March 2019

LONG-TERM STRATEGIC ASSET ALLOCATION 2019

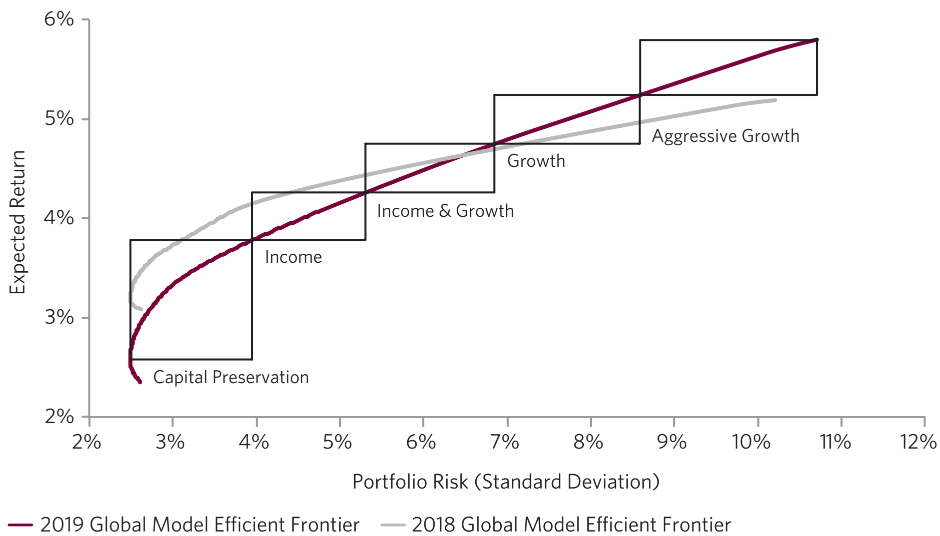
Raymond Foo, CFA
Investment Management Research
CIBC Asset Management Inc.
raymond.foo@cibc.ca

Luc de la Durantaye, CFA
Asset Allocation and Currency Management
CIBC Asset Management Inc.
luc.deladurantaye@cibc.ca

Objective: To provide a stable long-term asset allocation strategy that responds to individual investor objectives and risk tolerance, ignoring short-term market noise.

Inside this paper

Efficient Frontier (2019 Forward-Looking Estimates)



Source: CIBC Asset Management Inc.

Highlights

- This year, the long-term strategic asset allocation model incorporates CIBC Asset Management (CIBC AM) Multi-Asset and Currency Management forward-looking asset class views for the next 10-year period. This is complemented by tactical short-term opportunities to provide more robust and forward-looking allocations.
- Our 2019 strategic recommendations include a 5% shift from bonds to cash or shorter-term instruments in most investor profiles. This shift reflects lower expected returns from long-term bonds and improved risk-adjusted projections for shorter-term instruments.
- Returns were mostly flat in 2018, following a five-year run of positive returns for our five investor profiles. Five-year compound annual returns ranged from 4.5% for Capital Preservation to 13.6% for Aggressive Growth through 2017.
- While rising volatility and quantitative tightening are near-term concerns, we continue to recommend diversification to reduce overall portfolio risk and navigate around these concerns. We maintain a broad global asset allocation model within global equities and high yield bonds to further improve risk-adjusted returns for each profile.

- Alternative investments continue to gain focus within long-term models. An absolute return strategy was added this year to further broaden asset allocation and combat higher expected volatility and lower expected returns. These strategies can potentially improve the efficiency of investor profiles by providing low expected correlation to equities.
- Investors who are concerned about the impact of rising rates on the fixed income portion of their portfolios can increase their allocation to short-term instruments, including high yield and multi-sector fixed income alternatives, to reduce overall duration. These options can also potentially enhance yield and help diversify the portfolio.
- From a strategic asset allocation perspective, bonds remain an important part of a well diversified portfolio. Although expected returns for bonds have decreased, the correlation between bonds and equities remains low and can help offset the risks inherent in equity returns.
- An allocation to global markets in a Canadian portfolio increases foreign exchange risk over the short run. However, over the long run investing globally has provided diversification, increased return and reduced risk.
- To account for the risks associated with foreign currency exposure, investors with a shorter time horizon should consider global fixed income and equity products hedged to the Canadian dollar (CAD).
- Adjusting long-term allocations based on short-term volatility or momentum may prevent investors from reaching their long-term financial goals. Investors should remain diversified and invested to reduce unnecessary risks. This can be accomplished by regularly reviewing and rebalancing their portfolios to ensure allocations are aligned to meet their long-term financial goals.

Capital Market Review

Continued global expansion kicked off a strong start to 2018, and equity markets rose to record highs to begin the third quarter. However, equities ended the year in negative territory, as a multitude of uncertainties hit global markets. Much of the decade-long bull market was linked to quantitative easing and stimulus put in place since the 2008 financial crisis. This included record low interest rates, which helped fuel risk assets such as equities. In recent years, central banks have started unwinding these stimuli by raising interest rates in response to global expansion, while trying to balance inflation pressures and a maturing economic cycle.

Rising rates and uncertainty around trade war threats and tariffs led to turbulent market conditions in 2018, where most major equity markets posted negative returns in local currency. The MSCI World Index fell -8.2% in U.S. dollars (USD) with the S&P 500 falling -4.4% (USD), while the MSCI EAFE Index fell -13.4% (USD). Emerging markets were the weakest performers among major indices, with the MSCI Emerging Markets Index returning -14.3% (USD) as investors digested uncertainty from trade policies and slowing growth rates in China. The Canadian dollar fell against the U.S. dollar by 8.3% in 2018. This drop increased foreign investment returns for Canadian investors and helped cushion losses in foreign investments priced in USD.

Canadian equities turned negative in 2018, with the S&P/TSX Composite Index down -8.9%, capping off the worst year since the global financial crisis of 2008. A slowdown in emerging market growth led oil and commodities to fall in 2018, particularly in the second half. WTI crude oil prices started the year at $60 (USD) per barrel and reached a peak of $76 (USD) in October, only to end the year at $45 (USD). The S&P/TSX Composite Energy and the S&P/TSX Composite Materials Indices fell -18.3% and -9.3% respectively.

Calendar Year Equity Market Performance (%, CAD)

Asset Class	Index	2018	2017	2016	2015	2014	2013
Canadian Equity	S&P/TSX Composite	-8.9	9.1	21.1	-8.3	10.5	13.0
U.S. Equity	S&P 500	4.2	13.8	8.1	21.6	23.9	41.2
Global Equity	MSCI World	0.1	15.0	4.4	19.6	15.0	35.9
International Equity	MSCI EAFE	-5.6	17.4	-2.0	19.5	4.1	31.6

Source: Bloomberg, CIBC Asset Management Inc.

The influential financials sector also had a negative year, pressured by a flattening yield curve. The S&P/TSX Financials Index was down -9.3%. Less cyclically-sensitive sectors provided some refuge from this year's downturn, with the S&P/TSX Communication Services Index and S&P/TSX Consumer Staples Index returning -0.8% and 2.0% respectively.

U.S. equities ended a nine-year run of positive returns, with the S&P 500 Index declining -4.4% (USD). The second half of 2018 was an exceptionally volatile period, as major U.S. indices approached bear market territory. In the fourth quarter, the Nasdaq Composite Index dropped -17.3% (USD) while the S&P 500 Index declined -13.5% (USD). Despite robust corporate earnings and low unemployment, the U.S. market reacted to the rising probability of recession following interest rate policy normalization and volatile U.S.-China trade relations.

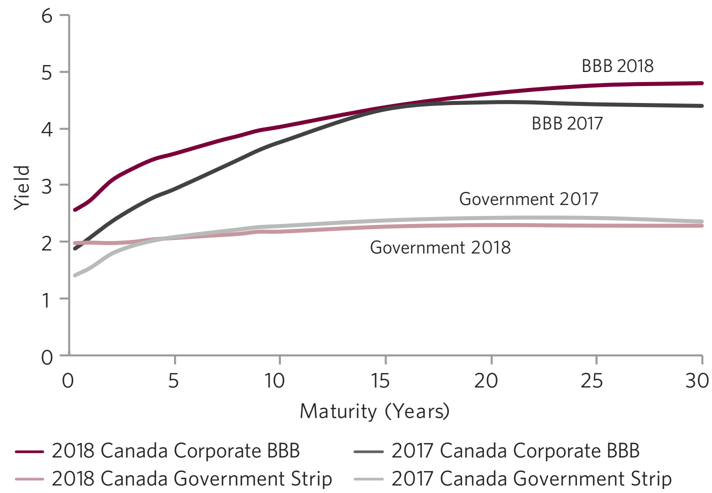
International developed equity markets recorded one of the worst calendar year returns since the financial crisis, with the MSCI EAFE Index falling -5.6% (CAD). With the eurozone economy growing at a healthy pace, the European Central Bank (ECB) announced it planned to end its asset purchasing program in early 2018, despite concerns of a growth reversion. Brexit uncertainty and budgetary debt concerns in Italy also weighed on European equities. The MSCI Europe Index finished the year down -6.6% (CAD). Despite low inflation pressures and Italian fiscal risk, the euro returned 3.8% against the Canadian dollar in 2018. This helped mitigate losses for Canadian investors with euro-denominated securities.

