

RET DAC Model Solutions

Fall 2016

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

Learning Outcomes:

- (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
- (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

Sources:

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

Commentary on Question:

Successful candidates needed to specifically state how the participant and company bear the risk in part (a). Stating that one party bears the risk does not imply that the other bears no risk. In Part (b), successful candidates needed to describe the Retirement Income Generator and how it addresses the longevity risk to get full points. Candidates struggled to get full points because they did one or the other and not both. Simply describing the Retirement Income Generator does not explain how it addresses the longevity.

1. Continued

Solution:

(a) Describe the following risks from the perspectives of the participants and Company ABC:

- Investment risk
- Retirement risk
- Longevity risk

Investment Risk:

- Participant bears all of the investment risk because all of the investment decisions are made by the participant and those decisions directly affect their retirement income.
- Company bears no investment risk.

Retirement Risk:

- Participant may not be able to retire at a desirable age if investments have not done well enough or if they haven't saved enough
- Company bears this risk by having no workforce planning mechanism in the defined contribution plan. Employees may not retire when planned, which could be earlier or later than desired. This would leave the company with a loss of talent or unengaged employees.

Longevity Risk:

- Participant bears the risk of outliving their assets.
- Company bears no longevity risk.
Defined contribution is an account value belonging to the participant. Once they retire the participant must manage their own payouts or purchase an annuity.

(b) Explain how each of the Retirement Income Generators listed below addresses the longevity risk the participants face:

- Managed payout fund
- Immediate fixed income annuity
- Longevity insurance

1. Continued

Managed Payout Fund:

- Mutual fund that invests retirement savings and pays out principal and investment earnings according to a specified strategy. May be calculated to last for the expected lifetime, which is recalculated each year.
- Reduces longevity risk by removing the participant's involvement in the decision of withdrawing money, but does not eliminate the risk since there is no guarantee if investment experience is poor or if the retiree lives well beyond life expectancies.

Immediate Fixed Income Annuity

- An annuity guaranteeing a fixed monthly payment, starting immediately, paid for the life of the retiree
- Eliminates all longevity risk by guaranteeing payments for the life of the participant.

Longevity Insurance:

- A deferred annuity usually purchased at retirement but starts at an advanced age, such as 80 or 85. Once the participant reaches the advanced age the annuity will provide fixed payments for the remainder of the participant's life.
- Reduces longevity risk, but there still remains the risk of assets lasting until the advanced age.

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

Sources:

Retirement Plans – 401(k)s, IRAs and Other Deferred Compensation Approaches

Morneau Shepell Handbook of Canadian Pension and Benefit Plans

Towers Watson Canadian Pensions and Retirement Income Planning

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

Commentary on Question:

Successful candidates covered each topic listed below.

2. Continued

Solution:

- (a) Explain why Company DEF may consider establishing an International Pension Plan instead of establishing local/host country pension plans.
- Increased number of expat employees and benefit fragmentation—over the course of a career, employees can be based in multiple locations, resulting in fragmented or no retirement benefits at all.
 - Competition—employees who are globally mobile expect to receive retirement benefits. In many cases, expats are high performers and companies wanting to offer a competitive benefits package will often include an IPP.
 - Lack of home/host country provisions—expats may be employed in locations without a domestic company pension plan or are posted to countries with no plan.
 - Top-up provision—an IPP can facilitate the provision of supplementary benefits for key international employees. This can apply to the replacement of company benefits as well as to offsetting any loss of social security benefits caused by mobility.
 - Administrative efficiency and simplicity—may be easier and more cost-efficient to provide benefits to these employees in one plan versus a possible mosaic of local plans. Company DEF may also benefit from economies of scale.
 - Response to legislation—some IPPs are introduced in response to changes in legislation (e.g., the Institutions for Occupational Retirement Provision Directive in Europe). In some cases, depending on the interpretation of the term of the Directive by local competent authorities, expats who may have triggered cross-border status for plans were removed from their home plans and placed into an IPP.
- (b) Describe the issues with respect to an International Pension Plan from the perspectives of the employees and Company DEF for each of the following:
- (i) Design/governance
 - (ii) Tax effectiveness
 - (iii) Funding

2. Continued

Commentary on Question:

There is a variety of valid responses to this question. The solution below is a sample and is not intended to be an exhaustive list of potentially legitimate issues.

- (i) Design/governance
Perspective of employees
- Prefer the benefit level and structure be competitive and portable
 - Replacement ratio (adequacy) of the benefit will depend on the country in which the employee chooses to retire
 - Benefit could be paid as a lump sum at retirement and not an annuity—would need to be managed into retirement
- Perspective of Company DEF
- Eligibility—carefully determine who will participate; monitor to ensure it is not used as a catchall solution
 - Structure—consider laws and cultural norms in countries where employees will be posted
 - Benefit levels—consider existing government-provided benefits, if any
 - Investment governance—determine integration with current governance model and who will be in charge of monitoring/controlling investments
- (ii) Tax effectiveness
Perspective of employees
- Contributions (if any) may not be tax exempt or deferred
 - If benefit is taxed when received, there's uncertainty of where that will be and the resulting tax impact
- Perspective of Company DEF
- Taxation of program is a grey area depending on host and home country
 - Tax efficiency of pre-funding depends on whether employer contributions and/or investment earnings are tax deductible
- (iii) Funding
Perspective of employees
- If plan is unfunded, benefit is less secure
 - Even if plan is funded, security of benefit depends on funding mechanism (e.g., whether or not an earmarked trust is used)
 - How is taxation treatment affected by funding method?

2. Continued

Perspective of Company DEF

- If funded, whether to use a trust or insurance arrangement
- If unfunded, expected benefit payments and cash flow need to be budgeted and assigned to different locations/operations
- Benefit can be very expensive (requiring large cash funding) versus host country benefits

3. 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:

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

Sources:

Retirement Plans - 401(k)s, IRAs and Other Deferred Compensation Approaches, Allen, 11th Edition Ch. 2 & Ch. 3, Ch. 29

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

Fundamentals of Retiree Group Benefits, Yamamoto, Second Edition Ch. 1 & Ch. 4 (excluding pp. 89-110)

DA-102-13: Evaluating the Design of Private Pension Plans: Costs and Benefits of Risk Sharing

DA-103-13: Risk Allocation in Retirement Plans: A Better Solution

DA-109-13: Seven Steps Toward Creating a Standout Retirement Savings Plan, pp. 13-16

DA-117-13: Sharing Risk: The Netherlands' New Approach to Pensions

New Retirement Plan Designs for the 21st Century, Pension Forum, December 2008, pp. 41-56 (include commentary and responses)

3. Continued

Commentary on Question:

Successful candidates provided a recommendation of a plan design and plan enhancements along with reasons for why it was better overall.

