RET DAC Model Solutions
Fall 2014

1. **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.

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:

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

(3a) Identify risks face by retirees and the elderly.

1. Continued

(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.

(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

(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.

(4e) In a given context, assess the effect that changes in the plan design might have on collective bargaining agreements.

(4f) Assess the impact of possible changes in plan design due to changes in legislation.

(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.

1. Continued

Sources:
DA-126-13 Constructing New Retirement Systems: Choosing Between Insurance and Investment, Choice and Default

DA-136-13 Selection of Actuarial Assumptions

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

DA-115-13 Private Pensions Alternative Appoaches Could Address Retirement Risks Faced by Workers but Pose Trade-offs

Solution:

(a) Describe anti-selection and how it may affect the cost implications of NOC's decision.

Anti-selection occurs when people elect their option based on their own individual understanding of their risk. For this benefit election, people who anticipate their health costs will be lower than $200,000 (including their 10% contributions) will elect option 1, and sicker people who anticipate their health costs will be higher than $200,000 will election option 2. While options 1 and 2 may be cost neutral to NOC based on the average participant, since all participants will elect what is best for them, the total cost to NOC will likely be higher than it currently is.

(b) If NOC makes this offer to participants,

(i) Describe how the assumptions used to determine the Benefit Obligation and Service Cost would be affected, and

(ii) Propose reasonable changes to each assumption.

(i) **Current retirement assumption** is age 62 with 10 years of service. If health care coverage for active employees is more than 90% covered by NOC, some employees may now opt to work longer to avoid having to pay 10% premium for health coverage. Some employees may retire earlier (at 55), take the $200,000 lump sum, and seek employment elsewhere to try to get other retiree medical coverage

1. Continued

Discount rate is dependent on expected cash flows from the program and how they match with high quality bonds. The duration of the plan is expected to decrease due to some participants electing to take an immediate lump sum; a lower duration will lead to a lower discount rate.
Turnover assumption is based on NOC experience from 86-88. Possibilty of $200,000 lump sum may lead to lower turnover in ages immediately preceding 55/10 eligibility. Turnover could increase as active participants look to find other job which provides full retiree medical benefits with $0 retiree premium.
Mortality assumption is 83 GAM for all participants, an outdated table which should be updated to reflect more recent mortality studies and trends. A less healthy population may be more inclined to choose Option 2 and stay in plan, meaning actual mortality experience of plan could be higher than NOC's past experience.
Per capita claims cost may need to be adjusted due to change in covered population. If less healthy population more inclined to stay in plan, actual per capita costs will likely increase, leading to higher PBO and SC. Could also see differences in per capita costs of participants who opted to stay in plan versus older participants who were already in plan and didn't have a choice to opt out.

(ii) **Current retirement assumption** should be updated to reflect possible retirements starting at age 55 and trending up to at least 65 (normal pension retirement age) since retiring at earlier ages increases number of years benefits are paid and directly releated to total employer liability. NOC should look at recent retirement experience for salaried and union employees to determine what is expected behavior
Discount rate should be updated based matching on new expected benefit payments with high quality bond yields. The new payments are based on updated assumptions and incorporating the assumption that some participants will elect to receive the immediate lump sum.
Turnover assumption needs to be updated based on more recent NOC experience than what happened over 20 years ago. They should use select and ultimate table varying turnover rates based on service at NOC.
NOC may consider using different **mortality assumptions** for its current versus future retirees in the plan to reflect the anti-selection of future retirees, and it should apply some type of mortality improvement projection to its base assumption.
Per capita claims should likely vary based on age since there are no caps and older people tend to have higher medical expenses than younger. May want to consider developing different expected claims for retirees who did not have option to opt out, versus all new retirees who opt in (and are expected to have higher costs).

1. Continued

(c) Describe the risks of these two options from the perspectives of both NOC and the retirees.

Option 1 Risks for NOC: Liquidity risk: NOC must have enough liquid assets to be able to pay out $200,000 lump sum benefits
Accounting risk: large numbers of lump sum payments could trigger settlement accounting

Option1 Risks for Retirees: Longevity risk: Retirees run risk of outliving their resources and then not being able to afford medical care
Investment risk: retirees in charge of investing lump sum to make it last

Option 2 Risks for NOC: Longevity risk: benefits still guaranteed for the lifetime of the participants who elect coverage
Inflation risk: Healthcare costs assumed to increase over time, probably at higher rate than general inflation and NOC will have to continue to pay for coverage

Option 2 Risks for Retirees: Inflation risk: retirees still have to pay 10% of medical benefits, and due to inflation, these costs will likely continually go up, possibly more than regular inflation
Plan sponsor risk: If NOC goes bankrupt or changes the plan to increase cost sharing participants may have gotten more benefit by taking option 1.

2. Learning Objectives:

2. The candidate will understand the impact of the regulatory environment on plan design.

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.

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:

(2e) Understand conflicts between regulation and design objectives and recommend alternatives.

(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.

(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

(5c) Assess the feasibility of achieving the sponsor's goals for their retirement plan.

Sources:

DA-113-13: Multi- Employer Plans

CIA Ed Note: Financial Risks Inherent in Multi-Employer Pension Plans and Target Benefit Pension Plans

DA-124-13: Funding Risks for Multi-Employer Pension Plans

2. Continued

Commentary on Question:
The candidate will be able to analyze the risks faced by retirees and the participants of a multiemployer retirement plan. The candidate will also be able to analyze the risks faced by companies participating in a multiemployer retirement plan.

Given a context, the candidate is expected to design retirement programs that manage retirement risk and are consistent with sponsor objectives.

The candidate will be able to evaluate the sponsor's financial goals and risk management with respect to their plan.

Solution:

(a) Describe the advantages and disadvantages of allowing XYZ to participate in the ABC Pension Plan from the perspectives of:

(i) ABC Pension Plan active and inactive plan participants

(ii) XYZ active employees

(iii) XYZ

ABC Current Plan Members Advantages
1. Portability of benefits if members change employment to XYZ.
2. XYZ has younger group so may subsidize ABC Plan - lowers overall average age of plan means lower per
capita cost requirements.
3. ABC Plan's membership size becomes larger - larger plan means more economies of scale.
Larger contribution base will lower per capita funding cost of any unfunded liability of the ABC Plan
(i.e., if leveraged).

ABC Current Plan Members Disadvantages
1. Granting past service benefits could weaken the funding position of ABC Pension Plan.
2. Lowers the funding percentage of ABC Plan unless a lump sum is paid to pay the additional liability from the
past service benefits.
3. Increases the funding cost requirements of ABC Plan unless certain provisions are made to make XYZ pay
for the additional cost.

2. Continued

XYZ Active Employees Advantages
1. Portability of benefits if changes employment to any employer participating in the ABC Pension Plan.
2. Able to get pension benefits (better retirement security).
3. Able to get past service benefits
4. ABC Plan's Board is composed of half management and half labor representatives. Since ABC Plan's Board has the responsibility of defining plan provisions and setting the benefit levels, XYZ does not have the unilateral ability to change the plan provisions.

XYZ Active Employees Disadvantages
1. XYZ's contributions to the Pension Plan may put pressure on wages and other benefits (i.e., may get relatively lower future wage increases or other benefits since some of that may have to be allocated to the Pension Plan).
2. If there is a reduction in hours among active employees, plan costs may increase.

XYZ Advantages
1. Having a Pension Plan can be used to attract and retain workers.
2. Pooling of assets and administration provides economies of scale. Permits the implementation of more sophisticated approaches to both administration and investment at more reasonable costs than it would have been if XYZ sponsored its own Pension Plan.
3. By joining ABC Pension Plan, XYZ does not have to worry about the administration of the plan and other fiduciary responsibilities.
4. Contributions to the Plan are tax deductible

XYZ Disadvantages
1. Contribution requirements to the ABC Pension Plan are additional cost to the Company.
2. Contribution requirements are set by collective bargaining agreements (CBA). Although they are set for the duration of the agreement, contribution requirements could increase in future CBAs depending on different factors.
3. If cost gets too high, XYZ could be at a competitive disadvantage to other companies in the Oil Industry.
If other employers withdraw from the plan or active membership decline, contribution requirements could increase especially if ABC Plan has an unfunded liability (i.e., leveraged).

