RET DAC Model Solutions
Spring 2019

1.

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:

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

Sources:

DA-114-13: Risk Management and Public Plan Retirement Systems - Appendices only (pp. 1-33 background only)

DA-137-13: Pension Projections

Commentary on Question:

This question tests candidates' knowledge of different types of projections and how projections are useful to public pension plan stakeholders.

Most candidates did well on this question.

Solution:

(a) Compare and contrast the following types of projections for a defined benefit pension plan:

(i) Deterministic

(ii) Stochastic

- For a deterministic projection, a single predetermined set of assumptions is used to project the population and assets; a stochastic projection uses random variables to bring forward the population and assets.
- The results from a deterministic projection provide a single answer for each set of assumptions; the results from a stochastic projection provide confidence intervals.
- A deterministic projection involves one or a few scenarios; a stochastic projection generally entails running of a series of random trials.

1. Continued

(b) Explain the rationale for performing projections for a public sector pension plan from the perspectives of the following stakeholders:

(i) Society/Taxpayers

(ii) Public Employees

(iii) Unions

(iv) Public Sector Employers

Society/Taxpayers

- When public plans provide adequate, secure, robust and well-designed retirement income to public employees, it minimizes the role society might need to play to backstop the plan.
- A projection study can help in the long-term decision-making process to help public plans ensure the security of the retirement income provided

Public Employees

- Most public employees make significant contributions to the plans and have a large stake in their benefits.
- A projection study can provide insights on the benefit security.

Unions

- Unions particularly favor benefits that continue unless renegotiated rather than benefits that must be bargained for anew in each round of bargaining.
- A projection study can provide information on sustainability of benefits and potential impact on any anticipated changes in trend (e.g. mortality improvements).

Public Sector Employer

- A public sector employer needs to make budgeting decisions and there are many competing needs for funds.
- A projection study can determine long term budgeting requirements.

2. 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.

(3d) Propose ways in which retirement plans and retiree health plans can manage the range of risks faced by plan participants and retirees.

(8e) Advise plan sponsors on accounting costs and disclosures for retirement plans under various standards and interpretations.

Sources:

DA-157-18: PWC IFRS Manual of Accounting Ch. 12 (excluding FAQ 12.113.2 to 12.127.1)

DA-179-19: Introduction (A58), IFRS1 (paragraphs 1-40 & Appendix A), IAS19, IFRIC14

Managing Post-Retirement Risks, A Guide to Retirement Planning

Commentary on Question:

This question tests candidates' knowledge of post-retirement risks faced by retirees and strategies that can be implemented to manage these risks. The question further tests candidates' knowledge of the defined benefit cost for post-employment health plans when a plan sponsor improves benefits under International Accounting Standards IAS 19, Rev. 2011.

Overall candidates' answered parts (a) and (b) well; candidates struggled with calculating the impact of the plan changes in part (c).

Solution:

(a) Describe six non-investment risks to which retirees may be exposed.

Commentary on Question:
Candidates received credit for appropriately describing other non-investment risks not described below.

2. **Continued**

- Longevity – Outliving retirement resources.
- Inflation – Fixed income stream losses purchasing power due to the price increase of goods and services over a period.
- Interest Rate – Low interest rate environment at retirement can result in lower retirement income due to annuities being more expensive.
- Public Policy – Policy risks include increase in taxes, new kinds of taxes, reduction in social security, Medicare, and Medicaid, increase in retiree contributions for Medicare.
- Unexpected health care needs and costs – Unexpected health care costs are a major concern. Employers continue to cut back on post-retirement health care benefits.
- Death of Spouse – Some income may stop at the death of a spouse or former spouse.

(b) Describe a risk management strategy that retirees can apply for each risk identified in part (a).

Commentary on Question:
To receive full credit, candidates had to describe management strategies for each of the 6 risks identified in part (a).

Candidates received credit for appropriately describing other management strategies not described below.

- Longevity – Deferred variable annuities can include guaranteed minimum floor for guaranteed lifetime income. Also available, longevity insurance and managed payout plans.
- Inflation – The retiree can purchase inflation-indexed annuities, which adjust payments for inflation up to a specified annual limit.
- Interest Rate – Investing in long-term bonds, mortgages, and dividend-paying stocks offers protection against lower interest rates, although the value of these investment will fluctuate.
- Public Policy – 401(k)s and RRSPs income grows tax free. Retiree would presumably withdraw income in a lower tax bracket in retirement. Planning for ongoing income should also address retirees' need or desire for liquidity to meet unexpected needs.
- Unexpected health care needs and costs – Federal or state-local programs may assist low-income retirees. Retiree may consider working, at least part-time, to remain covered. Consider "discount benefit plans" for typical non-covered services such as dental or vision care.
- Death of Spouse – Life insurance, survivor income in Social Security, pension plans and annuities, long-term care insurance, and savings.

2. Continued

(c) Calculate the impact of the plan change on the 2019 Defined Benefit Cost under International Accounting Standards IAS 19, Rev 2011.

Show all work.

Commentary on Question:
Most candidates calculated the defined benefit cost for the components recognized in the Profit and Loss (P&L) statement. Candidates struggled to identify the components and calculate the cost recognized in the Other Comprehensive Income (OCI) statement.

Candidates also struggled to identify that the reduction in retiree contributions results in an increase in future benefit payments. The reduction does not offset the plans service cost, as retirees do not have any service cost.

Past Service Cost = Increase in defined benefit obligation

= 650,000

Change in Service Cost = half of a year interest * change in Service Cost

= (1 + 0.0375/2) * 24,000

= 24,450

Change in Interest Cost = half of a year interest * Change in DBO - quarter of a year interest * change in expected benefit payments - quarter of a year interest * change in expected retiree contributions

= 0.0375/2 * 650,000 – 0.0375/4 * 15,000 – 0.0375/4 * 52,000

= 11,559

Change in Defined Benefit Cost recognized in P&L = Change in Current service cost + Past service cost + Change in Interest cost

= 24,450.00 + 650,000.00 + 11,559

= 686,009

Defined Benefit Cost recognized in OCI due to plan change = 0 (nil)

None of the impacted values are due to actuarial (gains)/losses arising due to remeasurement or assumption changes

3. Learning Objectives:

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

Learning Outcomes:

(9a) Apply the standards related to communications to plan sponsors and others with an interest in an actuary's results (i.e., participants, auditors etc.).

(9b) Explain and apply the Guides to Professional Conduct.

(9c) Explain and apply relevant qualification standards.

(9d) Demonstrate compliance with requirements regarding the actuary's responsibilities to the participants, plan sponsors, etc.

(9f) Recognize situations and actions that violate or compromise Standards or the Guides to Professional Conduct.

Sources:

SOA Code of Professional Conduct

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

DA-140-15: ASOP 27 - Selection of Economic Assumptions for Measuring Pension Obligations

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) List the communications and disclosure requirements of the Society of Actuaries Code of Professional Conduct for an actuarial report.

