CURATED PAST EXAM ITEMS
- Solutions -

RET 101 – Retirement Plan Design

Important Information:

- These curated past exam items are intended to allow candidates to focus on past SOA fellowship assessments. These items are organized by topic and learning objective with relevant learning outcomes, source materials, and candidate commentary identified. We have included items that are relevant in the new course structure, and where feasible we have made updates to questions to make them relevant.
- Where an item applies to multiple learning objectives, it has been placed under each applicable learning objective.
- Candidate solutions other than those presented in this material, if appropriate for the context, could receive full marks. For interpretation items, solutions presented in these documents are not necessarily the only valid solutions.
- Learning Outcome Statements and supporting syllabus materials may have changed since each exam was administered. New assessment items are developed from the current Learning Outcome Statements and syllabus materials. The inclusion in these curated past exam questions of material that is no longer current does not bring such material into scope for current assessments.
- Thus, while we have made our best effort and conducted multiple reviews, alignment with the current system or choice of classification may not be perfect. Candidates with questions or ideas for improvement may reach out to education@soa.org. We expect to make updates annually.

RET101 Learning Objective 1 Model Solutions

RETDAC, Fall 2020, Q3

Learning Outcomes:
Describe the structure of the following plans:

- Traditional defined benefit plans
- Defined contribution and savings plans
- Hybrid plans
- Other alternative retirement plans such as executive retirement plans, shared risk plans, target benefit plans, etc.

Sources:
RET-101-105-25: CAPSA Guideline No. 8: Defined Contribution Plans

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

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a) Compare and contrast the responsibilities outlined in CAPSA Guideline Number 8: Defined Contribution Pension Plans Guideline for each of the following:

(i) Plan Administrator

(ii) Employer

(iii) Plan Sponsor

Commentary on Question:

Overall this part was well done, with some confusion between the responsibilities of employers and plan sponsors. To receive full credit, candidates needed to fully address responsibilities of each party.

<u>Plan Administrator's Responsibilities:</u>

- Acts in the best interest of plan members (fiduciary)
- Comply with applicable laws.
- Delegation of certain tasks is permissible, but the Plan Administrator has the responsibility to monitor and document the delegation (i.e. selection and monitoring of third party service providers).
- Establishing and introducing the plan to the members, including establishing the plan terms and providing members with the initial and ongoing communication.
- Providing investment information and decision-making tools to members.
- Ensuring that the administration of members' right and obligations are done in accordance with applicable law (i.e. calculation of termination and retirement benefits, etc.)
- Ensuring that the required regulatory documents and forms are filed with the applicable regulators
- Establishing the selection of investment options including default option(s) available. This would include the decision whether different default options are used during the accumulation and decumulation phases.

<u>Employer's Responsibilities:</u>

- Remitting employee and employer contributions to the fund in accordance with applicable laws.
- Meeting funding requirements and holding the pension fund assets in trust (separate and apart).
- Accurate recordkeeping of member data and information.
- Co-operating with the Plan Administrator in the transmission of member data

<u>Plan Sponsor's Responsibilities:</u>

- Designing and establishing the pension plan, and setting the benefit structure.
- Deciding to wind up or amend the pension plan.
- Documenting decisions and record retention.
- Ensure plan has an administrator.

(b) Describe how the information and tools recommended in CAPSA Guideline Number 8 help the Plan Administrator meet the responsibilities identified in part (a).

Commentary on Question:
This part was generally not done well. Candidates focused responses on communication requirements and investment tools, but responses were lacking in the other areas (ex. legal requirements).

Credit was awarded for adequately describing how the information and tools help to meet the responsibilities of a Plan Administrator.

Information and tools provided to the member can meet Company ABC's fiduciary obligations to the members by:

- Informing members of their rights and obligations under applicable laws.
- Demonstrating that Company ABC is fulfilling its obligation to monitor and document the delegation of its responsibility to qualified third party service providers.
- Providing members with the initial and ongoing communication on plan terms and the administration of contributions so members can have an understanding of vesting rights, locking in rights, transfers of funds, maximization of employer matching, etc.
- Providing investment information/options, fee disclosure, and decision-making tools to members so members have sufficient detail to make informed investment choices in addition to meeting minimum legislative requirements with respect to member disclosure.
- Ensuring that Company ABC is administering the plan in accordance with applicable law and thus meeting its legal obligation to the members.
- Providing members with qualified statements with regard to future outcomes of the estimation and projection models, adequacy of savings and the need for other sources of income, would mitigate Company ABC's legal risk and help inform members of their responsibility as members of the plan (i.e. to seek sound investment advice, etc.) to achieve their investment goals.

(c) Describe how benefit estimation tools can assist employees in mitigating quantifiable risks and behavioural risks.

Commentary on Question:
This part of the question was not done well. Candidates focused mainly on the projection of account balance under various contribution percentages and investment returns. However, there was insufficient discussion on the potential risks mitigated.

Credit was awarded for describing the attributes of benefit estimation tools, and the types of risks mitigated. Credit was not given for listing the different inputs that can be changed in a benefit estimation tool.

- Tools to estimate plan benefits upon retirement should be provided at key intervals during the members' employment with the Company. The information would be an estimate of the accumulated value of the member's account at retirement, as well as an estimate or example of the benefit that may result from the accumulated value.
    - This would mitigate:
        - Longevity Risk, since members would have tools to estimate the adequacy of amount of their savings and how much those projected saving would provide during the member's retirement. This way, the member can take measures at the beginning of their retirement to avoid outliving their savings if the projections show the savings are not adequate.
        - Market risk, since these tools could also help illustrate the riskiness of certain investments and could avoid the market risk inherent in certain investment choices
        - The risk of high unsustainable withdrawal rates, and the temptation of members to spend savings immediately
- Estimation tools should state that projected account balances and future benefits are estimates only, and the assumptions used in the estimates should be clearly stated.
    - This would mitigate:
        - Behavioral finance risks - the risk of the member having an inadequate understanding of the need for a systematic method to generate lifetime retirement income and the temptation to spend savings immediately
- Benefit estimation tools should reveal that other sources of benefits or savings may be necessary to achieve retirement income goals. It is expected that the plan administrator will provide information regarding all of the regulated retirement products available to members with respect to the payout phase.
    - By informing and educating the DC plan member of their access to other saving vehicle options, this would mitigate:
        - The risk of savings loss due to mistakes, fraud, or cognitive decline in later years and the risk of financial losses due to poor or biased financial advice
        - Risk of inadequate income due to insolvency of one provider or one source for that income.
        - Liquidity risk by not having access to the single sources of savings in an emergency

- Estimation tools should incorporate and explain the fees, expenses, and penalties charged
    - This would help inform members' investment decision and mitigate:
        - Inadequate account balance due to high fees related to expenses, commissions, and transaction costs
        - risk of savings loss due to mistakes or poor execution of decisions

RETDAC/U, Fall 2020, Q11

Learning Outcomes:
b) Given a plan type, explain the relevance and range of plan features including the following:
• Plan eligibility requirements
• Benefit eligibility requirements, accrual, vesting
• Benefit / contribution formula, including methods of integration with benefits provided by social insurance
• Payment options and associated adjustments to the amount of benefit
• Ancillary benefits
• Benefit subsidies and their value, vested or non-vested
• Participant investment options
• Required and optional employee contributions
• Early and late retirement options
• Indexing

Sources:
CIA Report of the Task Force on Target Benefit Plans

Commentary on Question:
This question tested candidates' knowledge on the plan design of Target Benefit Plans. Further, it tested candidates' knowledge on underlying risks present in Target Benefit Plans and different mechanisms available to reduce those risks. The question required candidates to utilize their knowledge and apply it from the perspective of the actuary performing analysis and review on Target Benefit Plans.

Solution:
(a) Describe the policy ladder for a Canadian Target Benefit Plan (TBP).

Commentary on Question:
Overall, candidates successfully described the policy ladder as it pertains to the plan design of Target Benefit Plans.

The policy ladder outlines the type of actions to be taken regarding contributions, investments, and/or benefit changes and their priority, extent, and any limitations when specific triggers are hit. The policy ladder may leave some actions undefined, usually in respect of triggers identifying extreme events.

When a trigger is reached on the downside, the correction would ensure that benefits remain affordable, typically resulting in a benefit reduction. When a trigger is reached on the upside, the correction would distribute any excess assets that are deemed not to be needed to keep the plan sustainable, typically resulting in a benefit improvement.

(b) Describe three options available to a TBP to address the absence of a funding guarantee from a plan sponsor.

Commentary on Question:
Candidates struggled to identify options available to Target Benefit Plans to address the absence of funding guarantees. To receive full credit, candidates had to describe three distinct options.

Option 1
Allocate the risk directly to individual members, translating plan experience in each period to immediate benefit adjustments.
- If the plan suffers a loss, accrued benefits are reduced.
- If the plan experiences a gain, accrued benefits are increased.

Option 2
Transfer downside risk to a third party by purchasing a commercial hedging product.
- This may involve entering a longevity risk hedging contract with an insurer or employing derivatives to hedge the risk of investment losses of a certain size.
- Some risks may be difficult or expensive to transfer completely to a third party.
- Transferred risks are still subject to counterparty risk.

Option 3
Intergenerational risk sharing: have different generations of plan members enter hedging contracts for all or part of the residual mortality, investment, inflation, and/or other risks among themselves.
- This can take the form of explicit arrangements e.g., the operation of counter-cyclical risk buffer.
- If the approach to intergenerational risk sharing is explicit, the trade-off between risks and rewards is clear, e.g., a lower target benefit today in the hope of more future upside potential and less frequent potential reductions in benefits.
- If the approach to intergenerational risk sharing is implicit, younger generations partially or wholly underwrite the risks of older generations by putting their own benefits at greater risk. With implicit arrangements, two other risks are counterparty risk and plan termination risk.
- if the capacity of successive generations to honor the implicit contract is constrained, or willingness wanes, the target benefit plan may collapse (e.g., number of new entrants is declining).

(c) Describe four non-investment mechanisms that can be used to reduce benefit risk in a TBP.

Commentary on Question:

Successful candidates described non-investment mechanisms that are available to Target Benefit Plans that an actuary could utilize to reduce risk. Mechanisms such as annuity buy-outs and longevity swaps were not given credit, as these are investment type solutions.

Candidates were also given credit for relevant mechanisms not mentioned below.

1. **Contribution flexibility**
   - Employee and employer contributions could fluctuate within a prescribed, and presumably narrow range
   - Charges future generations more/less than past generations for the same benefit.
   - Allocates greater risk to active members than retirees

2. **Adjusting future service accruals**
   - Rather than adjusting past accruals, only adjust future accruals. Could be influenced by the source of the projected funding shortfall.
   - Allocates greater benefit risk to future generations.
   - Means that active members are subsidizing retirees if the reason for the reduced accrual is funded ratio being below target.

3. **Static margin in valuation assumptions (especially the discount rate)**
   - Adds conservatism to the affordability test by holding back all or a portion of the unearned risk premium.
   - Comparing benefit risk across plans with different margins is difficult

4. **Projection valuation methods (open group)**
   - Incorporate future contributions and benefit accruals of existing members over some fixed time horizon into valuations.
   - Provides stakeholders with a more realistic depiction of the future course of the plan.

RETDAC, Spring 2022, Q8

Learning Outcomes:
b) Given a plan type, explain the relevance and range of plan features including the following:
• Benefit eligibility requirements, accrual, vesting
• Payment options and associated adjustments to the amount of benefit
• Benefit subsidies and their value, vested or non-vested
• Early and late retirement options

Sources:
RET101-103-25: Phased Retirement – An Important Part of the Evolving Retirement Scene

Introduction (A58), IFRS1 (paragraphs 1-40 & Appendix A), IAS19, IFRIC14 (NOT ON RET101 SYLLABUS)

Commentary on Question:
This question was testing candidates' understanding of phased retirement programs.

Candidates who only provided suggested changes without justification of why they would increase utilization of phased retirement in part (a) or directional change of DBO/SC in (b), only received partial credit.

Solution:
(a) Recommend design changes to each of the following plan provisions to encourage utilization of the phased retirement program:

(i) Benefit service

(ii) Final average pay

(iii) Early retirement benefits

Justify your response.

Commentary on Question:
Most candidates were able to correctly identify that participants would miss out on accruals during phased retirement by not earning benefit service or reduce their benefit due to the final average pay definition. Many candidates correctly recognized that subsidized phased retirement if participants are allowed to start receiving pension benefits when they enter the phased retirement program.

(i) Benefit service: Under the current design, participants would be unlikely to accumulate enough hours to earn benefit service during a phased retirement due to working only part time.

- Company ABC could allow partial credit or reduce the amount of hours required such that the participants participating in the phased retirement program would be able to continue accruing benefit service.
- Company ABC could also remove the benefit service cap. Participants who are at the service cap and ready to retire would have incentive to remain employed part time and continue earning service.

(ii) Final average pay (FAP): Current design means those who utilized the phased retirement program would reduce their benefit since the final average earnings would be based on years during lower pay due to the reduced hours.

- The definition could be revised to use annualized compensation when calculating for the Final Average Pay (FAP). Participants would continue to increase their benefit for COLAs or merit increases during phased retirement.
- Another option would be to remove or extend the 5-year lookback period so the lower annual earnings during phased retirement do not hurt the participant.

(iii) Early retirement benefits: Current plan design subsidizes retirements prior to age 65 for participants with 10 or more years of service. Participants who have fewer than 10 years of service do not currently receive any subsidy if they retire early.

- Company ABC could consider providing the 3% reduction from age 62 to all employees who meet the early retirement requirement to encourage more participants to utilize the phased retirement program. Then employees with 5-10 years of service would receive a higher early retirement benefit than they would have otherwise and may be more financially able to retire under the phased retirement program.

(b) Assess the impact of a proposed plan design change from each subsection of part (a) under International Accounting Standard IAS 19, Rev. 2011 on the following:

(i) Defined Benefit Obligation

(ii) Service Cost

No calculations required and justify your response.

Commentary on Question:
The question was asking the candidate to assess ONE of the suggested plan design changes from each subsection of part (a). Responses analyzing all of the recommendations in part (a) only received credit for the analysis of one change for each subsection.

Most candidates did not recognize that DBO is a participant's accrued benefit, with consideration of future pay increases, for their response regarding change to the benefit service provision. Therefore, strictly increasing the potential to earn future service would not increase a participant's DBO. There are many reasons the DBO would increase for the suggested plan changes, but they were required to be described in order for candidates to receive credit.

Credit was provided in part (b) for incorrect responses in (a) if the response was valid.

1. DBO:

(i) Benefit service: Removing the service cap would increase the DBO for participants with more than 25 years of service if the change is applied retroactively. Otherwise, the current DBO would remain unchanged.

(ii) FAP: Removing the lookback limit may increase the DBO since some participants may have had higher salaries prior to the 5-year lookback window.

(iii) Early retirement benefits: Enhancing the early retirement subsidy would increase DBO if early retirement decrements are assumed for the phased retirement program or when a participant actually retires early under the program. This is because a number of participants would be eligible for larger early retirement benefit amounts if they commence benefits earlier than age 65.

2. SC:

(i) Benefit service: Removing the service cap would increase the service cost assuming some participants are at the cap. If no participants are at the cap then there would be no impact.

(ii) FAP: Removing the lookback limit would likely increase the service cost since the value of one more year of accrual would be higher for participants mentioned above.

(iii) Early retirement benefits: Enhancing the early retirement subsidy would increase SC if early retirement decrements are assumed. This is because a number of participants would be eligible for larger early retirement benefit amounts if they first commence benefits earlier than age 65.

RETDAC/U, Spring 2022, Q13

Learning Outcomes:
b) Given a plan type, explain the relevance and range of plan features including the following:
• Benefit / contribution formula, including methods of integration with benefits provided by social insurance

Sources:
RET101-101-25: Integration with Social Security

Retirement Plans - 401(k)s, IRAs and Other Deferred Compensation Approaches, Allen et al., 12th Edition, 2018 – Chapter 14 (pp. 250-263)

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a) Describe the advantages of integrating an employer provided retirement plan with a defined benefit social security program from the plan sponsor's perspective.

Commentary on Question:
This part was generally well answered. Candidates generally had to give three valid answers to receive full credit. Many students only gave two answers, both of which were valid, and received partial credit.
The following solution illustrates an answer that would have received full credit, yet it is not an exhaustive list of valid advantages.

Given that social security plans tend to only cover pay up to a limit, integrating social security into the plan is a way of making the replacement ratio provided by the plan equitable for both high and low earners.

Integrating social security into the plan allows the employer to account for the benefit the members receive from social security, which allows the employer to avoid giving an overly generous benefit.

Since plan sponsors often contribute to social security, offsetting the social security benefit from the pension plan is a way to avoid "double-paying," allowing them to save on cost.

(b) Propose two ways to integrate an employer provided retirement plan with a defined benefit social security program.

Commentary on Question:
This part was generally very well answered with many candidates having very similar answers regarding the direct and indirect method
The solution below represents an answer that would receive full credit; other acceptable answers also received credit.

1. Contribution offset
   a. E.g. if the sponsor's original formula was a non-elective contribution of 10% of pay and the expected value of the social security benefit on earnings up to the integration point was 5% of pay, the formula for the sponsor could be a contribution of 5% of pay up to the integration point and 10% of pay over the integration point
   b. This is a direct integration approach

2. Ignore a portion of the member's covered earnings
   a. E.g. if the average earnings for an employer are \$100,000 and their benefit formula is a 10% non-elective contribution, the employer could change the formula to be a 10% non-elective contribution on earnings over \$50,000 (assumes value of social security benefit is ~5% of pay)
   b. This is an example of an indirect integration approach

(c) Describe the challenges in achieving full integration of an employer provided retirement plan with a defined benefit social security program.

Commentary on Question:
Candidates did a good job describing some challenges; however there were many poor answers provided as well. Many candidates did not provide enough valid answers to receive full credit, candidates who received full credit tended to describe at least six valid challenges.
There are many different acceptable answers, valid answers not shown below also received credit.

1. Employer's plan only covers service at employer (typically) while social security covers service across entire career
2. The employer plan and social security may have different definitions of covered earnings (e.g. social security only covering earnings up to \$120,000 while employer plan covering all earnings)
3. The employer plan and social security may have different normal retirement dates

4. The employer plan may use different compensation than social security, e.g., the employer plan may exclude bonuses/overtime while these may be included in social security earnings
5. The social security benefit may change over time which can cause difficulty in integration
6. The social security benefit is indexed, meaning its value will be influenced by inflation, while the employer plan benefit may not be indexed

RETRPIRM, Spring 2022, Q2

Learning Outcomes:
c) Discuss investment of retirement plan assets
• Distinguish the various strategies, approaches and techniques used to manage retirement fund assets

Sources:
RET101-109-25: Designing the Future of Target-Date Funds

Commentary on Question:
Commentary listed underneath question component

Solution:
(a) Describe the risks faced by plan members of a defined contribution (DC) pension plan with assets invested in target date funds during the:

(i) accumulation phase; and

(ii) decumulation phase.