2. Continued

4. If XYZ wants to withdraw from the Plan, they may not be able to easily do so if withdrawal liability is too high.
XYZ does not have the ability to change the benefits to suit its own workforce management objectives.

(b) Describe plan design alternatives that may be used to reduce the costs involved in providing benefit accruals for service prior to January 1, 2015.

Provide lower accrual rate for the past service accruals.
Make the vesting of past service accruals depend on service earned on or after XYZ Oil Company's participation.
Provide the granting of past service on a "one-for-one" basis, whereby one year of past service is credited as each year of contributory service (or participation) is earned by the employee.
Allow the forfeiture of past service benefits if XYZ subsequently withdraws from the Plan.
Provide lower accrual rate for future service accruals up to a certain period for which XYZ's contributions to the plan have "paid for" the past service benefits.
Provide a cap on the amount of past service benefits that can be earned (or number of years of past service that can be earned).

3. Learning Objectives:

6. The candidate will be able to analyze, synthesize and evaluate plans designed for executives or the highly paid.

Learning Outcomes:

(6a) Given a specific context, synthesize, evaluate and apply principles and features of executive deferred compensation retirement plans.

(6b) Given a specific context, apply principles and features of supplemental retirement plans.

(6c) Integrate a plan for executives with the basic benefit plan.

Sources:

DA-144-13: Accounting for Pension Buy-In Arrangements

DA-143-13: Comp of IAS19, Rev. 2011 with FASB ASC 715 Summary of Provisions affecting Accounting for Postretirement

DA-804-13: FASB Accounting Standards Codification Top 715

DA-612-13: CICA Handbook 3461

DA-611-13: Introduction (A58), IFRS1, paragraphs 1-40, Appendix A, Appendix D, D10 and D11 only, IAS19, IFRIC14

Commentary on Question:

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

Successful candidates recognized that a re-measurement is not needed for a buy-in.

Solution:

(a) Describe the risks of an annuity buy-in and an annuity buy-out from the perspectives of the plan members and the plan sponsor.

3. Continued

Buy-in	
Plan Sponsor: • The plan sponsor is subject to credit risk of insurer • The plan sponsor may want to get out, so could be subject to termination penalty • There could be liquidity issues for buy in amount (unless transferring assets in kind, subject to whether insurance company will accept) • Fiduciary risks	**Plan Members:** • Plan sponsor could use the money from buy-in for other purposes under the plan • There is a risk it could become an annuity buy-out
Buy-out	
Plan Sponsor: • Expensive pricing, risk of overpaying for liability • Risk that retiree will think this signals negative things to come • Settlement accounting (could be large impact if there are large losses) • There could be liquidity issues for buy-out amount • The plan sponsor have no longer control over money as transferred out • It could have negative impact on post buy- out funded status • Fiduciary risks	**Plan Members:** • Retirees covered in buy-out are subject to credit risk of insurer • Retirees covered in buy-out are no longer protected by PBGC • Post buy-out funded status can trigger benefit restrictions for remaining members

(b) Calculate the estimated 2014 Net Periodic Benefit Cost under the following scenarios:

(i) Annuity buy-in for all current retirees as at July 1, 2014.

(ii) Annuity buy-out for all current retirees as at July 1, 2014.

Show all work.

(i)

January 1, 2014 – June 30, 2014 Net interest cost on DB asset (liability)

Net DB asset (liability) Jan 1	(2,000,000)	
Service cost	(956,938)	= 2,000,000 / 1.045 /2
Contributions (mid year)	750,000	= 3,000,000 / 4
DB asset (liability) - average balance for the year	(2,206,938)	
Net interest cost on DB asset (liability)	(49,656) = (2,206,938) x 4.5% / 2	

3. Continued

January 1, 2014 – June 30, 2014 Profit and Loss

Service cost	(956,938)
Net interest cost on DB asset (liability)	(49,656)
Profit and (Loss)	(1,006,594)

July 1, 2014 Asset

Fair value of plan assets - Jan 1, 2014	10,000,000	
Contributions	1,500,000	= 3,000,000 / 2
Benefit Payments	(600,000)	= 50,000 x 6 + 50,000 x 6
Interest	235,125	= (10,000,000+1,500,000/2-600,000/2)x4.5%/2
Fair value of plan assets - Dec 31, 2014	11,135,125	

July 1, 2014 DBO

DBO at January 1, 2014	(12,000,000)	
2014 Service Cost – beg of year	(956,938)	
Benefit Payments	600,000	= 50,000 x 6 + 50,000 x 6
Interest	(284,781)	= (12,000,000 + 956,938 - 600,000/2) x4.5%/2
DBO at January 1, 2014 (4.5%)	12,641,719	

July 1, 2014 Retiree DBO

Retiree DBO at January 1, 2014	(4,000,000)	
Benefit Payments	300,000	= 50,000 x 6
Interest	(86,625)	= (4,000,000 - 300,000/2) x4.5%/2
DBO at January 1, 2014 (4.5%)	(3,786,625)	
Buy-In Premium	5,000,000	
Buy-In Loss	(1,213,375)	

July 1, 2014	**Pre Buy-in**	**Buy-in**	**Post Buy-in**
Liabilities	(12,641,719)	(1,213,375)	(13,855,094)
Assets	11,135,125	1,213,375	12,348,500
Funded Status	(1,506,594)	0	(1,506,594)

- No settlement on buy-in, obligation not transferred, it's a contract with an insurance company where the insurance company reimbursed the future benefit payments to the plan in return for a single premium
- asset value for buy-in liability = $5 million so no "change" in assets
- liability value for retiree increases by loss above = retiree obligation now $5 million

3. Continued

July 1, 2014 – December 31, 2014 Net interest cost on DB asset (liability)

Net DB asset (liability) Jan 1	(1,506,594)	
Service cost	(977,995)	= 2,000,000 / (1 + 0.045/2) / 2
Contributions (mid year)	750,000	= 3,000,000 / 4
DB asset (liability) - average balance for the year	(1,734,589)	
Net interest cost on DB asset (liability)	(39,028)	= 1,734,589 x 4.5% / 2

July 1, 2014 – December 31, 2014 Profit and Loss

Service cost	(977,995)
Net interest cost on DB asset (liability)	(39,028)
Profit and (Loss)	(1,017,023)

2014 Profit and Loss

January 1, 2014 – June 30, 2014 Profit and Loss	(1,006,594)	
July 1, 2014 – December 31, 2014 Profit and Loss	(1,017,023)	
Settlement Profit and Loss	0	<--No Settlement for Buy-In
Profit and (Loss)	**2,023,617**	

(ii) Buy-out

January 1, 2014 – June 30, 2014 Net interest cost on DB asset (liability)

Net DB asset (liability) Jan 1	(2,000,000)	
Service cost	(956,938)	= 2,000,000 / 1.045 /2
Contributions (mid year)	750,000	= 3,000,000 / 4
DB asset (liability) - average balance for the year	(2,206,938)	
Net interest cost on DB asset (liability)	(49,656) = (2,206,938) x 4.5% / 2	

January 1, 2014 – June 30, 2014 Profit and Loss

Service cost	(956,938)
Net interest cost on DB asset (liability)	(49,656)
Profit and (Loss)	(1,006,594)

July 1, 2014 Asset

Fair value of plan assets - Jan 1, 2014	10,000,000	
Contributions	1,500,000	= 3,000,000 / 2
Benefit Payments	(600,000)	= 50,000 x 6 + 50,000 x 6
Interest	235,125	= (10,000,000+1,500,000/2-600,000/2)x4.5%/2
Fair value of plan assets - Dec 31, 2014	11,135,125	

3. Continued

July 1, 2014 DBO

DBO at January 1, 2014	(12,000,000)	
2014 Service Cost – beg of year	(956,938)	
Benefit Payments	600,000	= 50,000 x 6 + 50,000 x 6
Interest	(284,781)	= (12,000,000 + 956,938 - 600,000/2) x4.5%/2
DBO at January 1, 2014 (4.5%)	12,641,719	

July 1, 2014 Retiree DBO

Retiree DBO at January 1, 2014	(4,000,000)
Benefit Payments	300,000 = 50,000 x 6
Interest	(86,625) = (4,000,000 - 300,000/2) x4.5%/2
DBO at January 1, 2014 (4.5%)	(3,786,625)

July 1, 2014	**Pre Buy-out**	**Buy-out**	**Post Buy-out**
Liabilities	(12,641,719)	3,786,625	(8,855,094)
Assets	11,135,125	(5,200,000)	5,935,125
Funded Status	(1,506,594)	(1,413,375)*	(2,919,969)

* Settlement Loss include profit and loss

July 1, 2014 – December 31, 2014 Net interest cost on DB asset (liability)

Net DB asset (liability) Jan 1	(2,919,969)	
Service cost	(977,995)	= 2,000,000 / (1 + 0.045/2) / 2
Contributions (mid year)	750,000	= 3,000,000 / 4
DB asset (liability) - average balance for the year	(3,147,964)	
Net interest cost on DB asset (liability)	(70,829)	= 3,147,964 x 4.5% / 2

July 1, 2014 – December 31, 2014 Profit and Loss

Service cost	(977,995)
Net interest cost on DB asset (liability)	(70,829)
Profit and (Loss)	(1,048,824)

2014 Profit and Loss

January 1, 2014 – June 30, 2014 Profit and Loss	(1,006,594)
July 1, 2014 – December 31, 2014 Profit and Loss	(1,048,824)
Settlement Profit and Loss	(1,413,375)
Profit and (Loss)	**3,468,793**

4. **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.

