



2021 Long-Term Asset Class Forecast

| | |
|-----------|---|
| 02 | Joint CIO and CISO Message |
| 03 | AIMCo 2021 Long-Term Forecast |
| 06 | Global Economic Scenarios |
| 08 | Topic of the Year: Considering Climate Change in Long-Term Forecasting |
| 11 | Forecast by Asset Class — Fixed Income |
| 15 | Forecast by Asset Class — Illiquid Assets |
| 23 | Forecast by Asset Class — Public Equities |
| 30 | Risk Forecast Methodology |
| 30 | Currency Forecast Methodology |
| 31 | Disclaimer |

Joint CIO and CISO Message

Carefully devising strategic asset allocation assumptions is paramount to generate positive risk-adjusted outcomes for client portfolios. In this spirit, we are pleased to present the 2021 AIMCo Long-Term Asset Class Forecast. This exercise is a collaborative endeavour across AIMCo to construct a cohesive, long-term view to be used by our clients in their asset-liability discussions and actuarial deliberations. Long-term financial returns are underpinned by robust building blocks that are more stable than on shorter time investment horizons. These characteristics are supportive of long-term capital market assumptions as a reliable process to align clients' long-term objectives and their long-term portfolio allocations.

Certainly, from a short-term perspective, the COVID-19 pandemic has materially changed the world. Various economic sectors have been hit particularly hard, potentially requiring a restructuring in certain cases. Having learned some useful lessons during the Global Financial Crisis (GFC), policymakers across the globe reacted in an unprecedented and concerted manner to provide fiscal and monetary stimulus. They worked towards alleviating cash crunches for households and extended loans and bailouts thereby preventing going concern businesses from failing. In the footsteps of this unprecedented, whatever-it-takes stimulus approach, global markets have rebounded handsomely from the sharp drop of mid-March 2020.

Although the path could reveal itself to be a bumpy one, under the lens of a longer time horizon, the global economy is likely to recover. In the short-term, however, a rise in public spending has hit public finances similarly to past wars — government deficits have been pushed to levels not seen since the two world wars of the twentieth century. Furthermore, debt burdens have increased for many households and corporations, although the cost of debt has diminished due to lower interest rates. Optimistically, even with virus cases rising entering 2021, the advent of vaccines becoming more widely distributed could support a significant economic rebound accompanied by job

growth, rising household and business incomes and expanding demand for goods and services. These elements should lead pressures on government finances to gradually abate and to a broader acceleration of prices and wages from depressed levels in the medium term. As such, we remain relatively constructive on the economic and market outlook over the next decade.

Many ongoing structural trends, such as an aging population in much of the developed world, are likely to continue slowing productivity growth. Such challenging economic trends are now compounded by the once-in-a-century shock induced by the pandemic, firmly leading to lower global trend growth onwards compared to what was experienced before the GFC. With monetary policy expected to be at the lower bound in terms of interest rates for the first few years of the next decade before tightening, financial conditions should remain supportive of risky markets, including equities and illiquid assets, such as real estate, infrastructure, private equity and renewable resources.

In equity markets, however, valuations have rebounded post-March 2020 to rich levels in the footsteps of the consensus for moderate, albeit volatile, long-term economic growth. Furthermore, the increased focus on resolving social and economic inequalities from various governments might result in policies which could put upward pressure on wages, reversing past trends in high corporate margins. Combined with lower-trend economic growth, this points to more challenged equity returns over the next 10 years. In this scenario of gradually improving economic fortunes, bond yields are also expected to increase moderately over time.

We look forward to discussing our long-term capital market assumptions with all clients and continuing the fruitful dialogue surrounding their impact on long-term portfolio construction.



A handwritten signature in dark ink, appearing to read 'Dale MacMaster'.

Dale MacMaster
Chief Investment Officer



A handwritten signature in dark ink, appearing to read 'Amit Prakash'.

Amit Prakash
Chief Investment Strategy Officer

AIMCo 2021 Long-Term Forecast

AIMCo's long-term capital markets forecast for 2021, broadly speaking, follows the same process and methodology as in previous years. The unifying foundation of our approach is a macroeconomic forecast of the global economy over the next 10 years. This macroeconomic forecast is then consistently translated into specific asset class risk and return expectations. Our long-term forecast covers 18 asset classes, including equities, fixed income and private assets. Our goal is for these projections to help inform our clients' strategic asset allocation decisions and establish reasonable expectations for risks and returns over a 10-year time frame.

AIMCo strives to enhance our capital markets forecast each year, particularly in response to feedback from our clients. Among the improvements in AIMCo's 2021 capital markets forecast is a new model for private mortgages to reflect the newly-adopted AIMCo client benchmark for this asset class. We have also incorporated climate change assumptions into our analysis which is discussed further in a dedicated section.

In 2020, for the first time ever, we provided clients with a mid-year update of our forecasts to offer a timely reflection of the significant economic (and health) disruptions brought about by the COVID-19 pandemic. The 2021 capital markets forecast is our best estimate of a changed world as we move past the pandemic scars.

Return Forecast

Table 1 summarizes our outlook for the main asset classes over the next decade. Our 2021 forecast is based on an expectation of a robust economic rebound in the next couple of years, before growth rates settle back towards long-term trends. Such a recovery pattern will mean rising interest rates over the forecast horizon, which will reduce traditional fixed income product return. More opportunities will be present in growth-oriented fixed income assets such as private debt and loan, as well as private mortgages.

For public equity assets, earnings growth will provide a tailwind as the economic recovery ensues. However, the elevated starting valuation multiples will offset this growth potential and dampen the long-term returns for equities.

Illiquid assets, across the range of such products, are expected to rebound strongly over the next decade. This favourable prospect is a function of better income growth tied to the economic recovery, as well as a catch-up in valuations, from the current depressed levels towards where public markets are trading.

The return forecast details will be discussed in the **Forecast by Asset Class** sections.

Risk Forecast

The risk forecast used is based on the same methodology (VAR-GARCH-DCC¹ statistical model) we have utilized in previous years. The model allows us to forecast asset class volatilities and correlations simultaneously to provide consistent, forward-looking estimates. This forecast incorporates more accurate market return distribution to capture the so-called "fat tails". Additional details can be found in the **Risk Forecast Methodology** section.

1. Vector Auto Regressive - Generalized Autoregressive Conditional Heteroscedasticity - Dynamic Conditional Correlation

Overview

By taking into account both long-term return and risk expectations, we can envision an efficient frontier which incorporates all our forecasts. Putting it all together, a balanced portfolio (represented by AIMCo's aggregate balanced fund), is expected to achieve a 4.9% annualized return over the next decade.

Table 1: Forecasted Return and Risk 2021-2030

| Asset Class | Benchmark | Expected Return (Annualized %) | Expected Risk* (Annualized %) |
|------------------------------------|---|-----------------------------------|----------------------------------|
| Fixed Income | | | |
| A Money Market | FTSE Canada 91-Day T-bill Index | 1.4% | 0.2% |
| B Short-Term Bonds | FTSE Canada Short-Term All Government Bond Total Return Index | 1.8% | 1.9% |
| C Universe Bonds | FTSE Canada Universe Bond Total Return Index | 2.0% | 3.7% |
| D Long Bonds | FTSE Canada Long-Term All Government Bond Total Return Index | 0.8% | 8.1% |
| E Real Return Bonds | FTSE Canada Real Return Bond Total Return Index | 0.6% | 7.7% |
| F Private Debt and Loan | FTSE Canada Short-Term Overall Index | 4.2% | 4.5% ² |
| G Mortgages | 60% FTSE Short-Term Overall Bond Index and 40% FTSE Canada Mid-Term Overall Bond Index + 50 bps | 2.8% | 2.6% |
| Illiquid Markets | | | |
| H Canadian Real Estate | REALpac/IPD Canadian All Property Index – Large Institutional Subset | 6.2% | 8.4% ² |
| I Foreign Real Estate | MSCI Global Region Property Index | 7.4% | 8.8% ² |
| J Infrastructure | Total CPI 1 Month Lagged + 450 bps (5-year rolling average) | 7.0% ¹ | 11.9% ² |
| K Renewable Resources | Total CPI 1 Month Lagged + 450 bps (5-year rolling average) | 7.1% ¹ | 8.6% ² |
| L Private Equity | Total CPI 1 Month Lagged + 650 bps (5-year rolling average) | 10.0% ¹ | 13.7% ² |
| Public Equities | | | |
| M Global Equities | MSCI World Net Total Return Index | 4.3% | 12.3% |
| N Canadian Equities | S&P/TSX Composite Total Return Index | 4.5% | 16.1% |
| O Emerging Markets Equities | MSCI Emerging Markets Net Total Return Index | 5.4% | 17.3% |
| P Global Small Cap Equities | MSCI World Small Cap Net Total Return Index | 5.5% | 14.7% |
| Q AIMCo Balanced Composite | AIMCo Composite: 38% Equity 26% Fixed Income 36% Illiquid Assets | 4.9% | 6.8% |
| R Inflation | Consumer Price Index | 1.9% | 1.3% |

*Expected risk in standard deviation terms.

¹ Annualized return forecast consistent with the underlying asset class, not benchmark.

² Annualized risk forecast consistent with the underlying asset class, not benchmark.

Chart 1: Efficient Frontier and Asset Class Forecast



Source: AIMCo

Global Economic Scenario



As U.S. households have mostly deleveraged back to the long-term debt-to-income ratio average during the pandemic, consumers are expected to see disposable income grow at a decent pace in the footsteps of the economic recovery of 2021-2022. The U.S. will benefit from competitive wage costs, an expanding labour supply and continued productivity gains over the next decade. However, there is a risk that protectionist measures, such as trade tariffs with respect to China and other countries, and current immigration restrictions may not be removed swiftly, potentially harming key sectors of the U.S. economy. However, as trend inflation could undershoot the Federal Reserve target for a period, benchmark policy interest rates are expected to rise gradually over time, thereby keeping monetary policy relatively accommodative for the first few years of our forecast period.



Canada is likely to experience gradual gains in productivity growth as the digital economy progresses. This growth lever, however, could be somewhat offset by increased competition for skilled migrants from the U.S., impeding Canadian labour force growth. This is expected to result in long-term potential growth slightly lower than in the U.S. Potentially fewer small businesses, the main engine of the economy, and challenges to the energy infrastructure policy should also weigh on business investment growth. However, the diversified sector composition of the economy and an easing of “Buy America” procurement plans should help to support trade and long-term growth, albeit regionally unbalanced.



In China, long-term potential growth is expected to gradually ebb as the economy rotates away from export-led and becomes more focused on domestic consumption. Moreover, China's aging population is an unfavourable labour force trend. Upside risk to long-term growth will hinge on China's continued reorientation of exports towards higher value-added economic sectors focussing on the digital economy in a self-reliant fashion. In addition, the government is likely to continue opening its financial sector and undertaking targeted reforms of its state-led enterprises. Monetary policy is expected to aim at macro-prudential measures to contain leverage across domestic economic sectors.



In the Eurozone, the long-term potential growth of the world's most trade-oriented regional economic block will be under pressure as the nascent global process of re-shoring manufacturing capacity gradually takes hold. Alongside continued youth underemployment, the shrinking working-age population is also expected to challenge labour force expansion, growth and inflation prospects. On the positive side, the coronavirus crisis and Brexit process triggered progress in coordinating European governance and fiscal union discussions, potentially paving the way for impactful structural reforms.



In Japan, long-term potential growth is expected to remain challenged due to weak demographic trends and sluggish inflation. In response, we expect monetary policy to remain in easing mode for the foreseeable future. One long-term support, however, is that Japan became more embedded into Asian supply chains over time, a positive given the continued Asian regional trade integration process. Additionally, Japan stands to benefit from sitting at the higher end of the value-added product chain.