The MSCI Emerging Markets Index had a difficult year, falling -6.5% (CAD), snapping a streak of gains (in CAD) that extended from 2012. Emerging markets were particularly impacted by the slowdown in the global economy. A temporary ceasefire in the U.S.-China trade war brought some respite for investors, but uncertainty led to heightened volatility in 2018. Countries such as Turkey and Argentina endured currency and debt crises, while China's GDP decelerated as export tariffs and a potential trade war weighed on consumers and businesses.

In contrast to equity markets, global growth concerns provided some support for bonds as investors moved away from risk assets. U.S. Treasuries led advances among global bonds and provided some buffer from otherwise negative global sentiment. The Barclays Global Aggregate Bond Index returned 7.7% CAD (-1.2% USD) for the year.

In Canada, the yield curve continued to flatten. The 10-year Government of Canada yield ended the year at 2.18%, a decrease of 10 basis points (bps) year-over-year. On the short end of the curve, two-year yields increased from 1.80% to 1.98% as the Bank of Canada continues its pace of monetary policy renormalization. Overall, short-term bonds outperformed long-term bonds as long-term bonds were dragged down by the falling price of long corporate bonds as credit spreads widened. The FTSE Canada Short Term Bond Index returned 1.9%, while FTSE Canada Long Term Bond Index returned 0.3% in 2018.

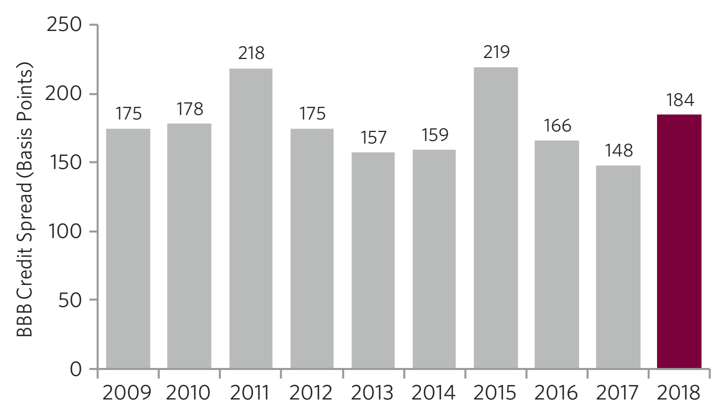
Canadian Government and High Yield Curve Changes



Source: Bloomberg, CIBC Asset Management Inc., as of December 31, 2018

Falling oil prices and diminished expectations for global growth led to a risk-off stance in Canadian corporate bonds, as credit spreads widened. Energy and communication services dragged corporate bonds lower, particularly among longer maturities. Canadian 10-year BBB-rated credit spreads rose 36 bps year-over-year to 184 bps on December 31, 2018. This resulted in the FTSE Canada All Government Bond Index (+1.5%) outperforming the FTSE Canada All Corporate Bond Universe Index (+1.1%) in 2018.

End-of-Year Canadian BBB Credit Spread (BPS)



Source: Bloomberg, CIBC Asset Management Inc., as of December 31, 2018

Calendar Year Bond Market Performance (%, CAD)

Asset Class	Index	2018	2017	2016	2015	2014	2013
Canadian Bonds	FTSE Canada Universe Bond	1.4	2.5	1.7	3.5	8.8	-1.2
Canadian Government Bonds	FTSE Canada All Government Bond	1.5	2.2	0.9	3.8	9.3	-2.0
Canadian Corporate Bonds	FTSE Canada All Corporate Bond	1.1	3.4	3.7	2.7	7.6	0.8
U.S. Bonds	Barclays U.S. Aggregate Bond	9.0	-3.3	-0.9	20.6	15.5	4.6
Global Bonds	Barclays Global Aggregate Bond	7.7	0.4	-1.5	16.2	9.7	3.9
U.S. High Yield	Bank of America Merrill Lynch U.S. High Yield Master II	6.6	0.4	13.4	14.4	11.7	14.6
Canadian Cash	FTSE Canada 91 Day T-Bill	1.4	0.6	0.5	0.6	0.9	1.0

Source: Bloomberg, CIBC Asset Management Inc.

U.S. bonds, as represented by the Barclays U.S. Aggregate Bond Index, were flat in U.S. dollars (0.01% USD) but gained 9% CAD as a result of the falling Canadian dollar in 2018. Government issues outperformed corporate and high yield bonds. The Barclays U.S. Government Index was up 0.9% USD while the Barclays U.S. Corporate Index and the Bank of America Merrill Lynch U.S. High Yield Master II Index were down -2.5% and -2.3% respectively (USD). U.S. high yield spreads[1] ended the year at 5.3% after reaching a 10-year low of 3.2% in September. In parallel with U.S. high yield spreads, Canadian high yield credit spreads[1] increased to 4.3% to end 2018, after reaching a 10-year low of 3.2% in January 2018.

Investor Profile Performance

While markets experienced higher volatility and negative asset class returns, diversified portfolios, although volatile over the year, did not experience the same drawdowns as the major equity markets. Using the returns of major asset class indices as proxies, balanced investors in our five investor profiles enjoyed strong relative returns versus most major asset classes. This underscores the benefits of asset class diversification. The methodology for these investor profiles is explained in subsequent asset allocation sections.

Calendar Year Investor Profile[2] Performance (%, CAD)

Annual Return (%)	2018	2017	2016	2015	2014	2013
Capital Preservation	1.6	3.1	4.3	4.0	7.9	3.7
Income	1.0	4.5	5.8	4.7	9.5	8.6
Income and Growth	0.3	6.2	7.3	5.2	10.2	13.0
Growth	0.0	8.8	7.9	7.2	11.6	19.2
Aggressive Growth	-1.2	11.6	9.1	9.6	13.0	25.3

Source: CIBC Asset Management Inc.

Strategic Asset Allocation Methodology

The long-term asset allocation methodology applied in this paper is a two-step process.

First, we establish a global asset allocation model based on traditional asset classes: Canadian money market, Canadian equities, global equities, Canadian fixed income, global fixed income and high yield debt[3].

Second, we extended the global model to include a broader asset mix, which is expected to improve the portfolio's risk-adjusted returns. In addition to the major asset classes, we included real assets, floating rate loans, multi-sector fixed income and alternative asset classes offered through absolute return strategies.

High Yield Bonds

As a hybrid asset class with both debt and equity characteristics, high yield debt provides diversification benefits to a balanced portfolio. High yield debt offers excess interest rate spreads versus investment-grade issuers to compensate investors for the additional risk when investing in these securities. High yield credit spreads are a function of the issuer's credit quality and are impacted by the performance of a company's fundamentals. The correlation of high yield debt to equities is low but still positive, and increases in times of crisis due to deteriorating issuer fundamentals, which are reflected in both spreads and equity prices. As such, high yield debt does not generally provide all of the much-needed diversification benefits of bonds in bear markets, and should not be considered a direct replacement for traditional bonds.

In addition to credit performance, high yield debt provides diversification through shorter duration versus traditional bonds. As an example, the average duration of U.S. high yield is 4.2 years, considerably shorter than global bonds with a duration of 7 years[4]. The lower the duration of the asset class, the lower its sensitivity to interest rate movements; consequently, high yield debt should provide less sensitivity in a rising-rate environment.

Alternative Asset Classes

Our allocation to alternative asset classes is comprised of real assets, multi-sector fixed income, floating rate loans and absolute return strategies. The inclusion of these asset classes causes the efficient frontier to shift up and to the left, with higher long-term expected return and less risk (as measured by standard deviation). Our recommendation is to reallocate a portion of global equity and high yield components to these diverse alternatives.

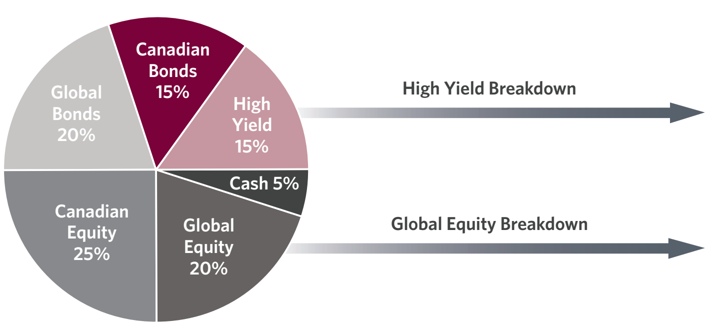
Real Assets

Real asset strategies can improve diversification through exposure to both infrastructure and real estate. Infrastructure investments provide the benefits of stable cash flows and long-term returns that are highly correlated to economic growth. Infrastructure has a low, but positive, correlation to debt and is also positively correlated to equities. In the long run, we believe that infrastructure investments will be impacted by a number of uncorrelated factors. Slow but steady economic growth will positively impact more cyclical sectors, while regulated sectors will feel the negative impact of their longer-dated cash flows in a rising-rate environment. The required liquidity premium for holding these long-term assets increases as duration risk increases.

