

RET DAC Solutions for Fall 2013

1. Learning Objectives:

5. The candidate will be able to evaluate sponsor's goals for the retirement plan, evaluate alternative plan types and features, and recommend a plan design appropriate for the sponsor's goals.

Learning Outcomes:

- (5l) Give examples of plans that are appropriate for multinational companies and their employees including third country nationals and expatriates.
- (5m) Recommend an appropriate plan type and plan design features for providing retirement benefits and defend the recommendations.

Sources:

DA-130-13: International (offshore) Pension Plans - A Growing Trend

DA-133-13: Chapter 34 of The Handbook of Employee Benefits: Health and Group Benefits

Commentary on Question:

Successful candidates listed key points for each questions and accompanied each point with coherent explanation demonstrating understanding. Successful candidates discussed employment arrangements, not pension arrangements.

Solution:

- (a) Describe four arrangements that XYZ could use to employ workers outside XYZ's home country.

The following types of employees can be employed to work outside of XYZ's home country:

Expatriates

- XYZ can hire employees from XYZ's home country and send them on temporary assignments overseas
- Typically compensation and benefit are in accordance with terms and conditions of their home country

Local Nationals

- XYZ can hire employees working and residing on a long term basis in country where XYZ has foreign operations
- Employees may or may not be a citizen of the country where they reside
- Typically compensation and benefits are based on local practices

1. Continued

Locally Hired Foreigners

- XYZ can hire nonlocal individuals in country where XYZ has foreign operations
- Typically reside in nearby countries
- Employed on local terms and conditions
- Often get extra compensation (eg. housing, medical)

Third Country Nationals

- XYZ can hire foreigners and send them on assignment to country where XYZ has foreign operations
- Individuals working for a foreign company on assignment outside of their home country (i.e. Canadian working for a US company on assignment in Germany)
- Typically more than one assignment during career
- Compensation may be provided on a home country, host country or special basis to suit needs

- (b) Explain why XYZ may consider sponsoring an international pension plan.

The following are reasons XYZ may consider sponsoring an international pension plan (IPP):

There is an increase in number of expatriates that XYZ employs

- Creating an IPP meets the wants and the needs of the employees
- The number employees must be large enough to make plan viable (economies of scale)
- Allows for continuity in retirement benefits, uniform/equitable treatment
- Solves the problem of fragmented retirement benefit caused by work in multiple locations
- Meets social obligation
- Provide flexible benefits
- Cost savings and simplified administration

Competition

- Growing competition, need to offer at least equivalent benefits as competitors
- Employees who are globally mobile are typically talented and high performers that expect to receive retirement benefits
- Need competitive benefits package to attract and retain employees

There is a lack of home or host country plan provisions

- Employees are unable to participate in home or host plan
- No home or host country plan exist
- Employers want to provide the minimum home or host country provisions as not to deter employees from accepting positions
- Employees who are globally mobile expect to accumulate home or host country retirement benefits

1. Continued

XYZ may want to provide top-up provision

- Allows for XYZ to provide supplementary benefits for key expats/employees
- Allows XYZ to offset loss of social security benefits due to mobility

XYZ may want to implement an IPP as a response to legislation

- Having expats in a home country or host country plan may be complex as a result of legislation (i.e. difficult to joining or leaving), may be easier to sponsor IPP
- Easy to settle if an employee leaves the company
- Legislation is introduced that does not allow you to participate in a home or host country plan
- IPP's are not normally tax effective, contributions normally taxed in host country, typically receive tax free investment returns, benefit payments typically taxed in country in which they are received.

XYZ has goals of becoming a global management company

- XYZ wants a structure in place that can provide an IPP to expatriates hired on contract
- globally designed to deal with expatriate population and special employees

- (c) Describe the key features of a global benefit policy statement.

The key features of a global benefit policy statement are as follows:

- Statement of the company's philosophy and overall attitude for employee benefits
- Outline of the process to receive approval for new programs or plan changes
- Provides guidance on implementation, modification and ongoing administrations
- Focuses on polices and principals in general, not specifics
- Contains broad policy statements on the following:

Total Remuneration

- Competitiveness of each element of pay: salary, bonus, pension, health benefits
- Tax effectiveness and state of the business;
- Preferences for specific levels and types of benefits included

Competitive practice

- Dictates how XYZ will compete
- Outlines XYZ stance on competitors
- Provides general guidelines for identifying competitors,
- Competitors may be based on industry, geographic location; size, activity, type of ownership or by employee group

1. Continued

Uniformity of treatment and internal equity

- Equity amongst employee groups across borders
- Equity amongst employee groups within each location

Mergers & Acquisitions

- Specify how company should deal with M&A
- Due diligence
- Methods:
 - Immediate integration,
 - Maintain current arrangements
 - Gradual integration

Costs

- How to budget and report costs
- Levels of cost-sharing with employees
- Preferred funding levels and investment guidelines

Employee communications

- Availability of information to employees
- Frequency of communications and method of deliver

2. Learning Objectives:

3. Candidate will be able to analyze the risks faced by retirees and the participants of retirement plans and retiree health plans.
4. The candidate will be able to evaluate plan design risks faced by sponsors of retirement plans and retiree health plans.
7. The candidate will be able to analyze/synthesize the factors that go into selection of actuarial assumptions.

Learning Outcomes:

- (3a) Identify risks face by retirees and the elderly.
- (3b) Describe and contrast the risks face by participants of:
 - (i) Government sponsored retirement plans
 - (ii) Single employer sponsored retirement plans
 - (iii) Multiemployer retirement plans, and
 - (iv) Social insurance plans
- (4a) Identify how plan features, temporary or permanent, can adversely affect the plans sponsor.
- (4b) Assess the risk from options offered, including:
 - (i) Phased retirement
 - (ii) Postponed retirement
 - (iii) Early Retirement
 - (iv) Option factors
 - (v) Embedded options
 - (vi) Portability options
- (7b) Describe and explain the different perspectives on the selection of assumptions.
- (7c) Describe and apply the techniques used in the development of economic assumptions.
- (7d) Recommend appropriate assumptions for a particular type of valuation and defend the selection.

Sources:

Key Findings and Issues: Understanding and Managing the Risk of Retirement, 2011
Risks and Process of Retirement Survey Report, March 2012

Fundamentals of Private Pensions, McGill, 9th Edition Ch. 5

“Downsizing and Plan Design”, RSA 1995, Vol. 21 No. 3A

DA-122-13: Turner & Watanabe, Private Pension Policies in Industrialized Countries, chap 5, “Pension Risk and Insurance,” pp 65-81

2. Continued

DA-136-13: 2009 Selection of Actuarial Assumptions, Consultant Resource Manual, SOA Version, Mercer (excluding pp. 13-31, pp. 34-37 and pp. 63-64)

DA-139-13: ASOP 35, Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations

DA-140-13: ASOP 27 Selection of Economic Assumptions for Measuring Pension Obligations

Commentary on Question:

Part (a), most candidates identified 1-2 of the main points of each section. Additional points were available for a description of how assumptions are generally determined, . Successful candidates discussed assumptions in context with the question.

Part (b), most candidates identified the risks faced by retirees, while generally identifying fewer of the risks faced by the sponsor. Points were awarded for all reasonable descriptions but no points were awarded for simply listing the risks.

Part (c), most candidates identified 2-3 points for each of the employer and employee perspective, while higher scoring candidates identified 4-5. Successful candidates provided an in depth analysis.