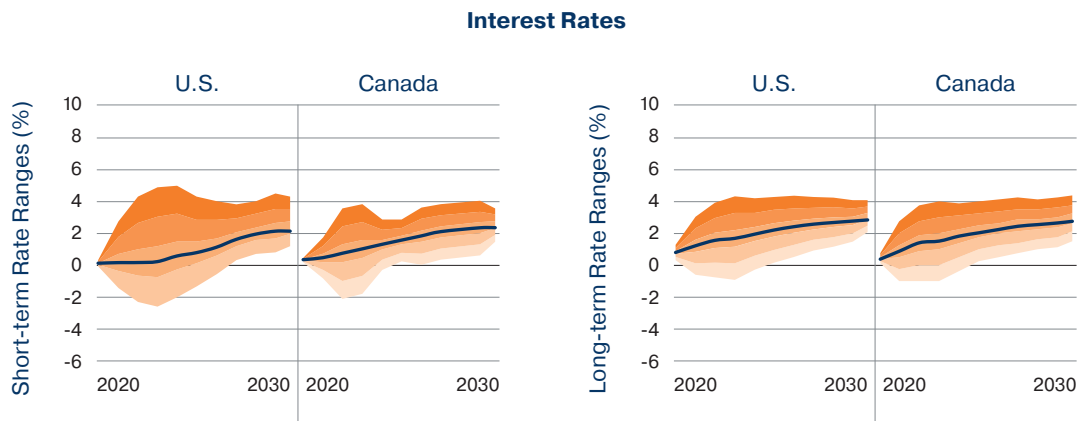
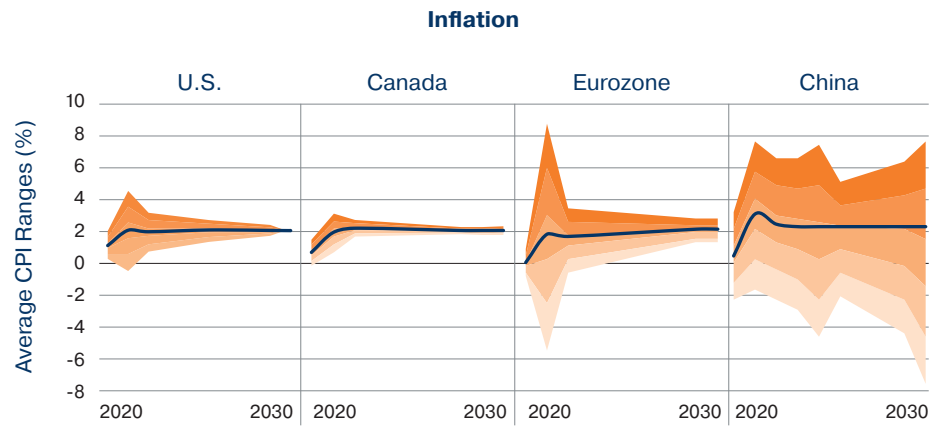
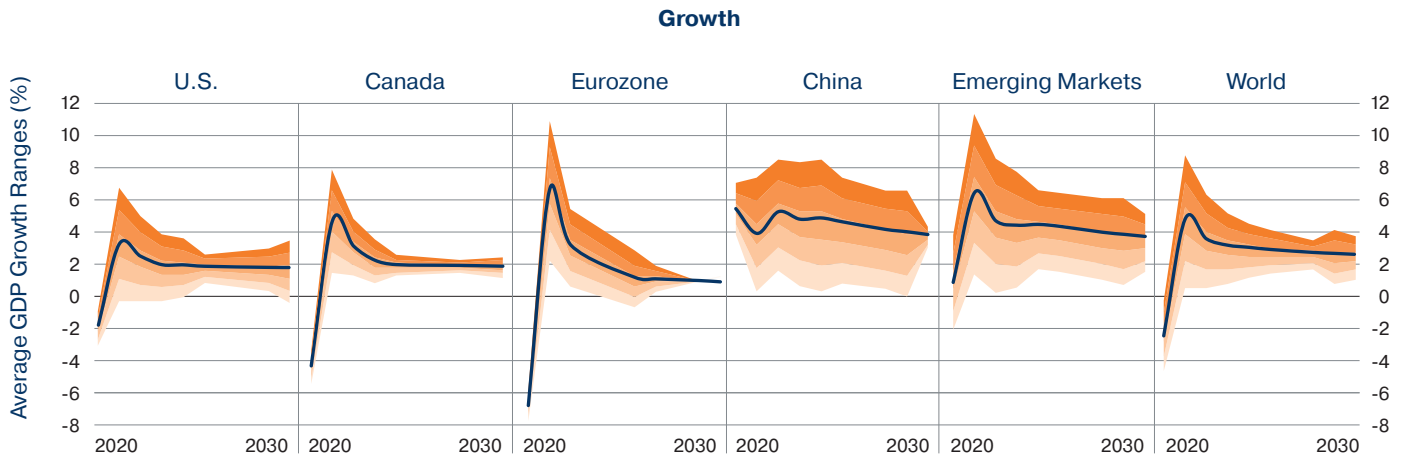


Emerging markets are expected to continue seeing consumption and investment being bolstered over the long term as their middle class grows larger and, aside from China, workforce growth will remain robust in comparison to developed economies. Social and economic inequity may also take time to be resolved in the aftermath of the pandemic given the more feeble structure of certain emerging economies. Finally, in the short term, mild manufacturing re-shoring may hamper emerging markets to some extent but the shift of developing economies towards idea-intensive sectors should ultimately prove to be a boost to their long-term prospects.

Range Forecast

In line with last year's theme which focused on the idea that variations around our central return and risk expectations are important for a comprehensive understanding of the outlook, we show the distributions surrounding the main macroeconomic variables. The distributions in **Chart 2** illustrate the range of uncertainty embedded in AIMCo's long-term economic scenario. The centre mid-point (dark blue line) is used in the AIMCo 10-year forecast.

Chart 2: Economic Scenario



Topic of the Year: Considering Climate Change in Long-Term Forecasting

AIMCo has been closely assisting clients with their strategic asset allocation processes for years with its annual 10-year forecast exercise. Every year we keep looking for ways to further enhance our capital market forecasting process. In this year's publication, we have incorporated certain climate change considerations into the financial return outlook. Components of climate systemic risk include physical, natural catastrophic events and chronic weather pattern change, as well as the regulatory and market response such as carbon pricing and consumer behaviour.

While acknowledging any model limitations, the approach undertaken is a two-step process with the assistance of our macroeconomic modelling partner, Oxford Economics. We first take account of the link between changes in carbon emissions and temperature. Secondly, the economic output impact caused by the relationship between temperature variations and productivity growth is estimated. Since many of the underpinnings of the asset classes' building blocks are grounded on long-term macroeconomic assumptions, financial returns implications are then derived as alternatives to our central scenario.

We begin by highlighting that, in the long term, global warming may affect either infrastructure or the labour productivity required to generate economic growth. In assessing the potential effects of global warming, we follow the approach of the United Nations' Intergovernmental Panel on Climate Change (IPCC) whereby a chief driver of warming resides in greenhouse gas (GHG). The IPCC has previously reported on different warming scenarios, the Representative Concentration Pathways (RCPs), where GHG

emission levels corresponded to a range of warming degrees above the pre-industrial average. We next make use of the existing levers of our global economic model to convert our baseline scenario in terms of oil, gas and coal output into carbon emissions. This translation is achieved via the carbon intensity of each fuel source. The final step is to use a linear relationship to extrapolate the impact of carbon emissions into temperature changes, consistent with the IPCC scenarios. Note that various countries or regions are expected to respond differently in economic terms to changes in temperature.

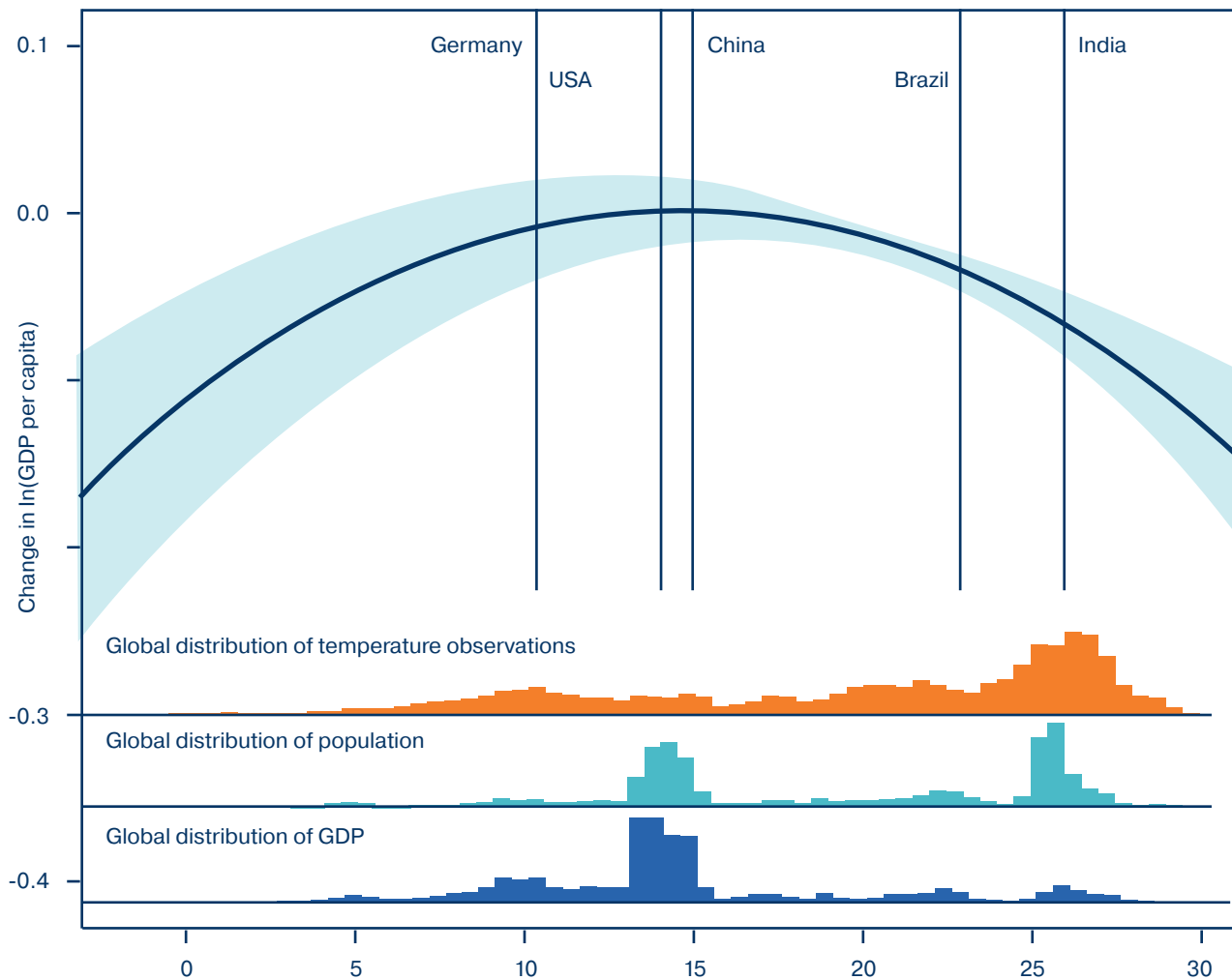
The concluding part of the two-pronged approach is grounded on Oxford Economics research as well as a seminal 2015 academic paper² which links GDP growth to temperature transitions. This technique is similar to the one employed by the International Monetary Fund to gauge climate impacts. The model utilizes a non-linear relationship between the country-specific annual average temperature³ and GDP per capita growth. **Chart 3** illustrates that countries located in warmer locations, such as Brazil and India, might experience significant negative impacts on trend growth from even a slight increase in warming. In comparison, colder northern countries would need to witness a much larger warming scenario before the economic activity trajectory is permanently impaired. Those countries may, in fact, benefit from some degree of added climatic warming.

