

Financial Planning Assumptions

PWL

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1. Introduction

This guide is intended to provide Canadian financial planners with our best estimates of future asset class returns and volatilities to produce financial projections for their clients. Throughout this document, it is assumed that investors hold a broadly diversified portfolio of publicly traded Canadian fixed income securities and global equity, the latter including both developed and emerging markets. These estimates are valid uniquely in the context of an investor who purposely avoids concentration in one or a few securities or sectors. Our investment horizon is 40 years. A comprehensive description of our [methodology](#) is also available. For users of the Naviplan financial planning software, key inputs are highlighted in blue. We have added an appendix to provide users of Naviplan with data presented in a more compatible format.

2. Expected Inflation

Our estimate for long-run Canadian inflation is the average of 30-year Government of Canada bond breakeven inflation, historical Canadian inflation 1900 – 2020, and the Bank of Canada’s inflation target.

Table 1 - Expected inflation composition

0.33 x (Breakeven Inflation) Plus	0.33 x (Historical Inflation) Plus	0.33 x (Bank of Canada Target Inflation)	Equals Expected Inflation
1.8%	3.0%	2.0%	2.3%

Source: PWL Capital; Data Sources: Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of Optimists: 101 Years of Global Investment Returns*, Princeton University Press, 2002; Elroy Dimson, Paul Marsh and Mike Staunton, *Credit Suisse Global Returns Yearbook and Sourcebook*, 2018, Zurich: Credit Suisse Research Institute, 2021, Bank of Canada

3. Primary Residence

We estimate the expected real capital return for personal residences at 1% annually. The carrying costs of real estate including maintenance and insurance costs, and property taxes, must also be captured. We estimate a 1% annual cost for maintenance and insurance. As property taxes vary greatly, we do not attempt to prescribe a figure here, but users should be sure to include them based on their circumstances. A 1% real return less maintenance and property taxes (not to mention the opportunity cost of home equity) may make housing look like a poor investment, but it is important to remember that the owner is receiving imputed rent as a benefit.

To estimate the volatility of the value of the returns on residences, we used the Teranet-National Bank House Price Index for the eleven largest Canadian cities. Like we do for fixed income and equity, we calculate an average of the 5 and 20 years annualized standard deviations of monthly returns. Our results are presented in table 2 below.

Table 2 - Standard Deviation of the Return on a Canadian Residence

Asset Class	Five-year Standard Deviation	20-year Standard Deviation	Estimated Standard Deviation
Primary Residence	2.85%	2.49%	2.67%

Source: Teranet - National Bank

4. Asset Class Expected Returns

Our estimate for asset class expected returns is a weighted average of the Market-Based Expected Return (MBER) and the Equilibrium Cost of Capital (ECOC). The MBER is an estimate of expected returns based on current market conditions. The ECOC is an estimate of expected returns based on more than 120 years of global asset class return historical data. The weighting of each component is derived from the statistical explanatory power of the MBER. Empirical evidence suggests that the MBER has a high explanatory power for fixed income and a relatively low explanatory power for equity.

In our calculation for the expected return of each asset class, we attribute a weight “W1” to the MBER and the balance of the attribution to the ECOC.

Nominal expected stock returns are calculated as:

$$E(R) = (W1 * \text{Nominal MBER}) + (W2 * \text{Nominal ECOC})$$

W1 = Weight of the Market-Based Expected Return

W2 = (100% - W1) = Weight of the ECOC

MBER = Market-Based Expected Return

ECOC = Equilibrium Cost of Capital

The details for calculating asset class expected returns are provided in Table 3 below.

