2021 Long-Term Capital Market Assumptions

Q1 Update

Invesco Investment Solutions | Pound Sterling (GBP)

Executive Summary

Duy Nguyen
CIO, Invesco Investment Solutions

+ **Strategic Perspective:** With 2021 still mired in the threat of COVID-19 and subsequent mutations, the Invesco Investment Solutions team remains committed to monitoring the risks to our outlook and our clients' portfolios. In the first quarter's update of our Capital Market Assumptions (CMAs), we maintain our base case scenario of a recovery and a continued strengthening of the fragile economy. This is not to say that the structural challenges for an investor in a diversified portfolio have been eliminated. Yields on bonds are close to historical lows and equity returns are anticipated to be below average **(Figure 1)**, with higher levels of risk.

+ **Tactical View:** We expect the global cycle to move into an expansionary regime, with growth above its long-term trend and continuing to improve. Our leading economic indicators continue to improve across regions despite the meaningful increase in COVID-19 infections and more stringent restrictions on mobility in some parts of the world. This stronger economic footing is also evident in market dynamics. Historical analysis of business cycles over the past 50 years suggests that volatility tends to decline across asset classes during the expansion phase, often reaching the lowest levels for the cycle.

+ **Global Market Outlook:** We expect last year's reflation hopes and portfolio rebalancing to resume albeit in stages rather than all at once, based on the sequencing of vaccination, and re-opening by location and by sector. Economic normalization is increasingly likely to be differentiated by variations in vaccination progress across countries. Asia most notably, and the EU managed the first wave of the pandemic effectively, but now lag the US and UK in vaccination rates. As such, the case for selective diversification across regions, countries, asset classes and sectors continue to grow in importance, compared to the long-term concentration strategies and tactical risk-on or risk-off portfolio rebalancing that have performed well over the last decade.

Figure 1: Expectations relative to historical average (GBP)
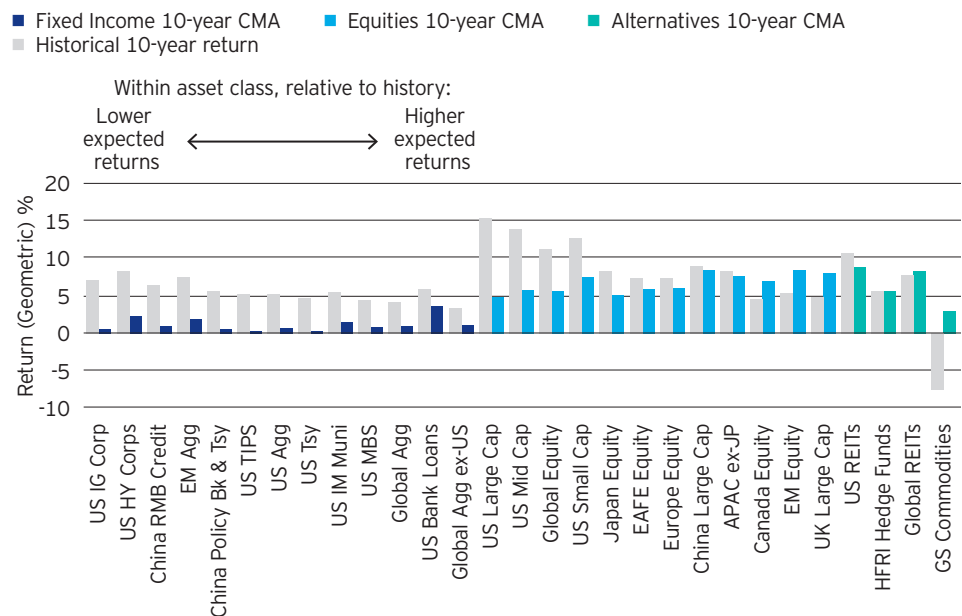
Source: Invesco, estimates as of Dec. 31, 2020. Proxies listed in **Figure 13**. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 14 for information about our CMA methodology. These estimates reflect the views of Invesco Investment Solutions, the views of other investment teams at Invesco may differ from those presented here.

Asset Allocation Insights

Jacob Borbidge
Senior Portfolio Manager,
Head of Investment Research,
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For further details on our process for defining scenarios and adjustments, please refer to our CMA Methodology paper.

Strategic perspective

Almost a year has passed since the pandemic hurtled most major economies into recession. Just looking at headline market performance, however, one would question whether anything disruptive has happened at all. In fact, nearly all asset classes exhibited strong, positive performance in 2020 apart from the US Dollar, REITs, and energy assets. While equities have far surpassed their prior peaks, aided by global coordinated policy efforts, there is plenty of room for the economic recovery to continue. As the vaccine rollout begins in developed economies, the reduced threat of lockdowns gives the struggling service sector hope for some sense of normalcy in the later part of the year.

With 2021 still mired in the threat of COVID-19 and subsequent mutations, the Invesco Investment Solutions team remains committed to monitoring the risks to our outlook and our clients' portfolios. In the first quarter's update of our Capital Market Assumptions (CMAs), we maintain our base case scenario, anticipating a recovery and a continued strengthening of the fragile economy. This is not to say that the structural challenges for an investor in a diversified portfolio have been eliminated. Yields on bonds are close to historical lows and equity returns are anticipated to be below average, with higher levels of risk **(Figure 2)**. Our strategic perspective is that asset class diversification is key to limit the impact of external shocks within portfolios and achieve ever more challenging return and income objectives.

Figure 2: 60/40 Portfolios, less return and more risk over the next 10 years (USD)
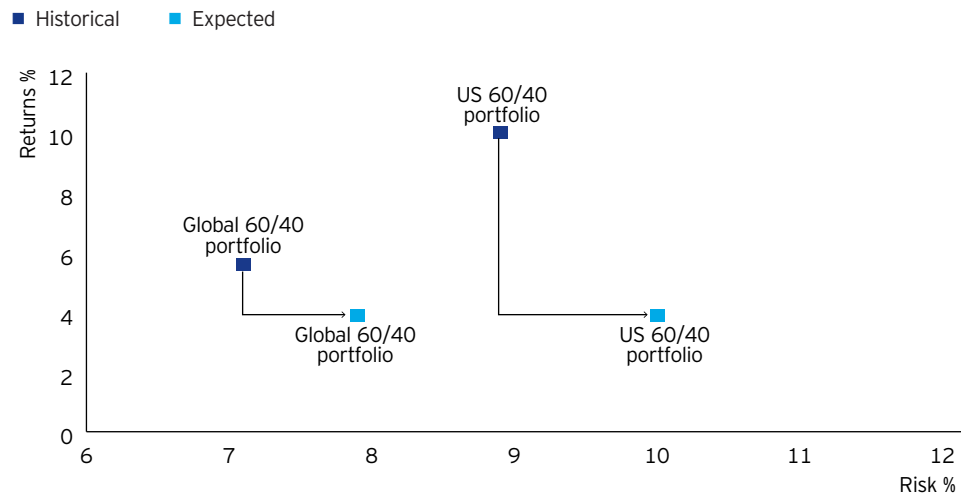
Source: Invesco Investment Solutions proprietary research, Dec. 31, 2020. US 60/40 represented by 60% S&P 500 Index and 40% BBG BARC US Aggregate Bond Index. Global 60/40 represented by 60% MSCI ACWI Index and 40% BBG BARC Global Aggregate Bond Index. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 14 for information about our CMA methodology. Please see the CMA methodology paper for additional CMA information. These estimates reflect the views of Invesco Investment Solutions, the views of other investment teams at Invesco may differ from those presented here. **Performance, whether actual or simulated, does not guarantee future results.**

1Q21 CMA Observations

+ **Equities:** Most major asset classes' return expectations are similar compared to those of the prior quarter as increased growth expectations counteracted higher valuations, while our medium-term, 5-year expectations are up slightly, anticipating the recovery to be front-loaded. Consistent with a recovery regime, the US small cap premium grew versus large caps, presenting a way to diversify a concentrated US equity market. Geographically, emerging markets (EM) return expectations increased mainly due to China, the only major economy to grow in 2020, and markets with close ties to China's economy, like Taiwan. UK equity expectations were unchanged, but it retains its spot as the highest risk adjusted return expectation among developed market (DM) equities.
+ **Fixed Income:** In expectation of further stimulus, high yield (HY), and other credit spreads continue to contract and are now at or near pre-crisis levels. Expectations around longer term rates increased marginally, driving longer duration, rate-sensitive fixed income expectations slightly higher. HY return expectations are down significantly as tighter spreads weigh more than the tailwind from our reduced forecast of losses in the space.