2. Burke, Hsiang and Miguel (2015), "Global non-linear effect of temperature on economic production".

3. Global temperature and rainfall data from a University of Delaware database: <http://climate.geog.udel.edu/~climate/>. Precipitations were found not to have a significant impact on GDP growth.



Learn more about AIMCo's use of scenario analysis to identify risks and opportunities related to climate change in the 2020 Responsible Investment Report available on aimco.ca.

Chart 3: Relationship Between Annual Temperature and Growth

Source: Oxford Economics

Similar to the approach taken by many international institutions, we utilize scenario analysis to assess the climate change impact on investment returns. In other words, the specific global warming paths we have chosen are not a forecast of what is likely to happen, but rather a reflection of the range of possible outcomes given the complexity of climate change.

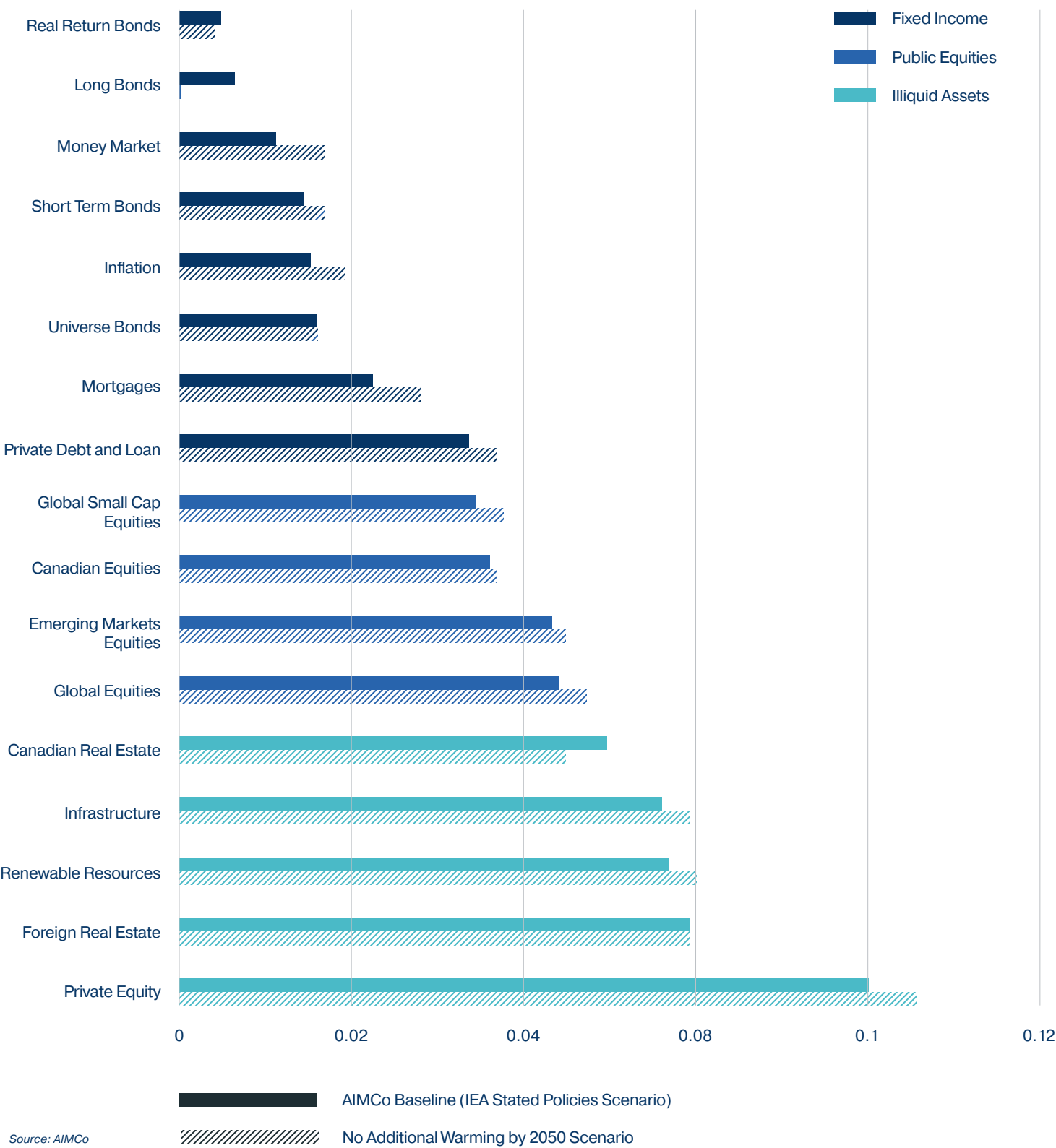
While our central scenario accounts for one degree of additional warming between 2020 and 2050⁴, we have also modelled our long-term forecast with no further warming and the warming implied by the International Energy Agency (IEA) Sustainable Development Scenario (SDS) in terms of carbon emissions. Global warming has a non-linear effect on macroeconomic variables that accumulate over longer time horizons. For the investment horizon covered by our long-term forecasts

(up to 2030), the impact of the IEA's SDS alternative scenario of reduced carbon emissions is in line with our baseline scenario (IEA's Stated Policies) across asset classes.

It is not surprising that the impact of reduced carbon emissions on temperature and productivity growth takes a few decades to affect the economy and asset returns. In contrast, the no-additional-warming alternative scenario results in higher inflation and, generally, better asset returns in the long term, as shown in **Chart 4**. There are also potential sectoral impacts, which is beyond the scope of our long-term forecast. We expect to complement this initial climate-aware long-term forecast, limited to the carbon emissions-temperature channel, with sensitivity analyses in future work, taking into account carbon pricing, carbon capture patterns, energy demand, etc.

4. The IEA's Stated Policies scenario maps somewhere between SSP2-RCP4.5 and SSP4-RCP6.0. This suggests global warming of 2°C by 2050 or, alternatively put, a warming equivalent to one additional degree over this horizon compared to year-end 2019 global temperature levels.

Chart 4: Investment Return Comparison in Different Climate Change Scenarios



Forecast by Asset Class — Fixed Income

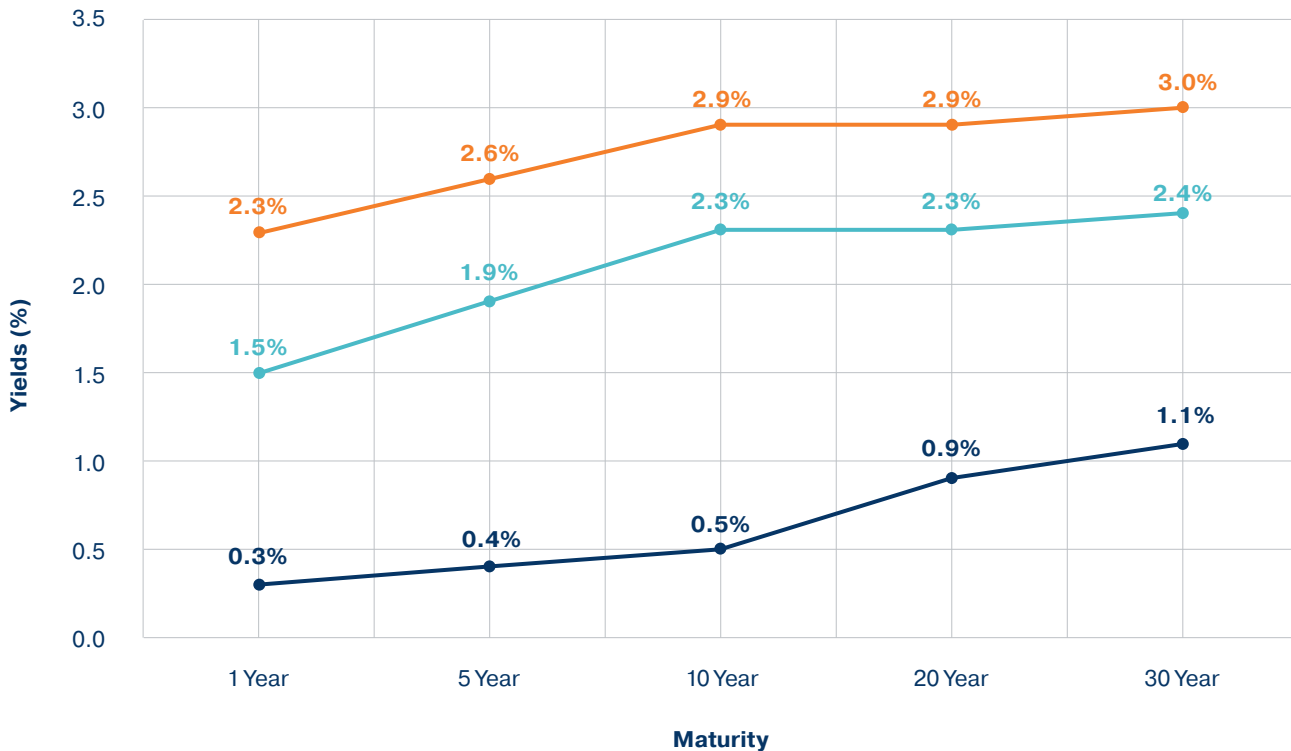
Overview

The significant monetary policy support from the Bank of Canada (BoC), in response to the pandemic effect, is expected to stay in place in the foreseeable future. The front end of the Canadian sovereign yield curve will therefore be anchored to the current, near-zero levels over the next couple of years. However, as the economic recovery gets underway and with the fiscal stimulus potentially adding further growth, we expect the yield curve to gradually both steepen and rise.

The bulk of this interest rate rise is expected to happen over the medium term. The return from longer-duration fixed income securities will be under pressure over that same horizon before recovering over the second half of the next decade (see 2030 yield curve in **Chart 5**).

Our economic growth forecast projects a level of support to credit spreads and therefore riskier fixed income products. This is not to suggest growth-oriented assets, such as credit products, will not see any short-term pull backs, but rather is our expectation of the average trend over the next 10 years. AIMCo's Private Mortgages portfolio, which is a new addition to our 2021 forecast, is projected to generate a reasonable return over the next decade, as is Private Debt and Loan.

