

RET DAC Model Solutions

Spring 2015

1. Learning Objectives:

3. Candidate will be able 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:

Replacement Ratio Study Aon A Measuring Tool for Retirement Planning

Commentary on Question:

Successful candidates understood the tax impact. Note that credit was given for using a discounting period of either 19 or 20 years.

Solution:

- (a) List four reasons an individual may need less gross income after retirement.
 - Income taxes go down after retirement (can also give credit here for mentioning that social security benefits are only partially taxed)
 - Social security taxes end at retirement
 - Saving for retirement is no longer needed
 - Work-related expenditures go away at retirement
- (b) Calculate the replacement ratio required to maintain the individual's pre-retirement standard of living.

Formula = Required replacement ratio = Required Gross Post-tax Retirement Income divided by Gross Pre-retirement Income

Pre-retirement gross income = $75,000 * 1.03^{20} = 135,458$

Pre-retirement taxes = $135,458 * 30\% = 40,637$

Expenditure change = 9,000

No savings, so this doesn't go away

1. Continued

Required post-retirement spendable income = $135,458 - 40,637 - 9000 = 85,821$

Required post-retirement gross income = $85,821/0.85 = 100,966$

Replacement ratio = $100,966 / 135,458 = 75\%$

- (c) Calculate the savings level, as a percent of pay, required to achieve a target replacement ratio of 70%.

Show all work.

Social Security is providing 40%. Therefore, need savings to provide 30% pay replacement.

Need a savings account balance equal to \$473,425 at retirement, which is derived from Age 65 salary * 30% * age 65 annuity factor ($135,458 * 30% * 11.65$)

Accumulated value of contributions must equal \$473,425 as shown below:

(X is the percent of pay necessary to meet replacement ration):

$$473,425 = (75,000 * x * 1.065^{20} + 75,000 * 1.03 * x * 1.065^{19} + 75,000 * 1.03^2 * x * 1.065^{18} + \dots + 75,000 * 1.03^{19} * x * 1.065)$$

The formula reduces algebraically to :

$$x = 473,425 / 75,000 / 1.065^{20} / \text{PV of } \$1 \text{ annuity at } 3.4\% \text{ interest}$$

$$3.4\% = [(1.03/1.065)^{-1}] - 1$$

$$x \sim 12\%$$

Note: It was possible to assume end of year salaries and savings deposits which would make the answer to 12.5%.

2. 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.

Learning Outcomes:

Describe the structure of the following plans:

- (a) Traditional defined benefit plans
- (b) Defined contribution and savings plans
- (c) Hybrid 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.
- (3b) Describe and contrast the risks face by participants of:
 - (i) Government sponsored retirement plans
 - (ii) Single employer sponsored retirement plans
 - (iii) Multiemployer retirement plans, and
 - (iv) Social insurance plans
- (4a) Identify how plan features, temporary or permanent, can adversely affect the plans sponsor.
- (4d) Analyze the issues related to plan provisions that cannot be removed.

Sources:

Hybrid Pensions: Risk Sharing Arrangements for Pension Plan Sponsors and Participants

2. Continued

Commentary on Question:

Successful candidates compared and contrasted the options rather than providing a list.

Solution:

- (a) Compare and contrast both plan design options from the perspective of the plan sponsor to traditional:

- final average defined benefit plan designs; and
- defined contribution plan designs.

Option 1 compared to final average defined benefit plan:

- Option 1 poses less funding volatility for employers as investment risk and longevity risk are both transferred to members in the form of employee contribution increases
- However, there are HR risk under Option 1 as member contribution increases during times of poor investment return and when life expectancies increase (i.e. intergenerational inequity)

Option 1 compared to defined contribution plan:

- risks are pooled and plan sponsor retain investment decisions under Option 1
- Under Option 1, less education is required on how much employees should save and how to invest

Option 2 compared to final average defined benefit plan:

- Option 2 poses less funding volatility for employers as wage increase risk is less
- It is easy for the plan sponsor to improve benefit when investment is good as decision is reviewed annually, which is appreciated by employees

Option 2 compared to defined contribution plan:

- risks are pooled and plan sponsor retain investment decisions under Option 2
- Under Option 1, less education is required on how much employees should save and how to invest

- (b) Compare and contrast the features and associated risks of both of the plan design options from the perspective of the plan participants.

Contributions:

Option 1: members bear the financial market risk associated with the plan in the sense that contribution rates might increase

Option 2: fixed/no contribution rate

2. Continued

Inflation protection:

Option 1/2: no indexing provisions, members bear inflation risk post retirement

Option 1: pre-retirement inflation is protected to the extent that the final average benefit formula is used to determine pension at retirement

Option 2: pre-retirement indexing is contingent on funded status, reducing pre-retirement inflation risk for members, however need for inflation protection more relevant in a career average plan vs final average or flat dollar plans

Option 2: members bear investment risk since pre-retirement inflation protection is subject to investment performance

Defined benefit provision:

Both options are defined benefit - longevity risk minimized

No purchase of annuity (effect of interest rate fluctuation on annuity pricing is irrelevant for members)

3. Learning Objectives:

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

Learning Outcomes:

- (3a) Identify risks face by retirees and the elderly.
- (7a) Evaluate appropriateness of current assumptions.
- (7b) Describe and explain the different perspectives on the selection of assumptions.
- (7c) Describe and apply the techniques used in the development of economic assumptions.
- (7d) Recommend appropriate assumptions for a particular type of valuation and defend the selection.

Sources:

Risk Management and Public Retirement Systems – Appendices only
2009 Selection of Actuarial Assumptions, Consultant Resource Manual, SOA Version,
Mercer, pp. 5-63

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) Describe the issues associated with using the assumed rate of return on plan assets as the discount rate to measure public sector defined benefit plan liabilities from the perspectives of:
 - (i) taxpayers;
 - (ii) public employee unions; and
 - (iii) the government.