Source: RET101-109-25: Designing the Future of Target-Date Funds

Commentary on Question:
Overall, candidates performed well on part (a). Most candidates can describe the main risks based on their understanding of the target date funds.

(i) Accumulation phase

- Subpar investment growth - the risk that stocks and bonds will fail to generate enough investment returns resulting in lower asset values at retirement which cannot be recouped through future income and savings.

- Market risk - the risk of a short-term market loss right before retirement where retirees do not have the time to recoup the losses.

- Inflation risk – when inflation rises, the benefits of traditional diversification can break down, exposing participants to potential larger-than-expected downside risks.

(ii) Decumulation phase

- Inflation risk – the risk that high inflation will decrease equity and bond valuations. In addition, the retiree's spending power declines since the annual expenses increase while portfolio values are declining.

- Longevity risk - the risk of living longer than expected and outliving your retirement savings.

- Market risk – the risk that the equity/bond mix (glide path) doesn't provide adequate return. For example, bonds may not return enough during an equity market plunge. Also, high concentration in bonds may not generate enough total portfolio growth from equity investments.

(b) Recommend strategies to mitigate the risks identified in (a).

Commentary on Question:
Candidates recommended some of the strategies to mitigate the risks, but most received partial credit. Candidates generally mentioned the strategy to mitigate longevity risk, but many did not provide the strategies to mitigate subpar investment growth and market risk.

Subpar investment growth
- Long/short equity – hedge risk using short positions that will benefit from underperforming stocks.
- Risk parity – in addition to investing in equities, add other asset classes such as commodities, corporate bonds, and government bonds to the portfolio.
- These strategies benefit even more during a long period of a down market.

Market risk
- Equity Risk Management:
    - Defensive equities – as participants near retirement, add low volatility equities and companies with dividends to the portfolio.
- Fixed Income Interest rate sensitivity
    - High-Income strategies – high yield bonds and emerging market bonds are not as sensitive to interest rates
    - Global bond strategies – hedges against rise in US interest rates
    - Low duration strategies – reduces interest rate sensitivity but with lower returns
    - Fixed-Income Diversifiers – include non-traditional bonds such as high-yield, securitized loans, and corporate debt in the portfolio

Inflation risk

- Historically real estate/commodities have performed well with rising inflation
    - Can raise rent prices for real estate
    - Commodities cause inflation
    - Good diversifiers since low correlation with each other
- TIPS will provide bond portfolio protection against upward movement of inflation

Longevity risk

- Can purchase annuity to provide lifetime income option in the DC plan.

Strategies for all risks:

- Dynamic asset allocation – ability to monitor and adjust asset allocation based on current market volatility and conditions.
- Multi-managers – research has shown using multiple managers results in more stable returns than a single manager.

RETDAC/U, Fall 2022, Q4

Learning Outcomes:
a) Describe the structure of the following plans:
• Traditional defined benefit plans
• Defined contribution and savings plans
• Hybrid plans
• Other alternative retirement plans such as executive retirement plans, shared risk plans, target benefit plans, etc.

Sources:
SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

RET101-104-25: The Hybrid Handbook: Not All Hybrids are Created Equal

Commentary on Question:
Candidates did not do well on part a; they struggled with the concept of redistributions. Many did not understand that the question was asking about generational inequities provided by the plan. In part b, many candidates struggled with adequately describing cash balance plans and collective defined contribution plans. Part c was answered well by most candidates.

Solution:
(a) Describe how redistributions occur among defined benefit pension plan participants with employee contributions and accrual rates which:

(i) Do not vary with age

(ii) Vary with age

(i) Do not vary with age
- From the young to the old: younger workers overpay to acquire pension benefits while older ones underpay.
- From those who join the plan early in their lives to those who join it late; early joiners overpay
- From those who leave the plan early to those who leave it later.
- From those who have flat earnings profiles to those with steeper earnings profiles towards the end of their career.

(ii) Vary with age:
- When deferred benefits are not revalued like accrued benefits, early leavers lose out at the expense of those who stay in the plan;
- In final pay plans, workers with steeper earnings profiles profit at the expense of workers with flatter profiles;

- Partnered members profit at the expense of single members as their partners obtain survivor pensions;
- Women on average get more value from equal contributions than men because of their longer average life expectancy

(b) Describe how the characteristics of the following pension arrangements affect risk sharing between the plan participants and plan sponsor:

(i) Traditional defined benefit plan

(ii) Cash balance plan

(iii) Collective defined contribution plan

(i) Traditional DB plans:

- In these plans, a formula links benefits to wages and the length of the service period.
- The replacement rate is fixed as a percentage of the worker's final or career average wage.
- To the extent that benefits are paid as inflation-indexed annuities, inflation risk is mitigated for pensioners
- These types of plans shift all risks related to benefit provisions to the sponsoring employer, and hence to current and future workers.

(ii) Cash balance plans:

- Benefits are calculated on the basis of individual accounts that are credited with a fixed investment return until retirement.
- At retirement, benefits may be paid as lump-sums or annuities.
- It protects employees against investment risk, but not longevity risk before retirement.
- It may also fail to protect against inflation risk if the investment return guarantee is set at too low a level (or a nominal level only).

(iii) Collective DC plans:

- In a collective DC plan, contribution rates are fixed.
- Benefits are calculated as in traditional DB plans but both the extent of indexation and nominal benefits are linked to the plan's funded status.
- Nominal accrued benefits and even nominal pensions in payment can be cut if the funding ratio falls below a certain level.
- Pensioners therefore face greater benefit risks than under the pension arrangements in (i) and (ii).

(c) List the criteria used to assess the effectiveness of hybrid plans.

To provide a general assessment of the various types of hybrid plans, the criteria listed below are used:

- Adequacy and provision of lifetime income to those who retire from the plan
- Purchasing power preservation in retirement
- Adequacy of retirement income for those terminating before retirement
- Funding predictability
- Funding flexibility
- Benefit predictability and transparency
- Workforce management effectiveness

RETDAC/U, Fall 2022, Q8

Learning Outcomes:
a) Describe the structure of the following plans:
b) Given a plan type, explain the relevance and range of plan features including the following:

Sources:
SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

RET101-104-25: The Hybrid Handbook – Not All Hybrids Are Created Equal

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a) Describe the following types of pension plans for government employees that combine elements of defined contribution and defined benefit plans:

(i) Vertical Hybrid

(ii) Horizontal Hybrid

(iii) Choice Scheme

Commentary on Question:
To receive full credit, candidates needed to describe all three types of Hybrid Pension Plans – Vertical, Horizontal, and Choice. The responses should go beyond defining a hybrid plan. Candidates generally did not perform well in part a) since the majority of candidates did not demonstrate that they could identify and articulate the differences between the Vertical Hybrid and Horizontal Hybrid designs. Candidates were most successful describing the Choice Hybrid Plan.

<u>Vertical hybrid</u>

The first portion of an employee's salary is subject to a contribution rate of the Defined Benefit component of the Plan

The remaining portion of salary is subject to contribution rate of Defined Contribution component.

The Integration Point and indexing of integration point are significant to the plan design: employer risk varies based on integration point and annuitization provided

The DB component provides Longevity and Investment risk protection, especially for lower-paid employees.

Horizontal hybrid

The entire salary is subject to respective contribution rates of DB and DC components.

Horizontal Hybrids plans provide greater portability of benefits and preserve retirement security for members who terminate before retirement.

Integration point can either be fixed level, so relative role of DB in total benefits declines over time, or can be indexed.

DB-type risks for sponsor, primarily investment and mortality risk, reduced (compared to full DB plan).

Choice Scheme

Members are provided a choice between DB only or DC only option
There is a Default Option if no choice made by the member.

Retirement security tied to member making the best choice given their situation.

If members made optimal choices, this would likely cause adverse selection problems for employers.

(b) Assess which option is the most advantageous for a new hire age 45 based on the assumptions provided.

Show all work and justify your response.

Commentary on Question:
Candidates generally did well in calculating each option – DB only, DC only, and Hybrid. The majority of candidates assumed that the test of which option was best was made at age 65. However, the test should be applied on a range of ages since the most advantageous choice differs based on how long the employee works at the company.

The model solution for this part is in the Excel spreadsheet.

RETDAC/U, Fall 2022, Q10

Learning Outcomes:
a) Describe the structure of the following plans:
b) Given a plan type, explain the relevance, risks and range of plan features including the following:

Sources:
CIA Report of the Task Force on Target Benefit Plans

Commentary on Question:
This question relates to the concepts of a Target Benefit Plan. Successful candidates were able to describe the risk-sharing features and describe the various concepts related to risk sharing/pooling and how these plans compare to the traditional plans. Most candidates did well on parts a and b, but many struggled with part c.

Solution:

(a) Describe the risk-sharing features of the Association of Canadian Pension Management Target Benefit Plan concept (TBP).

A TBP pools both economic and demographic risks

It has a predefined retirement income goal (the "target benefit"), where the employer's financial liability is limited to predefined contributions

Members' benefits may periodically be adjusted upwards or downwards relative to the original target.

A direct result of limiting the employer's liability is that members become the ultimate bearers of the plan's risks.

Such risks are not borne by each member individually, but pooled among the members.

(b) Describe the shortcomings of traditional defined contribution plans and traditional defined benefit plans when compared to TBP.

DC plans have significant shortcomings, including:

- Members often have insufficient knowledge and/or level of engagement to effectively manage retirement assets
- High management expense ratios can erode value

TBPs can retain the stability of costs associated with DC plans while allowing members to benefit from improved pension outcomes by pooling assets in a common fund and by pooling certain risks.

For DB plans, the combination of volatile markets and a low-interest-rate environment resulted in a pattern of plan costs that was no longer acceptable to many plan sponsors: cost is too volatile and expensive to continue to maintain

Traditional DB plan sponsors bear all investment risk and longevity risk

TBPs can retain the stability of costs associated with DB plans by adjusting the members' benefits based on how markets perform. Plan sponsors would be able to share the investment risk and longevity risk with participants under this arrangement.

(c) Explain how the different components of mortality risk are shared between plan participants and the plan sponsor in the following:

(i) Traditional defined contribution plans

(ii) Traditional defined benefit plans

(iii) TBP

Mortality risk can be split into two components: idiosyncratic and residual.

Idiosyncratic mortality risk refers to individual variations in mortality among members with similar risk characteristics.

Residual mortality risk is what is left and also arises from uncertainty about the "true" mortality rates applicable to a particular cohort (compared to assumption about current mortality rates and potential future mortality improvements).

In a DC plan all mortality risks are borne individually by plan participants.

In a DB plan and in a TBP, all mortality risk is pooled: individual mortality risks are offset against each other, thereby reducing the overall mortality risk.

A large DB plan or TBP with a homogeneous membership will have minimal residual mortality risk. Smaller plans will have less diversification and may be left with more residual mortality risk.

RETDAC, Fall 2022, Q11

Learning Outcomes:
a) Describe the structure of the following plans
b) Given a plan type, explain the relevance, risks and range of plan features including the following:

Sources:
SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

RET101-105-25: CAPSA Guideline No. 8: Defined Contribution Pension Plans

Commentary on Question:
The illustrative solution below provides an answer that would receive full credit. Other valid answers not shown below also received credit. The question was well-answered in general, with part (b) requiring detailed knowledge of the guidelines and the ability to select what information was applicable to the question

Solution:
(a) Describe information the administrator should provide in the following situations:

(i) Member who decides to retire

(ii) Removal of an investment option

(iii) Replacement of an investment option

Commentary on Question:
Part (a) was generally well-answered by the candidates. Those who studied the CAPSA Guidelines document were able to answer very well parts (i) and (ii), and they did moderately well on part (iii).

<u>(i) Retirement</u>

Jurisdiction's minimum disclosure
Options available to member
Actions member must take
Any deadline for member action
Default option if no action is taken
Information on regulated retirement products available during payout phase
Information to assist in retirement option decisions
Level of fees, including asset-based fees

<u>(ii) Removal of investment option</u>

Information regarding what must be done
Deadline
Manner assets allocated to new option
Consequence of not taking action
If option replaced, provide impact of liquidating and re-investing in replacement

<u>(iii) Replacement of investment option</u>

Provide advanced notice
Effective date of change
Description of change
Penalties or transaction fees
Where to find more information about the change
Action members must take
Consequence of not taking action

(b) Identify information the administrator should provide to members for a variable benefit retirement option that pays income directly from the plan.

Commentary on Question:
Part (b) required a good knowledge of the Guidelines for the candidates to be able to analyze the various requirements and select those that apply to variable annuities. This was less successfully answered by the candidates than part (a).

Changes in investment options available to member:

Changes to default option
Additional fees during decumulation phase
Legislative requirements regarding withdrawal rates

If investment choice provided:

Details of investment options
Changes to menu of investment options

Consider providing:

Information on withdrawal amount options, including minimum and maximum withdrawal requirements
Income estimates based on a range of investment assumptions
Pessimistic, best estimate and optimistic
Withdrawal patterns or income projection tool that accommodates varying investment return assumptions and withdrawal patterns
Disclaimer in tool that income will likely vary from estimates
Assumptions used for estimates

RETRPIRM, Spring 2023, Q1

Learning Outcomes:
c) Discuss investment of retirement plan assets
• Assess the different types and combinations of investment vehicles typically used for providing retirement benefits.
• Distinguish the various strategies, approaches and techniques used to manage retirement fund assets

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a) Describe desirable features for target date fund design.

Commentary on Question:
The list of desirable features below is not exhaustive, other reasonable answers were given credits for. However, the question was not designed to test knowledge of what a target date fund is, therefore responses focusing on basic characteristics of a target date fund were not given credits for.

(i) Have Multi-Manager/Open Architecture
- Common across most of the investment management industry but not target date funds
- Multi-manager funds have historically produced more stable returns with improved median alpha compared to single-manager actively managed funds.

(ii) Include Non-traditional Asset Classes
- Includes commodities, real estate, defensive equities, long/short equities, long/short credit, TIPS and unconstrained bonds.
- REITs and commodities respond positively to increases in inflation.
- Nontraditional bonds and global bonds can lower interest rate risk.

(iii) Dynamic Allocation
  - Provides the ability to monitor and adjust the glide path, responding to meaningful changes in market conditions.
  - Can adjust glide path if there's a big increase in market volatility or a sharp change in correlation characteristics of different asset classes.
  - This strategy should focus on reducing risk and not increasing returns.

(iv) Mixing Active and Passive investing strategies to enhance risk-adjusted returns and manage costs.

(v) Provide a lifetime income option to participants as the default investment for the DC plan

(b) Describe diversification solutions that address the following risks in target date funds:

(i) Growth risk

(ii) Inflation risk

(iii) Market risk

Commentary on Question:
This part of the question was straight forward, and candidates generally did very well.

(i) Growth risk
  - Long-short equity
    - generates more than half its returns from factors outside the benchmark movements of the equity market
    - Long-short equities is manager skill (alpha diversification)
  - Risk-parity strategies
    - Generate diversification by diversifying across broad asset markets (beta diversification).
    - They don't rely on equity market returns alone   They diversify their exposure across interest rates, commodities, credit and other asset classes.

(ii) Inflation risk
  - Real estate – can pass through rises in inflation by hiking rent prices
  - TIPS – protects a bond portfolio against inflation, since TIPS absorb the upward movement in inflation

(iii) Market risk

- Equity risk management
    - Defensive equities
    - Dynamic allocation
- Fixed income diversifiers are designed to generate stable returns without being sensitive to the interest rate environment.

RETDAC/U, Spring 2024, Q3

Learning Outcomes:
b) Given a plan type, explain the relevance and range of plan features including the following:

Sources:
RET101-103-25: Phased Retirement – An Important Part of the Evolving Retirement Scene

Commentary on Question:
The model solution below is an example of an answer that would receive full credit; it does not include all possible answers. Other reasonable answers also received credit.

Solution:
(a) Describe the advantages and disadvantages of offering a phased retirement program from NOC's perspective.

Commentary on Question:
Candidates generally performed well on part a. To receive full credit, candidates needed to specifically relate the impact of a potential phased retirement to the case study and list both advantages and disadvantages. No credit was given for statements that were not consistent with the laws of Gevrey listed in the case study or for age-related statements about employees struggling with new technology.

Advantages
- NOC has seen lots of employee turnover the past few years. A phased retirement program may allow for a stabilization of NOC's workforce.
- A phased retirement program may allow for transfer of knowledge between longer service and shorter service employees
- A phased retirement program may increase employee satisfaction by providing options to employees close to retirement age

Disadvantages
- A phased retirement program may increase administrative and legal complexity to NOC
- NOC may face some anti-selection risk if the program is poorly designed

(b) Compare and contrast the potential impacts of the following phased retirement schedules from NOC's perspective:

(i) 75% of full time during phased retirement

(ii) 25% of full time during phased retirement

Commentary on Question:
Candidates had a mixed performance on part b. Many candidates correctly identified that the 75% schedule employees would likely continue to accrue benefit service in the National Oil Pension Plan while the 25% employees would not. Candidates struggled to consider that NOC would need to clarify the health care options that would be available to employees adopting either phased retirement schedule. To receive full credit, candidates needed to describe both similarities and differences between the impacts of the two phased retirement schedules.

- Both schedules would require NOC to clarify health care options. Participants who have not attained ten years of service would not be eligible for the retiree health care plan.
- Both schedules would allow flexibility to the employee associated with working less and may allow for a transfer of knowledge to younger workers
- 75% schedule employees would continue to accrue pension plan benefit service and may continue to accrue pay, potentially increasing costs to NOC; 25% schedule employees would not likely accrue additional benefits in the pension plan. This reduction in benefit accruals could offset any increased costs to NOC as a result of their initial benefit commencement relative to a status of continued employment
- 75% schedule employees would likely remain more committed to their role, potentially resulting in a more successful transfer of knowledge than with 25% employees

(c) Describe the advantages and disadvantages of incorporating an in-service distribution option in the National Oil Pension Plan.