Learning Outcomes:

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

(5h) Evaluate the pros and cons from both a sponsor and employee perspective of introducing options that impact the labor force demographics.

(7b) Describe and explain the different perspectives on the selection of assumptions.

(7d) Recommend appropriate assumptions for a particular type of valuation and defend the selection.

Sources:

LO1-DA-100-13: Issues for Implementing Phased Retirement in Defined Benefit Plans

LO1-DA-128-13: Phased Retirement: Problems and Prospects

LO7-DA-136-13: 2009 Selection of Actuarial Assumptions, Consultant Resource Manual, SOA Version, Mercer

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

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

4. Continued

Solution:

(a) Describe three reasonable approaches for calculating final average earnings under a phased retirement program.

- Use actual pay during phased retirement in final average earnings
  - Final average earnings will likely be lower since less hours worked
  - All past service years will be impacted as well
- Annualize pay during phased retirement
  - Service is reduced during phased retirement, but using annualized pay during the phased retirement period assumes pay doesn't decrease during phased retirement and stays in-line with pay prior to phased retirement
- Use actual pay for the highest earning years during the participant's career instead of the final years of the participant's career
  - Likely means the years of earnings during phased retirement are not counted in the final average earnings

(b) Describe the legal, human resources, and financial issues of phased retirement.

Legal Issues

- Effective communication about phased retirement offer is very important
- Spousal consent is required upon commencement of benefit during phased retirement as well as commencement of benefit upon full retirement. Multiple spousal consents may be confusing. Sponsor needs to ensure the spouse understands the first consent is only for phased retirement

HR Issues

- Phased retirement allows a transition from full-time work to something less stressful
- Phased retirement allows the worker to make adjustments for age-related changes in stamina and ability. Allows the worker to feel like they are still useful and boosts morale
- Helps retain workers with specialized knowledge to mentor their sucessors
- Phased retirement is often conditional on the availability of a part-time job, thereby implying employer discretion in who is eligible
- Employees might be assigned to a different job when flexible hours in their current position are not available, which could lead to lost productivity and the need for more training of the phased retirees – not the employer's intent
- Employees participating in phased retirement may not be eligible for health care coverage due to minimal hours worked

4. Continued

Financial Issues

- Financial impact of phased retirement should be actuarially neutral to the employee
- The key to making it actuarially neutral is full reductions for early retirement distributions as well as full actuarial increases for working beyond normal retirement
- Phased retirement may not be actuarially neutral to the employer, particularly if item noted above is not followed

(c) Assess how accounting valuation assumptions may be impacted if a company were to implement a phased retirement program.

Investment Return

- The investment return assumption may be affected by phased retirement if the phased retirement program materially alters the plan's cash flows and the plan sponsor attempts to match the cash flows in their asset allocation

Discount Rate

- May affect discount rate if discount rate is based on the plan's cash flows and the cash flows are materially different after implementing phased retirement
- Discount rate is not affected if plan's cash flows are not used to determine the rate, ie if hypothetical cash flows or an index is used instead

Inflation

- No impact. Inflation is based on CPI, forecasts of inflation, and yields on government securities. None of these items are impacted by a phased retirement program

Compensation increase assumption

- Depending on the plan sponsor's definition of final average earnings during phased retirement, the compensation increase assumption for phased retirees may be impacted. Will the phased retirees receive pay increases and bonuses that they received as full-time employees? If not, the salary scale may be lower for phased retirees

Mortality

- It is possible mortality could decrease under a phased retirement program as less healthy employees may see a benefit to their health of working only part-time under a phased retirement program

4. Continued

Termination

- Since this assumption typically ends at early retirement, it is unlikely this assumption is affected by a phased retirement program that begins at early retirement age

Retirement

- Will need to review assumption after the phased retirement program is successfully implemented. Phased retirement will affect the retirement assumptions

Percent married and spousal age difference

- Unaffected by a phased retirement program

5. Learning Objectives:

6. The candidate will be able to analyze, synthesize and evaluate plans designed for executives or the highly paid

Learning Outcomes:

(6a) Given a specific context, synthesize, evaluate and apply principles and features of executive deferred compensation retirement plans.

(6b) Given a specific context, apply principles and features of supplemental retirement plans.

(6c) Integrate a plan for executives with the basic benefit plan.

Sources:

DA-141-13: An Introduction to Duration for Pension Actuaries

DA-143-13: Comp of IAS 19, Rev. 2011 with FASB ASC 715 Summary of Provisions Affecting Accounting for Postretirement

DA-804-13: FASB Accounting Standards Codification Topic 715

DA-142-13: ASOP 4, Measuring Pension Obligations and Determining Pension Plan Costs or Contributions

Commentary on Question:

The goal of the question is for the candidate to perform an accounting calculation and outline all of the appropriate disclosures from the relevant standards of practice, which includes:
Performing valuations for special purposes, including accounting valuations,
Advising plan sponsors on accounting costs and disclosures for their retirement plans, and
Apply the standards related to communications to plan sponsors and others with an interest in an actuary's results (i.e., participants, auditors, etc)."

Note that full points were given for candidates that adjusted results for $000's and those who did not adjust.

Solution:

(a) Calculate the funded status and the charge to Other Comprehensive Income at December 31, 2014. Show all work.

5. Continued

Estimate DBO

DBO at January 1, 2014 (5.00%)	1,265,686
Duration	16
DBO at January 1, 2014 (4.75%)	1,316,313 = 1,265,686 x (1 + 16 x (5%-4.75%))

Estimate Service Cost

2014 Service Cost (5.00%) – beg of year	59,302
Duration	16
2014 Service Cost (4.75%)– beg of year	61,674 = 59,302 x (1 + 16 x (5%-4.75%))

DBO Rollfoward

DBO at January 1, 2014 (4.75%)	1,316,313
2014 Service Cost (4.75%) – beg of year	61,674
Actual Benefit Payments	(40,000)
Interest	64,504 = (1,316,313 + 61,674 - 40,000/2) x 4.75%
DBO at January 1, 2015 (4.75%)	1,402,491

Expected Return on Assets

Fair value of plan assets - Jan 1, 2014	1,261,471	
Expected Contributions (Mid Year)	20,591	= 41,182 / 2
Expected Benefit Payments (Mid Year)	(18,000)	= 36,000 / 2
Sub Total	1,264,062	
Expected return on plan asset	63,203	=1,264,062 x 0.05

Asset Rollfoward

Fair value of plan assets - Jan 1, 2014	1,261,471
Contributions	41,182
Actual Benefit Payments	(40,000)
Expected return on plan asset	63,203
Actuarial gain (loss) on plan assets	(200,000)
Fair value of plan assets - Dec 31, 2014	1,125,856

Funded Status

DBO Dec 31, 2014	(1,402,491)
Fair value of plan assets - Dec 31, 2014	1,125,856
Funded Status - plan (deficit) surplus	**(276,635)**

2014 Interest cost on DBO

DBO Jan 1, 2014	1,265,686	
Service cost– beg of year	59,302	
Expected Benefit Payments (Mid Year)	(18,000)	= 36,000 / 2
DBO - average balance for the year	1,306,988	
Interest cost on DBO	65,349	= 1,306,988 x 0.050

5. Continued

Actuarial gain (loss) on DBO

DBO Jan 1, 2014	(1,265,686)
2014 Service cost	(59,302)
Interest cost on DBO	(65,349)
Actual Benefit Payments	40,000
Expected DBO	(1,350,337)
DBO Jan 1, 2015	(1,402,491)
Actuarial gain (loss) on DBO	(52,154)

Calculate 2014 OCI

Actuarial gain (loss) on DBO	(52,154)
Actuarial gain (loss) on plan assets	(200,000)
Total amount recognized in OCI for the year	**(252,154)**

(b) Calculate the estimated 2015 total defined benefit cost recognized in Profit and Loss and Other Comprehensive Income. Show all work.