Alessio de Longis
Senior Portfolio Manager,
Head of Tactical Asset Allocation,
Invesco Investment Solutions

For further details on our macro regime
framework, please refer to our CMA
Methodology paper.

Tactical view

We expect the global cycle to move into an **expansionary regime**, with growth above its long-term trend and continuing to improve. Our leading economic indicators continue to improve across regions despite the meaningful increase in COVID-19 infections and more stringent restrictions on mobility in some parts of the world. Improving growth momentum is most evident in the US, now in an expansion regime, while developed markets outside the US continue to lag in the speed of recovery given mobility restrictions in the Eurozone and the UK. While consumer sentiment and spending in the developed world have been somewhat impacted by restrictions over the past couple of months, CapEx spending, manufacturing orders and international trade have improved. In emerging markets, Asia is slowing at the margin and settling around its long-term trend growth rate while the growth momentum is picking up in the rest of the emerging world. This is not a surprising development from our perspective, given that Asia led the global recovery after the first wave of COVID -19 infections. Market sentiment continues to improve, as evidenced by the broad-based outperformance in risky assets across geographies and sectors, signaling improving growth expectations **(Figure 3)**.

Figure 3: The global cycle moves to expansion, with improvements across the developed world, led recently by stronger momentum in the US, while Emerging Asia settles around trend growth.

Current Leading Economic Indicators (LEIs) – Jan. 31, 2021
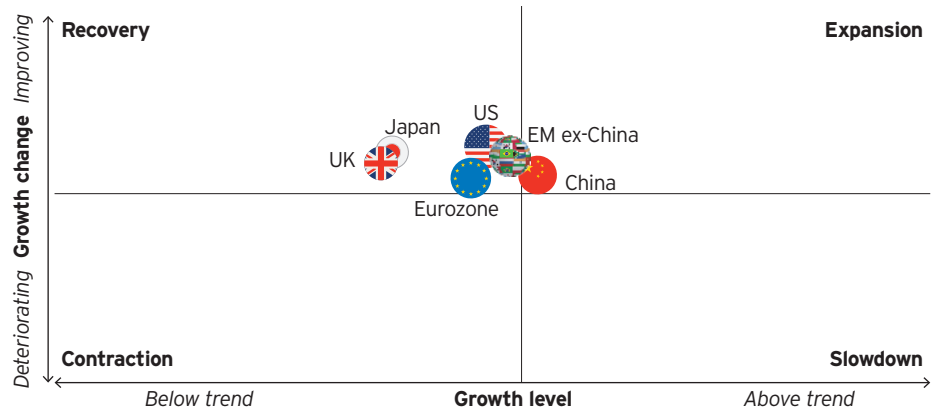
	LEIs	Global Risk Appetite	Expected macro regimes
Region	Current level of growth	Change in global growth expectations	
Global	**Above Trend**		**Expansion**
United States	**Above Trend**		**Expansion**
Developed Markets ex-USA	Below Trend		Recovery
Europe	Below Trend		Recovery
United Kingdom	Below Trend	**Growth Expectation Improving**	Recovery
Japan	Below Trend		Recovery
Emerging Markets	**Above Trend**		**Expansion**
China	**Above Trend**		**Expansion**
Emerging Markets ex-China	**Above Trend**		**Expansion**

Sources: Bloomberg L.P., Macrobond. Invesco Investment Solutions research and calculations. Proprietary leading economic indicators of Invesco Investment Solutions.

As global growth moves above trend, economic risk tends to decline from a cyclical perspective, driven by improving corporate fundamentals, stronger earnings growth and falling unemployment. This stronger economic footing is also evident in market dynamics. Historical analysis of business cycles over the past 50 years suggests that **volatility tends to decline across asset classes during the expansion phase,** often reaching the lowest levels for the cycle (**Figure 4**). While this doesn't preclude the occurrence of equity market corrections and bouts of volatility, the distinguishing feature of expansionary regimes is the stability of credit spreads, providing an important stabilizer to equity markets and the key differentiator between short-lived technical corrections and more severe market sell-offs, fueled by tightening credit conditions and rising cost of capital. This improved stability in default risk has historically emerged also in the changing correlation between credit and government bonds. As the economy moves from a recovery to an expansion phase, correlations between risky credit and government bonds move from negative to positive, driven by a decline in the credit risk[1] component of corporate fixed income relative to its rate duration risk, or term premium risk, explained by the performance of sovereign bonds (**Figure 4**).

Investment Positioning

We believe the macro backdrop remains supportive for equity and credit premia, cyclical factors, and risk assets more broadly. We maintain a **higher risk posture** than our benchmark in the Global Tactical Asset Allocation model[2], sourced through an overweight exposure to equities and credit at the expense of government bonds. As the economy moves to an expansion phase, we expect **equities to benefit from improving earnings and to take the lead in terms of total return potential** as spreads on lower-quality, risky credit have compressed below historical averages. This is consistent with historical cycles. In particular:

- Within **equities** we continue to favor emerging markets and developed markets outside the US, driven by improving risk appetite, attractive valuations and a supportive global cycle. We continue to foresee a weakening US dollar trend, historically supportive for emerging markets via capital inflows and easing of financial conditions. We remain tilted in favor of (small) size, value and momentum factors. Despite the typically negative correlation between momentum and the former two factors, we expect the transient nature of momentum to gradually shift towards a more balanced composition, less-dominated by mega-cap, quality stocks, and reflecting the recent outperformance in smaller capitalization, value-oriented equities.

- In **fixed income,** we remain constructive on risky credit despite the compression in spreads. While the total return potential on credit assets has clearly diminished given lower yields, as the cycle moves from recovery to expansion financial markets volatility tends to decline, turning the investment case for credit from capital appreciation (i.e. spread compression) to income generation. We are overweight US high yield, bank loans and emerging markets debt, local and hard currency, at the expense of investment grade corporate credit and government bonds. We favor US Treasuries over other developed government bond markets. Overall, we are overweight credit risk and underweight duration versus the benchmark, expecting yields to rise and the curve to steepen in an orderly fashion, in a manner similar to what we've seen in the past six months.

- In **currency markets** we maintain an overweight exposure to foreign currencies, positioning for long-term US dollar depreciation. Within developed markets we favor the Euro, the Canadian dollar, Singapore dollar and the Norwegian kroner, while we underweight the British pound, Swiss franc and Australian dollar. In emerging markets, we favor the Indian rupee, Indonesian rupiah, Russian ruble and Colombian peso. We expect the EM FX carry trade to play "catch-up" sometime in 2021, having lagged in performance compared to most recovery trades in 2020.

1 Credit risk defined as DTS (duration times spread).
2 Global 60/40 benchmark (60% MSCI ACWI / 40% Bloomberg Barclays Global Agg USD Hedged).