Chart 5: Canadian Sovereign Yield Curves 2021 Economic View



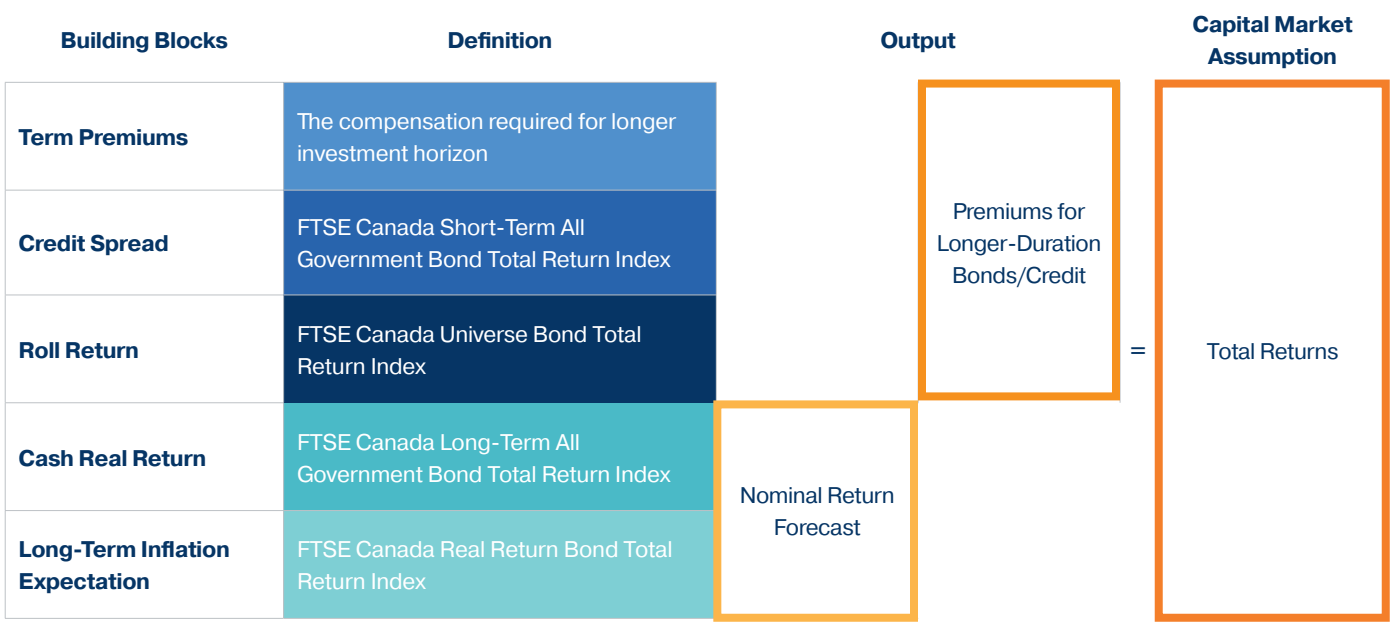
Source: AIMCo

— 2021 Yield Curve — 2025 Yield Curve — 2030 Yield Curve

Building Blocks

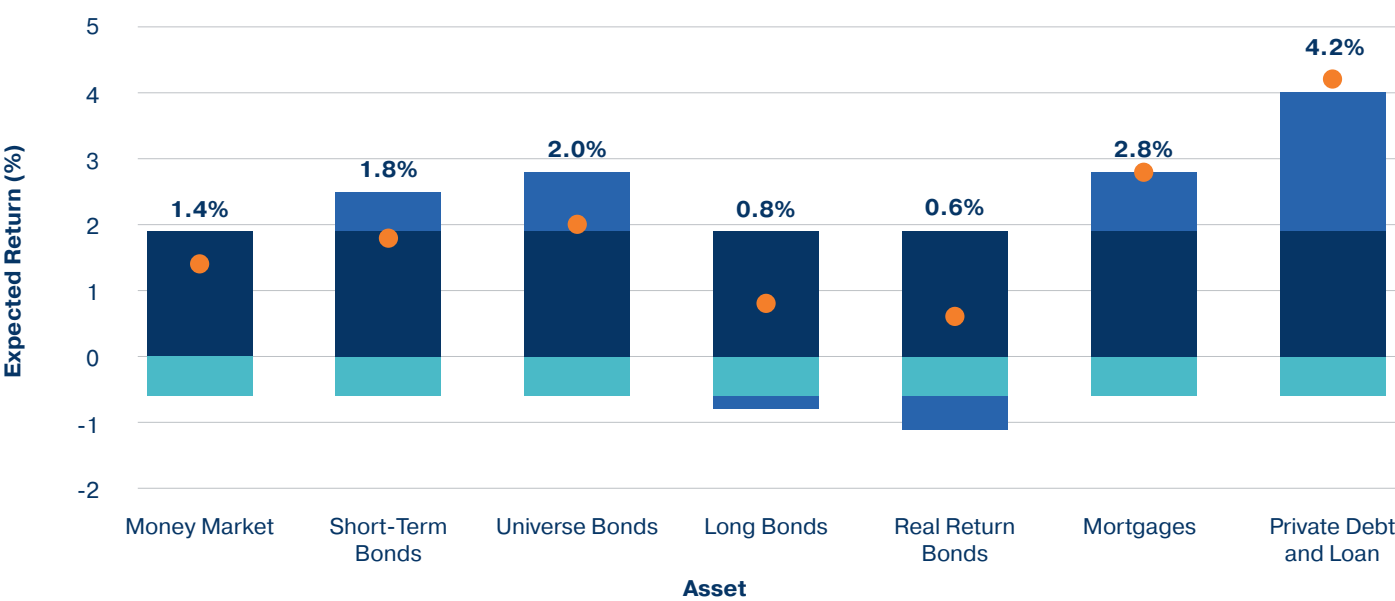
AIMCo’s fixed income capital market assumptions are based off interest rate forecasts, term premiums, roll returns, and credit spreads/expected default loss. These underlying components are consistent with our global, long-term economic scenario.

Chart 6: Building Blocks of Fixed Income Return Assumptions



Source: AIMCo

Chart 7: Building Blocks for Fixed Income Assets



Source: AIMCo

Inflation

Cash Real Return

Bond Premiums

Total Return

Sub Asset Classes

Money Market



Benchmark Description

FTSE Canada 91-Day T-bill Index

Market Comments

We expect that money market returns will be negligible for an extended period. Longer-term forecasts remain challenging as they are highly dependent on assumptions made about the progression of the pandemic, the timeliness and effectiveness of treatments and the degree to which changes to patterns of work and consumption become entrenched. The Bank of Canada has indicated that they expect to maintain the target for the overnight rate at the effective lower bound until inflation is sustained above 2%, sometime in 2023. That assumes vaccines become widely available by mid-2022. However, recent developments suggest an acceleration of that timeline. Regardless, nominal returns for this asset class will continue to be very low and real returns are expected to remain negative for several years.

Universe Bonds



Benchmark Description

FTSE Canada Universe Bond Total Return Index

Market Comments

Since the onset of COVID-19, global central banks have strongly telegraphed that they will keep interest rates low and monetary conditions stimulative for an extended period. This will likely keep government bond yields out to the 5-year maturity point muted versus history for several years, with yields for maturities out to 10 years still weighed down by that short-term anchor to unusually low yields. Bonds with maturities greater than 10 years have the flexibility to price in greater optimism about a normalization in the economy, hence having a greater chance in showing a trend to higher yields. Taken all together, however, the large weight of low-yielding bonds in the short- to mid-term area of Universe bonds is likely to keep returns low for several years.

Short-Term Bonds



Benchmark Description

FTSE Canada Short-Term All Government Bond Total Return Index

Market Comments

There is likely to be a persistent economic output gap in Western economies as a result of the ravages of COVID-19. In addition, many global central banks, including the Bank of Canada, are seen to be extra patient in seeing economies rebound to generate a sustained overshoot of their inflation mandates. As such, an anchoring of the Canadian Bank of Canada rate near zero seems likely for many years. This would result in lower annual returns compared to the past.

Long Bonds



Benchmark Description

FTSE Canada Long-Term All Government Bond Total Return Index

Market Comments

As is typical, long bonds have the most two-sided risk of the bond universe. While long-term bond yields have plummeted due to the effects of COVID-19, they optically display a considerable amount of yield pickup versus shorter-dated bonds. In a world starved for yield and still looking for hedges against riskier assets, long bond portfolios still have the potential to generate significant gains if long government bond yields plunge further towards 0%. Given the low starting point of long bond yields, however, a material backup in long bond yields would result in a period of negative performance. If central banks, with help from fiscal authorities, can generate sustained inflation then the likelihood of poor performance is high. But the recent experience of Japan, with both low rates and high government spending, does not yet foreshadow this outcome.

Real Return Bonds



Expected Return

0.6%

Expected Risk

7.7%

Benchmark Description

FTSE Canada Real Return Bond Total Return Index

Market Comments

The heavy presence of central bank quantitative easing policies is felt significantly in the real return bond sector. Financial repression helped along by the macro response to COVID-19 has put the entire Canadian and U.S. real yield curves in negative territory. From the current starting level of real yields, the prospect of achieving significant positive returns rests on some combination of even more financial repression and higher-than-expected inflation. Real yields could go even more negative, thus producing a positive return, if the central banks are successful in generating inflation while at the same time keeping nominal bond yields compressed due to continued central bank bond buying. This higher inflation would also boost the return of real return bonds. Alternatively, the sector is not well positioned for an unexpected return to disinflation.

Private Debt and Loan



Expected Return

4.2%

Expected Risk

4.5%

Benchmark Description

FTSE Canada Short-Term Overall Index

Market Comments

Private debt and loan investments protect clients against a rise in interest rates due to the short duration/short effective life of the products. They also provide asset class diversification benefits due to the low correlation with traditional fixed income investments.

The returns are primarily driven by the all-in interest income net of loan losses. The all-in interest income for senior loans comprises a base rate plus a credit spread. Post pandemic, the base rate is forecasted to remain low for a number of years until central banks start to increase interest rates. The credit spread tends to widen during or after a recession as the economy recovers, and then tightens as the credit cycle matures. Over a 10-year period, however, we forecast the credit spread, on average, to be consistent with the level observed in historical credit cycles. Similarly, the loan losses, driven by default rates and loss recovery rates, are expected to be consistent with historical experiences over a long run.

Mortgages



Expected Return

2.8%

Expected Risk

2.6%

Benchmark Description

60% FTSE Canada Short-Term Overall Index + 40% FTSE Canada Mid-Term Overall Index + 50 bps (Previously FTSE Canada Universe Bond Total Return Index)

Market Comments

Private mortgages provide clients with consistent monthly cash flow and long-term capital preservation. Mortgage loans are less liquid than marketable fixed income securities therefore enabling a risk premium or spread over government bond yields.

Upon the onset of the COVID-19 pandemic, Canadian commercial mortgage spreads widened given risks associated with economic shutdowns and lack of liquidity. As the economy reopened, there were improvements in the overall real estate market and as a result, commercial mortgage spreads started to tighten. Currently, Canadian commercial mortgage spreads are in line with longer-term averages. Looking ahead, commercial mortgage spreads are expected to remain relatively stable with potential for further tightening given the competitive Canadian market and robust lender appetites. Although impacts on hospitality and retail sectors have been evident, it will take time to fully understand the long-term effects of COVID-19 on commercial real estate and commercial mortgage lending.

Forecast by Asset Class — Illiquid Assets

Overview

An important differentiating factor for private markets is the relative uniqueness of each asset. Although similar classes of assets, for example office real estate buildings, have resembling characteristics, any attempt to create a generalized forecast will necessarily overlook, to some degree, the nuances of AIMCo's private asset portfolios. Nevertheless, capturing the broad risk and return dynamics of private assets (as with public markets) ensures we provide a timely perspective to our clients in their strategic decision-making processes.

Our 2021 forecast paints a favourable picture for all private assets on a combination of strong earnings growth potential and a favourable valuation starting point. The diversification benefit from owning such private assets further adds to the case for an expanded ownership of these products in order to meet long-term liability requirements.

Currently, on behalf of our clients, AIMCo invests in private Canadian real estate, foreign real estate and private equity, infrastructure and renewable resources globally. The building blocks, explaining the sources of return for each private asset class are discussed in their respective sections.