Solution:

(a) Describe the impact of the window on the following valuation assumptions:

(i) Salary increases

Salary increase = Inflation + real wage growth + employer specific adjustments + age component

The window encourages high level/senior employees to terminate. The remaining employees will be younger/lower salaried and will see more promotion to the vacated senior positions, increasing the salary increase assumption

A select and ultimate table should be used to reflect the short term nature of the window.

If the assumption was already graded by age/service, it's possible that no change to the assumption is required.

(ii) Retirement rates

Valuations should in general use a retirement rate table.

Increase rates at ages where early retirement subsidies are first available.

Reduce rates immediately before subsidies take effect.

Use separate rates for those eligible and those not eligible for a subsidy.

A single age assumption does not reflect the effects of subsidized early retirement.

2. Continued

A select and ultimate table should be used.
Rate should increase during the window.

Rate should be reduced after the window for a short period (i.e. 1 year) after the window.

Rate may be reduced for a longer period if employees wait for the next window.

Rate should increase amongst those with 25+ years of service

(iii) Termination of employment

ASOP 35 advises the actuary to consider:

- Occupation
- Employment policies
- Work Environment
- Unionization
- Hazardous work conditions
- Location of employment

Termination rates should take into account plan provisions such as early retirement benefits.

Those who will be eligible for the window will have a very low rate of termination prior to the window. After the window, with a shorter average service turnover will likely be higher.

(b) Describe the risks of the plan changes from the perspectives of both the plan sponsor and the eligible employees.

Risks to employers

- Employee that you want to retain leave, and those you want to leave remain
- Liquidity of plan assets is a concern because of the lump sum option
- The full cost of the window is an accounting charge in the current period.
- Employee communications are critical, as morale may be affected by the reasoning for the window
- A culture shift after the window (younger workers, more mobile) may make the DB plan less effective, and a new design should be considered
- The plan would become more underfunded.
- Legal issues such as ratio percentage test, non-discrimination

Risks to employees

- Longevity risk – Outliving assets
- Inadequate replacement ratio – Will need to spend less
- Interest rate/investment risk – The lump sum option is at risk of providing less income than the pension plan would.

2. Continued

- Inflation Risk – The real value of the pension will erode if it is not increased periodically. Future salary increases will not be considered as they would have been if retirement occurred at the normal retirement age.
- Medical coverage – Retirees may face higher costs without coverage as compared to an employee.
- Risk of wrong doing – Retirees are at risk that the sponsor or fund manager inappropriately invests the plan assets.
- Risk of public policy changes – new taxes, means testing of government benefits

(c) Critique this proposal from the perspectives of both the plan sponsor and the active employees.

Plan sponsor perspective

- The program may be retaining the employees who are no longer effective, rather than the highly skilled employees.
- There may be workforce disruption issues, which may be more costly than a normal early retirement window would have been.
- Should consider only offering the program to specific groups who have specialised knowledge the company wants to be passed on
- The full pension accrual will put added pressure on the funded status of the plan
- Liquidity concerns and the immediate consequences to the funded status are less severe as there is no lump sum option and the early retirement is delayed for two years.
- The funded status and industry outlook may improve in two years.
- 60% pay for 50% working hours is overpaying for labor.
- Retirement during the period will slow down.

Employee perspective

- Gives employees a chance to adjust to retirement
- Gives employees who do not want to retire time to search for other full time work
- 60% of pay may not be adequate so a new job or additional part time job may be required
- Morale and productivity may decrease during the two year period for those leaving
- Employees do not lose any value of their pension
- Lower level employees have more opportunity to advance

3. Learning Objectives:

8. The candidate will be able to recommend and advise on the financial effects of funding policy and accounting standards in line with the sponsor's goals, given constraints.

Learning Outcomes:

- (8a) Perform valuations for special purposes, including:
- (i) Plant termination/windup
 - (ii) Accounting valuations
 - (iii) Open group valuations
 - (iv) Plan mergers, acquisitions and spinoffs
- (8e) Advise plan sponsors on accounting costs and disclosures for their retirement plans.
- (8f) Demonstrate the sensitivity of financial measures to given changes in plan design.

Sources:

Morneau Sobeco, 14th Edition, Chapter 12

Watson Wyatt Canadian Pensions and Retirement Income Planning, 4th edition Ch 16

R-C121-07: converting pension plans from a DB to a DC design – Issues to consider in Canada

Commentary on Question:

Some candidates set up a prior service cost base and some candidates interpreted the 2014 service cost associated with terminated employees as the 2014 service cost for the remaining employees. Credit was awarded for both interpretations.

Solution:

- (a) Calculate the impact of this event on the 2013 pension expense. Show all work.

Canadian Case Study confirmed that NOC was using IAS19R (2011) effective January 1, 2011. Therefore, not 10% corridor – all remeasurements flow through OCI in that year.

Events and Treatment:

Since IAS19R – all remeasurements flow through OCI in that year; any past service cost, curtailment or out of valuation scope settlement events all are P&L impact. Total expense is P&L plus OCI events.

The question gave actuarial gains of \$130,000 at end of 2013

These were separate from events (curtail/settlement) – so flow through OCI at end of 2013

Terminating of 40% actives – curtailment – P&L impact

Immediate vesting amend – P&L impact

Purchasing annuities – settlement – P&L impact

3. Continued

Amendment and Curtailment:

Liabilities for severed group were \$575,000

Losses of \$25,000 for immediate vesting for the terminated members

Gains \$175,000 to reflect elimination of future salary growth on liabilities (get current final average earnings, not projected)

Net gain \$150,000

Settlement:

Liabilities for terminated (affected) group now \$425,000 (after curtailment adjustments above)

Purchase price is \$600,000

Loss of \$175,000

2013 P&L = expense (given) + amend/curtail/settlement = \$80,094 (given)
+(150,000)+175,000 = \$105,094

Total P&L hit due to events was \$175,000 + (\$150,000) = \$25,000 expense increase

To derive 2014 expense the projected 2013 liabilities and assets must be calculated

If candidates calculated pension expense using separate line items for interest on liabilities and return on assets (but applying discount rate now under IAS19R) they likely did the following:

Assets at end of 2013 = assets at beg of year + contributions – benefit pays + expected return on assets

= \$1,188,240 + 42,391 – 33,000 + 53,682 (given in case study however many candidates tried to calculate and numerical errors were made) = \$1,251,313

Expected Liabilities at end of 2013 = liabilities at beg of year + current service cost (assumed it was at BOY) – benefit pays + interest cost (given in case study but some candidates tried to calculate with some errors) = \$1,537,239.

After applying Actuarial gains of \$130,000 the end of year liabilities were \$1,407,239 (many candidates forgot to adjust for this gain).

If candidates calculated pension expense using Net Interest Cost as combined [funded status] * [discount rate] they projected the funded status, not individual liabilities and assets and generally responded as follows:

Funded status at beg of 2013 = \$1,188,240 - \$1,436,463 = \$248,223

Funded status at end of 2013 = beg of year funded status + 2013 pension expense (given in question) + employer contributions (given in question) + actuarial gains (given in question) = (\$248,233) + (\$80,094) + \$42,391 + \$130,000 = (\$155,936)

Credit was given for either of these approaches.

3. Continued

The settlement impact:

Assets reduced by \$600,000 to pay the premium and the liabilities are reduced for the affected group.

So funded status after all events are recognized is now $(\$155,936) + (\$600,000) + \$575,000 = (\$180,936)$

- (b) Calculate the 2014 pension expense. Show all work.

2014 P&L expense:

= Current service cost + Net Interest Cost (credit given for including interest of current service cost in either current service cost or net interest cost since not clearly defined) **OR**

= Current service cost + interest on liabilities – expected return on assets (using discount rate)

No asset ceiling limitations assumed

Question provided the current service cost as \$25,000 – much lower now since terminated group no longer included.