Figure 4: In an expansion, volatility has declined across assets, while correlations between risky credit and government bonds have become positive

Volatility across asset classes by regime

- Equities
- High yield
- bank loans
- Investment grade
- Gov't bonds

Correlations between risky credit and government bonds by regime

- High yield vs Gov't bonds
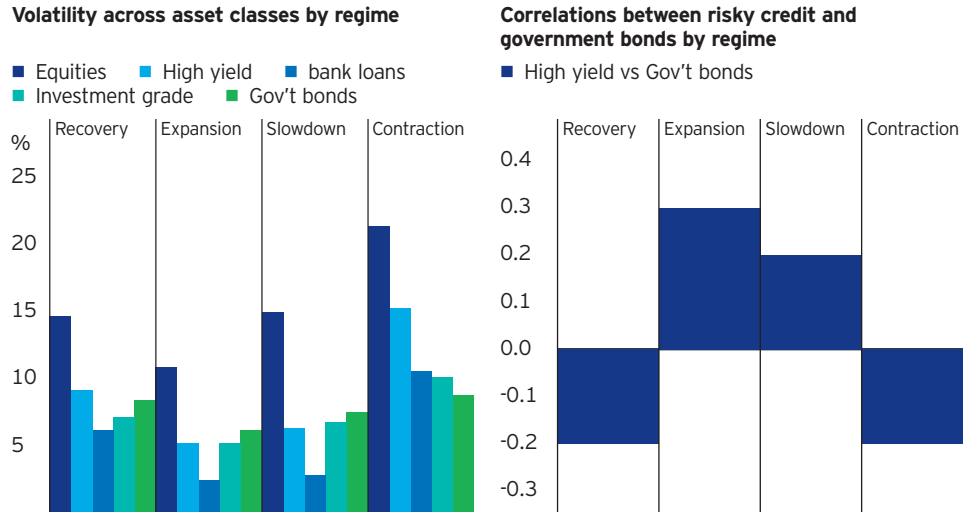
Source: Invesco Investment Solutions' proprietary global business cycle framework and Bloomberg L.P. Index return information includes back-tested data. Returns, whether actual or back-tested, are no guarantee of future performance. Annualized monthly returns of the defined risk premia from January 1973 – December 2020, or since asset class inception if at later date. Asset classes excess returns defined as follows: Equities = MSCI ACWI - US T-bills 3-Month, High Yield = Bloomberg Barclays HY - US T-bills 3-Month, Bank loans = Credit Suisse Leveraged Loan Index - US T-bills 3-Month, Investment Grade = Bloomberg Barclays US Corporate - US T-bills 3-Month, Government bonds = US Treasuries 7-10y - US T-bills 3-Month. For illustrative purposes only.

Figure 5: Expansion results in a shift towards equities and a reduced overweight to cyclicals and credit
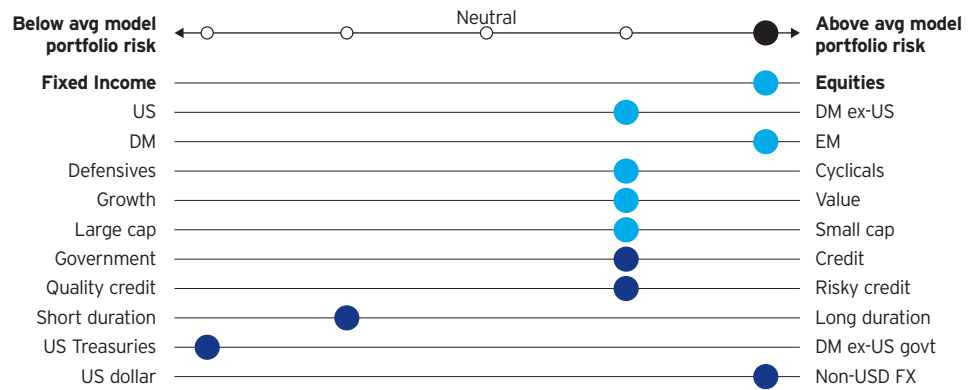
Source: Invesco Investment Solutions, Jan. 31, 2021. For illustrative purposes only.

Global Market Outlook

Kristina Hooper
Chief Global Market Strategist

Arnab Das
Global Market Strategist - EMEA

Brian Levitt
Global Market Strategist - North America

Revisiting Growth, Inflation, Public Health, Fiscal and Monetary Policies, and Markets

The global market outlook continues to depend on the pandemic and associated policies, especially vaccine rollouts, lockdowns, and monetary and fiscal support. Tactical and strategic asset allocators face opposing market forces – almost a tug of war between "risk-off" and "risk-on" even as major structural changes contribute to differentiated performance across economies and sectors.

On the downside are arrayed near-term double-dip contractionary pressures as the virus resurges in the West and Emerging Markets (EM), mostly outside Asia, with lockdowns intensifying especially in Europe, and the associated risks of further damage to potential growth in the longer-term. On the upside lie hopes of fuller and more durable economic re-opening as herd immunity is achieved via widespread vaccination, boosted by monetary and fiscal policy support; the US Federal Reserve's reframing of monetary policy. Further there are structural forces that are re-shaping the global economy and markets; technological disruption; Environmental/Social/Governance issues; geo-economics and geopolitics.

The Q4-2020 "reflation rotation" (into COVID-hit market segments and regions including Value, Cyclicals, the EU, UK and EM, from COVID winners including China, the US, Growth and Technology) has paused as new, more infectious strains of the virus contributed to new waves of the pandemic in the UK, South Africa and Brazil. Some of these strains have also been identified in the US and EU, raising short-term risks to public health and, by extension, to global growth. On top of this, hard-hit EU economies are suffering logistical and availability constraints that now seem likely to delay vaccination and herd immunity by a few months, raising the risk of both delayed recovery and increased damage to trend growth.

Even so, we expect last year's reflation hopes and portfolio rebalancing to resume albeit in stages rather than all at once, based on the sequencing of vaccination and re-opening geographically and by sector. Economic normalization is increasingly likely to be differentiated by variations in vaccination progress across countries. Asia most notably, and the EU managed the first wave of the pandemic effectively, but now lag the US and UK in vaccination rates. Rapid vaccination progress in the UK and US suggests that herd immunity thresholds could be achieved by H1-2020. We expect vaccination programs to get back on track in the EU in Q1-2 and vaccination progress to catch up to the UK and US by H2, and in emerging markets during 2021-2022.

Figure 6: US and UK may be 1-2 quarters from herd immunity; the EU some 2-3 quarters, and EM 4-5
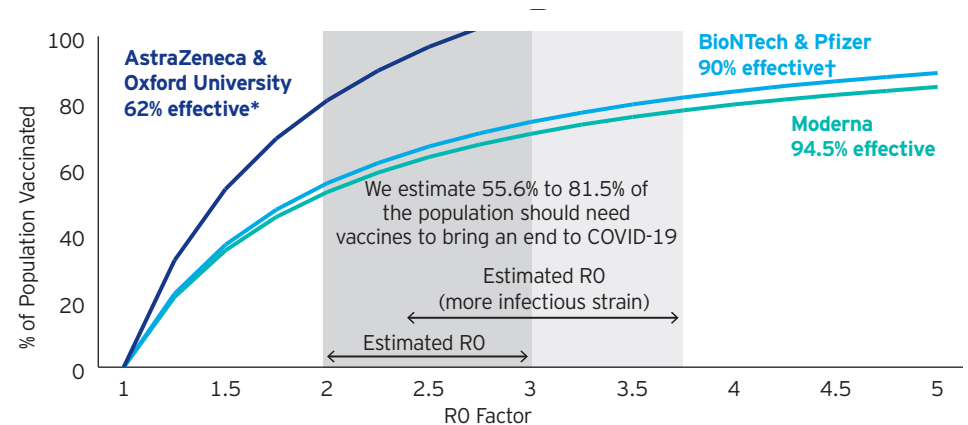
Note: * With one dose; using 1.5 doses increases effectiveness to 90%. † also includes the vaccine from AstraZeneca & Oxford University, using 1.5 doses. Here, "Herd Immunity" is the theoretical level of vaccination that yields an R0 of 1.0. Higher vaccination rates should yield an R0 below 1.0, which should gradually reduce viral presence, tending towards viral extinction. "Herd Immunity"= (1-(1/R0))/Effectiveness.