Table 3 - Nominal Asset Class Expected Returns

Asset Class	W1	Nominal MBER	W2	Nominal ECOC	Nominal Expected Return
Cash	75%	0.18%	25%	3.10%	0.91%
Short Term Fixed Income	75%	1.32%	25%	3.75%	1.93%
Fixed Income	75%	1.84%	25%	4.40%	2.48%
Canadian Equity	25%	5.90%	75%	6.80%	6.58%
U.S. Equity	25%	4.60%	75%	6.80%	6.25%
International Equity*	25%	7.71%	75%	6.80%	7.03%
Global Equity 33-33-33**					6.62%

*International Equity includes developed and emerging markets

** "Global Equity 33-33-33" is a global equity portfolio equally weighed between Canadian, U.S. and international equity

Source: PWL Capital; Data sources: Bloomberg, Morningstar, Robert Shiller, Elroy Dimson, Paul Marsh and Mike Staunton, Triumph of the Optimists: 101 Years of Global Investment Returns, Princeton University Press, 2002; Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Returns Yearbook and Sourcebook, 2018, Zurich: Credit Suisse Research Institute, 2021

5. Expected Standard Deviations

Asset Class standard deviations are estimated using a simple average of the 5-year and 20-year historical standard deviations.

Table 4 - Estimated Volatility of Major Asset Classes

Asset Class	Five-year Standard Deviation	20-year Standard Deviation	Estimated Standard Deviation
Fixed Income	4.43%	3.92%	4.17%
Canadian Equity	15.27%	14.13%	14.70%
U.S. Equity	14.71%	13.43%	14.07%
International Equity*	11.56%	13.48%	12.52%
Global Equity 33-33-33**	12.83%	12.19%	12.51%

Source: PWL Capital; Data Source: Morningstar

6. Expected Correlations

Asset Class correlations are estimated using a simple average of the 5-year and 20-year historical data.

Table 5 - Correlation Estimates

	Fixed Income	Canadian Equity	U.S. Equity	Int. Equity	Global equity 33-33-33
Fixed Income	1.00	0.23	0.25	0.24	0.26
Canadian Equity	0.23	1.00	0.77	0.73	0.92
U.S. Equity	0.25	0.77	1.00	0.79	0.91
International Equity*	0.24	0.73	0.79	1.00	0.91
Global Equity 33-33-33**	0.26	0.92	0.91	0.91	1.00

Source: PWL Capital; Data Source: Morningstar

7. Composition of Asset Class Returns

The composition of returns, primarily consisting of the mix between capital appreciation, interest income and dividends, is important for financial planning. The tax liability in taxable and non-taxable (due to foreign withholding tax) accounts will hinge on the portion of returns assumed to be coming from dividends, realized capital gains and unrealized capital gains.

To determine the composition of equity asset class returns, we proceed as follows:

- Establish one or more mutual funds or ETFs that represent the passive benchmark for each asset class.
- For fixed income, the average distribution yield is assumed to be equal to the expected return and to be 100% interest income.
- For Canadian equity, the average distribution yield is assumed to be 100% Canadian dividends.
- For U.S. and international equity, the average distribution yield is assumed to be 100% foreign dividends.
- The balance of expected returns (net of distribution yields) is treated as capital gains.
- We assume a 50%/50% split between realized and unrealized capital gains.

Current funds in use to estimate the composition of asset class returns:

Fixed income: 100% Vanguard Aggregate Bond ETF (VAB)

Canadian equity: 50% iShares S&P/TSX Composite ETF (XIC), 50% DFA Canadian Core Equity fund (DFA256)

U.S. Equity: 50% Vanguard U.S. Total Market ETF (VUN), 50% DFA U.S. Core Equity fund (DFA293)

International Equity: 35% Vanguard FTSE Developed All Cap Ex North America (VIU), 15% Vanguard FTSE Emerging Markets All Cap Index (VEE), 50% DFA International Core Equity fund (DFA227)

Our estimates for the composition of expected returns are illustrated at Table 6. This data is reproduced in a Naviplan-compatible format in the Appendix.