Interest on liabilities cost (including interest on current service) = \$37,833 (marks for showing intermediary steps)

Expected return on assets = \$29,520 (marks for showing intermediary steps)

OR Net interest cost = [funded status with expected cash flow adjustments] * [discount rate] = \$8,313 (marks for showing intermediary steps)

Total P&L expense of \$33,313

No OCI impacts indicated in question.

4. Learning Objectives:

3. Candidate will be able to analyze the risks faced by retirees and the participants of retirement plans and retiree health plans.
4. The candidate will be able to evaluate plan design risks faced by sponsors of retirement plans and retiree health plans.

Learning Outcomes:

- (3a) Identify risks face by retirees and the elderly.
- (3b) Describe and contrast the risks face by participants of:
 - (i) Government sponsored retirement plans
 - (ii) Single employer sponsored retirement plans
 - (iii) Multiemployer retirement plans, and
 - (iv) Social insurance plans
- (3d) Propose ways in which retirement plans and retiree health plans can manage the range of risks faced by plan participants and retirees.
- (4a) Identify how plan features, temporary or permanent, can adversely affect the plans sponsor.
- (4c) Recommend ways to mitigate the risks identified with a particular plan feature.
- (4d) Analyze the issues related to plan provisions that cannot be removed.

Sources:

McGill: Fundamentals of Private Pensions – Ch. 4, 5, 9

Solution:

- (a) (a) Compare and contrast the two plan design options from the employees' perspective with respect to each of the following risks:
 - (i) Longevity risk
 - (ii) Inflation risk
 - (iii) Investment return risk

(i) Longevity risk

Option 1 provides protection against longevity risk since the normal form of payment would be an annuity benefit

Option 2 provides no protection again longevity risk since the benefit is payable as a lump sum.

Option 2 – members can protect themselves against longevity risk by purchasing an annuity

4. Continued

(ii) Inflation risk

Option 1 provides protection against pre-retirement inflation as it relates to salary since final average pay is used to determine benefit amounts.

An additional note is that contributions are based on pay each year, while the final benefit is determined based on final average pay.

This offsets some of the inflation risk protection since there is a higher chance benefits will need to be cut if salary inflation is high because assets are less likely to be sufficient.

Option 2 provides less protection against pre-retirement inflation as it related to salary since a career average pay is used

Neither option 1 nor option 2 provide protection against inflation after retirement

(iii) Investment return risk

Option 1 provides no protection against investment return risk since employees' benefits may be reduced if there are unfavorable asset returns

Option 2 provides protection against investment return risk since there is a minimum guaranteed interest crediting rate

Post-retirement risk born by employee

- (b) Describe the advantages and disadvantages of each plan design option to XYZ.

Option 1 - Advantages

The contributions each year are predetermined as a fixed % of pay

The investment return risk is hedged since benefits may be reduced if assets perform poorly

Option 1 - Disadvantages

The company retains longevity risk since the benefit payable upon retirement is an annuity benefit

There are higher administrative costs since employees remain plan participants after termination/retirement (until annuity payments are complete)

Option 2 - Advantages

The contributions each year are predetermined as a fixed % of pay

The interest crediting rate is tied to the plan's asset return, so that hedges some of the investment risk

The company does not retain longevity risk since the benefit is paid as a lump sum upon termination/retirement

Administrative fees are lower since employees are paid out upon termination/retirement

4. Continued

Option 2 - Disadvantages

There is higher exposure to downside investment return risk since there is a floor crediting rate

The company is not rewarded for good plan asset performance since the excess asset returns are passed on to participants.

The potential long-term savings that cash balance plans can offer to companies is not available if the plan cannot earn higher asset returns than what is credited to accounts

- (c) XYZ has decided to implement Option 2, but the CEO is concerned with the risks associated with the interest crediting rate design. Propose ways the company can reduce the risks through both plan design and investment strategy.

Reduce the interest rate floor to something lower

Change the basis used to determine the interest crediting rate. The company can use another measure, like government bonds or another standard indice, which would reduce volatility

The company could structure the asset portfolio to closely align with the securities in the index used to credit accounts

The company could use a flat interest crediting rate each year, like 5%. That would ensure no volatility in the interest crediting rate. There would still be risk that the asset return is not sufficient to cover the crediting rate.

Introduce a ceiling on the interest crediting rate

Allow the employee to invest the assets or choose the index for the interest crediting rate

5. Learning Objectives:

1. The candidate will be able to analyze different types of registered/qualified retirement plans and retiree health plans.
5. The candidate will be able to evaluate sponsor's goals for the retirement plan, evaluate alternative plan types and features, and recommend a plan design appropriate for the sponsor's goals.
7. The candidate will be able to analyze/synthesize the factors that go into selection of actuarial assumptions.
8. The candidate will be able to recommend and advise on the financial effects of funding policy and accounting standards in line with the sponsor's goals, given constraints.

Learning Outcomes:

Describe the structure of the following plans:

- (a) Traditional defined benefit plans
- (b) Hybrid plans
- (c) Defined contribution plans
- (d) Retiree Health plans

Given a plan type, explain the relevance, risks and range of plan features including the following:

- (a) Plan eligibility requirements
 - (b) Benefit eligibility requirements, accrual, vesting
 - (c) Benefit/contribution formula, including the methods of integration with government-provided benefits
 - (d) Payment options and associated adjustments to the amount of benefit
 - (e) Ancillary benefits
 - (f) Benefit subsidies and their value, vest or non-vested
 - (g) Participant investment options
 - (h) Required and optional employee contributions
 - (i) Phased retirement and DROP plans
- (5a) Describe ways to identify and prioritize the sponsor's goals related to the design of the retirement plan.
 - (5b) Assess the tradeoffs between different goals.
 - (5c) Assess the feasibility of achieving the sponsor's goals for their retirement plan.
 - (5d) State relationships or recognize contradictions between a sponsor's plan design goals and the retirement risks faced by retirees.
 - (5e) Identify the ways that regulation impacts the sponsor's plan design goals.
 - (5f) Design retirement programs that manage retirement risk and are consistent with sponsor objectives.

5. Continued

- (5g) Design retirement programs that promote employee behavior consistent with sponsor objectives.
- (5h) Evaluate the pros and cons from both a sponsor and employee perspective of introducing options that impact the labor force demographics.
- (5i) Recommend a method to integrate government-provided benefits with retirement plan designs in order to meet the plan sponsor's particular goals and defend the recommendation.
- (5j) Advise a plan sponsor regarding the choice of design elements for their retiree health program.
- (5k) Evaluate and incorporate, as appropriate, different social insurance and employer sponsored plan types and features that occur internationally in providing recommendations.
- (5l) Give examples of plans that are appropriate for multinational companies and their employees including third country nationals and expatriates.
- (5m) Recommend an appropriate plan type and plan design features for providing retirement benefits and defend the recommendations.
- (7a) Evaluate appropriateness of current assumptions.
- (7b) Describe and explain the different perspectives on the selection of assumptions.
- (7c) Describe and apply the techniques used in the development of economic assumptions.
- (7d) Recommend appropriate assumptions for a particular type of valuation and defend the selection.
- (7e) Select demographic and economic assumptions appropriate for a projection valuation.
- (8a) Perform valuations for special purposes, including:
 - (i) Plant termination/windup
 - (ii) Accounting valuations
 - (iii) Open group valuations
 - (iv) Plan mergers, acquisitions and spinoffs
- (8b) Analyze, recommend, and defend an appropriate funding method and asset valuation method in line with the sponsor's investment policy and funding goals.
- (8c) Demonstrate how the retirement plan's cash inflows and outflows can affect the plan sponsor.

