2021 Long-Term Capital Market Assumptions

Q2 Update

Invesco Investment Solutions | United States Dollar (USD)

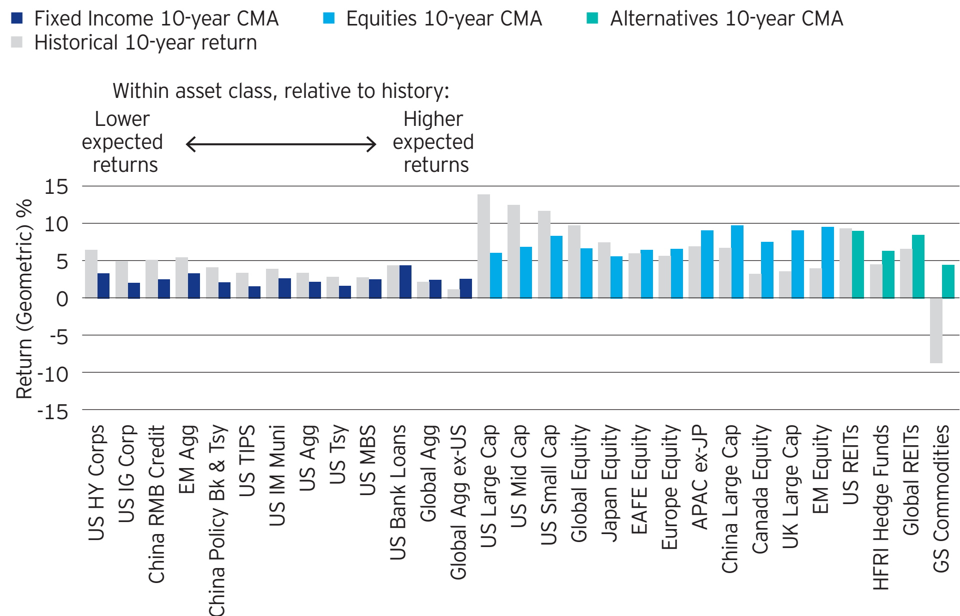
The document is intended only for Professional Clients in Continental Europe (as defined under Important Information); for Professional Clients in Dubai, Ireland, the Isle of Man, Jersey and Guernsey, and the UK; for Institutional Investors in Australia; for wholesale investors (as defined in the Financial Markets Conduct Act) in New Zealand, for Professional Investors in Hong Kong; for Qualified Institutional Investors in Japan; for Qualified Institutional Investors and/or certain specific institutional investors in Thailand, for certain specific institutional investors in Indonesia and for qualified buyers in Philippines for informational purposes only; for Institutional Investors and/or Accredited Investors in Singapore; for certain specific Qualified Institutions/Sophisticated Investors only in Taiwan and for Institutional Investors in the USA. The document is intended only for accredited investors as defined under National Instrument 45-106 in Canada. It is not intended for and should not be distributed to or relied upon by the public or retail investors.

Executive Summary

Duy Nguyen
CIO, Invesco Investment Solutions

+ **Strategic Perspective:** It was just a year ago that the pandemic drove the global economy into a recession, ending the longest bull market on record. As we have expressed in prior editions of this publication, the stimulus over the past year and current reopening of economies should be treated as unparalleled events in terms of magnitude when estimating the future behavior of any asset class. Presently, we believe the risks are skewed to the upside for most assets, given the trend in global growth, inflation, and earnings, and have adjusted our CMA methodology last year to account for rapid shifts in market expectations. While rising growth rates and yields have improved our CMAs, they are still broadly lower than history **(Figure 1)** with elevated levels of risk.
+ **Tactical View:** The global cycle continues to expand with growth above its long-term trend and expected to improve across both developed and emerging markets. Further, our global risk appetite framework suggests market sentiment continues to improve, signaling growth expectations continue to be revised to the upside. The macro environment of the past year has, by and large, evolved in line with historical cyclical patterns. As growth moves above trend and the economy enters an expansion phase, inflation begins to rise, which we view as a normal part of this cycle, and at this stage, does not imply a structurally higher inflation regime.
+ **Global Market Outlook:** Many parts of the globe are experiencing a resurgence in economic activity, benefiting from the distribution of effective vaccines, as well as significant fiscal and monetary stimulus. To address the breadth of possibilities that lie ahead in this environment, we have provided asset allocation and market rational for three scenarios; a base case (effective vaccine rollout and steady growth), and two other possible paths that explore what we believe to be the biggest risks facing the global economy and markets (high inflation and pandemic resurgence).

Figure 1: Expectations relative to historical average (USD)



Source: Invesco, estimates as of March 31, 2021. Proxies listed in **Figure 13**. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 15 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.

Executive Summary	02
Asset Allocation Insights	03
Global Market Outlook	08
2021 Capital Market Assumptions – Q2 Update	10

Asset Allocation Insights

Jacob Borbidge
Senior Portfolio Manager,
Head of Investment Research,
Invesco Investment Solutions

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

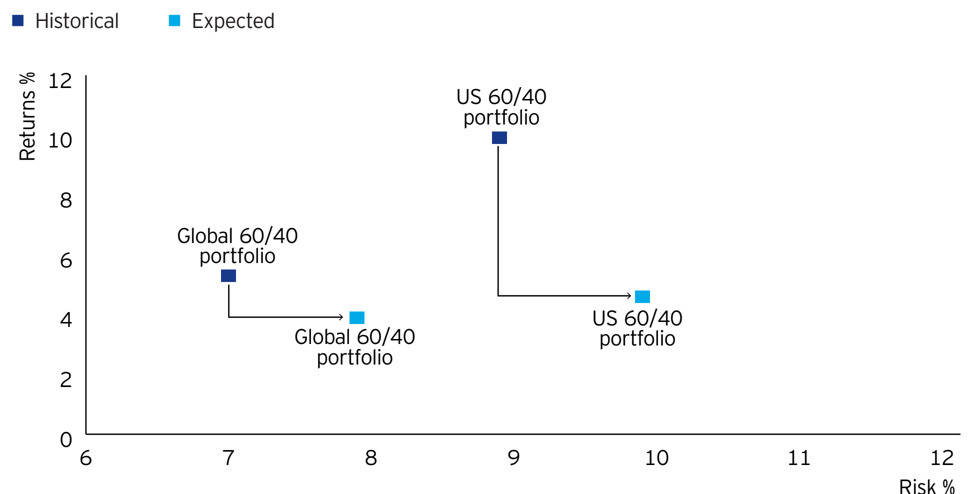
Strategic perspective

The first quarter of 2021 has brought us confirmation of something many have been doubting for some time: The recovery from COVID-19 is here. For most major economies, earnings, interest rates, and inflation expectations are growing at rates similar to the first year of prior cycles after a large market drawdown. Also, in a similar fashion to prior cycles, present market commentary believes that the current environment is too good to be true, with the most recent examples being the double-dip concerns of 2010 or the "taper tantrum" of 2013; the narrative being that interest rates or inflation from fiscal and monetary stimulus will cause the Federal Reserve (Fed) to act sooner than their current guidance is portraying and thus economic growth will sputter. While cycles tend to rhyme more than they repeat, our **strategic perspective** within Solutions is to look through this noise and anchor portfolios with diversified, long-term, and data-driven methods, an example being our Capital Market Assumptions (CMAs). We provide commentaries on our tactical views and market-based scenarios in the following sections for those looking to make allocation decisions within the cycle.