Commentary on Question:
Candidates had a mixed performance on part c. Many candidates correctly identified that an in-service distribution option would allow employees to take advantage of the early retirement subsidy in the Pension. Most candidates described impacts to both NOC and its employees. Some candidates confused adding an in-service distribution option with adding a lump sum option to the plan. To receive full credit, candidates needed to describe both advantages and disadvantages of the in-service distribution option and describe the impact to both NOC and its employees.

NOC
- An in-service distribution option may better facilitate achievement of NOC's goals as part of the phased retirement program (knowledge transfer and seasonal workforce).
- NOC could see increased costs due to additional early commencements and administrative complexity

- Administrative complexity would likely increase for NOC if participants commence while accruing additional benefits, especially if both lump sum and annuity options are offered

Employees

- Participants at age 62 would be able to take advantage of the early retirement subsidy while still working, making the phased retirement program more attractive to employees concerned with losing the value of the subsidy.
- Participants would still be able to accrue benefits if they continue to work.
- An in-service distribution option could allow employees to receive subsidized early retirement benefits and continue working to obtain eligibility for the retiree medical plan if the employee has less than ten years of service

RETDAC/U, Spring 2024, Q6

Learning Outcomes:
a) Describe the structure of the following plans:
b) Given a plan type, explain the relevance and range of plan features including the following:

Sources:
Analysis of Target Benefit Plan Design Options, Feb 2016, pp. 12-16

CIA Report of the Task Force on Target Benefit Plans, Jun 2015, (excluding sections 4, 5 & Appendices)

CIA Educational Note: Financial Risks Inherent in Multi-Employer Pension Plans and Target Benefit Pension Plans, May 2011

RET101-111-25: Risk Management and Public Plan Retirement Systems - Appendices only (pp. 1-33 background only)

Commentary on Question:
This question requires candidates to demonstrate their ability to analyze the Target Benefit Pension Plan (TBPP) design and explain the relevant risks associated with TBPPs.

Successful candidates were able to identify and articulate that the benefit levels in TBPP will depend on the asset mix, discount rate, and the predefined triggers and actions (i.e. "no action range") set by the plan.

Generally, answers for parts (a) and (c) were decent. Candidates seemed less familiar with the concept of a "no action range" and thus Part (b) was the weakest. A number of candidates completely skipped this question.

Solution:
(a) Analyze how the following affect benefit levels in a target benefit plan:

(i) Asset mix

(ii) Using risk-free discount rate to value liability

(iii) Using best estimate discount rate to value liability

Commentary on Question:
In part (a), a lot of candidates were able to grasp that the more aggressive asset mix will contribute to higher volatility and a conservative discount rate would lead to a higher initial liability.

(i) Asset Mix
Choice of investment mix has a greater impact on the size of benefit adjustments than on the frequency of the adjustment.
Asset mix with a higher equity allocation does not change the likelihood of funding shortfalls (and benefit adjustments) in the short term.
Asset mix with a higher equity allocation does increase both the likelihood of funding shortfalls and the severity of funding shortfalls occurring in the long term. These shortfalls would lead to benefit level adjustments.

(ii) Risk Free Discount rate to value all benefits:
- Target pension is initially set conservatively
- Less likely to need benefit adjustments (i.e. lower probability of benefit decreases)
- Benefit increases are financed by gains that are primarily due to realized equity risk premium and the rising bond yields.
- there is still a significant probability of falling below the initial pension during a particular member's retirement period due to the long period of retirement years (30-40 years) (i.e. adjustments could be frequent).

(iii) Best-estimate discount rate to value all benefits
- The potential upside risk is lower; and the downside risk is increased
- Increased likelihood of annual benefit reductions
- Increased severity of benefit reductions
- Decreases the likelihood and size of potential annual benefit increases
- The median annualized growth rate of pensions after retirement is near zero (i.e. less potential for a pension benefit increases during the retirement years for a pensioner)

(b) Describe the advantages and disadvantages of a "no-action range" in a target benefit plan where benefit adjustments, positive or negative, are not implemented.

Commentary on Question:
Part (b) was generally poorly done and attempted. Candidates were unfamiliar with a "no action range."

<u>Advantages</u>

"No-action range" reduces the frequency of benefit changes.

Builds up a countercyclical buffer where past positive experience is drawn down with negative experience without having to decrease benefits.

When using a "no-action range," the distribution of the funded ratio tends to revert to the mean

Leads to more stable pension outcomes without added cost for employer

Higher benefit security and stability during the ultimate period.

Disadvantages

Single trigger for action would result in benefits that are too volatile.

Intergenerational inequity because “no action ranges” reward the later cohorts of retirees.

Higher risk during the transition period (applicable to earlier cohorts).

(c) Describe the advantages and disadvantages of a public sector target benefit plan from the employer’s perspective.

Commentary on Question:
Part (c) was generally well-done. Candidates were prepared to discuss the advantages and disadvantages of Public Sector Target Benefit Plans (TBPs). Candidates were able to describe the majority of the unique elements that characterize a large Public Sector Target Benefit Plan. The model solution below is an example of an answer that would receive full credit; it does not include all possible answers. Other reasonable answers also received credit.

Advantages for Employers of Public Sector TBP

Contribution rate:
- stable contribution rate
- employer obligation limited to pre-defined amounts
- contributions vary within a range that provides the plan with an additional lever to control the affordability of benefits

Target benefit level
- higher degree of benefit security and stability
- risk sharing between employers and employees
- benefits may be adjusted up and down frequently in response to market conditions and other plan experience

Investment policy.
- By specifying a certain risk/reward trade-off of how plan assets can be invested, investment policy of TBP directly affects affordability of the target benefit as well as the risk of actual benefits falling short of or exceeding the target.

- Generally, the size of public sector employers allow them to have the advantage of risk pooling, economies of scale, and the ability to use dedicated professional advisors which may not be available to smaller plans.

Disadvantages

- Benefits can be reduced which may not be allowed in certain jurisdictions
- Currently, no real regulatory framework exists for TBP
- Intergenerational inequity where the capacity of successive generations to honor the implicit contract is constrained (e.g., because the number of new entrants is declining), or if the willingness of the next generation to participate in the risk transaction wanes, the TBP may collapse.
- Generous benefit subsidies, enhanced early retirement benefits and/or disability benefits can complicate risk management and can endanger sustainability
- Funding is highly sensitive and dependent on the active employee population. Although mass layoffs are rare in the public sector, decreases in the active population could result in decreased funding and thus trigger benefit decreases at an inconvenient time for the pension plan

RETDAU, Spring 2024, Q4

Learning Outcomes:
a) Describe the structure of the following plans:
target benefit plans, etc.
b) Given a plan type, explain the relevance and range of plan features including the following:

Sources:
SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a) Explain the risks associated with cash balance plans from the perspective of the following:

(i) Plan sponsors

(ii) Plan participants

Commentary on Question:
Generally, candidates did well on this part of the question. Candidates needed to elaborate on how the risks impact plan sponsors and/or plan participants and not just list them to receive full credit.
The model solution below is an example of an answer that would receive full credit; it does not include all possible answers. Other reasonable answers also received credit.

(a) Plan sponsors

- Longevity risk: The risk remains with the employer until the participant has been fully paid out. Most likely not everyone will take a lump sum so the plan sponsor will still have to manage the risk of participants living longer than expected and paying out the annuity payments until their death.

- Investment risk: Plan sponsors are responsible for managing the assets from the time of the participant joining the plan until the benefits are fully distributed. That means they will need to contribute more if the assets don't keep up with the crediting rate. They can mitigate this risk by choosing a crediting rate that is market-based, where the rate varies from year to year. This reduces the sponsor's risk in having to maintain investment returns that exceed the crediting rate.

(ii) Plan participants

<u>Longevity risk:</u>

- Benefits are typically communicated in terms of an account balance, increasing the chances participants will elect a lump sum at retirement. This increases their risk of outliving their pension income.
- If the participant takes a lump sum, the longevity risk transfers to the employee

<u>Investment risk:</u>

- If the participant takes a lump sum, the investment risk is also transferred to them

<u>Inflation risk:</u>

- Participants bear pre-retirement inflation risk since annual contributions are based on salary, like a career average plan.
- Similarly, due to the increased likelihood of electing a lump sum, participants may take on post-retirement inflation risk if their investments are not earning enough to cover inflation.

(b) Critique the use of the following assumptions in a cash balance plan:

(i) 100% of participants take a lump sum immediately upon termination or retirement

(ii) Age 62 single point retirement age

(iii) An interest crediting rate 50 basis points lower than the discount rate

Commentary on Question:
Candidates who did well on this question provided ample details in their critique of the assumptions. They also provided a suggestion on how the assumptions can be refined.

(i) Using a 100% lump sum at termination assumption will not capture the impact of post-retirement mortality since everyone is assumed to take a lump sum once they leave employment. It will also not reflect the true duration of the plan and could skew projected cash flow needs. This assumption should be based on actual experience from recent years in the plan.

(ii) A single point retirement age assumption will likely result in liabilities being undervalued if members retire later than expected. Depending on plan experience, it could also cause expected cashflows to deviate significantly making investments more difficult to hedge. This assumption should better align with actual plan experience, and depending on materiality, can be refined to use an age/service table.

(iii) This assumption could result in less accurate projections of the liability (depending on the actual interest crediting rate (ICR)) since the cash balances are projected forward with the ICR and discounted back with the discount rate. The assumption will need to be monitored and compared to the actual interest crediting rate to make sure it aligns.

(c) Calculate the replacement ratio assuming an asset return of -15% in year 1 and 4% in year 2.

Commentary on Question:
Most candidates received full credit for this question. The most common error was capping the member's balance at the end of the first year and not at retirement.

The model solution for this part is in the Excel spreadsheet

RETDAC/U, Fall 2024, Q4

Learning Outcomes:
a) Describe the structure of the following plans:
• Traditional defined benefit plans
• Defined contribution and savings plans
• Hybrid plans
• Other alternative retirement plans such as executive retirement plans, shared risk plans, target benefit plans, etc.
b) Given a plan type, explain the relevance and range of plan features including the following:

Sources:
CIA Report of the Task Force on Target Benefit Plans, Jun 2015 (excluding sections 4, 5 & Appendices)

CIA Educational Note: Financial Risks Inherent in Multi-Employer Pension Plans and Target Benefit Pension Plans, May 2011

Commentary on Question:
This question was intended to test candidates' knowledge of Target Benefit Plans and the risks faced by the employer and employees in a Target Benefit Plan. Candidates who did well provided enough examples to show a thorough understanding of the topic and related their responses back to the case study.
The model solution below is an example of an answer that would receive full credit; it does not include all possible answers. Other reasonable answers also received credit.

Solution:
(a) Describe the advantages and disadvantages of a target benefit plan from the following perspectives:

(i) NOC

(ii) NOC employees

Commentary on Question:
Most candidates did well on this part and were able to identify advantages and disadvantages from both perspectives. Some candidates did not provide enough detail to receive full credit.

(i) NOC:
Advantages:
- NOC's contributions are predefined, providing stability in pension expense and balance sheet impacts and greater ability to plan for their business needs

- NOC can share investment and longevity risks with members while still providing them a stable retirement income

Disadvantages:

- Since NOC is limited in how much they can contribute, this limits the tax advantages of additional contributions to the pension plan if cashflow is available
- Could be more administratively complex and costly

(ii) NOC employees

Advantages:

- Employees could benefit from higher than expected demographic and economic gains by having their benefit increased compared to their current DB plan.
- Members are paid a lifetime pension which eliminates their individual longevity risk.

Disadvantages:

- If plan's economic and demographic assumptions lead to losses, member benefits could be reduced compared to their current DB plan.
- Since employer contributions are fixed, members ultimately bear the plan's risk either by increasing contributions or reducing benefits to cover deficits.

(b) Recommend changes to NOC's defined benefit plan provisions to qualify it as a target benefit plan.

Commentary on Question:

Many candidates did poorly on this part. Candidates who assumed that the Plan needs to be converted into a defined contribution plan to qualify as a Target Benefit Plan did not receive credit. A successful candidate needed to recommend changes to the defined benefit plan provisions outlined in the case study.

- Make the 2% accrual rate variable based on the plan's funded status
- Add conditional post-retirement indexation based on the plan's funded status
- Change pension formula to a career-average plan with conditional pre-retirement indexation
- Make plan reduction variable and dependent on the funding policy
- Change period for final average earnings varying on the funding policy (36 months instead of 60 months if plan is well funded)
- Make unreduced retirement date variable (example ranging from 62 to 65 based the funded status)

(c) Describe the potential uses of stochastic modeling when analyzing a target benefit plan.

Commentary on Question:
Candidates who did well clearly described the benefits of stochastic modelling relating to target benefit plans and not just in general.

- Identifies the likelihood of the plan being able to meet its targets, and the likelihood of benefits being paid at the identified levels in the benefit/policy ladder;
- Understand the effectiveness of various mechanisms designed to make the plan more resilient to emerging experience and assess the residual risk borne by individual members
- Understand how risks and rewards are allocated among different generations of plan members over time.
- Understand the effects of changing certain assumptions based on updated experience

RET101 Learning Objective 2 Model Solutions

RETDAC/U, Fall 2020, Q1

Learning Outcomes:

a) Identify risks faced by retirees and the elderly
c) Evaluate benefit adequacy and measure replacement income for members of a particular plan given other sources of retirement income

Sources:
RET101-102-25 Defined Contribution Plan Success Factors

Retirement Plans - 401(k)s, IRAs and Other Deferred Compensation Approaches, Allen et al., 12th Edition, 2018 – Chapter 11 (excluding pp. 198-200)

Commentary on Question:
This question tested the candidates' understanding of the potential benefits and risks involved from an employee perspective of moving from a defined benefit plan to a defined contribution plan. Most candidates performed well on all parts of this question, though some candidates struggled keeping the answers internally consistent.

Solution:
(a) Describe four disadvantages of a DB plan from the perspective of Company ABC's employees.

Commentary on Question:
To receive full credit, four distinct disadvantages needed to be described in detail and had to be internally consistent with the responses given throughout the question. Credit was given for other relevant answers not provided below.

Portability: DB plan lacks portability, which is generally favored by a younger population.

Investment return: Employees cannot share in investment returns under a DB structure. Younger participants may wish to direct their own investments and share in the return.

Accruals: Incremental value for younger employees is relatively small in a final average pay plan. Accruals in a DC plan are based on pay earned in a given year, similar to a Career Average Pay plan.

Savings: While DB plans can include employee contributions, most DB plans tend to not encourage employees to save for retirement.

(b) Describe how moving to a defined contribution (DC) plan can address the disadvantages described in part (a).

Commentary on Question:
Most candidates did well on this part by successfully describing how a DC plan structure addresses the disadvantages from part (a). Credit was given for other relevant answers not provided below.

Portability: DC plans provide the employee's account balance as a lump sum, which allows more portability to the mobile workforce.
Investment return: In a DC plan, the investment reward is assumed by the employee. There is a large window of opportunity for investment reward for a young workforce.
Accruals: DC accruals are based on pay in a given year. Therefore, incremental value of a DC benefit is generally the same at all ages.
Savings: DC plans allow and encourage employee contributions. Company ABC can define a matching contribution to incentivize employee savings.

(c) Describe behavioral factors that may lead Company ABC's employees to make suboptimal choices if the company adopts a DC plan.

Commentary on Question:
To receive full credit, candidates needed to describe four behaviors that can lead to a suboptimal decision in detail. Candidates were not expected to provide the exact terminology for the behavior that is contained in the model solution so long as the behavior was described in detail. Similarly, candidates who merely listed the behavioral factor did not receive full credit.

Credit was given for other relevant answers not provided below.

Bounded rationality: Individuals have inherent limitations in their ability to make complex retirement decisions. The decisions required of a defined contribution plan may exceed the participant's skill set.
Past performance: Individuals tend to overweight past performance as an indicator of future performance when reversion to the mean is often more likely than continued above-average performance.
Savings anchors: Younger workers tend to contribute minimum level to receive full match when higher contributions might be necessary to retire comfortably. Similarly, some young workers may contribute less than the level required to receive the full match.
Inappropriate risk discounting: Participants may not diversify appropriately, especially if company stock is involved. A downturn in the company can have negative effects on both current income and retirement income.

(d) Identify DC plan design features that Company ABC should consider to improve their employees' retirement income adequacy.

Justify your response.

Commentary on Question:
To receive full credit, candidates needed to provide four features and express how their suggested design features would improve income adequacy. Some candidates focused on the investment options that would be provided rather than plan design features, which did not receive full credit. Credit was given for other relevant answers not provided below.

Immediate Eligibility: Immediate eligibility increases the amount of employee and employer deferrals into the plan. Also, employees may view DC deferrals as a pay decrease if they do not begin with the first paycheck and want to not participate.

Automatic Enrollment: Automatically enroll participants, perhaps at a rate that ties to the plan design to maximize employee and employer contributions. This is a proven way to increase participation since participants are less likely to actively opt out rather than opt in.

Stretch employer matching contributions: Increasing the employee deferral amount necessary to earn the maximum employer contribution will increase employee savings while being cost neutral to Company ABC. Example: provide a 50% match on first 10% of employee contributions instead of a 100% match on first 5% of employee contributions.

Re-enrollment: Automatically re-enroll non-participants who have opted out of the plan in the past. This will increase the participation and encourage employee contribution deferral since participants are less likely to actively opt out (again) than to take action to enroll in the plan.

RETDAC/U, Fall 2020, Q2

Learning Outcomes:
b) Describe and contrast the risks faced by participants of various sponsored plans, such as:
- Retirement plans sponsored by public sector employers
- Single employer sponsored retirement plans
- Retirement plans involving more than one employer, and
- Social insurance plans

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

Commentary on Question:
This question tested candidates' understanding of multiemployer retirement plans. Candidates did okay on this question, but many failed to fully answer all aspects of the question and did not receive full credit.

Solution:
(a) Describe the following risks from the perspectives of the remaining participating employers and plan members.

(i) Funding risk

(ii) Risk of decline in work hours

(iii) Risk of intergenerational transfers

Commentary on Question:
Credit was given for describing the risks related to the bankruptcy of a participating employer in a large multiemployer pension plan (MEPP). Candidates generally performed well in part a) and demonstrated that they understood the effect of the bankruptcy on the contributions as well as the effect on the remaining workforce.

<u>Funding Risk</u>

For MEPPs, the actual cash contribution is usually determined by the collective bargaining agreement (CBA). As such, the minimum required contribution defined in the CBA does not assure that the plan will be well funded.

With the exit of a large participating employer from the MEPP, there is a risk that the existing contribution determined by the CBA in force at the time, would not meet the minimum statutory required contributions.

<u>Risk of decline in work hours</u>

Reduction in the hours worked leads to lower contributions to finance the legacy deficit.

