

Projection Assumption Guidelines

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1. EXECUTIVE SUMMARY

LIFE TAKES PLANNING AND IT STARTS WITH REALISTIC PROJECTIONS

An important facet of the financial planner's task is to make a variety of projections: retirement income needs, insurance needs, children's education funding needs, etc.

To make these projections, financial planners must estimate future inflation and borrowing rates, returns, how long the need will exist... In short, they must make assumptions.

This is why the Institut québécois de planification financière (IQPF) and FP Canada Standards Council publish the Projection Assumption Guidelines: to help financial planners make realistic financial projections. Judicious use of these assumptions should protect both the client and the financial planner.

HOW TO USE THE GUIDELINES

These Projection Assumption Guidelines are intended as a guide and are appropriate for making realistic long-term financial projections. Predicting the direction the economy will take and how financial markets will evolve is a difficult exercise requiring the integration of a large number of variables and, therefore, highly sophisticated valuation models.

Financial planners should also develop sensitivity analyses to illustrate and assess the impact of changes in assumptions on clients' financial position. This is particularly important when client goals may be at risk.

GUIDING PRINCIPLES FOR ESTABLISHING THE GUIDELINES

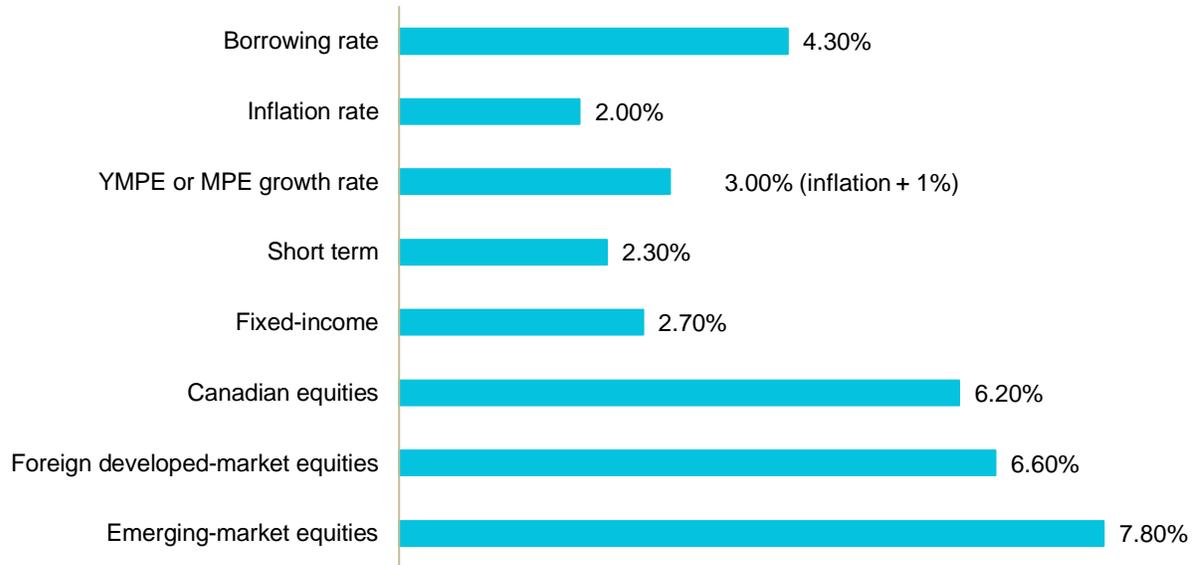
These Guidelines were established using a variety of reliable and publicly available sources. They do not represent the individual opinion of the members of the task force, the IQPF or FP Canada Standards Council.

Using numerous sources of data also eliminates the potential bias that may be created by relying on any single source.

The fact that the Quebec Pension Plan and Canada Pension Plan actuarial reports are updated every three years ensures the Guidelines will remain stable.

GUIDELINES FOR 2021

FINANCIAL ASSUMPTIONS (before any eventual administrative and investment management fees)



Note that the investment management fees paid by clients both for products and advice must be subtracted to obtain the net return.