Some candidates struggled with fully addressing both the second goal (Provide predictable retirement income for long service employees) and fourth goal (Provide valuable benefits with predictable company costs). The second goal is concerned with providing predictable retirement income, not with rewarding long service employees. For the fourth goal, a number of candidates addressed the valuable benefit provided but failed to address the predictable company costs element of the goal.

Solution:

- (a) Critique each option with regard to Company XYZ's objectives.

Commentary on Question:

To receive full credit for part a, candidates needed to address each of the 4 goals with respect to both options and explain why the plan features were or were not meeting sponsor goals (not just list features).

- Option 1
 - a. Attract younger employees
 - i. Hourly union plan pays term benefit as lump sum (attractive to mobile workforce who may leave before retirement)
 - ii. DC plan pays benefit as lump sum (attractive to mobile workforce)
 - iii. DC plan provides immediate vesting (attractive to mobile workforce who may not intend to work many years)
 - b. Provide predictable retirement income for long service employees
 - i. Hourly plan benefit payable as monthly annuity to participants who retire
 - ii. Defined benefit formula for hourly piece is straightforward so participants know how much they will receive each month in retirement
 - iii. DC plan benefit is payable as lump sum so does not meet this objective

3. Continued

- c. Encourage employees to save their own money for retirement
 - i. Hourly plan benefit does not encourage (or discourage) employees savings – employee contributions not allowed for DB
 - ii. DC plan allows employees to defer 1-20% of pay with favorable tax treatment, depending on what employee wants to do
 - iii. Company match isn't dependent on employees deferring, so could be designed to better encourage employee savings
- d. Provide valuable benefits with predictable company costs
 - i. Hourly plan is DB so still subject to longevity and interest rate risks that make company costs less predictable
 - ii. DC plan company costs are very predictable: 3% of pay
- Option 2
 - a. Attract younger employees
 - i. 5% employer contribution: benefit appears to be defined as account balance which is attractive to younger employees
 - ii. 5% employer contribution: benefit not dependent on employees making own contributions which could be attractive to younger employees with lower salaries
 - iii. DC match: DC benefit will be payable as a lump sum which is attractive to younger employees
 - b. Provide predictable retirement income for long service employees
 - i. 5% employer contribution: guaranteed annual return of at least 4% should lead to decent, and somewhat predictable account balance at end of career
 - ii. Both parts of plan seem to be payable as lump sum rather than as guaranteed annuity streams – so won't provide predictable retirement income unless annuitized
 - c. Encourage employees to save their own money for retirement
 - i. 5% employer contribution: does not encourage (or discourage) employees savings
 - ii. DC match provides 50% match on employee savings, so employees are strongly encouraged to contribute
 - iii. DC match allows employees to defer up to 10% of pay with favorable tax treatment, depending on what employee wants to do

3. Continued

- d. Provide valuable benefits with predictable company costs
 - i. 5% employer contribution: company cost is fairly predictable since based on set percentage of annual salary
 - ii. 5% employer contribution: minimum 4% return guarantee adds some interest rate risk to company costs, making them less predictable
 - iii. DC match: company cost is fairly predictable since based on straight deferral match each year (only unknown is how much employees will choose to defer)

- (b) Recommend one of the two plan design options.

Justify your response.

Commentary on Question:

Candidates could choose either option and receive full credit as long as they adequately justified their choice, explaining why the option they recommended better met the plan sponsor's set of goals than the other option. The model solution shown below reflects a recommendation of option 1, but candidates were awarded points for either option as long as it was supported.

- Option 1 meets all 4 company objectives, through one of the two pieces
 - Providing DC benefit piece with immediate vesting helps attract younger/shorter service workers
 - Providing DC benefit piece payable as a lump sum helps attract younger, more mobile workers
 - Option 1 provides predictable retirement income (while option 2 does not, absent action taken by employees to annuitize)
 - Option 1 allows employees to save/defer to retirement more of their own money (up to 20% vs. 10%) with tax favorable environment
 - Investment and longevity risk for all of DC plan is transferred to employees who choose how to elect funds (so company costs are more predictable)
 - Plan sponsor costs for DB portion of option 1 are fairly predictable since based on fixed dollar multiplier (not impacted by salaries)
 - Both elements combined can provide valuable retirement benefits, assuming employees do elect to make contributions and receive match
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- (c) Recommend changes to the design in part (b) to better align with Company XYZ's objectives.

Justify your response.

3. Continued

Commentary on Question:

Candidates needed to provide recommended changes only to the option they recommended in part b of their answer. To receive full credit, candidates needed to both provide a list of changes and explain why each change would result in better meeting a stated objective of Company XYZ. The model solution below provides sample changes for option 1 since option 1 was recommended in part b above. This list is not comprehensive of all recommendations that could receive credit.

- a. Goal: Attract younger employees
 - i. Change - shorten vesting service for DB portion (currently 5 years) to 2 years to appeal to a more mobile, younger workforce
 - ii. Change - allow loans/withdrawals from DC portion of plan so that younger employees may be more inclined to invest (no risk of trapped money they may need for emergency)

- b. Goal: Provide predictable retirement income for long service employees. This goal can be met by giving employees the option to receive monthly annuity payments at retirement.
 - i. Change - Provide for optional annuitization of DC portion of benefit through plan
 - ii. Change - Provide employees who terminate before retirement the option to take DB benefit as annuity (rather than immediate lump sum)

- c. Encourage employees to save their own money for retirement
 - i. Change - For DC portion of benefit, change employer contribution from automatic 3% to be match based (i.e. provide 50% match on first 6% of employee contributions)

- d. Provide valuable benefits with predictable company costs
 - i. Change - Reduce/remove post-retirement indexation from DB benefit so that future cost of monthly annuities will be better estimated and not subject to inflation risks

4. 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:

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

Sources:

Pension Issues in Mergers and Acquisitions study note

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) Describe the pension plan considerations associated with the following transactions, in the context of corporate mergers and acquisitions:
 - (i) Share Purchase Transactions
 - (ii) Asset Purchase Transactions

Commentary on Question:

A successful candidate explained the difference between these transactions in the context of pension plans.