It was just a year ago that the pandemic drove the global economy into a recession, ending the longest bull market on record. As we have expressed in prior editions of this publication, the stimulus over the past year and current reopening of economies should be treated as unparalleled events in terms of magnitude when estimating the future behavior of any asset class. Presently, we believe the risks are skewed to the upside for most assets, given the trend in global growth, inflation, and earnings, and we adjusted our CMA methodology last year to account for rapid shifts in market expectations. That said, we'd like to reiterate that markets never fail to surprise even the most diligent investors, and our risk-aware approach towards portfolio management accounts for uncertainty by diversifying across asset classes, regions, and factors.

The purpose of this report is to illustrate our approach to estimating long-term returns given a challenging environment for asset allocators. With equities expected to underperform relative to history, the low and rising trend in yields and inflation, and elevated risks and correlations, investors may need to diversify out of traditional assets to reach their investment goals **(Figure 2).** While these increases in yields and inflation have slightly improved our CMAs for a 60/40 portfolio, they're still roughly half that of history with elevated levels of risk. Few assets are expected to deliver higher returns than history outside of non-US equities and alternatives.

Figure 2: 60/40 portfolios, less return and more risk over the next 10 years (USD)



Source: Invesco Investment Solutions proprietary research, March 31, 2021. 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 15 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.**

Executive Summary 02
Asset Allocation Insights 03
Global Market Outlook 08
2021 Capital Market Assumptions – Q2 Update 10

2Q21 CMA Observations

+ **Equities:** Earnings estimates continue to climb as the global recovery continues. Broad stimulus and reopenings after vaccine rollouts in the developed world should deliver ample push for the cyclical portions of the economy to continue to outperform growth/lockdown assets. Regionally, our equity CMAs are up within the US and emerging markets (EM) and lower in developed markets outside of the US (DM ex-US). Positive changes from last quarter came from higher earnings and inflation and a weakening dollar, while some detractors were higher valuations and lower total yields. Earnings growth is expected to be up broadly, up the highest in EM and the lowest in DM ex-US. Due to recent price increases, valuations are higher for most regions, lowering expected returns but broadly offset by our other return building blocks. We still anticipate a long-term weakening of the US dollar, which should improve dollar-based returns of assets outside of the US. The size premium in the US has shrunk given the recent outperformance of small-cap assets. Within EM, growth has been the primary driver of the return increase this quarter, mainly attributed to China and other regions that have escaped the pandemic largely unscathed, like Taiwan. UK expectations have increased in line with global equities yet have retained their spot as the equity asset with the highest anticipated risk-adjusted returns.
+ **Fixed Income:** Recent weakness within fixed income from rising current and expected yields has led income assets to increase broadly. Other building blocks, like roll, credit loss, and currency adjustments, are all expected to be positive contributors. The only negative component this quarter has been from valuation change, which we define as the expected duration-adjusted shift in the yield curve. Rate assets are up significantly, while longer duration assets are anticipated to receive most of the benefit from a steepening yield curve. Within credit, the riskier the asset, the less we anticipate their returns will increase as spreads have compressed over the past quarter. For example, investment grade (IG) is expected to rise more than high yield (HY). Bank loans are up slightly driven by higher expected yields but offset by lower valuations and current yields.
+ **Alternatives:** In our view, there are few better places than alternatives when looking for high expected risk-adjusted returns. Hedge funds and global REITs are two standouts relative to traditional assets within equities and fixed income. Real assets have moved in separate directions, given their homogenous outlooks. Global infrastructure is expected to be higher after increases in growth have offset higher valuations. US REITs are lower mostly due to lower earnings growth and dividend yields.

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

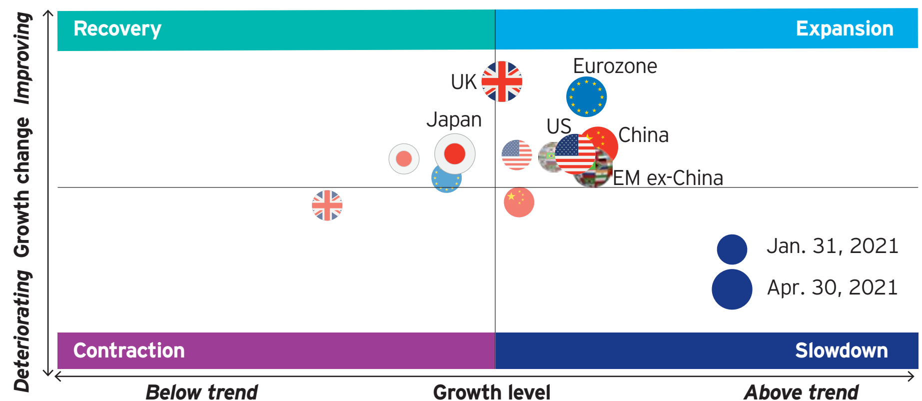
For further details on our macro regime framework, please refer to our CMA Methodology paper.

Tactical view

The global cycle continues to expand with growth above its long-term trend and expected to improve across both developed and emerging markets. Our indicators suggest positive economic momentum is widespread across all major countries. At a regional level, we continue to see the strongest momentum in the Eurozone and the UK, where business surveys continue to signal a strong rebound in demand and production expectations, couple with low inventories and a steady improvement in consumer sentiment. These dynamics increase the probability of positive growth surprises in the region in the second half of 2021 as economies reopen and vaccinations continue **(Figure 3)**. Our global risk appetite framework suggests market sentiment continues to improve, signaling growth expectations continue to be revised to the upside.

As discussed in our last update, the macro environment of the past year has, by and large, evolved in line with historical cyclical patterns. As growth moves above trend and the economy enters and expansion phase, inflation begins to rise. This reflationary environment has been reflected quite broadly in asset prices across assets classes, regions, sectors, and styles. In some cases, strength of this reflation trade has led to the rise of inflationary fears, with concerns that rising inflation may turn from a desirable cyclical development to a more enduring and pernicious long-term problem. What is our take on medium term inflation risks?

Figure 3: The expansion continues across regions, with strong momentum in the Eurozone and the UK
Current Leading Economic Indicators (LEIs) - Apr. 30, 2021



Region	LEIs Current level of growth		Global Risk Appetite Change in global growth expectations		Expected macro regimes
Global	Above Trend	&	Growth Expectation Improving	=	Expansion
United States	Above Trend				Expansion
Developed Markets ex-USA	Above Trend				Expansion
Europe	Above Trend				Expansion
United Kingdom	Above Trend				Expansion
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. Macro regime data as of April 30, 2021.
The Leading Economic Indicators (LEIs) are proprietary, forward-looking measures of the level of economic growth. The Global Risk Appetite Cycle Indicator (GRACI) is a proprietary measure of the markets' risk sentiment.

