2023 Edition

Long-Term Asset Class Assumptions

AIMCo

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Joint CIO and CFMO Message

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Last year was challenging for global financial markets. The persistent rise in inflation caught many central banks off guard, forcing them to undertake the most aggressive interest rate hiking cycle seen in decades. This resulted in a significant repricing of risk, which saw bond yields rise and global equity values fall. The silver lining is that valuations across many public market asset classes have become more attractive.

These starting points are important drivers that feed into our forward-looking expectations for financial market performance and are reflected in our 2023 Long-Term Asset Class Assumptions, which we are pleased to present in this report. This year we have again included a forecasted range of outcomes to complement our baseline estimates. Considering a range of expectations is always a prudent practice and reflects the fact that the path ahead remains highly uncertain. We must consider the possibility that the world may be facing a regime shift away from what we've become accustomed to over the past ten years: lengthy economic cycles, minimal geopolitical risk and low inflation that contributed to an environment of easy monetary policy and muted volatility. For instance, an environment where both inflation and interest rates are somewhat higher versus history may also be contemplated. For each asset class, we have decomposed our return forecast into the building blocks that have proven to be reliable estimates of forward-looking risk and return.

In 2022, higher discount rates and greater economic uncertainty caused global equity prices to experience their largest annual decline since the Global Financial Crisis (GFC). As the threat of stagflation and recession continues to cloud global growth outlooks in the short term, the compression in valuation multiples makes for a more favourable outlook over the longer term. Yet there is still some disparity across markets. Valuations in the United States for example, continue to be priced at a premium relative to Europe, Canada, and Emerging Markets. Emerging markets are also expected to benefit from higher nominal growth relative to developed markets over the next decade.

Interest rates across most of the world are significantly higher than they were at the end of 2021, which has improved future return expectations for fixed income investments. As we enter 2023, nominal rates may be near a cyclical peak as most major central banks have signalled that they are nearing a pause in their rate hiking cycle, but interest rates and inflation may remain higher than we have been accustomed to over the past decade, at least in the medium term. Against this backdrop, the expected income that can be generated throughout the life of a bond has increased, which now accounts for the bulk of fixed income returns over the forecast horizon.

We're pleased to present a more in-depth examination of the outlook for short-term interest rates, which is our spotlight topic this year. As always, we look forward to continuing the dialogue around this forecast and exploring how we can further enhance our clients' portfolios as a result.

AIMCo 2023 Long-Term Assumptions

The long-term capital markets assumptions have become a staple deliverable for our clients at the beginning of each calendar year. At its heart, it provides long-term return and risk forecasts for 17 asset classes, broadly split into fixed income, public equities and illiquid assets. By forecasting various macroeconomic variables and economic scenarios along with modelling different components or building blocks, we arrive at reasonable risk and return expectations over a 10-year time horizon.

While we broadly follow the same proven process every year, we are constantly evolving our processes and methodologies to improve our forecasting ability. Introduced in last year's forecast, and presented again this year, we have included a range of forecasted returns for each asset class to supply our readers with a more robust picture of return expectations. These values can be found in the Long-Term Forecasted Return Ranges.

Return Assumptions

Our 2023 forecast is based, similar to last year, on expectations of a challenging global macroeconomic backdrop as we enter a period of materially slower growth in the near term. In 2023, we expect many countries to experience above-target inflation and tight monetary policy from central banks. We anticipate inflation decline this year, albeit potentially remaining higher than levels witnessed prior to the pandemic. Government bond yields, over the forecast horizon, are expected to remain relatively high, at levels closer to the ones seen before the Global Financial Crisis.

Given market developments over 2022, the outlook is more attractive for public equities over the next decade in comparison to last year's forecast. On the valuation side, price-to-earnings (P/E) ratios have improved from last year, more in line with their long-term average, if not lower in some cases (i.e. there is room for multiple expansion). Earnings growth is expected to remain healthy due to a combination of increased support from the inflation pass-through and robust demand globally.

Illiquid assets continue to exhibit high return-to-risk ratios. Overall, current private asset valuations are less expensive in comparison to last year, resulting in a reduced drag on returns. Illiquid real assets can be significantly impacted by macroeconomic factors such as inflation and real yields. However, they can also provide a degree of protection against inflation as these investments can pass through a portion of inflation to end-users.

Risk Assumptions

The risk forecast is based on the same methodology (VAR-GARCH-DCC[1] 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 a more accurate market return distribution to capture the so-called "fat tails". Additional details can be found in the Risk Assumptions Methodology section.

[1] Vector Autoregressive - Generalized Autoregressive Conditional Heteroscedasticity - Dynamic Conditional Correlation.

Overview

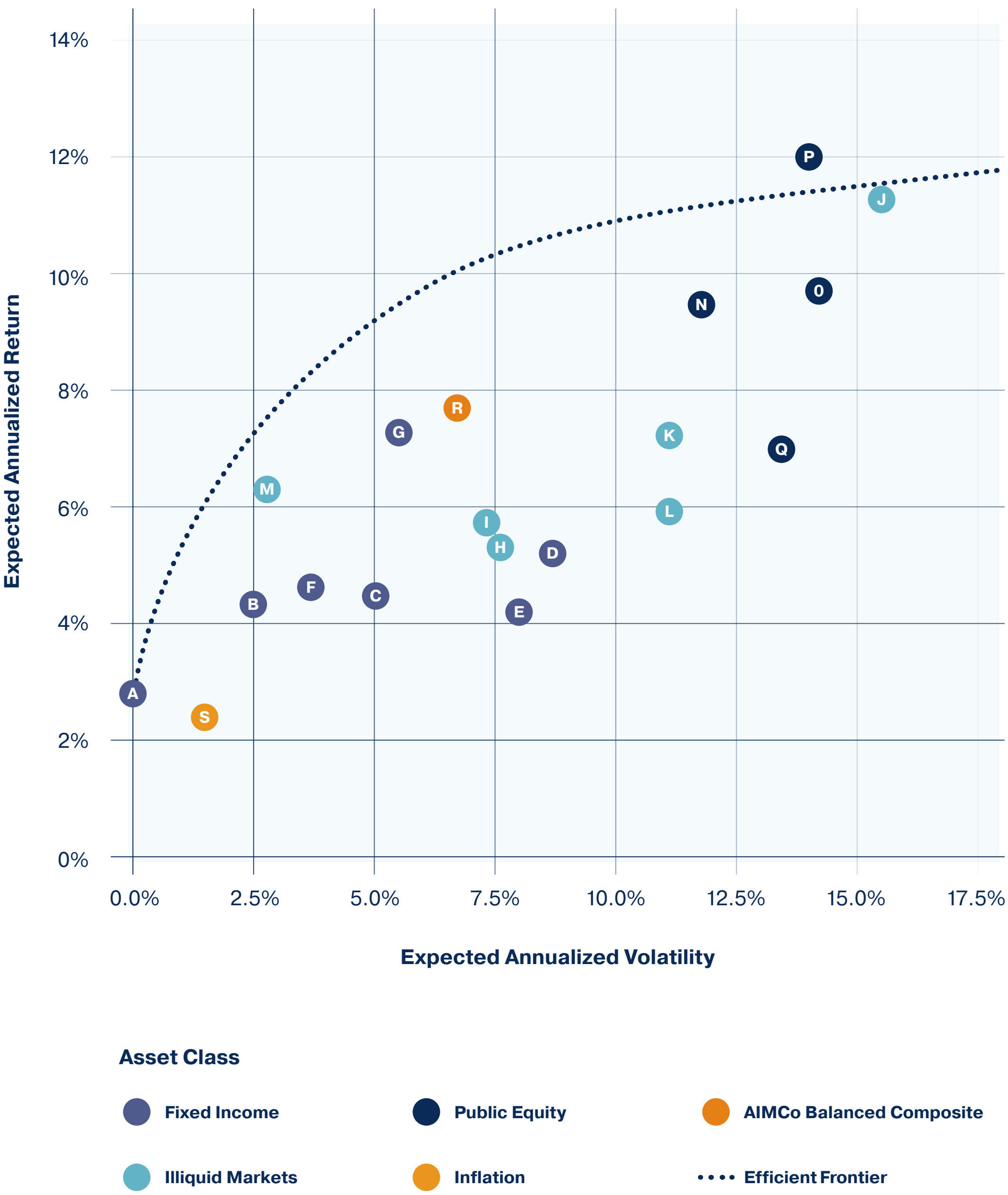
By taking into account both long-term return and risk expectations, we can envision an efficient frontier that incorporates all our forecasts. Putting it all together, a balanced portfolio (represented by AIMCo's aggregate balanced fund), is expected to achieve a 7.7%[2] annualized return over the next decade.