Investment in real estate also provides the benefits of potential growth and high dividend income streams. Dividends in real estate typically come in the form of relatively stable rents paid to real estate investment trust (REIT) companies. Investments in real estate remain well diversified across real estate sectors and countries. In multi-asset portfolios, REITs act as diversifiers to broad equity markets due to their typically low correlation with equities. Notwithstanding, REITs can experience severe downturns, such as during the 2008 financial crisis. In the current environment, REIT investments are expected to benefit from a focus on demand for new developments combined with low borrowing costs. As a result of performance pattern diversification, the addition of REITs and infrastructure to balanced portfolios would broaden the asset mix and potentially improve its risk/return profile.

Strategic Asset Allocation Methodology

Step 1: Asset Allocation based on Five Broad Asset Classes



Step 2: Asset Allocation Recommendation for High Yield Debt and Global Equities Exposures

Source: CIBC Asset Management Inc, Income and Growth Model

Floating Rate Loans

Floating rate loans are debt instruments with a variable interest rate. Interest rates on floating-rate loans are reset on a scheduled and frequent basis based on market rates. When interest rates rise, the interest paid by a floating-rate loan will also rise. Thus, floating rate loans provide protection against rising interest rates. The debt of these companies is typically rated below investment grade, providing a credit risk profile similar to high yield. However, floating rate loans represent a senior/secured claim against the company, and holders of the loans have first claim on the company's assets in the event of default. From a diversification view, floating rate loans have low-to-negative correlation to traditional investment-grade fixed income and equity asset classes, and provide more optimal portfolios.

Multi-Sector Fixed Income

The multi-sector fixed income component incorporates a wide range of fixed income securities, with the goal of minimizing risk while producing sufficient yield to meet return objectives. A multi-sector portfolio is positioned to add value through tactical allocations among a number of fixed income instruments. These include global government and agency bonds, money markets, corporate investment-grade and high yield debt, asset-backed securities, mortgage-backed securities and local and U.S. dollar-denominated emerging market debt. Tactical allocation to multiple fixed income assets can potentially lower volatility relative to individual asset classes like high yield or emerging market debt.

Absolute Return Strategy

We have added an absolute return strategy to our asset allocation model to help investors mitigate risk against our forecast of lower expected returns and higher volatility. The strategy can add value to a balanced portfolio by 1) seeking an absolute positive return over a cash benchmark regardless of the global macro environment and equity market cycles, and 2) lowering potential risk by managing volatility relative to equities. It can achieve this through diversification by selecting securities outside of traditional stock and bond markets. These could include currencies, commodities and factor-based strategies, as well as expressing short-exposure views on asset classes.

An absolute return strategy differs from traditional asset classes that are benchmarked to indices where performance can be episodic. Traditional broad asset allocation portfolios were built with a concentration on equity risk. The addition of a benchmark-agnostic absolute return strategy can potentially reduce this risk by lowering portfolio volatility with the goal of a smoother investment experience.

Long-term Capital Market Assumptions

The strategic allocation methodology is based on forward-looking estimates for 10-year returns. We believe that longer-term, forward-looking estimates best capture the current and potential global economic and financial environment. This year, CIBC Asset Management (CIBC AM) Multi-Asset and Currency Management's 10-year forward looking returns were incorporated into our asset allocation models. This process is described as follows:

1. Long-term GDP projections	2. Long-term market projections	3. Volatility and correlation projections

Step 1: Long-term Potential GDP Growth Projections

We use a macroeconomic textbook framework to make our projections, where GDP growth is a function of labour and capital inputs, as well as total factor productivity. A key feature of our approach is that we augment the textbook specification to take into account the negative impact of monetary policy renormalization in a context of elevated indebtedness across major economies.

The most important views stated in our projections are:

- Demographics will be an important headwind to growth. We use labour market projections made by the International Labor Organization;
- Productivity growth will remain weak by historical standards. Technological advances are still having a decreasing impact on the growth rate of productivity.
- Central banks will gradually increase their policy rates over the long-term, eventually reaching a neutral policy stance (which equals nominal potential GDP growth over the long run). Unfortunately, higher indebtedness as a share of GDP will result in a higher debt-servicing burden for most large economies.

Step 2: Long-term Capital Market Expected Returns

For the asset classes we cover, we calculate expected returns based on the following approach:

RETURN = Current income + Growth in income + Change in value

Where:

- [Current Income] is the coupon yield (fixed income), or the dividend yield (equity);
- [Growth in Income] refers to earnings growth. This only applies for equity;
- [Change in Value] is the impact of varying interest rates (fixed income), or cyclically-adjusted P/E ratios converging towards their long-term equilibrium value (equity);

For fixed income, the fair value for rates corresponds to the sum of: 1) the neutral policy rate of the reference economy 2) the current country-risk premium 3) an asset-class specific risk premium, in the case of corporate bonds 4) a default rate (for corporate bonds) and 5) a term premium.

For equities, cyclically-adjusted P/E ratios are projected to converge gradually towards their respective historical averages, as has been the case in the past. We use a similar framework for currency returns, which are used for converting expected non-domestic investment returns into Canadian dollars.

- [Current Income] refers to the proceeds from carry trade, while [Change in Value] refers to the impact of currency prices converging towards their respective long-run equilibrium value. (This value is based on the assumption that purchasing power parity (PPP) will hold across economies in the long-term.)

Step 3: Expected Volatilities and Correlations

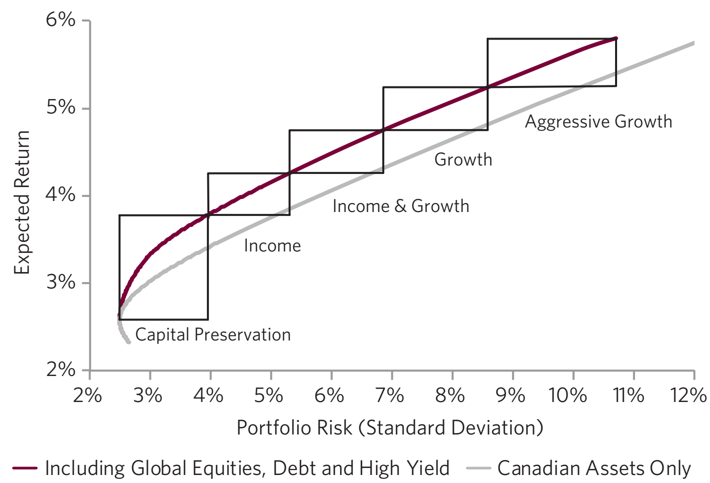
In estimating expected volatilities and correlations, we select a time period that will produce stable estimates and capture multiple cycles. We believe that too long a time period may not capture structural changes to asset classes. Conversely, too short a time frame may not capture idiosyncrasies of the asset class over a full business cycle. As such, we have used 13 years of historical data, extending from last year's estimate using 12 years. This period covers recession and growth periods and spans a full business cycle, appropriate for estimating volatility and correlation parameters.

Strategic Asset Allocation Process

The asset allocation process is founded on the principle that each combination of stocks, bonds and cash will provide a different expected risk and return level. In this step we determine an optimal allocation for each asset class based on our long-term expectations of return and risk.

For every level of risk, a portfolio is constructed and optimized with a combination of cash, bonds and equities that results in the highest expected return. In this way the optimization process eliminates portfolio combinations that have a lower expected return with the same level of risk. The remaining portfolios are the most efficient given our long-term expectations. These portfolios form the efficient frontier, which we have plotted for both Canadian-only and Canadian plus global investments.

Efficient Frontier (2019 Forward-Looking Estimates)



Source: CIBC Asset Management Inc.

2019 Expected Long-term Asset Class Returns and Risk

Our projections and forecasts resulted in the following long term expected returns and risk (in CAD):

Expected Long-term Asset Class Risk and Returns (%, CAD)

	Equities		Bond		Cash	U.S.
	Global	Canadian	Global	Canadian	Canadian	High yield
Expected Returns	5.0	5.9	1.6	2.2	2.5	5.4
Expected Risk	11.2	12.6	9.2	3.5	0.4	8.7

Source: CIBC Asset Management Inc.