Inflation

We expect headline and core inflation to rise through 2021 in most of the world, driven by several transitory factors including "base effects" in year-over-year calculations. The large price declines caused by lockdowns in 1H 2020 will drop off the year-over-year statistics in the coming months, likely causing headline inflation to breach the cyclical highs of the past few cycles. These effects tend to occur during every recession and recovery but, given the severity of the 2020 recession, they are likely to be quite large in 2021. Additionally, positive momentum in commodity prices is likely to provide upward pressure on headline inflation for a few months. **These developments are consistent with typical cyclical patterns of an expansionary regime and, at this stage, do not imply a new, structurally higher inflation regime.**

The Federal Reserve and the European Central Bank have gone out of their way to communicate their intentions to see through these transitory effects and, additionally, their willingness to let inflation run "above average" also on a medium-term, cyclical basis. Therefore, assuming we can rule-out a premature tightening in monetary policy, **the question is whether this cyclical build-up in inflation will lead to an orderly or disorderly bear steepening in the yield curve,** and what the impact of these two scenarios would look like for our asset allocation.

In an orderly scenario we can expect market volatility to decline and our current expansion/reflationary portfolio to perform well. In a disorderly inflationary scenario, market volatility and dispersion between asset class returns are likely to increase meaningfully. We would expect equities, value and cyclicals to still outperform fixed income, quality and defensives, respectively, given their relative exposures to interest rate risk. However, given the potential rise in USD funding risk, our emerging markets tilts are likely to underperform relative to developed markets across equities, fixed income, and currencies. We believe the underperformance of emerging markets in the past two months partially reflects some pricing of this disorderly scenario.

The probability of a disorderly market reaction is likely to increase with upside surprises in wage inflation, inflation expectations and end-consumer prices, as these categories tend to be less volatile. We expect these categories to remain stable. In this regard, to support our assessment of inflationary pressures, we gather information on price trends from different parts of the economy and summarize them into a composite **Inflation Momentum Indicator (IMI) (Figure 4)**. The indicator measures the acceleration/deceleration in inflation on a trailing 3-month basis, covering consumer and producer prices, inflation expectation surveys, import prices, wages, and commodity prices. A positive (negative) reading implies inflation has been rising (falling) on average over the past three months. While inflation is rising across all sectors of the economy, above average contributions have come from import prices (energy prices and dollar depreciation) and the manufacturing goods sector, while wages, consumer prices, and inflation expectations have been more muted.

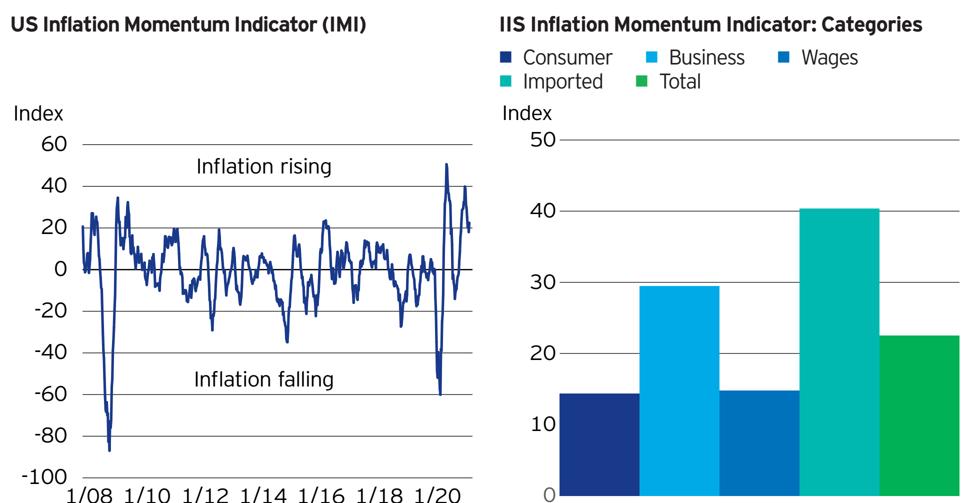
By design, the indicator is mean reverting, and captures only short-term fluctuations in inflation. However, the persistency of a positive reading over multiple months, or quarters, coupled with its composition across categories could provide early signs of a more persistent inflation problem.

The large price declines caused by lockdowns in 1H 2020 will drop off the year-over-year statistics in the coming months, likely causing headline inflation to breach the cyclical highs of the past few cycles.

In an orderly scenario we can expect market volatility to decline and our current expansion/reflationary portfolio to perform well. In a disorderly inflationary scenario, market volatility and dispersion between asset class returns are likely to increase meaningfully.

While inflation is rising across all sectors of the economy, above average contributions have come from import prices (energy prices and dollar depreciation) and the manufacturing goods sector, while wages, consumer prices, and inflation expectations have been more muted.

Figure 4: Inflation momentum indicator



Source: Bloomberg data. Invesco Investment Solutions calculations. The US Inflation Momentum Indicator (IMI) measures the change in inflation statistics on a trailing three-month basis, covering indicators across consumer and producer prices, inflation expectation surveys, import prices, wages and energy prices. A positive (negative) reading indicates inflation has been rising (falling) on average over the past three months.

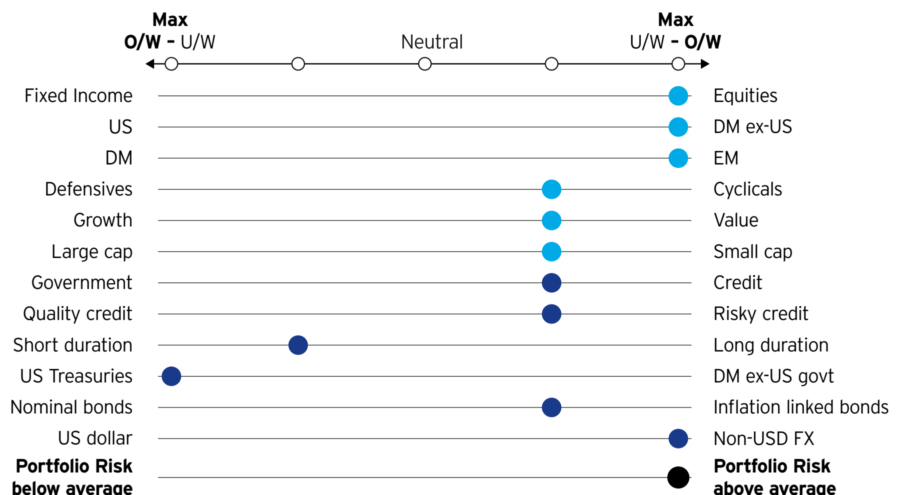
The momentum factor is gradually moving away from quality and mega cap stocks towards smaller capitalization and value segments of the market.