Commentary on Question:

Successful candidates also mentioned the pros of a high discount rate.

3. Continued

In general using the rate of return as the discount rate results in a higher discount rate than other methods, resulting in lower liabilities and lower required contributions to the plan.

Taxpayers:

- A higher discount rate results in lower liabilities, which results in lower contributions, which results in less taxes for current taxpayers.
- Higher funded ratios as a result of lower liabilities due to a higher discount rate could result in taxpayers agreeing to an increase in benefits
- Generational equity – future taxpayers may have to pay more in taxes to make up for funding shortfalls by current taxpayers as a result of lower contributions because of a higher discount rate
- Taxpayers may not understand the risks of using the rate of return as the discount rate

Public Employee Unions

- Most unions represent current actives, and not retirees. Thus, the current actives may be making fewer contributions due to a higher discount rate to pay for current retiree benefits, but future actives may then need to pay more for the current actives once they retire
- Lower contributions due to a higher discount rate are popular for current union members
- Unions will likely push for benefit increases if funded ratio is high enough as a result of using a higher discount rate

Government

- Government is pressured to decrease current contributions (keep taxes down). This is easier to accomplish by using a high discount rate
- Government is pressured to increase benefits when the plan is well funded as a result of a high discount rate
- Asset mix may be invested in more risky investments in order to achieve a higher rate of return and thereby a higher discount rate
- Fiscal gaming – benefit increases or decreases may be made without the risks known in the interest of short-term re-election without considering long-term implications on the plan

- (b) Describe three methodologies for setting accounting discount rates for private sector defined benefit plans.

Commentary on Question:

Successful candidates described the methodologies.

3. Continued

Cash Flow Matching

- Discount rate is based on plan's projected cash flows
- Discount rate is the single rate that results in the same present value as discounting each projected cash flow at the spot rate for its duration on the yield curve
- Alternatively under a bond model cash flow matching approach, a limited number of long-term bonds are selected on an optimized basis that match the cash flows of the plan instead of using a broad-based yield curve

Index rates for hypothetical cash flows

- Discount rate is based on a broad based yield curve or index
- Discount rate is selected based on the rate for an index of similar duration to the plan's cash flow
- Discount rate is adjusted up or down to the extent the plan's duration differs from the index

Building Block Approach

- discount rate is inflation + expected real return + diversification effect - admin expenses - investment expenses - margin for adverse deviation
- Same as funding/going concern rate
- Can use stochastic model to model expected returns

4. 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.

Sources:

DA-803-13: Evaluating Financing Options for Nonqualified benefit plans

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) Describe the considerations when evaluating whether to finance or fund non-qualified pension plans.

Commentary on Question:

Successful candidates demonstrated their understanding of tax deductibility, contributions subject to creditor claims, and various implications for the employee, the employer, and its shareholders.

The following are considerations when evaluating whether to finance or fund non-registered pension plans:

- Contributions to a non-registered pension plan are subject to the claims of the company's creditors.
- Financial statement volatility: How will financing affect the company's P&L? How will the financing option match the plan's liabilities over the life of the plan?
- Cash flow: Is cash available for financing?
- Benefit security: Financing increases benefit security. However, benefits are not guaranteed if a company is in bankruptcy.
- Tax advantages: Tax consequences of the financing vehicle should accommodate the company's tax status. However, note that contributions to a non-registered plan are not tax deductible for the employer until benefits are received by the employee (executive).
- Current vs. future shareholders: When a company chooses not to finance, they are pushing the responsibility for today's benefits to future shareholders.
- Funding is independent of accounting expense

4. Continued

- (b) Describe the features of four financing or funding options for non-qualified pension plans.

Commentary on Question:

Successful candidates identified four financing/funding options for non-qualified plans and describe their distinguishing features – e.g., how they operate and what the tax implications may be. Though not listed in the solution below, credit was also given for describing secular trust and financing with company stock.

Four financing or funding options for non-qualified plans are: 1) Rabbi Trust; 2) Corporate-Owned Life Insurance (COLI); 3) purchasing taxable securities; and 4) self-financing with cash.

Four financing or funding options for non-registered plans are: 1) pay-as-you-go; 2) a Retirement Compensation Arrangement (RCA); 3) an Employees' Profit Sharing Plan (EPSP); and 4) exempt life insurance policies.

- 1) Pay-as-you go:
 - a. No funds are set aside to pay for future non-registered plan benefits.
 - b. Benefits are paid out of company's current revenue (corporate assets).
 - c. Tax consequences occur only on payment of benefits.
 - 2) RCA:
 - a. Arrangement is used to hold a Letter of Credit (LOC).
 - b. Funded by the employer with 2x issuance of LOC.
 - c. The LOC is held in the name of the RCA trust.
 - d. RCA trust receives half of the tax-deductible contributions. The other half goes into a refundable tax account.
 - e. No taxation until employee receives benefits.
 - 3) EPSP:
 - a. Employer contributions are tax deductible but immediately taxable to participants.
 - b. EPSP earnings must be allocated to participants and taxed in the year of allocation.
 - 4) Exempt life insurance policy:
 - a. Employer owns life insurance policy on behalf of executive.
 - b. Ultimate death benefit is tax exempt
 - a) Earnings on the cash value of the policy are also tax exempt.
- (c) Describe the considerations in choosing a financing or funding option for non-qualified pension plans.

Commentary on Question:

Successful candidates demonstrated their understanding of the factors to consider when evaluating a particular funding vehicle.