Table 6 - Composition of Expected Asset Class Returns

Asset Class	Expected Return	Interest & Foreign Dividends	Canadian Dividends	Realized Capital Gains	Unrealized Capital Gains
Fixed Income	2.48%	2.48%	0.00%	0.00%	0.00%
Canadian Equity	6.58%	0.00%	2.31%	2.14%	2.14%
U.S. Equity	6.25%	1.10%	0.00%	2.58%	2.58%
International Equity*	7.03%	2.44%	0.00%	2.30%	2.30%

Source: PWL Capital; Data Sources: Bloomberg, Morningstar, Robert Shiller, Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists: 101 Years of Global Investment Returns*, Princeton University Press, 2002; Elroy Dimson, Paul Marsh and Mike Staunton, *Credit Suisse Global Returns Yearbook and Sourcebook*, 2018, Zurich: Credit Suisse Research Institute, 2021

8. Portfolio Expected Returns

To simplify the practical application of the information presented in this paper, we present portfolios consisting of various mixes between stocks and bonds.

Table 7 - Composition of Expected Portfolio Returns

Asset Mix (Equity/Bond)	Expected Return	Expected Standard Deviation	Interest & Foreign Dividends	Canadian Dividends	Realized Capital Gains	Unrealized Capital Gains
0/100	2.48%	4.17%	2.48%	0.00%	0.00%	0.00%
5/95	2.68%	4.21%	2.41%	0.04%	0.11%	0.11%
10/90	2.88%	4.24%	2.35%	0.08%	0.22%	0.22%
15/85	3.09%	4.41%	2.28%	0.12%	0.35%	0.35%
20/80	3.31%	4.66%	2.22%	0.15%	0.47%	0.47%
25/75	3.54%	5.00%	2.15%	0.19%	0.60%	0.60%
30/70	3.73%	5.34%	2.09%	0.23%	0.71%	0.71%
35/65	3.91%	5.68%	2.02%	0.27%	0.81%	0.81%
40/60	4.11%	6.10%	1.96%	0.31%	0.92%	0.92%
45/55	4.34%	6.60%	1.89%	0.35%	1.05%	1.05%
50/50	4.56%	7.11%	1.83%	0.38%	1.17%	1.17%
55/45	4.77%	7.62%	1.76%	0.42%	1.29%	1.29%
60/40	4.97%	8.12%	1.70%	0.46%	1.41%	1.41%
65/35	5.17%	8.63%	1.63%	0.50%	1.52%	1.52%
70/30	5.37%	9.14%	1.57%	0.54%	1.63%	1.63%
75/25	5.59%	9.73%	1.50%	0.58%	1.76%	1.76%
80/20	5.78%	10.23%	1.44%	0.61%	1.87%	1.87%
85/15	6.00%	10.82%	1.37%	0.65%	1.99%	1.99%
90/10	6.19%	11.33%	1.31%	0.69%	2.10%	2.10%
95/5	6.41%	11.92%	1.24%	0.73%	2.22%	2.22%
100/0	6.62%	12.51%	1.18%	0.77%	2.34%	2.34%

Source: PWL Capital; Data Sources: Bloomberg, Morningstar, Robert Shiller, Elroy Dimson, Paul Marsh and Mike Staunton, Triumph of the Optimists: 101 Years of Global Investment Returns, Princeton University Press, 2002; Elroy Dimson, Paul Marsh and Mike Staunton, Credit Suisse Global Returns Yearbook and Sourcebook, 2018, Zurich: Credit Suisse Research Institute, 2021

Appendix: Composition and Standard Deviation of Expected Returns – Naviplan Input Format

Table 8 - Composition and Standard Deviation of Expected Returns – Naviplan Input Format

Asset Class	Interest	Dividends	Capital Gains	Deferred Growth	Total	Standard Deviation
Fixed Income	2.48%				2.48%	4.17%
Canadian Equity		2.31%	2.14%	2.14%	6.58%	14.70%
U.S. Equity		1.10%	2.58%	2.58%	6.25%	14.07%
International Equity*		2.44%	2.30%	2.30%	7.03%	12.52%

Source: PWL Capital; Data Sources: Bloomberg, Morningstar, Robert Shiller, Elroy Dimson, Paul Marsh and Mike Staunton, *Triumph of the Optimists: 101 Years of Global Investment Returns*, Princeton University Press, 2002; Elroy Dimson, Paul Marsh and Mike Staunton, *Credit Suisse Global Returns Yearbook and Sourcebook*, 2018, Zurich: Credit Suisse Research Institute, 2021

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