Commentary on Question:

Successful candidates listed specific requirements from the SOA Code of Professional Conduct.

No credit was given for listing requirements from the Standards of Practice.

- Ensure report is clear and appropriate to circumstances
- Ensure report is clear and appropriate to intended audience
- Ensure report satisfies standards of practice
- Report should clearly identify responsible actuary
- Report should indicate extent to which actuary/other sources are available to provide supplementary information and explanation

3. Continued

- Principal for whom report is issued should be clearly identified
- Report should describe capacity in which actuary serves
- Actuary shall make appropriate/timely disclosure to Principal of sources of all direct and indirect material compensation actuary has/will receive from another party in relation to work performed for Principal
- Actuary who is not financially/organizationally independent should disclose to Principal any pertinent relationship that is not apparent
- Actuary subject to compensation disclosure requirement for work performed for Principal, regardless of office location in which compensation received

(b) Critique the adequacy of the above assumptions disclosure based on the following Actuarial Standards of Practice:

(i) No. 27, Selection of Economic Assumptions for Measuring Pension Obligations

(ii) No. 35, Selection of Demographic and other Noneconomic Assumptions for Measuring Pension Obligations

Commentary on Question:
Many candidates struggled with this part since they commented on the reasonability of assumptions, instead of critiquing the disclosure of assumptions as the question asked.

ASOP 27 items
- No inflation assumption provided: should be included
- No description of market-related value of assets provided
- Need to provide more information for discount rate (ex. the effective rate used)
- Should disclose rationale (information/analysis) used in selecting each economic assumption that was not prescribed

ASOP 35 items
- Mortality assumption is too vague: cannot be replicated/verified by another actuary
- No mortality projection noted in assumptions: need to include scale or indicate why no provision made for future improvement
- Retirement information is not complete / could not be replicated: should provide full age table
- Termination information is not complete / could not be replicated: should provide full age/service table
- Not clear if retirement assumption relates to just actives or both actives and terminated vested participants

3. Continued

- Need to add conversion assumptions for optional form of payment
- Need to add percentage of participants assumed to elect straight life annuity vs. 10 C&C
- No description of administrative expenses (whether included in service cost or not applicable)

Additional Disclosure Requirements relevant to both ASOPs

- Should disclose any changes in assumptions from prior year
- General effect of any change in assumption should be disclosed
- Should state the source of any prescribed assumptions
- For all prescribed assumptions/methods set by another party, should disclose if assumption significantly conflicts with actuary's judgment of reasonability or if actuary unable to evaluate reasonability
- For each assumption, should indicate whether it represents estimate of future experience, actuary's observation of estimates inherent in market data, or combination thereof
- For each significant assumption, should disclose rationale (information and analysis) used for its selection

4. 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.

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.

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

Sources:

Retirement Plans - 401(k)s, IRAs and Other Deferred Compensation Approaches, Allen et al., 12th Edition, 2018, Ch. 14

DA – 156 -15: Moving from a DB Executive Retirement Plan to a DC Executive Retirement Plan, October 2014

Commentary on Question:

This question tests objectives of a non-qualified plan. Candidates also had to demonstrate understanding of a change from a DB plan to DC plan from both the employer's and executive's perspectives.

Solution:

(a) Describe four employer objectives when establishing a non-qualified retirement plan.

4. **Continued**

Commentary on Question:
Candidates did well on this part.

Other appropriate objectives not described below received credit.

1. Restoration: The employer is happy with their qualified (or registered) plan, but benefits for highly compensated employees are restricted due to tax limitations. Employer wants to address issues of benefit equity.
2. Retention (Golden Handcuffs): The employer wishes to address the issue of executive turnover, and retain key employees.
3. Recruiting: The employer wishes to entice employees who are mid-career and bridge the gap of benefits that may be lost in switching careers
4. Performance: The employer wants to reward employees for attaining pre-determined performance objectives.

(b) Critique each of the plan provisions for the defined contribution plan from Company ABC's perspective.

Commentary on Question:
Candidates struggled with this part. Some candidates critiqued the plan provisions from an employee perspective, as opposed to the employer's perspective. Also, many candidates described how a plan provision changed, but did not explain how the change would impact the employer.

Benefit:

- DC plan provides more predicable benefit accrual and more predictable costs for ABC
- Including bonus may provide more incentive to employees but will also increase volatility of benefit accruals and cost for ABC

Early Retirement Benefit:

- ER Subsidy removed which may result in employees working longer and ABC has less incentives if they wish to encourage employees to retire early

Form of Benefit:

- Paid in installments over 10 years contains costs for ABC closer to retirement, costs more predictable as not subject to longevity or inflation risk
- If plan unfunded, may increase cash flow volatility as benefit paid over shorter period, and immediately in situations of death or termination prior to retirement

4. **Continued**

Vesting:

- Immediate vesting may result in less retention, ABC no longer has any golden handcuff provision
- Immediate vesting may assist ABC in recruiting younger employees who value portability or employees closer to retirement who wouldn't meet the 10-year vesting requirement

General:

- DC is easier to understand and communicate to employees, employees may perceive more value in the plan and in working for ABC
- Lower accounting and administrative cost as benefit accrual and plan provisions less complex

(c) Describe the advantages and disadvantages of the plan change from the executive's perspective.

Commentary on Question:
Candidates did well on this part.

Advantages:

- If executive passes away, her beneficiary would receive a benefit under the DC plan as the death benefit is not dependent on marital status. Under the DB plan, the benefit would be surrendered if no surviving spouse.
- Since a significant portion of her salary is bonus, compensation from bonuses being included in DC benefit formula may result in a higher pension benefit and a higher replacement ratio at retirement
- She has more flexibility if she wishes to leave the company in the short term as the DC benefits vest immediately and benefit is more portable

Disadvantages:

- Executive is exposed to market risk as the DC benefit at retirement is dependent on market returns
- No longevity protection in the DC Plan, which exposes her to risk of outliving her retirement savings
- The DC plan does not provide subsidy for early retirement which may limit her options when considering retirement timing
- The DC Plan does not provide protection against inflation throughout retirement which could expose her to risks if the costs of goods/services increases drastically during retirement.

5.

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.

(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 retirement plans under various standards and interpretations.

(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.

Sources:

Pension Risk Transfer: Evaluating Impact and Barriers for De-Risking Strategies

DA-168-19: IFRS and US GAAP: Similarities and Differences, Ch. 5 only

DA-170-17 Accounting for Buy-ins

DA-179-19: Introduction (A58), IFRS1 (paragraphs 1-40 & Appendix A), IAS19, IFRIC14

Commentary on Question:

Overall most candidates demonstrated their understanding of the differences between a plan merger and an annuity purchase. Most candidates indicated the impact on the cash funding and the accounting as a result of the recommended option.