The efficient frontier is then divided into five segments, corresponding to our investor profiles. Our five investor profiles are intended to serve as guidelines for clients, covering a variety of investor and risk profiles. From most conservative to the most aggressive, these are: Capital Preservation, Income, Income and Growth, Growth and Aggressive Growth. Our asset allocation recommendations blend equity, bond and cash weightings for each profile.

The strategic mix within high yield and global equities is constructed in a similar way to the broad asset allocation. The recommended mix within high yield and global equities is the portfolio with the highest expected Sharpe ratio (expected portfolio return – expected cash return)/ expected portfolio volatility).

2019 Recommendations

The asset allocation chart below illustrates recommended global strategic allocations based on the broader asset classes. Across profiles, the expected return is lower versus last year as a result of both reduced equity and bond expected returns. Expected volatility is higher year over year as we model in higher currency volatility from global bonds.

The lower returns across profiles can be largely attributed to much lower expected returns for Canadian and global bonds. This is due to negative valuation effects associated with monetary policy normalization through higher interest rates.

Within equities, lower returns are partly driven by global equities, and U.S equities in particular. Despite the correction in 2018, U.S. equities remain overvalued relative to their long-term cyclically adjusted price-to-earnings (CAPE) fair value. Lowered expectations for U.S. equities are counterbalanced by increased emerging market equity projections, as those markets remain undervalued relative to long-term CAPE fair value. The growth differential between emerging markets and developed markets also favours emerging markets. As Canadian equities are also trading below fair value relative to other developed markets, Canadian equities remain attractive.

We expect higher returns for cash versus long-term bonds. As a result of its risk-free status and improved yields in recent years, cash is currently the most attractive risk-adjusted asset class. Traditional bonds are not expected to provide much of a term premium or yield enhancement over short-term bonds. However, traditional bonds do provide a shock absorber to equity drawdowns. Our recommendation is for a 5% reallocation from longer duration global and Canadian bonds in most risk profiles to cash or short-term equivalents.

In the income profile, we recommend a 5% shift to high yield to meet expected return and risk parameters. A high yield allocation is expected to provide the most efficient risk-adjusted return over the long term. In the income and growth profile, global equities exposure has been increased by 5% with a reallocation from bonds. Global equities continue to provide diversification versus other asset classes and will help maintain long-term expected return objectives for this profile.

2019 Asset Allocation for Canadian Investors (%, CAD)

The numbers in brackets indicate the change in allocation from the prior year's recommendation

	Equities		Bond		U.S.	Cash	Expected	
	Global	Canadian	Global	Canadian	High yield	Canadian	Return	Volatility
Capital Preservation	5	15	20(-5)	30	5	25 (+5)	3.0	3.4
Income	10	20	15(-5)	25(-5)	15(+5)	15 (+5)	3.7	4.5
Income & Growth	25(+5)	25	10(-5)	15(-5)	15	10 (+5)	4.3	6.1
Growth	40	25	10(-5)	5	15	5(+5)	4.7	7.6
Aggressive Growth	60	25	0	0	15	0	5.3	9.6

Source: CIBC Asset Management Inc.

For clients investing in Canadian asset classes only, changes largely mirror the global portfolio recommendations. Given reduced Canadian bond return expectations, reallocations are recommended to cash equivalents. In addition, equity allocations have been reduced in higher-risk profiles as follows:

Recommended Asset Allocation Using Domestic Only Assets (%)

The numbers in brackets indicate the change in allocation from the prior year's recommendation

	Expected Return	Expected Volatility	Canadian Equity	Canadian Bonds	Canadian Cash
Capital Preservation	3.0	3.4	18 (+3)	60 (-5)	22 (+2)
Income	3.4	4.7	30	60 (-5)	10 (+5)
Income & Growth	4.1	6.8	50	45 (-5)	5 (+5)
Growth	4.8	9.0	70 (-5)	25	5 (+5)
Aggressive Growth	5.4	10.8	85 (-5)	15 (+5)	0

Source: CIBC Asset Management Inc.

Diversification within Broad Asset Classes

In this section, we provide guidance on diversification through reallocations of existing asset classes to achieve the most efficient portfolios, as measured by expected return per unit of risk. Existing high yield debt allocations can be further diversified through a number of debt instruments, including floating-rate loans and other fixed income found within a multi-sector fixed income strategy. Allocations are tilted towards U.S. high yield debt, given its higher return/risk outlook versus other debt instruments. Floating rate loans feature low interest rate sensitivity and are therefore recommended reallocations from high yield, given the rising interest rate environment.

Recommended Strategic Mix within the High Yield Asset Class (%, CAD)

High Yield Fixed Income[5]	Weight	Expected Returns[5]	Volatility
Multi-Sector Fixed Income	20	4.2	7.9
Floating Rate Loans	30	5.2	8.9
U.S. High Yield Debt	50	5.4	8.7

Source: CIBC Asset Management Inc.

Within global equities, allocations are varied geographically and by underlying exposures. We have increased the recommended allocation to emerging markets given the higher long-term return expectations and lower relative valuations versus U.S. and international equities. This year, we have observed global macro events that caused correlations to rise. Diversification is key to lower risk, and can be achieved through uncorrelated return patterns relative to current portfolio exposures. Absolute return strategies are also added to this year's global strategic mix, as they represent a return stream that is expected to be uncorrelated with global macro events that can impact global equities. This is expected to provide stable returns in environments where long-term expected returns are low and accompanied by volatility.

Recommended Strategic Mix for Global Equities (%, CAD)

Global Equity Asset Class	Weight	Expected Returns	Volatility
U.S. Equity	45	2.8	11.3
International Equity	15	6.0	12.8
Emerging Markets	20	12.4	16.3
Real Assets[6]	10	4.8	11.1
Absolute Return Strategy[7]	10	7.5	5.6

Source: CIBC Asset Management Inc.

Why Does Diversification Matter

Diversification can be a powerful tool to avoid painful drawdowns. No single market or security can outperform all the time. In 2018, investors experienced unpleasant surprises that affected individual companies (e.g. the impact of unexpected wildfires on a utility in California), countries (Italy and Turkey) and the global macro economy (U.S. trade war). Investors can, however, protect themselves through diversification.

Portfolio risk is not just the sum of individual security volatilities and must take into account the correlation of all securities in the portfolio. Geopolitical risk, technological changes and monetary policy can increase idiosyncratic risks both to individual securities and to broader sectors and asset classes. Investors seeking to reduce exposure to any individual risk can diversify across asset classes and geographic exposures. While a diversified portfolio will likely never beat the best performing asset class, it will also likely never match the worst. An appropriately diversified portfolio can provide investors with a smoother return experience by applying principles of portfolio efficiency, while meeting investment objectives.

A common historical example of diversification benefits can be observed by comparing an all-Canadian investment portfolio with our Growth investor profile that includes global assets. Both portfolios have a 65/35 equity-bond mix.

At the portfolio level, risk-adjusted returns are improved by adding uncorrelated investment sources from varied geographic regions. The Growth profile is able to achieve higher returns at lower risk levels for historical 10-year and 25-year periods, illustrating its superior efficiency and diversification benefits over the Canadian-only portfolio.

Domestic-Only (65% Equity/35% Fixed Income) Portfolio vs Growth Profile with Global Assets, Historical Performance (CAD) as of December 2018

Domestic Assets Only	10 yrs	25 yrs
Annualized Return	6.7%	7.1%
Annualized Risk	7.0%	9.5%

Growth Profile with Global Assets	10 yrs	25 yrs
Annualized Return	9.3%	7.2%
Annualized Risk	6.7%	8.1%

Source: Bloomberg, CIBC Asset Management Inc.