- (i) The purchased corporation continues as same legal entity but under the control of new shareholders, so the employer-employee relationship does not change.
No regulatory approval is required concerning the pension plan.
The funded status of the pension plan directly impacts the value of shares, so both buyer and seller should complete due diligence process concerning the pension plan.
- (ii) The seller's pension plan is not necessarily transferred to the buyer.
This is a more complex transaction than a share purchase transaction as the buyer has many options for future of pension benefits offered to employees of bought company.

4. Continued

- (b) Describe four options for a buyer with respect to pension plans in an asset purchase transaction and the effect on impacted parties.

Commentary on Question:

There are five possible options. The fifth not shown below is a wrap-around arrangement.

Successful candidates focused on looking at the possible options of whether or not to transfer the pension obligations and not the options for the buyer after accepting transfer of the full pension plan (option four below).

Buyer does not offer a pension plan

- Exposure to pension risk is limited for the buyer
- May require full/partial wind-up of pension plan by the seller
- Could lead to dissatisfaction among transferred employees

Seller retains past-service liability and buyer offers a plan for future service only

- The buyer may establish new pension plan for transferred employees or permit them to participate in existing pension plan
- The seller should not have to deal with windup of the plan since transferred employees have not had their employment terminated
- Employees will receive their final pension from two sources upon retirement

Carve-Out Arrangement

- Transfer assets and liability associated with transferred employees from seller's pension plan to buyer's plan (existing or new plan)
- Requires regulatory consent, which can take years to obtain
- Results in employees receiving 1 pension benefit from 1 one source at retirement

Transfer of Pension Plan

- Buyer assumes all assets and liabilities of seller's pension plan
- Seller gets rid of pension obligation
- Results in employees receiving 1 pension benefit from 1 one source at retirement

- (c) Recommend a retirement plan option she should pursue for employees of Company B, including how it will impact both Company A and the transferred Company B employees.

Justify your recommendation.

4. Continued

Commentary on Question:

A successful candidate could have suggested any legal option. Explanations regarding the impact on Company B or the employees of Company A did not receive marks. Successful candidates were required to make a recommendation to get full marks.

Recommendation: Transfer of Pension Plan – Company A becomes sponsor of Company B DC plan

COMPANY A IMPACT

- Company A assumes all assets and liabilities of bought company's pension plan (for transferred employees and former employees)
- Regulatory approval required but is straightforward transaction for Company A since only changing name of plan sponsor
- Since Company B has fully funded plan, Company B may factor that into the purchase price
- May have employee dissatisfaction if different retirement benefits/payment options are offered to Company A vs. transferred Company B
- Could be more costly since have to administer separate Company B plan in addition to Company A plan

EMPLOYEE IMPACT

- Attractive because get pension benefit from 1 source
- Employees may be happy that there is no change in their current retirement arrangement (or retirement planning) since other aspects of their work are changing due to being transferred to Company A
- Could be more attractive for employees who like/understand current DC arrangement
- Transferred employees may be dissatisfied if Company A does not move them into its existing plan (so they get different bft formula than their new fellow employees)
- Transferred employees may feel less secure in the future of their pension benefits (and continued accruals) since they were in a fully funded plan and are now acquired by Company A that had an underfunded plan

5. Learning Objectives:

1. The candidate will be able to analyze different types of registered/qualified retirement plans and retiree health plans.
3. Candidate will understand how to analyze the risks faced by retirees and the participants 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.

Sources:

DA-152-15

DA-153-15

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

Solution:

- (a) Explain the advantages of the Association of Canadian Pension Management (ACPM) Target Benefit Plan concept (TBP) compared to a traditional defined benefit pension plan from the perspective of the plan sponsor.
 - Funded on a similar basis as to MEP (e.g. fixed employer contribution and fixed benefit)
 - Accrued benefits can be increased or decreased over time if funded status excessive or insufficient

5. Continued

- Removes funding risk caused low interest and annuity rates
 - Not responsible for investment risk in complex and volatile investment markets
 - Retirement patterns less tied to market performance
 - Defined pension attractive for retention
 - More workforce management flexibility
 - Fixed cost remove contribution volatility

 - No volatility of pension expense and balance sheet impacts
 - Financial statement impact of mark to market accounting

 - No solvency or wind up cost variability
 - No PBGF premium (Ontario)
 - Plan causes fewer issues and is more portable under employer M&A activity
- (b) Explain how the TBP may improve retirement outcomes for pension plan participants compared to a defined contribution pension plan.
- Evidence suggests DC members must delay retirement due to insufficient savings
 - Decline in participation rates of DC and group RRSPs
 - Coverage and benefit adequacy problem for significant share of population
 - Viable, sustainable pension model means lower likelihood of termination

 - Significantly higher expected (target) benefit for same cost via risk sharing
 - Pooling of longevity risk, no risk of outliving assets
 - Pooling of investment risk – studies show member own investing underperforms professional investments

 - Easier to plan retirement because target benefit is formula-based
 - More predictable stream of income compared to LIF withdrawals

 - Retirement date sensitivity risk is low – because account balances can be volatile. Asset pooling and target formula is predictable

 - No conversion risk to annuity at rates prevailing at the time of retirement
 - Annuity rates, with margins for profit and anti-selection, are less attractive
 - Indexed annuities not available at competitive cost
- (c) Describe information that should be communicated to help members understand the risks of the TBP.

5. Continued

- Must inform members of nature of TBP, with possible benefit reductions
- Communication at regular intervals (at least annually) to active, retired and deferred members
- Communicate during membership, on conversion, enrollment, termination and retirement; also spouse and beneficiary
- Clear, plain language statement the employer contributions are fixed

- Benefits may be reduced
- Reduction may apply to accrued and future accruals

- Benefit policy, including process by which benefits are increased or reduced
- Factors used by administrator to increase/reduce benefits (active vs. retired, impact on accrued
- vs. future accruals, protection of pre-conversion benefits)
- If benefits transferred, rules for transfer amount computation
- Impact if plan were terminated immediately

- Funded status of the plan, going concern and wind-up basis
- Investment performance of pension fund

- Sources of significant changes in plan liabilities
- Results of stress testing of the plan

- Administrator's assessment of the need to reduce benefits, or opportunity to increase
- Discussion of risk factors affecting the plan (investment performance, changes in interest rates, changes in mortality rates)

6. 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
- (3a) Identify risks face by retirees and the elderly.
- (3b) Describe and contrast the risks face by participants of:
- (i) Government sponsored retirement plans
 - (ii) Single employer sponsored retirement plans
 - (iii) Multiemployer retirement plans, and
 - (iv) Social insurance plans
- (4a) Identify how plan features, temporary or permanent, can adversely affect the plans sponsor.
- (4b) Assess the risk from options offered, including:
- (i) Phased retirement
 - (ii) Postponed retirement
 - (iii) Early Retirement
 - (iv) Option factors
 - (v) Embedded options
 - (vi) Portability options
- (4c) Recommend ways to mitigate the risks identified with a particular plan feature
- (4d) Analyze the issues related to plan provisions that cannot be removed.