Source: New York Times, The Lancet "Estimating the COVID-19 R number: a bargain with the devil?", Imperial College of London "Transmission of SARS-CoV-2 Lineage B.1.1.7 in England", Invesco, as of Jan. 7, 2021.

A more protracted global vaccination period than previously expected points to both a more delayed and staggered re-opening sequence across the global economy, as well as across economic sectors, such as tourism, hospitality and leisure, and physical retail – particularly in the resumption of cross-border business travel and tourism. Indeed, high-frequency growth and activity data trackers already point to major variations in economic growth across major economies in Q4-2020, reflecting re-opening rebounds vs. double-dips driven by the resumption of lockdowns.

In the near term, we expect monetary and fiscal policy to continue to be highly supportive of economic recovery, especially in the United States, United Kingdom and Eurozone. Indeed, the advent of new virus strains and further lockdowns strengthens the case for further monetary and fiscal support. The US Federal Reserve's new monetary policy framework, "Flexible Average Inflation Targeting", should also support US and global economic recovery through a more gradual monetary policy normalization and a weaker dollar than under its previous policy framework, in our view. The Fed's preferred measure of Discretionary Core Personal Consumption (PCE) inflation has come in below target for more than 15 of the last 25 years. The Fed's new approach shifts from fully focusing on current and expected inflation with no direct role for past inflation, to some emphasis on past inflation overshoots or undershoots.

The Fed's new approach reflects a desire to prevent inflation and inflation expectations falling too far, even if that requires allowing significantly lower unemployment, lower interest rates and a larger balance sheet than in its previous framework. In contrast, other major central banks have a single-mandate – headline inflation. As a direct result, rising inflation or inflation expectations would require normalizing policy sooner and more fully than the Fed, despite risks to growth or financial conditions. This difference implies both a weaker dollar against other major currencies and easier US and global financial conditions than otherwise, which should in turn support EM recovery, given their heavy exposure to dollar-priced commodity trade and international dollar funding. This new policy should also reduce the probability of a premature or pre-emptive policy tightening, and thus the risk of another "Taper Tantrum" in which both government bonds and risk assets suffer losses.

Beyond the post-pandemic reopening rebound, economic recovery and longer-term trend growth is likely to be differentiated across economies by the shift from maximizing overall GDP growth and, by extension, maximizing financial returns, to more specific policy goals of Environmental, Social and Governance concerns. This shift of emphasis is most clearly visible in the United States, but also remains prominent in other major economies, with emphasis on policies aimed at addressing climate change and inequality through a better-balanced distribution of income, wealth, and opportunity. The advent of policies aiming beyond the macro considerations of maximizing potential growth at full employment with low inflation is shifting the focus of portfolios to the wide range of ESG-related risk-return trade-offs. As such, the case for selective diversification across regions, countries, asset classes and sectors continues to grow in importance, compared to the long-term concentration strategies and tactical risk-on or risk-off portfolio rebalancing that have performed well over the last decade.

2021
Capital Market
Assumptions -
Q1 Update

Figure 7: 10-year asset class expectations (GBP)
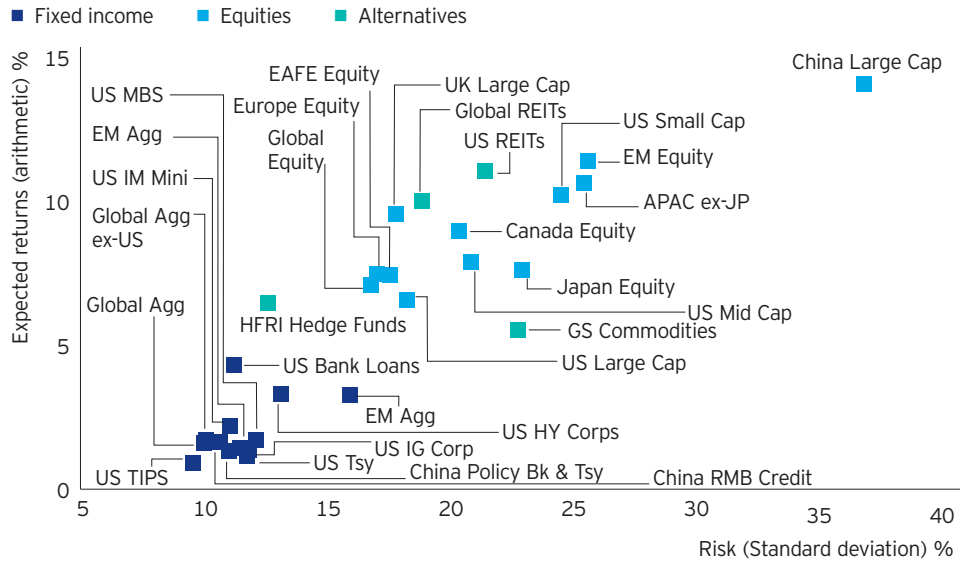
■ Fixed income ■ Equities ■ Alternatives

Source: Invesco, estimates as of Dec. 31, 2020. Proxies listed in **Figure 13**. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 14 for information about our CMA methodology. These estimates reflect the views of Invesco Investment Solutions, the views of other investment teams at Invesco may differ from those presented here. **Performance, whether actual or simulated, does not guarantee future results.**

Figure 8: CMA difference: 5-year minus 10-year assumptions (GBP)

■ Fixed income ■ Equities ■ Alternatives

Source: Invesco, estimates as of Dec. 31, 2020. Proxies listed in **Figure 13**. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 14 for information about our CMA methodology. These estimates reflect the views of Invesco Investment Solutions, the views of other investment teams at Invesco may differ from those presented here. **Performance, whether actual or simulated, does not guarantee future results.**

Figure 9: Equity year-over-year change (GBP)

■ Expected Return
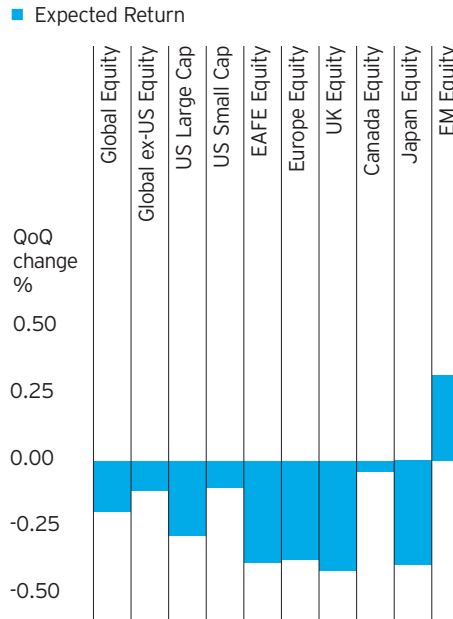
Figure 10: Fixed income year-over-year change (GBP)
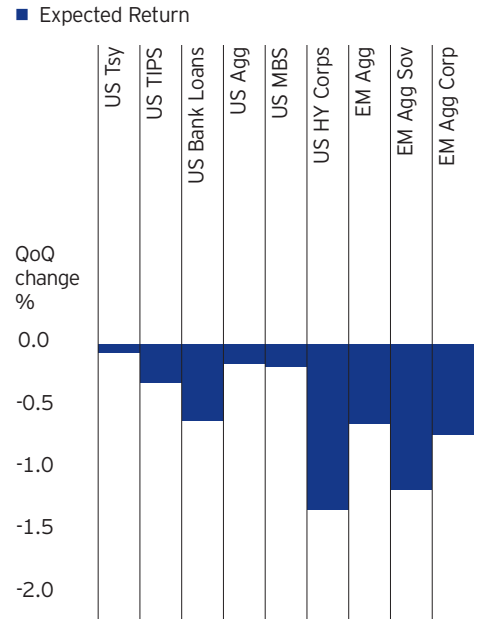
■ Expected Return