Table 1: Forecasted Return and Risk 2023-2032

Asset Class	Benchmark	Expected Return	Expected Volatility
Fixed Income			
A Money Markets	FTSE Canada 30-Day T-Bill Index	**2.8%**	**0.1%**
B Short-Term Bonds	FTSE Canada Short-Term All Government Bond Total Return Index	**4.3%**	**2.5%**
C Universe Bonds	FTSE Canada Universe Bond Total Return Index	**4.5%**	**5.0%**
D Long Bonds	FTSE Canada Long-Term All Government Bond Total Return Index	**5.2%**	**8.7%**
E Real Return Bonds	FTSE Canada Real Return Bond Total Return Index	**4.2%**	**8.0%**
F Private Mortgages	60% FTSE Short-Term Overall Bond Index and 40% FTSE Canada Mid-Term Overall Bond Index + 50 bps	**4.6%**	**3.7%**
G Private Debt & Loan	40% S&P/LSTA Leveraged Loan Index + 40% S&P European Leveraged Loan Index + 90bps	**7.3%**	**5.5%**
Illiquid Markets			
H Canadian Real Estate	REALpac/IPD Canadian All Property Index – Large Institutional Subset	**5.3%**	**7.6%**
I Foreign Real Estate	MSCI Global Region Property Index	**5.7%**	**7.4%**
J Private Equity	Total CPI 1 Month Lagged + 650 bps (5-year rolling average)	**11.3%**	**15.5%**
K Infrastructure	Total CPI 1 Month Lagged + 450 bps (5-year rolling average)	**7.2%**	**11.1%**
L Renewable Resources	Total CPI 1 Month Lagged + 450 bps (5-year rolling average)	**5.9%**	**11.1%**
M Absolute Return	Money Markets + 350 bps	**6.3%**	**2.8%**
Public Equity			
N Global Equities	MSCI World Net Total Return Index	**9.5%**	**11.8%**
O Canadian Equities	S&P/TSX Composite Total Return Index	**9.7%**	**14.2%**
P Emerging Markets Equities	MSCI Emerging Markets Net Total Return Index	**12.0%**	**14.0%**
Q Global Small Cap Equities	MSCI World Small Cap Total Return Index	**7.0%**	**13.4%**
R AIMCo Balanced Composite	AIMCo Composite: 38% Equity, 26% Fixed Income, 36% Illiquid Assets	**7.7%**	**6.7%**
S Inflation	Canadian Consumer Price Index	**2.4%**	**1.5%**

[2] This AIMCo balanced composite representation aggregates the asset class weights of our balanced fund clients. As such, it constitutes an illustrative return as it encompasses clients who may have very different portfolio objectives. This explains why such a weighted average of differing portfolios does not sit on the efficient frontier found in Chart 1.

Chart 1: Efficient Frontier and Asset Class Forecast[2]



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Long-Term Forecasted Return Ranges

Range Forecast

In last year's edition, we introduced forecast ranges to provide readers with a better understanding of the embedded variation within our central forecasts. We are pleased to present the analysis again this year. We have simulated scenarios around the major economic inputs to the various asset classes' building blocks to derive ranges for the expected returns.

Chart 2: Forecasted Return Ranges

Global Economic Scenario

U.S.

The U.S. enters 2023 with, generally, positive albeit waning cyclical momentum as outlook surveys such as PMIs and ISM point to declining economic activity. The ratio of job openings to unemployed people, or labour market tightness, stands high in historical terms but appears to be plateauing. This suggests that unemployment could rise this year alongside wage growth stalling. Private spending will continue to be boosted by a mix of excess savings and falling unemployment. Inflation is expected to continue moderating as base effects and lower housing inflation start having more significant effects. However, inflation is likely to remain uncomfortably above the Federal Reserve's 2% target. Overall, we project 2023 U.S. economic growth between 0% and 1% but downside risks to that scenario exist.

In the long term, as in past years, themes contributing to lower U.S. potential growth remain such as weaker demographics and Baby Boomers retiring leading to a shrinking working-age population, deglobalization, increased regulation and the plight of elevated public debt. However, more immigration-friendly policies introduced by the current U.S. administration may cause a rise in labour force growth and productivity. Monetary policy is expected to be kept less accommodative than before the pandemic, with benchmark policy interest rates remaining around current levels over time. Overall, we forecast the U.S. economy to grow around the 2% level on an annual basis for most of the next decade.

Canada

Canada's economy is expected to stall in 2023, as higher interest rates and a global slowdown flow through domestically. Consumer spending may ebb downward as excess accumulated savings during the pandemic wear off and the housing market decelerates further. This could lead to growth around 0% in 2023. Canadian inflation for 2023 will average, between 4% and 4.5%, with inflation from the services sector driving much of the elevated price pressures. This set of assumptions is also subject to downside risk.

Canadian structural potential growth could increase in the long term. It remains to be seen whether prospects for strong immigration gains could offset the aging population impact of reducing labour force growth. However, global opportunities related to the energy transition theme and reshoring may lead to a demand increase for Canadian goods and services over the long haul. In summary, Canada's growth is forecasted to average slightly above 2%, annually, in the next 10 years. In addition, we believe that various factors could lead to inflation sustainably above the 2% Bank of Canada's target (see "Topic of the Year" section for more) and, as such, interest rates could remain close to current levels over the forecast horizon.

China

We forecast China to grow at a faster pace in 2023 due to the reopening of its domestic economy. Growth could be in the range of 4% to 5% this year. China's continued property sector woes constitute a risk to the outlook.

In the long term, China's adoption of the "common prosperity" policy to reach a high-income status nation by 2025 and targeted industries for investment should support potential growth. Economic growth is expected to hover between 3.5% and 4.5% per year in the next decade as an ageing population crimps labour force growth. Monetary policy should continue to target measures to contain economy-wide imbalances.

Eurozone

The euro area is facing challenging conditions in 2023. Relatively high energy costs should continue to impact businesses and consumers, albeit not as dramatically forecasted in the fall of 2022. But a global economic slowdown may cause a more protracted decline in economic activity given the region's sensitivity to global trade dynamics. Lastly, with higher wage agreements taking hold by the second half of this year, inflation could be persistently above the 2% target of the European Central Bank.

Since the eurozone is the world's most trade-oriented economic block, it stands to be the most affected by the process of reshoring the global manufacturing capacity. Labour costs are elevated in that region. Furthermore, the Eurozone ranks second only to Japan in terms of risk of lower trend growth due to its shrinking working-age population. On the positive side, the region's focus on green economic policies and building a resilient energy infrastructure would involve material investments in the related sectors, in support of growth.

Japan

Japan recently experienced green shoots domestically as the country reopened in earnest post-pandemic. In 2023, domestic demand is expected to drive growth compared to external trade. Inflation is anticipated to continue being in line with the Bank of Japan's medium-term targets thanks to higher wage agreements.

In the long term, however, its potential growth remains hampered by an aging population. Conversely, Japan's industries could benefit from secular trends such as an increase in local manufacturing capacity, a rise in its share of the global electric vehicle market and industry automation product needs. Overall, growth is forecasted to be relatively sluggish and inflation to endure at the lower end of the central bank's expectations.

Emerging Markets

Emerging market (EM) countries, excluding China, are slated to enjoy a moderate return to a positive economic growth differential in comparison to developed countries in 2023. Leading economic indicators point to relative outperformance of their manufacturing sector despite the projected global slowdown as China's reopening has positive implications for the EM world. Consumer inflation has likely peaked across emerging markets and most central banks have reached terminal policy rates.

From a structural perspective, emerging markets continue to be less reliant on capital inflows and they continue to benefit from positive demographics and urbanization tailwinds which are supportive long term.

Climate Change

Climate change remains an important subject for AIMCo and our clients. We strive to identify and integrate environmental drivers into our long-term forecasting. Climate change was first introduced in our 2021 long-term asset class forecast and the baseline economic scenario in our 2023 forecast continues to incorporate an assumption of one additional degree of warming to 2050, globally, from levels observed at year-end 2019, in line with a current assessment of credible stated policies, policies susceptible to be implemented over this long horizon.

Topic of the Year

The “Natural” Short-Term Interest Rate

The price of money is one of the primary drivers of our capitalist societies. Interest rates represent the cost of money or the future cost of capital. As long-term investors, calibrating our strategies concerning this hurdle rate and its various impacts is of critical importance. For instance, should interest rates structurally shift higher versus recent history, certain fixed income assets would then become more attractive from a yield-generating standpoint whilst a potentially higher discount rate for cashflows may negatively impact the valuation of riskier assets. Furthermore, a higher cost of capital for most companies would change how they access capital, select capital expenditures and the nature of their cashflow streams. Finally, such an outcome may modify the level of attractiveness for certain investment strategies which, to some degree, use leverage to generate returns in the long term.

