	-0.14	0.00	-0.04	0.37	-0.26	-0.21

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



	Dividend yield	Buyback yield	LT earnings growth	Expected inflation	Valuation change	Currency Adj. (IRP)
Global equity	-0.33	-0.18	0.39	-0.05	-1.50	-0.03
Global ex-US equity	-0.34	0.00	0.39	0.00	-0.83	-0.17
US large cap	-0.28	-0.32	0.17	-0.09	-1.87	0.09
US small cap	-0.31	0.07	-0.02	-0.09	-1.47	0.09
EAFE equity	-0.23	0.00	0.22	-0.12	-0.76	-0.23
Europe equity	-0.21	0.00	0.34	-0.11	-0.89	-0.05
UK equity	-0.09	0.00	0.23	-0.14	-0.25	-0.29
Japan equity	-0.08	0.00	-0.30	-0.25	0.13	-0.79
EM equity	-0.52	0.00	0.64	0.24	-0.87	-0.13
APAC ex-JP	-0.51	0.00	0.80	0.17	-0.96	-0.10

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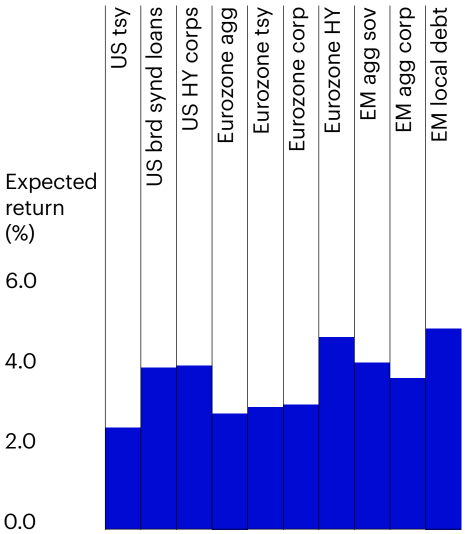
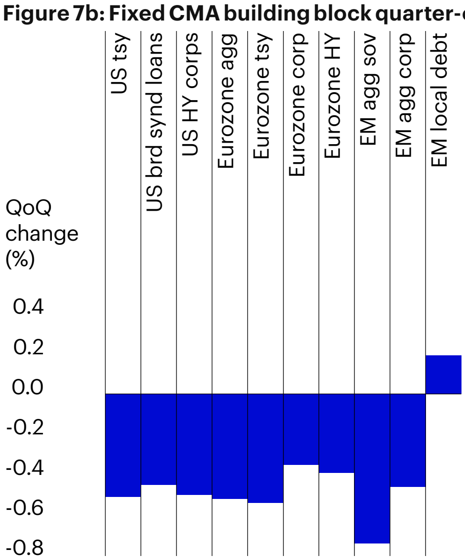
Figure 7a: Fixed CMA building block contribution (EUR) (%)



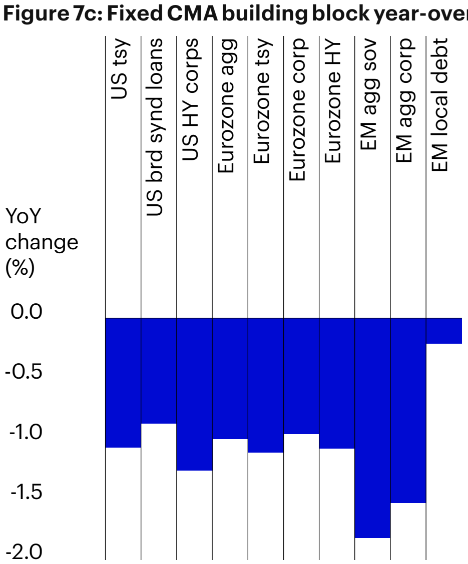
	Average yield	Roll return	Valuation change (yield curve)	Valuation change (OAS)	Credit loss	Currency Adj. (IRP)
US tsy	3.93	0.47	-0.20	0.00	0.00	-1.67
US brd synd loans	6.85	0.00	0.00	-0.24	-0.92	-1.67
US HY corps	7.98	0.05	-0.01	-0.61	-1.68	-1.67
Eurozone agg	2.96	0.46	-0.14	-0.13	-0.27	0.00
Eurozone tsy	2.72	0.46	-0.14	0.00	0.00	0.00
Eurozone corp	3.42	0.31	-0.01	-0.16	-0.47	0.00
Eurozone HY	6.53	-0.07	0.04	-0.44	-1.30	0.00
EM agg sov	7.12	0.71	-0.39	-0.47	-1.16	-1.67
EM agg corp	6.96	0.35	-0.12	-0.90	-0.87	-1.67
EM local debt	6.01	0.47	0.09	0.00	0.00	-1.59