Source: Invesco, estimates as of Dec. 31, 2020. Proxies listed in **Figure 13**. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 14 for information about our CMA methodology. These estimates reflect the views of Invesco Investment Solutions, the views of other investment teams at Invesco may differ from those presented here. **Performance, whether actual or simulated, does not guarantee future results.**

Figure 11: Equity year-over-year change attribution (GBP)

■ Dividend Yield
■ Buyback Yield
■ LT Earnings Growth
■ Valuation Change
■ Currency Adj. (IRP)
■ Expected Inflation
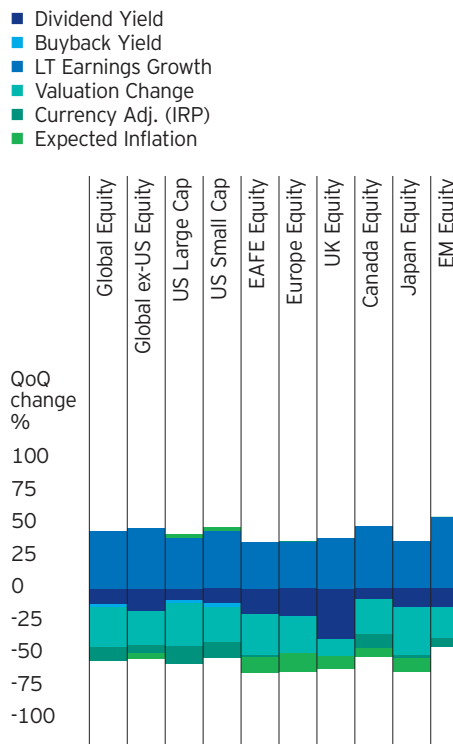
Figure 12: Fixed income year-over-year change attribution (GBP)
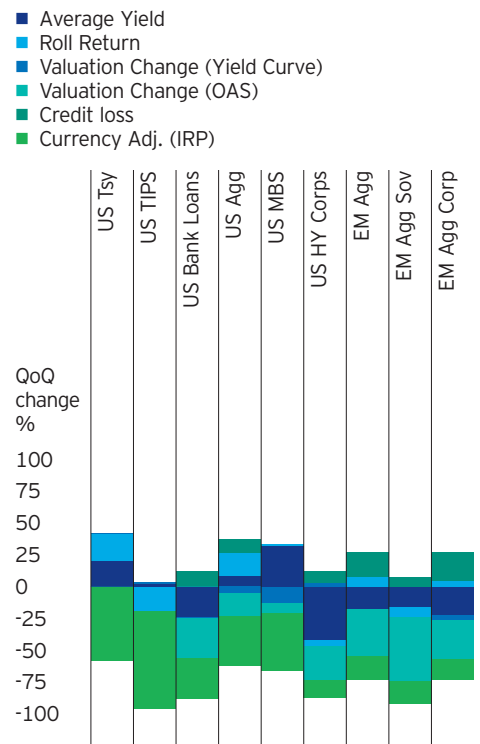
■ Average Yield
■ Roll Return
■ Valuation Change (Yield Curve)
■ Valuation Change (OAS)
■ Credit loss
■ Currency Adj. (IRP)

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Figure 13: 10-year asset class expected returns, risk, and return-to-risk (GBP)

	Asset class	Index	Expected geometric return %	Expected arithmetic return %	Expected risk %	Arithmetic return to risk ratio
Fixed income	US Tsy Short	BBG BARC US Tsy Short	-0.2	0.3	10.0	0.03
	US Tsy IM	BBG BARC US Tsy IM	0.0	0.6	11.1	0.05
	US Tsy Long	BBG BARC US Tsy Long	0.1	1.3	15.8	0.08
	US TIPS	BBG BARC US TIPS	0.4	0.8	9.5	0.08
	US Bank Loans	CSFB Leverage Loan	3.6	4.2	11.1	0.38
	US Agg	BBG BARC US Agg	0.7	1.3	11.4	0.12
	US IG Corp	BBG BARC US IG	0.6	1.3	11.8	0.11
	US MBS	BBG BARC US MBS	0.9	1.6	12.0	0.13
	US Preferred Stocks	BOA ML Fixed Rate Pref Securities	2.0	3.1	15.2	0.20
	US HY Corps	BBG BARC US HY	2.4	3.2	13.1	0.24
	US IM Muni	BOA ML US Muni (3-15 Y)	1.5	2.1	11.0	0.19
	US HY Muni	BBG BARC Muni Bond HY	1.6	2.5	14.3	0.18
	Global Agg	BBG BARC Global Agg	1.0	1.5	10.0	0.15
	Global Agg ex-US	BBG BARC Global Agg ex-US	1.1	1.6	10.0	0.16
	Global Tsy	BBG BARC Global Tsy	0.8	1.4	11.2	0.13
	Global Sov	BBG BARC Global Sov	0.6	1.0	9.4	0.11
	Global Corp	BBG BARC Global Corp	1.0	1.4	8.7	0.16
	Global IG	BBG BARC Global Corp IG	0.8	1.1	8.6	0.13
	Eurozone Corp	BBG BARC Euro Agg Credit Corp	0.8	1.2	9.1	0.13
	Eurozone Tsy	BBG BARC Euro Agg Gov Tsy	0.7	1.2	10.5	0.12
	Asian Dollar IG	BOA ML AC IG	1.3	2.1	13.2	0.16
	Asian Dollar HY	BOA ML AC HY	5.2	6.7	17.7	0.38
	EM Agg	BBG BARC EM Agg	2.0	3.2	15.9	0.20
	EM Agg IG	BBG BARC EM USD Agg IG	0.9	1.7	12.9	0.13
	China Policy Bk & Tsy	BBG BARC China PB Tsy TR	0.6	1.2	11.0	0.11
	China RMB Credit	BBG BARC China Corporate	1.0	1.5	10.6	0.14
Equities	Global Equity	MSCI ACWI	5.7	7.0	16.7	0.42
	Global ex-US Equity	MSCI ACWI ex-US	6.8	8.2	17.7	0.46
	US Broad Market	Russell 3000	5.1	6.8	18.9	0.36
	US Large Cap	S&P 500	4.9	6.4	18.2	0.35
	US Mid Cap	Russell Midcap	5.8	7.8	20.8	0.37
	US Small Cap	Russell 2000	7.5	10.1	24.5	0.41
	EAFE Equity	MSCI EAFE	5.9	7.3	17.5	0.42
	Europe Equity	MSCI Europe	6.0	7.3	17.0	0.43
	Eurozone Equity	MSCI Euro ex-UK	5.5	7.0	18.5	0.38
	UK Large Cap	FTSE 100	8.0	9.4	17.7	0.53
	UK Small Cap	FTSE Small Cap UK	9.4	11.7	23.0	0.51
	Canada Equity	S&P TSX	7.0	8.9	20.3	0.44
	Japan Equity	MSCI JP	5.1	7.5	22.9	0.33
	EM Equity	MSCI EM	8.4	11.3	25.6	0.44
	APAC ex-JP	MSCI APXJ	7.7	10.5	25.4	0.41
	China Large Cap	CSI 300	8.4	13.9	36.8	0.38
Alternatives	US REITs	FTSE NAREIT Equity	8.9	10.9	21.4	0.51
	Global REITs	FTSE EPRA/NAREIT Developed	8.3	9.9	18.8	0.53
	HFRI Hedge Funds	HFRI HF	5.6	6.4	12.5	0.51
	GS Commodities	S&P GSCI	3.1	5.4	22.7	0.24
	Agriculture	S&P GSCI Agriculture	-1.2	1.1	22.0	0.05
	Energy	S&P GSCI Energy	5.3	10.7	36.1	0.30
	Industrial Metals	S&P GSCI Industrial Metals	2.9	5.1	21.9	0.23
	Precious Metals	S&P GSCI Precious Metals	1.3	3.0	18.9	0.16