Investment Positioning

We have not implemented any changes to our positioning. We maintain a **higher risk** posture than our benchmark in the Global Tactical Asset Allocation model[1], with an overweight to equities and risky credit at the expense of government bonds and higher quality credit assets **(Figure 5)**. In particular,

- Within **equities** we favor emerging markets and developed markets outside the US, driven by improving global growth, rising risk appetite and a rebound in growth momentum relative to the US. We remain tilted in favor of (small) size and value. In addition, we are tilted in favor of momentum which, in line with the growth vs. value rotation, is gradually moving away from quality and mega cap stocks towards smaller capitalization and value segments of the market.
- In **fixed income**, we are overweight credit risk[2] and underweight duration versus the benchmark. We favor risky credit despite tight spreads, seeking income in a low volatility environment. We are overweight high yield, bank loans and emerging markets debt at the expense of investment grade credit and government bonds. We favor US Treasuries over other developed government bond markets given the yield advantage.
- In **currency markets** we maintain an overweight exposure to foreign currencies, positioning for long-term US dollar depreciation. We remain constructive on EM FX given attractive valuations, an improving cycle, and a favorable backdrop for capital inflows, favoring the Indian rupee, Indonesian rupiah, Russian ruble, and Brazilian real. Within developed markets we favor the Euro, the Yen, the Canadian dollar, Singapore dollar and the Norwegian kroner, while we underweight the British pound, Swiss franc and Australian dollar.

Figure 5: Relative Tactical Asset Allocation Positioning
Global cycle remains in Expansion Regime



Source: Invesco Investment Solutions, May 2021. For illustrative purposes only.

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

Global Market Outlook

Kristina Hooper
Chief Global Market Strategist

Arnab Das
Global Market Strategist - EMEA

Brian Levitt
Global Market Strategist - North America

Executive Summary	02
Asset Allocation Insights	03
Global Market Outlook	08
2021 Capital Market Assumptions – Q2 Update	10

Mid-Year Outlook 2021

Introduction

In just over a year, the world has gone through incredible change – thrown into a pandemic and plunged into a global recession. Now many parts of the globe are experiencing a resurgence in economic activity, benefiting from the development and distribution of effective vaccines, as well as significant fiscal and monetary stimulus. However, the outlook is not simple.

We at Invesco have again brought together some of our most experienced investment professionals and thought leaders to provide a mid-year update to our outlook. To continue to address the breadth of possibilities that lie ahead in this environment, we have provided a base case scenario which we believe is highly probable, and two other possible scenarios that explore what we believe to be the biggest risks currently facing the global economy and markets. In contrast to most past cycles, we see the tail risks as being higher and better defined than is usual in a recovery environment **(Figure 6)**.

Our Base Case

Our base case anticipates that economies will accelerate as they reopen but that any accompanying rise in inflation would be transitory. The United States has had a very effective vaccine rollout and is likely to take the lead in the global economic recovery as growth in China moderates. The UK and eurozone are likely to follow the US recovery, with emerging markets countries generally lagging behind because of the obstacles they face vaccinating their respective populations, which is likely to result in episodic resurgences of COVID-19. As economies reopen and spending increases, inflation should rise significantly, especially in the US as the Fed expects, but we expect it will moderate to a rate faster than pre-crisis trends but not sufficient to induce action from central banks. Over the longer term, we expect demographics and innovation to place downward pressure on inflation.

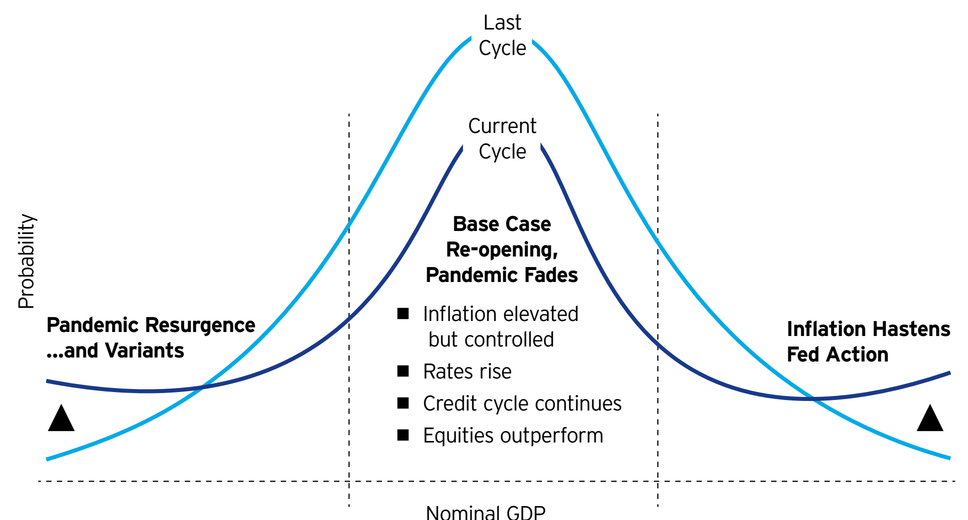
High Inflation Scenario

In this scenario, we contemplate a strong economic reacceleration accompanied by a rise in inflation that is more persistent. We expect nominal GDP growth to average 7-8% in the developed world, with real growth to remain well above trend but slowing. We expect the Fed to initially delay responding, deliberately staying "behind the curve." We anticipate inflation will overshoot central bank targets globally, led by the US reaching 4% in 2022. The Federal Reserve and other central banks would then be forced to tighten more aggressively than markets anticipated, which would temper economic growth and have a significant impact on capital markets.

Pandemic Resurgence Scenario

In this scenario, we contemplate a resurgence of the pandemic as a result of the spread of more powerful virus mutations against which existing vaccines are substantially less effective. This would have a negative impact on economic growth globally, but the impact would not be nearly as dramatic as the initial wave of COVID-19 because economies have learned to adapt to lockdowns and other tools utilized to control the spread of the pandemic. Emerging markets economies would likely be hit hardest due to relatively limited health care infrastructure as well as lower vaccination levels.

Figure 6: We Believe the Pandemic Continues to Fade, and Re-opening Continues
Inflation to rise on the back of policy and pent-up demand, then moderate



Source: Invesco. For illustrative purposes only.

For more information on Invesco's market and economic positioning, please refer to our forthcoming 2021 Mid-Year Outlook.

Asset Allocation Implications

In our base-case scenario, we would take a 'risk on' approach, expecting equities to outperform fixed income as economies continue to accelerate through the end of the first quarter of 2022 and then decelerate but still remain well above trend. We also expect fiscal stimulus and monetary policy accommodation to continue to support risk assets. We expect market volatility to decline across asset classes. We expect more cyclical regions, sectors, and styles to outperform. We expect developed markets outside the US to assume leadership in cyclical growth in 2022, further supporting the rotation into value-oriented equity markets. We expect emerging markets equities to outperform driven by global growth, easy monetary conditions, and a weakening dollar. In fixed income, we expect stable credit spreads, with credit and high yield outperforming government bonds through higher yields. We favor a moderate underweight stance to global duration, with yield curves expected to steepen but not far in excess of the current pricing of inflation expectations and forward curves.