Central banks are deemed to lead the way in establishing the basic cost of capital our modern economies are facing via the conduct of monetary policy. They represent the central channel for the price of money. For monetary policy to be successful, central banks need to balance their various mandates which typically encompass aiming for stable prices and maximum employment. The key tool at their disposal in that pursuit is calibrating the interest rate they influence to balance inflation and jobs. Too low interest rates in the economy can discourage savings. Low rates may also lead to wealth inequality as only wealthier households may be able to save for retirement. Lower interest rates can keep unprofitable companies afloat, resulting in unproductive growth and can foster speculation and financial market bubbles. Conversely, too high interest rates can lead to balance sheet stress both for indebted households and corporations, restrictive credit growth, lower trend economic growth and potential market freezes.

The pricing of nominal interest rates has been trending downward since the Global Financial Crisis — hitting not only the zero lower bound but even threading into negative territory for certain jurisdictions up until the COVID crisis. Before the pandemic, extremely low or even negative nominal interest rates were deemed to be in line with the subdued global growth environment we have been experiencing since the early 2010s. The concept to explain such an occurrence is called secular stagnation. It posited that weak productivity and demographic growth would lead countries to be mired in a deflationary environment for an extended period.

The experience of the recent years suggests that we may have begun evading deflation fears for some time. Indeed, in 2022, the combination of pandemic-era spending and lingering supply chain challenges resulting from the coronavirus pandemic drove consumer prices to 40-year highs. In addition, the economic impact of the Russian invasion of Ukraine also led to significant price pressures. Global central banks responded by using their toolset to reduce aggregate demand and inflation via significantly increasing policy interest rates. However, inflation is still well above target at the time of writing.

Whether an economy would remain in a state of secular stagnation or able to reach the escape velocity status in the medium- to long-term could entail a significant impact on the final station in a central bank's interest rate normalization journey. That final monetary policy station is known as the neutral or natural short-term interest rate (R*). In essence, R* represents the "neutral" interest rate that is consistent with stable, non-inflationary growth in the longer term[3]. In other words, it is the interest rate that balances supply and demand when inflation is equal to expected inflation. A recent Bank of England report[4] confirmed that since the 1950s globally, slowing productivity growth and increasing longevity had been the two major factors driving trends in the real neutral rate across the 31 countries studied. Global inflation-adjusted R* rose from the mid-1950s (from 1.25%) to the mid-1970s (to 2.75%), declining since then (reaching -0.25% by 2015).

Are we then heading towards a renewed bout of secular stagnation, reverting to much lower interest rates in the long term once inflation declines in the next year, or is it the opposite situation and the hurdle rate for any financial investment has inched up structurally?

First, other than factors that structurally influence the supply of goods and services such as productivity growth and demographics (the latter for the supply of labour), various studies have highlighted other types of factors explaining the fall of R* through time. They can further be categorized under factors that influence the demand for goods and services (e.g. fiscal policy, too high savings rates resulting in low levels of investment, etc.) and the sensitivity of demand for goods and services to the real interest rate.

Secondly, based on the above findings, there are various arguments in favour of believing that the decline in R* will be persistent versus arguments favouring the view that headwinds are slated to fade. We have summarized such arguments in the table below (in no particular order):

Exhibit A

R* Decline To Remain Persistent	R* To Rise
Population aging leads to a smaller workforce and lower consumption and output growth.	A fall in the global household savings rate as the middle class ranks swell in emerging countries triggering a consumption and output boom.
A slowdown in productivity and output growth is caused by a decline in the pace of technological progress, chronic underinvestment, etc.	Productivity growth could increase over the next decade, perhaps by an incremental 0.5 to 1% versus current trends (1.1% y/y in the 10 years before the pandemic). Robots and investments in new technologies such as artificial intelligence could boost productivity gains.
The risk of too-aggressive tightening, much lower credit growth and expensive government debt forces central banks to remain accommodative at the risk of "zombification" of the economy and lower potential growth.	Inflation expectations could rise boosted by structural public deficits due to income redistribution policies by governments, higher prices for the commodities required for the energy transition or deglobalization.

Source: "The U.S. Economic Outlook and the Implications for Monetary Policy", Bill Dudley, New York Fed (July 31, 2016), "Three Remarks on the US Treasury Yield Curve", Olivier Blanchard, Peterson Institute for International Economics (June 22, 2016), M. Saunders, "Why neutral rates have risen and why it matters", Oxford Economics (January 2023), AIMCo Investment Strategy Research.

[3] According to the Swedish economist Knut Wicksell, the natural rate is the real short-term interest rate consistent with economic output equaling its natural rate (potential) and constant inflation to which it will converge over time. It can help to measure the stance of monetary policy, with policy expansionary (contractionary) if the short-term real interest rate lies below (above) the natural rate. In other words, close to the natural rate of unemployment while inflation is at the central bank target.

[4] Decomposing the drivers of Global R*, BoE (Cesa-Bianchi, Harrison and Sajedi), July 2022.

Overall, we acknowledge the population aging trend as a significant secular force potentially driving a low R* in the long term. That being said, we believe that on balance, the inflation expectations channel might overwhelm the impact of weak demographics as the world becomes more driven by inflationary trends such as policies centred on income redistribution, and deglobalization (or reshoring) alongside the cost of transitioning to a lower carbon economy.

While R* is unobservable, various academic models attempt to measure R* in the U.S., in particular[5]. Such forecasts embed a material degree of uncertainty; however, the Lubik-Matthes model estimated the median U.S. R* at 1.3% as of the end of the third quarter of 2022, for example. To conclude on the prospective range of outcomes for both Canadian and U.S. terminal short-term nominal rates (in nominal not real terms), we compare central bank research forecasts of R* versus estimates based on AIMCo's long-term baseline scenario in the table below:

Exhibit B

	Canada	U.S.
Range of terminal nominal short-rate based on Bank of Canada and Lubik-Matthes for the U.S.	2.0% to 3.0%	1.5% to 5.3%
AIMCo Baseline View vs Central Bank Estimates (as of January 2023)		
AIMCo range of terminal nominal short-rate forecast (2032)	Between 2.0% and 2.5%	Between 2.0% and 2.5%

AIMCo views are similar for both Canada and the U.S. and stand above the zero-lower bound for nominal short-term rates observed in the past, a sign that we are optimistic in averting a return to a so-called secular stagnation era. Moreover, our nominal R* range estimation is in line with the Bank of Canada's equivalent forecast. We note that our upper bound could move higher should Canada's immigration policy target become a reality alongside appropriate measures to provide more housing supply, which could further boost potential growth domestically. In summary, we anticipate Canada's terminal station for short-term rates to sit somewhat higher than what we have grown accustomed to in the last decade. Whether the Bank of Canada sets its base policy rate above or below the nominal R* will dictate if monetary policy is accommodative or restrictive. More importantly, our view implies that the cost of capital for our domestic economy may potentially have increased structurally from the zero-lower bound alongside the real long-term discount rate in risky markets and the hurdle rate for various client investment strategies. A new world?

[5] See Laubach, Thomas and John C Williams (2016): "Measuring the natural rate of interest redux," Business Economics, 51(2), 57-67 for a seminal version.
[6] Faucher et. al., "Potential output and the neutral rate in Canada: 2022 reassessment", Bank of Canada Staff Analytical Note 2022-3.
[7] Thomas A. Lubik and Christian Matthes, "Calculating the Natural Rate of Interest: A Comparison of Two Alternative Approaches," Federal Reserve Bank of Richmond Economic Brief 15-10, October 2015. Assumes the Federal Reserve is successful to bring core PCE inflation to the 2% target. Extracted on January 31, 2023 at www.richmondfed.org/research/national_economy/natural_rate_interest