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Figure 14: 10-year correlations (GBP)

Legend:
- Greater than 0.70
- 0.30 to 0.70
- Less than 0.30

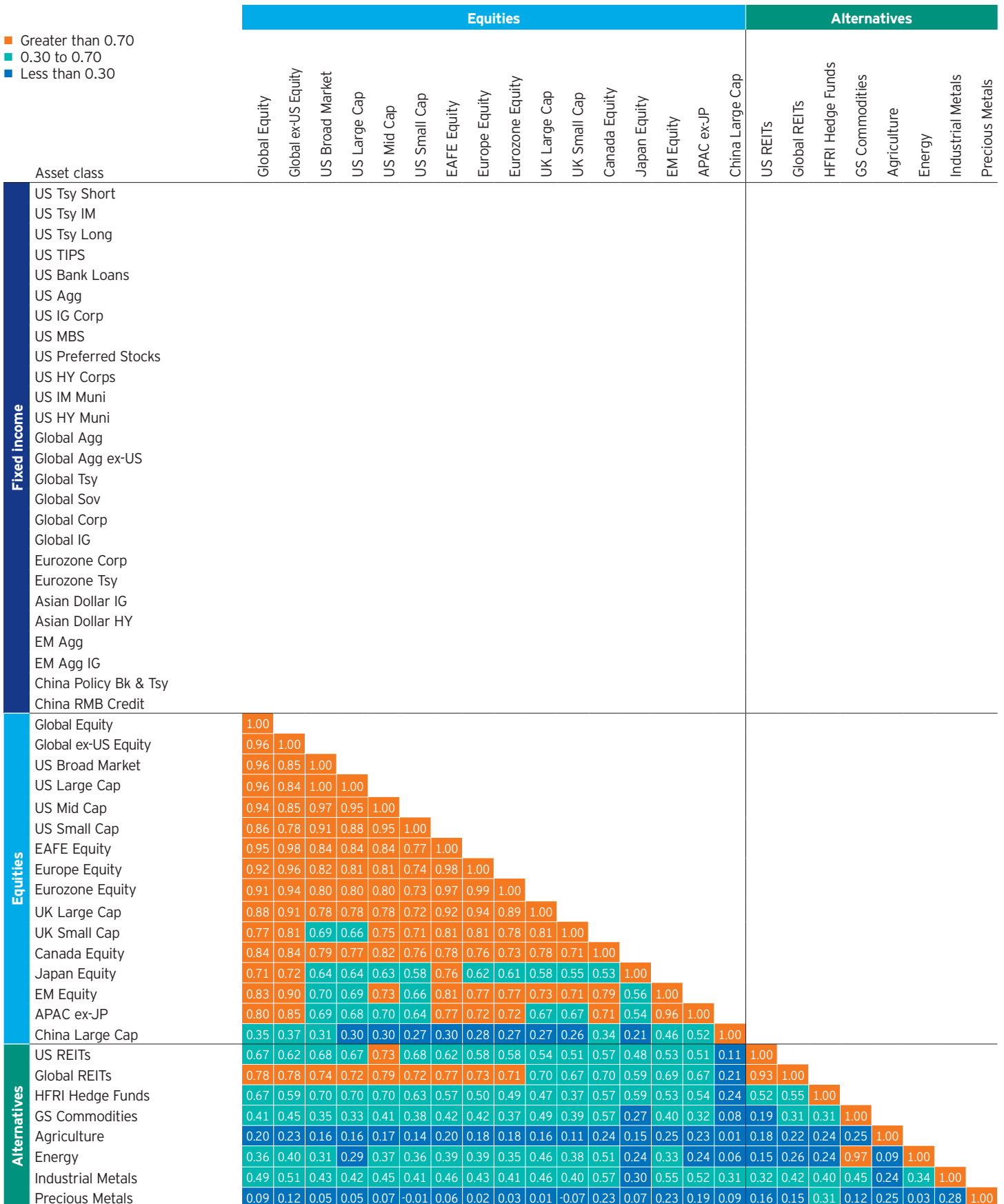| Asset class	US Tsy Short	US Tsy IM	US Tsy Long	US TIPS	US Bank Loans	US Agg	US IG Corp	US MBS	US Preferred Stocks	US HY Corps	US IM Muni	US HY Muni	Global Agg	Global Agg ex-US	Global Tsy	Global Sov	Global Corp	Global IG	Eurozone Corp	Eurozone Tsy	Asian Dollar IG	Asian Dollar HY	EM Agg	EM Agg IG	China Policy Bk & Tsy	China RMB Credit
US Tsy Short	1.00																									
US Tsy IM	0.96	1.00																								
US Tsy Long	0.74	0.86	1.00																							
US TIPS	0.83	0.90	0.86	1.00																						
US Bank Loans	0.69	0.60	0.39	0.66	1.00																					
US Agg	0.94	0.98	0.89	0.94	0.67	1.00																				
US IG Corp	0.81	0.85	0.81	0.90	0.76	0.93	1.00																			
US MBS	0.97	0.99	0.84	0.90	0.65	0.98	0.86	1.00																		
US Preferred Stocks	0.52	0.52	0.45	0.57	0.54	0.58	0.68	0.53	1.00																	
US HY Corps	0.52	0.46	0.33	0.60	0.86	0.57	0.74	0.52	0.62	1.00																
US IM Muni	0.92	0.94	0.81	0.89	0.72	0.96	0.90	0.94	0.60	0.60	1.00															
US HY Muni	0.73	0.72	0.62	0.76	0.81	0.77	0.80	0.74	0.51	0.69	0.85	1.00														
Global Agg	0.82	0.90	0.85	0.90	0.58	0.93	0.89	0.89	0.60	0.56	0.88	0.71	1.00													
Global Agg ex-US	0.64	0.73	0.73	0.77	0.44	0.76	0.77	0.71	0.54	0.48	0.73	0.59	0.95	1.00												
Global Tsy	0.77	0.86	0.85	0.86	0.48	0.88	0.83	0.84	0.55	0.46	0.83	0.65	0.99	0.97	1.00											
Global Sov	0.73	0.80	0.76	0.87	0.67	0.86	0.91	0.80	0.60	0.70	0.85	0.77	0.93	0.87	0.88	1.00										
Global Corp	0.71	0.77	0.74	0.86	0.71	0.86	0.96	0.78	0.69	0.74	0.83	0.75	0.92	0.87	0.87	0.95	1.00									
Global IG	0.70	0.75	0.74	0.85	0.71	0.84	0.96	0.77	0.69	0.75	0.82	0.75	0.90	0.85	0.84	0.94	1.00	1.00								
Eurozone Corp	0.30	0.36	0.37	0.49	0.35	0.44	0.56	0.36	0.47	0.50	0.42	0.39	0.68	0.81	0.67	0.74	0.76	0.77	1.00							
Eurozone Tsy	0.44	0.53	0.56	0.58	0.28	0.57	0.59	0.51	0.41	0.38	0.53	0.43	0.79	0.88	0.80	0.78	0.75	0.75	0.92	1.00						
Asian Dollar IG	0.85	0.88	0.81	0.93	0.77	0.94	0.95	0.90	0.58	0.70	0.91	0.83	0.88	0.74	0.82	0.91	0.90	0.90	0.52	0.59	1.00					
Asian Dollar HY	0.35	0.33	0.25	0.53	0.74	0.45	0.64	0.39	0.42	0.81	0.46	0.59	0.46	0.40	0.36	0.64	0.68	0.69	0.51	0.35	0.68	1.00				
EM Agg	0.60	0.61	0.55	0.75	0.76	0.71	0.84	0.66	0.56	0.84	0.72	0.76	0.73	0.66	0.65	0.87	0.86	0.86	0.62	0.57	0.85	0.83	1.00			
EM Agg IG	0.72	0.76	0.72	0.87	0.75	0.85	0.93	0.79	0.62	0.80	0.83	0.79	0.85	0.75	0.78	0.95	0.92	0.93	0.63	0.63	0.94	0.76	0.95	1.00		
China Policy Bk & Tsy	0.90	0.89	0.71	0.78	0.59	0.87	0.75	0.89	0.50	0.46	0.85	0.65	0.80	0.67	0.77	0.68	0.68	0.67	0.35	0.48	0.77	0.32	0.57	0.66	1.00	
China RMB Credit	0.91	0.89	0.69	0.79	0.62	0.87	0.76	0.90	0.50	0.49	0.86	0.67	0.80	0.67	0.77	0.70	0.69	0.68	0.36	0.49	0.79	0.35	0.59	0.68	0.98	1.00
Global Equity	0.06	-0.02	-0.10	0.13	0.45	0.07	0.28	0.03	0.41	0.64	0.09	0.21	0.15	0.20	0.08	0.33	0.38	0.39	0.44	0.24	0.22	0.59	0.52	0.40	0.05	0.06
Global ex-US Equity	-0.05	-0.11	-0.15	0.06	0.36	-0.01	0.22	-0.05	0.36	0.59	0.02	0.16	0.12	0.20	0.05	0.30	0.35	0.35	0.48	0.27	0.15	0.57	0.50	0.36	-0.03	-0.01
US Broad Market	0.15	0.06	-0.05	0.18	0.51	0.15	0.32	0.12	0.43	0.66	0.16	0.26	0.18	0.17	0.09	0.34	0.38	0.38	0.35	0.18	0.26	0.56	0.51	0.41	0.13	0.14