Reduction in hours worked, or hours of work available due to the exit of a large participating employer, may influence part of the workforce to retire earlier. This would lead to an experience loss when subsidized early retirement is offered which would further hinder the MEPPs ability to adequately fund the legacy deficit.

Also, an increased lump sum termination benefit for members employed by the exiting employer can result in (or increase) negative cash flows, thus increasing liquidity needs and limiting investment alternatives.

If the hiring and layoff practices are based on seniority, a reduction in employment due to the bankruptcy of the large employer would likely result in an increase in the average age of working members and in the normal actuarial cost rate

<u>Risk of Intergenerational Transfers</u>

The risk of intergenerational inequity can be measured by splitting the current contributions into the portion to fund the normal cost and the portion to fund the legacy deficit.

With the exit of a sizable portion of the active membership, a larger portion of the current contribution would go towards funding the legacy deficit. Thus, there is a wealth transfer from the current and future generations of workers to the past generation.

The value that similarly situated members take out of a plan can vary widely depending on plan experience, the individual's personal circumstances, basic plan design terms, etc.

Given the exit of a major employer, the board of trustees would need to decide the extent to which inequities are reasonable and which generation of workers would bear the negative impact of an exit of a large portion of the active membership.

(b) Describe the advantages and disadvantages of the proposed amendment from the following perspectives:

(i) Remaining participating employers

(ii) Plan members

Commentary on Question:

Part b) was well attempted and candidates were generally able to articulate the advantages and disadvantages to employees and employers. To receive full credit, candidates need to adequately describe both advantages and disadvantages for remaining participating employers and plan members. Candidates tended to focus on HR related issues and did not fully address disadvantages for remaining employers

Advantages – Remaining employers

The legacy deficit would not increase because the amendment decreases the accrued liabilities.

As such, the cashflow and liquidity needs of the MEPP would be better managed due to decrease in pensions in pay.

There would not be a need to renegotiate the CBA to address funding of legacy cost since the contributions would still meet statutory minimum funding requirements.

Advantages – Remaining members

The past accrued benefits would decrease but the improved funded position of the plan after the reductions may allow active members to keep the negotiated level of benefit accruals and ancillary benefits.

The improved funded position after the benefit reductions may allow the plan to be more financially stable in the future and forgo future benefit reductions with the possibility of restoring past benefits if surpluses arise in the future.

Active members would not need to contribute more to the plan (i.e. employee current contributions would not need to increase).

The wealth transfer between generations are minimized (i.e. more generational equity).

Disadvantages – Remaining employers

Remaining employers may have difficulty in recruiting new employers to join MEPP.

They also may have difficulty in meeting the benefit expectations of the remaining plan members.

The reduced cash contributions going into the plan may delay or hinder the plan becoming better funded in the future.

Other employers may consider withdrawing from the MEPP

Disadvantages – Remaining members

There may be a decrease in morale;

There may be increased communication risk that the benefit reductions are misunderstood by members;

The adverse amendment may affect the pattern/incidence of retirements going forward.
The reduced pension might not provide adequate retirement income.

(c) Describe three alternatives to address the ongoing funding of the MEPP after the withdrawal of a large employer and barriers to their implementation.

Commentary on Question:
Many candidates were able to identify three alternatives but struggled with identifying barriers to the implementation of these alternatives. Other relevant alternative solutions to address the ongoing funding also received credit.

Possible Alternatives

- Increase Employer contributions to the MEPP by renegotiating the CBA
- Increase Employee contributions to the MEPP
- Decrease future benefits and or ancillary benefits

Barriers to implementation

- Regulatory barriers and Anti-cutback rules may prohibit the benefit reductions;
- Non-discrimination and Age discrimination rules need to be considered;
- Decreased benefits may reduce the ability to attract new employees to join the MEPP;
- Changes can be subject to lawsuits if considered unfair;
- Plan administration may become too complex; and
- Unions may grieve the proposed changes

RETDAC/U, Fall 2020, Q8

Learning Outcomes:
a) Identify risks faced by retirees and the elderly
d) Describe ways in which retirement plan design can manage the range of risks faced by plan participants and retirees

Sources:
RET101-115-25: An Improved Application of the Variable Annuity

Commentary on Question:
This question referred to a specific Study Note. Some candidates were able to explain their understanding of this specific plan type, mentioning the hurdle rate and its role in determining the pension payments. Many candidates did not appear to understand this concept and did poorly on this question.

Solution:
(a) Describe how a variable annuity pension plan delivers benefits.

Commentary on Question:
In this part of the question, some candidates were able to demonstrate their understanding of variable rate pension plans. They described the hurdle rate, the mechanism of comparing it to the plan's expected long-term real rate of return and how it impacts benefit payments. Some also discussed their role in offsetting inflation.

- A variable annuity is an innovative payout mechanism
- It is a concept of putting aside enough money for each pensioner so that the pension fund can pay for their future pensions, including reasonable inflationary increases to their pensions.
- The pension plan establishes a <u>hurdle rate</u> which is set equal to the expected long-term real rate of return for the underlying plan assets given the investment mandate selected for the variable annuity assets.
- The difference between the hurdle rate and the plan fund's actual investment return is used to adjust monthly pensioner payments each year.
    - Variable annuities have been used to provide the plan pensioners with increases that offset inflation.
    - They can result in volatile adjustments to pensions in pay when investment markets are volatile.

(b) Explain how risks could be transferred between the employer and the employee under a variable annuity pension plan.

Commentary on Question:
Some candidates explained how the longevity risk could be transferred from employers to employees. A few candidates mentioned the expense risk transfer

item. Overall, candidates showed some difficulty in identifying different risks and how they could be transferred between the employer and employee under a variable pension plan. To receive full marks a candidate had to explain <u>how</u> multiple risks could be transferred, not just identify the risks.

1. Expense risk transfer
    - All expenses could be included in the determination of the fund rate of return.
    - This would result in a lower recognized rate of return on the variable annuity assets and therefore lower pension increases.
    - As a result, the variable annuity "hurdle rate" would be reduced.
    - The plan would be self-sufficient with respect to expenses and the expense risk (and burden) is completely transferred to the pensioners.

2. Longevity risk transfer
    - Introduce the concept of a "hurdle annuity" which is the present value of the members' entitlement using the hurdle rate and the hurdle mortality assumptions.
    - When a new pensioner joins the variable annuity fund, the pensioner contributes an amount equal to the pensioner's hurdle annuity at entry.
    - To determine the annual pensioner increase at the end of each year, an actuarial valuation is conducted for the variable annuity fund to balance accounts by adjusting the pensioners' payments (liability side of the balance sheet).
    - Offering lump sum payments would transfer the longevity risk from the employer to the employees.

3. Inflation risk transfer:
    - Use a "hurdle rate" that is close to the expected real rate of return on plan assets
    - Difference between the hurdle rate and the plan's investment return is expected to be equal to inflation and adjusts the annuity payments accordingly
    - If hurdle rate set appropriately, mitigates inflation risk for the pensioners since their benefits increase with approximate inflation

RETDAC/U, Spring 2021, Q2

Learning Outcomes:
a) Identify risks faced by retirees and the elderly
b) Describe and contrast the risks faced by participants of various sponsored plans, such as:
• Retirement plans sponsored by public sector employers
• Single employer sponsored retirement plans
• Retirement plans involving more than one employer, and
• Social insurance plans
c) Evaluate benefit adequacy and measure replacement income for members of a particular plan given other sources of retirement income
d) Describe ways in which retirement plan design can manage the range of risks faced by plan participants and retirees

Sources:
SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

RET101-118-25: Pension Issues in Mergers and Acquisitions

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a) Analyze the impact of the three options on the following:

(i) Accounting cost to the merged company

(ii) Administrative cost to the merged company

(iii) Disruption to current employees

Commentary on Question:
The question asked for an analysis of the three options, not to compare and contrast them against each other; many candidates listed comparison points of the options against each other. Further, the question asked for the accounting cost and administrative cost to the merged company; some candidates focused their responses on the addition of Plan X, as opposed to focusing on costs before and after the creation of the merged company.

Option 1 – no change
Accounting Cost:
- no change to the accounting cost to the company
- DC expense for Plan A is straight forward and simply equal to contributions

- DB expense for Plan X will continue to be based on annual valuations (or extrapolations) at year end measurement dates under accounting statement

Administrative Cost:

- minimal additional cost (compared to before the merger) since no changes required to plans (plan changes are expensive and time consuming).
- Only thing likely required is communication related to new entity (name changes, etc.).
- Ongoing, company will need to have two plan government filings, different retirement packages and other required communications, so more time consuming.

Disruption:

- low since everything is as it was before merger related to pension plans.
- However, need to consider the potential effects on employee morale - perception of fairness (one may be perceived as superior than the other based on an employee's perception of performance of plans, different risk of DB vs DC plans, different forms of payment and death benefits payable).

<u>Option 2 – freeze X (DB), future accruals all in A (DC)</u>

Accounting Cost:

- Curtailment accounting for Plan X due to the freezing of benefits. If X is a final average earnings (FAE) plan, likely to be a gain due to the decrease in PBO to ABO
- No future service costs going forward in Plan X since no future accruals
- DC expense for Plan A is simply the increased contributions going forward covering both member populations

Administrative Cost:

- can be expensive - costs are required to freeze plan X benefits and enroll all those members into plan A (plan amendments, participant communication, etc).
- However, going forward, plan A is less costly to maintain overall, being a DC plan.
- Also, Plan X will likely be less costly to maintain than before, now being a closed plan.

Disruption:

- Plan X members may not be happy to lose benefit security of DB plan and forced change.
- DB plan accruals usually more valuable at end of career near retirement so Plan X members will lose out on this.
- Also, employees currently in Plan X will receive benefits from two separate sources, and total benefit is likely reduced.

<u>Option 3 – employee choice & if move to A, convert past service</u>

Accounting Cost:

- Some members in Plan X will elect to enroll in Plan A and convert past benefits to Plan A:
    - There will likely be a curtailment/settlement gain (assuming an FAE plan) for Plan X as they will no longer have future accruals under Plan X, and

will be transferring liability (settling the liability on a specific measurement date) to Plan A
    - Future service costs would be zero for these members (total service cost for Plan X will decrease going forward)
- Some members in Plan X will elect to stay in Plan X, so there will continue to be service cost and interest cost in this plan, but at reduced levels
- Expect anti-selection to increase total costs since employees will pick option most beneficial to themselves

Administrative Cost:
- expensive. Communication requirements to give members the option to convert (likely running projections with scenarios to assist with choice, hosting employee education sessions, etc.), actual process of collecting employee choice and doing the conversion.
- More ongoing maintenance too, since 2 open plans to manage (one of which is DB).

Disruption:
- XYZ members will be happy to have the option to pick the plan best for their circumstance.
- No changes for ABC members.
- from an employee perspective, this may be a best case scenario with least disruption.

(b) Recommend which plan the following employees should choose:

(i) 30-year old with one year of service in Plan X

(ii) 55-year old with 25 years of service in Plan X

No calculations required. Justify your response.

Commentary on Question:
For employee (i), quite a few candidates provided points for both options and did not recommend one over the other; these candidates did not receive full credit since they were asked to recommend one option. For employee (ii), the majority of candidates recommended to stay in Plan X, however they had difficulty articulating why – many solutions focused on why not Plan A, as opposed to highlighting the benefits of staying in Plan X. The model solution below highlights a sample recommendation; credit was also given if candidates recommended the other option with proper justification.

(i) Young employee – recommend converting to Plan A
- fairly new in Plan X where benefits are likely not material yet
- DC is better for portability for a more mobile work force (this employee is fairly new at this company and may not become a career employee, especially considering the merger may change company culture)
- potential investment choice in the DC plan

(ii) Older employee – recommend staying in Plan X

- not too far from retirement age, likely not changing jobs until retirement
- even if company culture changes for the worse due to acquisition, can consider retiring early with a more secure benefit in Plan X (DB benefit has better security for employee)

- Want to maximize any early retirement subsidies which may be available from DB plan, which are dependent on age and service

RETDAC/U, Spring 2021, Q4

Learning Outcomes:

a) Identify risks faced by retirees and the elderly
b) Describe and contrast the risks faced by participants of various sponsored plans, such as:
• Retirement plans sponsored by public sector employers
• Single employer sponsored retirement plans
• Retirement plans involving more than one employer, and
• Social insurance plans
d) Describe ways in which retirement plan design can manage the range of risks faced by plan participants and retirees

Sources:
SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

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

Morneau Shepell Handbook of Canadian Pension and Benefit Plans 16th Ed. Ch 1

Commentary on Question:
This question tests candidates' knowledge of the plan design, specifically the risk sharing structure between employees and employers, of Multi-Employer Pension Plans, Single Employer Defined Contribution Pension Plans, and Single Employer Defined Benefit Pension Plans. Further, it tests candidates' knowledge on underlying risks present in Multi-Employer Pension Plans and potential investment strategies to mitigate these risks.

Solution:
(a) Compare and contrast a Multi-Employer Pension Plan's (MEPP) risk sharing structure to the risk sharing structure of the following:

(i) Single employer defined contribution pension plan

(ii) Single employer defined benefit pension plan

Commentary on Question:
Overall, candidates successfully compared and contrasted the risk sharing structure of these different plan designs.

(i) **MEPP & Single Employer Defined Contribution Plan (DC Plan)**
- Risk sharing structure of a MEPP and DC Plan are similar.

- **Risks Borne by -** In MEPPs and DC Plans, risks are borne by the members. Members' benefits can be reduced in a MEPP and members' account balances can decrease in a DC Plan.
- **Risk Pooling -** MEPPs pool risks among members (i.e., longevity risk, investment risk, etc) whereas there is no pooling of risk in a DC Plan.
- **Costs -** MEPPs and DC Plans both have known costs for the employers.
- **Contributions -** In MEPPs and DC Plans, the employer risk is limited to the negotiated or promised contribution rate.

(ii) **MEPP & Single Employer Defined Benefit Plan (DB Plan)**

- Risk sharing structure of a MEPP and DB Plan is significantly different.
- **Risks Borne by -** In MEPPs risks are borne by the members, whereas the employer bears the risks in a Single Employer DB Plan. Members' benefits can be reduced in a MEPP, but plan sponsors cannot reduce accrued benefits in a DB Plan.
- **Risk Pooling -** Both MEPPs and Single Employer DB Plans pool risks among members (i.e., longevity risk, investment risk, etc).
- **Costs -** MEPPs have known costs for the employers, whereas in Single Employer DB Plans, the employer pays the balance of unexpected costs
- **Contributions -** In MEPPs, the employer risk is limited to the negotiated contribution rate, whereas plan sponsors for DB Plans contribute based on the plan provisions and remit any additional funds required to meet minimum funding requirements.

(b) Propose three investment strategies to mitigate risks in a MEPP.

Justify your response.

Commentary on Question:
Overall, candidates were able to generally identify investment strategies but failed to adequately justify their responses. This resulted in partial credit being awarded. Many candidates proposed assumption or plan design changes for this question and were not awarded points for those types of answers.

Candidates were also given credit for relevant investment strategies not mentioned below, such as portfolio diversification.

Reducing the equity allocation:

- Plans typically want to provide inflation protection; equities do not have good inflation matching characteristic.
- Trustees may want to consider alternative asset classes with reasonable inflation matching characteristics and traditionally lower volatility. Asset classes with these characteristics include:
    - Real return bond coupons: by their design, match inflation extremely well.

    - Real estate holdings have some inflation protection matching characteristics.
    - Infrastructure has exhibited better inflation matching than real estate.
- Reducing equity allocation may reduce risk in the plan, but the asset allocation is directly linked to the actuarial assumption for future returns and could result in increased cost.

Increasing the duration of fixed income assets:

- Helpful when the dollar duration of the plan's liabilities exceeds that of the plan's assets.
- The plan's asset allocation would be considered directly in setting the actuarial assumptions for future rates of return.
- Increase the duration of fixed income assets to better match the long-term payment streams to pensioners.
- Where managing the asset/liability mismatch risk is a key driver, asset allocation may focus on matching of expected plan liability cash flows, leading to high fixed income allocations and lower equity exposures.

Applying Immunization techniques:

- Immunization techniques include duration matching, cash flow matching and annuitization of retired life liabilities.
- Full cashflow matching or duration matching increases the likelihood that benefits will be paid.
- Complete matching of assets and liabilities is rarely appropriate, though, as the level of benefits that can be provided on this basis is likely lower. A balance must be struck.
- Annuitization of retired life liabilities ensures a perfect immunization for this group, and, in most cases, is a complete transfer of future risk to the insurer.

RETDAC/U, Fall 2021, Q10

Learning Outcomes:
a) Identify risks faced by retirees and the elderly.
b) Describe and contrast the risks faced by participants of various sponsored plans, such as:
• Retirement plans sponsored by public sector employers
• Single employer sponsored retirement plans
• Retirement plans involving more than one employer, and
• Social insurance plans
c) Evaluate benefit adequacy and measure replacement income for members of a particular plan given other sources of retirement income
d) Describe ways in which retirement plan design can manage the range of risks faced by plan participants and retirees

Sources:
SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

Fundamentals of Private Pensions, McGill et al., 9th Edition, 2010
• Chapters 5 & 9

Morneau Shepell Handbook of Canadian Pension and Benefit Plans, Shepell, Morneau, Whiston, Bethune and Clooney, J. Gregory, 16th Edition, 2016
• Chapter 3

DA-114-13: Risk Management and Public Plan Retirement Systems, Appendix only

Commentary on Question:
Most candidates answered this question very well, with many earning full points for their answers. This was not a difficult question as the concepts tested are central to this exam and the question format and plan features were straightforward to analyze.

Solution:
(a) Describe the differences in the following risks between Option 1 and Option 2 from the perspective of Company XYZ:

(i) Longevity risk

(ii) Inflation risk

(iii) Retirement risk

Commentary on Question:
Points were awarded for other reasonable answers that explained the risk differences between the two options. The few candidates who answered the

question from the perspective of the participants did not receive credit for their answer.

(i) Longevity Risk
Option 1 has subsidized survivor pension, therefore greater longevity risk to the employer as potentially covering the cost of the spouse as well

(ii) Inflation Risk
Option 1 provides higher uncertainty of inflation costs and therefore has more downside risk
Depending on long-term inflation assumptions, Option 1 may provide higher inflation cost to the plan

(iii) Retirement Risk
Early retirement reduction factor may make employees stay until unreduced at age 65 in option 2
In low inflation environment, employees may decide to retire under option 1 to get guaranteed indexation

(b) Evaluate each plan provision independently under Option 1 and Option 2 from the perspective of:

(i) Employee A

(ii) Employee B

Justify your response.