Net DB asset (liability)

Funded Status - Dec 31, 2014	(276,635)	<-- calculated in (a)
Asset Ceiling Adjustment	0	
Net DB asset (liability) Dec 1, 2014	(276,635)	

Estimate Service Cost

2014 Service Cost (4.75%) – beg of year	61,674	<-- calculated in (a)
Salary Increase Rate	3.5%	<-- plan is currently open
2015 Service Cost (4.75%) – beg of year	63,833	= 61,674 x 1.035

2015 Net interest cost on DB asset (liability)

Net DB asset (liability) Jan 1	(276,635)		
Service cost	(63,833)		
Expected Contributions (mid year)	20,591		= 41,182 / 2
Expected Benefit Payments (mid year) – liabilities	20,000		= 40,000 / 2
Expected Benefit Payments (mid year) – assets		(20,000)	= 40,000 / 2
DB asset (liability) - average balance for the year		(319,877)	
Net interest cost on DB asset (liability)		(15,194)	= (326,719) x 4.75%

2015 Profit and Loss

Service cost	(63,833)
Net interest cost on DB asset (liability)	(15,194)
Profit and (Loss)	**(79,027)**

The estimated 2015 Other Comprehensive Income will be 0 as no gains and losses are assumed.

5. Continued

(c) Outline the non-financial items that should be included in your report to NOC.

Non-financial items that should be included in the report

- Include the calculation date and the report 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
- Describe the tests applied to determine the sufficiency and reliability of the membership data and plan asset data for purposes of the work
- Describe the market value of assets and a summary of the assets by major category
- Describe the pension plan's provisions
- Describe any commitment to provide benefits beyond the terms of the plan reflected in the valuation of pension obligations
- Describe the method used to value the pension plan's assets
- Describe the actuarial cost method
- Describe the assumptions used to determine the actuarial present value of projected benefits
- Report the funded status at the calculation date and the applicable service cost
- 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
- Disclose subsequent events of which the actuary is aware, whether or not the events are taken into account in the work , and, if there are no subsequent events of which the actuary is aware, include a statement to that effect
- 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
- Describe the method and period selected in connection with any amortizations
- If the valuation is an extrapolation of an earlier valuation, then describe the method and any assumptions for, and the period of, the extrapolation
- State whether or not the valuation conforms with the actuary's understanding of the financial reporting standards specified by the terms of an appropriate engagement

With respect to the assumptions, the actuary should report:

- That the preparers of the financial statements have selected the assumptions and the actuary expresses no opinion on them;

5. Continued

- That the preparers of the financial statements have selected the assumptions and they are, or are not, in accordance with accepted actuarial practice in Canada; or
- That the actuary has selected the assumptions and they are in accordance with accepted actuarial practice in Canada

6. **Learning Objectives:**

1. The candidate will be able to analyze different types of registered/qualified 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.

6. The candidate will be able to analyze, synthesize and evaluate plans designed for executives or the highly paid.

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

(4a) Identify how plan features, temporary or permanent, can adversely affect the plans sponsor.

(4b) Assess the risk from options offered, including:
Phased retirement
(i) Postponed retirement
(ii) Early Retirement
(iii) Option factors
(iv) Embedded options
(v) Portability options

(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.

6. Continued

(4e) In a given context, assess the effect that changes in the plan design might have on collective bargaining agreements.

(4f) Assess the impact of possible changes in plan design due to changes in legislation.

(6a) Given a specific context, synthesize, evaluate and apply principles and features of executive deferred compensation retirement plans.

(6b) Given a specific context, apply principles and features of supplemental retirement plans.

(6c) Integrate a plan for executives with the basic benefit plan.

Sources:
DA-126-13: "Constructing New Retirement Systems..."

Solution:
(a) Describe the risk-sharing features in the industry-wide career pay plans in the Netherlands.

Plans are collective funds covering entire industries/professions. Vast majority of employees participate. Plans operate independently of employers.

Indexation on the fixed career pay benefit is conditional based on fund performance.

- For example, no indexation if funded status <85%; partial indexation if funded status is between 85% and 105%; full indexation if funded status >105%.
- Indexation foregone in the past can be restored if superior funding levels achieved.

Post-retirement indexation is also conditional on fund performance; i.e., retiree COLAs could be reduced or suspended depending on funded level.

Contributions vary based on funding level. Below the target funding level, contributions are gradually increased. Above the target, contributions are reduced.

Benefit formula is based on career average pay.

6. Continued

(b) Describe the potential effect of implementing the risk-sharing features identified in part (a) in the NOC Full-Time Salaried Pension Plan (Salaried Plan).

Potential effects from NOC's perspective:

- Lower risk; more stable cost
- Some loss of control over plan design, funding, and operation
- Less contribution flexibility
- When funded status declines, automatic increase in NOC's contribution leads to greater business stress, potentially at a time when business as a whole is suffering
- Employee morale will improve when funding levels are higher / benefits increased through indexation
- Employee morale will suffer when funding levels are lower / benefit indexation reduced or eliminated; possible retention challenges

Potential effects from participants' perspective:

- More risk borne by employees and retirees
- Less predictable benefit stream; harder to plan for retirement
- Loss of preretirement inflation protection if formula moved to career average
- Increase in postretirement inflation protection due to addition of indexing
- Greater overall benefit security and sustainability (more likely that plan will not be frozen or terminated)
- Greater participant involvement in plan (if changes are made to governance structure)
- Could reduce intergenerational equity and increase intergenerational friction

Note that certain features that could potentially be added, such as employee contributions, would not be available under current Gevrey law.

(c) Describe employer considerations in providing employees with this choice.

Choice is more costly due to antiselection—an employee will generally select the plan that is more valuable to him/her, increasing NOC's overall cost.

Choice is more costly due to additional administration, compliance, and communication.

Choice can potentially aid attraction and retention, not only because participants generally prefer choice but also because a DC plan would be more appealing to some employees. Having a portion of the employee population in the DC plan, however, would reduce NOC's ability to manage its workforce.

6. Continued

NOC must make various decisions related to design and transition, including:

- When will the choice be offered?
- Will participants be given an opportunity to switch their choice?
- Will current DB participants be able to transfer DB benefit value to DC account?
- How will the DC formula be set?

Robust communication/education will be valuable in helping employees make a better decision.

NOC must decide how to structure the choice:

- What will be the default?
- Will one plan or the other be encouraged or discouraged?

While education, structured choices, and strong defaults help, employees do not always act in their best interest:

- Suboptimal decisions lead to reduced retirement income
- Potential source of litigation against NOC
- NOC will need to determine who pays the penalty when an employee makes a poor choice—NOC, the employee, or society.

The greater the DC plan utilization, the less cash contribution flexibility NOC has.

Curtailment and/or settlement accounting could be triggered if there is significant departure from the DB plan.

7. Learning Objectives:

4. The candidate will be able to evaluate plan design risks faced by sponsors of retirement plans and retiree health plans.

9. The candidate will be able to apply the standards of practice and guides to professional conduct.

Learning Outcomes:

(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

(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.

(4e) In a given context, assess the effect that changes in the plan design might have on collective bargaining agreements.

(4f) Assess the impact of possible changes in plan design due to changes in legislation.

(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.).

(9e) Explain and apply all of the applicable standards of practice related to valuing retirement obligations.

Sources:

CIA Standards of Practice: Pension Plans

Solution:

(a) Calculate the interest rates applicable at February 1, 2014 for a lump sum payment of the commuted value of a non-indexed pension from a registered pension plan determined in accordance with the Canadian Institute of Actuaries' Standards of Practice.