5. Continued

Solution:

(a) Recommend one of the following actions for Company XYZ:

(i) Take no action

(ii) Only merge the plans

(iii) Merge the plans and purchase annuities

Justify your response and show all work.

Commentary on Question:
Most candidates provided the calculations for all three options and were able to determine the impact on the cash funding and insurance premiums. Successful candidates recommended "only merge the plans", as this was the ideal action based on the given goals of Company XYZ.

Cash implications:

(i) *Take no action:*

- Plan A funding requirements:
  - Funded status = $220M / ($60M+$230M) = 75.9%
  - Would require cash funding to get up to 80% funded status. Cash requirement = $12M:
    - 80% × $290 − $220M = $12M
- Plan A insurance premium for 2019 = (300 + 1000) × $500 = $650,000
- Plan B funded requirements before merger:
  - Funded status = $126M / ($25M + $115M) = 90.0%
  - No funding required since over 80%
- Plan B insurance premium for 2019 = (100 + 500) × $500 = $300,000
- Total cash outlay in 2019 = $12M + $950,000 = $12,950,000

(ii) *Only merge plans:*

- Merged Plans A+B funding requirements:
  - Funded status = ($126M + $220M) / ($60M + $230M + $25M + $115M) = 80.5%
  - No funding required if plans merged since combined funded status ≥ 80%
- Merged Plans A+B insurance premium for 2019:
  - $300,000 + $650,000 = $950,000
- Cash outlay in 2019 reduces from $12,950,000 to $950,000 (only insurance premiums apply since merged plan is funded over 80%)

5. Continued

(iii) *Merge plans and purchase annuity buy-out:*

- Annuity purchase would be $230M for 1,000 retirees (retirees of Plan A only)
- Funding requirements after annuity purchase:
  - Funded status = ($126M + $220M − $230M) / ($60M + $230M + $25M + $115M − $230M) = 58%
  - Would require cash funding to get up to 80% funded status on a combined basis. Cash requirement = $44M:
    - (80% × $200M) − $116M = $44M
- Insurance premium for 2019 = $950,000 – (1,000 × $500) = $450,000
- Merging plans and purchasing annuities increases cash outlay to $44M + $450,000 = $44,450,000

Recommendation:

- Merge the plans but do not purchase buy-out annuities.
  - Not merging the plans results in 2019 cash requirement = $12,950,000
  - Merging the plans and not purchasing annuities results in 2019 cash requirement = $950,000
  - Merging the plans and purchasing the annuities results in 2019 cash requirement = $44,450,000
  - Therefore, merging and not purchasing annuities results in lowest cash requirement of the three options
  - Also, not purchasing annuities will avoid a settlement charge
  - So, while it will not lower government insurance premiums as the CFO was hoping, it will reduce their cash requirements by more than the savings would be if they merged and purchased the buy-out annuities, which is the overall stated goal of the Company.

(b) Explain the accounting implications of your recommendation in part (a).

Commentary on Question:
Most candidates did well on part (b).

Accounting implications of recommendation in part (a):

- Merging of the plans involves combing all assets/liabilities and service cost of the two separate plans
  - Merging alone should not affect total expense
- Merging of the plans does not trigger a settlement under IAS 19, as opposed to annuity purchases that would trigger a settlement charge equal to Settlement charge = cost of annuities – DBO released

5. **Continued**

- There would be no remeasurement as opposed to an annuity purchase, that being a settlement, would trigger a remeasurement under IAS 19 (as revised in 2018) whereby P&L expense would be remeasured for the portion of the fiscal year after the settlement. However, since annuities would be purchased on the regular annual measurement date of January 1, assumptions would not change
- Merging the plans would not impact annual Defined Benefit Cost recognized in P&L due to change in Net Interest Cost. On the other hand, purchasing annuities would impact annual Defined Benefit Cost recognized in P&L ("expense") due to change in Net Interest Cost:
  - If cost of annuities exceeds DBO released (likely situation), Net Interest Cost will increase
  - If cost of annuities is less than DBO released (unlikely), Net Interest Cost will decrease

(c) Describe how your recommendation would change if buy-in annuities were proposed instead of buy-out annuities.

Commentary on Question:
Most candidates did well on this part.

Purchasing a buy-in vs a buy-out in this situation would:

- A buy-in would not trigger a settlement charge since the annuity contract would be part of the assets
- It would not reduce the merged plan's combined funded status, so would not increase the funding requirement above that of just simply merging the plans
- Buy-in would require higher government insurance premiums than a buy-out
- However, it would add the benefit of reducing volatility in cash and expense in the future as certain risks are transferred to the insurer / annuity provider
- May have the ability to convert to buy-out annuity sometime in the future if funded status improves and reduce government insurance premiums
- The buy-in option is a good recommendation for the plan sponsor. While it does not address the immediate need to reduce cash/expense in 2019, nor reduce government insurance premiums in the near term, it does reduce future financial volatility, especially considering that the merged plan is barely over 80% funded and dipping below 80% will trigger additional funding.

6. **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.

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
(e) Other alternative retirement plans

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

(j) Plan eligibility requirements
(k) Benefit eligibility requirements, accrual, vesting
(l) Benefit/contribution formula, including the methods of integration with government-provided benefits
(m) Payment options and associated adjustments to the amount of benefit
(n) Ancillary benefits
(o) Benefit subsidies and their value, vest or non-vested
(p) Participant investment options
(q) Required and optional employee contributions
(r) Phased retirement and DROP plans
(s) Risk-sharing provisions

(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.

(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.

6. Continued

Sources:
DA-159-16: The OECD Roadmap for the Good Design of Defined Contribution Pension Plans

DA-164-17: Defined Contribution Plan Success Factors

Morneau Shepell Handbook of Canadian Pension and Benefit Plans, Shepell, Morneau, Whiston, Bethune and Clooney, J. Gregory, 16th Edition, 2016: *Ch 1*

Canadian Pensions and Retirement Income Planning, Willis Towers Watson, 6th Edition, 2017: *Chapter 1 (sections 120 – 145)*

Commentary on Question:
This question tests candidates on the different types of capital accumulation plans. It further focuses on the effectiveness of defined contribution plans to provide adequate retirement income and factors to consider when changing the investment offering.

Most candidates did well on parts (a) and (b), but struggled with part (c).

Solution:
(a) Describe the advantages and disadvantages of the following savings vehicles from a participant's perspective:

Commentary on Question:
Candidates received credit for other described not indicated below.