4. Continued

When choosing a financing or funding option for a non-registered pension plan, the following factors need to be considered:

- After-tax return: Will the after-tax growth of the asset track against the tax-deferred growth of the benefit?
- P&L impact: Will the asset generate a P&L gain that will offset the P&L expense of the non-registered plan?
- Cash flow: Will the asset require excessive amounts of cash, either as contributions or for paying benefits?
- Present value: Will the cost of the security be minimal and provide a positive return to the company given the cash outlay?
- Asset-liability matching: Will gains and losses in the liability be appropriately hedged by the asset?
- Flexibility: Can the asset be used in multiple circumstances, and will it meet the liquidity needs of the employer in paying benefits?
- Security: How does the asset perform in conjunction with Rabbi Trusts and other security devices?

5. Learning Objectives:

3. Candidate will be able 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.
- (8a) Perform valuations for special purposes, including:
 - (i) Plant termination/windup
 - (ii) Accounting valuations
 - (iii) Open group valuations
 - (iv) Plan mergers, acquisitions and spinoffs

Sources:

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

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

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) Describe the issues associated with the treatment of benefits accrued up to the closing date for each potential acquisition from the perspectives of:
 - (i) Acquired employees; and
 - (ii) ABC Company.

Commentary on Question:

Successful candidates demonstrated their understanding of the accrued benefit issue in an acquisition from different points of view.

Factory A

Acquired Employees:

- Definition of accrued benefit – will it reflect expected future salary increases?
- Accrued benefit security – if future salary increases are reflected, then maintain some level of pre-retirement inflation protection
- Concern over future of their accrued benefits – ie. will plan wind up, be frozen, etc.
- Disposition of surplus – if a surplus exists, are they entitled to any of it?
- Treatment of unvested accrued benefits

5. Continued

ABC Company:

- Definition of accrued benefit – will it reflect expected future salary increases?
- Disposition of surplus – vendor may argue that accrued benefit should not include future salary increases and attempt to receive a refund of surplus from the plan
- If salary increases included in accrued benefit, purchaser may subsequently wind up the plan and reap a salary projection “windfall”
- Asset transfer – vendor may argue that accrued benefit should not include future salary increases and transfers a reduced amount of pension assets to the purchaser’s pension fund
- Purchase price – vendor may argue that accrued benefit should not include future salary increases and attempt to negotiate higher purchase price to reflect sudden change in interpretation of “accrued benefits” and sudden “decrease” in liabilities

Factory B

Acquired Employees:

- Definition of accrued benefit – will it reflect expected future benefit increases?
- Accrued benefit security – current benefit unaffected, but future flat benefit rate upgrades are uncertain (want to maintain some level of pre-retirement inflation protection)
- Concerns over future of their accrued benefits – ie. will plan wind up, be frozen, etc.
- Disposition of surplus – if a surplus exists, are they entitled to any of it?
- Treatment of unvested accrued benefits

ABC Company:

- Definition of accrued benefit – will it reflect expected future benefit increases?
- Purchase price – if substantial history of upgrades exists, or a substantial expectation on the part of the employees exists that there will be adjustments in the future, purchaser will want this to be reflected
- Disposition of surplus – vendor may argue that accrued benefit should not include future benefit increases as there is no legal obligation on the corporation or on the pension plan to provide upgrades in the future and attempt to receive a refund of surplus from the plan
- If benefit increases included in accrued benefit, purchaser may subsequently wind up the plan and reap a benefit projection “windfall”
- Asset transfer – vendor may argue that accrued benefit should not include future salary increases and transfers a reduced amount of pension assets to the purchaser’s pension fund

5. Continued

Factory C

Acquired Employees:

- No accrued benefit issue – accrued benefit is simply equal to account balance
- Concerns over future of their accrued benefits – ie. will plan wind up, change in contribution formula, change in investment options, etc.

ABC Company:

- No accrued benefit issue – accrued benefit is simply equal to account balance
- Disposition of future forfeitures of unvested account balances is a matter of negotiation

- (b) Describe the pension information required to perform due diligence for the acquisition of Factory A.

Plan documentation, including:

- Retirement plan documents
- Summary of plan descriptions (SPDs)
- Owner data
- Union arrangements
- Undocumented promises
- Summary of material modifications (SMMs)

Detailed compliance tests, including:

- Nondiscrimination testing results
- Top-heavy testing results

Administrative reports, including:

- Financial statements
- Actuarial reports
- Administrative procedures
- Trust statements
- Census data
- Employee reports
- Employee communications

Miscellaneous reports, including:

- Reportable events
- History of litigation
- Service contracts

6. Learning Objectives:

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

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
- (6a) Given a specific context, synthesize, evaluate and apply principles and features of executive deferred compensation retirement plans.
- (8a) Perform valuations for special purposes, including:
- (i) Plant termination/windup
 - (ii) Accounting valuations
 - (iii) Open group valuations
 - (iv) Plan mergers, acquisitions and spinoffs

Sources:

Retirement Plans - 401(k)s, IRAs and Other Deferred Compensation Approaches, Allen, 11th Edition) Ch. 14, pp. 250-263

DA-156-15: Moving from a DB Executive Retirement Plan to a DC Executive Retirement Plan

DA-112-13: Converting Pension Plans from a Defined Benefit to a Defined Contribution Design - Issues to Consider in Canada

6. Continued

Commentary on Question:

Successful candidates described the issues rather than providing a list.

Solution:

Describe five issues ABC Company should consider when designing the defined contribution SERP.