PROBABILITY OF SURVIVAL TABLE

| Current Age in 2020 | 10% | | | 15% | | | 20% | | | 25% | | | 30% | | | 35% | | | 40% | | | 45% | | | 50% | | |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | M | F | M/F |
| 20 | 99 | 101 | 102 | 97 | 100 | 101 | 96 | 98 | 100 | 95 | 97 | 99 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 95 | 97 | 91 | 94 | 96 | 90 | 93 | 95 |
| 25 | 99 | 101 | 102 | 97 | 99 | 101 | 96 | 98 | 100 | 95 | 97 | 99 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 97 | 91 | 93 | 96 | 90 | 92 | 95 |
| 30 | 98 | 101 | 102 | 97 | 99 | 100 | 96 | 98 | 99 | 95 | 97 | 99 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 91 | 93 | 96 | 90 | 92 | 95 |
| 35 | 98 | 100 | 102 | 97 | 99 | 100 | 96 | 98 | 99 | 95 | 97 | 98 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 91 | 93 | 96 | 90 | 92 | 95 |
| 40 | 98 | 100 | 101 | 97 | 99 | 100 | 95 | 98 | 99 | 94 | 97 | 98 | 93 | 96 | 98 | 92 | 95 | 97 | 91 | 94 | 96 | 90 | 93 | 95 | 89 | 92 | 95 |
| 45 | 98 | 100 | 101 | 96 | 99 | 100 | 95 | 98 | 99 | 94 | 97 | 98 | 93 | 96 | 97 | 92 | 95 | 97 | 91 | 94 | 96 | 90 | 93 | 95 | 89 | 92 | 95 |
| 50 | 98 | 100 | 101 | 96 | 99 | 100 | 95 | 97 | 99 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 91 | 93 | 96 | 90 | 92 | 95 | 89 | 91 | 94 |
| 55 | 98 | 100 | 101 | 96 | 98 | 100 | 95 | 97 | 99 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 91 | 93 | 96 | 90 | 92 | 95 | 89 | 91 | 94 |
| 60 | 97 | 100 | 101 | 96 | 98 | 100 | 95 | 97 | 99 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 91 | 93 | 96 | 90 | 92 | 95 | 89 | 91 | 94 |
| 65 | 97 | 100 | 101 | 96 | 98 | 99 | 95 | 97 | 98 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 91 | 93 | 95 | 90 | 92 | 95 | 89 | 91 | 94 |
| 70 | 97 | 100 | 101 | 96 | 98 | 99 | 95 | 97 | 98 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 91 | 93 | 95 | 90 | 92 | 95 | 89 | 91 | 94 |
| 75 | 97 | 100 | 101 | 96 | 98 | 99 | 95 | 97 | 98 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 91 | 93 | 95 | 90 | 92 | 95 | 89 | 91 | 94 |
| 80 | 97 | 100 | 101 | 96 | 98 | 99 | 95 | 97 | 99 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 92 | 94 | 96 | 91 | 93 | 95 | 90 | 92 | 94 |
| 85 | 98 | 100 | 101 | 97 | 99 | 100 | 96 | 98 | 99 | 95 | 97 | 98 | 94 | 96 | 98 | 94 | 95 | 97 | 93 | 94 | 96 | 92 | 94 | 96 | 92 | 93 | 95 |
| 90 | 99 | 101 | 102 | 98 | 100 | 101 | 97 | 99 | 100 | 97 | 98 | 99 | 96 | 97 | 99 | 95 | 97 | 98 | 95 | 96 | 98 | 94 | 96 | 97 | 94 | 95 | 97 |
| 95 | 101 | 102 | 103 | 100 | 101 | 102 | 100 | 101 | 102 | 99 | 100 | 101 | 99 | 100 | 101 | 98 | 99 | 100 | 98 | 99 | 100 | 98 | 98 | 100 | 97 | 98 | 99 |
| 100 | 105 | 105 | 106 | 104 | 104 | 105 | 103 | 104 | 105 | 103 | 103 | 104 | 103 | 103 | 104 | 102 | 103 | 104 | 102 | 102 | 103 | 102 | 102 | 103 | 102 | 102 | 103 |

The table used to calculate the probability of survival is the [CPM2014 Mortality Table](#), based on data from both public and private sector plans for 1999-2008, taken forward to 2014 using the CPM Improvement Scale B. For years beyond 2014, the same improvement scale was used to establish generational mortality rates. This mortality table and the improvement scale were published by the Canadian Institute of Actuary on February 2014.

2. BACKGROUND

An important facet of the financial planner's work is to make a variety of projections (retirement needs and retirement income, insurance needs, children's education funding needs, etc.). In making projections, financial planners are bound by method, rather than results. The purpose of this document is to map out the assumptions to use in the preparation of these projections.

The Guidelines are intended as a guide and are appropriate for making long-term (10+ years) financial projections that are free from the potential biases of financial planners. Predicting the direction the economy will take and how financial markets will evolve is a difficult exercise requiring the integration of a large number of variables and highly sophisticated valuation models. To protect themselves and their clients, financial planners are encouraged to rely on these Guidelines.

Financial planners should develop sensitivity analyses to illustrate and assess the impact of changes in assumptions on clients' financial positions. This is particularly important when client goals may be at risk.

a) Updating and useful life of the Guidelines

The Guidelines are updated annually. Although some of the assumptions set out in these Guidelines may change from time to time, this does not mean that projections based on previously published assumptions are no longer valid. In fact, projections are considered valid at the time of preparation.

b) Use of the Guidelines

The use of the Guidelines is strongly encouraged to promote trust and confidence in the financial planner's projections, given their objectivity and basis in reliable sources.

That said, a financial planner is in the best position to understand their clients' unique circumstances. Because every client situation is different, assumptions that vary from the Guidelines may be used.