Forecast by Asset Class

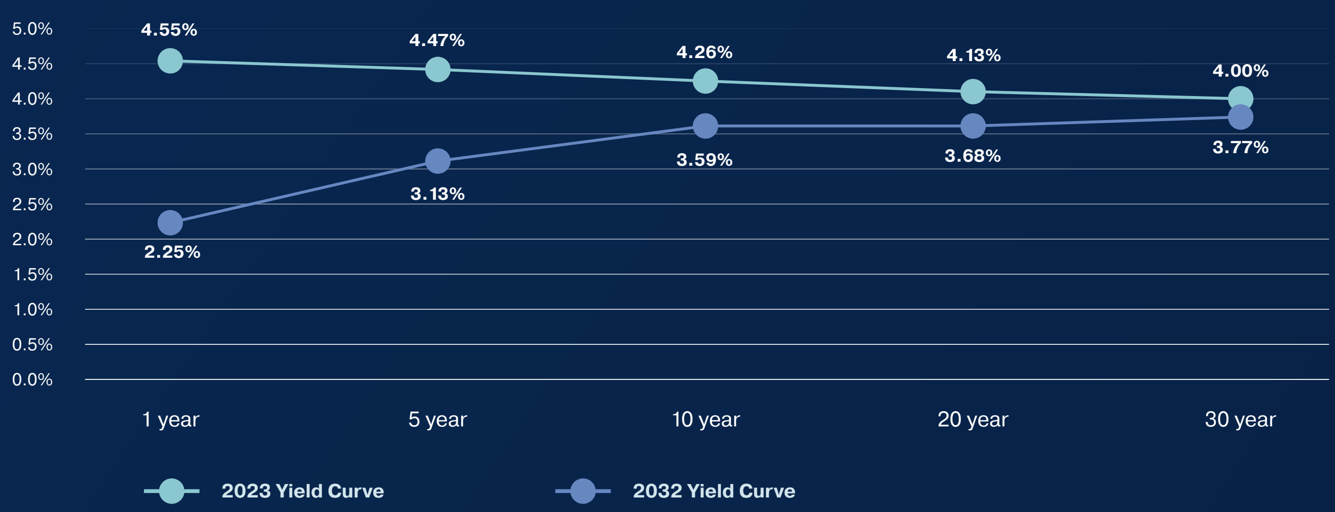
Fixed Income

Overview

Globally, central banks spent the past year aggressively raising rates to fight multi-decade inflation highs. The Bank of Canada (BoC) raised its overnight lending rate by 400 basis points in 2022, the largest and fastest rate hike cycle on record. As rate increases gathered momentum during the year, fixed-income markets grew weary of economic growth prospects leading to inverted yield curves in major economies. While the BoC's policy intends to slow growth, expected fixed income returns will benefit from higher starting yields. As such, our forecast this year highlights materially higher fixed income returns. Over the forecast horizon, we expect Canada's yield curve to moderate and steepen to levels that reflect a more normalized growth and inflation environment. In the short term, while the economic effects of higher rates are only beginning to transmit through the economy, we believe given the BoC's recent rate hike in January 2023, the central bank will now take a wait-and-see approach for most of this year.

Despite increasing chatter of a potential recession in 2023, credit spreads have remained resilient. Our economic growth forecast implies credit spreads will be supported and trade within the lower end of their historical range over the next 10 years. Alternative credit asset classes, namely Private Debt and Loan and Private Mortgages provide opportunities for AIMCo to selectively underwrite unique credit opportunities and are expected to generate a premium over their public market comparables.

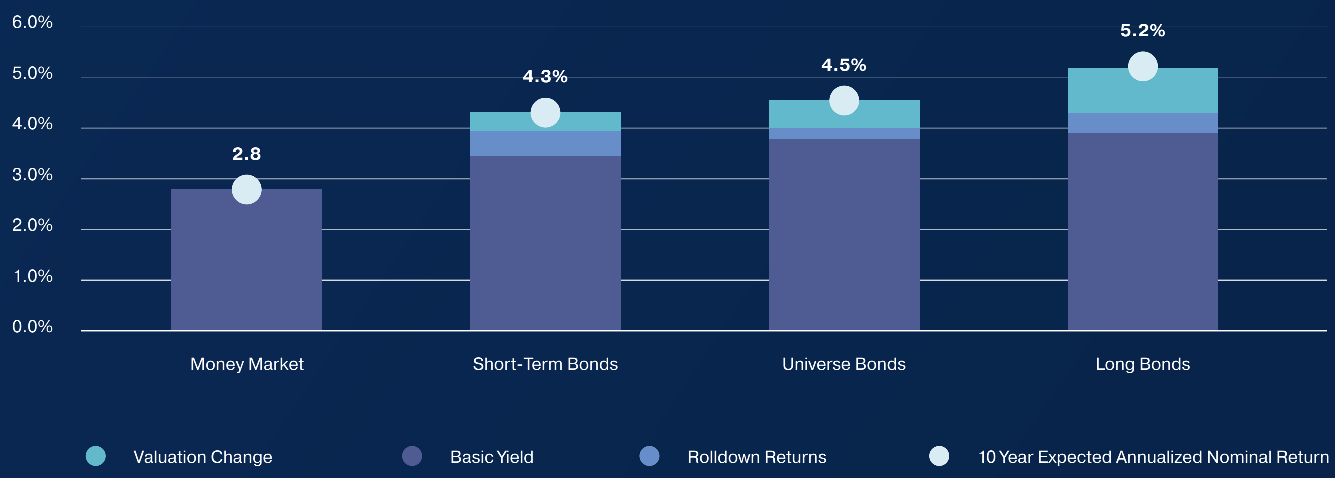
Chart 3: Canadian Sovereign Yield Curves 2023 Economic View



Building Blocks

AIMCo's fixed income capital market assumptions are based on 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 4: Building Blocks for Fixed Income Assets



Sub Asset Classes

Money Market

Fighting inflation has been the focal point of central banks this past year and that will continue in the near term. Inflation-focused rate hikes by the Bank of Canada have created more uncertainty in the magnitude and length of the rate hiking cycle which will continue throughout 2023.

Over the short term, there is increased concern about a deeper slowdown in the general economy as opposed to a mild downturn. That, in combination with the supply-side adjustments, geopolitical concerns and uncertainty over inflation volatility, may create higher uncertainty of rate adjustments. In the mid-to-longer term, the expectation is that inflation will subside and with the combination of mentioned economic pressure, short term rates should moderate from their near-term highs.

Short Term Bonds

Returns for this sector can be expected to be strongly correlated to movements in the overnight rate of the Bank of Canada. After a period of aggressive rate hikes, short-term bonds are coming off a year of negative performance. With the overnight rate ending last year in restrictive territory, the likelihood of short bonds prospectively having a negative year of performance is low.

Our forecast suggests that the returns for short bonds going forward should track the more recent and higher level of central bank rates. Accordingly, the current level of yields in the short-maturity sector is a reasonable expectation of future returns.

Universe Bonds

Following a significant move higher in yields during 2022, the long-term return profile of Universe Bonds is expected to be more stable. At the start of this year, index yields are two times higher than at the same point a year ago. That means the positive asymmetry of bond portfolio returns is a much more tangible benefit going forward. Universe bond yields are expected to fluctuate in a range around current levels as we navigate through the business cycle during the forecast horizon. A return to yield levels prevailing during periods of ultra-accommodative monetary policy is not expected. With a significantly inverted yield curve, there is the possibility that inflation does not return to target in the time frame anticipated by the market in the short term. If elevated inflation becomes persistent, yields at the long end of the bond market are likely to increase from current levels therefore negatively impacting returns.

Long Bonds

After a poor year in 2022, the prospective return for long bonds is more favourable in the years ahead. Long-term Canadian bond yields now reflect a level consistent with a moderate term premium and the implied long-term neutral policy rate of the Bank of Canada. Going forward the return profile for long bonds should be more correlated to the market's assessment of long-term growth and inflation rather than being tethered to moves in the overnight rate of the central bank, which was prevalent for a large part of last year.

Our return forecast for long bonds reflects an extended period of fluctuation around current yields which would be a new era that does not anticipate another drop to pandemic-era levels. The current level of yields depicts a stronger income narrative from a returns perspective while also putting the sector in a better place to act as a total portfolio diversifier going forward when compared to levels from a year ago. A major risk to our forecast is the possibility that economies do not realize the moderation of inflation currently priced by financial markets resulting in longer-dated yields reflecting a less benign long-term inflationary environment.

Real Return Bonds

Despite the emergence of unexpected inflation throughout 2022, the significant rise in real yields resulted in a year of poor absolute returns. As is the case with nominal bonds, the starting yield levels for real return bonds for long-term prospective returns are more favourable compared to last year. Real yields have returned to positive levels, and break-even yields reflect a return to central bank inflation targets from current elevated levels. Accordingly, forecasted returns project a regime consistent with current market conditions and not returning to an ultra-accommodative monetary policy environment. Relative to nominal bonds, real return bonds hold the upside return potential of actual inflation realizing higher than expected inflation. As with nominal bonds, another upward shock in real yields would be a significant headwind to long-term returns.

Private Debt & Loan (PDL)

The shift in monetary policy in 2022 that led central banks to increase interest rates was positive for the long and short-term returns of Private Debt assets. Last year, the positive dynamic of higher rates, given the portfolio's focus on floating rates, was offset by the widening of spreads in response to heightened recessionary fears and decreased market liquidity. Heading into 2023 and beyond, both factors higher rates and wider spreads, will benefit the asset class. While the near-term economic outlook is challenging is challenging, potentially leading to increased defaults. The asset class has historically experienced high recovery rates due to PDL's focus on senior, secured loans. Thus, the high interest rates earned on these assets are expected to absorb the impact of increased defaults in a highly diversified portfolio.