Sources:

DA-103-13: Risk Allocation in Retirement Plans: A Better Solution

DA-152-15: ACPM Target Benefit Plan Paper, March 30, 2012

DA-153-15: ACPM Target Benefit Plan Supplemental Paper

6. Continued

New Retirement Plan Designs for the 21st Century, Pension Forum, December 2008, pp. 41-56 (include commentary and responses)

Fundamentals of Private Pensions, McGill, 9th Edition Ch. 5, Ch.9, Ch. 10 & Ch. 12

Retirement Survey Report Key Findings and Issues: Understanding and Managing the Risks of Retirement

Commentary on Question:

In order to successfully answer this question, candidates needed to demonstrate their understanding of risk sharing based on the three different plan designs. Most candidates were able to list the applicable risks but very few mentioned the impact of risk pooling or how the risks were shared or transferred from the employer to the employees from Option 1, 2 and 3.

Solution:

Describe the risks of each design from the perspectives of the employer and its employees.

Option 1: Traditional DB Plan

- Longevity risk is entirely born by the employer.
- Investment risk is entirely born by the employer
- Investment and Longevity risk is pooled such that it is less risky for the employer to take on for the group than for an individual employee
- Interest rate risk is entirely born by the employer
- Inflation risk is entirely born by the employer (since final pay)
- Employer has a risk that contributions may be volatile/rise beyond expectations
- If the plan does not provide for postretirement indexation, employees will be exposed to that risk whereas if the plan provides such a protection, the employer will bear the risk.
- More of the risk is borne by the employer, not the employees

Option 2: Combination of DB and DC where the DB plan is offered on earnings up to an inflation-linked threshold

- Risks are shared between the employee and employer.
- The amount of risk an employee takes on is related to the income level of the employee, and the risk distribution favors lower-income earners.
- Investment risk is shared between the employee and employer - the EE bears investment risk for the DC portion, and the ER bears investment risk for the DB portion.
- Low & Middle Income Earners take little to no investment risk, while high income earners take on more investment risk

6. Continued

- Post-retirement investment risk for the DC plan is passed on to the employer if the benefit is annuitized
- Longevity risk is shared between the employee and employer: The employer bears longevity risk for the DB portion; the employee bears longevity risk for the DC portion if a cashout is chosen.
- Only high-income earners need to take on longevity risk if they choose to cashout their DC portion
- Employers risk that additional longevity risk may all be passed to them if the DC benefit is annuitized
- Preretirement inflation risk is taken on by the employers since the covered pay is indexed
- Interest rate risk is borne by the employer for the DB portion of the benefit only
- Employer has stable contributions for DC portion, but is still subject to the risk of volatility in contributions for the DB portion. (incl. asset liability mismatch)
- Risk of contribution volatility is borne by employer for DC portion

Option 3: Fixed employer contribution to DB and benefit that changes based on funded status

- Risks are shared between the employee and employer.
- Risks of contribution variability from the employer are eliminated.
- Employers take on the investment risk but will have the opportunity to pass some of this risk to employees since if markets are not favorable, the benefit may decrease.
 - The above may pass on more risk to the participant than immediately visible since the employer has less incentive to invest resources to asset management of the pension fund.
- Employers take on Interest rate risk but will have the opportunity to pass some of this risk to employees since if markets are not favorable, the benefit may decrease.
- Employees bear a risk that their retirement income may be volatile if benefits can change for retirees / standard of living may change
 - Less risk for retirees in a plan design which preserves benefit levels for in payment participant, however this passes on more investment and interest rate risk to the employer.
- Longevity risk is shared;
 - Employers take on the longevity of benefit payout
 - Significant longevity changes may be passed to the employee by way of benefit decreases
- Longevity and investment risks are managed because of pooling
- Pre-and post-retirement inflation risk is shared since benefits may be decreased.

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:

- (7c) Describe and apply the techniques used in the development of economic assumptions.
- (8a) Perform valuations for special purposes, including:
 - (i) Plant termination/windup
 - (ii) Accounting valuations
 - (iii) Open group valuations
 - (iv) Plan mergers, acquisitions and spinoffs
- (9c) Explain and apply relevant qualification standards.
- (9d) Demonstrate compliance with requirements regarding the actuary's responsibilities to the participants, plan sponsors, etc.
- (9e) Explain and apply all of the applicable standards of practice related to valuing retirement obligations.

Sources:

DA-146-15 ASOP 6 (see section 3.12.1.a)

Financial Reporting Considerations Related to Pension and Other Postretirement Benefits
Deloitte Alert (see page 6 & 7)

DA-804-13 (US) / DA-611-13 (CA)

Modeling Long Term Healthcare Cost Trends, Getzen

SOA Long Term Healthcare Trends Resource Model

Fundamentals of Retiree Group Benefits Yamamoto –Ch 7

DA-143-13

7. Continued

Commentary on Question:

Commentary listed underneath question component.

Solution:

(a) Describe considerations in determining the medical trend assumption according to the Canadian Institute of Actuaries Consolidated Standards of Practice and International Accounting Standard (IAS) 19.

- Reflect change in per capita health costs over time due to inflation, medical inflation, utilization, technology improvements, definition of covered charges, leveraging caused by plan design features not explicitly modeled and health plan participation.
- Consider separate trend rates for major cost components – hospital, prescription drug, other medical services, Medicare integration, administrative expenses.
- Initial trend – consider the known or expected changes in per capital health costs in the year following the measurement date. Consider the sustainability of current trends over an extended period of time and a possible need for a long term trend
- If there is a separate long term trend, need to determine the appropriate select period. Also consider relevant long term economic factors such as projected long term wage inflation, projected growth in per capita GDP, projected health care expenditures as a percentage of GDP.