(i) Defined contribution (DC) pension plan

(ii) Deferred Profit Sharing Plan

(iii) Group Registered Retirement Savings Plan

Defined Contribution Plan
Advantages:
- Benefit "locked-in" upon meeting plan rules
- Employer can contribute to a member's account based on deemed earnings
- Employer contributions are not subject to payroll taxes
- Employer contributions are tax deductible
- Investment earnings accumulate before tax

6. Continued

Disadvantages:
- Eligibility depends on plan provisions
- Need to meet “lock-in” requirements
- Withdrawals are taxed

Deferred Profit Sharing Plan
Advantages:
- CRA requires employer contributions to be at least 1% of employees earnings even in years where there is no profit
- Profits allocated to employees on an objective basis (i.e., based on service, earnings, or both)
- Earnings and forfeitures allocated to employees in proportion to their account balances
- Employer contributions not taxable to employees.
- Employer contributions do not attract payroll tax

Disadvantages:
- Employer contributions linked to profitability of company therefore employee may see volatility year-to-year
- Employer contributions subject to 2-year vesting requirement
- Employees not permitted to contribute
- Earnings may also be volatile if the plan is primarily invested in company stock.

Group Registered Retirement Savings Plan
Advantages:
- Immediate vesting
- More flexibility of employer contributions
- No locking-in requirements
- Can contribute to the spousal RRSP, but this impacts the contribution ceiling of the contributor for the RRSP
- Employee contributions are tax deductible
- Investment earnings accumulate before tax

Disadvantages:
- Contribution is included as taxable income and incurs payroll taxes
- Individual’s allowable RRSP contributions are reduced by the value of any benefits earned under registered pension plans or DPSPs
- Withdrawals are taxed

6. Continued

(b) Describe key metrics Company ABC might use in its evaluation.

- Participation rates: A high participation rate of 90-100% ensures the majority of employees are saving for retirement through ABC's program. If participation is low, ABC could consider auto-enrollment/re-enrollment strategies along with reviewing the education of its program.

- Deferral rates: Optimal range is an average total deferral rate between 10% to 15%, which demonstrates the extent to which participants are saving through ABC's program. If deferral rates are low, ABC could review its employer match and consider auto-escalation strategies, along with the education of its program.

- Asset allocation/diversification: Review the extent to which participants are utilizing different investment options offered. If not diversified enough or over diversified, ABC could consider targeted communications to help them make more effective decisions.

- Plan fees: Review plan fees against peer-based benchmarks or other market-based analyses to assess they are at appropriate levels for ensuring participant benefit security.

- Income Replacement Ratio: Review retirement income offered by current plan design as a percentage of employee compensation to determine appropriateness of plan design.

- Retirement Readiness: Review value of DC plan in the context of other sources of retirement income to determine if current offering is adequate for employees to retire.

(c) Describe the factors Company ABC should review in proposing changes to its investment offerings.

- Include professionally-managed investment options such as managed accounts, target date funds, and balanced account options.
- Develop and document the rationale for the DC plan's core investment lineup and QDIA (Qualified Default Investment Alternative)

6. Continued

- Open architecture that allows plan fiduciaries to designate an investment lineup with multiple underlying investment managers and to offer exposure to diverse investment offerings
- Offer a low number of core investment options
- Offer a mix of active and passive investment options
- Exclude or limit company stock
- Review different investment vehicles
- Look at retirement income options (annuity and life insurance products, managed payout funds, and other decumulation strategies)
- Alternative investment strategies
- Assess the appropriate balance of 1) offering investment products, 2) providing access to professional advisors, and 3) providing guidance.

7. Learning Objectives:

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

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

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

Learning Outcomes:

(7a) Evaluate appropriateness of current assumptions.

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

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

(8e) Advise plan sponsors on accounting costs and disclosures for their retirement plans under various standards and interpretations.

(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.).

(9d) Demonstrate compliance with requirements regarding the actuary's responsibilities to the participants, plan sponsors, etc.

(9f) Recognize situations and actions that violate or compromise Standards or the Guides to Professional Conduct.

Sources:

DA 136-17: Selection of Actuarial Assumptions, Consultant Resource Manual, SOA Version, Mercer (excluding pp. 1-4, 14-25, 29-32, and 68-109)

DA-140-15: ASOP 27 - Selection of Economic Assumptions for Measuring Pension Obligations

DA-142-15: ASOP 4, Measuring Pension Obligations and Determining Pension Plan Costs or Contributions

DA 179-19: Introduction (A58), IFRS1 (paragraphs 1-40 & Appendix A), IAS19, IFRIC14

DA-614-19: Practice Specific Standards for Pension Plans 3100-3560, CIA Consolidated Standards of Practice

7. Continued

Commentary on Question:
Commentary listed underneath question component.

Solution:

(a) Critique the following assumptions used in the NOC Full-Time Hourly Union Pension Plan ("Hourly Pension Plan") accounting disclosures:

(i) Retirement Age

(ii) Termination Rates

(iii) Mortality Rates

Commentary on Question:
Candidates generally answered this question well. Most candidates evaluated the assumptions and identified potential improvements. To receive full credit, candidates needed to identify and explain the strengths or weaknesses of each assumption.

Retirement Age

- it may be more appropriate for large plans to use a retirement rate table instead of a single assumed retirement age
- a table of retirement rates produces a more realistic pattern of cash flows
- a more complex granular assumption may not provide material improvements

Termination Rates

- termination rates that vary by service or a combination of age and service are better predictors of turnover
- it is appropriate to evaluate recent Plan experience when setting assumptions
- must have credible historical turnover to develop termination rates

Mortality Rates

- mortality should be projected forward from the measurement date at an appropriate mortality improvement scale to reflect expected future mortality improvements
- it may be appropriate to employ different assumptions for participant sub-groups, beneficiaries and disabled lives

(b) Recommend a course of action to address the CFO's direction.

Justify your response.

7. Continued

Commentary on Question:
To be awarded full marks the candidate must recommend a course of action and provide support that demonstrates compliance with requirements and standards.

Many candidates did not identify that the actuary should use accounting assumptions chosen by the client and indicate if the assumption conforms with the actuary's understanding of the financial reporting standards.

Candidates who indicated they would not perform the work received limited points.

Course of Action

- explain to client why the actuary has recommended the discount rate assumption
- the actuary should use accounting assumptions chosen by the client
- the actuary should indicate in the external user report if the client selected assumptions conform with the actuary's understanding of the financial reporting standards
- The actuary should also provide a qualified opinion on the assumptions in the external user report

Justification

- actuarial assumptions should reflect the management's best estimate of variables that will determine the ultimate cost of providing post-employment benefits
- the actuary should evaluate whether a prescribed assumption set by another party is reasonable for the purpose of the measurement
- an actuary who performs actuarial services shall take reasonable steps to ensure that such services are not used to mislead other parties
- the actuary should determine whether the prescribed assumption or method significantly conflicts with what, in the actuary's professional judgment, would be reasonable for the purpose of the measurement
- if, in the actuary's professional judgment, there is a significant conflict, the actuary should disclose this conflict
- actuarial assumptions shall be unbiased and mutually compatible
- for purposes of this evaluation, reasonable assumptions are not necessarily limited to those the actuary would have selected for the measurement

8. **Learning Objectives:**

1. The candidate will be able to analyze different types of registered/qualified retirement plans and retiree health plans.