Over the longer term, an environment of higher interest rates and tighter monetary policy will benefit the returns of the asset class, enabling lenders to charge higher rates for borrowing. As borrowing costs have increased, so has the quality of companies looking to secure financing. Thus, investors are benefiting from both higher returns and higher credit quality. The lower-quality borrowers will struggle to receive financing and will have to turn to higher cost means of financing such as equity.

Overall, we expect private debt & loan to show resilience and generate contractual income with stable returns over the long term.

Mortgages

Following years of historically low borrowing costs, commercial mortgage rates more than doubled last year as a result of rising government bond yields and commercial mortgage spreads. The rapid rise in yields during 2022 put downward pressure on mortgage returns in the existing portfolio.

Many Canadian lenders continue to have an appetite for high-quality industrial, logistics and multifamily properties, although, liquidity in the commercial lending market has decreased compared to previous years. Looking ahead, prospective all-in rates for new commercial mortgages are attractive compared to recent years. That's due to higher government bond yields and elevated commercial mortgage spreads, with the latter currently sitting above the long-term average. Although the pace of interest rate hikes is expected to slow, persistently high inflation could lead to further rate increases that are above market expectations. This could negatively impact short-term returns, and at the same time increase long term return expectations.

Forecast by Asset Class

Illiquid Assets

Overview

Illiquid assets are crucial in constructing a well-diversified portfolio, and 2022 was a prime example of that. These asset classes exhibit low correlations to traditional fixed income and public equity markets. Investment opportunities in private asset markets are unique, even within the same asset class category, which helps diversify the risk across the portfolio. One commonality between these asset classes is the longer investment lifespan, which is suitable for long term investors. Furthermore, the illiquid nature of these investments generally means a higher premium and therefore a higher expected return. Over time, investors' appetites for illiquid assets have increased, and our clients continue to allocate more to illiquid asset classes to take advantage of the attractive return-risk characteristics.

Our 2023 forecast paints a favourable picture for all private assets with strong cashflow growth potential. Currently, on behalf of our clients, AIMCo invests in private Canadian real estate domestically and foreign real estate, 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.

Real Estate

Building Blocks

For real estate, we use forecasts from the Oxford Economics model for Canadian and foreign Real Estate. In this model, income yield, rental income growth and valuation change are the main building blocks. These building blocks are forecasted using the path of macroeconomic variables such as inflation, bond yields along with inputs on market rents, construction activity and relevant demand drivers.

Values for Canadian and Foreign real estate building blocks are shown in the following exhibits. We continue to expect foreign real estate to provide a higher return environment for investments compared to the Canadian market. In both cases, the expected income drives the respective assumptions.

Chart 5: Canadian Real Estate

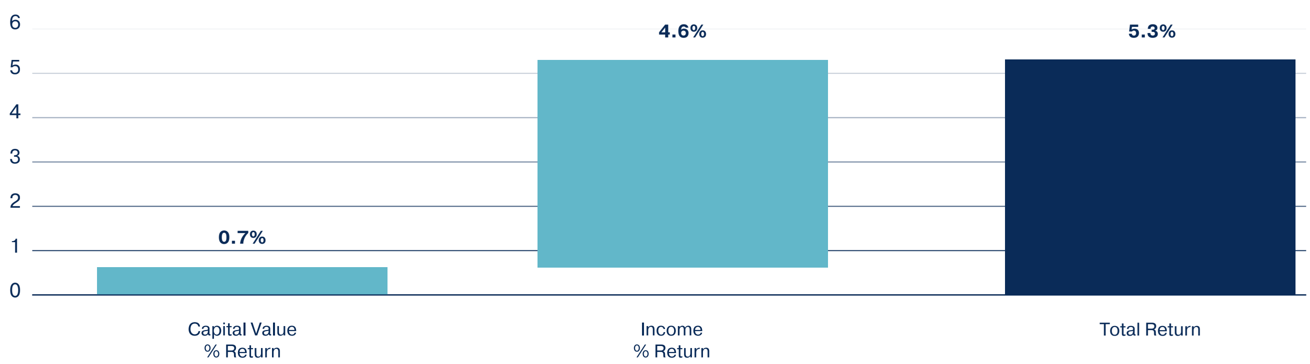
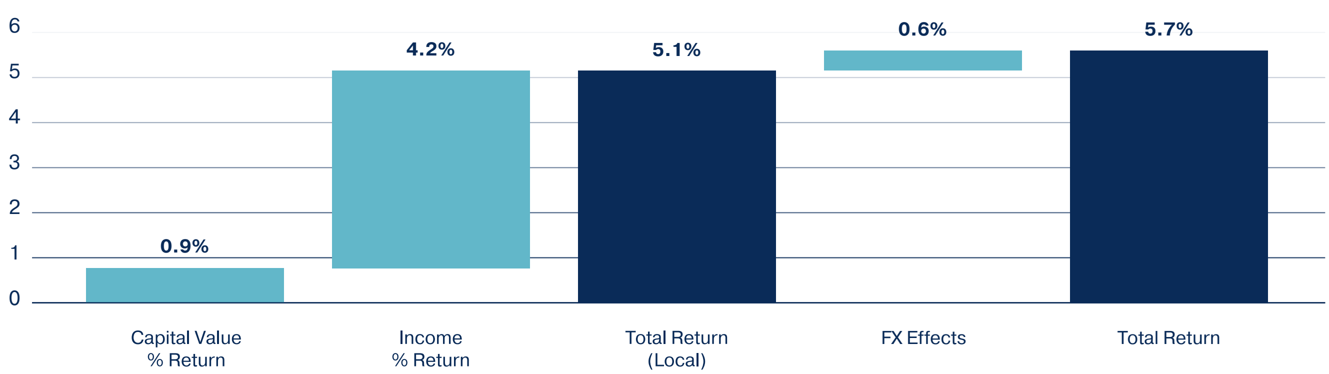


Chart 6: Foreign Real Estate



Market Comments

The overall Real Estate market hit a tipping point in 2022. Equity drawdowns, high inflation, and interest rate hikes began to have an impact on Real Estate pricing, volumes, and debt availability. Cap rates rose across nearly all sectors and geographies, driving up the Canadian national average cap rate figure to its highest level since before the pandemic. Furthermore, investment activity slowed in 2022 as more investors began taking a more cautious approach to capital allocation. However, not all sectors are equal. Namely, industrial, multi-family, and necessity-based retail are continuing to garner interest. Valuations are trending downwards for office properties, particularly in the U.S. and Europe. In addition, cap rates will need to adjust to find an equilibrium when compared with risk-free rates.

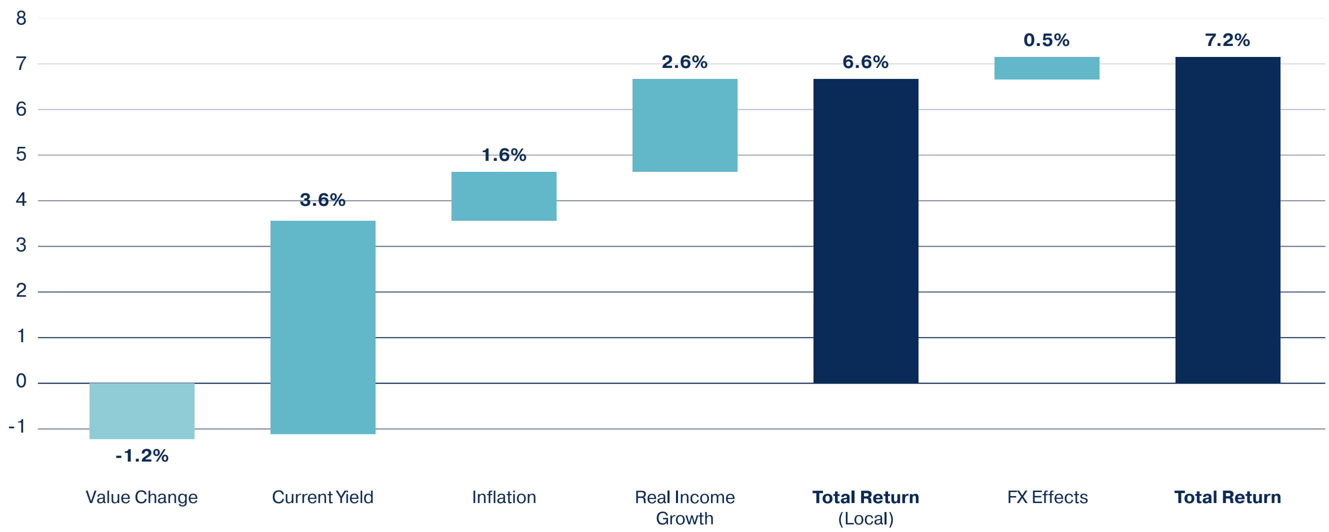
A flight to quality is beginning to take hold within capital markets and spatial markets. Office tenants are prioritizing quality and wellness in their leasing decisions. There is a renewed focus on Core/Stabilized properties as a better risk-adjusted investment opportunity. Long-term forward-looking returns will benefit from income gains as a result of expanding capitalization rates last year. We also expect a modest gain from valuation changes as rates markets level off over the forecast horizon.