5. Continued

- (8d) Advise retirement plan sponsors on funding costs including tax deductibility, required contributions and other alternatives to meet the sponsor's goals, consistent with government regulation.
- (8e) Advise plan sponsors on accounting costs and disclosures for their retirement plans.
- (8f) Demonstrate the sensitivity of financial measures to given changes in plan design.
- (8g) Describe how a plan's funded status can impact union negotiations and multiemployer plans.
- (8h) Perform and interpret the results of projections for short and long range planning including the effect of proposed plan changes.

Sources:

CIA General Standards of Practice Part 1

CIA General Standards of Practice Part 2

CIA SOP Practice Specific Standards for Pension Plans

Commentary on Question:

Part (a) – successful candidates commented on the methods and the assumptions.

Part (c) – successful candidates made a recommendation on what should be done.

Solution:

- (a) Discuss the appropriateness of the actuarial assumptions and methods.
 - 1. Mortality table is outdated and may not be sufficient to reflect current experience
 - 2. Reflecting sufficient provision for future mortality improvement should also be considered
 - 3. If a significant number of retirements is expected to occur at different ages, a single retirement age may not be appropriate.
 - 4. Assuming 100% retirement at earliest retirement age with unreduced pension may be overstating the liabilities
 - 5. Liability breakdown shows significant liability for inactive vesteds and disabled pensioners
This means that it is probably not appropriate to have no disability and turnover assumptions
Since the disability pension is unreduced, the lack of disability assumption result in cumulative losses in future years
 - 6. Lack of turnover assumption may result in overstating the liabilities

5. Continued

7. Since there is a significant amount of disability pension, a different mortality table for disabled lives should have been used
 8. Net investment return (discount rate) assumption may be too high considering asset allocation
 9. J&S pension is fully subsidized so assuming 100% electing life only could understate the liabilities
 10. The magnitude of understatement in the liabilities will partly depend on the percent of population assumed to be married at retirement
 11. Given that the average future working lifetime is 15 years, calculating the recommended contribution rate using a 5-year amortization schedule might be too conservative.
 12. Liability breakdown shows a relatively smaller percentage from actives which indicates that the plan is mature
 13. Given that the plan is relatively mature, Unit Credit cost method could result in rising normal costs if the plan has aging demographics
 14. Entry age normal method produces a stable level of costs and may be more appropriate for a plan with aging demographics if a stable level of costs is desired
 15. Adopting an asset valuation method that smoothes asset values to promote contribution stability may also be appropriate since contributions to a multiemployer plan is based on the length of the collective bargaining agreement.
 16. 20% margin might result in more contributions than necessary to fund the plan.
- (b) Identify additional information that may be necessary to perform an independent evaluation of the recommended hourly contribution rate.
1. Historical rates of investment return to evaluate past performance and appropriateness of current assumption
May be used to evaluate actuarial value of assets under different asset valuation methods and effect on recommended contribution rate
Building blocks used to determine/justify investment return assumption
 2. Historical demographic experience of mortality, retirement, disability, turnover and form of payment chosen used to evaluate current demographic assumptions
 3. Input from Trustees about future industry activity or assumed employment level to determine hourly recommended rate

5. Continued

Historical information on hours worked (or employment level) and demographic statistics to evaluate whether assuming a stable active population implicit in the determination of the recommended contribution rate is reasonable.

Historical information on employers withdrawing from the Fund and whether any withdrawal liability amounts were collected.

4. Information explaining selection of an assumption that deviates (or perceived to deviate) from actuarial standards, if any
5. Projections of minimum funding requirements including plan solvency

Used to determine whether recommended contribution rate is sufficient to meet minimum funding requirements

6. Sensitivity analysis on various assumptions such as investment return, level of work and utilization of earlier retirement provisions.

This is especially important because plan is mature and therefore if plan's funding deteriorates, it can be extremely difficult to increase contributions enough to meet funding requirements.

This analysis can be used to evaluate whether there is enough or too much margin in the recommended contribution rate

7. Information pertaining to possibility of having a companion retiree health plan. Provisions of retiree health plan can affect the retirement patterns in the plan

- (c) The union representing the employees of Employer A has indicated that it wants to maintain a defined benefit plan.

Recommend alternative ways to redesign the XYZ Plan to lower the recommended hourly contribution rate.

1. Remove/modify unreduced service pension at 25 years of service
 - Add age requirement to service pension
 - Make service requirement higher than 25 years of service
 - Provide an actuarially equivalent early retirement reduction from NRA
 - Eliminate the provision altogether
2. Remove/modify early retirement provision
 - Increase age/service requirement above 55/10
 - Provide an actuarially equivalent early retirement reduction from NRA
 - Eliminate the provision altogether
3. Reduce future accrual rate below \$100
4. Modify plan design from flat dollar formula to percent of contributions/hours formula that caps the accrual rate at \$100
5. Require a greater number of hours worked above 800 hours to obtain full benefit credit for the year

5. Continued

6. Remove/modify disability benefit provision
 - Add age requirement
 - Make service requirement higher than 10 years of service
 - Provide an actuarially equivalent early retirement reduction from NRA
 - Eliminate the provision altogether
7. Remove both lump sum death benefits
8. Reduce accrued benefits to the extent possible under the law. In US, can only do this if plan is in the Red zone status. In Canada, some jurisdictions may permit reduction in accrued benefits.
9. Implement a reduced actuarially equivalent 50% joint-and-survivor annuity option

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Learning Outcomes:

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- (m) Payment options and associated adjustments to the amount of benefit
- (n) Ancillary benefits
- (o) Benefit subsidies and their value, vest or non-vested
- (p) Participant investment options
- (q) Required and optional employee contributions
- (r) Phased retirement and DROP plans

- (5b) Assess the tradeoffs between different goals.
- (5d) State relationships or recognize contradictions between a sponsor's plan design goals and the retirement risks faced by retirees.
- (5f) Design retirement programs that manage retirement risk and are consistent with sponsor objectives.

Sources:

DA-107-13: Green DB: Eliminate Wasteful Practices and Make Your DB Plan Sustainable

Retirement Plans (Allen) Chapter 14

Commentary on Question:

Many candidates were able to identify the key features of a Green DB plan, however to achieve full credit, candidates were required to link their response to the case study. Candidates were granted credit for other correct answers not listed below, such as employee contributions to a DC provision which would allow for higher accruals, ancillary benefits, assumption reviews, etc. Successful candidates discussed the impact a change will make.

6. Continued

Solution:

- (a) List possible ways of lowering the risk, volatility and costs of defined benefit pension plans resulting in a more sustainable or “Green” program. The following features of a Green DB plan help to reduce risk, volatility and costs:

Investment Strategy

- Move assets from equities to duration-matched bonds and other interest-sensitive investments

Form of Payment

- Eliminate lump sum benefits and only provide pensions on retirement

Benefit Level & Formula

- Provide a modest amount of guaranteed income
- Replace final average pay provisions in favor of career pay or career units

Subsidized Benefits

- Eliminate subsidized benefits and replace with actuarial equivalence
- Eg. Early retirement subsidy or subsidized normal form for married members

Defined Contribution Provision

- Employees can contribute to a defined contribution provision to provide ancillary benefits

- (b) Analyze the impact of adopting a “Green” retirement program for the Full-Time Salaried Pension Plan from the perspectives of both NOC and the plan members.