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

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) Defined contribution and savings plans
(c) Hybrid plans
(d) Retiree Health plans
(e) Other alternative retirement 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
(j) Risk-sharing provisions

(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.

(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.

8. Continued

(5e) Identify the ways that regulation impacts the sponsor's plan design goals.

(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:
DA-617-16: The TFSA: A Practical Addition to You Client's Savings Portfolio

Commentary on Question:
This question tests candidates' understanding of TFSAs and RRSPs.

Solution:
(a) Compare and contrast the features of Tax-Free Savings Accounts (TFSAs) and Registered Retirement Savings Plans (RRSPs).

Commentary on Question:
Most candidates did well on part (a). Candidates had to compare and contrast eight features to receive full credit.

Candidates received credit for other features that were appropriately compared and contrasted.

<u>Contribution rules</u>

- TFSA
  - limit $6,000 unrelated to income withdrawals restore room
  - Unused contribution room can be carried forward indefinitely
  - no age limit to contributions/withdrawal
- RRSP
  - limit 18% of previous year's pay up to $26,500 (2019)
  - limit reduced by pension adjustment if in DB or DC registered pension
  - plan must convert to RRIF at the end of the year of the 71st birthday
  - Unused contribution room can be carried forward indefinitely

8. **Continued**

Income tax treatment

- TFSA
  - contributions not tax-deductible
  - Investment income not taxable
  - withdrawals not taxable
  - Penalties for over-contributions
  - withdrawals do not affect federal income-tested benefits and tax credits
- RRSP
  - contributions tax-deductible
  - Investment income not taxable
  - withdrawals taxable
  - Penalties for over-contributions
  - withdrawals affect federal income-tested benefits and tax credits

Loans

- TFSA
  - Plan can be used as collateral for loans
  - It is not advantageous because interest is not deductible
- RRSP
  - Plan cannot be used as collateral for loans

Investments

- Any types of investments allowed for both

Spousal plans

- TFSA: Individual can give money to spouse for contributions
- RRSP: Contributions affect contribution ceiling of the payer

Eligibility

- TFSA: Residents 18 or above
- RRSP: Residents earning a salary

Death

- TFSA: No tax impact if spouse designated as sole beneficiary
- RRSP: Amounts may be transferred to surviving spouse's RRSP with no tax impact

Divorce

- For both, amounts can be transferred with no tax impact
- TFSA: No impact on contribution limit; room not reinstated by transfer to other spouse

8. **Continued**

(b) Recommend whether group TFSAs or group RRSPs would be more appropriate for the participants in the following plans:

(i) National Oil Full-Time Salaried Pension Plan

(ii) National Oil Part-Time DC Pension Plan

Justify your response.

Commentary on Question:
Successful candidates analyzed the demographics of both plans and commented on the impact of the recommended arrangement on the members.

Candidates received credit for other recommendations that were appropriately supported.

Some candidates struggled with part (b), as they did not address the question in the context of Gevrey or NOC.

Analysis of demographic and income levels before deciding whether to use RRSP or TFSA

- Salaried: high income, older demographic
- DC: young, lower-paid demographic, etc.

(i) National Oil Full-Time Salaried Pension Plan

Recommend group RRSP

- More suitable to higher-paid individuals, such as the Salaried employees
- Additional retirement savings for clients with deeper pockets
- Investors who used up all their RRSP contribution room can use the TFSA as an alternative tax-effective retirement savings vehicle
- Since this is Gevrey, there is no pension adjustment
- RRSP defers tax, but same tax of 40%, so no difference
- RRSP offers more options such as annuity purchase or RRIF

8. Continued

(ii) National Oil Part-Time DC Pension Plan

Recommend group TFSA

- TFSA may be more advantageous than an RRSP if it is anticipated that the income tax rate will be higher during retirement, which is the expectation for the DC employees who are currently in a low-income tax bracket
- Contributions can be transferred to an RRSP later, resulting in a potentially substantial tax refund.
- Offers tax-free withdrawals
- May provide mechanism to deal with contributions above TFSA maximum, e.g. RRSP or taxable account
- Simpler, more flexible with tax advantage
- TFSA for a more mobile PT workforce that may need access to funds

9. Learning Objectives:

1. The candidate will be able to analyze different types of registered/qualified retirement plans and retiree health plans.

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

Learning Outcomes:
Describe the structure of the following plans:

(a) Traditional defined benefit plans
(b) Defined contribution and savings plans
(c) Hybrid plans
(d) Retiree Health plans
(e) Other alternative retirement plans

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

Sources:
Canadian Pensions and Retirement Income Planning, Willis Towers Watson, 6th Edition, 2017, Ch. 1 (sections 120 – 145)

DA-604-13: Canadian Pension Plan Design

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a) Describe reasons an employer may offer a flexible pension plan.

Commentary on Question:
To receive full credit, candidates had to describe 4 reasons an employer may offer a flexible pension plan.

Other reasons not listed below that were appropriately described received points.

- enables employees to make tax deductible contributions on a voluntary basis to enhance the value of their pensions
- allows for higher pension accumulation at little or no additional cost to the employer
- Pension Adjustment for employees is based on defined benefit formula & employee contributions are used to fund ancillary benefits, which do not affect the PA
- provides greater flexibility and choice to plan members

9. Continued

(b) Explain the differences between a front-end flexible pension plan and a back-end flexible pension plan.

Commentary on Question:
Many candidates struggled on this part.

Front end:

- members elect to contribute a pre-determined amount up front, in exchange for a set of pre-defined ancillary benefit
- most front-end plans are designed as two or more provisions within one defined benefit pension plan, a basic benefit and enhanced benefit. Members elect whether to remain in basic provision or contribute to a higher amount and participate in enhanced provisions. Both the basic and enhanced provisions generate the same PA.
- Front-end is not as common as back-end

Back-end:

- members are permitted to make contributions to a flex account, which accumulates with interest on a tax deferred basis and it is ultimately used to purchase ancillary benefits upon retirement or termination. The selection of ancillary benefits or combinations thereof takes place at retirement. Actuaries determine the value of the ancillary benefit based on age, spouse's age and actuarial assumptions.
- More flexible than front end, as members may contribute any amount up to the maximum annual limit (vs a fixed contribution in a front end plan)

(c) Describe four situations that could cause an employee to be impacted by the "use it or lose it" condition in a back-end flexible pension plan.

Commentary on Question:
Other reasonable scenarios are acceptable. However, the following ancillary benefits would not be a missed opportunity to "use it".