Assumptions may also differ from the Guidelines based on local market peculiarities. As an example, projections of education costs, which tend to be impacted by local market differences, may justify using an inflation rate that differs from the Guidelines. Projections of salary increases may justify an inflation rate that differs from the Guidelines, where clients give good reason for the change.

c) Compliance with the Guidelines

In all cases, assumptions used should be documented, with sound rationale, and clearly communicated to clients. The use of the Guidelines can be disclosed using a statement such as the following:

- Projection prepared using the IQPF and FP Canada Standards Council *Projection Assumption Guidelines*.
- Analysis prepared using the IQPF and FP Canada Standards Council *Projection Assumption Guidelines*.
- Study prepared using the IQPF and FP Canada Standards Council *Projection Assumption Guidelines*.
- Calculation made using the IQPF and FP Canada Standards Council *Projection Assumption Guidelines*.

d) Deviation margins

Where appropriate, financial planners may deviate within plus or minus 0.5% from the rate of return assumptions and continue to be in compliance with the Guidelines.

In making a judgement call around whether to deviate 0.5% up or down, financial planners may consider the following factors:

- The impact of a variation in return on the expected lifestyle of clients. As an example, it would not be prudent to increase return assumptions to “force” a projection that secures a client’s goal.
- The propensity of clients to buy high and sell low, thereby reducing their long-term rates of return. Where the propensity is high, one may consider reducing the expected rate of return on their portfolio.¹
- The degree to which clients rely on professional financial advice in managing their investment portfolio, including regular rebalancing of their portfolio, which may increase their long-term rates of return.²

Please note that the deviation margins relate to the rate of return guidelines only, not to the inflation rate guidelines. Any deviation in excess of 0.5% in either direction of the guidelines should be reasonable and supportable.

e) Effective date of the Guidelines

The Guidelines for 2021 are effective as at April 30, 2021.

¹ Dalbar. (2014). 2014 DALBAR QAIB Highlights Futility of Investor Education [Press release]. Retrieved from <https://globenewswire.com/news-release/2014/04/09/625908/10076149/en/2014-DALBAR-QAIB-Highlights-Futility-of-Investor-Education.html>.

² Masters, S. J. (2003). Rebalancing. *The Journal of Portfolio Management*, 29(3), 52-57.

3. CONSIDERATIONS FOR ESTABLISHING THE GUIDELINES

a) Use of external sources

The Guidelines were established using a variety of reliable and publicly available data sources. They do not represent the individual opinions of the members of the Projection Assumption Guideline Committee, IQPF or FP Canada Standards Council .

Using numerous sources of data also eliminates the potential bias that may be created by relying on any single source.

The [Addendum to the 2021 Projection Assumption Guidelines](#) provides links to sources, data and calculations used in the development of the Guidelines. The Addendum is provided for transparency and replicability of the Guidelines by financial planners and firms.

Note that IQPF and FP Canada distribute a yearly long-term expectations survey to source data. The source data points are detailed in the Addendum. In the fall of 2020, the survey was sent to industry firms and CFP and F.PI. professionals who held the CFA designation. IQPF and FP Canada thank all participants, including AON, IG Wealth Management, Louisbourg, Normandin Beaudry, RBC Global Asset Management, SEAMARK Asset Management, Vestcor, and all other contributors.

The Guidelines were prepared using geometric mean (GM) assumptions. For the purposes of Monte Carlo analysis, a conversion needs to be done from geometric to arithmetic mean (AM) assumptions. With this conversion of the GM assumptions from the Guidelines, the financial planner will need to identify an expected standard deviation. This conversion is applicable when the volatility is higher, as often seen with equity holdings. Since the Guidelines have adjusted the equity assumptions by 0.5 %, this adjustment needs to be added back to calculate the AM. Once the financial planner has identified a realistic standard deviation (σ), the following formula could be applied to arrive at the AM estimate:

$$\begin{aligned} \text{For equities: AM (est)} &= \text{GM from the Guidelines} + 0.5 \% + \sigma^2/2 \\ \text{For other assets: AM (est)} &= \text{GM from the Guidelines} + \sigma^2/2 \end{aligned}$$

b) Aim of stability

The fact that the Quebec Pension Plan (QPP) and Canada Pension Plan (CPP) actuarial reports are updated every three years ensures the Guidelines will remain stable.

As well, to ensure stability from year to year and more closely reflect the underlying data, the Guidelines will continue to be rounded to the nearest 0.10%,³ as has been done since 2015 when it was changed from rounding to the nearest 0.25%.

c) Limitations

The Guidelines cover the main asset classes—short-term assets, Canadian fixed-income, Canadian equities, foreign developed-market equities (including U.S. equities, Europe, Australia and Far East equities) and emerging-market equities.

³ By rounding to the nearest .25%, a 3.10% result would generate a guideline of 3.00%, while a result of 3.15% would generate a result of 3.25%. By rounding to the nearest .1%, a 3.10% result would maintain the guideline of 3.10%, while a result of 3.15% would generate a guideline of 3.20%.

Guidelines are not provided for other asset classes, including global bonds, U.S. equities, small-capitalization equities, value and growth equities, because they are not addressed in the QPP and CPP actuarial valuation reports. The guideline for foreign developed-market equities may be used as a proxy for U.S. equities.