NOC’s perspective:

- Currently 40% invested in fixed income, under Green approach would move to a higher percentage
 - will result in higher, but more steady and predictable contributions
 - will likely result in lower asset returns with less volatility
- Currently allow lump sum cash-outs, under Green approach this would not be allowed
 - will increase the long term liability and longevity risk exposure
 - will increase the longevity-pooling effect and cost-efficiency of the plan
- Currently offer a generous early retirement subsidy, which would be eliminated under a Green approach
 - Will lower the overall cost of the plan
 - Could lead to workforce management issues since employees will be working later
- Reduce overall benefit levels (i.e. reduced accrual rate, FAE to CAE, no indexing, definition of earnings)
 - Will lower the overall cost of the plan

6. Continued

Employees' perspective:

- Higher fixed income allocation will lead to more secure benefits
- Receiving an annuity benefit rather than a lump sum cash-out will provide members with guaranteed income during retirement
 - Some employees prefer a lump sum and will be unhappy with the change
- Elimination of the early retirement subsidy will result in lower benefits for retirees, reducing the incentive for them to retire early
- Reduction in overall benefit level will mean less retirement income
- Changes could lead to lower employee morale, resulting in workforce management issues

7. Learning Objectives:

7. The candidate will be able to analyze/synthesize the factors that go into selection of actuarial assumptions.
9. The candidate will be able to apply the standards of practice and guides to professional conduct.

Learning Outcomes:

- (7a) Evaluate appropriateness of current assumptions.
- (7b) Describe and explain the different perspectives on the selection of assumptions.
- (9a) Apply the standards related to communications to plan sponsors and others with an interest in an actuary's results (i.e., participants, auditors etc.).
- (9b) Explain and apply the Guides to Professional Conduct.
- (9c) Explain and apply relevant qualification standards.
- (9d) Demonstrate compliance with requirements regarding the actuary's responsibilities to the participants, plan sponsors, etc.
- (9e) Explain and apply all of the applicable standards of practice related to valuing retirement obligations.
- (9f) Recognize situations and actions that violate or compromise Standards or the Guides to Professional Conduct.
- (9g) Recommend a course of action to repair a violation of the Standards or the Guides to Professional Conduct.

Sources:

DA-614-14: Practice Specific Standards for Pension Plans 3100-3500, CIA Consolidated Standards of Practice

CIA Rules of Professional Conduct

Solution:

- (a) List the reporting requirements that must be included in actuarial communications under the applicable professional standards.

An external user report should include the following disclosures:

Include the calculation date, the report date, and the next calculation date;

Describe the sources of membership data, plan provisions, and the pension plan's assets, and the dates at which they were compiled;

Describe the membership data and any limitations thereof;

Describe the tests applied to determine the sufficiency and reliability of the membership data and plan asset data for purposes of the work;

7. Continued

Describe the assets, including their market value and a summary of the assets by major category;

Describe the pension plan's provisions, including the identification of any pending definitive or virtually definitive amendment;

Disclose subsequent events of which the actuary is aware, whether or not the events are taken into account in the work, or, if there are no subsequent events of which the actuary is aware, include a statement to that effect;

State the type of each valuation undertaken under the terms of the appropriate engagement; and

Describe any significant terms of the appropriate engagement that are material to the actuary's advice (i.e. the terms of engagement).

Describe the actuarial cost method;

Describe the method used to value the pension plan's assets (i.e. asset valuation methods);

Describe the assumptions used to determine the actuarial present value of projected benefits, including the extent of any margin for adverse deviations included with respect to each such assumption, and provide the rationale for each assumption that is material to the actuary's advice (i.e. actuarial assumptions);

Describe the rationale for any assumed additional returns, net of investment management expenses, from an active investment management strategy as compared to a passive investment management strategy, included in the discount rate assumption (i.e. rationale for additional returns due to active management);

Report the funded status at the calculation date and the service cost or the rule for calculating the service cost between the calculation date and the next calculation date;

Disclose any pending but definitive or virtually definitive amendment of which the actuary is aware, and whether or not such amendment has been included in determining the funded status and the service cost;

Describe any contingent benefits provided under the pension plan and the extent to which such contingent benefits are included or excluded in determining the funded status and the service cost;

Describe any benefits that are not contingent benefits and that have been excluded in determining the funded status and the service cost (i.e. excludable benefits); and

If there is no provision for adverse deviations (i.e. PfADs), include a statement to that effect. If an external user report includes one or more going concern valuations then the external user report should, for at least one such valuation included in the report, describe and quantify the gains and losses between the prior calculation date and the calculation date (i.e. gain and loss analysis).

If an external user report includes one or more going concern valuations, other than a valuation for the purpose of determining the maximum funding permitted by law for a "designated plan", as that term is defined in the Income Tax Regulations (Canada), then the external user report should, for at least one such valuation included in the report, report the effect of using a discount rate 1.0% lower than that used for the valuation on (sensitivity analysis on liabilities and service cost):

- The actuarial present value, at the calculation date, of projected benefits allocated to periods up to the calculation date; and
- The service cost or the rule for calculating the service cost between the calculation date and the next calculation date.

An external user report that provides advice on funding should:

- Describe the determination of contributions or a range of contributions between the calculation date and the next calculation date (i.e. the contribution requirements);

7. Continued

An external user report should provide the following four statements of opinion, all in the same section of the report and in the following order:

- A statement regarding membership data, which should usually be, “In my opinion, the membership data on which the valuation is based are sufficient and reliable for the purpose of the valuation.”;
- A statement as to assumptions, which should usually be, “In my opinion, the assumptions are appropriate for the purpose(s) of the valuation(s).”;
- A statement as to methods, which should usually be, “In my opinion, the methods employed in the valuation are appropriate for the purpose(s) of the valuation(s).”; and
- A statement as to conformity, which should be, “This report has been prepared, and my opinions given, in accordance with accepted actuarial practice in Canada.”

An external user report should be sufficiently detailed to enable another actuary to assess the reasonableness of the valuation

- (b) Describe potential violations of the applicable professional standards and the steps that should be taken to remedy the violations.

The following CIA SoP may have been violated:

With respect to DATA, the prior actuary should have documented and disclosed (if appropriate) the following:

A description of the membership data and any limitations thereof.

A description of the tests applied to determine the sufficiency and reliability of the membership data

A qualified statement regarding the membership data, which could be a modification of the first of the four statements of opinions

Any assumptions and methods used in respect of insufficient or unreliable membership data would be described

Description of any significant terms of the appropriate engagement that are material to the actuary’s advice

With respect to the PLAN AMENDMENT, the prior actuary should have documented and disclosed (if appropriate) the following:

A description of the pension plan’s provisions, including the identification of any pending definitive or virtually definitive amendment;

Disclosure of any subsequent events of which the actuary is aware, whether or not the events are taken into account in the work, or, if there are no subsequent events of which the actuary is aware, include a statement to that effect;

With respect to the SELECTION OF ACTUARIAL ASSUMPTIONS, the prior actuary should have documented and disclosed (if appropriate) the following:

Description of the retirement assumption used

Disclosure of any margin for adverse deviations included in the retirement assumption,

Disclosure of the rationale for using the selected retirement assumption

A qualified statement regarding the selection of the retirement assumption, which could be a modification of the second of the four statements of opinions

7. Continued

With respect to the EXTERNAL USER REPORT, the prior actuary should have provided:
A qualified statement regarding the conformity to accepted actuarial practice in Canada, which could be a modification of the fourth of the four statements of opinions
Sufficient detail to enable another actuary to assess the reasonableness of the valuation

Possible Remedies

Since a few CIA Standards may have been violated, according to Rule 13 of the CIA Professional Code of Conduct: A member who becomes aware of an apparent material noncompliance with the Rules or the standards of practice by another member shall attempt to discuss the situation with the other member and resolve the apparent noncompliance. In the absence of such discussion and resolution, the member shall report such apparent noncompliance to the Committee on Professional Conduct, except where such reporting would be contrary to law or, when the member is acting in an adversarial environment, for the duration of such adversarial environment.