7. Continued

Month	CANSIM V122542 i_7	CANSIM V122544 i_L	CANSIM V122553 r_L
November 2013	1.46%	2.30%	0.34%
December 2013	1.55%	2.37%	0.38%
January 2014	1.70%	2.57%	0.54%
February 2014	1.53%	2.53%	0.52%

Show all work

The calculation should use the economic assumptions that depend on the reported rates for the applicable CANSIM series for the calendar month immediately preceding. In this case, the rates should be based on the applicable CANSIM series for January 2013. The CANSIM series are always reported as semi-annual rates.

$i_{1\text{-}10}=i_7+0.90\%$
Calculate annualized i_7= 1.70723%
$i_{1\text{-}10}=1.70723\%+0.90\% = 2.60723\%$
$i_{10}+=i_L+0.5*(i_L- i_7)+0.90\%$
round $i_{1\text{-}10}$= 2.60%

$i_{10}+=i_L+0.5*(i_L- i_7)+0.90\%$
Calculate annualized i_L= 2.58651%
$i_{10}+=2.58651\% + 0.5 * (2.58651\% – 1.70723\%) + 0.90\% = 3.92616\%$
round i_{10}+= 3.90%

(b) Assess whether each assumption listed above would be acceptable for determining the lump sum amounts under the Canadian Institute of Actuaries Standards of Practice assuming no pension legislation exists. Justify your response

Interest Rates should be:

- two interest rates, one applicable to the first 10 years after the valuation date and the second applicable to all years there
- based on prescribed CANSIM (bond) series
- using one month lag
- using prescribed formula

7. Continued

It would not be permissible to use GAM83. Mortality rates is prescribed and should be:

- the UP-94 Table
- Generational projection using mortality projection scale AA should be used

For the unisex assumption, the actuary would calculate commuted values that do not vary according to the sex of the plan member where the actuary is required to do so by applicable legislation or by the provisions of the plan or by the plan administrator if the administrator is so empowered by the provisions of the plan. In this case, the actuary would adopt a blended mortality approach by either developing a mortality table based on a combination of male and female mortality rates, or computing the commuted value as a weighted average of the commuted value based on male mortality rates and that based on female mortality rates. The relative proportions of males versus females would be appropriate for the particular plan.

There should be no pre-retirement mortality table. (i.e. In the case of a deferred pensioner, the commuted value should include the value of the death benefit that would have applied before commencement of the deferred pension.)

Optimal Age of member should be used. Age 62 would only be a correct assumption if that age maximizes the value of the pension for the member.

Actual age of spouse should be used if available. (i.e. If the plan provides a contingent benefit only to the person who is the plan member's spouse at the date of termination of membership, the actual age of the spouse, if any, should be used in the computation. If this information cannot be obtained, an appropriate proportion married and age difference between the plan member and spouse should be assumed)

80% married assumption would be appropriate if in the actuary's professional judgement the assumption is an appropriate assumption of there being an eligible spouse at the time of death.

The actuary may calculate a commuted value on methods and assumptions that differ from those prescribed in these standards only if:

- The resulting value is larger; and
- Such value is required by the plan terms or applicable legislation, or by a plan administrator who is empowered to specify the basis on which commuted values are to be determined.

8. **Learning Objectives:**

2. The candidate will understand the impact of the regulatory environment on plan design.

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.

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:

(2a) Explain and apply restrictions on plan design features to a proposed plan design.

(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.

(2e) Understand conflicts between regulation and design objectives and recommend alternatives.

(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.

(5g) Design retirement programs that promote employee behavior consistent with sponsor objectives.

8. Continued

(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.

(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.

(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.

8. Continued

(8h) Perform and interpret the results of projections for short and long range planning including the effect of proposed plan changes.

Sources:
Morneau Shepell Handbook of Canadian Pension and Benefit Plans, 15th Edition

Intricately Linked: Pensions and Corporate Financial Performance

DA-608-13: Funding Supplementary Pension Plans

Commentary on Question:
Successful candidates 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.
Successful candidates will be able to compare the, sometimes conflicting, interests of management, employees and shareholders.

Solution:
Discuss the advantages and disadvantages of each of these options from the perspectives of the following stakeholders:

(i) Active employees

(ii) Inactive members of both plans

(iii) Shareholders

(iv) XYZ

8. Continued

Option 1: Make large lump sum contribution to the qualified pension plan

Active employees	
Advantages: • The active employees may be happy with contribution to the underfunded plan because it improves benefit security of accrued benefits. • It reduces probability of involuntary plan termination or plan freeze of future accruals. • It reduces probability of benefit restrictions - restrictions on lump-sum payments or ceasing future benefit accruals.	**Disadvantages:** • Active employees may prefer a one-time cash bonus. • Active employees may prefer a salary increase.
Inactive members of both plans	
Advantages: • The inactive members may be happy with contribution to the underfunded plan because it improves benefit security and reduces probability of involuntary plan termination or benefit restrictions such as restrictions on lump sum payments.	**Disadvantages:** • The inactive members may prefer cost-of-living increases on accrued benefits and benefits currently in in-pay status.
Shareholders	
Advantages: • Large lump-sum contribution to the qualified plan could result in improved funded status, reduced future contribution levels and pension expense volatility; potentially increasing shareholder equity.	**Disadvantages:** • Shareholders might misconstrue contribution to the plan as an imprudent investment by the employer; it may result in a decline in shareholders' equity.

8. **Continued**

XYZ	
Advantages: • If contribution does not exceed the maximum deductible contribution limit recommended by the actuary, then the contribution to the plan may be tax effective because contributions to qualified plans are tax deductible. • Large lump-sum contribution to the qualified plan may improve funded status and reduce future contribution volatility. • HR strategy may be to use the qualified plan as a recruiting tool to attract and retain the cream of the crop; large contribution may improve funded status of the plan. • It could reduce PBGC variable rate premiums with large contribution to the plan due to the smaller underfunded liabilities. • Large contribution may improve funded status of plan, reduce volatility on balance sheet; improve credit rating and increase shareholders equity. • It reduces probability of benefit restrictions. • Reduce probability for accelerated funding requirements for "at-risk" plans.	**Disadvantages:** • The employer may have been able to earn a higher rate of return (net of taxes) if invested large contribution in company vs. in trust fund of pension plan, thereby increasing the value of the company and improving credit rating of the company. • The employer could use the extra cash to pay off creditors.

8. Continued

Option 2: Pay a one-time payroll bonus that would be immediately taxable to the employees

Active employees	
Advantages: • Beneficial to employees in the lower income tax bracket as the one-time lump-sum payment may rise standard-of-living (immediately). • May boost employees' morale and result in increased productivity.	**Disadvantages:** • May not be tax advantageous to active employees in the higher income tax bracket. • Some employees may prefer a salary increase rather than a one-time bonus.

Inactive members of both plans	
Advantages: • None	**Disadvantages:** • Inactive members may demand cost-of-living increases on accrued benefits and benefits currently in in-pay status. • Inactive members may prefer that the employer contribute to the qualified pension plan to improve benefit security.
Shareholders	
Advantages: • None	**Disadvantages:** • Payment of bonus maybe misconstrued by shareholders as an imprudent investment by the employer; may result in a decline in shareholders' equity.
XYZ	
Advantages: • The employer may see the one-time bonus disbursement as a reward to employees and a way to help boost morale and increase employees' productivity.	**Disadvantages:** • It may cost the employer more than expected because the employer may have to pay additional payroll taxes on the one-time bonus since it may be considered as additional compensation. • The employer could use the extra cash to pay off creditors.

8. **Continued**

Option 3: Fund the SERP arrangement

Active employees	
Advantages: • Active members entitled to benefits from this plan will be happy because funding the benefits with a contribution will ensure that the benefits promised will be paid when due.	**Disadvantages:** • Depending on funding vehicle used to fund the nonqualified pension plan, active employees might be subject to immediate taxation of their benefits because of the contributions. • Active employees not entitled to benefits from the nonqualified pension plan, may prefer that the employer make large contribution to the qualified pension plan to improve benefit security.
Inactive members of both plans	
Advantages: • Inactive members entitled to benefits from the nonqualified pension plan will be happy because funding the benefits with a contribution will ensure that the benefits promised will be paid when due.	**Disadvantages:** • Inactive members not entitled to a benefit from the nonqualified pension plan may prefer cost-of-living increases on accrued benefits and benefits currently in in-pay status payable from the qualified pension plan. • Inactive members not entitled to benefits from nonqualified pension plan may prefer that the employer contribute to the qualified pension plan instead to improve benefit security under the qualified pension plan.
Shareholders	
Advantages: • Current shareholders are paying for current benefits.	**Disadvantages:** • Funding nonqualified pension plan may be misconstrued by shareholders as an imprudent investment by the employer may result in a decline in shareholders' equity.