Similarly, guidelines are not provided for changes in the real estate market for the following reasons:

- Separate guidelines would have been required for residential, commercial and industrial buildings.
- A regional index would also have been necessary (the real estate market behaves differently in Halifax, Montréal, Toronto and Vancouver).

When making assumptions around real estate growth, it is important to consider an appropriate starting valuation for the property and use an inflation-based assumption that is suitable based on the local market context.

Guidelines are not provided for exchange rates since the net long-term effect of changes in exchange rates is generally nil. Financial planners should develop sensitivity analysis to illustrate and assess the potential ramifications of changes in exchange rates. Clients who may require income in a foreign currency may wish to maintain assets in that foreign currency to avoid foreign exchange rate risk.

It is also important to note that the Guidelines do not contemplate personal risk profiles. Since an individual's risk profile or change in risk profile may have consequences at least as significant as or more significant than the rate of return guidelines used in developing financial projections, sound risk assessments are critical.

d) Standard deviation

The Addendum provides historical data on standard deviation for information purposes. No guideline is provided on standard deviation for each asset class. For future standard deviation, the CPP provides tables for different portfolios with expected rates of return and standard deviations. Financial planners who run Monte Carlo analyses may add back the 0.50%⁴ on the equity portion of the portfolio and make the conversion from geometric to arithmetic means using the expected standard deviation.

⁴ [Dupras, M. \(2004, November\). Retraite et Monte Carlo. La Cible, 12\(4\), 6-8.](#)

4. ASSUMPTIONS SUBJECT TO THE GUIDELINES

Two types of assumptions are subject to guidelines: financial assumptions (inflation, changes in the year's maximum pensionable earnings [YMPE or MPE], long-term returns on short-term investments, fixed-income securities, Canadian equities, foreign developed-market equities and emerging-market equities, and borrowing rates) and demographic assumptions (life expectancy).

a) Inflation

The inflation assumption is central to the preparation of medium- and long-term projections. The inflation assumption is made by combining the inflation assumptions from the following sources (each weighted at 25%):

- the average of the inflation assumptions for 30 years (2019 to 2048) used in the most recent QPP actuarial report⁵
- the average of the inflation assumptions for 30 years (2019 to 2048) used in the most recent CPP actuarial report⁶
- results of the 2020 IQPF/FP Canada survey; the reduced average was used where the highest and lowest value were removed
- current Bank of Canada target inflation rate

The result of this calculation is rounded to the nearest 0.10%.

A discussion was held about the use of separate inflation rates for older individuals or high earners. Two studies by Radu Chiru of Statistics Canada⁷ demonstrate that there are small differences in inflation for these two groups of Canadians as compared to others, but these differences are not deemed to be material.

i. Wage increases

The inflation assumption can be used to project wage increases by adding 1.00% to reflect productivity gains, merit and advancement.⁸

It may be appropriate to deviate from the guidelines where a client reasonably expects higher or lower wage increases for the foreseeable future. As an example, where a client is reaching the end of his or her career or is in a position with no real chance of advancement, the financial planner may consider a wage increase equal to or less than inflation.

ii. Year's maximum pensionable earnings (YMPE or MPE)

The year's maximum pensionable earnings (YMPE or MPE) is based on average increases in salaries. Therefore, the inflation assumption plus 1.00% should be used.

b) Nominal returns (before fees)

Rate of return assumptions have been established for short-term investments (91-day T-bills), Canadian fixed-income securities, Canadian equities, foreign-developed market equities and emerging-market equities. These assumptions represent gross nominal returns (including inflation).

⁵ December 31, 2018 QPP actuarial report, published December 2019, updated February 2020.

⁶ December 31, 2018 CPP actuarial report, published November 2019.

⁷ Is Inflation Higher for Seniors? (2005) Catalogue no. 11-621-MWE2005027 and Does Inflation Vary with Income? (2005) Catalogue no. 11-621-MWE2005030.

⁸ In the most recent QPP and CPP actuarial reports, a final margin between wage increases and inflation was applied. In the CPP report, a margin of 1.00% was applied and in the QPP report, a margin of 0.9% was used.

The guidelines for short-term investments and Canadian fixed-income securities were set by combining assumptions from the following sources (each weighted equally at one third):

- the average of the assumptions for 30 years (2019 to 2048) used in the most recent QPP actuarial report
- the average of the assumptions for 30 years (2019 to 2048) used in the most recent CPP actuarial report
- results of the 2020 IQPF/FP Canada survey; the reduced average was used where the highest and lowest value were removed

Note that for both the short-term and fixed-income assumptions, the 50-year historical average rate was removed in 2020 as a data source in determining these assumptions. The decision was made to review the validity of this portion of the assumption calculation given its position as a significant outlier for both the short-term and fixed-income calculation inputs. It is viewed that these historical variables may so significantly depart from future expectations that they should not be used in the current environment. Furthermore, it can be noted that the fixed-income assumption based on the most recent CPP Actuarial Report (December 2018) was reduced by 1% compared with the previous year, which increases the gap between the historical data and the assumption from the CPP Actuarial Report by more than 2%.