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



	Average yield	Roll return	Valuation change (yield curve)	Valuation change (OAS)	Credit loss	Currency Adj. (IRP)
US tsy	-0.47	0.13	-0.41	0.00	0.00	0.24
US brd synd loans	-0.64	0.00	0.00	-0.05	0.00	0.24
US HY corps	-0.54	0.11	-0.26	-0.05	0.00	0.24
Eurozone agg	-0.15	0.19	-0.55	-0.04	0.02	0.00
Eurozone tsy	-0.18	0.19	-0.55	0.00	0.00	0.00
Eurozone corp	-0.19	0.24	-0.40	-0.01	0.01	0.00
Eurozone HY	-0.14	0.06	-0.28	-0.02	0.00	0.00
EM agg sov	-0.47	0.27	-0.54	-0.23	0.00	0.24
EM agg corp	-0.40	0.08	-0.37	0.02	-0.03	0.24
EM local debt	-0.55	-0.02	0.06	0.00	0.00	0.70

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



	Average yield	Roll return	Valuation change (yield curve)	Valuation change (OAS)	Credit loss	Currency Adj. (IRP)
US tsy	-0.38	0.06	-0.84	0.00	0.00	0.09
US brd synd loans	-0.72	0.00	0.00	-0.24	0.00	0.09
US HY corps	-0.75	0.12	-0.54	-0.18	0.01	0.09
Eurozone agg	-0.22	0.13	-0.87	-0.10	0.07	0.00
Eurozone tsy	-0.26	0.07	-0.92	0.00	0.00	0.00
Eurozone corp	-0.44	0.14	-0.67	-0.14	0.14	0.00
Eurozone HY	-0.39	0.09	-0.47	-0.28	-0.04	0.00
EM agg sov	-0.67	0.35	-1.01	-0.58	0.00	0.09
EM agg corp	-0.91	0.10	-0.71	-0.47	0.36	0.09
EM local debt	-0.35	-0.18	-0.29	0.00	0.00	0.61