Ch 7 (Yamamoto)

- Do not reflect aging and population changes in the trend assumption
- Consider inflation, utilization (mix of services and intensity)
- Trend should reflect actual plan design so need to consider plan design changes and effects on trend (putting limits, OOP costs, deductibles etc)
- Consider advancements in medical technologies and impact on Health Care Trend

(b) Describe the purpose of and inputs required for the Getzen model.

Purpose of the model:

- Designed to make long-run forecasts
- Includes constraints to cap the rising costs of healthcare
- User inputs short term trend rates and model generates long term trend rates

7. Continued

Inputs for the model:

- Short term trend rates – first 5 years of trend
- Inflation – ordinary increase in prices, consistent with inflation component of other economic assumptions
- Rate of growth in income/GDP – primary driver of all expenditures
- Excess trend due to technology and other factors – determines how much medical care is valued more than other items in the budget
- Optional capacity constraints –share and/or year above which medical costs are limited share

- (c) Calculate the revised 2016 Benefit Cost under IAS 19.

Show all work.

Commentary on Question:

All work was expected to be shown. If calculations were incorrect, but work was correct, partial credit was given. If expected benefit payments were not used, but the reason for not using them was justified (i.e. change in 2016 trend won't affect benefit payments so no change necessary), then credit was given for not using expected benefit payment adjustment. Compound or simple interest was accepted.

Revised 2016 Benefit Cost:

$$\begin{aligned} \text{SC Current SC} + \text{Additional SC} &= (108,792 + 5,000) = 113,792 \\ \text{IC} &= (108,792 + 5,000 + 3,128,517 + 125,000) * .0375 - (60,000 + 600 * .0375 * .5) = \\ &= 125,138 \text{ or alternatively } \text{Prior IC} + (\text{Increase in obligation} + \text{increase in service} \\ &\text{cost minus half a year of benefit payments}) * \text{discount rate} = 120,274 + \\ &(125,000 + 5,000 - 600 * (0.5)) * 0.0375 = 125,138 \\ \text{Total Defined Benefit Cost} &\text{ is } 238,930 \end{aligned}$$

- (d) Describe, in words, how your answer in (c) would differ under U.S. Accounting Standard ASC 715.
- Under ASC 715, the cost recognized is the service cost + interest cost – expected return on assets +/- net loss or gain amortized +/- prior service cost amortized recognized + temporary deviation from the plan (ASC 715-60 only) +/- curtailment/settlement effects
 - In part c, the expected return on assets would also need to be considered
 - In part c, the unrecognized prior service cost would need to be added
 - In part c, the unrecognized gain/loss amortization would need to be calculated for the additional loss due to the change in medical trend

7. Continued

- The additional loss is amortized outside of the corridor of 10% of the greater of APBO and MRV of plan assets over the average remaining service period of all active employees expected to receive benefits under the plan.

8. Learning Objectives:

5. The candidate will be able to evaluate sponsor's goals for the retirement plan, evaluate alternative plan types and features, and recommend a plan design appropriate for the sponsor's goals.
6. The candidate will be able to analyze, synthesize and evaluate plans designed for executives or the highly paid.

Learning Outcomes:

- (5a) Describe ways to identify and prioritize the sponsor's goals related to the design of the retirement plan.
- (5d) State relationships or recognize contradictions between a sponsor's plan design goals and the retirement risks faced by retirees.
- (6b) Given a specific context, apply principles and features of supplemental retirement plans.

Sources:

DA-114-13: Risk Management and Public Plan Retirement Systems – Appendix only (pages 1-33 background only)

DA-119-13: State and Local Pensions are Different From Private Plans

DA-155-15: TW Executive Retirement Benefits 2013: Recent Action and Design Considerations

Commentary on Question:

Successful candidates listed the stakeholders and explained the objectives each stakeholder with a focus on benefits.

Solution:

- (a) List six stakeholders in a retirement system that covers public sector employees.

Commentary on Question:

Successful candidates listed all six stakeholders.

- Society/Taxpayers
- Public Employees
- Unions
- Public Sector Employers
- Retirement System Governing Body
- Elected Officials

8. Continued

- (b) Describe for each stakeholder identified in part (a) the key objectives as they relate to a public sector employee's retirement system.

Commentary on Question:

Successful candidates explained the main objectives of each of the stakeholders identified in part (a) and did not explained who the stakeholders were.

- Society/Taxpayers: Want predictable costs of providing public services without sacrificing other public services; opposed to taxes being raised for the purpose of over-compensating public servants
 - Public Employees: Want secure retirement benefits, looking for an adequate replacement ratio at retirement that is competitive with the private sector, plans are not integrated with social security so are often looking for retirement benefits to make up the difference
 - Unions: Want competitive benefits for their members; will be negotiating for benefit increases or best benefits possible for their members; want to keep current members happy with union provided support
 - Public Sector Employers: Want to be able to attract and retain high achieving workers that provide general services and safety for the public; want to encourage timely exit from the workforce as the employee population ages
 - Retirement System Governing Body: Want to meet the fiduciary responsibilities to ensure the security and stability of the retirement system; want to provide adequate benefits on a cost-efficient basis
 - Elected Officials: Want to provide services that tax-payers expect at the lowest possible cost; often have a short time horizon as these officials are looking to be re-elected at the end of their term; can sometimes lead to overpromising benefit increases to make supporters happy now
- (c) Describe the considerations when providing enhanced pension benefits to executives in a public sector plan from the point of view of three of the stakeholders in part (a).

Commentary on Question:

Any of the six stakeholders from part (a) could have been used in this part of the question. Successful candidates expanded on the considerations and addressed from the perspective of actual stakeholders.

Public Sector Employers:

- Allows employees to better compete with private sector increasing attraction to employees
- Benefits for executives are expensive, need to consider who should pay for those benefits?

8. Continued

- Could bring negative publicity to employers if public does not approve of the changes.
- Will executives decide to take their benefits early and leave the workforce earlier than they otherwise would?

Society/Taxpayers:

- Will taxpayers benefit from attracting high-priced executives?
- Do the taxpayers have a say in whether these benefits are provided?
- Will this encourage top performers to exit the workforce earlier impacting public sector services?
- How will these benefits be paid for: increased taxes or redistributing money from other public services?