- Eligibility – What will be the eligibility requirements for plan participation? Participation could be limited to top hat employees, C-level executives, those impacted by legislative limits. Consider whether participation should mimic the DB plan being replaced.
- Benefit Level
 - How will benefit formula be determined? Potential options include
 - Uniform percentage of salary: This is appropriate if the intent is to provide consistent benefits for all participants
 - Tiered percentages: This is appropriate if the intent is to reward longer service employees
 - Formula offset by other benefits: This is appropriate if the plan is intended to replace benefits lost due to legislative limits
 - Does the benefit level achieve corporate goals?
 - Is the benefit competitive regarding benefit level and cost?
 - Does the benefit coordinate with other benefits? How does it relate to the total reward package?
 - What message is the benefit sending, and is it consistent with overall compensation philosophy?
 - Does the benefit compare appropriately to the DB plan being replaced? Is it intended to completely replace the plan, or to offer a higher or lower benefit?
 - Is the benefit tied to performance in order to encourage specific behaviors?
- Vesting and handcuffs
 - What are the vesting provisions? Options include
 - Service-based
 - Class-year
 - Performance-based
 - What is the purpose of the vesting requirement?
 - To retain employees?
 - To incent employees to leave at a certain age?
 - Do certain criteria need to be met to get the benefit?
- Distributions and payout options
 - What form of benefit will be offered, and will the employee have a choice of benefit? Payout options include lump sum, installment payments, annuity options.
 - What timing of payment will be allowed? Options include at a specific age, at termination of employment, or employee choice.

6. Continued

- Do any events trigger early distribution, such as change in control?
- What is the purpose of the distributions offered? Is the plan intended to provide lifetime security, or portable benefits?
- Plan Structure
 - Will the plan be funded or unfunded? There are trade-offs between security of benefit, restrictions on funding vehicles, and a need to avoid constructive receipt issues.
 - Will there be actual or imputed contributions?
 - Will there be actual or imputed investment income? How will the rate of return be determined for imputed investment?
 - Will employees have choice in how contributions are invested?
- What income will contributions be based on? Bonuses and deferred compensation may be included or excluded depending on the desired goal of the program.

7. 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.
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:

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
- (3b) Describe and contrast the risks face by participants of:
- (i) Government sponsored retirement plans
 - (ii) Single employer sponsored retirement plans
 - (iii) Multiemployer retirement plans, and
 - (iv) Social insurance plans
- (4a) Identify how plan features, temporary or permanent, can adversely affect the plans sponsor.

7. Continued

- (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.
- (5a) Describe ways to identify and prioritize the sponsor's goals related to the design of the 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.
- (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.

Sources:

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

DA-113-13: Multi-Employer Plans

CIA Ed Note: Financial Risks Inherent in Multi-Employer Pension Plans and Target Benefit Pension Plans, CIA TF on MEPP/TBPP Funding, May 2011

Commentary on Question:

Commentary listed underneath question component.

7. Continued

Solution:

- (a) Describe the factors that create cost pressures for multiemployer plans.

Commentary on Question:

Successful candidates described the factors rather than providing a list.

- Total annual cost of plan = annual normal cost + annual admin. expense + annual amortization payments
- Cost pressures arise when the total annual plan costs exceeds the total annual contributions remitted to the trust
 - Cost pressures especially prevalent when annual amortization payments required to pay for funding deficiencies of the plan is on the rise because of various factors such as the ones listed below

Factors that can lead to cost pressures for pension plans include the following:

1. Aging demographics – e.g., mature plan or where the ratio of inactive participants (retirees) to active participants is greater than 1
2. Asset allocation/asset return volatility – bull/bear markets can lead to volatility in funded ratio of plan and therefore contribution volatility
3. Investment policy – asset liability mismatch can lead to contribution volatility
4. Secular market changes – low interest rates can lead to significant cost pressures due to increase in funding deficiency of the plan and thus requirement for increased contribution to cover increased annual amortization payments required to pay down the plan's deficit
5. Plan design – risk of contribution levels being inadequate to support the annual accruals
6. Plan benefits – e.g., plans that pay lump-sums upon termination that are based on mandated discount rates that are far less than the long-term expected discount rates used to value the pension liabilities on an on-going basis
7. Leverage – more than 50% of the contribution is used to cover normal cost; more of an issue for plans that cover participants working in cyclical industries
8. Withdrawal of key employer – can be a significant risk if the withdrawal changes the plan demographic profile, the plan is leveraged
9. Regulatory risk – risk of legislative changes that can inadvertently increase plan costs
10. 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, plan has only a limited ability to absorb experience losses
11. 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

7. Continued

12. Mortality/longevity risk - longevity improvements reflected in the liabilities are not sufficient for either or both plan members and their spouses
13. Retirement risk - plan members retire earlier than anticipated with a subsidized early retirement pension
14. Risks of intergenerational transfer - 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
15. Communication risk

- (b) Describe the options available to the Board of Trustees to address a funding shortfall in a multiemployer plan.

Commentary on Question:

Note that Candidates need not provide responses with the level of detail presented below to earn full credit, but rather demonstrate their understanding of the learning objective/outcome of the question.

There are many options available to the BOT to address shortfall in MEPP.

The following is a list of available options that would help the BOT address funding shortfall from a more holistic perspective - assets and liabilities:

- Variability of funded status can be reduced by increasing the match between the assets and the liabilities. This can be achieved by:
 1. Reducing the equity allocation,
 2. Increasing the duration of the fixed income assets; and
 3. Applying other immunization-like tools such as duration matching, cash flow matching and annuitization of retired life liabilities.
- Employ an asset-smoothing method to reduce volatility of funded position of the plan.

Instead of using marked-to-market value of assets, if permitted by law, can implement an appropriate asset smoothing method that may be useful to provide for some deferred recognition of investment gains/losses.

- Assess appropriateness of the plan's asset allocation future rates of return used for funding valuations, given target asset allocations
- Utilize a cost method that will reduce cost volatility. For example, when the plan members are in an industry or division of the plan wherein the future new entrant stream is uncertain, it may be appropriate to utilize the entry age normal actuarial cost method, rather than the unit credit method.