Infrastructure

Building Blocks

Many real assets, including infrastructure, provide both inflation protection and an income stream to investors. While the degree to which a pass-through inflation rate impacts infrastructure return can vary based on specific investments, overall, we expect infrastructure as an asset class will benefit from the higher expected inflation rate over the forecast horizon in this year's economic forecast. The detailed building block values contributing to our return forecast are shown in the following exhibit.

Chart 7: Building Blocks of Infrastructure



Market Comments

Infrastructure sectors performed well in 2022 relative to broader public equities. Underlying business dynamics remained largely resilient and benefitted from demand normalization post-pandemic. While there are still some lingering effects from the pandemic in certain sub-sectors (for example, transport), the shift back to a normalized demand environment continued in 2022 for most countries. Private investment in infrastructure is largely back to pre-pandemic levels and expected to increase on a longer-term basis, benefitting from some key trend drivers such as decarbonization and digitalization. Many government policies in various countries are also expected to be near-term supportive factors for further investment into infrastructure areas that drive decarbonization goals and the reshoring of various supply chains.

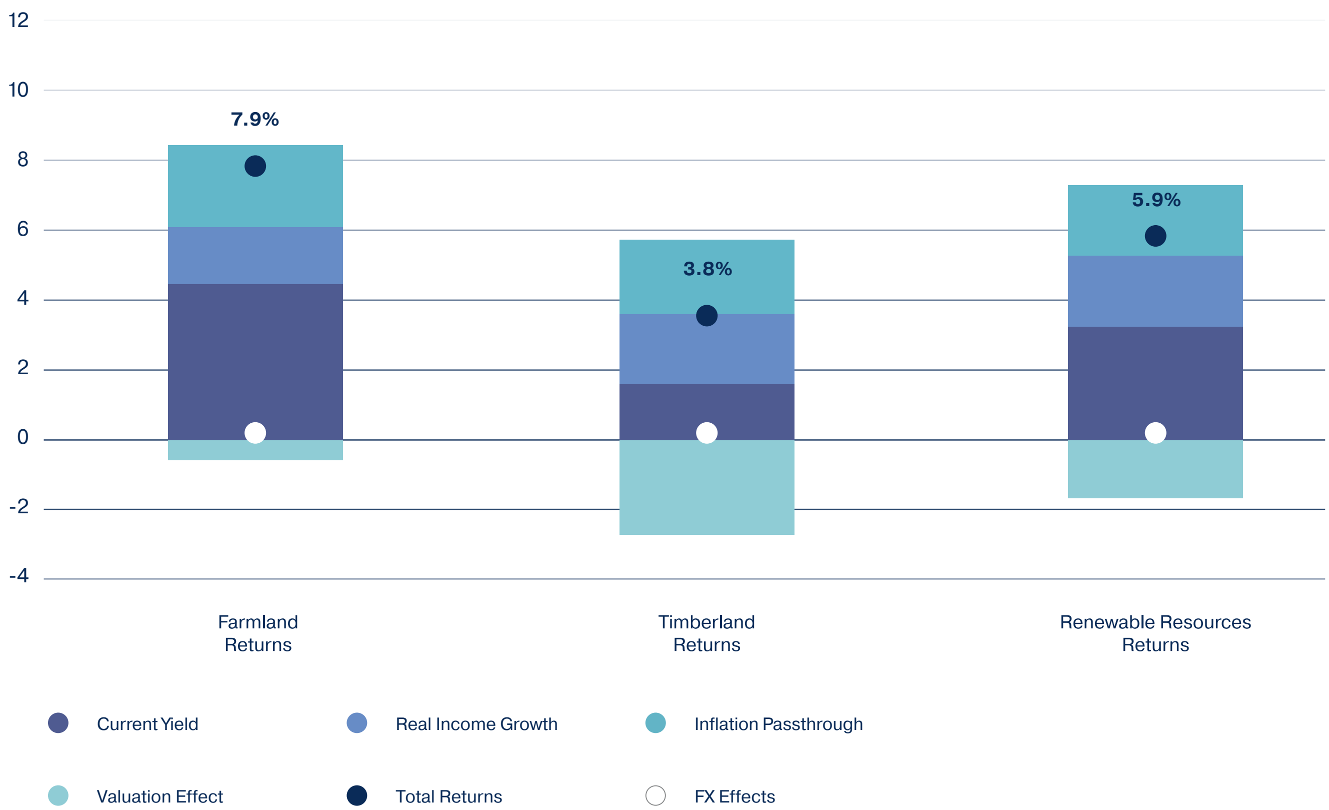
Forward-looking long-term returns have largely stayed close to the same levels as last year, with some impacts from valuation multiples reverting to longer-term normalized levels. In addition, the amount of undeployed capital seeking exposure in the space is expected to be a headwind for the asset class. Inflation is expected to be supportive of long-term returns, given the inflation-linked nature of many of the infrastructure sub-sector businesses. While the outlook has improved for several other asset classes, real assets will continue to play an important role as a diversified source of returns.

Renewable Resources

Building Blocks

Renewable resources is another asset class which provides a degree of inflation protection for AIMCo clients. We utilized a similar model to last year, incorporating both income generation capacity and valuation growth for this asset class. Our building blocks are highlighted in the following exhibit.

Chart 8: Building Blocks for Renewable Resources



Market Comments

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

The demand for timberland and agriculture investments has increased as investors seek low correlations to conventional asset classes, inflation protection, and positive sustainability attributes. Underlying land values are generally correlated with inflation, whereas the income component of returns depends on the extent to which inflation impacts commodity prices/ revenues and costs. The impact of inflation on key inputs such as fertilizer has put pressure on farm incomes in 2022, but generally, the increase in costs has been offset by relatively strong commodity prices. Competition has continued to drive valuations higher and compressed expected returns, especially in core timberland regions. Investors continue to seek timberland and agriculture investments due to their positive environmental, social, governance (ESG) characteristics and expected return sources for the asset classes have evolved beyond traditional income with more value being placed on carbon sequestration, conservation, and biodiversity.

Key risks to our Renewable Resources forecasts include sustained high interest rates which could put pressure on timberland and farmland valuations, pressure on farm income due to high input costs, decreased production due to natural disasters or climate change, labour availability, and lower commodity prices.