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

	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	1.6	2.2	2.8	10.5	0.21
	US tsy IM	BBG US tsy IM	2.2	2.8	2.0	10.5	0.26
	US tsy long	BBG US tsy long	2.4	3.4	2.5	14.7	0.23
	US TIPS	BBG US TIPS	2.6	3.1	2.2	10.2	0.31
	US brd synd loans	CSFB leverage loan	4.0	4.8	6.1	12.9	0.37
	US agg	BBG US agg	2.8	3.4	2.6	10.7	0.32
	US IG corp	BBG US IG	3.1	3.7	3.1	11.1	0.33
	US MBS	BBG US MBS	3.2	3.8	2.9	11.2	0.34
	US preferred stocks	BOA ML fixed rate pref securities	2.9	3.7	4.4	13.4	0.28
	US HY corps	BBG US HY	4.1	4.9	5.3	13.6	0.36
	UK linker	BofA ML UK inflation-linked gilt	3.1	3.8	2.4	11.9	0.32
	UK gilts	BBG sterling agg gilts	2.6	3.1	2.3	9.5	0.32
	UK corp	BBG sterling agg non-gilts corp	3.3	3.9	3.4	10.9	0.35
	Global agg	BBG global agg	2.8	3.1	2.5	7.8	0.40
	Global agg ex-US	BBG global agg ex-US	2.8	3.0	2.5	6.4	0.47
	Global tsy	BBG global tsy	2.8	3.1	2.3	8.3	0.38
	Global sov	BBG global sov	2.9	3.3	2.9	9.0	0.36
	Global corp	BBG global corp	3.1	3.4	3.1	8.1	0.42
	Global IG	BBG global corp IG	3.1	3.5	3.2	8.3	0.42
	Eurozone corp	BBG euro agg credit corp	3.1	3.3	3.2	6.4	0.52
	Eurozone tsy	BBG euro agg gov tsy	3.0	3.3	2.6	7.0	0.47
	Asian dollar IG	BOA ML AC IG	3.0	3.9	3.0	14.0	0.28
	EM agg	BBG EM agg	3.9	5.3	4.6	17.0	0.31
	EM agg sov	BBG EM sov	4.1	5.4	4.9	16.4	0.33
	China policy bk & tsy	BBG China PB tsy TR	2.6	3.1	1.9	10.8	0.29
	China RMB credit	BBG China corporate	2.6	3.1	2.5	10.7	0.29
Equities	Global equity	MSCI ACWI	3.7	5.1	1.2	17.3	0.30
	Global ex-US equity	MSCI ACWI ex-US	5.0	6.4	2.2	17.9	0.36
	US broad market	Russell 3000	2.6	4.4	0.7	19.8	0.22
	US large cap	S&P 500	3.1	4.8	0.6	19.1	0.25
	US mid cap	Russell midcap	4.1	6.3	1.1	21.5	0.29
	US small cap	Russell 2000	6.0	8.8	0.6	25.0	0.35
	EAFE equity	MSCI EAFE	4.3	5.7	2.9	17.6	0.32
	Europe equity	MSCI Europe	4.6	6.1	2.8	17.5	0.35
	Eurozone equity	MSCI euro ex-UK	4.5	6.0	3.0	18.0	0.33
	UK large cap	FTSE 100	4.5	6.3	2.0	19.8	0.32
	UK small cap	FTSE small cap UK	7.7	10.7	2.4	25.9	0.41
	Canada equity	S&P TSX	3.7	5.8	1.9	21.5	0.27
	Japan equity	MSCI JP	3.0	5.2	3.4	22.0	0.24
	EM equity	MSCI EM	6.8	9.6	1.0	25.4	0.38
	China large cap	CSI 300	7.3	12.6	2.4	35.9	0.35
	pacific ex-JP equity	MSCI pacific ex-JP	4.7	7.5	2.2	25.4	0.30
Alternatives	US REITs	FTSE NAREIT equity	4.4	6.6	1.9	22.1	0.30
	Global REITs	FTSE EPRA/NAREIT developed	4.6	6.3	2.4	19.6	0.32
	HFRI hedge funds	HFRI HF	5.0	5.8	-	13.7	0.43
	GS commodities	S&P GSCI	3.7	6.3	-	24.0	0.26
	Agriculture	S&P GSCI agriculture	2.4	4.7	-	22.1	0.21
	Energy	S&P GSCI energy	6.0	11.6	-	36.8	0.31
	Industrial metals	S&P GSCI industrial metals	1.9	4.3	-	22.8	0.19
	Precious metals	S&P GSCI precious metals	-5.2	-3.7	-	17.4	-0.21

Source: Invesco, estimates as of September 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 (EUR)