8. **Continued**

XYZ	
Advantages: • Large lump-sum contribution to the nonqualified pension plan could result in lower pension expense; reduce balance sheet volatility and improve shareholders equity. • Large lump-sum contribution to the nonqualified pension plan could improve perception of the value of the benefit and may result in improved morale and productivity.	**Disadvantages:** • It is less tax efficient than if employer were to contribute to the qualified pension plan instead; contribution is not immediately taxable unless benefits are paid immediately. • Depending on the tax status of the company, funding the nonqualified pension plan may not be tax efficient • The employer may have been able to earn a higher rate of return (net of taxes) if invested large contribution in company vs. in trust fund of pension plan, thereby increasing the value of the company and improving credit rating of the company. • The employer could use the extra cash to pay off creditors instead of funding nonqualified pension plan.

9. **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.

6. The candidate will be able to analyze, synthesize and evaluate plans designed for executives or the highly paid.

Learning Outcomes:

(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.

(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.

9. Continued

(6a) Given a specific context, synthesize, evaluate and apply principles and features of executive deferred compensation retirement plans.

(6b) Given a specific context, apply principles and features of supplemental retirement plans.

(6c) Integrate a plan for executives with the basic benefit plan.

Sources:
Creative Compensation Arrangements
Canadian Pensions & Retirement Income Planning, Ch 23

Commentary on Question:
Successful candidates were able to fully identify and provide justification on how the proposed plan qualified or did not qualify as a SDA.

Solution:
(a) Describe a salary deferral arrangement under the ITA.

A salary deferral arrangement ("SDA") is defined in the Income Tax Act to mean any arrangement under which a person has the right in a taxation year to receive an amount in a future year in lieu of salary or wages rendered in the year or a preceding year.

One of the main purposes is to postpone payment of taxes on such amount.

The deferred amount of salary and wages are treated as employment income, thus subject to tax, in the year the employee earns the amount arises rather than in the year that the amount is actually received or paid.

The burden is on employer to demonstrate that there is no intention to defer taxes.

There are a number of listed exemptions in the SDA definition. They include:

- pension plans
- 3 year bonus deferral plans
- Employees Profit Sharing Plans (EPSP)
- Deferred Profit Sharing Plans (DPSP)

(b) Assess whether your client's proposed SERP qualifies as a "pension plan" for salary deferral arrangement purposes.

9. Continued

Certain characteristics of the proposed plan conformed to the definition of an SDA while some did not.

The proposed plan meets the following criteria of an SDA:
The proposed plan provides for periodic payments commencing at termination or retirement.
The proposed plan does not provide for an unreasonably large benefit
The proposed plan does not offer cash out option prior to retirement or termination (i.e. no lump sum option)

The proposed plan does not meet the following criteria of an SDA:
There is no reasonable relationship to the member's compensation or service
The plan benefit is linked to performance. This is outside the pension plan mould. Therefore could be seen as being tied too closely to incentive compensation.
The benefit does not follow the uniform accrual pattern of a Registered Pension Plan.

Candidates should state whether or not the proposed plan met the definition of a SDA and provide justification consistent with the above observations.

10. **Learning Objectives:**

3. Candidate will understand how 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

(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.

(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

(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.

(4e) In a given context, assess the effect that changes in the plan design might have on collective bargaining agreements.

(4f) Assess the impact of possible changes in plan design due to changes in legislation.

Sources:

CIA Ed. Note: Financial Risks Inherent in MEPPs and TBPP

10. Continued

Commentary on Question:
Successful candidates described the risks and the ways in which the risks could be mitigated.

Solution:
(a) Describe a Target Benefit Pension Plan (TBPP).

The plan design and governance structure of the TBPP include:
1) known cost for participating employers (costs may differ between employers)
2) reasonable benefit expectations for plan members,
3) economies of scale (e.g.: expenses and investment fees),
4) administrative ease for participating employers,
5) benefit portability (assuming multiple participating employers), and
6) improved pension coverage, specifically in sectors of the economy that have identified gaps in coverage, such as small and medium-sized employers

The key element in the design of a TBPP is the establishment of the level of benefits for the given level of contributions.
The benefit level includes the amount and structure of the lifetime pension as well as any ancillary benefits (early retirement, post-retirement death benefits etc.)

The design of the plan can limit the ability of plan members and employers to manipulate the system by receiving more than their *a prior* expected value. One should focus on the core benefit. The following are examples of implications:
- pre-retirement indexation might be by reference to an external index, not actual earnings increases; and
- actuarial equivalent early & postponed retirement factors could be used

The main plan risks include investment, inflation, longevity, and expenses.

For governance, the plan administrator will be a board of trustees. The selection process would recognize that the board members act solely in the best interest of plan beneficiaries. The board should have policies to manage conflict of interest. The board should have or retain expertise in investment, governance, legal, actuarial, record-keeping etc. The expertise should align properly the plan's risk profile with the characteristics of the plan. Depending on the provisions of the trust, the board may seek to obtain input from all plan beneficiaries when considering design and risk issues.

The funding framework consists of contribution that may be a fixed amount per hour worked or a fixed percentage of earnings. Different participating employers may contribute at different rates.

10. Continued

The communicated benefit should be funded including appropriate margin, the target benefit should be funded with relative small margins. This is because we want to minimize the likelihood of the communicated benefit being reduced due to adverse plan experience. The rationale for a small margin in the funding of the real benefit is to minimize the a priori expectation of intergenerational transfers of wealth, where it is expected that experience gains not retained as a margin are primarily allocated to provide the real benefit.

(b) Describe the risks inherent in TBPPs.

(c) Describe ways in which the risks identified in part (b) could be mitigated.

1. Assets/Liability Mismatch Risk
Asset/liability mismatch risk is the risk that the assets and liabilities move in opposite directions with an adverse effect on the plan's financial position. (i.e., assets decrease when liabilities increase), or that they move in the same direction but to significantly different degrees. For purposes of assessing risk, the market value of assets is usually preferred.

How to mitigate assets/liability mismatch risk:

- reduce the equity allocation
- increase the duration of the fixed income assets (given the typical situation where the dollar duration of the plan's liabilities exceeds that of the plan's assets)
- apply other immunization-like tools such as duration matching, cash flow matching and annuitization of retired life liabilities.

2. Inflation Risk
The risk that the value of a plan's benefits in nominal terms will decline over time, even when inflation is very low.
Inflation risk can be measured by monitoring annual inflation rates, as well as cumulative inflation during periods between ad hoc increases.

How to mitigate inflation risk:
Using asset classes with reasonable inflation matching characteristics such as:
Real return bond
Real estate holdings
Infrastructure

10. Continued

Asset classes with reasonable inflation matching characteristics often come with other drawbacks:
Real return bond coupons by their design match inflation extremely well, but their market value can be volatile in the short term, which can limit their suitability. Also, the amount issued is modest and the market lacks the liquidity of nominal bonds. Because of this illiquidity, investments in real return bonds tend to be acquired on a "buy and hold" basis.
Real estate holdings have some inflation matching characteristics, but generally only when the supply and demand are in reasonable balance. Also, real estate is an illiquid asset that may not be appropriate for very mature plans that have negative cash flows (i.e., benefit payments exceed contributions).

Infrastructure has exhibited better inflation matching characteristics than real estate. However, it suffers from the same problem of illiquidity.

The plan's asset allocation would be considered directly in setting the actuarial assumptions for future rates of return.

3. Risk from the Difference between the Contribution Rate and the Cost of Accruals:
If the difference between the contribution rate and the normal actuarial cost is small, then the plan has only a limited ability to absorb experience losses. This is because only a small part of the contribution rate is available to fund any required past service contributions. This risk is particularly great for mature plans. This risk can be measured by looking at the present value of the portion of future expected contributions that is in excess of the cost of expected future accruals. This represents the maximum experience loss that can be absorbed by the plan. Expressing this excess present value as a percentage of the liabilities provides an indication of the relative risk of the plan. Expressing the sum of the surplus and the present value of the excess contributions as a percentage of the liabilities provides an indication of the cushion that exists to avoid the risk that the total contribution rate could become insufficient to support the benefits.