Violations can be corrected by redoing the valuation results to reflect the plan amendment on early retirement benefits.

Violations can be corrected by documenting all work and reviews that have been done regarding the data and appropriately disclosing the adjustments made and any limitations of the results due to such adjustments (i.e. including proper disclosure of data assumptions).

Violations can be corrected by revisiting the retirement assumptions to make sure the assumptions are still reasonable and if not, modify the assumptions to reflect future expectations. The review of assumptions should take into account:

Experience studies showing relevant plan experience and analysis of gains and losses in past years

Studies of reports of the effects of plan design, specific events, economic conditions, or sponsor characteristics. Increasing early retirement benefits might affect the retirement pattern of plan participants and this should also be considered while reviewing retirement assumptions.

Violations can be remedied by re-issuing the January 1, 2013 valuation report with all the proper disclosures about data, benefits, including plan amendments, and assumptions.

8. Learning Objectives:

1. The candidate will be able to analyze different types of registered/qualified retirement plans and retiree health plans.
2. The candidate will understand the impact of the regulatory environment on plan design.

Learning Outcomes:

Describe the structure of the following plans:

- (a) Traditional defined benefit plans
- (b) Hybrid plans
- (c) Defined contribution plans
- (d) Retiree Health plans

Given a plan type, explain the relevance, risks and range of plan features including the following:

- (e) Plan eligibility requirements
- (f) Benefit eligibility requirements, accrual, vesting
- (g) Benefit/contribution formula, including the methods of integration with government-provided benefits
- (h) Payment options and associated adjustments to the amount of benefit
- (i) Ancillary benefits
- (j) Benefit subsidies and their value, vest or non-vested
- (k) Participant investment options
- (l) Required and optional employee contributions
- (m) Phased retirement and DROP plans

- (2b) Explain and test for limits on plan designs and features that protect participation rights.
- (2c) Test for plan design restrictions intended to control the use of tax incentives.
- (2d) Describe the process and apply the principles and rules governing the conversion from one type of plan to another.

Sources:

Morneau Sobeco, 14th Edition, Chapter 12 –Canada Only

Watson Wyatt Canadian Pensions and Retirement Income Planning, 4th edition Ch. 16 pp 295-297, p. 313, Canada Only

R-C121-07: Converting Pension Plans From a DB to a DC design – Issues to Consider in Canada (Canada Only)

Commentary on Question:

Successful candidates compared and contrasted the types of plans in addition to providing information on each plan. Part b) of the question asked for options with respect to "treatment of accrued benefits". In addition to discussing plan designs for converting from DB to DC, successful candidates focused on the treatment of the past service benefits prior to conversion.

8. Continued

Solution:

- (a) Compare and contrast the following arrangements:
- (i) Defined contribution (DC) pension plan
 - (ii) Group RRSP
 - (iii) Deferred Profit Sharing Plan (DPSP)

| |
|--|
| EE Contributions |
| EE contributions are permitted |
| EE contributions are permitted and are done through payroll deductions |
| EE contributions are not permitted. |
| ER Contributions |
| ER contributions are specified as either a percentage of earnings or a flat dollar amount. |
| ER can contribute to EE's account based on deemed earning during periods of unpaid absence (not possible in Group RRSP or DPSP). |
| More flexibility to vary ER contributions among plan members |
| ER contributions could be calculated by "reference to the ER's profits" or "out of profits" from the ER's business. They could be based on a fixed dollar amount per EE or as a percent of EE salary. |
| Benefit Distribution |
| Retirement incomes are provided based on EE's account balances at retirement. Transfers usually locked in (subject to provincial unlocking rules) |
| Since ER contributions are vested immediately, there is no way to ensure that the funds will eventually be used for retirement purposes rather than for any other personal purposes. |
| Possible to include non-withdrawal clauses, however care must be taken so that withdrawal restrictions do not deem the Group RRSP as pension plans subject to pension standards legislation. |
| To discourage withdrawals, employers can suspend matching contributions for a period of one to five years in the event withdrawals are made during employment. |
| Can make lump-sum withdrawal of benefits at retirement; flexibility allows EE to transfer their benefit entitlement to an investment vehicle that might produce a higher ROR compared to leaving benefit in plan. |
| EE may not borrow from the fund, nor surrender nor assign their interests |
| Purpose of Plan Design/Legislation |
| DC RPP is a pension plan and must comply with applicable pension standards legislation. CAP Guidelines |
| Group RRSP is not a pension plan but is an alternative to pension plans. Therefore, it is not subject to pension legislations and standards: i.e., no lock-in requirements, more flexibility in establishing eligibility conditions, no restriction on beneficiary designation, no mandatory joint and survivor pension or no pension committee required. CAP guidelines |
| Often used on a stand-alone basis or as a supplement to a non-contributory DB or DC or DPSP. A DPSP in this case is used to receive ER contributions as they are not considered as salary subject to payroll taxes. |

8. Continued

| |
|---|
| DPSP is not subject to detailed pension standards legislation but must satisfy several registration requirements. |
| Designed to reward EEs for good performance and to instill a sense of partnership between the ER and EE. The intention is to establish a common interest for EEs and ER. As a result, frequently improves labor relations with reduced absenteeism and labor turnover without incurring a fixed financial commitment. |
| Frequently used as a retirement income vehicle on a stand-alone or supplementary basis. |

| |
|--|
| Vesting |
| Subject to pension legislation |
| Since ER contributions are considered salaries to the employee, they are immediately vested |
| Minimum of 24 months of participation; plan design |
| Administration |
| May be administratively complex given that plan sponsor has to keep track of separate EE accounts with EE and ER contributions, forfeited amounts, etc. Also there are still some compliance/fiduciary obligations that plan sponsors need to fulfill under the DC plan. |
| Poor communication to EEs may lead to lawsuits if EEs don't understand their responsibilities w.r.t. their contributions and investment options. |
| Time limits on uses of forfeiture amounts |
| EEs can benefit from advantage of greater purchasing power: (1) reduced administration of fund management costs (partially subsidized by ER); (2) access to wide variety of investment funds that wouldn't ordinarily have access to as an individual. |
| Even though it is not subject to pension standards legislation, ER has fiduciary-like responsibility as it selects the administrator and fund managers. ER has a responsibility to select with prudence and diligence, and monitor performance on an ongoing basis. |
| Opportunity for the EE to arrange income splitting through spousal RRSPs. |
| ER contributions are paid to a Trustee who holds and invests the contributions on behalf of EEs. |
| Tax penalty if the DPSP fund is not invested in Qualified Investments as defined in the ITA. |
| Does not have the 10% limit on the investment in one security. Therefore, can invest DPSP funds heavily in the ER's own common stock, although not in the ER's notes or bonds. |
| ER Costs/Commitments |
| ER contributions are not subject to payroll taxes. Must be paid even in poor economic times. |
| ER contributions are considered salaries to the EEs and therefore subject to payroll taxes in the form of contributions to government plans: CPP, employment insurance, provincial health care plans and worker's compensation |
| Provides benefits to EEs without management's guaranteed commitment (since benefits are based on profits) and therefore reduces management's exposure to incur a fixed cost in times of economic downturns, etc. |
| ER contributions are not subject to payroll taxes same with MPP. |
| Tax Implications |
| There is no limit on the amount that can be transferred from a DC RPP |
| Tax-deductible contributions cannot exceed a max contribution per EE that is limited to the lesser of: |
| i) 1/2 x MPP limit for the year; or |
| ii) 18% of the compensation for the year. |