- *final average earnings – indexed or reducing the number of years in the Final Average Earnings*
- *extending the guarantee period, without decreasing the pension amount*
- *Indexing pre & post retirement – index with average wages pre-retirement or inflation postretirement*

Situation: investment returns are greater than expected. Justification: balance accumulated during active working years and is higher than necessary to purchase additional desired benefits
Situation: attained age past early retirement Justification: no longer have the ability to receive early retirement subsidy

9. Continued

Situation: over age 65 Justification: aged out of ability to receive bridge benefit (temporary benefit payable until 65)
Situation: not married Justification: No ability to elect joint & survivor benefit if unmarried at retirement

(d) Calculate the amount the member should contribute each year to their flexible pension plan in order to purchase post-retirement indexation at age 55.

Show all work.

Commentary on Question:
Most candidates did well on this part.

The question explicitly states that Member makes contributions at beginning of each year. Therefore, no points were awarded for middle of year timing. Partial credit was awarded where applicable.

Commuted Value of benefit without indexation = 2,000 * 12 * 15.5
= 372,000

Commuted Value of benefit with indexation = 2,000 * 12 * 20.0
= 480,000

Value of Indexation = 480,000 – 372,000
= 108,000

108,000 = 95,000*(1.05)^2 + X * [((1+ i) ^ n) -1 / i] / (1 + i), OR
108,000 = 95,000*(1.05)^2 + X*(1.05^2) + X*(1.05)

X = $1,515.68 per year

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

(8e) Advise plan sponsors on accounting costs and disclosures for retirement plans under various standards and interpretations.

Sources:

DA-170-17: Accounting for Buy-Ins

DA-179-19: Introduction (A58), IFRS1 (paragraphs 1-40 & Appendix A), IAS19, IFRIC14

Duration and Convexity for Pension Liabilities, Pension Section News Issue #81, Sep 2013

Pension Risk Transfer: Evaluating Impact and Barriers for De-Risking Strategies, pp. 16, 17 & 20-27

Commentary on Question:

This question tests candidates' understanding of accounting for a settlement under IAS 19. Candidates were also expected to know how to adjust liability using duration.

Solution:

(a) Calculate the 2019 Defined Benefit Cost under International Accounting Standard IAS 19, Rev. 2011(IAS 19).

Show all work.

Commentary on Question:

Credit was given for either simple or compound interest calculations.

10. **Continued**

The pension plan is frozen, so service cost is $0.
Interest on DBO = (125,000,000 x 0.05) – (10,000,000 x (1.05^.5-1)) =6,003,049
Interest on assets = (100,000,000 x 0.05) - (10,000,000 x (1.05^.5-1)) +(25,000,000 x (1.05^.5-1)) = 5,370,426
Defined Benefit Cost = service cost + interest on DBO - interest on assets = *0* + 6,003,049 – 5,370,426 = $632,623

(b) Identify advantages and disadvantages of implementing this strategy.

No calculations required.

Commentary on Question:
Most candidates did well on this part. Other relevant responses not listed below also received credit.

- An annuity purchase can be used as a risk mitigation technique since the overall size of Company XYZ’s pension obligation will be smaller after the annuity purchase.
- An annuity purchase consisting of retirees with small dollar amounts can have additional benefits to Company XYZ, since there are fixed administrative costs associated that are paid as a result of administering the benefits (for example PBGF premiums, trustee expenses) that represent a larger proportion of the underlying benefit obligation for these retirees. As a result, there could be an economic savings since the present value of benefits and expenses associated with a small dollar retiree may be less (or similar to the amount of) than the premium charged by the insurance carrier.
- This contrasts with larger scale annuity purchases, where the annuity purchase premium may represent a larger load on the current obligation than the present value of expected expenses.
- Reduces Company risk of mortality, investment returns and credit default or downgrades for those where annuity is purchased and risk is transferred to insurer
- Company XYZ may trigger a settlement under ASC 715 if the total amount of the annuity purchase exceeds the settlement threshold.

10. **Continued**

(c) Calculate the 2019 Defined Benefit Cost under IAS 19 reflecting the annuity buy-out.

Show all work.

Commentary on Question:
Some candidates struggled with this part.

Credit was given for both simple and compound interest calculations.

<u>Determination of liability loss</u>

Expected liability at 9/30/19 = 125,000,000 + (6,003,049 x 9/12) – 7,500,000 = 122,002,287

The remeasured liability at 9/30/19 reflecting the discount rate change was not provided, but can be derived using the information given.

Liability associated with the annuity purchase is $28,500,000. It is implied that this was developed using the 9/30/19 discount rate of 4%. Since the duration for this group is 10, the corresponding liability at 5% is estimated as 28,500,000/1.1 = 25,909,091.

Liability for participants not part of the annuity purchased at 5% = 122,002,287 – 25,909,091 = 96,093,196.

The liability for this group at 9/30/19 using a discount rate of 4% and duration of 15 can be estimated as 96,093,196*1.15 = $110,507,175.

Liability loss for change in discount rate = (28,500,000 – 25,909,091) + (110,507,175 – 96,093,196) = 17,004,888

Loss from annuity purchase = 30,000,000 – 28,500,000 = 1,500,000

<u>Determination of assets loss</u>

Expected assets 9/30/19 prior to the annuity purchase = 100,000,000 + 5,370,426 x 0.75 – 7,500,000 + 25,000,000 = $121,527,820

Loss on assets = 121,527,820 – 110,000,000 = 11,527,820

10. Continued

<u>Determination of DBC from 10/1/2019 – 12/31/2019</u>
Expected contributions 10/1/2019 – 12/31/2019 = assume 0 contributed 25,000,000 which was same as original expectation
Asset after annuity purchase = 110,000,000 – 30,000,000 = 80,000,000
Liability after annuity purchase = 110,507, 175 (calculated above)

Interest cost 10/1/2019 – 12/31/2019 = (110,507,175 - 80,000,000) * (1.04^0.25-1) = 300,600

Defined Benefit Cost 2019 = Defined Benefit Cost for first 9 months + interest cost in Q4 + loss from annuity purchase = 632,623 x 0.75 + 300,600 + 17,004,888 + 11,527,820 + 1,500,000 = 30,807,775

(d) Propose an alternative approach that would decrease or eliminate the impact while still achieving the advantages of an annuity buy-out.

Justify your response. No calculations required.

Commentary on Question:
Successful candidates identified an approach, described the impact on the settlement charge, and indicated how the approach would achieve the benefits of the buy-out. Other relevant responses that were appropriately supported received credit.

Company XYZ could use an annuity buy-in option. With a buy-in, the company still manages and pays benefits but transfers risk to an insurer. No settlement would be triggered under a buy-in. The advantages of a buy-out are still achieved with a buy-in (other than reducing PBGF premiums, as still considered participants in the plan) as mortality and interest rate risk are transferred to the insurer, rather than remaining with the sponsor.

11. **Learning Objectives:**

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

Learning Outcomes:

(7a) Evaluate appropriateness of current assumptions.