Currency Impact for Canadian Investors

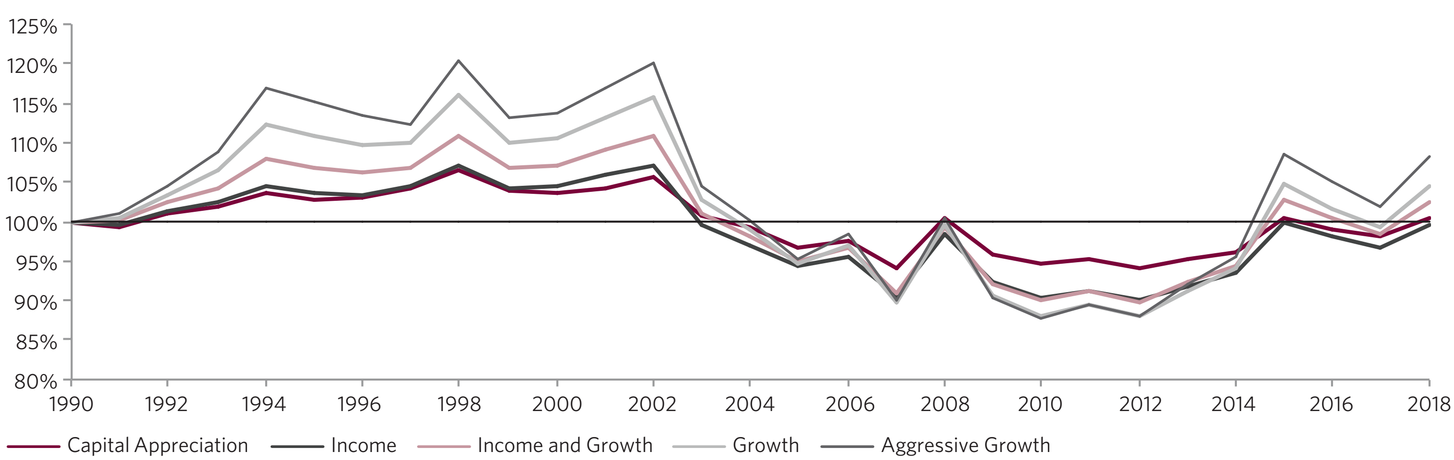
Currency exposure can add foreign exchange fluctuations to portfolio returns in the short run. Examples of this were observed when the Canadian dollar traded above par with the U.S. dollar in late 2007 and again in 2011, only to steadily retreat in the following time periods. However, over a longer time frame, foreign exchange exposure becomes less of a concern, and represents a small risk relative to the benefits of global diversification.

When determining our long-term asset allocation profiles, we factored in foreign exchange risk with respect to the risk and return objective of each investor profile. Foreign exposure increases for riskier profiles, as these investors will typically have longer time horizons, lower liquidity requirements and higher risk tolerance.

Conversely, an investor with lower risk tolerance will likely have higher short-term liquidity requirements and more sensitivity to foreign exchange volatility. These investors will also typically have less foreign content and therefore less exposure to currency fluctuations.

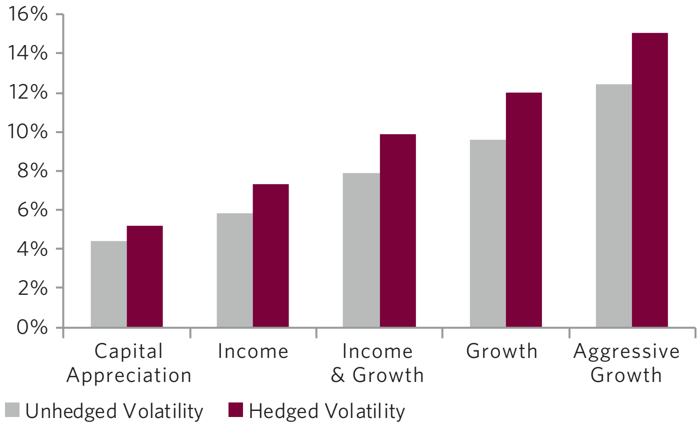
In the long run, the inclusion of additional currencies in the portfolio has resulted in the diversification benefit of reduced volatility. Historical data shows a positive correlation between Canadian equities and Canadian currency because they are still both highly dependent on oil prices. However, there is a lower correlation between domestic asset classes and unhedged global assets. The effect of lower correlations, as shown in the next exhibit, is improved diversification and reduced volatility in all of the risk profiles when unhedged foreign investments are added to the profile.

Cumulative Excess Return[8] of Unhedged vs. Hedged Proxy Portfolios (January 1991 – December 2018)



Source: CIBC Asset Management Inc. for Model Portfolio Weights; Bloomberg for indexes as proxies for asset class performance.

Historical Volatility for Unhedged and Hedged Portfolios (January 1991 – December 2018)[9]



Foreign Exposure	30%	40%	50%	65%	75%

Source: CIBC Asset Management Inc. for model portfolio weights; Bloomberg for index returns as proxies for asset class performance.

The impact of a hedged investment on total returns is also a key consideration. Currency fluctuations in any one year could materially impact returns in the short run and indicates potential hedging benefits for lower-risk portfolios, given their shorter investment horizons. Generally, in years when the Canadian dollar appreciates, hedging enhances non-domestic returns; otherwise, hedging impedes returns. In 2017, for example, the Canadian dollar appreciated 6.9% against the U.S. dollar, and hedged portfolios outperformed unhedged portfolios by 0.9% for the Capital Preservation profile, and by 2.8% for the Aggressive Growth profile. In 2018, on the other hand, the Canadian dollar depreciated 7.7% against the U.S. dollar, and hedged portfolios underperformed unhedged portfolios by 2.2% for the Capital Preservation profile, and by 6.0% for the Aggressive Growth profile.

To hedge or not to hedge depends on risk tolerance, investment horizon and currency outlook. We recommend that clients with short-term requirements use hedged products for non-domestic investments to lessen the impact of currency fluctuations. However, over the long run, an unhedged portfolio has historically provided better risk-adjusted returns over a hedged portfolio.

Finding the Optimal Profile

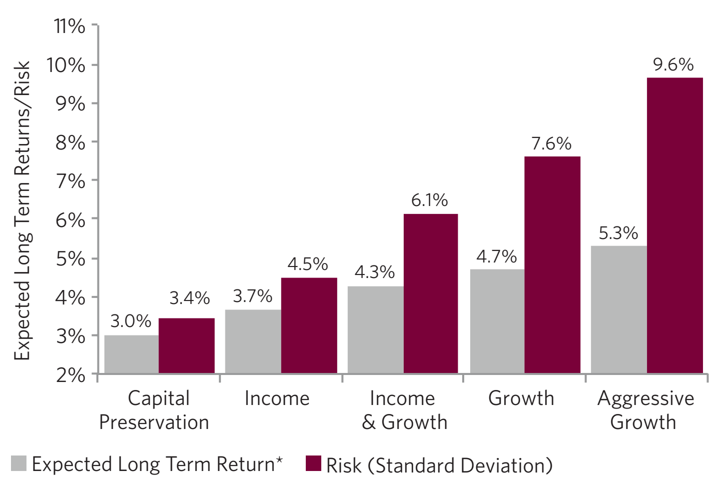
Investors' goals, risk tolerance, time horizon, financial situation, income needs, liquidity, tax considerations, unique circumstances and attitude toward global investing are variables that need to be considered when determining an appropriate investment profile. When selecting an appropriate profile, it is also necessary for an investor to determine long-term return objectives. Importantly, risk tolerance should not be based on the last 12 months of performance and volatility, but instead on longer periods that better coincide with the investor's time horizon. Investors need to be comfortable with the volatility of their asset allocation in every type of market through a full market cycle.

The search for an optimal investor profile begins with a risk/return analysis. Risk and return characteristics must be viewed in tandem, as each provides an essential piece of the asset allocation puzzle. The expected return must be sufficient to achieve the investor's long-term goals, while the risk must be tolerable.

The risk measures discussed throughout this paper can help investors decide on the suitability of each profile. Historically, over the long- term, equities have outperformed bonds and bonds have outperformed cash; but outperformance comes with the cost of higher risk as measured by volatility (standard deviation).

Regardless of the measurement used to quantify risk, higher returns are accompanied by higher risk. The five investor profiles, ranging from Capital Preservation to Aggressive Growth, have incrementally higher levels of expected return and volatility, as shown below.

Investor Profile Expected Returns and Risk[10]



Source: CIBC Asset Management Inc.

The following table summarizes the historical returns for the five investor risk profiles. The ranges of performance illustrate the short-term volatility risk and benefits of remaining invested for the long run. The longer the investment horizon, the lower the likelihood of experiencing negative average returns.

Annualized Return Variability 1950-2018 (%, Not Annualized if Less than 1 year)

	Monthly Returns		3 months		6 months		1 year		3 years		5 years		10 years		% Neg.	Historical*	
	Best	Worst	Best	Worst	Best	Worst	Best	Worst	Best	Worst	Best	Worst	Best	Worst	Mths	Ret.	Std. Dev.
Capital Preservation	6.1	-4.1	14.8	-5.5	23.3	-8.4	35.1	-8.8	21.3	1.8	19.1	2.8	14.4	3.9	28.9	7.2	4.1
Income	7.8	-6.0	17.0	-10.0	26.5	-13.4	42.2	-16.5	23.7	-0.3	21.7	1.7	15.9	3.3	32.0	8.1	5.6
Income & Growth	10.5	-8.5	17.4	-15.5	29.4	-18.9	47.7	-23.8	27.1	-4.6	25.3	0.1	18.0	2.2	32.4	9.0	7.5
Growth	12.4	-11.7	19.1	-18.6	30.7	-23.7	49.9	-29.3	31.8	-8.2	28.5	-1.4	20.0	0.8	33.7	9.7	9.1
Aggressive Growth	15.1	-15.9	24.2	-23.7	37.8	-30.9	54.8	-36.3	37.8	-13.1	32.6	-3.3	22.2	-0.9	35.3	10.6	11.3

Source: CIBC Asset Management Inc.
* *Historical returns and standard deviation of the five investor profiles from 1950-2018.