The guidelines for equity assets were set by combining assumptions from the following sources (each weighted equally at one quarter):

- the average of the assumptions for 30 years (2019 to 2048) used in the most recent QPP actuarial report
- the average of the assumptions for 30 years (2019 to 2048) used in the most recent CPP actuarial report
- results of the 2020 IQPF/FP Canada survey; the reduced average was used where the highest and lowest value were removed
- historic returns over the 50 years ending the previous December 31st (adjusted for inflation)

The historical component used is based on the S&P/TSX (Canadian equities) index, the S&P 500 Composite Index (U.S. equities), the MSCI EAFE (Europe, Australia, Far East) Index and the MSCI Emerging Markets Index.

For the sake of consistency, the afore-mentioned indices expressed in real returns (returns reduced by the total CPI inflation index as published by the Bank of Canada) are increased by the future inflation assumption (before rounding).

The following considerations are also of note:

i. Short-term

The guideline of 2.3% for short-term investments represents a long-term assumption of short-term returns. As an example, consider the long-term return for a mutual fund holding 5.0% of its assets in short-term investments. Over the long term, these assets would be expected to generate an annual return equal to 2.3%.

For shorter term financial projections (less than 10 years), financial planners may use actual rates of return on fixed term investments held to maturity.

ii. Fixed-income securities

The fixed-income assumptions used in the most recent QPP and CPP actuarial reports have been adjusted to account for the opportunity of the QPP and CPP to buy and hold fixed-income securities for significantly longer than the typical holding period of individuals. A margin of 0.75% is therefore deducted from the QPP and CPP actuarial assumptions to convert the long-term fixed-income

ASSUMPTIONS

assumptions into a more relevant fixed-income assumption for individual financial planning. The projected fixed-income rate of return can also be applied to preferred share holdings. Please note that this is not an opinion regarding the volatility of preferred shares versus fixed-income securities and that preferred shares can have different characteristics that can impact their pricing.

iii. Canadian equities

For investments in Canadian equities, a safety margin of 0.50%⁹ is deducted from the result obtained by weighting the different data sources to compensate for the variability of the long-term returns. The adjustment aligns with the outcome of a Monte Carlo analysis that approximates the probability of future Canadian equity returns by running 300,000 trial runs, called simulations.

iv. Foreign equities

Foreign equities consist of U.S., Europe, Australia, Far East and emerging-market equities. Like for Canadian equities, a safety margin of 0.50% is deducted from the result obtained by weighting the different data sources to compensate for the variability of the long-term returns.

The guideline can be used as a proxy for U.S. equities. No separate guideline is provided for U.S. equities for the following reasons:

- QPP and CPP do not distinguish U.S. equities from foreign developed equities in their reports, however the reports indicate that U.S. equities are a part of their investment portfolio.
- Result of the 2020 IQPF/FP Canada survey. The reduced average was used where the highest and lowest value were removed. The value used is the average between MSCI EAFE Index and S&P 500 US Index.

Note, however, the historical returns used to develop the guideline for foreign developed equities include the MSCI EAFE Index Foreign Equities (Developed) and the S&P 500 Composite Index for U.S. equities.

v. Type of equity return

In a non-registered investment account, projections must take account of income taxes. For significant sums, it might be appropriate to divide the return into two categories: dividends and capital gains. Historically, from 25% to 50% of overall equity returns has been made up of dividends. It therefore seems reasonable to assume that 33% of the overall equity return will be made up of dividends and that the rest will be capital gains.¹⁰

vi. Equity risk premiums

Since risk taking must be rewarded, equity returns are developed by adding an equity risk premium to the long-term bond returns. Historical equity risk premiums have decreased over time due to several non-repeatable factors (mainly diversification and globalization) and are almost identical for Canadian and foreign developed-markets at 3.5% and 3.9% respectively. The equity risk premium for emerging-market equities is expected to be higher than for developed-market equities, reflecting the additional risk inherent with investments in emerging countries. It is important to note that the world economy has become increasingly financially integrated. Countries, financial institutions and businesses have become increasingly large, with a more sophisticated and interconnected range of activities. When one country experiences a financial crisis, it quickly propagates among others.

⁹ Dupras, M. (2004, November). *Retraite et Monte Carlo*. *La Cible*, 12(4), 6-8.

¹⁰ [Projection Assumption Standards Committee analysis completed using the S&P/TSX total return index.](#)

vii. Blend of forecasting and backcasting

The Guidelines consider both expected future economic behaviour based on assumptions provided in the QPP and CPP actuarial analyses and the 2020 IQPF/FP Canada survey, as well as historical market performance. Projecting the future by relying solely on historical returns would suggest an expectation that the future will mirror the past. This is not the expectation. In addition to increasingly greater globalization, demographic changes, including labour participation rates and dependency ratios, are predicted to have a significant impact on the economy going forward. Therefore, a sole reliance on historical returns to project the future would have major limitations.^{11,12}

c) Considerations concerning fees¹³

The investment management fees paid by clients must be subtracted to obtain the net return. Depending on the type of asset management clients use (mutual funds, pooled funds, advisor managed account, etc.), these fees typically range from 0.5% to 2.5%. When a client's portfolio is made up of a wide variety of mutual funds with different management expense ratios, an average fee ratio per asset class may be used. All fees, paid directly or indirectly, that impact potential return, must be considered in the calculation.¹⁴ Transparency around fees is important, in terms of the amount of fees charged (direct or indirect), the impact of fees on investment performance and the value the financial planner provides in exchange.

d) Borrowing rate

A great number of factors influence a client's borrowing rate, such as the type of loan and the client's credit history. However, consider the following relationships:

- There is a very strong correlation between the target overnight rate and the 91-day T-bill rate.
- The bank rate is set by adding 0.25% to the target overnight rate.
- The prime rate is set by adding 1.75% to the bank rate.