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

(7c) Describe and apply the techniques used in the development of economic assumptions.

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

(7e) Select demographic and economic assumptions appropriate for a projection valuation.

Sources:

Credibility Educational Resource for Pension Actuaries, Society of Actuaries

Selection of Mortality Assumptions for Pension Plan Actuarial Valuations, CIA Education Note, Dec 2017

Commentary on Question:

This question tests candidates' understanding of credibility and selecting a mortality assumption.

The SOA Study Note "Credibility Educational Resource for Pension Actuaries" indicates that the variability of the data is an important aspect of assessing the credibility of the mortality assumption. That is to say, if there is a large amount of variation in the subject experience, the data will not be very useful in estimating the mortality assumption and thus be given less weighting.

Most candidates struggled with this question, as they only indicated that a large amount of data is needed which is true, but they did not address the variability of the data.

Solution:

(a) Describe considerations, including applicable Actuarial Standards of Practice, for determining the credibility factor applied to a pension plan's actual mortality experience.

11. **Continued**

Consideration should be given to two factors when deciding how much credibility (Z) to assign to the linear estimator formula that combines the relevant and subject experience:

$$\hat{E} = Z \cdot \hat{m} + (1-Z) \cdot \hat{a}$$

. The "accuracy" of the relevant experience (i.e. standard mortality table). If the variability in the "a" is small then there is a high degree of "accuracy" of relevant experience.

More weight can be assigned to "a" and less weight to "m" subject experience (i.e. experience from the specific plan's population).

2. The variability of the subject experience "m". Large amount of variation in "m" may indicate that that experience will not be very useful in estimating the expected value of "m".

Small amount of variation in subject experience (m) indicates that we should assign a large amount of credibility to it.

The availability of large amounts of subject experience data (for "m") is also a consideration as it would result in more accurate estimates, less variability and thus higher credibility.

Detailed data on the individual contributions (such as company name or plan) to the standard mortality table is needed to evaluate the variability of the mortality rates for the individual contributions relative to the estimated composite rates of death from the standard mortality table.

Consider if the information on each subgroup is actually available to evaluate the accuracy of "a".

Consider comparing mortality experience between each subgroup to validate whether separate adjustments should be made.

Consider the size of the plan and the amount of data available to develop the best estimate of the current levels of mortality.

Consider adjustments based on characteristics such as collar type, industry and pension size

Consider the preferred approach to reflect actual credible plan experience rather than standard tables.

11. Continued

Consider using data from populations with comparable socio-economic indicators to the plan where the plan's own mortality experience is not fully credible.

Consider modifying published tables to reflect actual, credible experience of the union rather than applying data from published mortality table to adjust for plan characteristics.

Consider if characteristics of the pension plan's membership if significantly different from the data used in the standard tables, if not, then adjustments may not be required.

Consider not using adjustments if there is no credible plan experience to suggest the actual experience is different from standard tables.

Consider the shape of the subject experience as compared to the standard tables since simply shifting the table would not appropriately reflect the pension plan experience.

(b) Describe the procedures to modify the plan-specific mortality table to reflect the experience of a single union within the MEPP.

The following procedures using credibility modify the plan's mortality table to reflect the experience of a unionized subgroup within the MEPP.

1) Collect Data - Specific company mortality data provide the experience-based results needed for weighting with the relevant experience.

Isolate data collection to pensioners

Decide if single mortality study can be performed or if separate studies are needed.

Actuarial judgment is necessary to decide whether different mortality adjustments (and, thus, separate mortality studies) are required for different subgroups.

Consider splitting plan experience by gender.

Consider the number of years of experience to include in the study. Generally, three to five years is a good rule of thumb to use in an experience study.

Consider the ages of retirees or beneficiaries included in the study. For traditional plans with clearly defined retirement eligibility, the group included in the study will, for the most part, automatically be limited by the age of earliest retirement eligibility (usually 50 to 55 and above).

11. Continued

2) build the mortality table - the actuary would need to estimate qx at each age

3) Select the standard valuation mortality table to blend with the subject experience

4) Apply generational projections

5) Adjust standard table to reflect plan experience - decide whether to use GACT method or LFCT method

In constructing a plan specific mortality table, separate credibility analyses may need to be performed for each subgroup within the plan. That is to say, each union's own subject experience and standard mortality table be used to determine the adjustment factor

12. Learning Objectives:

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

Learning Outcomes:

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

Sources:

DA-169-17: Mergers and Acquisitions: Key Considerations for Retirement Plan Conversion

DA-130-13: International (Offshore) Pension Plans – A growing trend

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Describe the investment features that must be considered if Company ABC merges the two DC pension plans.

Commentary on Question:
Some candidates struggled with this question, as they described features that are not investment related. Successful candidates described the investment features from the context of a plan merger.

The following investment features should be considered if the two DC plans will be merged:

- The investment lineup
  - Determine whether the Company ABC investment lineup will be sufficient for the Company XYZ population.
  - Are there important differences in the types of investments used by the two populations?
  - Compare the plans for similar investment options. Is there savings to be had from lower cost alternatives or economies of scale?
- Withdrawal fees and early termination fees
  - Will any investments impose a charge for terminating the contract early?
  - If so, who will bear the cost?

12. Continued

- Decision making tools
  - Are participants receiving enough guidance to make informed decisions about their retirement?
  - What default option is best for this population?
  - Are target date funds or managed accounts a good fit for this population?
  - How frequently are participants given the opportunity to reinvest?

(b) Describe Company ABC's considerations when developing a communication strategy for merging the two DC pension plans.

Commentary on Question:
Successful candidates described considerations of a communication strategy from the context of merging two plans.

In developing a successful communication strategy, Company ABC must:

- Consider the new workforce when developing communications:
  - Consider the work habits of the acquired employees
  - The new workforce may have different expectations of the level and frequency of communications
- Identify the impact of the plan changes on plan participants. If a particular group is impacted differently, consider changing the communications accordingly.
- Plan the timing of key communications mindfully:
  - Don't send important communications over holidays or during peak production season.
  - Ensure a smooth transition for employees that are set to retire in the near future
  - Make employees aware of any "blackout" periods.
- Consider the best means of delivering information:
  - E-mail or letter? Employees may be more likely to read an email, but may be able to give more time to important documents at home.
  - Should Company ABC provide personal statements?
- Consider ways to promote interest and enthusiasm in the changes:
  - Webcasts may be the most effective tool if there are a lot of mobile employees at Company XYZ.
  - Town halls or group meetings can be an effective way to answer questions and address concerns.
- Enlist key employees to champion the changes and ensure participants understand the changes to the plan. Manager endorsement can be key to employee buy-in.

12. Continued

(c) Explain why Company ABC might consider terminating the international pension plan.