Sub Asset Classes

Real Estate — Canadian and Foreign

Canadian Real Estate



Expected Return

6.2%

Expected Risk

8.4%

Benchmark Description

REALpac/IPD Canadian All Property Index — Large Institutional Subset

Foreign Real Estate



Expected Return

7.4%

Expected Risk

8.8%

Benchmark Description

MSCI Global Region Property Index

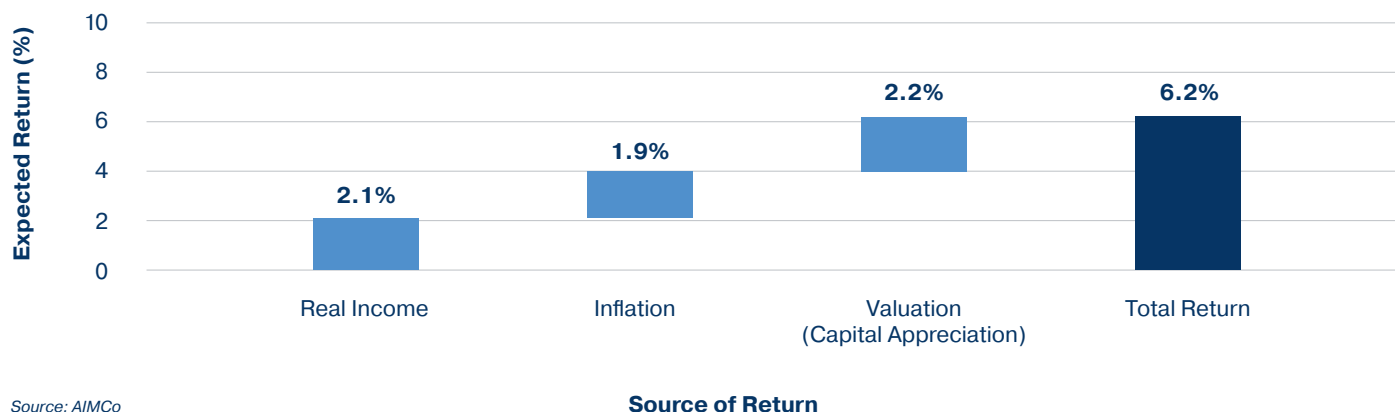
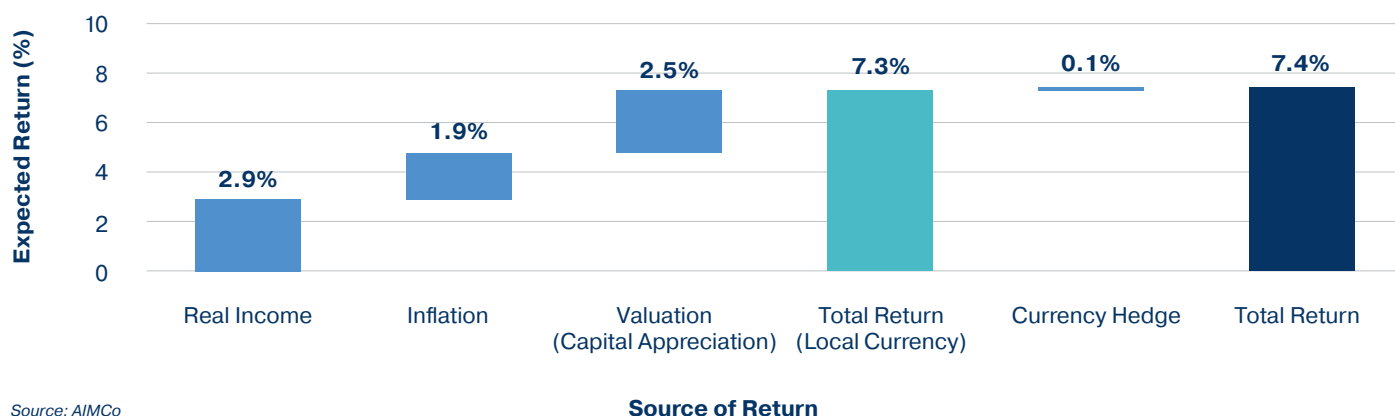
Building Blocks

For real estate, current income yield, expected inflation and yield curve assumptions are amongst the variables used to determine long-term return forecasts. We model the asset class using a capitalization rate (cap rate) approach. The beginning real estate yield is used as one of the primary inputs. Real estate yields are forecasted using a pass-through rate of Canadian CPI inflation.

Forward real estate cap rates are derived from a combination of the current cap rate, the duration-matched nominal government bond rate scenario and real GDP growth of the respective countries which are parts of the foreign real estate benchmark. The cap rate path is used to determine the valuation change.

For Canadian real estate, the real income yield averages at 2.1% over the next decade and inflation averages at 1.9%. We expect the valuation component from this asset class to grow by 2.2% in the long term. Taking these building blocks together, we are forecasting a return of 6.2% in Canadian dollar terms.

For foreign real estate, we expect benchmark-weighted inflation rates in the global markets affecting our foreign real estate program to stabilize in the long term, around 1.9%. The income stream from this asset class is expected to grow, on average, by 2.9% in the long term. The valuation component is expected to grow, on average, at 2.5%. Taking these three building blocks together means a foreign-currency expected return of around 7.3% for foreign real estate over the long term. We expect a modest currency conversion effect which rounds up to 0.1%, bringing our forecasted return to 7.4% in Canadian dollar terms.

Chart 8: Building Blocks for Canadian Real Estate**Chart 9: Building Blocks for Foreign Real Estate****Market Comments**

COVID-19 has brought about varying impacts depending upon sectors and geographies due to market composition and supply chains. Some of the hardest-hit real estate sectors included most retail activity, due to the decline in shopping footfall, and dense urban offices as the occupancy patterns changed dramatically given government-mandated restrictions related to working from home. In contrast, the increase in e-commerce saw demand growing for last-mile distribution warehouses. Whether the changes will persist in the aftermath of the pandemic remains to be seen. We expect the retail and office cap rates to rise and the large negative valuation trends to remain in place through at least 2021, as a result of the uncertain demand disruption. The long-term return projections are therefore expected to be negatively impacted by the magnitude of the value downdrafts.

Secular trends influencing real estate investment continue to evolve according to the demand characteristics of the market. Demographics, with the growing influence of millennials, are moving office space to more flexible and smarter buildings. The trend towards the digital economy will continue to play a role with the locations and buildings in attracting entrepreneurial talents. Urbanization trends will also likely increase real estate demand in dense areas.

Infrastructure



Expected Return
7.0%

Expected Risk
11.9%

Benchmark Description

Total CPI 1 Month Lagged + 450 bps (5-year rolling average)

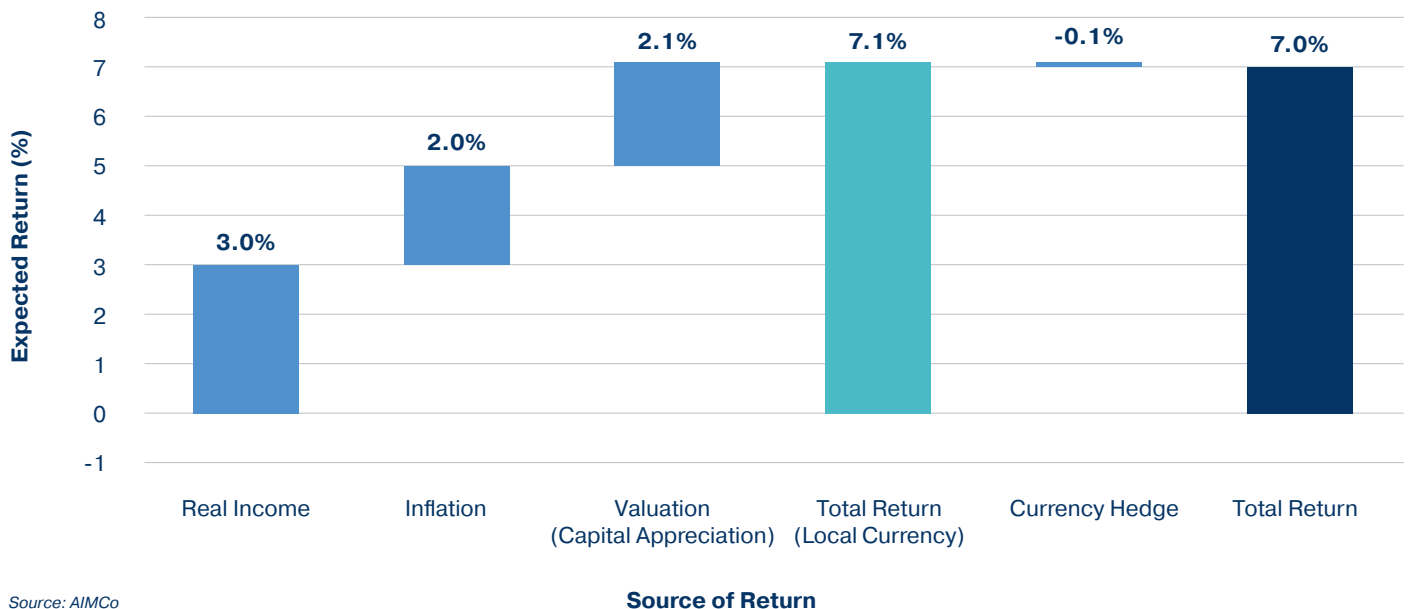
Building Blocks

Infrastructure, like real estate and renewable resources, provides both inflation protection and an income stream to investors. Among other possible approaches to model the future returns for this asset class, we adopted a cap rate model which captures the growth and income potential of infrastructure assets and provides consistency in modelling compared to real estate and renewable resources.

In our model, the real income yields are tied to underlying economic variables and averages at 3.0% over the next decade. Inflation provides 2.0% additional gain as part of the inflation

protection afforded by infrastructure assets. We expect the valuation component from this asset class to grow, on average, by 2.1% in the long term. Taking these three building blocks together means we expect a local-currency return of around 7.1% for infrastructure over the long term. We expect a modest currency conversion effect which rounds up to -0.1%, bringing our forecasted return to 7.0% in Canadian dollar terms.

Chart 10: Building Blocks for Infrastructure



Source: AIMCo

Market Comments

The COVID-19 pandemic is unprecedented in terms of events and impact on underlying asset classes. In the infrastructure space, most sub-sectors have held up relatively well with only temporary demand depression, given their essential service nature (e.g. utilities). In general, we expect activity levels to remain subdued in the near term and begin to quickly revert to more normalized levels over the medium term. Some specific sub-sectors (e.g. transport, airports) have had larger impacts, and the reversion to more normalized levels of activity will depend heavily on the efficacy of vaccines and their rollout.

As investors' appetites for infrastructure continue to increase, the supply of investable assets has not kept pace leading to a rise in pricing pressure. The amount of uninvested capital waiting to be deployed by infrastructure managers remains at record levels. Moreover, this uninvested capital continues to be more concentrated in fewer investment managers as mega-sized funds continue to grow, squeezing out smaller investment entities in their fundraising efforts. We believe this increased manager concentration will continue to mean high levels of competition in the infrastructure space.

Most infrastructure investors have responded to these trends by either focusing on investment strategies intended to gain core asset exposure as efficiently as possible or, alternatively, shifting to more value-oriented, non-core strategies that offer relatively higher return and risk. The level of interest for Environmental, Social and Governance (ESG)-focused investment strategies for infrastructure has continued to increase dramatically. Recent decarbonizing initiatives announced by various policy makers across the globe may represent a tremendous, long-run source for opportunities in infrastructure investments going forward. Such a large-scale energy transition will likely also represent a significant long-run risk for assets which cannot mitigate their carbon exposure.

Although new infrastructure assets are expected to become available to the market via privatizations and new development activity, these new assets will only partially address the continued strong demand for investable infrastructure assets. As such, the expectations for core assets will likely reflect continued return compression given the strong overhang in uninvested capital. Pricing pressure on non-core assets is, however, expected to be less homogeneous with greater differences across sub-sectors and geographies.