In terms of sectors, we expect the global cyclical rebound through the first quarter of 2022 to further support value sectors with higher operating leverage compared to more quality-oriented sectors. We favor industrials, materials, financials, and consumer discretionary over health care, staples, technology, and communication services. Momentum, which has recently included more value and smaller-capitalization characteristics, typically outperforms in this expansionary phase of the cycle, providing further support to this rotation.

In our high inflation scenario, we expect overall market returns across asset classes to underperform relative to our base-case scenario, given a sharp rise in long-term yields, with increased volatility and dispersion in returns. As in recent 'bear steepening' episodes (January-April 2006 or April-December 2013), we expect equities to outperform fixed income. We favor commodities as well, as we expect them to benefit from higher inflation. We also expect risky credit to outperform government bonds. We are positive on inflation-protected bonds in this scenario. We expect fixed income and emerging markets to suffer, while equities are likely to still deliver positive returns. In this scenario, we expect value and cyclicals to outperform higher duration assets such as growth, quality, low volatility, and large-cap equities.

In terms of sectors, we expect dispersion in sector performance to increase relative to the base-case scenario, exacerbated by differences in interest rate sensitivity. We expect long-duration sectors such as utilities, consumer staples, health care, and technology to underperform, while sectors with real asset characteristics such as industrials, materials, and energy are likely to outperform.

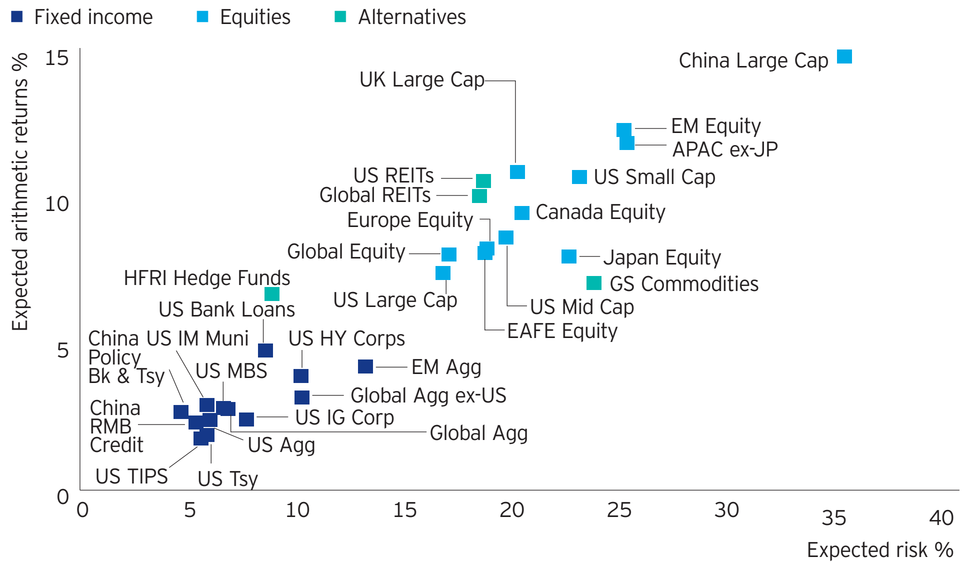
In our pandemic resurgence scenario, we would take a more neutral approach to risk. We expect equity and fixed income markets performance to converge to the mid- to high-single-digit returns range, with a rally in bond yields and stable credit spreads to provide relatively solid returns for quality fixed income, while riskier credit segments would be expected to moderately lag given their lower duration profile. In this scenario, we also favor gold.

We expect equities to provide modest additional risk compensation given a downshift in growth expectations. We expect lower growth coupled with falling bond yields to provide a shift in favor of defensive sectors and higher duration assets such as growth equities, quality, and low volatility factors. We expect cyclical divergence to favor equities in developed markets outside the US.

In terms of sectors, we expect lower growth expectations and falling bond yields to provide a catalyst in favor of defensive sectors with stable cash flows and wider margins, leading to outperformance in information technology, communication services, and health care, which would additionally benefit from a prolonged "work from home" environment. Conversely, we would expect cyclical sectors to underperform as the recent value rotation comes to a halt in this scenario, with financials hit by a flattening of the yield curve.

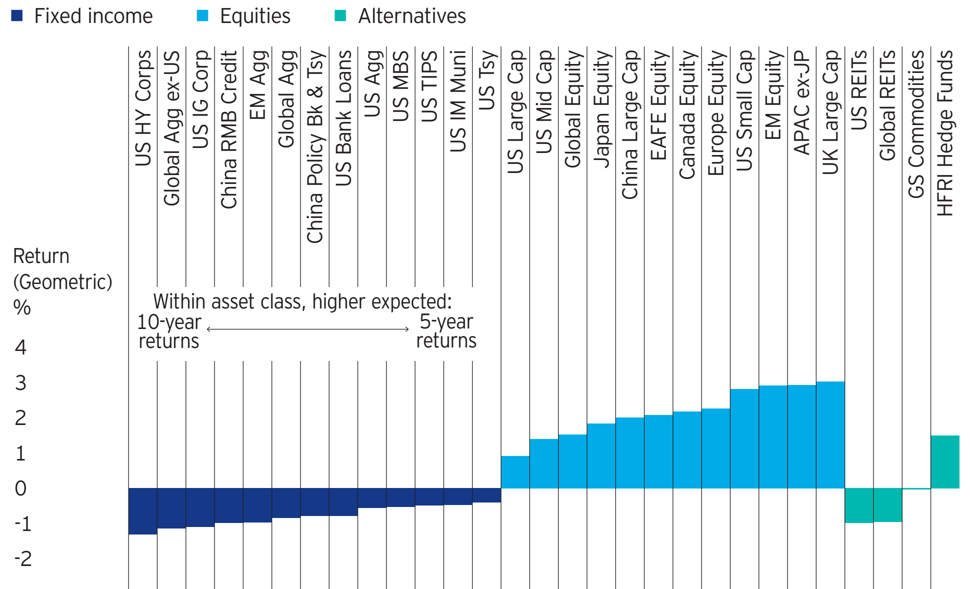
2021 Capital Market Assumptions - Q2 Update

Figure 7: 10-year asset class expectations (USD)



Source: Invesco, estimates as of March 31, 2021. Proxies listed in **Figure 13**. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 15 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 (USD)



Source: Invesco, estimates as of March 31, 2021. Proxies listed in **Figure 13**. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 15 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.**

Executive Summary 02
Asset Allocation Insights 03
Global Market Outlook 08
2021 Capital Market Assumptions - Q2 Update 10

Figure 9: Equity quarter-over-quarter change (USD)