7. Continued

If membership can be expected to age because of few new entrants, the unit credit normal actuarial cost can be expected to rise relative to the contribution rate, potentially creating a situation where the contribution rate does not even cover the normal actuarial cost.

- Minimize and mitigate interest rate and inflationary risks to which the plan's liabilities might be exposed
- Assess the difference between the contribution rate and the cost of benefit accruals. Assess the degree of asset/liability mismatch and the current level of "margin":
 - If the margin is too small for the level of the asset/liability mismatch, the benefits may not continue to be supportable.
 - 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.
- Hours Worked – can pursue stress testing to determine the extent of the risk of a reduction in hours worked. When undertaking such stress testing, it is important not only to reflect a reduction in hours worked, but also to reflect any other experience that is likely to occur due to the reduction in hours worked. Examples of other adverse experience include:
 - If the reduction in hours is likely to be borne by older members; then there may be associated losses due to additional retirements;
 - If the reduction in hours is likely to be borne by younger members, then there may be an associated increase in the unit credit normal cost rate;
 - Many MEPPs permit the banking of hours such that a reduction in hours worked (leading to a reduction in contributions) may not result in a similar reduction in the hours credited under the plan (at least in the short term); and
 - Some MEPPs have a relatively low threshold for a full year of credit, in which case reduced hours (and the related reduction in plan contributions) may not result in reduced credits.
- Mortality/Longevity Risk – assess reasonability of current mortality rates used for valuations; want to use mortality rates that reflects improvements from the date of the mortality table to the date of the valuation and improvements after the date of the valuation and a base table that is reflective of the plan's membership

7. Continued

- Plan Design Issues – review and assess the plan costs/financial risks of providing certain benefits such as early retirement subsidies. Early retirement subsidies expose the plan to financial risk in the event of an economic downturn, as members elect to retire early in the face of less work.

Also, automatic inflation adjustments, such as a final-pay plan design or contractually committed indexing, increase the financial risk of a plan.

May want to consider eliminating early retirement subsidies, COLA awards (perhaps consider awarding on an ad hoc basis rather than periodic basis), lump-sum benefits after certain age (e.g., no LS benefit if terminate membership after early retirement age), or unreduced benefits due to disability, or subsidized spousal death benefits

- Implement policies that would encourage participation of new employers and incent current employers to stay in fund
- Pursue open-group projections (deterministic) – BOT can assess the impact to funded ratios and contribution levels due to a decline in active membership over a certain period of time

This would be very useful especially if the plan is very mature and annual benefit payments often far exceed annual contributions; projections can help to anticipate and take corrective actions before funding levels start to deteriorate.

- Increase contribution levels
- Implement a margin technique during contribution negotiation, e.g., of a typical margin is

Total annual cost of plan = annual normal cost + annual admin. expense + annual amortization payments over some period of time (say 10 years)

- Regulatory Risk – BOT should follow 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 proactively lobbying regulators and educating them on the issues unique to these types of plans.

BOT may also want to consider taking advantage of any kinds of funding reliefs meant to help MEPP to stay healthy and meet future benefit obligations.

7. Continued

- Communications Risk - conduct a communications audit, identifying gaps and shortfalls, and develop a plan to address them. The only way a MEPP can be successful in the long run is if it is transparent to all parties.

8. Learning Objectives:

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

Describe the structure of the following plans:

- (a) Traditional defined benefit plans
 - (b) Hybrid plans
 - (c) Defined contribution plans
 - (d) Retiree Health plans
- (8e) Advise plan sponsors on accounting costs and disclosures for their retirement plans.
- (8f) Demonstrate the sensitivity of financial measures to given changes in plan design.

Sources:

DA-105-13: Measuring Terminable Postretirement Obligations

Morneau Shepell Handbook of Canadian Pension and Benefit Plans, 15th Edition: Ch. 18 and 22

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) Explain why plan sponsors are reducing or eliminating their post-retirement health benefit plans.
 - Costs are increasing due to the increase in number of retirees (baby boom generation now retiring) at earlier retirement ages (more years of postretirement benefits).
 - Life expectancy is increasing so costs are increasing due to an increase in the duration of the benefit.
 - Government sponsored benefits continue to be reduced. Unless the employer plan is worded with specific limitations for adding new services, the benefits removed from provincial Medicare plans may automatically be covered by employer plans, increasing costs.
 - Postretirement benefits are accounted for under IFRS and a reduction in discount rates is increasing the liability. Financial analysts and investors have put more focus on the postretirement costs and liabilities, causing employers to review the benefit promise.

8. Continued

- Employers are reviewing & benchmarking the benefit design, looking for cost savings through design changes.
 - The Employee Life & Health Trust is a new vehicle created by the Canadian Federal government. It provides an option to move the financial obligations of these programs to a third party in a task effective manner once settlement funds are paid in full.
 - There is continuing steep increase in plan costs due to participant count increases, anticipated increases from price inflation and additional utilization of medical goods and services.
 - Increase in health care costs are also due to rising cost of drugs (increase in pharmacy fees, more expensive drugs such as biologics) and obesity.
 - Group payments increase for a closed group many years after the count has begun decreasing, possible beyond 50 years, due to aging affect and mostly due to compounding effect of health care trend (absent a plan cap).
 - Employers are starting to take a holistic approach to managing overall health benefit costs, so there is a better detection of trends, which results in a more comprehensive picture. Root causes of rising costs can be identified and resolved.
- (b) Critique the actuarial assumptions model used for post-retirement health benefit plan valuations given that benefits may be reduced or eliminated at any time.

Commentary on Question:

Successful candidates focused on the critique of the actuarial assumptions model.