For an individual with an average credit rating, the borrowing rate assumption is equal to the return assumption for 91-day T-bills plus 2.00%. While recent borrowing rates have been relatively low, the Guidelines are forward looking and reflect expectations over the longer term. Primarily, the borrowing rate assumption was provided to help illustrate the potential impact of a borrowing to invest strategy over the long-term. That is, while current short-term borrowing rates are low by historical standards, borrowing rates can change and need to be appropriately accounted for in projections. It is prudent professional practice to consider the potential for borrowing rates to increase for purposes of assessing the relative benefits and risks associated with leveraging. It is also sensible to use a long-term borrowing rate assumption when projecting the impact of debt on a client's financial position over the longer term. Actual borrowing costs may be more logically used for short-term projections.

e) Life expectancy

There are several different mortality tables, each based on a specific target group. The following factors are examples of target group characteristics:

- gender

¹¹ Foot, D. K. & Stoffman, D. (1996). *Boom, Bust & Echo: How to profit from the coming demographic shift*. Toronto: Macfarlane, Walter & Ross.

¹² Vettese, F. (2015). *The Road to Retirement. The Essential Retirement Guide: A Contrarian's Perspective*. New Jersey: John Wiley & Sons.

¹³ Lussier, J. (2013). *Successful Investing Is a Process: Structuring Efficient Portfolios for Outperformance*. New Jersey: John Wiley & Sons.

¹⁴ Examples of these fees may include, but are not limited to, management expense ratio, advisory fees, custodian fees, trailing fees, commissions and transaction costs

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- smoker or non-smoker status
- place of residence (e.g., province, country)
- evidence of good health (for life insurance pricing)
- wealth¹⁵
- being retired

The 2014 Canadian Pensioners' Mortality Table¹⁶ may be used as the basis for assuming an individual's life expectancy. While the table reflects the average probability of survival for a subset of the Canadian population (i.e. Canadian pensioners), it can be appropriately used to represent the life expectancy of the full Canadian population, given that its bias toward longer life expectancies provides a more conservative approach to developing projections.

Projection period

It is recommended to assume a projection period for clients where the probability of outliving their capital is no more than 25%. Forecasting a longer projection period offers protection from future improvements in mortality and accounts for the greatest financial risk to an individual: longevity risk. It is also recommended that the greatest mortality age be used that corresponds to the client's circumstances, unless there is substantial information suggesting an adjustment should be made. This recommendation aligns with the expected growth in the number of centenarians in Canada.¹⁷ Financial planners are encouraged to develop sensitivity analyses related to mortality (e.g. +/- 5 years), given the dramatic effects that may result when the projection period is changed by a relatively small number of years.

¹⁵ Statistics Canada. *Table 102-0122 - Health-adjusted life expectancy, at birth and at age 65, by sex and income, Canada and provinces, occasional (2005-2007)*, CANSIM table (102-0121). (accessed:2013)

¹⁶ [2014 Canadian Institute of Actuaries Canadian Pensioners' Mortality Report](#).

¹⁷ Statistics Canada. Centenarians in Canada, Age and sex, 2011 Census. Catalogue no. 98-311-X2011003. Retrieved from: http://www12.statcan.gc.ca/census-recensement/2011/as-sa/98-311-x/98-311-x2011003_1-eng.pdf.