8. Continued

| |
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| Payroll deductions are tax deductible subject to a limit. |
| Depending on EEs personal situation, may not be able to contribute as much to Group RRSP if already have personal RRSP contributions made; need to keep maximum tax deductible limit in mind. |
| ER contribution is deductible to the extent it is paid in accordance with the plan as registered; must be made in the taxation year or within 120 days after the end of the taxation year. |
| Tax-deductible contributions cannot exceed a max contribution per EE (half of DC) |

- (b) Describe the options available to XYZ with respect to the treatment of accrued benefits on transition, including the Canadian tax implications.

| |
|--|
| Cannot reduced accrued benefits for past service prior to transition |
| Option 1 - Maintain the DB provisions for the accrued benefits |
| Need to still file regular actuarial reports; pbgf assessments; annual filing fees etc. |
| XYZ may decide to go this route due to: |
| Concern about the cost of converting existing DB entitlements to DC account balances (particularly in current low interest rates environment). |
| Concern about short-term accounting implications due to settlement accounting rules |
| Can accept ongoing investment and liability risks from these liabilities; can continue to hold these obligations on company financial statements |
| Can make contributions to fund past service as regular unfunded deficits (no accelerated funding due to conversion etc). |
| |
| Option 2 - Convert accrued benefits from DB plan to DC account balance |
| XYZ may decide to do this if want to reduce DB commitments more quickly. Since Ontario members cannot be forced to convert accrued benefits into DC accounts, XYZ may want to consider offering an enhanced DC conversion formula to encourage conversion of DB accrued benefits to DC accounts. |
| May trigger Pension Adjustment Reversals (PAR) if DC conversion value is less than the amount of PAs and PSPAs reported with respect to the same period of past service. Could affect members' decision to convert. |
| Cannot transfer commuted value (CV) of accrued benefit out of the pension plan - portability rights not available unless plan is wound up. For ex., transfer into another retirement account or pay as cash. |
| When CV is more than maximum amount that can be transferred into a DC provision on a tax-deferred basis, the excess must be paid in cash and is subject to income tax. |
| Conversion cannot reduce accrued benefits earned to date of conversion. CV of accrued benefits cannot be less than the value of the benefits immediately before the conversion – must be greater than CIA prescribed commuted value |
| This ensures that those who have met requirements for ancillary benefits such early retirement enhancements and refund of contributions do not lose those ancillary benefits. |
| Since benefits are based on final average earnings, a reasonable projection of salary increases must be included in the conversion basis. |
| Since Plan is significantly underfunded, deficit must be funded immediately with respect to members electing to convert accrued benefits into DC accounts. |
| Must file actuarial report and amendment with provincial and federal pension authorities that outlines the impact of the conversion on the funded status of the plan and future contribution requirements. |
| Must provide notices (as per provincial regulations) to affected members prior to effective date of the conversion. |

8. Continued

Conversion is subject to approval by provincial and federal pension authorities.

Option 3 - Accrued benefits guaranteed through annuity purchase -- assumes future service is DC, thus the past service accrued benefits are known (except for future earnings, ret dates etc)

XYZ may decide to do this if want to completely eliminate DB coverage

- but may still be responsible for paying the annuities if the insurer is unable to do so.

Benefits must be substantially the same benefits as were provided under the terms of the plans, including ancillary benefits.

If current benefits are based on final average earnings, annuity purchase must reflect a reasonable assumption for salary increases. Reasonable termination rates in recognition that not all members will reach NRA can be used. Flat benefit and career average benefits much easier to handle for this option.

Because only an estimate is being insured, members must be allowed to choose between annuity purchase or lump sum conversion to DC account balance.

No longer require regular actuarial reports.

Since Plan is significantly underfunded, deficit must be funded immediately with respect to these benefits

9. Learning Objectives:

3. The candidate will be able to evaluate risks faced by sponsors of retirement plans.
6. The candidate will be able to recommend and advise on the financial effects of funding policy and accounting in line with the sponsors' goals, given constraints.

Learning Outcomes:

- (3a) Identify how plan features, temporary or permanent, can adversely affect the plan sponsor. For example – an early retirement window offering or a lump sum payment option.
- (3e) Compare the economic value of different plan designs for different stakeholders.
- (6d) Advise plan sponsors on accounting costs and disclosures for their retirement plans. This would include restrictions imposed by applicable accounting authorities (FASB, CICA, IASC, FRS17).

Sources:

IAS 19 Employee Benefits (2011)

Commentary on Question:

Part (b) and part (c) - Under IAS19R P&L expense is current service cost plus Net Interest Cost plus impacts from amendments/curtailments/settlements. Net Interest Cost is the funded status multiplied by the discount rate. It does not include CSC interest for the year; so CSC should include the interest and should not be calculated as a beginning of year CSC. Points were awarded if candidates split out the Net Interest Cost calculation into Interest on Liabilities and EROA similar to old accounting standards and using DR instead of EROA on the asset side.

The case study did opt to split out the Interest on Liabilities and EROA components separately but when some candidates did the calculation, the Interest on Liabilities included the interest for CSC. Points were awarded for CSC interest being included on the CSC, the Interest on Liabilities, or Net Interest Cost.

Solution:

- (a) Compare and contrast the arrangements from the perspectives of both NOC and the executive.

Option 1 Executive

receives the cash compensation with no vesting rules
will be taxed at the current income tax bracket which is higher than ret
compensation is not deferred so may not be able to save for retirement
may not achieve target bonus if objectives not met (i.e. income is at risk)

Option 1 Employer

may have strain on cash-flows
cannot be used to retain executive as no vesting rules (i.e. no golden handcuffs)
may be used to motivate executive as compensation tied to future health of the
company

9. Continued

Option 2 Executive

will be taxed at the current income tax bracket (income immediately taxed)
may decrease in values as share prices may be lower at redemption than at time of grant (price volatility of shares)
overall compensation may be less than Option 1 if not performing well, target bonus less and lower share values

Option 2 Employer

can be used to motivate executive as compensation is tied to company shares
can impose restrictions on the shares (e.g. vesting rules) to retain the executive

Option 3 Executive

receive the lump sum at retirement at lower tax bracket
benefits are not secured and are only paid at retirement
receives a reduced salary but higher amount at the end of the 3rd period
no termination or death benefits as lump sum are only paid at retirement (i.e. no ancillaries)

Option 3 Employer

golden handcuffs as no Lump sum until retirement
significant cash outlays at end of third year
will need to record an expense and have accounting implications
not performance linked as lump sum will be paid at retirement regardless of performance

- (b) Calculate the 2014 pension expense and impact on Other Comprehensive Income (OCI). Show all work.

Expense = CSC + net interest cost + remeasurement
DBO at 1/1/2014 = 0 since new member as at 1/1/2014
DBO at 1/1/2015 at time 0 = Present Value of \$2,500,000 at time 0
= $\$2,500,000 / (1.03)^3 \times 1 \text{ year of service} / \text{total of 3 years of service}$
= 762,618
CSC with interest = (DBO at 1/1/2015 - DBO at 1/1/2014) x 1.03
= $(\$762,618 - 0) \times 1.03$
= 785,497

Net Interest Cost = Interest on net defined benefit liability (asset)
no asset and no benefit payments; no asset ceiling
Interest Cost = $0.03 \times 0 = \$0$

2014 P&L expense = CSC with interest + net interest cost
= $\$785,497 + 0$
= 785,497

9. Continued

Remeasurement = g/l on PBO and g/l on assets

OCI can only be determined at end of year since the discount rate and the actual assets (if any) will be known. Then calculate if there are gains and losses on DBO and on assets.