US Large Cap	0.17	0.09	-0.03	0.19	0.51	0.16	0.33	0.14	0.44	0.65	0.18	0.27	0.20	0.19	0.12	0.35	0.39	0.39	0.36	0.20	0.27	0.55	0.51	0.42	0.15	0.16
US Mid Cap	0.10	0.01	-0.08	0.16	0.54	0.11	0.32	0.07	0.43	0.69	0.14	0.26	0.15	0.16	0.07	0.33	0.38	0.39	0.36	0.18	0.25	0.61	0.52	0.41	0.09	0.11
US Small Cap	0.05	-0.05	-0.16	0.07	0.45	0.03	0.21	0.00	0.35	0.59	0.06	0.16	0.06	0.07	-0.02	0.21	0.26	0.27	0.26	0.08	0.15	0.50	0.41	0.29	0.04	0.06
EAFE Equity	-0.03	-0.09	-0.14	0.05	0.35	0.00	0.21	-0.04	0.36	0.57	0.03	0.15	0.11	0.18	0.05	0.29	0.33	0.34	0.46	0.27	0.14	0.53	0.47	0.34	-0.03	-0.02
Europe Equity	-0.10	-0.16	-0.20	-0.02	0.28	-0.07	0.14	-0.11	0.30	0.51	-0.03	0.10	0.05	0.13	-0.01	0.24	0.27	0.28	0.45	0.25	0.07	0.47	0.41	0.28	-0.10	-0.10
Eurozone Equity	-0.08	-0.14	-0.18	-0.01	0.27	-0.05	0.15	-0.09	0.30	0.51	-0.03	0.09	0.07	0.16	0.02	0.26	0.29	0.30	0.48	0.30	0.08	0.47	0.42	0.29	-0.09	-0.08
UK Large Cap	-0.13	-0.20	-0.25	-0.06	0.29	-0.11	0.10	-0.14	0.26	0.47	-0.06	0.10	-0.02	0.04	-0.09	0.15	0.21	0.22	0.33	0.12	0.03	0.45	0.37	0.22	-0.12	-0.12
UK Small Cap	-0.29	-0.36	-0.36	-0.19	0.25	-0.25	0.00	-0.30	0.18	0.45	-0.20	0.01	-0.18	-0.10	-0.23	0.00	0.09	0.10	0.21	-0.03	-0.09	0.44	0.26	0.09	-0.29	-0.28
Canada Equity	-0.05	-0.11	-0.15	0.09	0.40	-0.01	0.22	-0.06	0.32	0.57	0.02	0.18	0.09	0.15	0.02	0.26	0.32	0.32	0.38	0.17	0.15	0.57	0.47	0.33	-0.06	-0.04
Japan Equity	0.19	0.14	0.05	0.23	0.41	0.20	0.32	0.18	0.40	0.51	0.21	0.22	0.23	0.22	0.17	0.33	0.36	0.36	0.30	0.20	0.28	0.43	0.45	0.37	0.20	0.22
EM Equity	-0.06	-0.10	-0.13	0.08	0.31	-0.01	0.20	-0.05	0.31	0.55	0.00	0.14	0.12	0.21	0.07	0.29	0.32	0.33	0.45	0.26	0.15	0.58	0.49	0.36	-0.01	0.00
APAC ex-JP	-0.01	-0.05	-0.08	0.11	0.31	0.04	0.23	-0.01	0.34	0.54	0.04	0.16	0.14	0.20	0.08	0.29	0.33	0.34	0.42	0.24	0.19	0.57	0.46	0.35	0.04	0.05
China Large Cap	-0.06	-0.09	-0.10	-0.02	0.09	-0.05	0.05	-0.06	0.05	0.18	-0.05	0.03	-0.03	-0.01	-0.06	0.06	0.08	0.09	0.13	0.05	0.05	0.25	0.16	0.10	0.00	-0.01
US REITs	0.18	0.17	0.19	0.32	0.50	0.27	0.43	0.20	0.49	0.65	0.27	0.37	0.33	0.34	0.28	0.47	0.49	0.50	0.42	0.32	0.39	0.58	0.56	0.52	0.18	0.17
Global REITs	0.06	0.05	0.09	0.25	0.47	0.17	0.39	0.09	0.48	0.65	0.19	0.34	0.27	0.32	0.22	0.44	0.48	0.49	0.48	0.33	0.32	0.63	0.57	0.49	0.09	0.08
HFRI Hedge Funds	0.71	0.62	0.42	0.67	0.85	0.69	0.77	0.67	0.63	0.83	0.71	0.73	0.65	0.54	0.55	0.72	0.76	0.76	0.47	0.40	0.74	0.69	0.78	0.77	0.66	0.68
GS Commodities	-0.11	-0.17	-0.26	-0.02	0.27	-0.13	0.01	-0.15	0.08	0.30	-0.06	0.14	-0.05	0.02	-0.08	0.10	0.09	0.09	0.22	0.07	0.01	0.31	0.22	0.11	-0.15	-0.10
Agriculture	0.15	0.16	0.07	0.20	0.16	0.16	0.19	0.16	0.22	0.23	0.16	0.14	0.25	0.29	0.25	0.26	0.25	0.24	0.28	0.21	0.25	0.25	0.26	0.25	0.16	0.16
Energy	-0.17	-0.23	-0.30	-0.09	0.23	-0.19	-0.05	-0.21	0.00	0.25	-0.10	0.11	-0.12	-0.06	-0.16	0.04	0.02	0.02	0.15	0.00	-0.06	0.24	0.16	0.05	-0.22	-0.17
Industrial Metals	0.05	0.00	-0.10	0.11	0.29	0.03	0.13	0.02	0.18	0.36	0.04	0.18	0.13	0.19	0.10	0.21	0.23	0.22	0.33	0.21	0.15	0.41	0.31	0.21	0.06	0.08
Precious Metals	0.28	0.36	0.40	0.47	0.19	0.38	0.40	0.35	0.16	0.24	0.34	0.30	0.51	0.55	0.52	0.48	0.46	0.44	0.41	0.43	0.42	0.32	0.43	0.44	0.28	0.29

Source: Invesco, estimates as of Dec. 31, 2020. Proxies listed in **Figure 13**. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 14 for information about our CMA methodology. These estimates reflect the views of Invesco Investment Solutions, the views of other investment teams at Invesco may differ from those presented here.