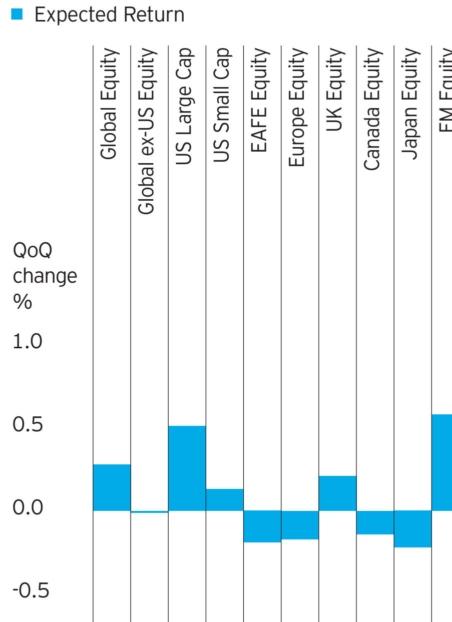
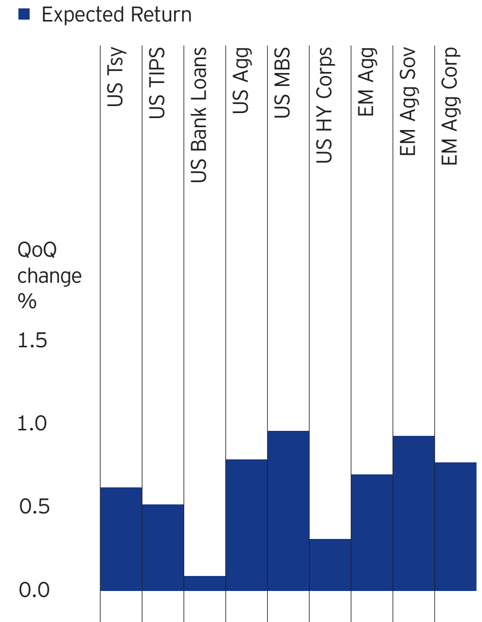


Figure 10: Fixed income quarter-over-quarter change (USD)



Source: Invesco, estimates as of March 31, 2021. Proxies listed in **Figure 13**. These estimates are forward-looking,are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 15 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 quarter-over-quarter change attribution (USD)

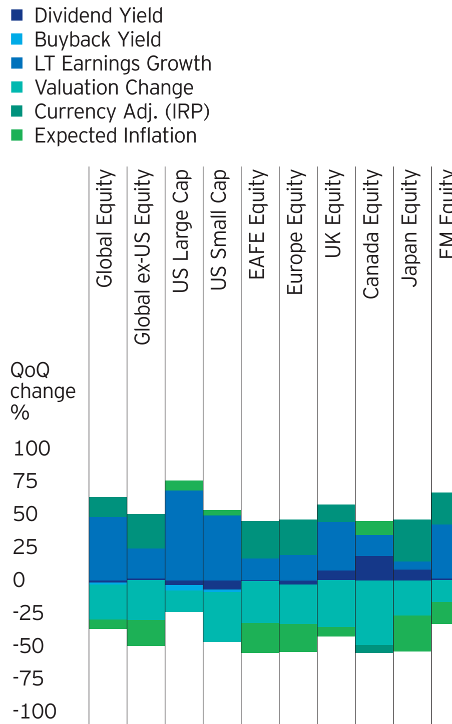
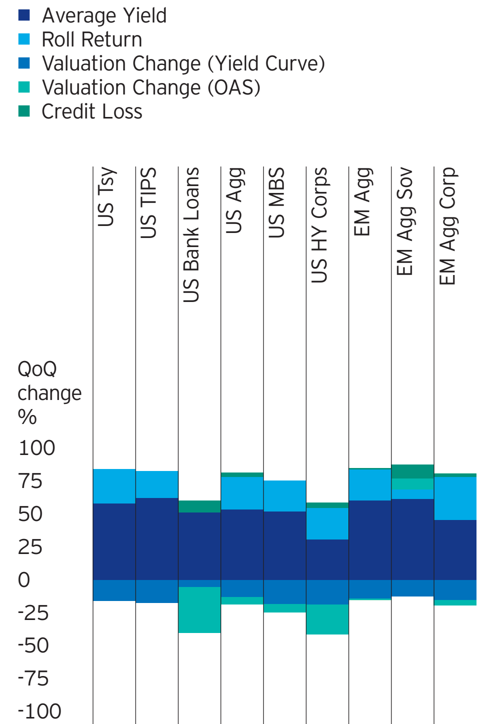


Figure 12: Fixed income quarter-over-quarter change attribution (USD)



Source: Invesco, estimates as of March 31, 2021. Proxies listed in **Figure 13**. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 15 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 13: 10-year asset class expected returns, risk, and return-to-risk (USD)

	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	0.9	0.9	1.5	0.62
	US Tsy IM	BBG BARC US Tsy IM	1.4	1.5	4.6	0.33
	US Tsy Long	BBG BARC US Tsy Long	1.2	1.9	11.8	0.16
	US TIPS	BBG BARC US TIPS	1.6	1.7	5.5	0.32
	US Bank Loans	CSFB Leverage Loan	4.4	4.8	8.5	0.56
	US Agg	BBG BARC US Agg	2.2	2.4	5.9	0.40
	US IG Corp	BBG BARC US IG	2.1	2.4	7.6	0.31
	US MBS	BBG BARC US MBS	2.6	2.8	6.6	0.43
	US Preferred Stocks	BOA ML Fixed Rate Pref Securities	3.3	4.1	12.5	0.33
	US HY Corps	BBG BARC US HY	3.4	3.9	10.2	0.38
	US IM Muni	BOA ML US Muni (3-15 Y)	2.7	2.9	5.8	0.50
	US HY Muni	BBG BARC Muni Bond HY	2.1	2.5	8.6	0.29
	Global Agg	BBG BARC Global Agg	2.5	2.8	6.8	0.41
	Global Agg ex-US	BBG BARC Global Agg ex-US	2.6	3.1	10.2	0.31
	Global Tsy	BBG BARC Global Tsy	2.4	2.7	8.4	0.32
	Global Sov	BBG BARC Global Sov	1.7	2.0	6.9	0.29
	Global Corp	BBG BARC Global Corp	2.5	2.7	7.7	0.36
	Global IG	BBG BARC Global Corp IG	2.4	2.7	7.8	0.35
	Eurozone Corp	BBG BARC Euro Agg Credit Corp	2.3	3.2	13.4	0.23
	Eurozone Tsy	BBG BARC Euro Agg Gov Tsy	2.3	3.1	12.4	0.25
	Asian Dollar IG	BOA ML AC IG	2.7	3.0	8.3	0.36
	Asian Dollar HY	BOA ML AC HY	6.8	8.4	18.6	0.45
	EM Agg	BBG BARC EM Agg	3.4	4.2	13.2	0.32
	EM Agg IG	BBG BARC EM USD Agg IG	2.5	2.8	8.3	0.34
	China Policy Bk & Tsy	BBG BARC China PB Tsy TR	2.2	2.3	5.3	0.44
	China RMB Credit	BBG BARC China Corporate	2.6	2.7	4.6	0.58
Equities	Global Equity	MSCI ACWI	6.7	8.0	17.1	0.47
	Global ex-US Equity	MSCI ACWI ex-US	7.5	9.1	19.0	0.48
	US Broad Market	Russell 3000	6.3	7.7	17.6	0.44
	US Large Cap	S&P 500	6.1	7.4	16.8	0.44
	US Mid Cap	Russell Midcap	6.9	8.6	19.7	0.44
	US Small Cap	Russell 2000	8.3	10.7	23.1	0.46
	EAFE Equity	MSCI EAFE	6.5	8.1	18.7	0.43
	Europe Equity	MSCI Europe	6.6	8.2	18.8	0.44
	Eurozone Equity	MSCI Euro ex-UK	6.0	7.7	19.8	0.39
	UK Large Cap	FTSE 100	9.1	10.9	20.2	0.54
	UK Small Cap	FTSE Small Cap UK	10.3	13.2	25.9	0.51
	Canada Equity	S&P TSX	7.6	9.5	20.5	0.46
	Japan Equity	MSCI JP	5.7	8.0	22.6	0.35
	EM Equity	MSCI EM	9.6	12.3	25.2	0.49
	APAC ex-JP	MSCI APXJ	9.1	11.8	25.4	0.47
	China Large Cap	CSI 300	9.8	14.9	35.5	0.42
Alternatives	US REITs	FTSE NAREIT Equity	9.0	10.5	18.7	0.56
	Global REITs	FTSE EPRA/NAREIT Developed	8.5	10.0	18.5	0.54
	HFRI Hedge Funds	HFRI HF	6.3	6.7	8.8	0.76
	GS Commodities	S&P GSCI	4.5	7.1	23.8	0.30
	Agriculture	S&P GSCI Agriculture	0.1	2.3	21.5	0.11
	Energy	S&P GSCI Energy	6.8	12.5	37.1	0.34
	Industrial Metals	S&P GSCI Industrial Metals	4.3	6.9	24.0	0.29
	Precious Metals	S&P GSCI Precious Metals	2.2	3.9	18.6	0.21