How to mitigate this risk:
This risk would first be considered by assessing the degree of asset/liability mismatch and the current level of "margin". The level of margin is the sum of the surplus and the present value of the excess of the expected contributions over the expected normal actuarial cost for a period of time (for example, the period permitted under legislation to eliminate a going-concern unfunded liability). If the margin is too small for the level of the asset/liability mismatch, the benefits may not continue to be supportable. Risk can, in this instance, be mitigated by means of effective disclosures in the actuarial report.

10. Continued

If the margin is more than sufficient, it suggests that the benefits can be improved (a decision of the board), but the advice that the actuary provides to the board would include the point at which the margin becomes too small.

4. Risk of a Decline in Hours Worked
Where a portion of the contribution is used to cover a deficit, a reduction in the hours worked leads to lower contributions to finance that deficit.

In addition, a reduction in hours worked, or hours of work available, may influence part of the workforce to retire earlier, leading to an experience loss when subsidized early retirement is offered. This risk may be measured by performing sensitivity and stress testing analyses.

How to mitigate this risk:
This risk can be mitigate by the use of margins such as including a margin in one or more of the actuarial assumptions (typically the discount rate), establishing a non-specific liability, or reserve, and specifying an acceptable range for the relationship between the contractual contribution rate and the best estimate normal actuarial cost or total actuarial cost.

5. Mortality/Longevity Risk
This risk manifests itself when the longevity improvements reflected in the liabilities are not sufficient for either or both plan members and their spouses. When liabilities are based on plan- specific mortality, members' longevity may improve more rapidly than the average population, increasing the risk that longevity improvements reflected in the valuation of the liabilities may not be sufficient. For joint and survivor pensions, spouses' longevity may be unrelated to plan members' mortality experience. This risk can be assessed, when plan size allows, by performing periodic experience studies (e.g., every five years). These experience studies would include analysis and comparison of the trend since the prior study in order to identify any accelerated or decreased trend.

How to mitigate this risk:
This risk can be mitigate by the use of margins such as including a margin in the mortality & longevity assumptions.

6. Retirement Risk
This risk emerges when plan members retire earlier than anticipated with a subsidized early retirement pension. When plan size allows, it is useful to measure this risk by performing periodic experience studies (e.g., every five years). While it is important to make appropriate provision for early retirement on an ongoing basis, it is particularly so to plan for the adverse retirement experience that may occur during times when the particular industry is struggling.

10. Continued

How to mitigate this risk:
This risk can be mitigate by the use of margins such as including a margin in retirement actuarial assumptions (typically the discount rate).

7. Risk of Intergenerational Transfers:
This is the risk that intergenerational equity is not violated, that benefits received from the plan is not reasonable based on the relative proportion of contributions made to the plan. The board of trustees would decide the extent to which inequities (expected on an a priori basis) are reasonable, particularly since many factors affecting the plan's finances are completely out of the board's control. In order to measure the risk of intergenerational inequity, current contributions can be split into the portion to fund the normal actuarial cost and the portion to fund any deficits (or reductions to take advantage of any surplus). The greater the amount by which current contributions differ from the normal actuarial cost, the greater is the wealth transfer among past generations, current generations, and future generations.

How to mitigate this risk:
This risk can be mitigate by the use of margins such as including a margin in one or more of the actuarial assumptions (typically the discount rate), establishing a non-specific liability, or reserve, and specifying an acceptable range for the relationship between the contractual contribution rate and the best estimate normal actuarial cost or total actuarial cost. This risk can also be mitigated by plan designs

8. Regulatory Risk:
Regulatory risk is the risk that legislation and/or regulations may change the funding rules or that the regulator may change a policy, increasing the potential that plan benefits may need to be reduced. Type I risks, representing legislative changes that might potentially be considered in the future, and Type II risks, representing legislative changes that are under current active consideration. For Type I risks, measurement is likely not possible, nor worth the cost, for any particular plan to "brainstorm". For Type II risks, the implication of alternative potential legislative changes can be measured in order to provide information to the trustees for future planning, and potentially for any advocacy/lobbying efforts in which they may choose to engage.

How to mitigate this risk:
Regulatory risk may be best mitigated by:

- following best practice for governance,
- monitoring the evolution of legislation and regulatory policies,
- maintaining a sufficient funding level (i.e., not putting members' benefits at risk), and

10. Continued

- proactively lobbying regulators and educating them on the issues unique to these types of plans.

9. Communications Risk:
The fundamental objective of communications is a clear and transparent understanding of the plan terms, benefits, obligations, financial position and the specifics of the "pension deal" and how it affects all parties to the program. The risk is that the communications are, in fact, unclear, opaque or misunderstood.

The risk can be measured in many ways:
Does a member booklet exist?
Is it distributed on a regular basis? Is it up to date?
Does the plan have a website? Is it up to date?
Do the trustees issue regular newsletters?
Are regular employee information session held?
Does the member booklet deal with the roles and responsibilities of all stakeholders, including the members?
Does it explain the governance structure?
Are the plan risks explained fully?
Does the booklet explain how future variations in experience will be treated?

How to mitigate this risk:
Communications risk can be managed by conducting a communications audit, identifying gaps and shortfalls, and developing a plan to address them. The trustees could go further by researching plan members' level of knowledge (survey, focus groups, etc.) to identify gaps and use the results to guide the development of future communications strategies.

11. Learning Objectives:

3. Candidate will understand how to analyze the risks faced by retirees and the participants of retirement plans and retiree health plans.

Learning Outcomes:

(3c) Evaluate benefit adequacy and measure replacement income for members of a particular plan given other sources of retirement income.

Sources:

Allen, 10th Edition, Chapter 1

Allen, 10th Edition, Chapter 2

Morneau Sobeco, Chapter 1

DA-123-13: Replacement Ratio Study – A Measurement Tool for Retirement Planning

Commentary on Question:

The goal of question was for candidates to analyze benefit adequacy. Successful candidates listed key points and accompanied each point with coherent explanation demonstrating understanding.

Solution:

A Canadian corporation implements a defined benefit pension plan that provides an unreduced benefit of 1% of final average salary per year of service payable at normal retirement age (65), indexed annually in line with the Consumer Price Index.

Assess the benefit adequacy of this plan given the availability of government programs.

Benefit adequacy is measured as the ratio of retirement income from all sources to earnings level just before retirement. The goal is to provide an adequate level of retirement income at normal retirement.

Replacement Ratio is used to measure of benefit adequacy and is calculated as the gross income after retirement, divided by gross income before retirement. The following are replacement ratio considerations:

- Usually less than 100% because retirement needs less than during working years
- Norm is usually 60% to 70% of pre-retirement income
- 30% to 40% of pre-retirement income from plan considered adequate for middle income, add public pensions and it takes it to 60%-70%.
- Total of 65%-70% may be low to maintain standard of living
- Public pensions may generate another 15%-20%
- Gross income after retirement is based pension, social security and personal savings

11. Continued

- Adequacy is relative and must be based on industry standard and competition
- Social security considerations:
  - CPP gets 25% and OAS 10%-15% / Social security may get 35%-40%
- Person savings considerations:
  - In order to achieve benefit adequacy, may have to consider personal savings

Service Analysis

- High earners will get 30% from plan with long service
- Low earners will also get 30% from plan with long service
- Those with lower service or older at inception will likely not generate a sufficient replacement ratio, but benefit adequacy measured for employees with full career retiring at their normal retirement age

Earnings Analysis

- Total Replacement Ratios required to maintain a person's pre-retirement standard of living are highest for lowest paid employees. Retirement income will need to be supplemented by social security and personal savings
- Before retirement lower paid save the least and pay the least in taxes
- At the lowest income levels, pre-retirement taxes are higher for singles than for married couples.
- Age- and work-related expenditures do not decrease by as much for the lower paid employees.
- After reaching an income level of $60,000, the required Replacement Ratios remain fairly constant at 77 percent – 78 percent.
- High earners may be restricted by tax limits, reducing their replacement ratio which would need to be supplemented by personal savings.
- Social Security replaces a larger portion of pre-retirement income at lower wage levels
- Since the pension is indexed, benefit adequacy is protected against inflation

12. Learning Objectives:

3. Candidate will understand how to analyze the risks faced by retirees and the participants of retirement plans and retiree health plans.