- The current model does not recognize the risk of termination when the retiree plan is terminable at the decision of the plan sponsor.
- The current model does not distinguish between a promise that is legally binding and a promise that depends on one party's willingness to pay. Most post-retirement HC benefits are not legally binding (unless in CBA).
- The current actuarial model does not reflect recognition that high payment far in the future implies a higher likelihood of future sponsor decisions to reduce benefits.
- The current actuarial model contributes to less pragmatic funding decisions, less sensible plan design decisions and less realistic generational expense allocations.
- A basic principle behind the current model is that when the employee retires, a financial reserve should be equal to the expected future benefit payments, which are uncertain. With the benefit subject to termination, the payments are uncertain and targeting a full financial reserve is not realistic.
- There is a major disconnect between actuarial model, projecting increasing payments for decades, and the reality of a plan sponsor contemplating major changes within a short period of time.

8. Continued

- If plan sponsors continue to terminate their plans, the measurement loses credibility.
- The postretirement actuarial model was derived from the pension model, where accrued benefits cannot be reduced.
- The employee or retiree in a terminable plan will have a diminishing asset and the plan sponsor should have a lower liability.
- The readers of financial statements are misled by an overstated liability, as it does not adjust for probability of termination.

9. 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.

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
- (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.

Sources:

Towers Watson Chapter 1

Allen, Chapter 11

Commentary on Question:

Commentary listed underneath question component.

9. Continued

Solution:

- (a) Describe the advantages and disadvantages of providing company stock as an investment option in Group RRSPs.

Commentary on Question:

Successful candidates provided 4 advantages and 4 disadvantages.

Advantages:

- Employee motivation
- Attract talent
- Retention
- Corporate and employee success tied together
- More stock is in friendly hands

Disadvantages:

- Fiduciary liability
- Risk of poor diversification
- Risk of being outside risk tolerance
- Risk of loss of retirement savings if bankrupt

Employees may be disgruntled if the stock loses value

- (b) Describe the factors contributing to poor diversification in Group RRSPs from a behavioral finance perspective.
- Individual investors are loss-averse
 - More remorse as a result of loss than satisfaction as a result of gain
 - effect on owning stock: may sell low if stock performs poorly and not recover after investing funds conservatively
 - Hyperbolic discounting
 - tendency to reduce importance of future in the decision-making process
 - effect on owning stock: may not understand that improper diversification may have adverse impact in the future and focus only on current company prospects
 - Procrastination and inertia
 - tendency to delay a decision and difficulty in taking action or change course
 - effect on owning stock: including stock in the mix, may not ensure asset allocation in line with risk profile
 - Status quo bias
 - Preference for status quo to making active decision
 - effect on owning stock: if recommended profile out of line may not buy/sell stock to rebalance

9. Continued

- Complexity
 - difficulty of making retirement planning decisions involving the future
 - effect on owning stock: hard to predict expected return having poorly diversified assets along with funds in various asset classes
- Choice overload
 - sheer volume of choice causes paralysis analysis
 - effect on owning stock: one more choice increase overload

10. Learning Objectives:

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

Learning Outcomes:

- (8a) Perform valuations for special purposes, including:
- (i) Plant termination/windup
 - (ii) Accounting valuations
 - (iii) Open group valuations
 - (iv) Plan mergers, acquisitions and spinoffs
- (8c) Demonstrate how the retirement plan's cash inflows and outflows can affect the plan sponsor.
- (8e) Advise plan sponsors on accounting costs and disclosures for their retirement plans.

Sources:

IAS 19, Rev. 2011

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

Commentary on Question:

Successful candidates not only calculated the Defined Benefit Cost but also the OCI. Successful candidates showed both formulas and/or written explanation along with numerical calculations. Reasonable approaches that may have differed from below were given full credit.

Part (b) Successful candidates listed differences between ASC 715 and IAS19, rev 2011 AND the impact on expense.

Solution:

- (a) Calculate the revised 2015 Defined Benefit Cost and Other Comprehensive Income (OCI) under international accounting standard IAS19, rev 2011.

Show all work.

All numbers in \$1,000s

- Service Cost (Current and Past):
 - Current Service Cost was reduced by \$10,000 for the window
 - Current Service Cost: $(\$62,543 - \$10,000) \times (1 + 4\%) = \$54,645$ at EOY
 - Past service cost due to curtailment:
 - PBO increase due to immediate decrement
 - $\$150,000 - \$140,000 = \$10,000$

10. Continued

- Past service cost due to plan amendment:
 - PBO increase due to enhanced window benefits
 - $\$225,000 - 150,000 = \$75,000$
 - Both of the items above are combined in past service cost
 - $\$10,000 + \$75,000 = \$85,000$
 - Revised Service Cost = $\$54,645 + \$75,000 + \$10,000 = \$139,645$

 - Net Interest Cost:
 - BOY Funded Status = Funded Status prior to window adjusted to PBO impacts due to window
 - $\text{BOY funded Status} = \$114,584 + \$140,000 - \$225,000 = \$29,584$
 - Contributions remain unchanged at $\$39,050$
 - EROA = discount rate and benefit payments do not affect interest cost
 - Interest Cost = $(-\$29,584 - \$39,050 / 2) * 4\% = -\$1,964$

 - Other Comprehensive Income (OCI)
 - Assuming no change in assumptions and without actual information for 2015, remeasurement amount is expected to be $\$0$

 - OCI = $\$0$

 - Total Defined Benefit Cost:
 - Revised Service Cost (Current & Past) + Net Interest Cost + OCI
 - $\$139,645 - \$1,964 + \$0 = \$137,681$
- (b) Describe in words how the answer to (a) would change under U.S. accounting standard ASC 715.

No calculations are required.