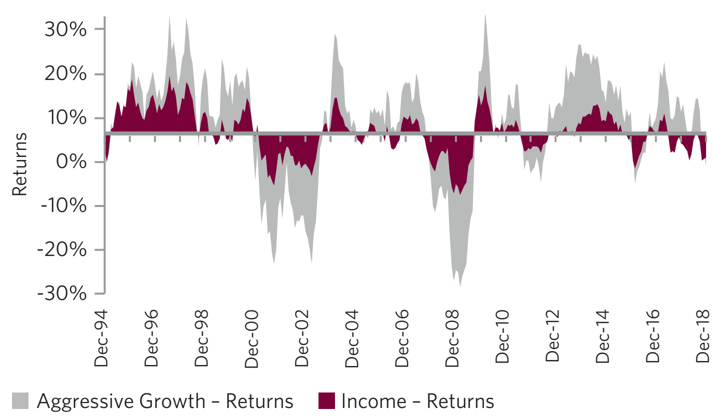
Risk Analysis of Investor Profiles

Different measurements may be used to quantify risk. There is no preferred method, but combining various risk measurements provides a more comprehensive analysis of the risk characteristics of an investment portfolio.

Standard deviation is one of the most commonly used risk measurements in investment theory, as it measures the variability around historical or expected returns. The lower the observed standard deviation, the lower the risk.

The variability chart demonstrates the risk for two investor profiles over the past 25 years. The historical 25-year annual standard deviation for the Aggressive Growth portfolio is 12.9% and 5.3% for the Income portfolio. Clearly, the returns are more variable for the Aggressive Growth profile. However, with a starting investment of $1000 25 years ago,the Aggressive Growth investor would have grown the investment to $6026 (annualized 7.4% return) by the end of 2018. This is materially higher than the Income investor, who would have grown the same starting investment to $4477 (annualized 6.2% return).

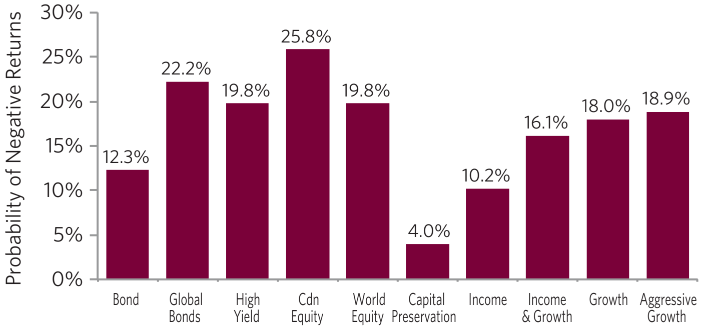
Variability in One Year Historical Returns for the Income and Aggressive Growth Profiles (December 1994 – December 2018)



Source: CIBC Asset Management Inc., Bloomberg

Another measurement to quantify risk is the probability of negative returns over a specific period. As shown in the following chart on page 13, the Capital Preservation portfolio has only a 4.0% chance of losing money over a one-year period, while the Growth portfolio has a much higher chance, at 18.0%.

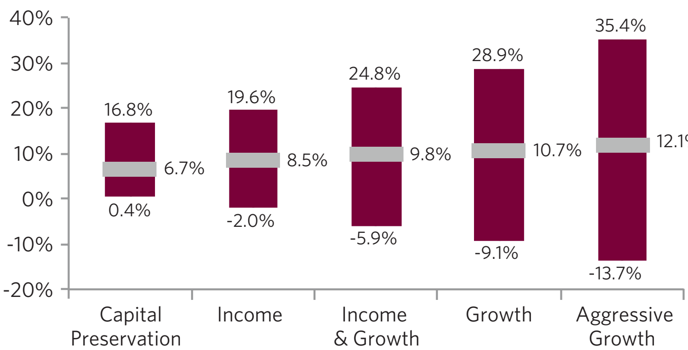
Probability of Negative Annual Returns in a One-Year Period (1950 – 2018)



Source: CIBC Asset Management Inc., Bloomberg

One problem with the "probability of negative returns" as a measurement of risk is that it does not address the magnitude of potential loss. A particular investment may have a small chance of experiencing a loss, but if the loss occurs it may be larger than the investor can tolerate. Return percentile is another risk measurement that combines the probability of loss occurrence with the magnitude of the corresponding return. The 5th percentile shows the lowest 5% for returns. The following table shows the 5th, 50th and 95th annual return percentiles for the five investor profiles from January 1950 through December 2018.

5th, 50th and 95th Annual Return Percentiles (1950 – 2018)



Source: CIBC Asset Management Inc., Bloomberg

Another risk-assessment approach is to test the length of time it takes each profile to traverse from peak to trough and back to the original peak again during the prior 69 years. Impressively, the most conservative Capital Preservation profile only required one year to recover once in the last 69 years. Conversely, the Aggressive Growth profile endured ten periods that required more than a year to recover and three periods required more than three years to regain their previous peak. The maximum period observed for the Aggressive Growth profile to recover was 73 months, after the dot.com bubble of 2000. Once again, this demonstrates the importance of time horizon when determining an appropriate investor profile.

Frequency of Extended Recovery Periods (1950 – 2018)

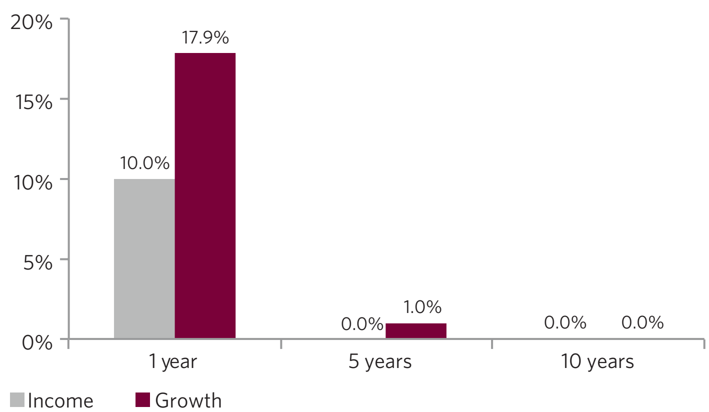
	3+ Years to Recover	2 to 3 Years to Recover	1 to 2 Years to Recover
Capital Preservation	0	0	1
Income	0	1	6
Income & Growth	2	1	6
Growth	2	1	6
Aggressive Growth	3	1	6

Source: CIBC Asset Management Inc.

Remain Diversified and Fully Invested

Investors are advised to set their long-term financial goals and maintain a disciplined asset allocation approach. This will help them meet their long-term goals in accordance with their risk profiles. Timing the markets typically prevents investors from achieving their long-term goals, as risk decreases over a longer time horizon. This should encourage investors to be patient, as the probability of realizing a loss diminishes over time. Based on the past 69 years, the probability of a negative return for the Income profile or the Growth profile is 10% and 17.9% respectively on a one-year basis, decreasing to 0.0% and 1.0% respectively on a five-year basis and 0% for both profiles over a ten-year period.

Percentage of Negative Annualized Returns for the Income and Growth Profiles (1950 – 2018)



Source: CIBC Asset Management Inc.

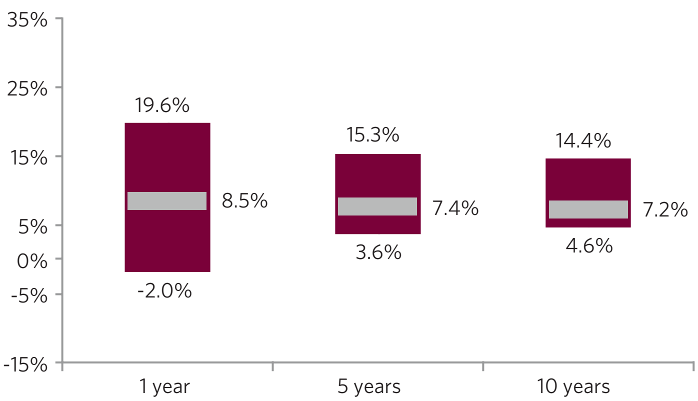
Investing is a long journey that requires careful planning and disciplined implementation to reduce the potential for emotional and inefficient responses to volatility. Investors should not allow short-term market movements to alter their approach.

In any short-term period, investors may face higher volatility and negative returns. However, this should not discourage them from investing—volatility tends to decrease in the long run and returns tend to revert to a narrower band around a long-term average.

Supported by this data, investors should establish a link between time horizon and their risk profile. For example, investors with a five-year time horizon may be comfortable investing in the Income portfolio.