Commentary on Question:
The model solution below provides an answer that would receive full credit. Credit was also awarded if a candidate had different rationale that still made sense. Few candidates commented on fairness changes set out below.

(i) **Lifetime Pension**

Member A
Lifetime pension for one year of service under Option 1
= 1.4% x 50,000 + 2.0% x ($100,000)
= $2,700
Lifetime pension for one year of service under Option 2
= 1.80% x 150,000 =
= $2,700
No change to lifetime pension

Member B

Since all the member's income is less than $50,000, member will have an increase in pension with Option 2 due to the accrual rate increase from 1.40% to 1.80%

This accrual rate is fairer to this member since member has the same accrual rate as everyone else for all their income

(ii) **Indexation**

Members A and B

Option 1 provides some protection against high inflation

Option 2 provides protection against low inflation

(iii) **Early Retirement Reduction**

Member A

Member is not expected to retire before age 60 so may not affect behavior under Option 1

Reasonably large reduction under option 2, therefore may delay retirement

Member B

Member expecting to retire before age 60, therefore will get subsidized early retirement under Option 1

Very large reduction under Option 2, which may cause them to retire later

Increased early retirement reduction in Option 2 fairer to all employees, was subsidizing early retirement under Option 1

(iv) **Normal Form of Pension**

Member A

Member is single, so change to normal form has no effect on pension

Member B

Member is married so will now have to pay for joint and last survivor coverage if elect a joint survivor pension

Same pension option for all employees is fairer, was subsidizing married members under Option 1.

(c) Calculate the replacement ratio provided by the pension plan as a percentage of final average earnings at retirement for Employee A assuming all service was earned under:

(i) Option 1

(ii) Option 2

Show all work.

Commentary on Question:
Most candidates answered this part correctly. The model solution for this part is in the Excel spreadsheet.

RETDAC/U, Spring 2022, Q2

Learning Outcomes:
a) Identify risks faced by retirees and the elderly
b) Describe and contrast the risks faced by participants of various sponsored plans, such as:
• Retirement plans sponsored by public sector employers
• Single employer sponsored retirement plans
• Retirement plans involving more than one employer, and
• Social insurance plans
c) Evaluate benefit adequacy and measure replacement income for members of a particular plan given other sources of retirement income
d) Describe ways in which retirement plan design can manage the range of risks faced by plan participants and retirees

Sources:
SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

RET101-102-25: Defined Contribution Plan Success Factors

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

Commentary on Question:
See commentary for each question part.

Solution:
(a) Describe the risks of the proposed plan design from the perspective of plan participants.

Commentary on Question:
To receive full credit, candidates needed to describe risks from the perspective of plan participants. Successful candidates provided justifications for each risk that they identified. The following solution illustrates many applicable risks, but it is not an exhaustive list. Other valid risks which were described also received credit.

Voluntary contributions may result in some participants having low or no contribution balance in the plan.

Matching contributions on voluntary employee contributions only (i.e., no core company contributions) reward only eager participants.

May result in delayed retirement for low or non-savers.

Withdrawals increase the risk of insufficient funds at retirement.

DC plan exposes participants to investment risk compared to current DB plan design.

DC plan may expose participants to potential longevity risk compared to current DB design (payout options not defined).

(b) Recommend six changes to the plan design that would help participants maximize retirement income.

Justify your response.

Commentary on Question:
To receive full credit, candidates needed to provide six plan design recommendations and provide justifications for each. The solution below is a sample and not intended to be an exhaustive list of possible responses. Other valid responses also received credit.

- The DC plan should be changed to include auto-enrolment (or mandatory enrolment) so that participation is automatic and will maximize participation.
- The DC plan should be changed to not allow withdrawals so that retirement savings and investment returns are maximized.
- The DC plan should be changed to allow for a higher company contribution maximum so that high earners (or higher savers) get a full match on more contributions.
- The DC plan could be changed to allow the company contribution to be stretched over more contributions – e.g., could be a lower match proportion to encourage participants to contribute more to maximize the match.
- The DC plan should be changed to provide a core company contribution without requiring participants to make additional contributions to increase retirement savings potential and ensure basic level of coverage for all.
- The DC plan should have auto-escalation features to maximize contributions.

RETDAC/U, Spring 2023, Q1

Learning Outcomes:
a) Identify risks faced by retirees and the elderly
b) Describe and contrast the risks faced by participants of various sponsored plans, such as:
• Retirement plans sponsored by public sector employers
• Single employer sponsored retirement plans
• Retirement plans involving more than one employer, and
• Social insurance plans
c) Evaluate benefit adequacy and measure replacement income for members of a particular plan given other sources of retirement income
d) Describe ways in which retirement plan design can manage the range of risks faced by plan participants and retirees

Sources:
RET101-112-25: Private Pensions: Alternative Approaches Could Address Retirement Risks Faced by Workers but Pose Tradeoffs, pp.1-35

RET101-102-25: Defined Contribution Plan Success Factors

Commentary on Question:
The question was testing candidates' knowledge of risks associated with converting a defined benefit plan to a defined contribution (DC) plan and plan features in a DC plan that help improve income adequacy at retirement.

Solution:
(a) Compare and contrast three risks faced by both participants.

Commentary on Question:
Most candidates were able to identify three risks with some similarities and differences. Full credit was awarded for answers that demonstrated the candidate understood how each risk provided is applicable to this scenario and provided how each sample participant faces the risk. Other valid answers not shown below also received credit.

Investment risk

- Since employer is responsible for making investment decisions, no investment risk for either participant for the DB plan. For the DC plan, employer provides participants with a range of investment options. Participants are responsible for allocating their funds and individually bear investment risks; they will have less money to provide income in retirement if make poor investment decisions or if investments do not perform as well as expected.
- Participant A might not be investment savvy given their age and may make poor investment such as high stock allocation. Unfavorable event (e.g., sharp drop in stock market) is particular concern for Participant A because he lacks enough years before retirement to recoup losses.

- Participant B bears the investment risk for a longer time and may gain greater investment knowledge over time. If he used target-date funds as an investment option, they would automatically shift investments from riskier assets (stocks) to more stable assets (bonds) as he progresses towards retirement and help mitigate his investment risk.

Longevity risk

- Although lump sum distributions may be allowed, DB plan retirement benefits are typically distributed as an annuity. DC plan benefits are typically distributed as a lump sum, and DC plans generally do not offer an annuity payout option. Both participants face longevity risk if DC benefits are taken as a lump sum.
- Longevity risk is contained for Participant A if DB plan benefits are distributed as annuity. However, if DB plan allows lump sum distribution, study shows that there is a higher chance that Participant A might opt to take lump sum from the DB plan and face longevity risk for both retirement benefits.
- After taking lump sum from the DC plan, Participant B must decide how to draw down the account to finance retirement. They may outlive their assets if draw down the benefits too quickly. Conversely, they may unnecessarily reduce consumption and leave more wealth than intended at death if draw down benefits too slowly.

Inflation risk

- Risk is minimal for the final pay DB plan (pension may be adjusted to reflect increase in cost of living). Participants of the DC plan are subject to inflation risk at both accumulation (career average scheme) and drawdown phase (the extent depends on how benefits are distributed in retirement).
- Given DB plan is frozen, Participant A is subject to some inflation risk, as the final average earnings will not reflect his final year of earnings (if work past 60). Less inflation risk at the accumulation phase of the DC plan for Participant A as he is fairly close to retirement.
- In contrast, Participant B's DC plan benefits will be based on average salary over virtually his entire period of service with Company XYZ (if he works until retirement).

(b) Describe provisions that can be included in a DC plan to improve post-retirement income adequacy.

Commentary on Question:
Most participants were able to identify 2-3 provisions to improve post-retirement income adequacy. 4 provisions needed to be described for full credit. Since the question asked the candidate to describe the provisions, a list of features without a description only earned partial credit. Other valid answers not shown below also received credit.

Increase employer contributions, i.e. Match employee contribution

- Employee contribution to the DC plan is optional. Employer could match employee contribution to encourage them to save for retirement.

Add required employee contribution

- Employees are more aware of the DC plan if they are required to contribute. Employer could educate employees in respect to their responsibility to save for retirement.

Automatic enrollment

- Auto-enroll employees at an initial employee contribution deferral percentage to establish a baseline savings rate for new participants.

Automatic contribution escalation

- Consider automatically increasing employee contribution (annually, tying increases to pay raise cycles, etc) to reach an ultimate rate (ex 10%).

RETDAC/U, Spring 2023, Q5

Learning Outcomes:
b) Describe and contrast the risks faced by participants of various sponsored plans, such as:
• Retirement plans sponsored by public sector employers
• Single employer sponsored retirement plans
• Retirement plans involving more than one employer, and
• Social insurance plans

Sources:
SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

RET101-111-25: Risk Management and Public Plan Retirement Systems - Appendices B and C only (remainder is background)

Commentary on Question:
Candidates generally did well on parts a and c. Candidates sometimes struggled to identify a second COLA structure for part b.

Solution:
(a) Describe the impact of the current inflationary environment on the following stakeholders of Municipality ABC's pension plan.

(i) Society/taxpayers

(ii) Municipality ABC

(iii) Current and future plan participants

Commentary on Question:
Candidates generally did well on this part.

Society/Taxpayers

- Higher inflation increases the cost of the plan without changing the plan provisions
- It could result in reduced quality of public services if less money is available to invest in other public items
- It could result in increased taxes if funding requirements increase as a result of the high COLAs

Municipality ABC

- Increases costs to the municipality by increasing pension benefits

- Could result in difficulty getting people to retire if they are concerned about the purchasing power of their benefits and they are not going to receive a COLA for at least 10 years after retirement
- Could lead to municipality employees expecting wage increases, resulting in 1) increased turnover if wages don't meet employee expectations and/or 2) increased costs to Municipality ABC as a result of increased wages

Current and future plan participants

- Inflation reduces the purchasing power of benefits for retirees not immediately eligible for a COLA
- Higher costs to the plan could result in reduced benefit security for participants that aren't immediately eligible for a COLA
- Retirees eligible for a COLA see no reduction in the purchasing power of their benefits
- Current employees rely on future wage increases in line with inflation to protect the purchasing power of their benefits

(b) Propose two alternative COLA structures that result in more equitable sharing of the inflation risk among current retirees, future retirees, and Municipality ABC.

Justify your response.

Commentary on Question:
Candidates needed to describe two separate COLA structures and describe how those structures shift the inflation risk to receive full credit. Credit was not given for proposing a second version of the same structure or for simply proposing an increase in benefits.

Automatic COLA for all retirees with cap (e.g., the COLA is equal to inflation but no greater than 3%).

- An automatic COLA with a cap allows all retirees to gain some sort of inflation protection
- Limiting the size of the COLA reduces Municipality ABC's cost and risk.

COLA for all retirees with amount tied to investment performance

- Design: COLA could be either [1] conditioned on investment return meeting a certain threshold (e.g., full COLA is given if return exceeds the discount rate) or [2] scaled on investment return (e.g., COLA is somewhere between 0% and inflation depending on how well assets performed).
- This method separates the direct link between inflation and the COLA, and allows all retirees to receive equal increases in their benefits

- Conditioning or scaling the COLA on investment performance makes the plan more affordable and less risky to Muncipality ABC.

(c) Describe how changing from a defined benefit structure to a defined contribution structure would impact the inflation risk faced by the following stakeholders:

(i) Current and future plan participants

(ii) Society/taxpayers

Commentary on Question:
Candidates generally did well on this part.

Current and future plan participants
- Current and future employees absorb the inflation risk associated with their DC benefit once retired.
- Inflation risk unchanged for legacy DB benefit for retirees and current employees
- It may be difficult to purchase an annuity with the DC benefit that provides inflation protection for current and future employees.

Society/Taxpayers
- Reduced inflation risk with regard to the DC benefit once it has been accrued
- Could exacerbate wage increases needed to retain employees to offset the increased risk retained by employees with regard to their retirement benefits
- Retains inflation risk associated with legacy DB benefit

RETDAC/U, Spring 2023, Q7

Learning Outcomes:
b) Describe and contrast the risks faced by participants of various sponsored plans, such as:
• Retirement plans sponsored by public sector employers
• Single employer sponsored retirement plans
• Retirement plans involving more than one employer, and
• Social insurance plans

Sources:
SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

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

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

Commentary on Question:
This question tests candidates' knowledge on the plan design and governance structure of multiemployer pension plans. Further, it tests candidates' knowledge on underlying risks present in multiemployer pension plans and different mechanisms available to reduce those risks. The question requires candidates to utilize their knowledge and apply it from the perspective of the Board of Trustees who administrate these types of pension plans.

To receive full credit, candidates must provide supporting information when requested to justify their response.

Solution:
(a) Identify the design and governance characteristics of a traditional multiemployer pension plan (MEPP).

Commentary on Question:
Overall, candidates successfully identified the design characteristics of a traditional multiemployer pension plan but struggled to fully identify the governance characteristics.

MEPP design characteristics:
- Known cost for participating employers
- Reasonable benefit expectations for plan members
- The business failure or other termination of participation of a participating employer will generally have little impact on the plan's sustainability, unless the failed group represents a dominant portion of the plan
- Administrative ease for participating employers

- Continued membership if the member changes employers within the same industry, thus full benefit portability
- Flat benefit or career average accrual formula
- Ability to reduce benefits, as the benefit that is communicated to members is a target
- Contributions are collectively bargained

MEPP governance characteristics:

- Administrator of a MEPP takes the form of a board of trustees
- Legislated plan member participation in plan governance because typically at least half of the board of trustees must represent plan members.
- The board is charged with the fiduciary responsibility of making decisions on behalf of all plan beneficiaries
- The Board sets the benefits based on the collectively bargained contributions

(b) Compare and contrast participation in a MEPP and a single employer defined contribution pension plan from the perspective of the plan participants.

Commentary on Question:
Candidates need to ensure they compare and contrast from the perspective of the plan participants.

COMPARE:
MEPP:

i. Employers remit contributions on a fixed rate basis for each employee.
ii. The risks are borne by the members as the benefits can be reduced (retroactive and prospective) if the benefits are not supportable or mis-managed.

Single Employer Defined Contribution Plan:

i. Employers remit contributions on a fixed rate basis for each employee
ii. The risks are borne by the individual members

CONTRAST:
MEPP:

The members are entitled to a lifetime pension at retirement based on the MEPP benefit formula and plan provisions.
The benefit communicated to members at their normal retirement age is a target.
The risks (investment, longevity, interest rate, credit, etc.) are pooled among the members and not assumed by each member.
No flexibility in retirement income.

Single Employer Defined Contribution Plan:

The members are entitled to an accumulated account balance at retirement based on the contributions remitted and the investment income earned over their career.
The benefit or retirement income at the normal retirement age is unknown.
The risks (investment, longevity, interest rate, credit, etc.) are not pooled among the members and are assumed by each member.

Flexibility in retirement income.

(c) Propose three ways a Board of Trustees could mitigate financial risks in a fully funded MEPP with a significant retiree population.

Justify your response.

Commentary on Question:
Candidates struggled to justify the risk mitigating techniques they proposed. Other valid mitigating strategies, with appropriate justification, also received credit.

Implement Margins:

- There are a variety of approaches that may be taken to include margins in the valuation. Such approaches include margin in the actuarial assumptions, establishing a non-specific liability or reserve, or specifying an acceptable range for the relationship between the contractual contribution rate and the best estimate normal actuarial cost or total actuarial cost.
- Most common assumption to include margin for adverse deviation is the discount rate. Can also include margin in the mortality and retirement rates.
- A variable level of margin (one that increases in good times and reduces in bad times) is appropriate to address risks such as interest rate risk, inflation risk, and demographic risk.
- The level of margin in the contribution rate is the present value of the excess of the expected contributions over the expected normal actuarial cost for a period of time (for example, the period permitted under legislation to eliminate a going-concern unfunded liability).

Reducing the equity allocation:

- Trustees may want to consider alternative asset classes with reasonable inflation matching characteristics and traditionally lower volatility. Asset classes with these characteristics include:
  - Real return bond coupons
  - Real estate
  - Infrastructure
- Reducing equity allocation may reduce risk in the plan, but the asset allocation is directly linked to the actuarial assumption for future returns. Reducing equity may result in the reduction in the plan's discount rate and an increase in the liabilities.

Applying Immunization techniques:

- Immunization techniques include duration matching, cash flow matching and annuitization of retired life liabilities.
- Full cashflow matching or duration matching increases the likelihood that benefits will be paid.

- Complete matching of assets and liabilities is rarely appropriate though, as the level of benefits that can be provided on this basis is likely lower. A balance must be struck.
- Annuitization of retiree life liabilities ensures a perfect immunization and, in most cases, is a complete transfer of future risk to the insurer.

RETDAC/U, Fall 2023, Q1

Learning Outcomes:
a) Identify risks faced by retirees and the elderly
b) Describe and contrast the risks faced by participants of various sponsored plans, such as:
• Retirement plans sponsored by public sector employers
• Single employer sponsored retirement plans
• Retirement plans involving more than one employer, and
• Social insurance plans
d) Describe ways in which retirement plan design can manage the range of risks faced by plan participants and retirees

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a) Describe the differences in risks faced by the plan participants of a traditional defined benefit pension plan to the risks faced by plan participants in the following types of plans:

(i) Traditional defined contribution pension plans

(ii) Flexible pension plans

(iii) Variable annuity plans

(iv) Target benefit plans

Commentary on Question:
To obtain full credit, candidates had to appropriately identify risks applicable before and after retirement for the 4 plans listed in the question vs DB plans from a <u>participant's perspective</u> (not plan sponsor). Candidates did very well when describing risks associated with DC plans as it is one of the most common arrangements offered in the industry, but not as well for other plans, in particular for the flexible pension plans.

The model solution below is an example of an answer that would receive full credit; it does not include all possible answers. Other reasonable answers also received credit.

(i)**Traditional defined contribution (DC) plans:**
(a) In a DC plan, participants bear the investment risk both before and after retirement (vs the sponsor bearing that risk under a defined benefit (DB) plan). Participants bear the investment risk on their individual accounts and are responsible for directing their investment decisions.

(b) As DC plans result in an accumulation of a balance at retirement which a participant must carefully invest and drawdown on their own during the decumulation phase, they are exposed to the risk of outliving their assets (longevity risk) and inflation risk (which can be eliminated if an annuity is purchased at retirement or diminished if their decumulation investments are selected to keep pace with inflation).