Public Employees:

- Who will receive the benefits and where will the line be drawn?
- There will be a perceived unfairness to non-executive employees who do not receive the benefit.
- Could provide incentive for high-level workers to seek promotion to executive positions.
- Could decrease from employees morale if they do not receive the additional benefit and may cause them to look elsewhere for employment

9. 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

Sources:

DA-611-13 –International Financial Reporting Standards

DA-145-13- Acquiring a U.S. Operation

Commentary on Question:

Commentary listed underneath question component.

Solution:

Calculate the following items for Company A under IAS 19 after the sale.

- (i) Funded status as of December 31, 2016,
- (ii) Other Comprehensive Income as of December 31, 2016,
- (iii) Change in the 2016 Defined Benefit Cost

Show all work.

Commentary on Question:

Note for (ii), if a candidate treats the \$35M as a remeasurement, the \$35M curtailment gain (highlighted below) should be zero, in other words, it is acceptable for the candidate to either interpret the \$35M as curtailment gain (if benefits are tied to future salary increases for example) or to interpret it as remeasurement gain (flat benefit plan for example)

- (i) Funded status as of December 31, 2016:
 - $DBO = \$650M - \$35M - \$200M = \$415M$
 - $FVA = \$750M - \$220M = \$530M$
 - Funded status = \$115M

9. Continued

- (ii) Other Comprehensive Income as of December 31, 2016:
Since the event happened at the end of fiscal year:
- There is no impact on 2016 service cost or net interest cost
 - Either one of these 2 answers are acceptable:
 - There is no remeasurement/OCI impact (both curtailment and settlement are not included in remeasurement)
 - The remeasurement impact is \$35M
- (iii) Since the number of active participants was significantly reduced, there is a curtailment.
- Past service cost due to curtailment:
DBO reduction due to curtailment = \$35,000,000
 - Settlement results from irrevocable action to eliminate employer responsibility and risk associated with the obligation.
 - Since the sale will eliminate all further legal or constructive obligations for the terminating employees, this will trigger a settlement.
 - Gain/loss due to settlement:
 - DBO = \$200,000,000
 - FVA = \$220,000,000
 - Gain/(loss) on settlement = \$200,000,000 - \$220,000,000 = (\$20,000,000)
 - Total impact of the curtailment and settlement on the 2016 Defined Benefit Cost:
 - = impact on SC & NIC + OCI = (\$15,000,000)
 - The defined benefit cost decreased by \$15,000,000 due to the transaction, with impact to OCI = \$0 (both curtailment and settlement results in a change to the service cost component which impacts P&L but not OCI)

10. Learning Objectives:

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

Learning Outcomes:

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

Sources:

Selection of Mortality Assumptions for Pension Plan Actuarial Valuations, CIA Education Note, March 2014

DA 136-16: Selection of Actuarial Assumptions – (start page 49)

DA 139-15 ASOAP 35

DA 162-16

Commentary on Question:

Successful candidates identified the factors to consider when evaluating the appropriateness of the mortality assumption. For example, successful candidates identified the accounting standard of “best estimate assumption”, internal consistency, and the recognition of the CPA Handbook section 3462 to permit the use of the most recent funding valuation to measure the benefit obligation.

Solution:

- (a) Identify considerations when selecting a mortality assumption for an accounting valuation.

Commentary on Question:

Successful candidates provided considerations beyond the standard responses related to credibility, industry, and workforce collar factors.

When selecting a mortality assumption for an accounting valuation, the following should be considered with respect to the accounting standards:

The mortality assumption shall be management’s best estimate solely, determined on the basis that the plan will continue to be in effect in absence of evidence to the contrary

10. Continued

The set of actuarial assumptions should be internally consistent.

CPA Handbook section 3462 allows for the use of the most recent funding valuation to measure the defined benefit obligation. The mortality assumption in that case would be the actuary's assumption described in the funding valuation report.

In addition, the actuary should also consider the following items:

The benefit features of The plan being valued – are they long term benefits, disability benefits, retirement benefits or perhaps just termination benefits.

The participant population – Who are you valuing? What types of individuals – are they blue collar workers, white collar workers, retirees, or active employees?

The measurement period during which the assumption will be used.

Appropriateness of using different table before and after retirement.

Provision for future mortality improvements (are generational tables appropriate).

Different assumptions for disabled lives.

Appropriateness of using different mortality assumptions for sub-groups or beneficiaries or sex-distinct tables.

The actuary should consider published mortality tables and assess if they suitable for the valuation being undertaken.

Is the population large enough to be credible and to use a custom mortality table?

The actuary should consider the use of the valuation - for instance using Best Estimate mortality assumption which is suitable for an accounting valuation

The actuary should incorporate any requirements by accounting standards, law, or regulations.

And, the actuary should reflect the terms of the appropriate engagement.

The actuary would need to develop the best estimate mortality assumption by considering the plan's actual mortality experience, the credibility of the plan's actual mortality experience, and the credibility of the similar plans in the construction industry

10. Continued

It is actually preferable to reflect the actual credible experience of the plans under review instead of relying solely on published mortality studies

- (b) Describe the adjustments that might be considered to the custom mortality table used in the plan's accounting valuation.

Commentary on Question:

Successful candidates understood why adjustments are needed and the types of adjustments that can be made.

Possible adjustments are:

Incorporate Margins for adverse deviations if applicable.

Since the best estimate of mortality is derived from an analysis of the actual experience, appropriate adjustment would need to be made to project the mortality rates to the valuation date

Although the custom mortality table was developed based on a large amount of statistically credible data (i.e. 20,000 lives), the actuary should recognize that the mortality experience of his small pension plan would generally not be fully statistically credible. Broad adjustments to the custom mortality tables (e.g., 90% or 110% of the custom table rates) may be used for a range of ages.

Industry information should be used with caution. An adjustment may be considered for a plan covering members in an industry which exhibits credible mortality experience that is significantly higher or lower than average (in this case, the construction industry). Larger, more homogeneous groups, such as workers in the construction industry, will likely have more credible results in an industry experience study than smaller, diverse industries

The same adjustments for pension size used for retirees would be applied to survivors

Adjusting for plan characteristics would be required since the characteristics of the plan are significantly different than the 2014 CPM Table and that there is credible plan experience which suggest that actual experience is different than the 2014 CPM (i.e. substandard)

Percentage adjustments can be used by age group and or gender.