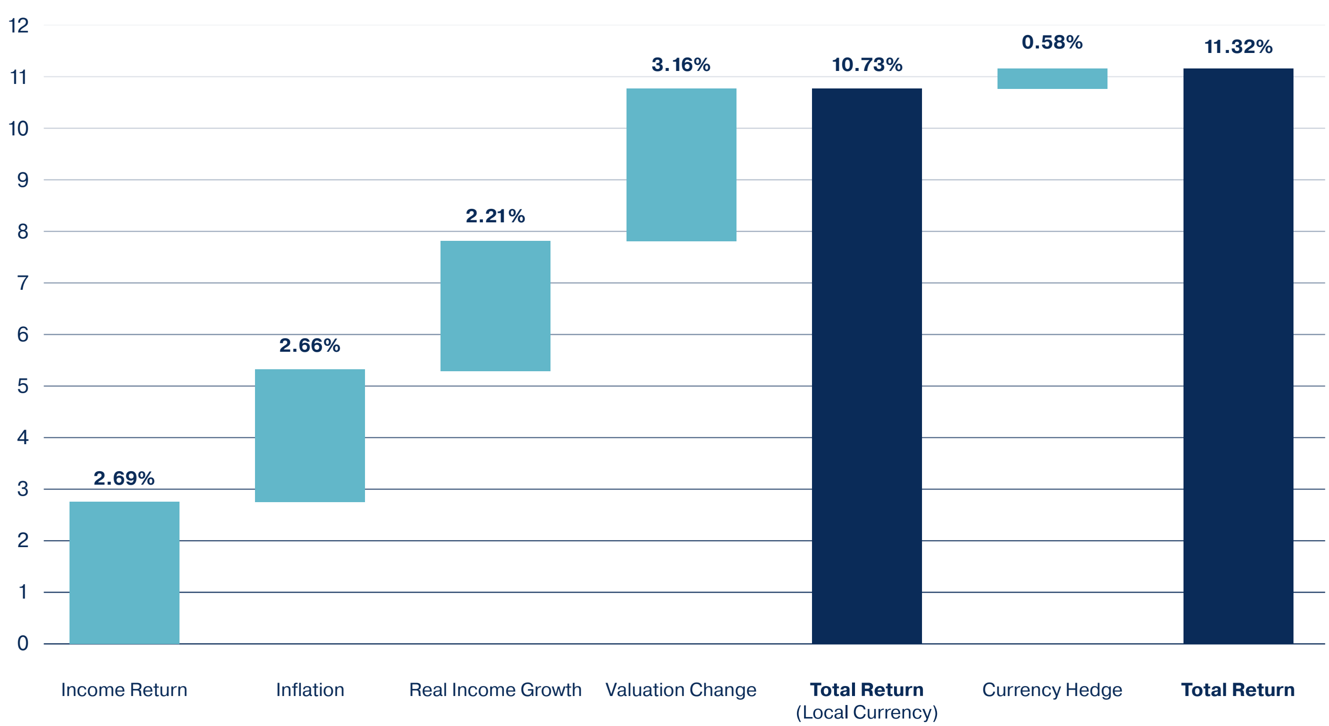
Private Equity

Building Blocks

Our private equity model, based on an AQR paper[8] we introduced in previous editions of our forecast, has similarities to the building blocks we use for public equities. Unlike public equities where we separately attribute income return to dividends and buybacks, for private equity, income return is forecasted using an estimated earnings yield. Our modelling framework uses a public equity comparable, namely MSCI World Index, to estimate the starting earnings yield and its long-term average, translating to an expected earnings yield of 2.7%. Based on our global GDP growth estimate, we assume real growth to be 2.2% for the decade.

Similarly, global inflation is expected to land at 2.7% over the next 10 years, boosting total returns. Valuation is the most challenging parameter to estimate over the long term. We use two metrics from data provider Preqin, "weighted net multiple" and "residual value to paid-in" ratio. By combining the effect of the convergence of the metrics from their current value to their long-term average, we expect a return from valuation gains to be 3.1%. The aggregate effect of all factors including currency translation produces an expected return of 11.3% over the coming decade.

Chart 9: Building Blocks for Private Equity



[8] Source: Demystifying Illiquid Assets: Expected Returns for Private Equity, AQR Whitepaper 1Q19, by Antti Ilmanen, Swati Chandra, Nicholas McQuinn."

Market Comments

Private equity will continue to be an attractive asset class in the long term and play an important role in portfolio diversification. The benefits of having a long-term approach, employing value-creation strategies and attracting best-in-class well-aligned management teams will continue to support attractive risk-adjusted returns. In the short term, valuations and performance have weakened in line with global macro factors including high inflation, supply chain disruption, slowing economic growth and widened bid-ask spreads as private market pricing has lagged depressed public valuations. This dynamic, compounded by a recent slowdown in exits, has led to the "denominator effect" being experienced by many public pension plans that have now reached or exceeded target allocations to the asset class. This, in turn, has contributed to a pullback in fundraising activity, which in aggregate has declined 14% year-over-year as of early December 2022. Nonetheless, there is still a large balance of dry powder already committed to private equity funds ready to invest, estimated to be approximately USD 1.3 trillion.

Private equity deal activity slowed in the second half of 2022 with volumes declining by 22% year over year. Turbulent leveraged financing markets have contributed to this dynamic, effectively limiting the size of deals that firms are currently able to execute. Meanwhile, higher interest rates and global economic uncertainty are also beginning to lower valuations, which had become frothy in recent years. As we enter an environment where leverage is increasingly expensive and valuation multiples may contract, operational value creation will likely drive an increasing share of private equity returns.

Two sectors that could see relative outperformance in this environment are healthcare and enterprise technology. Long-term global secular trends are providing strong tailwinds for the healthcare sector, including (i) demographics—an aging population, higher incidence of chronic diseases, growing middle class seeking better quality, and individualized healthcare; (ii) increased spending—pressure to find affordable products and services, increased spend by government, and fast-track processes for drug development; and (iii) transition towards greater personalization of treatment. The deal environment for the technology sector as well is likely to remain favourable—particularly in an environment with more palatable valuations—given long-term trends of (i) increased digitalization; (ii) greater adoption of recurring revenue models that should help insulate earnings through periods of economic volatility; and (iii) accelerating technological innovation. Rapidly evolving consumer behaviours and demands on businesses are similarly providing emerging opportunities within the consumer products and business services markets as well. Diversity, equity, and inclusion or "DEI" is an ancillary strategy traversing all sectors and represents an additional emerging yet undercapitalized opportunity for private equity investors. Historical performance of firms committed to DEI has proven to be at least comparable to that of nondiverse counterparts and, in certain cases, superior.

As traditional exits via sponsor-to-sponsor sales or IPOs stall in the near term, the continued rise of the secondaries market has helped enhance liquidity optionality in private markets. General Partners (GP) have increasingly embraced the market as a way to monetize stakes in companies that they do not want to exit completely even as they try to satisfy investor commitments. A GP-led secondary via a continuation vehicle creates a way to return capital to existing LPs while enabling the fund to maximize the value of the assets by extending the holding period, which is a trend we may see an increase over the coming years.

Forecast by Asset Class

Public Equities

Overview

Our forecast this year has forward-looking public equity returns increasing compared to a year ago. Lower starting valuations are the main driver of the increase in expected returns, given the retreat of price-to-earnings ratios experienced during 2022. Earnings growth is expected to be bound at the upper end by our GDP forecasts for each market. Rising input prices and cost of debt may manifest as a double-headed risk, should inflation persist over the coming years. Equity markets are, however, real assets and their cash flows are expected to keep pace with inflation over the longer term.

Dividends are reliable sources of return in equity markets. Our models assume dividends will persist based on current trends. In all markets, we expect valuations will help develop a positive contribution to equity returns over the next 10 years. Trailing 12-month Price-to-Earnings (P/E) ratios have dropped since our last forecast, as markets reset to a higher rate environment. We assume valuations will revert to the mean over the forecast horizon.