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

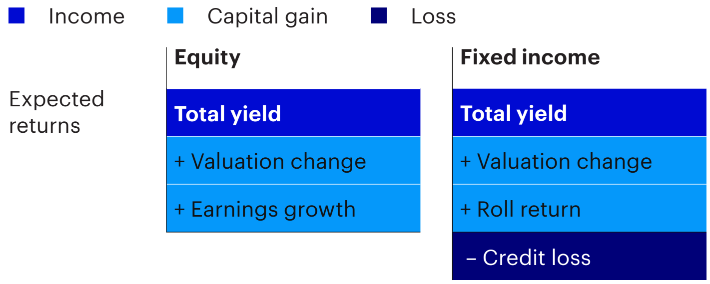
		Fixed income												Equities										Alternatives			
	Asset class	US tsy IM	US TIPS	US brd synd loans	US agg	US IG corp	US HY corps	US muni	US HY muni	Global agg	Global agg ex-US	EM agg	China RMB credit	Global equity	China large cap	US large cap	US mid cap	US small cap	EAFE equity	UK large cap	Canada 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	-0.25	0.27	1.00																							
	US agg	0.88	0.79	0.10	1.00																						
	US IG corp	0.63	0.77	0.43	0.89	1.00																					
	US HY corps	0.08	0.53	0.81	0.43	0.69	1.00																				
	US muni	0.60	0.63	0.29	0.78	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	0.73	0.76	0.19	0.86	0.83	0.53	0.68	0.55	1.00																	
	Global agg ex-US	0.61	0.69	0.20	0.74	0.74	0.52	0.59	0.48	0.98	1.00																
	EM agg	0.35	0.66	0.62	0.65	0.83	0.82	0.65	0.67	0.72	0.68	1.00															
	China RMB credit	0.32	0.32	0.09	0.40	0.36	0.22	0.33	0.28	0.50	0.51	0.32	1.00														
Equities	Global equity	0.04	0.43	0.63	0.35	0.57	0.81	0.38	0.45	0.52	0.55	0.72	0.29	1.00													
	China large cap	0.01	0.15	0.26	0.16	0.27	0.33	0.15	0.21	0.27	0.29	0.36	0.32	0.42	1.00												
	US large cap	0.03	0.40	0.58	0.32	0.53	0.76	0.35	0.41	0.45	0.46	0.63	0.23	0.97	0.34	1.00											
	US mid cap	-0.01	0.39	0.66	0.32	0.55	0.82	0.37	0.44	0.44	0.46	0.67	0.24	0.94	0.36	0.95	1.00										
	US small cap	-0.05	0.30	0.60	0.25	0.45	0.74	0.28	0.35	0.35	0.37	0.57	0.21	0.86	0.33	0.87	0.95	1.00									
	EAFE equity	0.05	0.40	0.59	0.35	0.57	0.78	0.39	0.44	0.55	0.59	0.73	0.31	0.96	0.41	0.87	0.87	0.79	1.00								
	UK large cap	-0.04	0.33	0.61	0.25	0.47	0.74	0.31	0.41	0.46	0.51	0.64	0.28	0.89	0.39	0.81	0.81	0.74	0.95	1.00							
	Canada equity	-0.01	0.42	0.66	0.30	0.54	0.78	0.33	0.44	0.48	0.52	0.68	0.27	0.89	0.40	0.83	0.87	0.80	0.86	0.86	1.00						
	Japan equity	0.09	0.35	0.48	0.34	0.51	0.66	0.35	0.36	0.46	0.47	0.61	0.29	0.81	0.32	0.74	0.73	0.69	0.85	0.73	0.68	1.00					
	EM equity	0.04	0.38	0.57	0.32	0.53	0.72	0.36	0.45	0.53	0.58	0.74	0.38	0.84	0.58	0.72	0.74	0.67	0.83	0.77	0.80	0.68	1.00				
Alternatives	Global REITs	0.16	0.52	0.62	0.47	0.65	0.80	0.47	0.54	0.59	0.59	0.75	0.30	0.86	0.31	0.82	0.86	0.78	0.84	0.79	0.80	0.68	0.73	1.00			
	Global infra	0.18	0.52	0.56	0.46	0.63	0.75	0.48	0.52	0.59	0.60	0.71	0.28	0.83	0.33	0.78	0.80	0.69	0.83	0.80	0.82	0.65	0.71	0.85	1.00		
	GS commodities	-0.30	0.11	0.52	-0.14	0.08	0.45	-0.02	0.20	0.09	0.17	0.31	0.08	0.49	0.16	0.42	0.46	0.42	0.50	0.59	0.61	0.35	0.47	0.37	0.44	1.00	
	HFRI hedge funds	-0.13	0.33	0.72	0.21	0.49	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 September 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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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.

Investment risks

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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