Assume the interest rate remains at 3% at end of year; then no gains and losses on DBO; thus OCI = 0

If interest rate differs from 3%, then there will be a g/l on DBO; the full amount of g/l will be recognized in OCI

Total 2014 expense = P&L + OCI = 785,497

- (c) Calculate the 2015 pension expense and impact on Other Comprehensive Income (OCI). Show all work

Expected DBO at 1/1/2015 using 3% = $\$2,500,000 / (1.03)^2 \times 1/3 = 785,497$

Expected DBO at 1/1/2015 using 4% = $\$2,500,000 / (1.04)^2 \times 1/3 = 770,464$

Gain from change in discount rate = remeasurement = OCI impact
= $(785,497 - 770,464) = \text{Gain } \$15,033$

Actual DBO at 1/1/2015 after plan amendment
= $(25\% \times \$2,500,000 / 1.04^2 + 75\% \times \$2,500,000 / 1.04^3) \times 1/3 = 748,239$

Gain from plan change = amendment = P&L impact
= $(770,464 - 748,239) = \text{Gain } \$22,225$

DBO at 1/1/2016 (2 years of service)
= $(25\% \times \$2,500,000 / 1.04^2 + 75\% \times \$2,500,000 / 1.04^3) \times 2/3 = 1,496,477$

CSC with interest = (DBO at 1/1/2016 - DBO at 1/1/2015) x 1.04
= $(1,496,477 - 748,239) \times 1.04 = 778,168$

Net Interest Cost = Interest on net defined benefit liability (asset)
no asset and no benefit payments
Net Interest Cost = $0.04 \times (748,239 - 0) = 29,930$

2015 P&L expense = CSC with interest + net interest cost +
amend/curtail/settlement
= $\$778,168 + \$29,930 + (\$22,225) = 785,873$

9. Continued

Total 2015 expense
= 2015 P&L expense + OCI
= \$785,873 - \$15,033 = \$770,840

10. Learning Objectives:

1. The candidate will be able to analyze different types of registered/qualified retirement plans and retiree health plans.
3. Candidate will be able to analyze the risks faced by retirees and the participants of retirement plans and retiree health plans.
5. The candidate will be able to evaluate sponsor's goals for the retirement plan, evaluate alternative plan types and features, and recommend a plan design appropriate for the sponsor's goals.

Learning Outcomes:

Describe the structure of the following plans:

- (a) Traditional defined benefit plans
- (b) Hybrid plans
- (c) Defined contribution plans
- (d) Retiree Health plans

Given a plan type, explain the relevance, risks and range of plan features including the following:

- (e) Plan eligibility requirements
- (f) Benefit eligibility requirements, accrual, vesting
- (g) Benefit/contribution formula, including the methods of integration with government-provided benefits
- (h) Payment options and associated adjustments to the amount of benefit
- (i) Ancillary benefits
- (j) Benefit subsidies and their value, vest or non-vested
- (k) Participant investment options
- (l) Required and optional employee contributions
- (m) Phased retirement and DROP plans

- (3a) Identify risks face by retirees and the elderly.
- (3b) Describe and contrast the risks face by participants of:
 - (i) Government sponsored retirement plans
 - (ii) Single employer sponsored retirement plans
 - (iii) Multiemployer retirement plans, and
 - (iv) Social insurance plans
- (3c) Evaluate benefit adequacy and measure replacement income for members of a particular plan given other sources of retirement income.
- (3d) Propose ways in which retirement plans and retiree health plans can manage the range of risks faced by plan participants and retirees.
- (5a) Describe ways to identify and prioritize the sponsor's goals related to the design of the retirement plan.

10. Continued

Sources:

R-C164-12: Accounting for Pension Buy-In Arrangements, PWCManging Post retirement risks

Solution:

- (a) Describe a pension buy-in arrangement.

Generally a single-premium contract arrangement between the pension plan and insurer, where an upfront payment is made by the pension plan to the insurer in exchange for the insurer making benefit payments to the plan.

The insurer will make payments to the plan however, the plan remains responsible for paying the benefits to the participants. Participants are not notified of the buy-in arrangement and cannot look to the insurer for payments directly.

It allows the employer to eliminate risks such as mortality and discount rate risk, however insurer credit risk remains. A pension buy-in is effectively an investment for the plan.

It may cover part of or all of the benefit obligations.

It does not trigger settlement accounting.

- (b) Explain the approaches to account for buy-in assets and the respective pension obligations.

There are 2 approaches to account for buy-in assets and 2 approaches for the obligations.

In general the assets and liabilities should move in tandem after the buy-in arrangement occurs.

Assets – first approach:

Fair value of the buy-in contract is measured at each plan measurement date.

Initial measurement is based on the purchase price of the contract.

In subsequent measurements, fair value would be estimated based on the contract exit price (i.e., the amount at which the contract could be sold to a willing third party buyer).

Factors to consider are similar to those used when initially pricing the contract.

10. Continued

Assets – second approach:

A stated cash surrender value.

It might include a fairly sizeable termination penalty for a buy-in contract, this may not be the best proxy for fair value.

Obligations – first approach:

Measured with traditional discount rate and mortality assumptions used by the employer.

We expect the value of the buy-in asset to exceed to pension obligation in this case because the discount rate would generally be higher to price the buy-in.

Obligations – second approach:

Set equal to the fair value of the buy-in contract at each measurement date using the discount rate used in pricing the buy-in contract .

11. Learning Objectives:

7. The candidate will be able to analyze/synthesize the factors that go into selection of actuarial assumptions.

Learning Outcomes:

- (7a) Evaluate appropriateness of current assumptions.
- (7b) Describe and explain the different perspectives on the selection of assumptions.
- (7c) Describe and apply the techniques used in the development of economic assumptions.
- (7d) Recommend appropriate assumptions for a particular type of valuation and defend the selection.

Sources:

Modeling long term healthcare cost trends

Fundamentals of Retiree Group Benefits, Yamamoto, 2006, Chapter 9

SOA Long Term Healthcare Trends Resource Model

CIA Standards of Practice for Post-Employment Benefit Plans

Commentary on Question:

Some candidates listed elements that affect the claims cost assumption rather than the trend rate assumption. For example, participant age is not a major factor in setting trend, but is rather reflected in the claims cost assumption.

Solution:

- (a) Describe the steps in setting a retiree medical trend rate.

Step 1: set underlying assumptions

- Rate of inflation - medical trend should never be lower than inflation and is the basic building block for the assumption.
- Multiplier for health spending - health spending can run higher than general inflation
- Technology - additional increase in costs due to advances in medical technology
- Past experience can provide some guidance for the above assumptions
- Net trend may be higher than gross trend before deductibles and cost sharing

11. Continued

Step 2: understand underlying limitations

Health care's share of GDP - health care trend cannot continue at a high pace otherwise the entire economy would exist solely of medical care, which is not rational.

Step 3: adjust for current plan design and known future changes

The assumption should reflect the trend of the services and design in the underlying plan; for example, trend for prescription drugs has historically been high

- (b) Critique the retiree medical trend rate for NOC's Retiree Medical Plan.
- Is higher than inflation - this is reasonable
 - Seems to be internally consistent with other assumptions such as discount rate
 - Actual trend has been higher than initial trend - ranging from 7% to 11%
 - Therefore, initial trend should be higher unless there is a really good reason for the difference
 - Years to ultimate seems short - however, since the initial trend is low, this explains why
 - Ultimate trend appears to be reasonable - at 5% with a 3% inflation, future medical GDP will still be reasonable over the valuation period