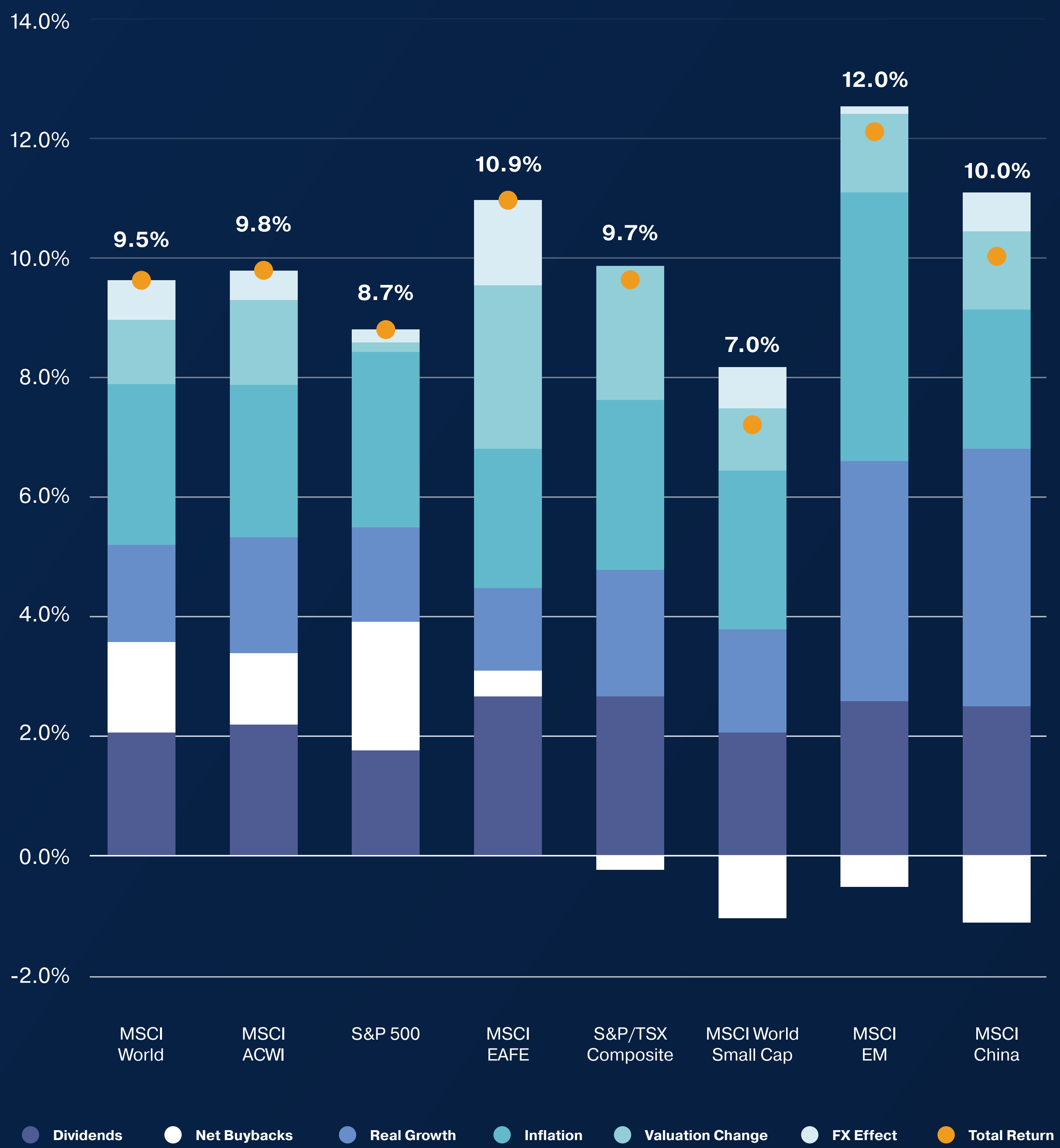
Building Blocks

AIMCo's public equity capital market assumptions are based on forecasts in inflation, real earning growth, dividend yield, buyback yield, net dilution and valuations for the respective index. AIMCo incorporates a currency view through conversion to the Canadian dollar.

For public equity 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: $E(r) \approx DY+g+\Delta v$

Expected trend growth in EPS is proxied by real GDP growth rates.

Chart 10: Building Blocks for Public Equity Assets



Global Equities

In the past year, Global Equity investors were forced to manage the simultaneous challenges of rising and persistent inflation, central bank hawkishness, and significant geopolitical headwinds. With few exceptions, developed markets all closed out 2022 in the red, with the US technology-heavy NASDAQ among the worst performers. With widespread interest rate hikes globally in 2022, long-duration equities were particularly punished after more than a decade of market leadership. Elsewhere, as global energy security came to the fore, investors in global developed markets are now confronted with the most perplexing set of economic headwinds seen in decades.

Our view is that delayed action by global central banks in response to inflationary pressures has ushered in a new and potentially extended period of monetary tightness. Broadly speaking, 2022 was a year of valuation multiple compression. Indeed, the cost of capital for corporates has seen its biggest 12-month move in four decades. The possibility of a more moderate-to-low economic growth environment in the years to come suggests earnings revisions ahead. As valuations could continue to reset in the short term, we expect corporations to take advantage of this via accelerated shareholder returns in the form of dividends and share repurchases. Nonetheless, the economic backdrop for global equities is now quite distinct from that of the past 40 years and will require rigour, agility, and patience.

Canadian Equities

The strength in Canadian earnings continued in 2022, carrying on the incredible growth and recovery of the prior year. It was inevitable that earnings growth would slow given the higher base, but the broad strength across the economy translated into high profitability for the Canadian market. Return on equity for Canada approached the mid-teens, which are levels not seen since before the great financial crisis. Corporations developed a greater appreciation for capital efficiency and increasingly returned capital to shareholders via increased dividends and share buybacks. This behaviour change was particularly notable in the energy sector where high commodity prices were met with production discipline, which translated into tremendous free cash flow for the industry.

Similar to many parts of the developed world, much of the economic growth of the past two years can be attributed to the lingering effects of the various forms of stimulus introduced during the pandemic. The stimulative effects of these policies highlighted some of the constraints and underinvestment in the world as rising demand for many products and services remains unmet, resulting in significantly higher prices. The Bank of Canada is attempting to cool demand and inflationary pressures through higher interest rates, resulting in 400 bps of tightening in 2022. This has pushed bond yields and discount rates higher. The lower valuation combined with an outlook for a slowing economy have been the primary reasons for the decline in the Canadian equity market this past year.

As has been the case for many years, the Canadian equity market continues to trade at a discount relative to the U.S. due to the country's greater cyclicality and persistently lower profitability. As markets begin to anticipate a pause in central bank tightening, and perhaps some easing in the latter half of 2023, Canadian equities may benefit from Canada's economy pro-cyclical nature alongside less rich valuations than the U.S.

Emerging Market Equities

Last year was another challenging year in emerging markets, driven by rising global interest rates, higher inflation, a stronger U.S. dollar, economic headwinds in China and the largest military conflict in Europe since World War II. These events contributed to lower Emerging Markets' valuation measures, which has made them a more attractive investment opportunity over the longer term. Attractive valuations are supported by expectations for stronger corporate earnings growth as Emerging Market companies benefit from being in the faster-growing parts of the global economy. In 2023, we expect Emerging Markets to deliver stronger growth as China reopens its economy, the outlook for the U.S. dollar weakens, and commodity suppliers continue to perform well. Longer-term geopolitical concerns temper somewhat our enthusiasm for the asset class.

Global Small-Cap Equities

Global small caps performed very much in line with their larger cap peers this past year as the entire market declined. Small-cap earnings growth slowed materially and faced lower valuations as higher interest rates and the prospects for slower, or perhaps even contracting growth presented headwinds to the overall market. With the underperformance of small-cap equities back in 2021, valuations between the two segments of the market have returned to levels more in line with longer-term averages. As the prospect of a shift in central bank policy becomes more apparent and markets begin to anticipate a pause in the tightening cycle, opportunities will present themselves for small-cap markets.

Chinese Equities

China's equity markets have endured a difficult three years of rolling pandemic-related lockdowns, a precipitous property market slump, and most recently, rising geopolitical tensions resulting from Russia's invasion of Ukraine. Yet following the People's Party Congress in the fall of 2022, signals point to a substantial easing in China's COVID restrictions, which could soon unlock China's economic potential. With a backdrop of lower commodity prices, an economic reopening, and an effective put from the Chinese government to property developers, we expect earnings and investor sentiment to significantly improve. If the North American experience is any guide, the relaxation of mobility restrictions should positively impact consumption in China, with goods consumption expected to see an earlier resurgence than that of services. On valuations, although they have been lower relative to history, many domestically oriented sectors in China are near cyclical troughs. Our forecast also acknowledges that foreign investors have been substantially underweighting China equities during the pandemic (and compounded by U.S.-China tensions), and we expect a portfolio normalization over time.

Risk Assumptions Methodology

The AIMCo 2023 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.

Similar to last year, we have incorporated the results of a collaboration with our partner AlphaLayer, to enhance the robustness of our risk forecast. AlphaLayer, a collaboration between AIMCo and AltaML, applies deep understanding and experience in machine learning techniques to deliver solutions specific to the investment management industry. Illiquid asset classes are valued infrequently and may not be marketable securities. As a result, illiquid assets can suffer from various biases and are difficult to compare to higher frequency data available for publicly-traded assets. Adjusting the data for these shortcomings can improve the statistical nature of the dataset and produce more robust and realistic estimates of risk. A few of the specific adjustments made were:

1. Seasonal effects of time series data were removed; for example, accounting effects that are noticeable at year-end.
2. Monthly data were imputed based on the adjusted quarterly data using machine learning techniques. The imputation considered not only an individual asset's return time series but also the appropriate statistical relationship with other assets.

AIMCo has implemented a VAR-GARCH-DCC[9] 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:

1. 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.
2. We used an asymmetric Student's t-distribution to incorporate skewness and kurtosis exhibited by most asset class historical statistical distributions.
3. 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.
4. We made use of long enough benchmark historical data for modelling purposes.
5. We selected the risk benchmarks either following the AIMCo official asset class benchmarks or researched representative benchmarks for the underlying asset class.

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

[9] Vector Autoregressive - Generalized Autoregressive Conditional Heteroscedasticity - Dynamic Conditional Correlation.

Currency Assumptions Methodology

To convert non-Canadian market returns to Canadian dollar terms, we adjust the expected return using the exchange rate such that purchasing power is maintained between other economies and Canada. Absolute PPP holds that exchange rates are in equilibrium when the value of a national basket of goods and services are the same between two countries.

Disclaimer

Return assumptions and risk estimates were developed by Alberta Investment Management Corporation and are for general information only. This information is not intended to provide specific advice to any individual. We make no representations or warranties with respect o the timeliness, accuracy, or completeness, and bear no liability for any loss arising from its use. All forward-looking information and forecasts contained herein, unless otherwise noted, are the opinion of Alberta Investment Management Corporation, and future market movements may differ significantly from our expectations. Index performance or any index related data is given for illustrative purposes only and is not indicative of the performance of any particular portfolio. Any performance data shown herein represents returns and is no guarantee of future results. Investment returns will fluctuate such that the value of holdings may be worth more or less than their original cost. Alberta Investment Management Corporation publication 2023.

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