(ii) **Flexible pension plans:**

(a) Risk is shifted to participants prior to retirement as they are subject to investment risk on the amount that they contribute to the tax-sheltered account (for e.g. a DC component) that will be used to purchase additional benefits to enhance their DB benefits at retirement. There is no longevity risk post-retirement as members receive benefits in the form of a lifetime pension. Note that participants also bear the risk of excess assets in their DC account if the amount exceeds the value of purchased ancillary benefits, which if not used will be forfeited.

(b) Participants are also subject to inflation risk at retirement which can be mitigated by the participant if they purchase automatic inflation indexing.

(iii)**Variable annuity plans:**

(a) The risk is shifted to participants during the accumulation phase, but not during the decumulation phase, as benefits are paid as a lifetime benefit. Investment risk is borne by the participants prior to retirement – a hurdle rate is defined, with the goal to capture the long-term expected real return of the assets backing the variable annuity liabilities. The adjustment between the actual fund return and the hurdle rate is applied to the pensions in payment (which can result in a decrease or an increase), effectively reflecting inflation and any returns different from expectation.

(b) If pension increases do not keep pace with at least CPI, then participants are subject to inflation risk.

(iv)**Target benefit plans:**

(a) The risk is shifted to participants during both the accumulation and decumulation phase. Contributions are set at a fixed level or within a fixed range base on a target benefit level, as such benefits are only a target. Since the sponsor's contributions are fixed, it transfers all plan risks to the participants as participants' contributions (if any) and benefits can either be increased or decreased.

(b) Investment and longevity risks are however pooled (unlike a traditional DC plan) which is better for the participant than bearing the risks individually.

(c) Participants also bear inflation risk if no post-retirement indexation is provided.

(b) Recommend three risk sharing plan design features that can help mitigate economic risks faced by Company ABC's plan participants.

Commentary on Question:
To obtain full credit, candidates had to clearly identify 3 risks from a participant's perspective (not plan sponsor) based on the 3 DB design features indicated in the question and suggest an appropriate risk sharing plan design feature that would help mitigate each identified risk. In general, candidates did better in part b) compared to part a) and were able to clearly identify risks and provide plausible options to address the risks.

Option 1: With a fixed benefit accrual of $50 per month per year of service, participants are subject to pre-retirement inflation risk. A proposed design change that could help mitigate this risk is changing to a benefit formula based on final average earnings so that the benefit accrual can keep pace with pre-retirement inflation.

Option 2: The plan currently offers no post-retirement indexation, as such participants are subject to post-retirement inflation risk. A feature offered under a flexible pension plan could help mitigate this risk is providing the option for the participant to purchase indexing. The indexing formula could be based on a % CPI and be subject to a pre-determined cap or floor and be conditional on the plan funded status.

Option 3: The early retirement reduction is subject to market interest rates, as such participants are exposed to interest rate risk. A feature that could help mitigate this risk is an early retirement subsidy that is based on a fixed early retirement formula that is not tied to market rates.

RETDAC/U, Spring 2024, Q10

Learning Outcomes:
a) Identify risks faced by retirees and the elderly
b) Describe and contrast the risks faced by participants of various sponsored plans, such as:
• Retirement plans sponsored by public sector employers
• Single employer sponsored retirement plans
• Retirement plans involving more than one employer, and
• Social insurance plans
c) Evaluate benefit adequacy and measure replacement income for members of a particular plan given other sources of retirement income

Sources:
Primer on Retirement Income Strategy Design and Evaluation, Jan 2023, Executive Summary, Sections 1,2,5, 6 & Appendix A

Managing Post-Retirement Risks: Strategies for Secure Retirement, 2020

The Next Evolution in Defined Contribution Retirement Plan Design: A Guide for DC Plan Sponsors to Implementing Retirement Income Programs, Sep 2013 (pp. 61-88 background only)

RET101-114-25: How Accurately does 70% Final Employment Earnings Replacement Measure Retirement Income (In)Adequacy? Introducing the Living Standards Replacement Rate (LSRR), (sections 3.1, 3.2, 3.4, 4 & 5 and Appendices background only)

Commentary on Question:
This question tested candidates' knowledge on risks faced by retirees in capital accumulation plans (CAPs), understanding of both strengths and weaknesses of various withdrawal strategies for CAPs, and finally, replicating a defined benefit through a defined contribution plan.

Solution:
(a) Describe three risks faced by a retiree in a capital accumulation plan.

Commentary on Question:
In general, candidates performed well on this question. The majority of the candidates identified the 3 primary risks faced by retirees: investment risk, inflation risk and mortality risk. To earn full credit, candidates needed to provide 3 supporting details for each of the risks to demonstrate comprehension. Simply listing risks without accompanying supporting information did not merit credit.

The model solution below is an example of an answer that would receive full credit; it does not include all possible answers. Other reasonable answers also received credit.

- **<u>Investment Risk</u>**
  - Retirees continue to be responsible for investing and generating income over a long horizon
  - May incur greater investment risk by investing in higher returning but riskier assets
  - Could incur financial losses due to poor or biased financial advice

- **<u>Longevity Risk</u>**
  - Risk of living longer than expected due to breakthroughs in the field of medicine or increased efforts to maintain one's health
  - Risk of outliving savings for oneself
  - Risk of reducing standard of living or cutting expenditures to make money last a lifetime

- **<u>Inflation Risk</u>**
  - Risk that rising prices may be greater than the increase in retirement income
  - Inflation hedging may come at a cost of lower real returns
  - Value of benefit is reduced if return on investment does not match or exceed inflation

(b) Critique the following decumulation strategies of a capital accumulation plan.

(i) Constant withdrawal amount

(ii) Dynamic withdrawal amount

(iii) Draw-to-target

Commentary on Question:
Candidates did not perform as well in part b. This question asked candidates to provide an analysis covering both strengths and weaknesses of each of the decumulation strategies. Instead, many candidates provided the definition of each decumulation strategy and did not receive credit for that.

The model solution below is an example of an answer that would receive full credit; it does not include all possible answers. Other reasonable answers also received credit.

(i) **Constant withdrawal amount**

<u>Pros</u>

- Simple strategy by establishing a fixed withdrawal amount

- Dollar amount can be adjusted periodically to reflect inflation to maintain standard of living

Cons

- If constant withdrawal amount is too low, may reduce standard of living
- If constant withdrawal amount is too high, may outlive savings

(ii) **Dynamic withdrawal amounts**

Pros

- Can easily adjust withdrawals based on retiree's financial situation
- Strategy maximizes retirement income.

Cons

- More complex strategy than constant withdrawal amounts
- Uncertainty and variability in retirement income in market downturns

(iii) **Draw-to-target**

Pros

- More holistic view. Withdrawal amount takes into account all other income streams.
- Aim to maintain a stable income

Cons

- May unnecessarily reduce standard of living if available assets are more than adequate to sustain the target
- Difficult strategy for members to understand and implement

(c) Calculate the required employer contribution rate under the defined contribution plan to provide the member with the same replacement ratio as a percentage of 3-year average earnings under the defined benefit plan.

Show all work.

Commentary on Question:
Candidates performed well in part c.

The model solution for this part is in the Excel spreadsheet

RET101 Learning Objective 3 Model Solutions

RETDAC/U, Fall 2020, Q6

Learning Outcomes:
a) Identify how plan features, temporary or permanent, can adversely affect the plan sponsor
b) Assess the sponsor risk from options offered, including:
• Postponed retirement
• Early retirement
• Optional forms of payment factors
• Embedded options
• Portability options
• Investment options
• Decumulation features

Sources:
RET101-117-25: Implementing Early Retirement Incentive Programs: A Step-by-Step Guide

Commentary on Question:
The question relates to a specific study note on implementing early retirement incentive programs and contrasting them with involuntary layoffs. Candidates were expected to apply the concepts from the study note to the details outlined in the question with respect to the hourly workforce characteristics and the current benefit programs. Candidates who only listed information from the study note without considering the hourly workforce characteristics or benefit program provisions did not receive full credit.

Solution:
(a) Company ABC needs to reduce costs through workforce reduction and is considering the following:

Option 1: Offering an early retirement incentive program (ERIP)

Option 2: Implementing involuntary layoffs

Compare and contrast the two options.

Commentary on Question:
The question is based on an example included in the study note about when a voluntary ERIP would be appropriate compared to involuntary layoffs. Candidates were expected to leverage the concepts and pros/cons from the study note and apply them to this question, taking into consideration the characteristics provided about the hourly workforce. Candidates must discuss both ERIPs and involuntary layoffs to receive full credit.

Option 1: ERIP

- An ERIP can take more time to develop and is a longer process than an involuntary layoff program
- Company ABC may achieve greater cost savings by doing a voluntary ERIP to target individuals closer to retirement since longer service equates to higher salaries, retaining shorter service employees with lower salaries
- An ERIP supports employees who want to retire and gives them a feeling of control over their future
- It may reduce the need for involuntary layoffs, however, if not enough employees elect to participate in the ERIP then Company ABC may still need to do involuntary layoffs
- This is a situation where it makes sense to do a voluntary ERIP because you do not need to be selective in how you reduce the hourly workforce since specialized skills and knowledge are not required

Option 2: Involuntary layoffs

- An involuntary layoff program would likely impact shorter service employees with less seniority who have lower salaries since wages are tied to years of service. That may not be who Company ABC wants to target to reduce costs.
- Involuntary layoffs allow Company ABC to target specific employees, which may be a good approach if there are strong performers that Company ABC wants to keep (Company ABC can target weak performers)
- Would be easier to achieve cost reduction targets because Company ABC can target the number of reductions they need
- Compared to ERIP, involuntary layoffs may lead to reduction in employee morale and productivity
- Greater threat of lawsuits with involuntary layoffs

(b) Describe considerations when determining the eligibility criteria for the ERIP.

Commentary on Question:
The study note recommends consulting applicable benefit plan documents such as pension and/or health insurance plans when determine eligibility criteria. Candidates were expected to apply this approach to the question and consider the benefit plan provisions provided in the question.

- When determining eligibility, Company ABC should consider their business objectives
- The eligibility criteria should be strictly objective.
- Decide what job classifications or locations should be included

- Want to ensure eligibility criteria aligns with eligibility or vesting for the pension and retiree healthcare program
- Consider when employees are eligible to retire (age 55 & 10 years of service) or entitled to an unreduced pension (age 62 & 30 years of service)?
- Consider when employees are eligible for retiree health plan (age 55 & 20 years of service)? This could be a key factor as employees may not want to participate in the ERIP if they would be without healthcare benefits
- Look at the age and service distribution to see how many employees would qualify based on the potential eligibility criteria to see if you have a large enough group. Target 2 times the number of employees you want to elect the ERIP to have a large enough group.

(c) Propose four ways to maximize the success of the ERIP.

Justify your response.

Commentary on Question:
Candidates had to discuss four different incentives to receive full credit. Candidates had to justify their response in order to receive full credit. This model solution focuses on benefit enhancements, however, candidates received credit if they discussed other ways to maximize the success of the ERIP and justified their response – for example, detailing a strong communication plan.

1) Offer an age credit in the pension plan
   - An age credit would add years to an employee's age that would allow the employees to collect a pension earlier than they otherwise would have been entitled to
   - Age credit could also impact the early retirement factor
   - You could add 3 years to age, so someone 55 would be treated as if they were 58
   - Incentives must be structured in a way to attract participants but also not be too costly to the company

2) Offer a service credit in the pension plan
   - A service credit can enhance the pension benefit
   - For example, add an extra 2 years of service when calculating the benefit formula (2 years x 12 months x $80/month = extra $1,920/year of benefit)
   - Could reduce the early retirement reduction factor or offer unreduced pension prior to age 62 & 30 years of service

3) Health insurance enhancement
    - One of the major factors that might prevent an employee from retiring early is health insurance if they would not have coverage
    - Company ABC could consider allowing those who take the ERIP to continue coverage under the active health plan to bridge them to age 65
    - Consider the length of time they will need coverage until provincial health care is available
    - Could reduce the service requirement for the retiree healthcare plan from 20 years to 10 years to align with the pension early retirement criteria

4) Enhanced benefits or lump sum
    - Could provide an incentive bonus paid as a lump sum
    - For example, employees receive two weeks of salary for each year of service
    - Could increase the benefit per month per year of service from $80 to $85 to increase the pension benefit

(d) List the information that should be included in the ERIP announcement to employees.

Commentary on Question:
The question is asking for what information should be included in the announcement, not the steps involved in creating the announcement or the steps involved in preparing the announcement. The study note outlined what should be included in the announcement (refer to sections 7 and 8).

- Outline the eligibility criteria
- Explain the program offerings and how benefits are impacted
- The effective date
- Explain how to accept or participate in the offer
- How long the ERIP window will remain open
- The deadline to respond to the offer
- Who employees should contact with questions
- That individuals should seek legal counsel and will be required to sign a waiver
- A statement that the organization has no current plans to offer other ERIPs in the future but reserves the right to do so
- A statement that continued employment is never guaranteed

RETDAC, Fall 2021, Q1

Learning Outcomes:
a) Identify how plan features, temporary or permanent, can adversely affect the plan sponsor
b) Assess the sponsor risk from options offered, including:
• Postponed retirement
• Early retirement
• Optional forms of payment factors
• Embedded options
• Portability options
• Investment options
• Decumulation features
c) Describe ways to mitigate the risks identified with a particular plan feature

Sources:
SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

Fundamentals of Private Pensions, McGill et al., 9th Edition, 2010, Chapter 5

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a) Critique the plan provisions with respect to Company ABC's objectives.

Justify your response.

Commentary on Question:
Successful candidates critiqued each plan provision in detail with respect to Company ABC's objectives. Some candidates only described a few plan provisions that help meet the company's objectives rather than critiquing them all individually and received partial credit.

Provision: Vesting

- A vesting period of 2 years will help reduce volatility from turnover of new hires as they must stay with the company in order to be entitled to a benefit
- A vesting period of 2 years may deter younger employees from joining Company ABC since they tend to be a more mobile workforce

Provision: Pensionable Earnings

- Overtime pay included as pensionable earnings will create volatility and uncertainty in projections when determining the expected share of retirement costs
- Overtime pay included as pensionable earnings will create uncertainty in retirement benefits and volatility in company costs

Provision: Employee Contributions

- Employee contributions help share the cost of the pension plan with Company ABC

Provision: Retirement Benefit

- An averaging period of 3 years can lead to more volatile retirement benefits as compared to a longer averaging period (e.g. 5 years)
- The retirement benefit is very generous and would be attractive to younger and long service employees

Provision: Early Retirement Benefit

- Early retirement subsidies are attractive to long service employees as they can retire prior to their normal retirement age with a more generous benefit than actuarial equivalence
- Early retirement subsidies are not service-related which limits retention incentives for long service employees
- Generous early retirement subsidies included in the retirement benefit will create volatility and lead to less predictable plan costs

Provision: Termination Benefit

- Actuarial equivalence reduction helps make the plan costs more predictable
- Might encourage retaining long service employees close to retirement due to the cliff eligibility of the early retirement subsidies

Provision: Portability

- Allowing portability on retirement can cause losses to the pension plan due to anti-selection and lead to volatility in funding requirements
- The plan pays a lump sum on termination which is attractive to a younger workforce as they tend to be more mobile
- Portability on retirement can be attractive to long service employees depending on their personal financial situation (e.g. potential for investment gains, more liquid, etc.)

Provision: Indexation

- The cost of indexing pension benefits can be unpredictable and cause fluctuations in funding requirements
- No defined maximum of indexation can leave the company exposed to costly rises in pension benefits in periods of high inflation
- Indexation of pension benefits to inflation is attractive to employees with long service as their pension does not lose purchasing power over time

(b) Evaluate how the overtime policy aligns with Company ABC's objectives for the defined benefit pension plan.

Commentary on Question:
Candidates struggled with how the overtime policy would affect the sharing of retirement costs. Overall, candidates successfully evaluated how the overtime policy would affect the predictability of company costs, attraction of younger employees and the retention of long service employees.

Share Retirement Costs

- Employees will contribute on lower earnings throughout their career and close to retirement receive large increases in their retirement benefit due to a spike in pensionable earnings within their final 3 years as a result of the overtime policy
- Employees with steep earning profiles in a final average pension plan may cause Company ABC to fund a higher than expected share of the cost

Predictable Company Costs

- Company ABC may have difficulty projecting future benefits as the overtime policy creates uncertainty in future earnings

Attract Younger Employees

- The policy may lower Company ABC's attraction and retention of younger employees as they are given the least priority to receive overtime

Retain Long Service Employees

- The overtime policy will help retain longer service employees as they have priority for overtime hours
- The overtime policy will help retain longer service employees because they have the potential to significantly improve their final average pay close to retirement leading to a higher benefit

(c) Recommend two changes to the plan design if Company ABC wants to keep the overtime policy.

Justify your response.

Commentary on Question:
Most candidates did not receive full credit for this question. Many suggested to exclude overtime pay in the definition of pensionable earnings but failed to recommend another plan design change to mitigate the impact of the overtime policy to help meet the company's objectives. Other valid answers were also accepted and received credit if appropriate justification was provided

Company ABC can make the following plan design changes to meet their objectives given the overtime policy:

- Exclude overtime pay in the definition of pensionable earnings
    - This will eliminate the effect of the overtime policy on the pension plan and help Company ABC meet their need to share retirement costs as it will decrease the likelihood of employees having steep earning profiles
    - Removing overtime pay from pensionable earnings will reduce volatility in retirement benefits and allow Company ABC to better predict their costs to the plan
- Change the retirement benefit from a final average pension plan to a career average pension plan
    - The retirement benefit for career average plans is determined using the associated pay for each period of service. This mitigates the risk that Company ABC will fund an unequal share of the retirement costs due to employees with steeper earning profiles from the overtime policy
    - Career average plans also provide for more predictable company costs than final average pension plans since future earnings do not affect the retirement benefit accrued for previous years of service

RETDAC/U, Fall 2021, Q5

Learning Outcomes:
b) Assess the sponsor risk from options offered, including:
• Postponed retirement
• Early retirement
• Optional forms of payment factors
• Embedded options
• Portability options
• Investment options
• Decumulation features
c) Describe ways to mitigate the risks identified with a particular plan feature

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

Commentary on Question:
This question was testing the candidates' ability to think like an employer for the design of an early retirement incentive program (ERIP) and comparing the similarities and differences in the public vs. private sector. The question was generally well done. Candidates generally did well to highlight eligibility and design considerations for an ERIP, but missed more specific points from a public or private plan perspective.