Renewable Resources



Expected Return

7.1%

Expected Risk

8.6%

Benchmark Description

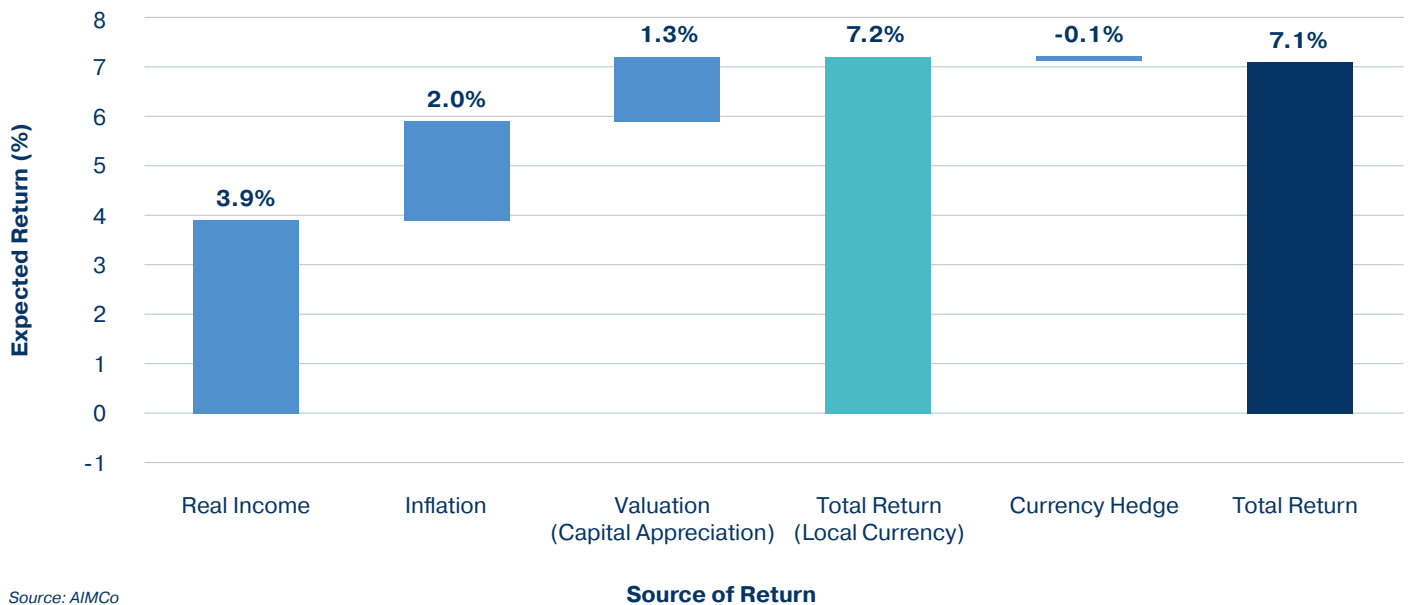
Total CPI 1 Month Lagged + 450 bps (5-year rolling average)

Building Blocks

Renewable resources fall into the same category as infrastructure and real estate in terms of providing a private income and inflation protection for AIMCo clients. This asset class has expanded from its roots in timberland investments and now also includes agriculture. We utilized the same cap rate model as discussed in the previous section. Given the diversity of the investment universe within the renewable resources asset class, the estimates used in the building blocks to form our expected return for this product should be interpreted as a blended average for timberlands and agriculture.

The assumptions for the building blocks used to forecast long-term return for renewable resources are shown in **Chart 11**. AIMCo's geographic exposure of renewable resources means inflation expectations and the income growth potential projected for this asset class are tailored to our assets. We expect a long-term return of around 7.1% in Canadian dollar terms for renewable resources.

Chart 11: Building Blocks for Renewable Resources



Source: AIMCo

Market Comments

Although most timberland and agriculture operations have continued as essential services throughout the COVID-19 pandemic, the market impact for forest and agriculture products varied widely during 2020. In the short term, market uncertainty will likely persist and until COVID-19 restrictions relax, demand for forest products is expected to be dampened by a lower level of economic activity.

The medium to long-term prospects for both timberland and farmland remain positive. Growing middle class populations globally will intensify demand for forest and agricultural products. At the same time, supply of arable land to grow trees and crops is finite and decreasing due to competing land uses and climate change in some countries.

Competition for timberland and farmland investments in lower-risk economies has become stronger over the last decade, leading to more expensive valuations and lower expected returns. New investors are entering the asset class seeking returns with low correlations to traditional asset classes and a mix of income, capital preservation and land price appreciation.

ESG considerations are a growing focus in timberland and farmland and will present both challenges and opportunities over the next decade.

Private Equity



Expected Return

10.0%

Expected Risk

13.7%

Benchmark Description

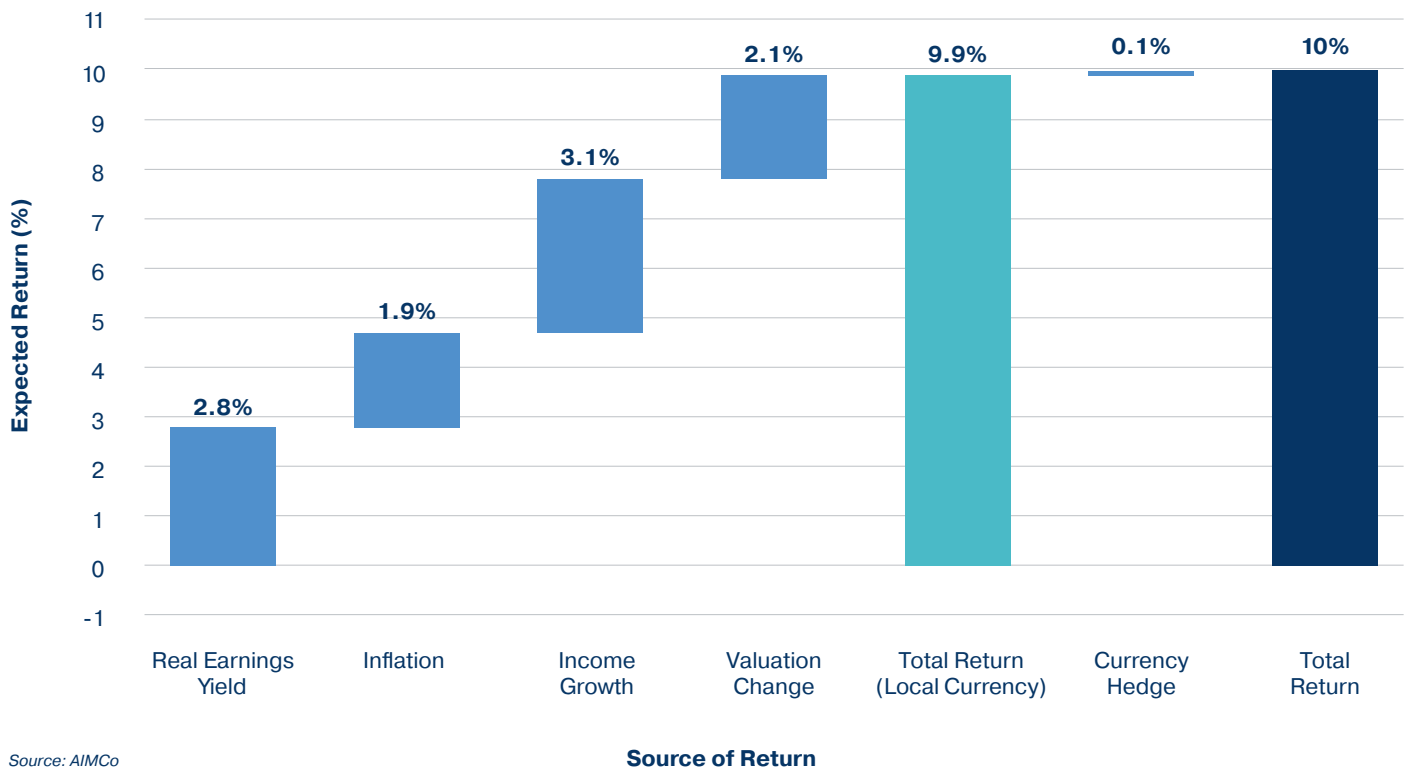
Total CPI 1 Month Lagged + 650 bps (5-year rolling average)

Building Blocks

Our private equity model has similarities to the building block approach used for public equities. While in the case of public equities, we explicitly provide an expectation for certain sources of return to investors, namely dividend and buyback, we use an earnings yield measure in our private equity model. Our modelling framework is based on a recent AQR working paper⁵. Similar to the AQR model, we use public equity markets (in our case, the MSCI World Index) parameters to estimate a starting earnings yield of 2.6% that will, over the long term, converge to a historical average of 3.0%. As a result, we factor in an average yield of 2.8% for our private equity model. The real growth is expected

to average 3.1%, based on our economic forecast for real GDP growth globally. Similarly, a world inflation expectation of 1.9% will boost our return projection for the next decade. Valuation is a more challenging metric to forecast over the long term. We used two metrics from data provider Preqin, namely “weighted net multiple” and “residual value to paid-in” ratio. Both metrics indicate a downward trending valuation for private equity in recent years. By averaging the effect of the convergence of both metrics, from their current starting value to their long-term average, we expect 2.1% valuation gain for private equity in future. The aggregated effect of all these building blocks, adjusted for currency effect, translates to 10% expected return for private equity over the long term.

Chart 12: Building Blocks for Private Equity



5. [Demystifying Illiquid Assets: Expected Returns for Private Equity](#), AQR Whitepaper 1Q19, by Antti Iltanen, Swati Chandra, Nicholas McQuinn

Market Comments

Private equity continues to be an attractive asset class. In the first nine months of 2020, private equity deals accounted for 15% of global M&A activity amounting to more than 5,500 private equity transactions, the highest year-to-date volume ever. Although dry powder has been on the rise since 2012, deal values declined 6% over the same period last year in part due to COVID-19 dislocations. Nevertheless, we expect deal volume in early 2021 to remain elevated as private equity firms continue to have substantial dry powder and are able to access the bond and leveraged loan markets to finance deals.

In terms of sectors, industrial companies and technology companies accounted for 41% of private equity deals as we neared the end of 2020. There also continues to be deal flow from large conglomerates that divest non-core divisions in need of operational transformation.

Digital expertise and ESG factors continue to emerge as sources of competitive advantage for investors. The best private equity firms are able to apply in-house digital and ESG capabilities to portfolio companies. This can make the underlying business models more mission critical for end customers and generate strategic value for the next buyer at exit.