Commentary on Question:
Many candidates commented that Company ABC may wish to terminate the international pension plan because it is unfunded. This received no credit, as the funded status of the plan was not provided and funding the plan is at the employer's discretion.

Company ABC may consider terminating the international pension plan if:

- There are not enough expatriates in the combined workforce to merit keeping the plan
    - The cost-per-head can be expensive if there is not a critical mass to run the program
    - Company ABC does not hire employees on an ex-pat contract
- After the acquisition, there is reduced competition for expatriates and the plan is no longer necessary as an attraction and retention tool
- Home and host country retirement plan provisions are flexible enough to meet the needs of employees moving locations
- Contributing to the plan is not tax effective; there are other ways to deploy capital that would be more cost effective and require less administration
- There is no need to provide top-up provisions

13. **Learning Objectives:**

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

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

Learning Outcomes:

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

(3b) Describe and contrast the risks face by participants of:
- (i) Government sponsored retirement plans
- (ii) Single employer sponsored retirement plans
- (iii) Multiemployer retirement plans, and
- (iv) Social insurance plans

(3d) Propose ways in which retirement plans and retiree health plans can manage the range of risks faced by plan participants and retirees.

(5b) Assess the tradeoffs between different goals.

(5f) Design retirement programs that manage retirement risk and are 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:

DA-174-18: An Improved Application of the Variable Annuity

Commentary on Question:

This question test candidates' understanding of variable annuity payout options.

Most candidates did well on this question.

Solution:

(a) Describe how a variable annuity payout option in a defined benefit pension plan can be used to manage retirees' inflation risk.

13. Continued

- Plan administrator establishes a hurdle rate
- The hurdle rate is the pension plan fund's targeted real rate of investment return.
- The difference between the hurdle rate and the plan fund's actual investment return is used to adjust monthly pensioner payments each year
- Example, if hurdle rate is 4% per annum and actual investment returns for a particular year are 6%, members would receive a 2% increase in their monthly pensions.
- It is effective if the selected hurdle rate is close to the average real rate of return of the plan's underlying assets over the long-term.
- In that way, the pension increase average will be close to the average rate of inflation over the long term.
- With a well selected hurdle rate that approximates the pension plan fund's real rate of return, and well managed investments, variable annuities have performed very well and average annual pension increases have been comparable to inflation over time.
- The variable annuity can result in volatile adjustments to pensions in pay when investment markets are volatile.

(b) Describe two approaches to minimize the volatility of variable annuity payouts in a defined benefit pension plan.

Commentary on Question:
Candidates received credit for describing other relevant approaches.

Averaging Mechanism

- Introduce an averaging mechanism to stabilize the year by year pension increases/decreases under the variable annuity
- accomplished by using a five-year recognition of each annual adjustment
- calculate annual adjustment over a five-year period that would change the pensioner liabilities by exactly the difference between the actual investment return and the agreed upon hurdle rate
- Example: if the actual change in the market value of assets was 2% more than the hurdle rate, then there would be an increase scheduled of a little more than 0.4% each year for the next five years. In the following year, the new "adjustment" would be added to the existing adjustment. For example, if the actual change in the market value of assets was 1% less than the hurdle rate, then this year's increase would be 0.2% (i.e. an increase of 0.4% carried forward from last year and a decrease of 0.2% from this year's results).

13. **Continued**

Longevity Risk Control

- Introduces a longevity risk control mechanism by introducing the concept of a "hurdle annuity".
- The hurdle annuity for any member would be determined using the "hurdle rate" and the "hurdle mortality assumption" that is established for the pension plan.
- In this way the hurdle annuity would be uniquely defined for any pensioner and the liability for each pensioner would be equal to their "hurdle annuity"
- Determine the ratio of the assets held for each pensioner at the end of the year to the liability
- For example, if the total assets exceed the sum of the "hurdle annuity" for all of the pensioners by 2%, then we would schedule increases equal to 2% in aggregate over the next five years.

14. Learning Objectives:

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

Learning Outcomes:

(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

Sources:

The Next Evolution in Defined Contribution Retirement Plan Design: A Guide for DC Plan Sponsors to Implementing Retirement Income Programs

Commentary on Question:

This question tests the candidates' understanding of retirement income generator options.

Overall, candidates answered parts (a) and (b) well; candidates struggled with parts (c) and (d).

Solution:

(a) Explain why a plan sponsor may want to include retirement income generator options within their Defined Contribution (DC) pension plan.

Including a retirement income generator will:

(i) Improve the retirement security of plan members by assisting employees in managing retirement risk
(ii) Retain the assets in the plan, which can help drive down per-capita administrative costs
(iii) Enable workforce succession by helping older workers retire "gracefully", thus improving productivity and morale
(iv) Enhance the employer brand as a desirable place to work

(b) Explain the advantages of the following retirement income generators from the employees' perspective:

(i) Investment earnings

(ii) Systematic withdrawals

(iii) Annuity purchase

14. **Continued**

(i) Investment earnings – principle is available for inheritance, employee has investment control

(ii) Systematic withdrawals – remaining assets (if any) are available for inheritance, employee has investment and withdrawal control

(iii) Annuity purchase – lifetime retirement income is guaranteed

(c) Describe the specific features that a plan sponsor should consider when evaluating which retirement income generators to include in their DC pension plan.

Commentary on Question:
Many candidates struggled on this part, as they focused on demographic and employee group traits and characteristics, rather than "features" of an RIG.

Features of an RIG to consider:
(i) Amount of initial income – comparison among different RIG options
(ii) Lifetime guarantee – is the income guaranteed for life?
(iii) Post-retirement indexing – is there potential for the retirement income to increase after retirement to address inflation risk?
(iv) Pre and post-retirement decreases – potential influence of investment volatility before and after retirement
(v) Access to savings – can election be changed, and assets be accessed after retirement income starts?
(vi) Inheritance potential – any remaining assets on death?
(vii) Investment control – who controls investments?
(viii) Withdrawal control – who controls withdrawal amounts?

(d) Evaluate the trade-offs between the following retirement income generators in a DC plan from the employer's perspective:

(i) Systematic withdrawals

(ii) Annuity purchase

Commentary on Question:
Many candidates struggled on this part, as they focused on the employee perspective, as opposed to the employer perspective.

14. Continued

From the employer's perspective:

(i) Systematic withdrawals

  a. Pros: in-plan solution increases assets under management which reduces the unit cost for administration
  b. Cons: retirees think income is guaranteed for life when it is not, and they may be surprised (or angry) to learn of the lack of guarantee. Also, increased maintenance as funds must be managed/kept until the last retiree passes

(ii) Annuity purchase

  a. Pros: easy maintenance and easy for retirees to understand, lifetime guarantee ensure retirees will not outlive their savings
  b. Cons: annuity products typically cannot be changed prospectively if the offering no longer meets the needs of participants, the plan sponsor may be exposed to fiduciary liability (i.e. on insurance company insolvency)