Adjustments for future improvements in mortality should also be considered.

10. Continued

Mortality improvement rates require large quantities of consistent data over a long period of time. Data is usually gathered through social security programs. As such, mortality improvement rates are usually based upon published mortality studies and not on custom mortality tables.

Adjustments for future mortality improvements could use 2-D generational tables, 1-D generational tables, or static mortality tables with a fixed projection period.

Adjustments for future mortality improvements would generally need to be updated at each subsequent valuation to reflect the new base year mortality rates and to revise the projection period to reflect any change in liability duration.

The adjustments for future mortality improvements is normally considered separately from the current level of mortality.

- (c) Recommend whether the custom mortality table should be used with or without adjustments for this valuation.

Justify your response.

Commentary on Question:

Successful candidates justified the use of the custom mortality table regardless of whether or not they believed the table needed to be adjusted or not.

The use of the custom mortality table is justified because it is based on plan's actual mortality experience and the experience of similar plans in the industry. The mortality experience is credible because of the size of the plans analyzed and the amount of data available for constructing the custom mortality table, with or without adjustments.

The plan population needs to be sufficiently credible to justify its own mortality table. The data for the small construction company, on its own, would not be credible due to the small size. The actuary, considering the relevant assumption universe, would consider experience of similar plans in the construction industry, or in the case of partially credible data, adjustments need to be made to published tables. The custom mortality table, with or without adjustments, would be preferable as the best estimate of the current rates of mortality since it is not expected that the mortality experience of the plan would deviate significantly from that of other pension plans in the same industry.

The actuary will need to make appropriate adjustments to project the mortality rates to the valuation date and also make adjustment for future improvements in mortality.

10. Continued

Other possible adjustments would be based on plan characteristics such as collar type, industry, and pension size. Adjustment to the custom mortality table might not be needed because the plan characteristics are not significantly different from the composite data used to construct the custom table. The plans are in the same construction industry that covers blue collar workers. The actuary would consider adjustments only if there is credible plan experience which suggests that actual experience would be different from the underlying custom base tables.

11. Learning Objectives:

4. The candidate will be able to evaluate plan design risks faced by sponsors of retirement plans and retiree health plans.
5. The candidate will be able to evaluate sponsor's goals for the retirement plan, evaluate alternative plan types and features, and recommend a plan design appropriate for the sponsor's goals.

Learning Outcomes:

- (4a) Identify how plan features, temporary or permanent, can adversely affect the plans sponsor.
- (4b) Assess the risk from options offered, including:
 - (i) Phased retirement
 - (ii) Postponed retirement
 - (iii) Early Retirement
 - (iv) Option factors
 - (v) Embedded options
 - (vi) Portability options
- (4c) Recommend ways to mitigate the risks identified with a particular plan feature
- (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.
- (5h) Evaluate the pros and cons from both a sponsor and employee perspective of introducing options that impact the labor force demographics.

Sources:

Deferred Retirement Option Plans DA-104-13

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

Commentary on Question:

Successful candidates identified the issues related to how the service was credited and the FAE definition. Successful candidates also proposed design changes to each of the issues.

Solution:

- (a) Assess the effect of the phased retirement program on the DB plan benefits of those who participate in the program.

11. Continued

- (a) Assess the effect of the phased retirement program on the DB plan benefits of those who participate in the program.

The effect of the phased retirement program on the DB plan are as follows:

Employees will not be credited with any benefit service for years they partake in the program because hours worked are less than 1,800 hours.

Final average pay will be reduced (or at least will not grow) because:

- Formula uses actual pay, not pay rates or annualized amounts
- Highest years of pay will drop out of the last 5 years, leaving lower amounts

Due to the heavily subsidized Early Retirement Benefit and service cap provision, benefit value will decrease after the member first becomes eligible for early retirement. So, by delaying retirement and participating in the phased retirement program, employees will forsake benefit value.

The above are expected to result in benefits that do not increase and possibly even decrease.

- (b) Recommend design changes to the DB plan to ensure employees are treated equally regardless of when they choose to retire and whether they elect to participate in the phased retirement program.

Justify your response.

Recommended design changes would be as follows:

Change how Benefit service is credited by grant partial years based on actual hours worked. For example, benefit service for a year = hours worked / 1800, not to exceed one (1).

Change how Final average pay (FAP) is calculated - three options:

- 1) Use pay rate instead of actual pay; or
- 2) Remove 5-year "consideration" period; or
- 3) Use partial years in divisor of FAP fraction (could tie to benefit service above)

Early retirement adjustments: change to be actuarially equivalent. This may need to be implemented prospectively to avoid benefit cutback issues.

Late retirement adjustments: change to be actuarially equivalent

12. 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.
3. Candidate will understand how to analyze the risks faced by retirees and the participants of retirement plans and retiree health plans.
4. The candidate will be able to evaluate plan design risks faced by sponsors of retirement plans and retiree health plans.

Learning Outcomes:

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:

- (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
-
- (2a) Explain and apply restrictions on plan design features to a proposed plan design.
 - (2e) Understand conflicts between regulation and design objectives and recommend alternatives.
 - (3a) Identify risks face by retirees and the elderly.
 - (4a) Identify how plan features, temporary or permanent, can adversely affect the plans sponsor.
 - (4c) Recommend ways to mitigate the risks identified with a particular plan feature
 - (4d) Analyze the issues related to plan provisions that cannot be removed.

12. Continued

Sources:

DA-158-15

Managing Post-retirement Risks Guide to Retirement Planning

Solution:

(a) Describe the key components of the New Brunswick Shared Risk Pension Plan (SRPP).

- New design splits plan benefits into highly secure base benefits and moderately secure ancillary benefits
- Guarantees base benefits and grants ancillary benefits if allowed by plan's financial condition
- Funding designed to ensure base and ancillary payable with a high likelihood
- Plan sponsor specifies protocol to increase/decrease contributions, change asset allocation and reduce/increase benefits

Protocol based on funding ratio

if below threshold, increase contributions, change ERF, reduce future service accruals, reduce past/future benefits until Risk management goal met if above threshold, use surplus to reverse contribution increases

Reverse reductions in benefits or change in ERFs

Index pensions

Increase benefits

Make lump sum payments

New risk management regulatory framework to keep plans on track

Based on stress testing

- 1000 20-year simulation based on relevant financial estimates
- Show that base benefits payable in 97.5% of cases
- At least 75% of ancillaries payable
- Project funded ratio to show it does not fall below 100% two years in a row

(b) Explain how the SRPP addresses defined benefit pension plan sponsor risks.