Solution:
Compare and contrast the considerations when designing an early retirement incentive program for the following:

(i) Public sector pension plan

(ii) Private sector pension plan

Similarities:

- Eligibility criteria for the program and target employees – need to consider the overall goal of the ERIP: who the program is targeting, and estimated take up rate. For example: all employees reaching age 62 by date X.
- Design of ERIP – what are the enhancements being offered by the program? For example: improving early retirement subsidies, additional years of service, improved payment options, etc.
- Cost considerations and affordability – offering additional benefits comes with a cost. What is that cost? Can the plan afford it, given current and projected funded status?

- Intergenerational inequity – the enhancements offered by the program only benefit those who elect to take advantage of the ERIP, which means additional costs are picked up by the plan and "future" service. Is that fair?
- Employee morale – how will the ERIP affect employee morale, of those eligible and not eligible for the ERIP?
- Timing – when is the window of eligibility and window of election for the ERIP
- Communication strategy – how will the program be announced? How can employees ask questions? Will there be a waiver for the employee to sign?

<u>Considerations specific to public sector pension plan:</u>
- Union rejection – public sector plans typically cover unionized employees. Any plan changes will need to go through union approval.
- Generous benefit – public sector plans typically offer more generous benefits (in part since they are not eligible for social security). The ERIP design would need to take these generous plan provisions into consideration.
- Tax payers – ultimately, the costs of the ERIP will be passed on to the tax payers. How will they feel about this?
- Societal consideration – there are other budgetary uses for public funds. For example, public programming (hospitals, schools, etc.). Is the ERIP the best use for the funds?
- Diffuse governance structure – there are many stakeholders in a decision for a public sector pension plan, and many parties will have a say in making the decision, many of which may lack pension knowledge or have different motivations (i.e. elected officials).

<u>Considerations specific to private sector pension plan:</u>
- Well defined decision makers – unlike for the public sector, private sector plans have well defined decision makers, so creating an ERIP will go through an easier approval process.
- Profit motive – private companies have a straight forward profit motive, so the main consideration in whether or not to offer an ERIP comes down to whether it makes sense from a cost perspective. Will it reduce future costs?
- Less generous benefits – private plan benefits are generally less generous, which means an ERIP has greater value in motivating employee behavior.
- Post-retirement health benefit – private companies can use the continuation of post-retirement health benefits as an incentive in the ERIP.
- Specialized skills – private plan employees tend to be less homogenous (compared to the public sector), the wrong design in the ERIP, and unintended take up rates, would mean loss of valuable knowledge.

RETDAC/U, Fall 2022, Q7

Learning Outcomes:
a) Identify how plan features, temporary or permanent, can adversely affect the plan sponsor
c) Describe ways to mitigate the risks identified with a particular plan feature

Sources:
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CIA Educational Note: Financial Risks Inherent in Multi-Employer Pension Plans and Target Benefit Pension Plans, CIA Task Force on MEPP/TBPP Funding, May 2011

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a) Compare and contrast the plan provisions to those of a traditional MEPP.

Commentary on Question:
The below table provides an answer that would receive full credit, but it is not an exhaustive list of valid responses. Additional valid responses received credit if sufficient justification was provided. Candidates did okay on this question, but many did not fully answer it. Some candidates confused MEPPs with public plans.

Provision	
Normal Retirement Age	Normal retirement age (NRA) is usually 65 but some industries with shorter careers may have an earlier NRA.
Benefit Formula	• 1.5% of final average earnings is not a typical MEPP formula. Traditional MEPP benefit is based on a formula that gives the employee a fixed dollar amount per month for every year of service or for every hour worked ($/month/year) Another popular benefit formula is the "percent of contributions" (contributions made on behalf of workers are tracked and percentage (typically 0.5% to 2.0%) multiplied by accumulated contribution amount) Traditional MEPP benefit formula is typically based on a flat benefit or career average structure rather than final average
Contribution	Employer contribution rate based on a $/hour is a common contribution structure for a Traditional MEPP Typically, employees do not contribute in a traditional MEPP
Early Retirement Benefit	Unreduced benefits can begin no later than the Normal Retirement Age under the plan. The early retirement benefit satisfies this requirement. The reduction is aligned with traditional MEPPs Traditional MEPPs can provide for early retirement provisions that are fully subsidized, partially subsidized, or actuarially equivalent
Form of Benefit	Traditional MEPPs provide a variety of pension forms Single life normal form (including Life guaranteed for 10-years) is appropriate when compared to traditional MEPPs
Optional Forms of Benefit	Lump sum option at retirement is not common in Traditional MEPPs Lump sum option reduces the assets and removes possibility of future asset returns.
Post-Retirement Indexing	Annual indexation of 2/3 inflation is not a typical benefit in a traditional MEPP Post-retirement indexation is typically provided on an ad hoc basis

(b) Recommend four changes to the plan provisions to meet the Board's objectives.

Justify your response.

Commentary on Question:
To receive full credit, candidates needed to both recommend changes and justify why those changes would meet the objectives. The illustrative solution below provides an answer that would receive full credit. Other valid answers not shown below also received credit.

1) Change the Benefit Formula:
- Change the benefit formula to a flat benefit per hours worked or a $ times years of service
- This reduces cost and risk under the MEPP, as prior year accruals are not increased due to an increase in earnings.
- This reduces risk of losses due to salary increase experience being greater than the salary increase assumption used by the MEPP's actuary

2) Change the early retirement benefit:
- Change the early retirement benefit to be actuarially equivalent to the Normal Retirement Age (Age 62)
- This reduces cost in the MEPP, as employees are no longer able to receive a subsidized benefit prior to age 62
- This reduces the risk of retirement experience being different than the actuary's assumption. Employees may retire earlier than expected in certain circumstances, such as a downturn in the market or a reduction of hours worked in the industry, resulting in early retirement losses

3) Change Normal Retirement Age:
- Change the Normal Retirement Age to 65
- This reduces the cost under the MEPP, as the benefit will now be reduced from age 65 as opposed to age 62
- This reduces the risk of retirement experience being different than the actuary's assumption.

4) Remove Post-Retirement Indexing:
- Change the contractual indexing benefit of 2/3 of inflation to an ad hoc basis
- This reduces the cost under the MEPP, as the Board of Trustees can now provide indexing when there is adequate surplus
- This reduces the risk of inflation being higher than the actuary's assumption, which would result in losses under the MEPP

(c) Propose four plausible adverse scenarios to measure risks inherent in MEPPs under a going concern valuation.

Justify your response.

Commentary on Question:
Candidates struggled with the concept of adverse scenarios and did not answer this part well. Justification was required for each scenario in order to receive full credit. The illustrative solution below provides an answer that would receive full credit. Other valid answers not shown below also received credit.

- **Scenario 1: Interest rates will be lower than expected**
    - Stress testing on interest rate can be done by decreasing discount rate by 1%
    - This scenario will measure the inherent risk in the MEPP associated with asset liability mismatch
    - MEPP's liabilities will increase given decrease in discount rate. This will be partially/fully offset by increase in fixed income asset allocation depending on difference in duration
    - This scenario will provide Board with valuable information regarding risk of assets & liabilities moving in opposite directions with adverse effect on MEPP's financial position

- **Scenario 2: Deterioration of Assets**
    - Stress testing on equity asset allocation can be done by decreasing market value of equities by 20%
    - This scenario will measure the inherent risk in the MEPP associated with a difference between contribution rate and cost of accruals
    - If the difference between the contribution rate and normal actuarial cost is small, then the MEPP has only limited ability to absorb experience losses, such as a market correction
    - This risk is particularly great for mature plans

- **Scenario 3: Potential that employees live longer than expected**
    - Stress testing can be done on the mortality/longevity risk in the MEPP by assuming that everyone will live longer (eg. by making everyone in the plan 1 year younger)
    - This scenario will measure the inherent risk in the MEPP associated with mortality/longevity risk

- This risk manifests itself when the longevity improvements reflected in the liabilities are not sufficient for plan members and their spouses
- This scenario will test whether the level of surplus in the plan, if any, is adequate to offset mortality experience losses in the future

- **Scenario 4: Potential that contribution base will be lower than expected**
  - Stress testing can be done on contribution margin in MEPP by decreasing the hours worked or removing a significant participating employer
  - This scenario will measure the inherent risk in the MEPP associated with a decline in hours worked
  - Where a portion of the contribution is used to cover a deficit, a reduction in the hours works leads to lower contributions to finance the deficit
  - This provides insight into the MEPP's ability to absorb variances in the contributions being remitted to the plan

RETDAC/U, Fall 2023, Q4

Learning Outcomes:
a) Identify how plan features, temporary or permanent, can adversely affect the plan sponsor
b) Assess the sponsor risk from options offered, including:

Sources:
SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

RET101-117-25: Implementing Early Retirement Incentive Programs: A Step-by-Step Guide

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a) Evaluate the potential effects of the ERIP on NOC.

Commentary on Question:
To receive full credit, the response needed to include commentary on the operational, legal, and financial considerations of an Early Retirement Incentive Program. While most candidates identified certain financial and operational considerations, few candidates recognized the legal considerations.

The model solution below is an example of an answer that would receive full credit; it does not include all possible answers. Other reasonable answers also received credit.

- Operational considerations:
  - NOC must consider how operations will be impacted if everyone offered the program accepts
    - 720 participants eligible for program (over age 55 and 5 years of service).
    - Will NOC be able to fill all vacancies with internal promotions, or will additional hiring need to be done? For reference, there were 140 retirements in the prior year and 230 new entrants.

    - Anti selection: NOC will not be able to control which of the 720 participants retire; NOC is potentially at risk of losing key positions that have specialized knowledge.
    - Eligibility for post-retirement health care begins at age 55 with 10 years of service. The window may not effectively target the 140 eligible participants with less than 10 years of service.
- Legal considerations
    - The program targets participants over age 55 with 5 years of experience. This may be viewed as employment discrimination
    - NOC should consult with legal counsel to ensure applicable laws in Gevrey are being followed in conjunction with this window
- Financial impact
    - The plan offers a lump sum termination benefit, which will require the plan to have liquidity. NOC must consider its cash position and its ability to pay-out 720 participants. For reference, there were 50 lump sum cash-outs in the prior year.
    - Unreduced early retirements and an enhanced benefit will further drive the plan into a deficit, increase the Net Periodic Pension Cost and increase the required employer contributions. NOC should work with its actuary to fully understand the financial implications.

(b) Describe the steps NOC should take to implement the ERIP.

Commentary on Question:
Candidates generally did well on this question, with many receiving full credit for this part.

Step 1: Finalize the eligibility group

NOC has indicated it will target participants currently eligible for early retirement. NOC should carefully consider the goals of the program when defining the eligibility parameters and the operational, legal and financial impacts of the selected group.

Step 2: Determine the Retirement Effective Date of the window

NOC must define the window during which the employees are eligible for the enhanced retirement and the lump sum options.

Step 3: Determine when the participants need to make a decision

NOC should carefully consider the window of time necessary to consider the options and make a decision from the participants' perspective

Step 4: Program offerings

Define the program objectives and consider how the benefits interact with the defined contribution plan and the post-retirement health plan

Step 5: Program costs

Analyze the cost / savings of the program in both the short and long term. Determine what happens if every targeted participant elects to participate from an operational and financial perspective.

Step 6: Prepare the Announcement

The announcement should explain the eligibility requirements, the program benefits, the interaction with other benefits, and a statement that NOC has no future expectations for a similar program. Prepare calculation statements for all participants.

(c) Describe the considerations for setting the retirement assumption.

Commentary on Question:
To receive full credit, candidates needed to speak to the retirement assumption in general rather than focusing in on the ERIP. Some candidates struggled to identify the potential impact of the eligibility for the retiree health care plan and the lack of government health care in Gevrey on the assumption. This part of the question was generally not well answered by candidates.

Per ASOP 35, the actuary should consider the reasonableness of each demographic assumption at each measurement date.

The current retirement assumption is age 62 with 10 years of service. It is unclear when this assumption was set and if it was based on credible NOC experience.

When reviewing the retirement experience, the actuary should consider:

1. The materiality of the assumption and the gains or losses year over year
2. The plan design and any early retirement incentives (such as the ERIP)
3. The availability of any employer or government sponsored postretirement health coverage
4. Whether the experience is sufficiently credible

Employees become eligible for NOC's retiree health benefit program at age 55 with 10 years of service. Government sponsored health plans do not exist in Gevrey. Both factors need to be considered when setting the assumption. Regarding the ERIP, the actuary should reflect specific experience of the covered group; however, the actuary should not give undue weight to the experience that is not sufficiently credible.

RETDAC/U, Fall 2023, Q6

Learning Outcomes:
a) Identify how plan features, temporary or permanent, can adversely affect the plan sponsor
b) Assess the sponsor risk from options offered, including:
• Postponed retirement
• Early retirement
• Optional forms of payment factors
• Embedded options
• Portability options
• Investment options
• Decumulation features
c) Describe ways to mitigate the risks identified with a particular plan feature

Sources:
SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

Pension Risk Transfer: Evaluating Impact and Barriers for De-Risking Strategies, 2014, pp. 16, 17 & 20-27 (REPLACED ON SYLLABUS WITH NEWER VERSION)

Managing Post Retirement Risks: Strategies for Secure Retirement, 2020

Embedded Options in Pension Plans: Catalogue of Embedded Options Survey of Prevalence of Embedded Options, pp. 1-17

Commentary on Question:
This question requires candidates to demonstrate their ability to evaluate the risks of each plan design feature from the employer's perspective. Successful candidates were able to recognize that the plan features were generous. These candidates were also able to articulate their rationale and tie it back to the plan terms.

Generally, part (a) and part (b) were done well. Most candidates did attempt both part (a) and part (b). The answers in Part (c) were adequate but relative to part (a) and part (b), part (c) answers were weaker.

The model solution below is an example of an answer that would receive full credit; it does not include all possible answers. Other reasonable answers also received credit.

Solution:
(a) Assess the risks of these plan provisions from the employer's perspective.

Commentary on Question:
In part (a), a lot of candidates were able to grasp that the plan provisions were generous and thus costly to the employer. Candidates also recognized that there was volatility in that cost from the employer perspective.

The majority of candidates did very well on part (a)

Normal Retirement Benefit
- The 2% average formula is generous and is a source of high cost in the pension plan.
- The averaging period of 3 years is a source of volatility in the retirement benefit compared to longer averaging periods (e.g. 5 years).

Pensionable Earnings
- Including the bonus will increase pensionable earnings and the retirement benefit, therefore increasing the cost.
- Also, bonuses create higher volatility in the cost as bonuses are less certain and can fluctuate year to year.

Form of Pension
- Life with guaranteed 15 years is highly generous and very costly.
- The 15-year guarantee does not add to volatility to the cost but it does in effect lengthen the duration of the liabilities and adds to the longevity risk to the employer.

Early Retirement Benefit (including Unreduced Pension availability)
- Early retirement subsidies permit employees to retire prior to their normal retirement age with a more generous benefit than actuarial equivalence. The 3% reduction per annum is very generous and adds to the cost of funding the pension plan.
- A part of the early retirement subsidies are service related which again adds to cost.
- Both early retirement provisions (i.e. the 3% per annum and the 60/10 provision) increase the risk for the employer and can introduce volatility depending on the uptake of the provision.

CPI Indexation
- Indexation is very expensive and highly unpredictable. This will cause fluctuations in funding requirements and increase funding risk
- There is no cap in the indexation provision which can be costly during periods of high inflation.

(b) Recommend changes to four of the plan provisions to reduce the risks identified in part (a) other than freezing future service or salary accruals.

Justify your response.

Commentary on Question:
Part (b) was also done well by the majority of candidates. They were able to recommend changes to the plan provisions to reduce both cost and volatility.

Normal Retirement Benefit

- Amend the plan to use Career Average earnings. This change would decrease the volatility and cost of the retirement benefit due to the much longer averaging period.

Pensionable Earnings

- Amend the definition of pensionable earnings to exclude bonuses. This will decrease both cost and volatility.

Early Retirement Benefit

- Remove the early retirement subsidies from the plan provisions; change to actuarial equivalent reductions. This change would decrease cost due to lower benefits.

CPI Indexation

- Indexation could be amended to introduce a cap. This change would reduce cost and also decrease volatility.

(c) Describe barriers to de-risking the pension plan through a pension risk transfer to an insurance company.

Commentary on Question:
Part (c) was the least well-done of the parts. Candidates were not able to go beyond the high cost of annuitization. Some were able to tie it back to settlement accounting and insurer declining quotations.

Barriers

There is a cost of annuitizing the plan that needs to be considered.

The insurer pricing basis for the discount rate includes credit risks, profit margins, investment management expenses, etc. as compared to the pension liability under US GAAP which can be overly optimistic when setting the assumed discount rate. Leads to a higher cost to annuitize.

Settlement accounting requires the immediate recognition of a portion of the accumulated unrecognized gains or losses in the fiscal year's pension expense, in proportion to the amount of obligation settled.

The cost of the buy-out premium may be prohibitive compared to what the company is budgeting or holding on their balance sheet as the PBO.

Insurers may also decline if their annual quota is exceeded and surplus cannot be allocated to the business line.

RETDAC/U, Fall 2023, Q9

Learning Outcomes:
a) Identify how plan features, temporary or permanent, can adversely affect the plan sponsor
b) Assess the sponsor risk from options offered, including:
c) Describe ways to mitigate the risks identified with a particular plan feature

Sources:
Managing Post Retirement Risks: Strategies for Secure Retirement, 2020

Embedded Options in Pension Plans: Catalogue of Embedded Options Survey of Prevalence of Embedded Options, pp. 1-17

Commentary on Question:
The question tested candidates' knowledge of plan features and plan design risks faced by retirees and employers of retirement plans.

Solution:
(a) Describe the two categories of embedded options in defined benefit pension plans.

Commentary on Question:
This part of the question was poorly answered by candidates in general. Many candidates did not properly describe what embedded options are in a defined benefit plan, gave incomplete responses, or skipped this part.

"Embedded Option" is a financial term to mean an inseparable part of a contract or financial instrument that provides a benefit to plan participants based on:

1) Choice by member; or
2) Underlying economic/financial factors

<u>Category 1: Choice by member</u>
These options are provided to the plan member through the plan provisions and the value is mainly based on the plan members' behavior or election.

For examples, subsidized early retirement provisions or subsidized option forms of payment.

Category 1 embedded options can be influenced by economic factors like interest rates, equity market performance, and inflation rates but these are generally viewed as secondary factors to the plan members' behavior and choice.

<u>Category 2: Underlying economic or financial factors</u>
Options provided to the plan member through the plan provisions, but the value is mainly based on the underlying economic factor or benchmark where the plan members' behavior does not come into play.