- Service Cost: under ASC 715, Service cost includes current service cost only, past service cost is a separate item
- Expected return on asset is based on expected long term rate of return on assets
 - Likely lowers the net benefit cost
- Gain/loss: corridor approach may be adopted
 - Likely lowers the net benefit cost as there could be unrecognized gains (or neutral if immediate recognition)
 - Only unrecognized portion goes to OCI
- Termination benefit - incentive to retire
 - Recognize when employees accept offer

10. Continued

- Curtailment
 - Increase of PBO in excess of unrecognized gain plus pro rata share of past service cost and transitional obligation
 - Recognized when loss is probable and reasonably estimable
- In aggregate, ASC 715 changes the allocation between P&L benefit cost and OCI (other than the EROA which reduce the total cost)
- Under ASC 715, there could be reduced P&L cost, increased OCI

11. Learning Objectives:

2. The candidate will understand the impact of the regulatory environment on plan design.
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.
6. The candidate will be able to analyze, synthesize and evaluate plans designed for executives or the highly paid.
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:

- (2c) Test for plan design restrictions intended to control the use of tax incentives.
- (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
- (4f) Assess the impact of possible changes in plan design due to changes in legislation.
- (5e) Identify the ways that regulation impacts the sponsor's plan design goals.
- (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.
- (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.

11. Continued

Sources:

Towers Watson Canadian Pensions and Retirement Income Planning, 5th Edition
o Ch. 1 (pp. 36-55, Sections 120-145)

Morneau Shepell Chapter 1, 5

Allen Ch8

Commentary on Question:

Successful candidates included at least two valid impacts under each Salaried and SRP plan and for each of the following: participants, plan sponsor considerations with respect to plan design and accounting.

Other valid points not listed below are also acceptable.

Solution:

Describe the impact of the increase on each of NOC's pension plans taking into consideration:

- the effect on plan participants;
- plan sponsor options with respect to plan design; and
- accounting implications.

Government of Gevrey is considering increasing the limit on periodic Pension payments from \$3,000 to \$4,000 per annum per year of service.

Describe the impact of the increase on each of NOC's pension plans taking into consideration:

- the effect on plan participants;
- plan sponsor options with respect to plan design; and
- accounting implications.

NOC Full-Time Hourly Union Pension Plan:

Participants

- Hourly plan accrual is $\$81 \times 12 = \972 / year of service so increase in limit does not apply to this plan

Plan sponsor options with respect to plan design

- The plan sponsor could choose to increase benefits in this plan if they are also increasing salaried plan benefits.

Accounting implications

- Likely no accounting impacts

11. Continued

NOC Full-Time Salaried Pension Plan

Participants

- higher benefits or higher funded benefits if SRP benefits are reduced as salaried limits are increased
- increased benefit security since funded
- Impacts employees earning >\$150,000/year – their qualified benefits will increase to cover salary up to \$200,000/yr.

Plan sponsor options with respect to plan design

- Could be more expensive for the plan sponsor since salaried benefits will increase and need to be funded
- Sponsor could choose to close or freeze the plan if it becomes too expensive (also accept other design alternatives)
- sponsor could also try to encourage early retirement to reduce the impact of increased benefit limits on funded plan costs

Accounting implications

- Will need to set up a prior service cost recognized immediately under IAS
- Increased future service cost and DBO
- Will likely increase EROA since assets will increase with requirement to fund more
- Any design changes chosen above would result in additional accounting impacts

NOC Full-Time Salaried Supplemental Retirement Plan

Participants

- Lower SRP benefits since more will be paid from the qualified plan.
- Could have fewer participants in the SRP plan

Plan sponsor options with respect to plan design

- Sponsor could choose to enhance SRP benefits if it is desirable for retention of executives
- Sponsor could freeze SRP benefits if plans become overly expensive with the new limits
- The increased limit will be beneficial to the sponsor from a tax perspective

Accounting implications

- Prior service credit (negative prior service cost)
- Lower DBO and future service cost
- any design changes chosen above would result in accounting impacts (could have curtailment if froze plan)

NOC Part-Time DC Pension Plan

- No direct impacts since \$3,000 limit does not apply to this plan
- If employer decides to close or freeze DB plan, DC plan could be enhanced or expanded

12. Learning Objectives:

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

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.

Sources:

Towers Watson Canadian Pensions and Retirement Income Planning, 5th Edition:
Ch. 1 (pp. 36-55, Sections 120-145) Plan, Ch. 16 (pp. 315-318, Sections 1615-1619 and p.333, Section 1680), Ch. 17 (pp. 397-398, Section 1790), Ch. 18 (pp. 410-413, Section 1825-1840) and Ch. 23

DA-112-13: Converting Pension Plans From a DB to a DC design – Issues to Consider in Canada

Commentary on Question:

Successful candidates were able to explain how a member's RRSP would be impacted if there were a surplus distribution to members.

Solution:

- (a) Describe the regulatory considerations with respect to the following:
 - actuarial basis;
 - funded position of the plan; and
 - portability of benefits.
 - **Actuarial basis**
 - (i) The actuarial basis used for conversion of DB accrual to DC balance is normally required to be no less than as calculated using CIA SOP assumptions.

