The Role of Actuaries in Defined Contribution Plan Design

By Minaz Lalani, BSc, FCIA, FSA

In Canada, over the last decade, there has been a shift towards the establishment of Defined Contribution (DC) Plans, which collectively include money purchase pension plans, group RRSPs and savings plans. Actuaries have not embraced their role in the management of DC plans, or more narrowly, in designing DC Plans. The role of designing DC plans has been left to asset consultants and non-actuarial retirement professionals. This article presents how actuaries can play a broader role in designing DC Plans.

Current State — Limited Actuarial Role

Currently, DC Plans are established primarily using a competitive perspective. Employers select contributions that are within an acceptable level of the competitive range taking into account their internal budgetary constraints (Table 1).

Table 1

Employer Contribution	% of DC Plans
Less than 5%	22%
Exactly 5%	19%
Greater than 5%	59%

Source: Towers Perrin Benefits Data Bank, 2007

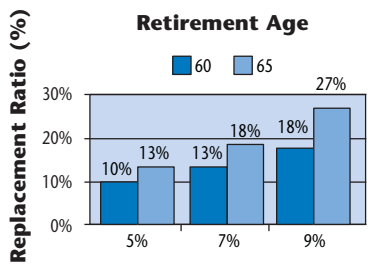
In order to increase employee participation in DC Plans, some employers make matching contributions (again within a competitive range). A concurrent step (undertaken by the employer with assistance from an asset consultant) is to select a set of investment options with an acceptable level of risk and return profile.

Actuarial input is limited to calculation of replacement ratios (retirement income as a percentage of earnings at retirement) based on a set of target investment returns and specific retirement ages. Unfortunately, many actuaries do not consider whether the target investment return assumptions used for the illustrations are internally consistent with the potential returns that can be generated by the investment options. Currently, there are no actuarial standards or educational notes that guide actuaries in the selection of acceptable actuarial assumptions for DC illustrations. Investment returns used for illustration purposes vary within a relatively wide range from 5% to 9% at sample retirement ages.

Chart 1 provides little value-added information from an actuarial perspective.

Chart 1

Replacement Ratio — Entry Level Employee



As a minimum, actuaries should ensure that DC illustrations are consistent with the returns generated by the investment options using a standard mix (bonds, equities, etc.). Actuaries should also ensure that they make explicit downward adjustments to the investment return assumption to reflect the reduction in the expected investment return by employees who manage their own asset allocation (case studies indicate that on average employees earn 3% per year less than professionally managed balanced funds).

> **"At the plan design stage, actuaries should use stochastic modeling to model the target replacement ratios with a selection of the investment options."**

Future State — Broader Actuarial Role

Defined Benefit (DB) Plan actuaries are well versed in modeling DB assets and liabilities. For DC Plans, deterministic modeling (a projection of retirement income based on an investment return at a specific retirement age) provides useful but inadequate information from both an employee and employer perspective. For example, the deterministic modeling does not address the question of whether the investment return can be achieved over the time horizon to the specified retirement age. Actuaries should develop and communicate stochastic modeling to employees and employers, that is, incorporate the probability (likelihood) of attaining a specified policy, or target retirement objectives.

At the plan design stage, actuaries should use stochastic modeling to model the target replacement ratios with a selection of the investment options. The actuarial modeling should also be used to provide the employer with a better understanding of the DC contribution formulas to meet the target replacement ratios.

Chart 2 provides a more insightful actuarial perspective, (for example, there is a 1% chance that a 1% chance of an employee retiring at age 65 attaining a replacement ratio of at least 25% at the specified contribution level and selected investment options).

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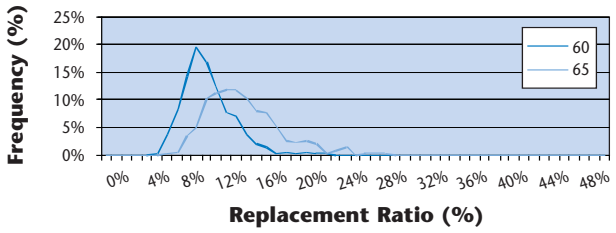
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Summary

The broader actuarial role turns the DC plan design process "upside-down" and produces an acceptable financial outcome based on a well-defined retirement objective.

Chart 2

Entry Level Profile Employee — Stochastic



Current State Limited Actuarial Role	Future State Broader Actuarial Role
Financial Objective Competitive Contributions	Retirement Objective Replacement Ratios
Deterministic Modelling	Stochastic Modelling
Retirement Objective Inadequate retirement income delivered at competitive level of contributions	Financial Objective Acceptable level of contributions delivers a well defined retirement income objective

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Classifieds

Claim Analytics Employment Ad

Claim Analytics Inc., a leading provider of innovative predictive modeling solutions to the insurance industry located in Thornhill Ontario (*www.claimanalytics.com*), currently is offering a unique and exciting opportunity to a senior actuarial student or recent Fellow (SOA or CAS).

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Calendar of Events

Event	Date	Location	Venue	E-info
Professionalism Workshop	November 15, 2007	Toronto	Holiday Inn on King	http://www.actuaries.ca/meetings/professionalism_e.cfm
General Meeting	November 29-30, 2007	Montréal	Fairmont The Queen Elizabeth Hotel	www.actuaries.ca/meetings/general_e.cfm
Professionalism Workshop	December 6, 2007	Montréal	Montréal Bonaventure Hilton Hotel	http://www.actuaries.ca/meetings/professionalism_e.cfm

* This event is not a CIA meeting.

Note: Additional information on all CIA meetings can be obtained at: *www.actuaires.ca/meetings/calendar_of_meetings_e.cfm*, or contact Sheila Richard at 613.236.8196.104, *sheila.richard@actuaries.ca*.