Based on the past 69 years of historical returns, the Income portfolio has a 50% chance of achieving an annualized return of 7.4% or better over a five-year period. It has only a 5% chance of an annualized return of less than 3.6% over a five-year period. We can compare that to the current expected returns for Canadian money markets at 2.5%. The probability over a one-year period of achieving an annualized return less than 2.5% is 21%. In other words, over the last 69 years, the Income portfolio (over one year) returned greater than the current Canadian money market expected return 79% of the time. If we extend the measurement to a five-year holding period—over the past 69 years (769 observation periods), the Income portfolio had 4 occurrences where the annualized return was lower than 2.5% (two occurrences in the 2008/9 financial crisis and two occurrences in the 1973/1974 stock market crash). Although the Income profile may have a higher volatility than cash, most of this volatility is upside volatility.

5th, 50th and 95th Annualized Return Percentile Over Time of the Income Portfolio (1950-2018)



Source: CIBC Asset Management Inc.

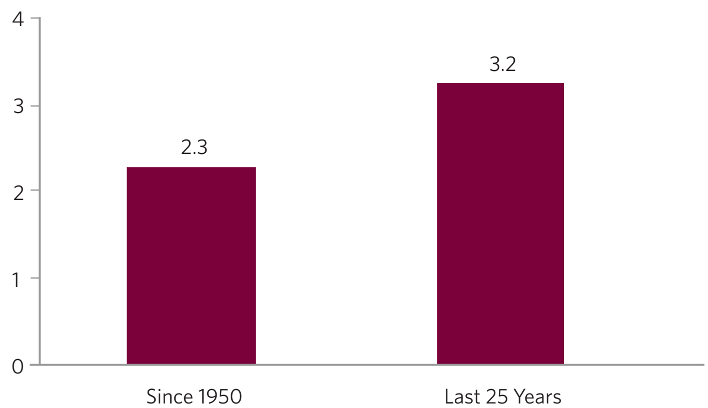
These statistics should be a wakeup call for risk-averse investors with a five-year time horizon who have all their money in saving accounts or cash. Many risk-averse investors unwittingly believe that cash is a safer investment than the Income portfolio in a five-year period. This may not be the case, particularly when taking historical probabilities and opportunity costs (upside volatility) into account.

Equities Produce the Best Returns Over the Long-term

In periods of strong equity market returns, investors can be tempted to establish or maintain very high allocations to equities in an effort to capture further gains. However, investors may not account for the fact that the higher potential returns of equities come with higher risk. Conversely, in periods of weak equity market returns, investors can be tempted to sell out of equities to reduce the risk of further losses. In all scenarios, investors should heed the long history of capital markets and maintain a disciplined, long-term asset allocation approach, taking into account their time horizon, liquidity needs and risk tolerance.

Bonds Mitigate Risk During Equity Drawdowns (1950 – 2018)

Average monthly return (bps) of Canadian bonds per 100 bps of TSX sell off

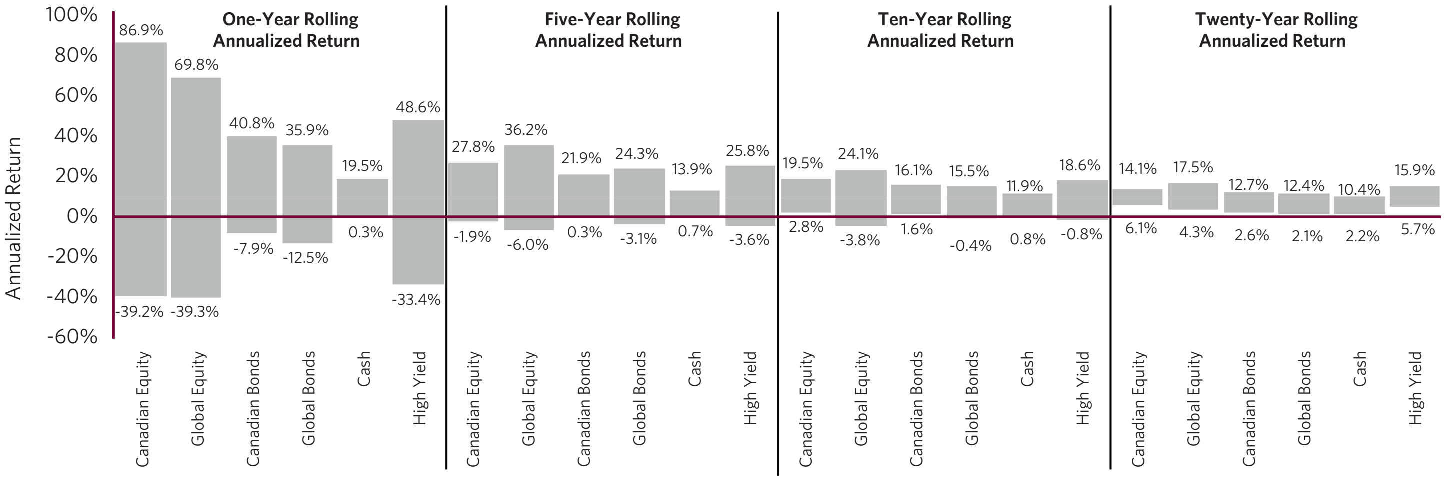


Source: CIBC Asset Management Inc.

Most investors would agree that, in the short-term, equities are more volatile than bonds and cash. In general, investors with very short-term goals should steer clear of equities and focus on guaranteed investments. A well-diversified portfolio should include an allocation to bonds, as they continue to be an effective shock absorber, and offer stability relative to a portfolio's equity holdings.

However, in the long-run, equities have been the superior asset class for investment growth. The worst 20-year period for Canadian equities (annualized return of 6.1%), is similar to the average performance from the Canadian bond market (6.5%) over the last 69 years. Over this same period, Canadian equities have outperformed Canadian bonds 72% of the time on a 10-year rolling basis and 81% of the time on a 20-year rolling basis.

Worst and Best Annualized Asset Class Returns (1950 – 2018)



Source: CIBC Asset Management Inc., Bloomberg.

Conclusion

Market volatility has a powerful impact on investor sentiment, an event we witnessed in 2018, particularly in the fourth quarter. Investors will often want to increase equity weightings at or near market peaks, and reduce or eliminate equities near a market trough. Long-term experience has taught us that discipline is paramount in trying environments and diversification can be a powerful tool to manage volatility. Although equities have historically provided higher returns than bonds, bonds remain an important part of a well-diversified portfolio, as they can help offset the risks inherent in equity returns.

Our research suggests that a balanced global portfolio's risk/return profile can also be improved by the addition of a number of asset classes including: global debt, high yield debt, global real assets, multi-sector fixed income strategies and absolute return strategies. This is due to their uncorrelated return pattern versus traditional global asset classes.

Currency risk is one of the main risks that Canadian investors face when adding foreign investments. To mitigate this risk, hedged portfolio products can provide the added benefits of exposure to global growth, with limited currency risk for investors with short time horizons. Over the long term, however, investors can achieve higher risk-adjusted returns using the additional diversification provided by adding unhedged currency risk.

Investors who are concerned about the current rising-rate environment and its impact on fixed income holdings can take advantage of shorter-duration bond instruments such as cash, floating-rate loans, high yield bonds and multi-sector fixed income strategies. They can also maintain a shorter overall duration in their bond portfolio, resulting in lower sensitivity to movements in interest rates. Higher-yielding corporate bonds generally offer less interest rate sensitivity, as changes in credit spreads have often been negatively correlated with changes in T-bill yields.

In our view, an appropriate asset allocation can provide diversification to help investors manage risks. Establishing and maintaining an appropriate asset allocation is essential to achieve long-term financial goals while maintaining acceptable portfolio risk and volatility.

While 2018 returns deviated from long-term return target averages, annual returns must be viewed in context and should not alter an investor's course or investment plan. It is imperative that long-term strategic asset allocation should be adhered to despite market fluctuations. Any tactical deviations should only be incorporated to add incremental return without threatening longer-term return and risk objectives.

Tactical Asset Allocation Opportunities

Luc de la Durantaye, CFA

Global Outlook

From Policy Renormalization to Policy Relief

The intensity of the late-2018 equity market pullback may seem counterintuitive—isn't the world economy still in decent shape? Although the global economy remains in expansion mode, market focus has shifted to deteriorating global liquidity conditions and what this could mean in 2019.

We believe that global policymakers, starting with the U.S. Federal Reserve (Fed), will increasingly shift from policy renormalization to policy relief.

- After more than three years of policy renormalization efforts, the Fed is expected to stop hiking rates and end its QT (Quantitative Tightening) policy in 2019, responding to tightening U.S. financial conditions.
- Already in easing mode, Chinese authorities are also expected to intensify their policy relief efforts with more proactive fiscal expansion and additional liquidity relief from the central bank.
- With the eurozone economy shifting into lower gear, the ECB will also do its best to cushion the downturn. While it has no choice but to put an end to its asset purchase program, it will likely launch a new TLTRO (targeted longer-term refinancing operation) program to attenuate the contraction in the eurozone's monetary base.