| Current Age in 2020 | 10% | | | 15% | | | 20% | | | 25% | | | 30% | | | 35% | | | 40% | | | 45% | | | 50% | | |
|---------------------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| | M | F | M/F |
| 20 | 99 | 101 | 102 | 97 | 100 | 101 | 96 | 98 | 100 | 95 | 97 | 99 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 95 | 97 | 91 | 94 | 96 | 90 | 93 | 95 |
| 25 | 99 | 101 | 102 | 97 | 99 | 101 | 96 | 98 | 100 | 95 | 97 | 99 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 97 | 91 | 93 | 96 | 90 | 92 | 95 |
| 30 | 98 | 101 | 102 | 97 | 99 | 100 | 96 | 98 | 99 | 95 | 97 | 99 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 91 | 93 | 96 | 90 | 92 | 95 |
| 35 | 98 | 100 | 102 | 97 | 99 | 100 | 96 | 98 | 99 | 95 | 97 | 98 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 91 | 93 | 96 | 90 | 92 | 95 |
| 40 | 98 | 100 | 101 | 97 | 99 | 100 | 95 | 98 | 99 | 94 | 97 | 98 | 93 | 96 | 98 | 92 | 95 | 97 | 91 | 94 | 96 | 90 | 93 | 95 | 89 | 92 | 95 |
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| 50 | 98 | 100 | 101 | 96 | 99 | 100 | 95 | 97 | 99 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 91 | 93 | 96 | 90 | 92 | 95 | 89 | 91 | 94 |
| 55 | 98 | 100 | 101 | 96 | 98 | 100 | 95 | 97 | 99 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 91 | 93 | 96 | 90 | 92 | 95 | 89 | 91 | 94 |
| 60 | 97 | 100 | 101 | 96 | 98 | 100 | 95 | 97 | 99 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 91 | 93 | 96 | 90 | 92 | 95 | 89 | 91 | 94 |
| 65 | 97 | 100 | 101 | 96 | 98 | 99 | 95 | 97 | 98 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 91 | 93 | 95 | 90 | 92 | 95 | 89 | 91 | 94 |
| 70 | 97 | 100 | 101 | 96 | 98 | 99 | 95 | 97 | 98 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 91 | 93 | 95 | 90 | 92 | 95 | 89 | 91 | 94 |
| 75 | 97 | 100 | 101 | 96 | 98 | 99 | 95 | 97 | 98 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 91 | 93 | 95 | 90 | 92 | 95 | 89 | 91 | 94 |
| 80 | 97 | 100 | 101 | 96 | 98 | 99 | 95 | 97 | 99 | 94 | 96 | 98 | 93 | 95 | 97 | 92 | 94 | 96 | 92 | 94 | 96 | 91 | 93 | 95 | 90 | 92 | 94 |
| 85 | 98 | 100 | 101 | 97 | 99 | 100 | 96 | 98 | 99 | 95 | 97 | 98 | 94 | 96 | 98 | 94 | 95 | 97 | 93 | 94 | 96 | 92 | 94 | 96 | 92 | 93 | 95 |
| 90 | 99 | 101 | 102 | 98 | 100 | 101 | 97 | 99 | 100 | 97 | 98 | 99 | 96 | 97 | 99 | 95 | 97 | 98 | 95 | 96 | 98 | 94 | 96 | 97 | 94 | 95 | 97 |
| 95 | 101 | 102 | 103 | 100 | 101 | 102 | 100 | 101 | 102 | 99 | 100 | 101 | 99 | 100 | 101 | 98 | 99 | 100 | 98 | 99 | 100 | 98 | 98 | 100 | 97 | 98 | 99 |
| 100 | 105 | 105 | 106 | 104 | 104 | 105 | 103 | 104 | 105 | 103 | 103 | 104 | 103 | 103 | 104 | 102 | 103 | 104 | 102 | 102 | 103 | 102 | 102 | 103 | 102 | 102 | 103 |

The table used to calculate the probability of survival is the CPM2014 Mortality Table, based on data from both public and private sector plans for 1999-2008, taken forward to 2014 using the CPM Improvement Scale B. For years beyond 2014, the same improvement scale was used to establish generational mortality rates. This mortality table and improvement scale were published by the Canadian Institute of Actuary on February 2014.¹⁸

Based on the table, a 70-year old would have a 25% chance of living to at least age 94 for a man and at least age 96 for a woman (25% column); by comparison, a 70-year old would have a 10% chance of living to at least age 97 for a man and age 100 for a woman (10% column). A 70 year-old couple would have a 25% chance that one of the members of the couple will live to at least age 98 and a 10% chance that one of the members of the couple will live to at least age 101. Again, to be prudent, it is recommended that financial planners select a projection period where the probability of survival is no more than 25% (25% column).

With the example of the 70-year old male/female couple, a projection period of 28 years (to age 98) could be used with the 25% probability that one of them may outlive their capital. It is important to remember that this table represents the average probability of survival for the entire population. People who are more financially comfortable and who have shown evidence of good health may find their life expectancy more toward the left end of the chart (the 10% survival group).

It is interesting to note that hereditary factors are not significant in predicting life expectancy.¹⁹ In contrast, the use of tobacco has a significant impact on life expectancy. A Statistics Canada publication from 2001²⁰ concludes that a 45-year-old smoker will survive 20% to 25% fewer years,

¹⁸ <https://www.cia-ica/docs/default-source/2014/214013e.pdf>

¹⁹ Wilhelmsen, L., Svärdsudd, K., Eriksson, H., Rosengren, A., Hansson, P. O., Welin, C., ... & Welin, L. (2011). Factors associated with reaching 90 years of age: a study of men born in 1913 in Gothenburg, Sweden. *Journal of internal medicine*, 269(4), 441-451.

²⁰ <http://www.statcan.gc.ca/daily-quotidien/010622/dq010622a-eng.htm>.

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depending on sex, than a non-smoker of the same age. This could be taken into consideration by using the 30% column in the above table for smokers and the 10% to 25% columns for non-smokers.