Figure 14: 10-year correlations (GBP)

Legend:
- Greater than 0.70
- 0.30 to 0.70
- Less than 0.30

Asset class	Global Equity	Global ex-US Equity	US Broad Market	US Large Cap	US Mid Cap	US Small Cap	EAFE Equity	Europe Equity	Eurozone Equity	UK Large Cap	UK Small Cap	Canada Equity	Japan Equity	EM Equity	APAC ex-JP	China Large Cap	US REITs	Global REITs	HFRI Hedge Funds	GS Commodities	Agriculture	Energy	Industrial Metals	Precious Metals
Fixed income																								
US Tsy Short																								
US Tsy IM																								
US Tsy Long																								
US TIPS																								
US Bank Loans																								
US Agg																								
US IG Corp																								
US MBS																								
US Preferred Stocks																								
US HY Corps																								
US IM Muni																								
US HY Muni																								
Global Agg																								
Global Agg ex-US																								
Global Tsy																								
Global Sov																								
Global Corp																								
Global IG																								
Eurozone Corp																								
Eurozone Tsy																								
Asian Dollar IG																								
Asian Dollar HY																								
EM Agg																								
EM Agg IG																								
China Policy Bk & Tsy																								
China RMB Credit																								
Equities																								
Global Equity	1.00																							
Global ex-US Equity	0.96	1.00																						
US Broad Market	0.96	0.85	1.00																					
US Large Cap	0.96	0.84	1.00	1.00																				
US Mid Cap	0.94	0.85	0.97	0.95	1.00																			
US Small Cap	0.86	0.78	0.91	0.88	0.95	1.00																		
EAFE Equity	0.95	0.98	0.84	0.84	0.84	0.77	1.00																	
Europe Equity	0.92	0.96	0.82	0.81	0.81	0.74	0.98	1.00																
Eurozone Equity	0.91	0.94	0.80	0.80	0.80	0.73	0.97	0.99	1.00															
UK Large Cap	0.88	0.91	0.78	0.78	0.78	0.72	0.92	0.94	0.89	1.00														
UK Small Cap	0.77	0.81	0.69	0.66	0.75	0.71	0.81	0.81	0.78	0.81	1.00													
Canada Equity	0.84	0.84	0.79	0.77	0.82	0.76	0.78	0.76	0.73	0.78	0.71	1.00												
Japan Equity	0.71	0.72	0.64	0.64	0.63	0.58	0.76	0.62	0.61	0.58	0.55	0.53	1.00											
EM Equity	0.83	0.90	0.70	0.69	0.73	0.66	0.81	0.77	0.77	0.73	0.71	0.79	0.56	1.00										
APAC ex-JP	0.80	0.85	0.69	0.68	0.70	0.64	0.77	0.72	0.72	0.67	0.67	0.71	0.54	0.96	1.00									
China Large Cap	0.35	0.37	0.31	0.30	0.30	0.27	0.30	0.28	0.27	0.27	0.26	0.34	0.21	0.46	0.52	1.00								
Alternatives																								
US REITs	0.67	0.62	0.68	0.67	0.73	0.68	0.62	0.58	0.58	0.54	0.51	0.57	0.48	0.53	0.51	0.11	1.00							
Global REITs	0.78	0.78	0.74	0.72	0.79	0.72	0.77	0.73	0.71	0.70	0.67	0.70	0.59	0.69	0.67	0.21	0.93	1.00						
HFRI Hedge Funds	0.67	0.59	0.70	0.70	0.70	0.63	0.57	0.50	0.49	0.47	0.37	0.57	0.59	0.53	0.54	0.24	0.52	0.55	1.00					
GS Commodities	0.41	0.45	0.35	0.33	0.41	0.38	0.42	0.42	0.37	0.49	0.39	0.57	0.27	0.40	0.32	0.08	0.19	0.31	0.31	1.00				
Agriculture	0.20	0.23	0.16	0.16	0.17	0.14	0.20	0.18	0.18	0.16	0.11	0.24	0.15	0.25	0.23	0.01	0.18	0.22	0.24	0.25	1.00			
Energy	0.36	0.40	0.31	0.29	0.37	0.36	0.39	0.39	0.35	0.46	0.38	0.51	0.24	0.33	0.24	0.06	0.15	0.26	0.24	0.97	0.09	1.00		
Industrial Metals	0.49	0.51	0.43	0.42	0.45	0.41	0.46	0.43	0.41	0.46	0.40	0.57	0.30	0.55	0.52	0.31	0.32	0.42	0.40	0.45	0.24	0.34	1.00	
Precious Metals	0.09	0.12	0.05	0.05	0.07	-0.01	0.06	0.02	0.03	0.01	-0.07	0.23	0.07	0.23	0.19	0.09	0.16	0.15	0.31	0.12	0.25	0.03	0.28	1.00

Source: Invesco, estimates as of Dec. 31, 2020. Proxies listed in **Figure 13**. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 14 for information about our CMA methodology. These estimates reflect the views of Invesco Investment 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 14). 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 assumption methodology whitepaper for more detail.

Figure 15: Our building block approach to estimating returns
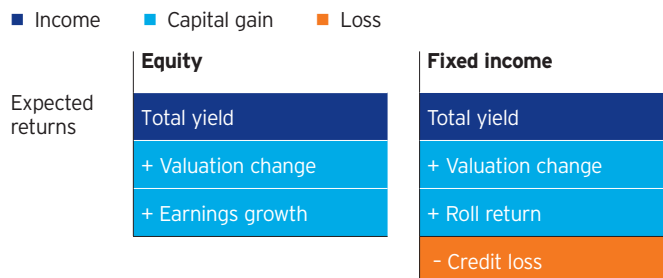
For illustrative purposes only.

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 in the growth of earning 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 rate of returns on deposits in different currencies because any excess return on deposits will be offset by changes in the relative value of currencies.

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 normalise 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 optimisation 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 optimisation 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 Investment Solutions is an experienced multi-asset team that seeks to deliver desired client outcomes using Invesco's global capabilities, scale and infrastructure. We partner with you to fully understand your goals and harness strategies across Invesco's global spectrum of active, passive, factor and alternative investments that address your unique needs. From robust research and analysis to bespoke investment solutions, our team brings insight and innovation to your portfolio construction process. Our approach starts with a complete understanding of your needs:
+ We help support better investment outcomes by delivering insightful and thorough analytics.
+ By putting analytics into practice, we develop investment approaches specific to your needs.
+ We work as an extension of your team to engage across functions and implement solutions.

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 Investment 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.

About the Invesco Global Market Strategist office

The GMS office is comprised of investment professionals based in different regions, with different areas of expertise. It provides data and commentary on global markets, offering insights into key trends and themes and their investment implications.

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 Investment 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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Further information is available using the contact details shown overleaf.

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