Source: Invesco, estimates as of March 31, 2021. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 15 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. 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.

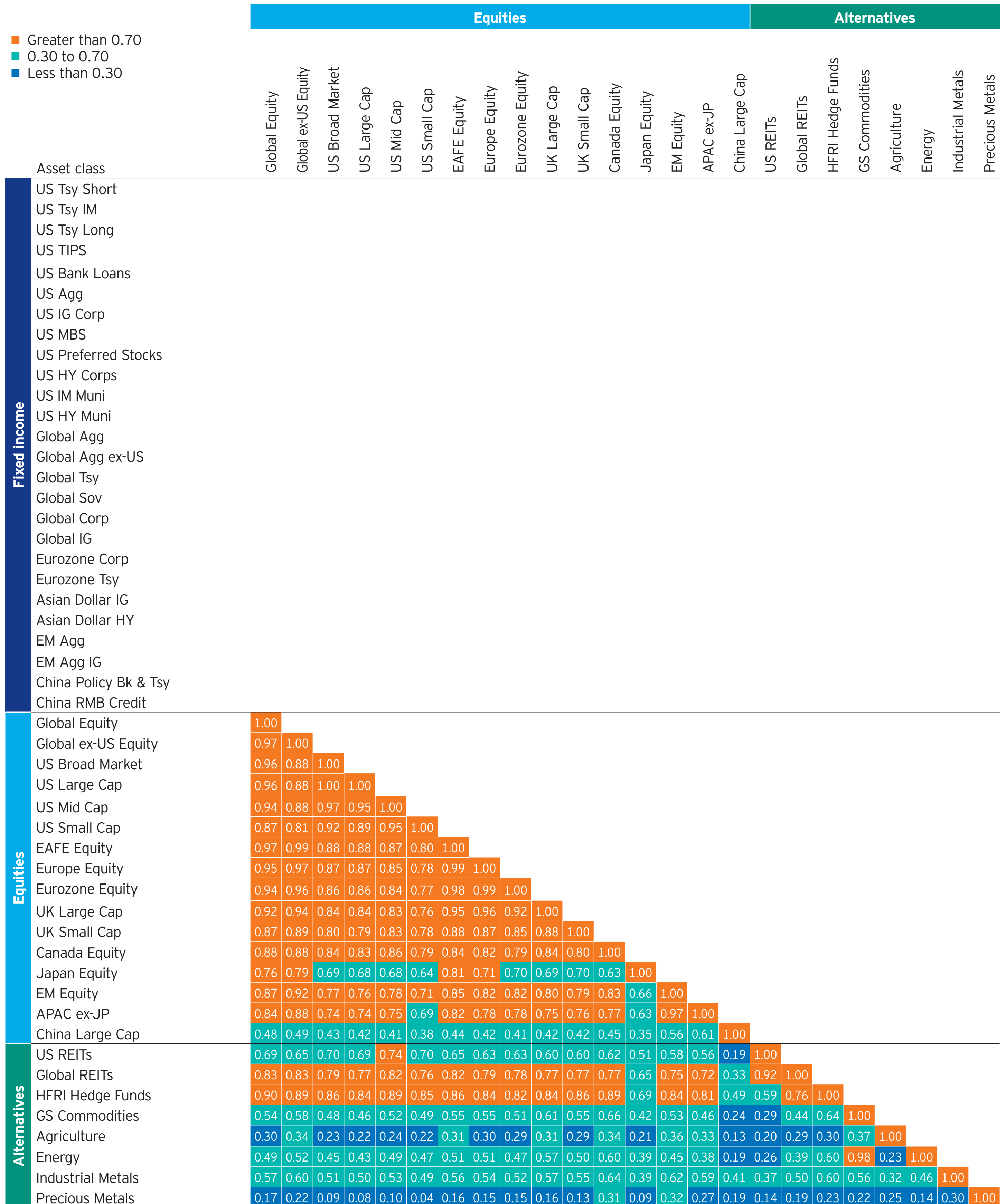
Figure 14: 10-year correlations (USD)

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

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

Source: Invesco, estimates as of March 31, 2021. Proxies listed in **Figure 13**. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 15 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 (USD)

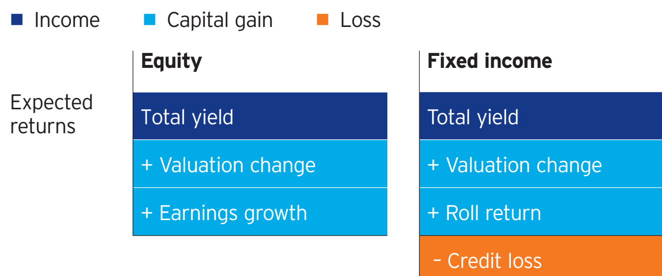


		Equities																Alternatives							
	Asset class	Global Equity	Global ex-US Equity	US Broad Market	US Large Cap	US Mid Cap	US Small Cap	EAFE Equity	Europe Equity	Eurozone Equity	UK Large Cap	UK Small Cap	Canada Equity	Japan Equity	EM Equity	APAC ex-JP	China Large Cap	US REITs	Global REITs	HFRI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

Source: Invesco, estimates as of March 31, 2021. Proxies listed in **Figure 13**. These estimates are forward-looking, are not guarantees, and they involve risks, uncertainties, and assumptions. Please see page 15 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 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 return 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.