Overall, navigation conditions for global investors will remain difficult in 2019. While these policy efforts should provide relief for financial markets, they may not be sufficient to prevent a growth slowdown. Also, global liquidity conditions should remain relatively tight because policy renormalization objectives will eventually move back to the top of the agenda—limiting the amount of liquidity relief that central banks can provide today.

Alternative Scenarios

In our Policy Renormalization scenario, recent global economic weakness subsides, which prompts the Fed and the ECB to continue their policy renormalization. This stronger global economic environment boosts earnings growth, providing an offset to higher interest rates. Continued Chinese easing efforts and constructive political developments in Italy could also contribute to improved sentiment and stronger economic activity than in our central scenario.

We suspect that the key Global Recession risk is more likely to emerge from the U.S., which is the most advanced in its business cycle. Stronger wage increases would support the rise in inflation but could put downward pressures on corporate profitability via declining profit margins. The pace of interest rate hikes could be more damaging than expected, particularly for weaker emerging economies.

Fixed Income vs. Equity

With significant corrections in most markets last year, equity valuation has improved. Strictly from a valuation point of view, equities are currently more attractive than government bonds.

Equity Market Outlook

Emerging markets have become more resilient but remain cyclical and higher octane assets. Given attractive valuation, they should be one of the better performing asset classes once market volatility subsides.

Fixed Income

We are lowering our global bond yield forecasts to account for the clouding global macroeconomic picture. Our revised forecast for 10-year sovereign bond yields is 3.00% (U.S.) and 2.40% (Canada) over a twelve-month horizon.

Currencies

U.S. Dollar
Well-supported by the Fed's efforts to renormalize its policy stance, the multi-year U.S. dollar bull market resumed in 2018, pushing it deep into overvalued territory. In our view, this is about to change as the Fed takes a pause on rates and puts an end to its Quantitative Tightening policy in 2019. However, the U.S. dollar's downside will likely be limited in the absence of more hawkish monetary policy shifts in the rest of the world.

Canadian Dollar
From a valuation perspective, the Canadian dollar has been deeply undervalued for more than four years. However, even with the undervalued loonie, the lack of apparent improvement on the trade front reflects the effects of increasing impediments to competitiveness on exports.Looking ahead, these impediments should limit the potential upside for the Canadian dollar against the greenback, even once oil prices stabilize and the Fed moves to the sidelines.

Euro

Could 2019 finally be the lift-off year for the euro? While the euro is expected to appreciate against the U.S. dollar, the ongoing fiscal situation in Italy and our view of a broad-based growth disappointment for the eurozone should limit the appreciation of the currency.

Japanese Yen

As navigation conditions for global investors should remain difficult in 2019, the yen should remain well supported owing to its safe haven status.

Economic Outlook Underlying Our Views

United States

The tightening of U.S. financial conditions has forced the Fed to the sidelines earlier than previously anticipated. However, a pause in its tightening campaign is not the only Fed policy shift expected to take place in 2019.

The Fed shrank its balance sheet at an accelerating pace in 2018, draining U.S. dollar liquidity from the global financial system (i.e. Quantitative Tightening). The Fed now recognizes there is a lot of uncertainty surrounding the long-run size and composition of its balance sheet. In our opinion, it will revise its QT operating framework and stop shrinking its balance sheet in 2019, which should provide some relief to financial markets.

The Fed holds a strong conviction that the U.S. economy is heading for a soft rather than hard landing in 2019. Our forecast calls for below-consensus average U.S. real GDP growth (2.1%).

Europe

Eurozone policymakers faced a challenging year in 2018—GDP decelerated materially and Italian fiscal woes resurfaced. Unfortunately, 2019 is shaping up to pose even greater challenges on the policy front. Monetary authorities probably face the biggest challenge of all. They have ended their quantitative asset purchase program, are now facing a broad-based slowdown of economic growth, and euro area banks will have to start paying back ECB loans made under previous TLTRO programs.

In our view, such a liquidity squeeze would constitute too much of a hit for the eurozone economy to absorb. To cushion the blow, we believe the ECB has no other choice but to launch a new TLTRO program in early 2019. Unfortunately, if delivered as expected, this will only attenuate, not eliminate, the contraction in the ECB's balance sheet. This has the potential to precipitate some negative economic and financial market impact.

Declining monetary stimulus in 2019 means that eurozone growth will likely slow further. Our forecast calls for below-consensus average real GDP growth (+1.5%) with an elevated risk that Italy will slip back into recession.

China

Our projection for 2019 real GDP growth for China is 6%, the lowest annual growth rate in over three decades. The slowdown in real GDP expansion is the result of a more challenging global trade environment (exacerbated by the China-U.S. trade dispute) where net exports are likely to be a drag on growth. Our outlook depends on a positive outcome for a medium-term trade agreement between the U.S. and China.

This slowdown will be met with more proactive fiscal expansion—both central and local government spending will be deployed to offset the drag. The Chinese government has already announced that it wants to support spending by providing lower personal income taxes and corporate taxes. We also expect China's central bank to provide additional liquidity relief by further decreasing the reserve requirement rate for commercial banks, increasing the size of its medium-term lending facility and ultimately lowering its policy rate.

Canada

The Bank of Canada may be forced to move to the sidelines earlier than generally expected, owing to a potential tightening of financial conditions and weaker foreign growth. We are working with a below-consensus forecast of +1.5% average real GDP growth for 2019.

[1]Canadian High Yield credit spread is the difference between the yield of the Bank of America Merrill Lynch Canada High Yield Index and that of the Bank of America Merrill Lynch Canadian Government Index. The US High Yield Spread is the difference between the yield of the Bank of America Merrill Lynch High Yield Master II Index and that of the Bank of America Merrill Lynch US Treasury Master Index.

[2]Rebalanced on a calendar year end basis using Strategic Asset Allocation recommendations based on IMR Long Term Strategic Asset Allocation papers (2012-2018).

[3]Proxy indices for these asset classes are: FTSE TMX Canada 91 Day T-Bills Index for cash; FTSE TMX Bond Universe Index for Canadian bonds since inception (1990), prior to 1990, All Government Canadian Bonds with 10yr + maturity; Barclay's Global Aggregate Bond Index for global bonds since inception (1990). 1986 to 1990 JP Morgan Global Government Bond Ex Canada, 1960 to 1985 U.S. Intermediate Government (%Total Return) in Canadian Dollars, 1950 to 1960 U.S. Intermediate Government (%Total Return) - Currency Prorated; Merrill Lynch U.S. High Yield Master II Index for U.S. high yield bonds since inception (1986). Prior to 1986, U.S. high yield asset class returns were approximated with a 20/80 blend of the S&P 500 Index with either U.S. government bonds (1950 to 1975) or the Barclays Global Aggregate Debt Index (1975 to 1986). S&P/TSX Composite Index for Canadian Stock returns since inception (1956), prior to 1956 data was from the Montreal Exchange and Toronto Stock Exchange Market Review(1950 to 1955); MSCI World Index for Global Stocks since inception (1982), 1950-1982 Global Financial Data C$ World.

[4]High Yield is represented by the Bank of America Merrill Lynch US High Yield Master II Index, Global Bonds is represented by the Bloomberg Barclays Global Aggregate Index. Duration as of December 31st, 2018

[5]Multi-sector fixed income returns were approximated through a blend of the Barclay's Aggregate Bond Index (50%), BoA Merrill Lynch U.S. High Yield Index (25%) and the J.P. Morgan Emerging Markets Bond Index (25%). Floating rate loans are approximated by the Credit Suisse Leveraged Loan Index and U.S. high yield debt by the BoA Merrill Lynch U.S. High Yield II Index.

[6]Real Assets returns is approximated through a blend of 40% Real Estate Equities (FTSE EPRA/NAREIT Developed Real Estate Index), 50% Infrastructure Equities (Dow Jones Brookfield Global Infrastructure Index) and 10% Real Asset Debt (70% Bank of America Merrill Lynch Global High Yield Index + 30% Bank of America Merrill Lynch Global Corporate Index)

[7]Absolute Return Strategy returns is approximated by using MSCI ACWI index and an expected return of 5% above Canadian cash.

[8]Excess return is measured as the difference in performance between the rolling one-year returns for the CAD portfolio and the hedged to CAD portfolios.

[9]Historical performance for each risk profile is based on historical returns for the component asset classes based on proxy indices[3] monthly rebalanced to the 2019 Long Term strategic global allocation recommendation.

[10]Expected Returns and Expected Risk for the component asset classes are based on 10 year forecast returns as explained in Long-Term Capital Markets Assumptions section of the paper.