Forecast by Asset Class — Public Equities

Overview

In spite of the most tumultuous year in living memory, global equity markets will close out what may prove to be a truly exceptional decade of market returns. Long gone are the days of the GFC where stocks traded at low multiples of trough earnings. Broadly, valuations in global equities are already at elevated levels, implying that future returns over the longer term should be more modest than what we have experienced for the past 10 years. Yet the global pandemic of 2020 has challenged

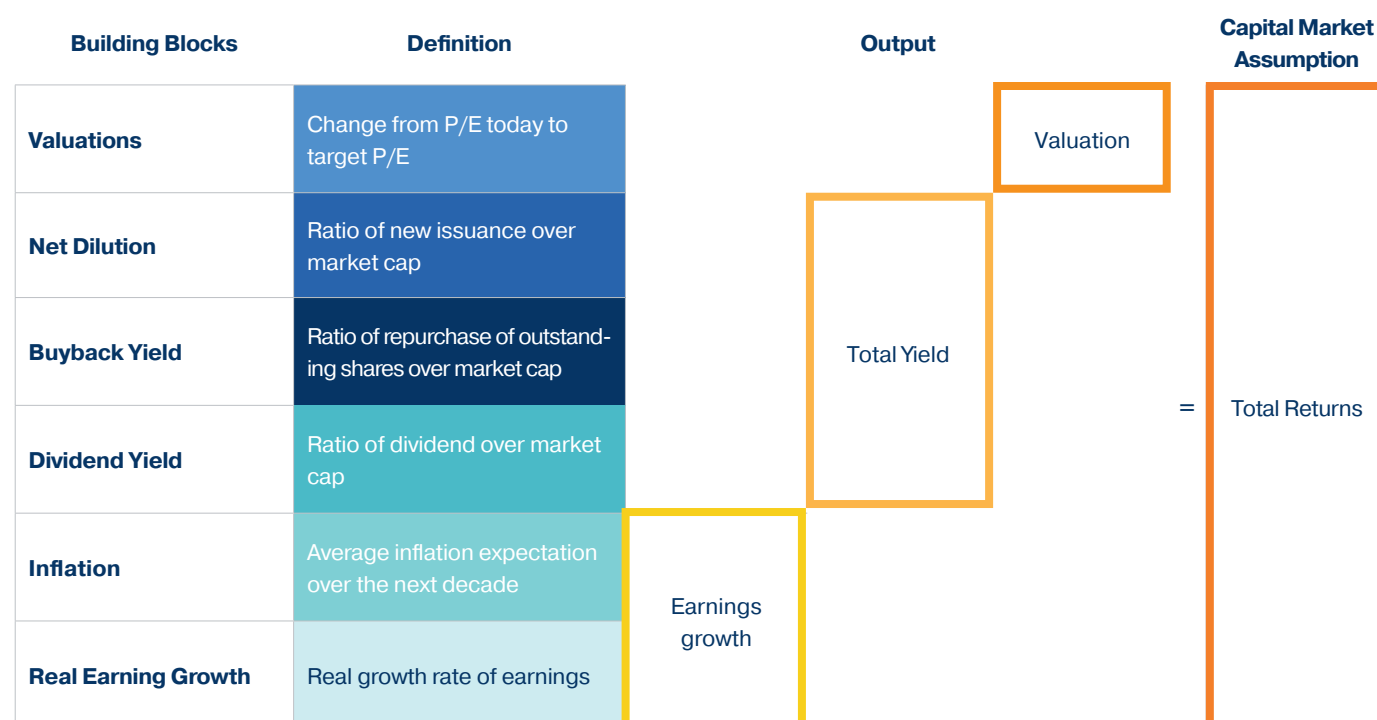
so many conventional market assumptions, having witnessed both the steepest recession ever recorded and the sharpest rebound within the space of a calendar year. A key component of historically high valuations has been the staggering decline in corporate earnings that occurred during the COVID-19-induced economic slowdown, while the expansionary fiscal and monetary policies of central banks globally have kept markets liquid and resilient.

Building Blocks

A select number of variables are modelled to forecast long-term equity returns. AIMCo considers such variables as valuations, earnings growth, dividend yields and net buyback yields. AIMCo incorporates currency view through conversion to Canadian dollar.

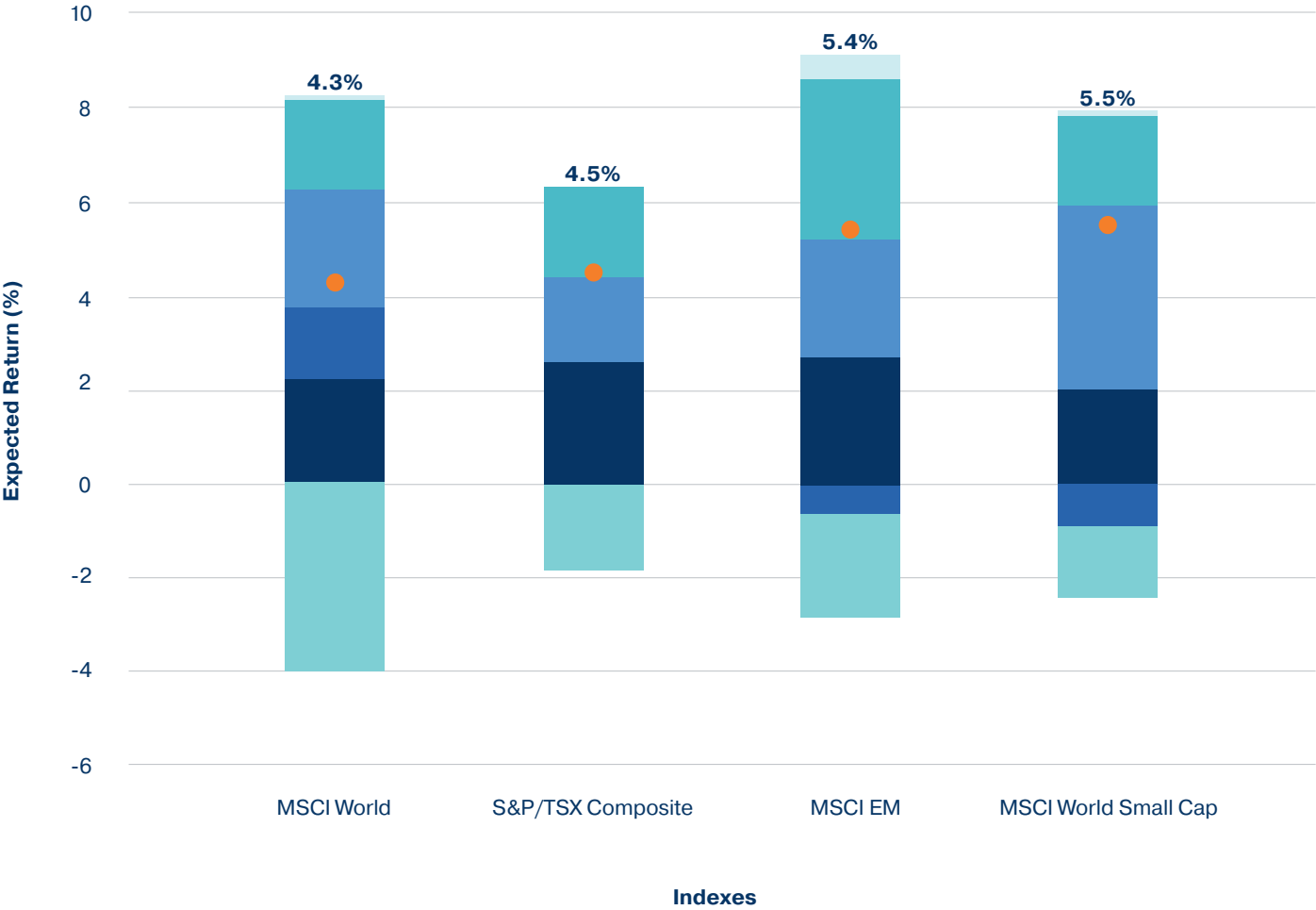
For public equities' benchmarks, we define the expected return as being the combination of total yield (dividend yield and net buyback yield), expected trend growth (g) in earnings per share EPS, and expected change in valuations (Δv). That is: $E(r) \approx DY + g + \Delta v$

Chart 13: Building Blocks of Public Equities Return Assumptions



Source: AIMCo

Chart 14: Building Blocks for Public Equities Indexes



Source: AIMCo

● Dividends ● Net Buybacks ● Real Growth ● Inflation ● Valuation Change ● FX Effect ● Total Return

Sub Asset Classes

Global Equities



Expected Return

4.3%

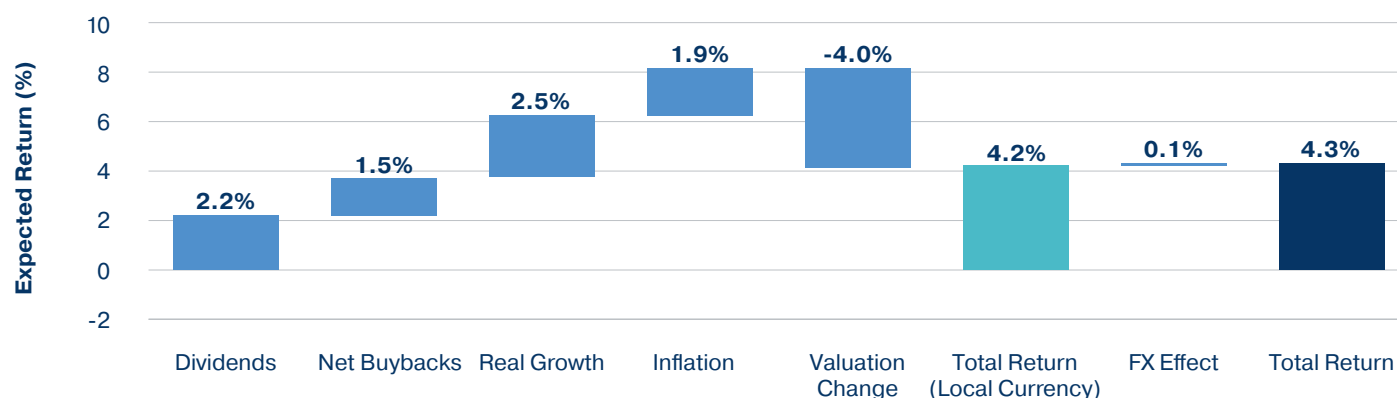
Expected Risk

12.3%

Benchmark Description

MSCI World Net Total Return Index. The index captures the return of large and mid-cap stocks across 23 developed markets.

Chart 15: Building Blocks for MSCI World



Source: AIMCo

Source of Return

Market Comments

Within global developed equities, U.S. markets appear the most highly valued when compared to history, while European equity markets are more attractively priced. Within global equity markets, and in the U.S. equity market in particular, extended valuations are concentrated in a few sectors including Information Technology, Consumer Discretionary and Industrials. Emblematically, the work-from-home trade became so narrow in a market context bereft of growth. This will no doubt present a headwind for global developed equities, where investors will increasingly look beyond 2021 as a transitional year to normalized earnings.

In developed Europe, Australia and Japan, valuation opportunities will need to be balanced with low-growth prospects, massive fiscal stimulus programs to finance and the growing acceptance that a response to climate change is increasingly consensual

regardless of political affiliations, yet not without substantial cost implications. Japan, perhaps, offers the best return prospects, given lower relative valuations, comparatively strong corporate balance sheets and a virtual “equity market put” courtesy of the Bank of Japan. Within this context, global developed equities will also need to respond to the uncertainties linked to trade wars. From Brexit to “America First”, global developed equities will continue to respond to “trade tribalism” (i.e. trade protectionism), with blinkered earnings visibility and consequently, rising risk premia.

Canadian Equities



Expected Return

4.5%

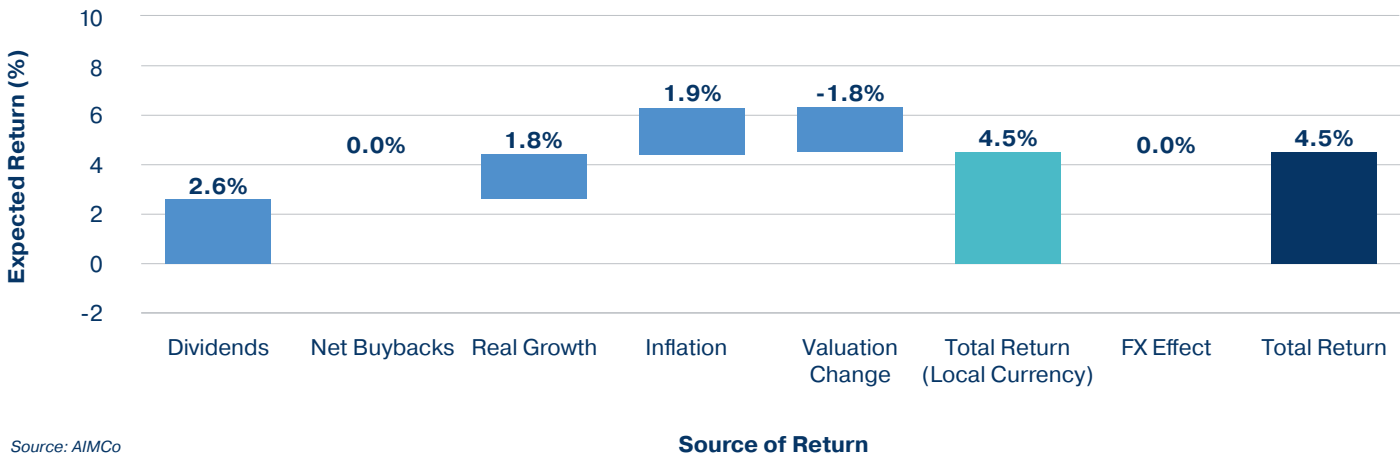
Expected Risk

16.1%

Benchmark Description

S&P/TSX Composite Total Return Index.
The index is a broad market index for the Canadian equity market.