Risks include:

- Increasing longevity impact on liabilities
- Cost of subsidized early retirement for maturing plan population
- Low market returns causes underfunding and requires larger contributions
- Market return volatility makes contributions less predictable
- Plan can be terminated or have permanent benefit reductions
- Minimum funding rules exemptions means plan never funded

12. Continued

Shared Risk Pension Plan:

- Helps in controlling costs
- Designed to make funding sustainable
- Framework in place to reduce benefits if not sustainable
- Removes prospect of permanent benefit cuts
- Plan can be secure, affordable and sustainable
- Easier to meet lower funding targets with Shared Risk
- Ancillary only provided if funding tests work

- (c) Describe the risks associated with the SRPP from the plan participants' perspective.

Investment risk

Poor returns means reduced benefits

Annuity risk

Poor returns affecting annuity payments

Inflation risk

High inflation may lead to COLA reductions if not sustainable

Longevity

Risk is assumed by plan sponsor; pension in pay can be reduced

Death

Impact of reduction to ancillaries

Bad advice

Resulting from poor understanding of plan

Public policy risk

If changes to SRPP legislation

Replacement ratio risk

If pension or ERFs reduced, may fall short

Business continuity

Plan termination would affect retirement planning

Employee contributions may increase

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.

Learning Outcomes:

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

Sources:

Managing Post-Retirement Risks, A Guide to Retirement Planning

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

Commentary on Question:

Commentary listed underneath question component.

Solution:

- (a) Describe the advantages and disadvantages of each option from the perspective of the individual.

Commentary on Question:

Successful candidates identified at least 2 advantages and 2 disadvantages of each option.

Option 1: Continue to manage his investments and annual payouts himself.

Advantages

- He has immediate access to the money
- He can withdraw more if the funds do better than expected
- His heirs will have a death benefit (remaining funds) when you die
- He can buy an annuity at some point in the future

13. Continued

Disadvantages

- There is lesser initial income (withdraw small amounts in the early years; as the balance grows over time with interest, withdraw larger amounts) than the annuity option which may pay a level amount for life
- He bears the risk of poor investment performance
- He could outlive the account
- He has to manage the money

Option 2: Use all of his personal savings to buy an immediate lifetime annuity.

Advantages

- He has higher initial income
- He cannot outlive the income
- He has no investment risk
- He has no investment decision to make

Disadvantages

- He loses flexibility over the timing of withdrawals
- He loses the possibility of much greater asset returns
- There is no death benefit (unless specified in the annuity)
- He is locked in to one insurance company (credit risk)

- (b) Explain other options that the individual may want to consider to mitigate the following post-retirement risks:
- (i) Inflation
 - (ii) Interest
 - (iii) Stock market

Inflation

Retirees can include the following in their investment strategies in order to protect retirees from inflation:

- Investment returns from **common stocks** have increased more rapidly than consumer prices in the long run. But in the short term, stocks don't offer reliable protection against inflation. The historically higher returns from stocks are not guaranteed and may vary greatly during retirement years.
- **Inflation-indexed Treasury bonds** grow in value and provide more income as the Consumer Price Index goes up. Many experts say that retirees' investments should include some of these securities.

13. Continued

- **Inflation-indexed annuities** not widely used in the United States, adjust payments for inflation up to a specified annual limit. Annuities with a predefined annual increase also are available. These kinds of annuities cost more than fixed-payment annuities with the same initial level of income
- Investments in **natural resources and other commodities** often rise in value during periods of long-term inflation, but the values may fluctuate widely in the short run.

Interest Rate

Lower interest rates tend to reduce retirement income in several ways; the following are investment strategies that retirees should consider to help with mitigating interest rate risk:

- **Income annuities** provide retirees with a guaranteed fixed income, despite changes in the interest rate environment, but most do not adjust the income for inflation.
- Investing in **long-term bonds, mortgages or dividend-paying stocks** also offers protection against lower interest rates, although the value of these investments will fluctuate. The risk is that rising interest rates will reduce the value of such assets available to meet unexpected needs.

Stock Market

- Stock market investors should **diversify** widely among investment classes (including bonds and other non-equities) and individual securities, and be prepared to absorb possible losses. Because it may take many years to recover losses, older employees and retirees should be especially careful to limit their stock market exposure.
- A variety of **pooled investment "funds"** exist, ranging from mutual funds and exchange-traded funds to managed accounts to hedge funds.
- **Hedge funds**, which are private investment funds that participate in a range of assets and a variety of investment strategies, may offer some protection, but they can be complex and have high expense charges.
- **Stock funds** offer opportunities to invest in both U.S. companies and international stocks.

13. Continued

- (c) Calculate the required replacement ratio, excluding social security benefits, using the Expenditure, Tax and Savings model.

Show all work

Commentary on Question:

Successful candidates identified the formula and showed the appropriate steps to calculate the replacement ratio using the Expenditure, Tax and Savings model.

Gross Pre-Retirement Income = 90,000

Gross Pre-Retirement Taxes

Social Security	= 7,000
Federal Income	=10,000
State/Provincial Income	<u>= 2,000</u>
	\$19,000

Disposable Income After Taxes = 90,000 – 19,000 = 71,000

Pre-Retirement Savings = 6% X 71,000 = 4,260

(As a % of disposable income 6%)

Pre-Retirement Spendable Income = 71,000 – 4,260 = 66,740

Expenditure Changes

Reading and Education	= 16,000-14,000 = -2,000
Healthcare	= 3,000-4,000 = -1,000
Utilities	=23,000-22,000 = <u>-1,000</u>
	-2,000

Required Post-Retirement Spendable Income = 66,740 – 2,000 = 64,740

Post-Retirement Taxes

Social Security	=0
Federal Income	=4,000
State Income	<u>=1,000</u>
	5,000

Required Gross Post-Tax Retirement Income = 64,740 + 5,000 = 69,740

Required Replacement Ratio = 69,740 / 90,000 = 77.5%

13. Continued

Estimated Social Security Benefit = 33,000

Social Security Replacement Ratio = $33,000 / 90,000 = 36.7\%$

Require Replacement Ratio from Other Sources = $77.5\% - 36.7\% = 40.8\%$