It is also interesting to observe that as advancements in medical science occur, those who are younger today may have the opportunity to benefit from these advancements for a longer period than those who are older today. These effects can be seen in the 50% column in the Probability of Survival table on the previous page by the initial decline in life expectancy as current age increases (e.g. a 30-year-old today has a higher life expectancy than their 60-year-old parent). This decline in life expectancy reverses at around age 80 because those who have already reached an older age today are more likely to continue to benefit from increased longevity.

5. GUIDELINES FOR 2021

The Projection Assumption Guidelines for 2021 are the following:

| | |
|---|-----------------------|
| a) Inflation rate | 2.0% |
| b) Return rates²¹ | |
| Short-term: | 2.3% |
| Fixed-income: | 2.7% |
| Canadian equities: | 6.2% |
| Foreign developed market equities | 6.6% |
| Emerging market equities | 7.8% |
| c) Borrowing rate | 4.3% |
| d) YMPE, MPE growth rate or salary | 3.0% (inflation + 1%) |
| e) Probability of Survival | See table in 4 e) |

Note that the investment management fees paid by clients both for products and advice must be subtracted to obtain the net return.

²¹ These are nominal rates.

6. ILLUSTRATIVE APPLICATION

By way of example only, for a projection prepared in 2021 for a portfolio holding investments in various asset classes, where the fees are 1.25% annually, we could use the following return assumptions:

| Portfolio return assumptions based on a varied asset allocation | | | | |
|---|-----------------------------------|--|---|-----------------------------------|
| Asset Classes | | Projected annual gross return for each asset class | % of portfolio holdings in each asset class | Projected annual portfolio return |
| Allocation | Short-term: | 2.3% | 5% | 2.3% times 0.05 = 0.12% |
| | Fixed-income: | 2.7% | 45% | 2.7% times 0.45 = 1.22% |
| | Canadian equities: | 6.2% | 40% | 6.2% times 0.40 = 2.48% |
| | Foreign developed market equities | 6.6% | 10% | 6.6% times 0.10 = 0.66% |
| | Emerging market equities | 7.8% | 0% | 0% |
| Totals | | | 100% | 4.48% |
| Less assumed fees | | | | - 1.25% |
| Net return after fees | | | | 3.23% |

This illustrative application is presented to provide guidance around calculating the net return after fees. **It is not intended in any way to offer a suggestion or recommendation by itself concerning asset allocation weightings.**

As well, these assumptions also depend on the investor's profile not changing over the years. If a client's investor profile is likely to change, it might be preferable to consider using an "average target allocation".

It is important to note that actual net portfolio returns will depend on actual product and portfolio-related fees and any other investment-related fees.

7. FINANCIAL GUIDELINES FOR PREVIOUS YEARS

The following table lists the financial guidelines for previous years along with their effective dates (the current guidelines are shown for comparison purposes):

| Effective date | | Inflation | Growth of the YMPE or MPE | Return | | | Foreign Developed market equities* | Foreign Emerging market equities* | Borrowing rate |
|----------------|----------|-----------|---------------------------|------------|--------------|-------------------|------------------------------------|-----------------------------------|----------------|
| | | | | Short-term | Fixed-income | Canadian equities | | | |
| 2009 | Feb. 17 | 2.25% | n/a | 3.75% | 4.75% | 7.25% | | | 5.75% |
| 2010 | April 12 | 2.25% | n/a | 3.75% | 5.00% | 7.25% | | | 5.75% |
| 2011 | April 8 | 2.25% | n/a | 3.50% | 4.75% | 7.00% | | | 5.50% |
| 2012 | April 12 | 2.25% | n/a | 3.25% | 4.50% | 7.00% | | | 5.25% |
| 2013 | April 30 | 2.25% | n/a | 3.25% | 4.25% | 7.00% | | | 5.25% |
| 2014 | April 25 | 2.00% | n/a | 3.00% | 4.00% | 6.50% | | | 5.00% |
| 2015 | April 30 | 2.00% | 3.00% | 2.90% | 3.90% | 6.30% | | | 4.90% |
| 2016 | June 30 | 2.10% | 3.10% | 3.00% | 4.00% | 6.40% | 6.80% | 7.70% | 5.00% |
| 2017 | July 31 | 2.00% | 3.00% | 2.90% | 3.90% | 6.50% | 6.70% | 7.50% | 4.90% |
| 2018 | April 30 | 2.00% | 3.00% | 2.90% | 3.90% | 6.40% | 6.70% | 7.40% | 4.90% |
| 2019 | April 30 | 2.10% | 3.10% | 3.00% | 3.90% | 6.10% | 6.40% | 7.20% | 5.00% |
| 2020 | April 30 | 2.00% | 3.00% | 2.40% | 2.90% | 6.10% | 6.40% | 7.10% | 4.40% |
| 2021 | April 30 | 2.00% | 3.00% | 2.30% | 2.70% | 6.20% | 6.60% | 7.80% | 4.30% |

*2009-2015 reports suggested a 1% increase to Canadian equities for foreign and emerging equities as a guideline.

Note that the investment management fees paid by clients for products and advice must be subtracted to obtain the net return.