12. Continued

- (ii) Salary projections for affected plan members in Quebec, Ontario, Manitoba, Saskatchewan, Alberta and those covered by Federally regulated plans: For DB benefits based on final average earnings - plan sponsor must reflect a reasonable increase for future salaries in the converted values.
 - (iii) The future salary projection can take into consideration reasonable termination and retirement rates; no required future salary scale stipulated but must be consistent with all economic assumptions used in the conversion.
 - (iv) Federal (ITA) Requirements: Assumptions used for salary projections and determining commuted values must be reasonable and acceptable by the CRA. In general if the actuarial assumptions are in accordance with CIA SOP for commuted values, the CRA will accept assumptions; otherwise actuary needs to justify assumptions before approval for conversion is granted.
- **Funded position of the plan**
 - (i) For affected plan members in **Ontario** – if the plan is in a deficit on conversion date, then provincial regulations require that the plan sponsor fully fund the benefits for those affected members that have elected to convert their DB benefits to a DC balance.
 - (ii) For affected plan members in **Quebec, Manitoba, Saskatchewan, Alberta and those covered by federally regulated plans** – if the plan is in a deficit on conversion date, then respective jurisdiction's regulation requires that the plan sponsor fund the deficit over a 5-year period after conversion.
- **Portability of benefits**
 - (i) Affected plan members cannot transfer the converted balance DB accruals into a personal locked-in retirement account (e.g., RRSP) or receive accrued benefit from DB plan as a commuted value cash value.
 - (ii) The commuted value of the converted DB benefits cannot be less than the value of the benefits to which the affected members would be entitled to had they terminated employment on the date of conversion and elected a lump sum value of their benefit accrued under the DB plan.
 - (iii) In general, affected plan members that have earned their rights to ancillary benefits (e.g., early retirement subsidies) before the conversion cannot lose their rights to these benefits after the conversion.

12. Continued

- (iv) Affected plan members in **Alberta, Manitoba and Saskatchewan** - conversion values must include ancillary benefits or the probability that affected members would have become entitled to the ancillary benefits had the plan not converted from DB to DC. The plan's actuary must certify that conversion values include appropriate values of ancillary benefits for each affected member.
- (v) Affected plan members in **Quebec, Ontario, and those covered by Federally regulated plans** cannot be forced into converting their DB accruals into DC balances.

Affected plan members **Manitoba, Saskatchewan and Alberta** cannot be forced into converting their DB accruals into DC balances if they are retirement eligible at conversion date.

- **Federal (ITA) Requirements:** To the extent that converted DB benefit exceeds the maximum amount of benefit that can be transferred to the DC plan (typically an issue for older affected plan members in plans with generous ancillary benefits), the excess benefit must be paid in cash to affected plan member, subject to income tax or if the plan so allows, retain excess benefit in the DB plan and pay as a bridge benefit from early retirement age to age 65 provided that the limit on bridge benefits is not violated. Also if there is available RRSP "contribution room", the EE can transfer the excess benefit into personal RRSP.
- (b) Discuss the impact on the plan participants' RRSP contribution room assuming the plan has a surplus on both a going concern and solvency basis.
 - (i) Under the ITA, if affected plan members' conversion balances include plan surplus as is the case in this plan, the plan administrator must report a Pension Adjustment (PA) equal to the affected member's surplus allocation. The PA would reduce the amount of the tax-deferred contributions affected plan members can make to an RRSP.
 - (ii) PAR may be generated if the past service DC conversion value is less than the total post-89 PAs and PSPAs for corresponding past service. The PAR can restore RRSP "contribution room" and can therefore be crucial to the affected plan member's decision to convert DB past service to DC benefit.

12. Continued

- (iii) Converted benefits in excess of ITA maximum: To the extent that converted DB benefit exceeds the maximum amount of benefit that can be transferred to the DC plan (typically an issue for older members in plans with generous ancillary benefits), the excess benefit can be transferred into a personal RRSP assuming there is available RRSP "contribution room". However, this transfer may eliminate available RRSP "contribution room" that the EE might otherwise need based on personal financial circumstances.
- (iv) The PA under the DB plan may be replaced by a higher PA (depending on DC benefit formula) under the DC plan, thereby reducing available RRSP "contribution room" and in some cases may create a negative PA room resulting in negative tax consequences if EE is making contributions to a personal RRSP.

13. Learning Objectives:

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

Learning Outcomes:

- (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:

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

CIA Educational Note: Selection of Mortality Assumption for Pension Plan Actuarial Valuations

DA-139-15: ASOP 35, Selection of Demographic and Other Noneconomic Assumptions for Measuring Pension Obligations

Commentary on Question:

Successful candidates demonstrated an understanding of mortality studies, key factors that can influence a plan's mortality experience, and how and when to adjust for these plan specific factors.

Solution:

- (a) Describe the information required in order to perform a mortality experience study.

Commentary on Question:

Successful candidates identified the membership data required and described how to assess the credibility of the plan's mortality experience. Successful candidates also listed plan characteristics that could lead to adjustments to existing tables.

Data Requirements:

- Large amount of historical data are required (3-5 years)
- To be considered credible, a plan should have at least 5,000 retirees
- Data should be split by age and gender
- Information on benefit amount or liability
- Consider the homogeneity of the group
- Experience gain and loss for the past few years
- Base year for the custom mortality table

13. Continued

Obtain mortality experience for similar plans and other published mortality tables

Plan Characteristics to Consider for Adjustments to Mortality Tables:

- Collar type (blue or white)
- Sector or underlying industry
- Socio-economic status (size of pension can be used as a proxy)
- Status of the plan

- (b) Explain how to develop a best-estimate mortality assumption.

Commentary on Question:

Successful candidates described how to use plan experience to develop a mortality table and how to make adjustments and refinements to the calculations.

- Methodology should mimic development of 2014 CIA CPM Study
- Crude mortality rates for each plan year are calculated by dividing the number of deaths by the number of life years exposed to death
- Crude mortality rate for base year determined as weighted average of crude mortality rates for each plan year
- Produce graduated rates for smoothness and fit (Whittaker-Henderson methods are commonly used)
- Assess credibility of plan experience
- Compare with published mortality tables
- Make adjustments for plan specific characteristics
- Select an adjustment for future improvements in mortality
- Consider using different tables for healthy vs disabled lives
- Consider different rates pre and post retirement