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:

(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.

(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.

(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.

(8h) Perform and interpret the results of projections for short and long range planning including the effect of proposed plan changes.

12. Continued

Sources:
DA-145-13: Acquiring a U.S. Operation—A Primer

DA-148-13: Mergers and Acquisitions: Due Diligence of Retirement Plans

DA-116-13: Pension Issues in Corporate Sales, Mergers and Acquisitions

RC 605-12 Asset Transfer Resulting from Sale of Business

Solution:

(a) Describe the objectives of the due diligence stage in the merger, as they pertain to the benefits and compensation programs only.

Gain a full understanding of the benefits and compensation programs and HR goals and structure.

Use this time to collect certain material pertaining to the benefit programs - registered and non-registered plans

- Plan documents (official plan texts, owner data, amendments, undocumented promises ,etc.)
- Administrative reports (actuarial valuation reports, trust statements, census data, etc.)
- Miscellaneous reports (funding reliefs/solvency moratoriums, litigation history, AIR/AIS/PBGF filings, etc.)

Review material collected above to identify and quantify potential pitfalls in areas such as:

- Non-compliance with CRA/FSCO and other local standards
- Hidden subsidies; Are spousal benefits subsidized? Are there special early retirement benefits with subsidies?
- Benefits and undocumented promises triggered upon the sale (e.g., benefits for executives under the non-registered plan)
- Financial health of the plans (registered and non-registered plans); Are the registered plans funded? Are non-registered plans funded or are benefits funded on a pay-as-you-go basis?
- When is COLA typically granted? How is it determined? Is it written in the official plan text? Who gets the COLA?

12. Continued

Due diligence also identifies post M&A activities, e.g., merging benefit programs, eligibility rules for certain benefit features, etc.
Example: currently XYZ offers ad hoc COLA to their retirees & beneficiaries in pay; if ABC does not offer COLA or ad hoc COLA to their retirees and beneficiaries in pay, they may have to consider granting COLA to their retirees and beneficiaries in pay or to no one post M&A.
Example: currently XYZ offers a disability benefit to members regardless if they are vested on the date of disability; if ABC does not offer a disabiliy benefit to their members, they may have to consider amending the provisions of their existing plan to provide for a disability benefit to current members in order to be fair to all employees; otherwise consider removing disability benefits for future members in the XYZ plan, post M&A.

Helps ABC to determine whether integration of benefit programs and HR goals of benefit programs will be a success post M&A.

(b) Describe the integration issues that ABC should consider as they pertain to the benefits and compensation programs only.

Employee issues

- Need to consider HR goals of both companies - benefit programs used to attract and retain the cream of the crop; encourage and reward employees to increase productivity; paternalistic view
- Need to reassure employees that they will not lose accrued benefits or future accruals will not be reduced

Employees of XYZ will be most concerned about:
(1) protection of accrued benefits
  - ABC to consider salary increases in determining the accrued pension liabilities at closing date; likewise XYZ want to consider clauses in the sale agreement that would allow ABC to windup the plan in the future and reap the 'windfall' of the salary projections consideration in the sale price.
  - ABC to consider ad hoc COLA to retirees and beneficiaries in determining the liabilities at closing date.
  - ABC to consider assumptions (prescribed Solvency assumptions) used to determine liabilities at close date.

(2) continuity of benefit accruals under new owner
  - XYZ want to consider clauses in sale agreement that will adversely change benefit formula, e.g., change from defined benefit to a less generous money purchase plan

12. Continued

(3) disposition of any pension surplus
- Ultimate goal of ABC post M&A is to be fair to employees from both companies
  - So ABC may want to do a comparative analysis of programs from both companies and decide on post M&A how to equalize benefits on all employees
  - For example, retirees and beneficiaries of ABC may want ad hoc COLA as well; ABC need to consider granting COLA to all EEs or eliminate COLA altogether. ABC need to consider providing for a disability benefit or eliminate for future Ees to the XYZ plan post M&A.

Assets, Liabilities and Surplus issues
- Because the M&A was effected through the acquisition of assets rather than shares, ABC/XYZ need to consider the following in drafting the purchase and sale agreement:
  - should the accrued benefits and liabilities continued to be administered through the trust account of XYZ?
  - should the accrued benefits under the pension plan sponsored by XYZ be wound up and assets distributed?
  - should assets and liabilities be transferred from XYZ to ABC?

Pricing issues
- ABC and XYZ need to review accounting policies; ABC needs to be comfortable with values, method and assumptions used to determine assets and liabilities at closing date.
- ABC may want to negotiate the purchase price to reflect any unfunded liabilities or pension surplus assumed in the acquisition.

Procedural issues
- Both companies should establish a clear and efficient process to follow
- All parties should meet early to allow ample time for discussion of all aspects of the acquisition as it pertains to the benefit programs
- ABC should review all agreements pertaining to the assets or liabilities - e.g., trust agreements; pension administration contracts, etc.
- XYZ may want to include a clause in the purchase and sale agreement that secures ABC's commitment to continued employment, benefits (qualified and non-qualified), and compensation to EEs from XYZ, including any ownerships of plan surplus.

13. 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.

4. The candidate will be able to evaluate plan design risks faced by sponsors 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:

(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

(3c) Evaluate benefit adequacy and measure replacement income for members of a particular plan given other sources of retirement income.

(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.

(5b) Assess the tradeoffs between different goals.

13. Continued

(5c) Assess the feasibility of achieving the sponsor's goals for their retirement plan.

(5f) Design retirement programs that manage retirement risk and are consistent with sponsor objectives.

(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.

(5m) Recommend an appropriate plan type and plan design features for providing retirement benefits and defend the recommendations.

Sources:
Morneau Sobeco Chapter 2

Morneau Sobeco Chapter 5

Morneau Sobeco Chapter 14

Canadian Pension Plan Design

Commentary on Question:
Credit given for comments related to:
- *providing disability benefit*
- *previous employer's service recognition*
- *additional long-service benefits*
- *setting up a cash balance plan*
- *enhancing portability*

Acceptable alternatives:
- *reducing early retirement benefits*
- *removing indexing*
- *removing joint and last survivor pension*
- *DROP or delayed retirement enhancements*
- *increasing flat pension benefit, subject to cost constraints*
- *cash balance design*
- *adding portability options*

13. Continued

Solution:
Recommend design changes to the NOC Full-Time Hourly Union Pension Plan that will help them achieve the above objectives while maintaining a defined benefit component.

Justify your response.

- Controlling costs means limited flexibility to improve benefits
- Younger employees will be more attracted to a DC type plan
- Experienced employees will tend to stay longer if plan based on final average earnings
- Provide immediate or faster vesting instead of 5 years of service
- Maintain retirement age and early retirement reductions
- If NOC plans to provide future ad hoc increases to the retirement benefit, make it guaranteed so employees know that staying longer will result in a higher pension
- This will have no impact on ultimate plan costs
- Provide a choice between DB and DC for new hires. The formula and terms can be similar to the part-time salaried plan.
- Ensure employer contributions to DC option are not too high so costs remain similar to DB normal cost.
- DC is good to control contribution requirements with no risk of unplanned increase
- DC has no unfunded liabilities
- DC has lower contributions overall relative to DB
- But investment risk is transferred to employees
- Another approach may be to add a flexible component to the plan where employees can purchase enhancements
- Allow this via additional voluntary contributions
- This may have to be negotiated with union in next contract
- Provide actuarially equivalent optional forms of pension for greater flexibility and no added cost.
- Life only option for non-married would improve with guarantee periods options
- These may increase costs slightly because of anti-selection
- Provide phased retirement option, where experienced workers can continue working part-time while collecting pension income and help in knowledge transfer
- Phased retirement option should be actuarially equivalent to value of accrued pension
- Provide delayed retirement option with actuarial increase. Again this has no impact on costs
- If changes cause an increase in costs, cost controls can be achieved with change to funding policy, funding method or asset valuation method
- Consider introducing employee contributions to pay for any cost increases as a result of enriched benefits