Chart 16: Building Blocks for S&P/TSX



Market Comments

For Canadian equities, the global pandemic may yet have prompted a pro-cyclical rotation in a market that has shunned cyclicals in a low-interest-rate environment. Financials and Commodities, particularly Energy-related, have substantially

lagged in the post-GFC decade of recovery. Canadian equities are trading at an attractive valuation discount to U.S. markets due to their concentration in Financials, Materials, Industrial and Energy sectors.

Emerging Market Equities



Expected Return

5.4%

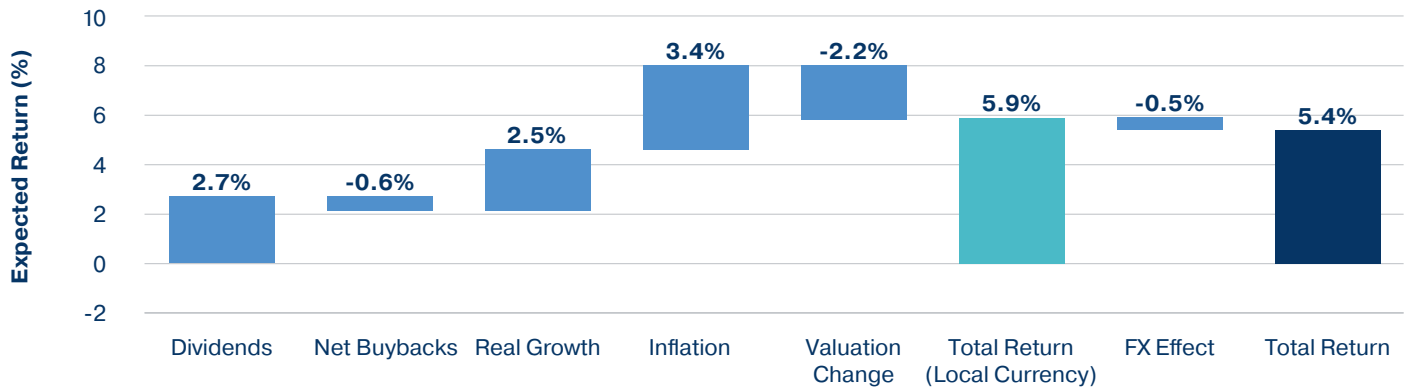
Expected Risk

17.3%

Benchmark Description

MSCI Emerging Markets Net Total Return Index. The index captures large and mid cap companies across 26 emerging market countries.

Chart 17: Building Blocks for MSCI Emerging Markets



Source: AIMCo


Source of Return

Market Comments

In emerging markets, we are optimistic that higher nominal economic growth and generally lower relative valuation metrics to global developed markets will provide a bid to equities.

The generally young populations in key emerging markets should also positively impact the global pandemic recovery in both wellness and corporate earnings.

Global Small Cap Equities



Expected Return

5.5%

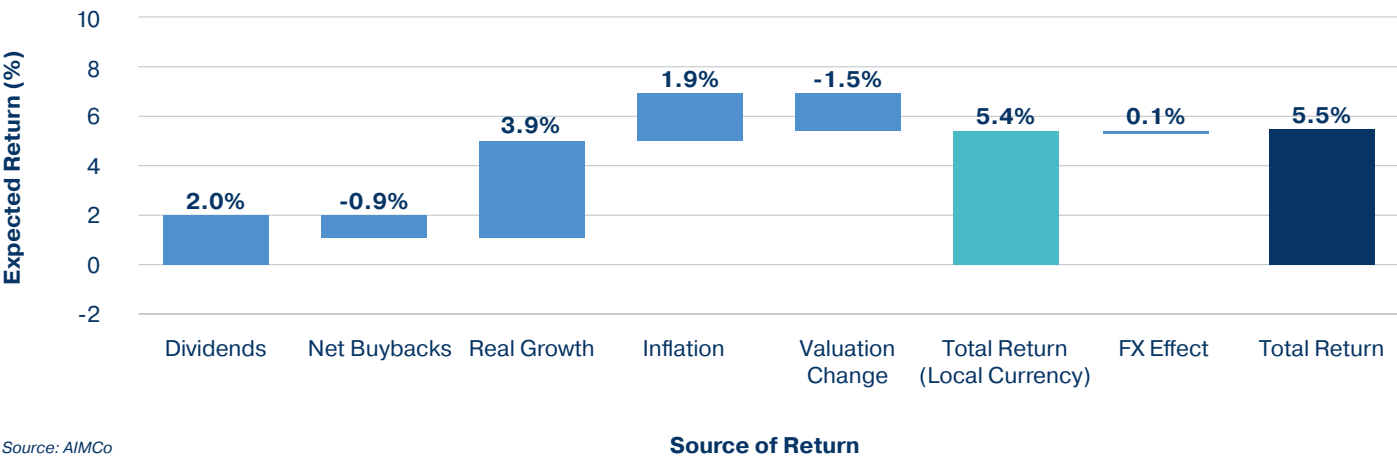
Expected Risk

14.7%

Benchmark Description

MSCI World Small Cap Net Total Return Index. The index captures the return of small cap stocks across 23 developed markets. Generally, these stocks have a market capitalization of less than USD 10 billion.

Chart 18: Building Blocks for MSCI World Small Cap



Market Comments

Like their larger cap brethren, small caps have become more expensive during 2020. Throughout history, smaller companies have tended to outperform in the initial stages of an economic recovery, boding well in a post-pandemic scenario. Starting with a historically large valuation tailwind compared to large caps,

global small caps offer particularly good value compared to larger companies. Should this valuation disparity continue amid a global economic recovery, small caps may offer the added benefit of capital returns from mergers and acquisitions.

Chinese Equities



Expected Return

7.0%

Expected Risk

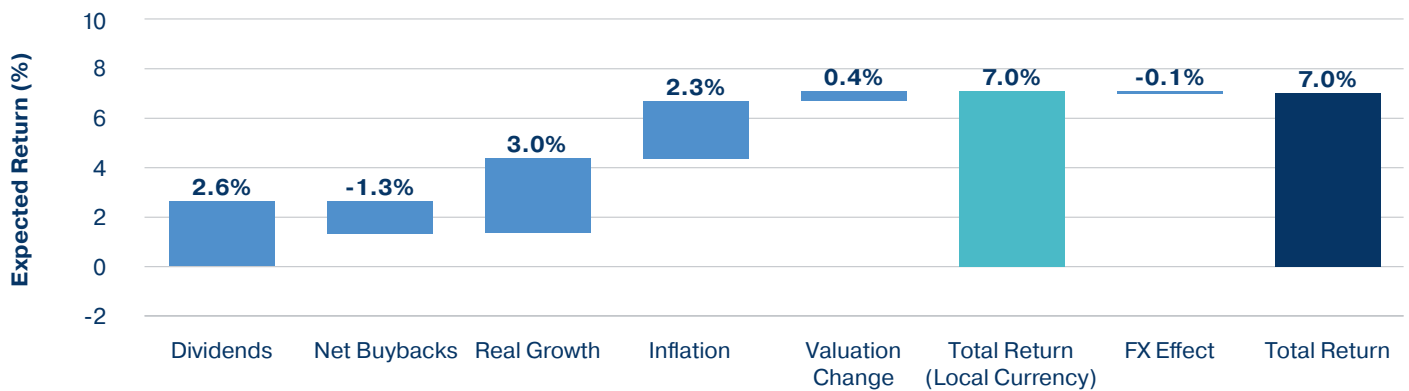
21.4%

Index Description

Shanghai Shenzhen CSI 300 Index. The index is a free-float weighted index that consists of 300 A-share stocks listed on the Shanghai or Shenzhen Stock Exchanges.

AIMCo expects to increase the focus on China's equity market in the coming years. Currently, we invest Chinese equity in the global equity pool.

Chart 19: Building Blocks for Shanghai Shenzhen CSI 300



Source: AIMCo

Source of Return

Market Comments

We remain convinced that the world's second largest equity market presents tremendous opportunities. For various reasons, and unlike global developed markets, mainland Chinese equities are dominated by retail investors rather than tenured institutions.

We believe that this will continue to be the case for the foreseeable future, which suggests a high potential for market inefficiencies, valuation discrepancies and therefore attractive implied sources of alpha.

Risk Forecast Methodology

The AIMCo 2021 long-term risk forecasts are volatility estimates, which are useful for building portfolios based on a mean-variance optimization analysis. However, investors should also consider the broader concept of risk, including tail risks, which can be measured by Value at Risk (VaR) and Expected Tail Loss (ETL). In addition, some assets, (e.g. real return bonds) may exhibit high volatility, but they help diminish inflation risk, which is important to investors sensitive to inflation. Although we will not cover the details of alternative risk measures, we would like to highlight the importance of understanding these dynamics, which can become particularly relevant in investment decisions.

AIMCo has implemented a VAR-GARCH-DCC⁶ statistical model for risk forecasting. This model was proposed by Nobel laureate Robert Engle and Kevin Sheppard to estimate time-varying covariance matrices through the concept of Dynamic Conditional Correlation (DCC) estimators in 2001. The DCC estimators are combined with a multivariate VAR-GARCH in a parsimonious manner to estimate correlation matrices.

The following considerations are given during the modelling process:

- We employed a multivariate time series model, which is a suitable choice when both volatility and correlation vary over time. The use of time series with varying volatilities across time to model asset return data is also supported by extensive academic literature.
- We used an asymmetric Student's t-distribution to incorporate skewness and kurtosis exhibited by most asset class historical statistical distributions.
- We ensured the benchmarks would be provided at a high frequency with the requirement of trying to capture the true, underlying volatility properties of the respective asset classes.
- We extended the benchmark historical data for modelling purpose.
- We selected the risk benchmarks either in accordance with the AIMCo official asset class benchmarks or researched liquid proxies.
- For the 2021 long-term risk forecasts, we introduced new proxies for benchmark volatility modelling. Specifically, we used EDHEC 300 for infrastructure, NCREIF Indexes for renewable resources and Cambridge Associate Index for private equity modelling. The indexes are more in line with the illiquid asset characteristics and the change results in a decrease in correlation between illiquid assets proxies and public assets.

The expected risks and correlations have also been reviewed by AIMCo's Chief Investment Officer and the Risk Management group.

Currency Forecast Methodology

To convert non-Canadian market returns to Canadian dollar terms, we adjust the expected return for a portion of the differential in expected inflation between other economies and Canada. The rationale is to somewhat equalize countries with relatively high inflation, which could reasonably be expected to have depreciating currencies, and countries with low inflation which could have appreciating currencies. Since the inflation pass-through mechanism is different between developed markets and emerging markets, we use different assumptions.

6. Vector Auto Regressive - Generalized Autoregressive Conditional Heteroscedasticity - Dynamic Conditional Correlation

Disclaimer

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