Contributors

Investment Solutions

Duy Nguyen
CFA, CAIA
CIO, Invesco Investment Solutions

Jacob Borbidge
CFA, CAIA
Senior Portfolio Manager,
Head of Investment Research,
Invesco Investment Solutions

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

Greg Chen
PhD, CFA
Senior Analyst

Patrick Hamel
MS, MBA
Quantitative Research Analyst

Chang Hwan Sung
PhD, CFA, FRM
Portfolio Manager,
Solutions Research, APAC

Debbie Li
CFA
Senior Analyst

Diane Ellis
MS
Macro Research Analyst

Yu Li
PhD
Quantitative Research Analyst

Global Market Strategy

Kristina Hooper
Chief Global Market Strategist

Arnab Das
Global Market Strategist, EMEA

Brian Levitt
Global Market Strategist, NA

Investment Solutions Thought Leadership

Kenneth Blay
Head of Research,
Global Thought Leadership

Drew Thornton
CFA
Head of Solutions Thought
Leadership

Invesco Investment Solutions

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.

Important information

The document is intended only for Professional Clients in Continental Europe (as defined under Important Information); for Professional Clients in Dubai, Ireland, the Isle of Man, Jersey and Guernsey, and the UK; for Institutional Investors in Australia; for wholesale investors (as defined in the Financial Markets Conduct Act) in New Zealand, for Professional Investors in Hong Kong; for Qualified Institutional Investors in Japan; for Qualified Institutional Investors and/or certain specific institutional investors in Thailand, for certain specific institutional investors in Indonesia and for qualified buyers in Philippines for informational purposes only;for Institutional Investors and/or Accredited Investors in Singapore; for certain specific Qualified Institutions/ Sophisticated Investors only in Taiwan and for Institutional Investors in the USA. The document is intended only for accredited investors as defined under National Instrument 45-106 in Canada. It is not intended for and should not be distributed to or relied upon by the public or retail investors.

For the distribution of this document, Continental Europe is defined as Austria, Belgium, Denmark, Finland, France, Germany, Greece, Italy, Liechtenstein, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden and Switzerland. This does not constitute a recommendation of any investment strategy or product for a particular investor. Investors should consult a financial professional before making any investment decisions.

By accepting this document, you consent to communicate with us in English, unless you inform us otherwise. This overview contains general information only and does not take into account individual objectives, taxation position or financial needs. Nor does this constitute a recommendation of the suitability of any investment strategy for a particular investor. It is not an offer to buy or sell or a solicitation of an offer to buy or sell any security or instrument or to participate in any trading strategy to any person in any jurisdiction in which such an offer or solicitation is not authorized or to any person to whom it would be unlawful to market such an offer or solicitation. It does not form part of any prospectus. All material presented is compiled from sources believed to be reliable and current, but accuracy cannot be guaranteed. As with all investments, there are associated inherent risks. Please obtain and review all financial material carefully before investing. Asset management services are provided by Invesco in accordance with appropriate local legislation and regulations. The opinions expressed are those of Invesco Investment Solutions team and may differ from the opinions of other Invesco investment professionals. Opinions are based upon current market conditions, and are subject to change without notice. Performance, whether actual, estimated, or backtested, is no guarantee of future results. Diversification and asset allocation do not guarantee a profit or eliminate the risk of loss.

Unless otherwise stated, all information is sourced from Invesco, in USD and as of March 31, 2021.

Further information is available using the contact details shown overleaf.

This document is issued in:

- **Australia** by Invesco Australia Limited (ABN 48 001 693 232), Level 26, 333 Collins Street, Melbourne, Victoria, 3000, Australia, which holds an Australian Financial Services Licence number 239916.
- **Canada** by Invesco Canada Ltd., 5140 Yonge Street, Suite 800, Toronto, Ontario, M2N 6X7, Canada.
- Issued in **Belgium, Denmark, Finland, France, Greece, Italy, Luxembourg, Norway, Portugal, Spain** and **Sweden** by Invesco Management S.A., President Building, 37A Avenue JF Kennedy, L-1855 Luxembourg, regulated by the Commission de Surveillance du Secteur Financier, Luxembourg.
- **Dubai** by Invesco Asset Management Limited, Po Box 506599, DIFC Precinct Building No 4, Level 3, Office 305, Dubai, United Arab Emirates. Regulated by the Dubai Financial Services Authority.
- **Austria and Germany** by Invesco Asset Management Deutschland GmbH, An der Welle 5, 60322 Frankfurt am Main, Germany.
- **Hong Kong** by Invesco Hong Kong Limited 景順投資 管理有限公司, 41/F, Champion Tower, Three Garden Road, Central, Hong Kong.
- **Japan** by Invesco Asset Management (Japan) Limited, Roppongi Hills Mori Tower 14F, 6-10-1 Roppongi, Minato-ku, Tokyo 106-6114; Registration Number: The Director-General of Kanto Local Finance Bureau (Kinsho) 306; Member of the Investment Trusts Association, Japan and the Japan Investment Advisers Association.
- **New Zealand** by Invesco Australia Limited (ABN 48 001 693 232), Level 26, 333 Collins Street, Melbourne, Victoria, 3000, Australia, which holds an Australian Financial Services Licence number 239916.
- **Singapore** by Invesco Asset Management Singapore Ltd, 9 Raffles Place, #18-01 Republic Plaza, Singapore 048619.
- **Switzerland, Liechtenstein** by Invesco Asset Management (Schweiz) AG, Talacker 34, CH-8001 Zurich, Switzerland.
- **Taiwan** by Invesco Taiwan Limited, 22F, No.1, Songzhi Road, Taipei 11047, Taiwan (0800-045-066). Invesco Taiwan Limited is operated and managed independently.
- **Jersey, Guernsey, The Isle of Man, Ireland** and **the UK** by Invesco Asset Management Limited, Perpetual Park, Perpetual Park Drive, Henley-on-Thames, Oxfordshire RG9 1HH. Authorised and regulated by the Financial Conduct Authority.
- **The United States of America** by Invesco Advisers, Inc., Two Peachtree Pointe, 1555 Peachtree Street, N.W., Suite 1800, Atlanta, Georgia 30309, US.

II-ISCMAUSD-BRO-1-E 04-21 GL1660762

Notes

Contact

Neil Blundell
Head of Global Client Solutions Development

212 278 9174
neil.blundell@invesco.com

Telephone calls may be recorded