For examples, “greater of” benefits where the lump sum is the greater of a variable rate and a fixed rate, COLAs with caps and floors, excess return COLAs, cash balance plans with caps and floors on the crediting rate, or flat dollar minimum/maximum benefits.

Category 2 embedded options are asymmetric in the sense that their value may be nil if a singular point estimate is used.

(b) Describe the risks of the COLA provision from the perspectives of the following:

(i) The employer

(ii) The retirees

Commentary on Question:
Many candidates only covered 1 or 2 risks from the employer perspective, so they only receive partial credit. Also, since the question asked the candidate to describe the risk faced by the employer and the retirees, a list of risks without a description only earned partial credit.
The model solution below is an example of an answer that would receive full credit; it does not include all possible answers. Other reasonable answers also received credit.

(i) The employer

Investment Risk
The pension plan is currently underfunded at 70%. These COLA provisions, sometimes referred to as “gain-sharing” provisions, are not linked to the funded status of the plan. As such, the plan cannot at this time afford to share any investment gains it may have with the pensioners that have the COLA provision

Funding Risk
The investment gains diverted to fund the COLA would leave the employer with the responsibility of funding the remaining deficit in the plan.

Funding risk would occur if this embedded option (100% CPI over 3% hurdle) is not valued correctly either because of the asymmetry or because the actuarial assumption is a singular point estimate. The employer is exposed to the funding risk of this provision as it is triggered (as it becomes an “in the money” option).

Inflation Risk
The prevailing CPI could be higher than the investment returns, even accounting for the 3% hurdle rate. The employer bears the risk of higher inflation.

Asset Liability Mismatch risk

Not only is the employer generally exposed to the risk that the assets and liabilities are not matched correctly, the employer is also exposed to the mismatch of their indexed linked investments, if any, and the CPI linked liabilities.

(ii) The retirees

<u>Inflation Risk</u>
Although the plan provisions give 100% CPI increases, the pensioners still have inflation risk if this "embedded option" does not get triggered because of the fund rate of return (e.g. if the fund RoR is 2% but inflation is at 5%).

<u>Investment Risk</u>
The pensioners have investment risk because the fund rate of return needs to exceed the 3% hurdle rate in order for the CPI embedded option to pay 100% CPI.

(c) Propose changes to the COLA provision to mitigate the employer risks.

Commentary on Question:
Most candidates were able to identify 2-3 proposed changes to the COLA provision to mitigate the employer risk. 4 proposed changes were needed for full credit.

- Remove or grandfather the indexation provision
- Increase the hurdle rate (e.g. 7% hurdle)
- Amend the indexation provision to be a function of CPI instead of the fund RoR (e.g. 75% CPI)
- Amend the indexation provision to account for the Funded Status of the plan

RETDAC/U, Fall 2024, Q6

Learning Outcomes:
a) Identify how plan features, temporary or permanent, can adversely affect the plan sponsor

Sources:
RET101-111-25 Risk Management and Public Plan Retirement Systems - Appendices only (pp. 1-33 background only)

RET101-119-25: Turner, Pension Policy: The Search for Better Solutions, 2010, Ch. 1 (pp. 4-11) and Ch. 5

Commentary on Question:
Candidates generally did well on this question overall.

Solution:
(a) Explain how public sector defined benefit pension plans are exposed to risk by the following sources:

(i) Contribution policy

(ii) Governance

(iii) Long time horizon

Commentary on Question:
Candidates did well on this part of the question and had good understanding of the risks for public sector DB plans.

(i) Contribution policy: Taxpayers fund the programs and do not want to overpay or may want to use the money for other purposes. This could lead legislatures to refuse to fund required contributions or take funding holidays which negatively impacts the DB plan.

(ii) Governance: Public sector plans don’t have a single governing authority which leads to diffuse governance and lack of accountability. There can be different stakeholders with competing interests such as elected officials, unions, public employees. Elected officials don’t always have the expertise to manage the pension programs.

(iii) Long time horizon: Having different stakeholders means that these change over time and obligations may be shifted into the future. This can mean risks to cash flow requirements in the future.

(b) Describe the advantages and disadvantages of the pooling of the following risks inherent in public sector defined benefit pension plans:

(i) Longevity

(ii) Investment

Commentary on Question:
Candidates had more difficulty on this part of the question. Successful candidates were able to provide adequate justification for the advantages or disadvantages of pooling.

Longevity: Most of the benefits of pooling fall directly to the participants, but all stakeholders will benefit because benefits are provided at a lower cost to the plan. It is important to use appropriate mortality assumptions with up-to-date projection scales to ensure any longevity improvements are forecast accurately.

Investment: Investment pooling leads to lower cost access to more sophisticated market instruments with higher returns to benefit taxpayers. Sophisticated managers may achieve higher alpha returns. One disadvantage is that participants may prefer to make their own investment choices.

RETDAC/U, Fall 2024, Q8

Learning Outcomes:
a) Identify how plan features, temporary or permanent, can adversely affect the plan sponsor

Sources:
SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

RET101-118-25: Pension Issues in Mergers and Acquisitions

Commentary on Question:
To earn full credits, candidates must recognize that this was an asset-purchase of a division of Company XYZ and not the entire company. Furthermore, candidates were expected to understand the different pension benefit solutions Company ABC could implement with respect to the transferred employees.

Solution:
(a) Identify the information Company ABC should obtain about Company XYZ's pension plan as part of the due diligence process before entering into an asset purchase transaction.

Commentary on Question:
To earn full credit, candidates needed to provide a full range of information Company ABC should obtain as part of the asset-purchase negotiations. Generally, candidates did well on this part.

Information:
- Obtain Plan Documents including: Plan Text, Amendments, Resolutions, including all historical versions;
- Obtain Administrative Reports – Actuarial Reports, Financial Statements, Employee Booklets, Other Regulatory Filings (ex. PBGF filings), Annual Pension Statements
- What is the funded status of the plan based on the Company ABC's Actuary's opinion and assumptions; and
- Are there any "Constructive Obligations" under the XYZ Pension Plan that need to be valued under accounting.

(b) Evaluate an arrangement where Company XYZ retains the past service liability from the following perspectives:

(i) Company ABC

(ii) Transferring employees of Company XYZ

Commentary on Question:
Overall, candidates did not perform well on this part. Candidates did not understand how this arrangement would be implemented after the division of Company XYZ is acquired. To receive full credit, candidates were expected to understand the accrued pension benefits from the transferred employees would remain separate, still under the Seller's pension plan, and that employees will begin future accruals under the Buyer's pension plan. Company ABC is not responsible for the previous accrued benefits.

(i) Company ABC:
- Simplest option to administer for Company ABC.
- Company XYZ retains responsibility for past service related to the transferred employees.
- Employees participate in Company ABC's pension plan for future service only. Therefore, no past service liability is created for transferring employees at the purchase date because they accrue benefits for future service.

(ii) Transferring employees of Company XYZ
- Averaging period for the final average earnings formula and service under Company ABC commences upon enrolment in Company ABC's pension plan.
- Compared to their career average formula under Company XYZ, transferred employees receive greater pension benefits for future accruals with Company ABC's pension plan.

(c) Evaluate a wraparound arrangement from the following perspectives:

(i) Company ABC

(ii) Transferring employees of Company XYZ

Commentary on Question:
Overall, candidates did not perform well on this part. Candidates did not understand how a wraparound arrangement within Company ABC's pension plan would be implemented after the asset-purchase transaction. To receive full credit, candidates were expected to recognize transferred employees will receive full benefits in Company ABC's pension plan, offset by their accrued pension entitlement in Company XYZ's pension plan.

(i) Company ABC:
- Company XYZ retains responsibility for past service related to the transferred employees
- Company ABC will provide pension benefits under their plan based on earnings and service over the employee's entire career, offset by the

pension benefits under the Seller’s plan

(ii) Transferring employees of Company XYZ

- Receive credit for earnings and service over their entire career with the new Company ABC
- Company ABC’s plan provides a greater benefit because of the enhanced defined benefit pension formula (final average earnings) and the early retirement subsidies (85 points)
- Transferred employees will receive a pension from two different pension plans at retirement
- Company ABC’s Plan is not fully funded so may not feel as secure about benefits

(d) Evaluate a carve-out arrangement from the following perspectives:

(i) Company ABC

(ii) Transferring employees of Company XYZ

Commentary on Question:
Overall, candidates did not perform well on this part. Candidates did not understand what a carve-out arrangement was and how it would be implemented after the asset-purchase transaction. To receive full credit, candidates were expected to recognize a portion of the assets and liabilities tied to the transferred employees would be moved into Company ABC’s pension plan.

(i) Company ABC:

- This is the most expensive arrangement to implement
- Significant regulatory constraints to overcome
- Complexities in negotiation to overcome such as:
  - What assumptions will be used to determine the transferred liabilities
  - How will assets be invested prior to transfer
- Pro-rata surplus position may be required to be transferred depending on Seller’s Plan terms and Trust Agreement

(ii) Transferring employees of Company XYZ

- Prefer the one payee for all their pension benefits
- Previously accrued benefits are now less secure due to Company ABC’s pension plan being more unfunded

RET101 Learning Objective 4 Model Solutions

RETDAC/U, Fall 2020, Q7

Learning Outcomes:

a) Describe ways to identify and prioritize the sponsor's goals related to the design of the retirement plan
c) Assess the feasibility of achieving the sponsor's goals for their retirement plan
d) State relationships or recognize contradictions between a sponsor's plan design goals, retirement risks faced by retirees
g) Design retirement programs that manage retirement risk are consistent with sponsor objectives and promote employee behavior consistent with sponsor objectives.
j) Recommend an appropriate plan type and plan design features for providing retirement benefits and defend the recommendations

Sources:

SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

RET101-103-25: Phased Retirement – An Important Part of the Evolving Retirement Scene

Commentary on Question:
This question relates to phased retirement programs and how various plan design components may affect equity between members when there is a phased retirement program. Successful candidates were able to describe the advantages of a phased retirement program from the employer's perspective and recommend changes that addresses any inequity between those who participate in the program and those who remain full time employees.

Solution:
(a) Describe the advantages of offering a phased retirement program from NOC's perspective.

- NOC has had a lot of turnover in the last 5 years. A phased retirement program will allow NOC to keep former full-time employees who may be best suited to train new hires.
- A phased retirement program will allow NOC to retain highly experienced employees, despite competition from other employers.
- NOC may need employees to work around the clock or beyond one work shift during busy times. Using a mix of part-time and full-time employees can be beneficial for NOC since its needs for employees are not constant throughout the year.

- A phased retirement program will help NOC with workforce planning. It will allow senior employees to move into different roles and help mentor and facilitate knowledge transfer to employees who get promoted to take their position.

(b) Recommend three plan design changes that NOC should make to its retirement benefit plans to ensure equitable treatment between those who participate in the phased retirement program and those who remain full time employees.

Justify your response.

Commentary on Question:
To receive full credit, candidates needed to recommend three separate changes and justify why these changes would ensure equitable treatment. Other valid answers were also accepted and received credit if appropriate justification was provided.

Service Definition:

- NOC's Salaried Plan currently does not credit any service for years where the employee works less than the threshold number of hours (1,000).
- This means that an employee who chooses phased retirement might not be credited any service during phased retirement.
- NOC should change the definition of service to allow partial years of service to be granted based on the number of actual hours worked by the employee during a year
- This plan design change should also tie in with vesting and early retirement eligibility criteria in the plan (55 with 5 years of service) i.e. allow for recognition of service for years when employee works less

Best average earnings:

- Best average earnings under NOC's Salaried Plan is defined as average annual earnings during 60 consecutive months in which earnings were the highest
- This means that an employee's best average earnings will likely not change during the phased retirement despite increases in salary rate because the formula uses actual pay, not annualized earnings or salary rate
- NOC can change the definition of best average earnings in one of the following ways to be more equitable: Base it on salary rate (or annualized earnings), not actual salary earned during a calendar year, or use partial year in the divisor of best average earnings

Early retirement subsidy:

- NOC's pension plan offers an unreduced benefit at age 62 and reduced benefits prior to age 62.
- Due to the heavily subsidized early retirement benefit, the value of an employee's benefit will reduce after the member first becomes eligible for early retirement but continues to work (especially if additional years of

service and higher salaries are not provided). In other words, the value of the early retirement subsidy will decrease with every year the participant doesn't retire after he first becomes eligible for early retirement.

- Therefore an employee who participates in the phased retirement program will not receive the advantages of early retirement subsidy.
- To correct for this and ensure equitable benefits for all, NOC can remove the early retirement subsidy for the plan and provide actuarially equivalent early retirement pension.

RETDAC/U, Fall 2020, Q12

Learning Outcomes:

a) Describe ways to identify and prioritize the sponsor's goals related to the design of the retirement plan
b) Design retirement programs that manage retirement risk are consistent with sponsor objectives and promote employee behavior consistent with sponsor objectives.
c) Recommend an appropriate plan type and plan design features for providing retirement benefits and defend the recommendations

Sources:
Fundamentals of Private Pensions, McGill et al., 9th Edition, 2010
Ch. 5

Commentary on Question:
Many candidates failed to realize that this question was under the legislative rules of the case study (Gevrey), which doesn't protect the accrued benefit from reduction or restrict vesting requirements or retirement eligibility. Any comments which imposed these requirements did not receive points.

Solution:
(a) Analyze the impact on current and future funded status of the following:

(i) Closing the plan to new entrants

(ii) Freezing plan accruals

No calculations required.

Commentary on Question:
Candidates that did not receive full credit were not able to correctly distinguish between closing a plan and freezing a plan. Additionally, some candidates did not focus their answers to the impact on the funded status and instead focused on other impacted items such as expense.

(i) Closing the plan: There will not be an immediate impact on the funding shortfall. This is because the ongoing accruals for current participants in the plan will not be impacted and the current accrued benefits will not be reduced. Because the current participants' benefits are not being reduced there will not be immediate funded status improvement. The funded status improvement will come slowly over time as participants retire from the plan and are replaced by non-pension participants.

(ii) Freezing the plan: There will be immediate improvement in the plan's funded status because the PBO will drop to the ABO as the plan participants will no longer be accruing. It won't be necessary to account for projected pay growth in the liability. Liabilities will slowly decline over time as participants retire from the plan and are replaced by non-pension participants so if assets remain invested the same, the funded status will improve. Additionally, the shortfall of the plan will decline over time as there are not future accruals increasing the plan liability.

(b) Propose a change to each of the following National Oil Full-Time Pension Plan provisions that would meet NOC's goal of improving the funded status of the plan:

(i) Early retirement eligibility

(ii) Best Average Earnings

(iii) Normal Retirement Age

Justify your response.

Commentary on Question:
Candidates that did not receive full credit failed to justify their answers to the proposed design changes or proposed changes that were not focused on improving the funding status. Examples of possible changes below. Credit was also provided for other relevant answers with proper justification.

(i) Early retirement eligibility: This can be adjusted to offer eligibility at age 60 and 10 years of service. This will allow for fewer participants to become eligible for the benefit which will in turn lower the liability since the retirement benefit can be discounted over a longer period of time if fewer participants are retiring early.

(ii) Best average earnings: This can be adjusted to a Career Average formula. This will reduce the "not in payment" participants' benefit immediately and will reduce the liability as pay is averaged over a longer period of time since larger, later salaries will be averaged with the small initial pay years. The projected future funded status will improve, but to a lesser degree over time than what would be recognized immediately after the change.

(iii) Normal retirement age: The normal retirement age can be pushed out to age 70. This could result in some benefit increases as participants accrue benefits over a longer period of time offset by a decrease resulting from the final benefit being discounted over more years as retirement is deferred. To improve funded status, this change would likely need to happen in combination with an adjustment to the early retirement provision since participants can currently receive unreduced benefits at age 62.

(c) Evaluate your proposed changes from part (b) from the perspective of:

(i) An employee age 25 with 2 years of service

(ii) An employee age 60 with 20 years of service

No calculations required.

Commentary on Question:
Generally, candidates were successful with this part of the question. To receive full credit, candidates needed to address all three proposed changes from the perspective of both employees.

Adjust early retirement eligibility to 60+10 –
(Young EE): Probably not very concerned since will have achieved the eligibility by the time reach age 60.
(Old EE): Not concerned since they have already reached the extended schedule

Adjust Pay to be Career Average –
(Young EE): Will result in little change to participant's current accrued benefit because the pay used in the benefit calculation is similar between the old and new formula.
(Old EE): Will result in a larger change to the participant's benefit since pay will be averaged over 20 yrs. Participant will likely be very unhappy about the reduction of their benefit since they are so close to retirement age and can't do much to increase their benefit.

Push the NRA out further –
(Young EE): Likely a lesser impact on this employee since they are not at the stage in their career to be thinking much about retirement. Savvy employees will see this as a potential reduction in benefits because of the requirement to work longer than otherwise would have been required to.
(Old EE): Could become unhappy because much closer to retirement age. Overall though may not be a huge deal if the early retirement provisions are not impacted since the plan currently allows for unreduced at age 62.

RETDAC, Fall 2021, Q4

Learning Outcomes:
a) Describe ways to identify and prioritize the sponsor's goals related to the design of the retirement plan
d) State relationships or recognize contradictions between a sponsor's plan design goals, retirement risks faced by retirees
f) Identify the ways that regulation impacts the sponsor's plan design goals
g) Design retirement programs that manage retirement risk are consistent with sponsor objectives and promote employee behavior consistent with sponsor objectives.

Sources:
SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

Fundamentals of Private Pensions, McGill et al., 9th Edition 2010, Chapter 9

RET101-114-25: How accurately does 70% Final Employment Earnings Replacement Measure Retirement Income (In) Adequacy? Introducing the Living Standards Replacement Rate (LSRR) – (sections 3.1, 3.2, 3.4, 4 & 5 and Appendices background only)

Managing Post-Retirement Risks: Strategies for Secure Retirement, 2020

Commentary on Question:
Part a and b were numerical questions and both were answered well, with many candidates receiving full credit for these parts. Candidates did okay on part c which tested their comprehension and application of the material.

The question tested the viability of converting a DB plan into a DC plan and maintaining plan sponsors' objectives.

Solution:
(a) Calculate the Service Cost under International Accounting Standard IAS 19, Rev 2011 as a percentage of base pay for the existing DB plan for the average participant.

Show all your work.

Commentary on Question:
See above

The model solution for this part is in the Excel spreadsheet.

(b) Calculate the flat DC contribution as a percentage of base pay for the average participant necessary to restore the lump sum value lost due to the DB plan freeze.

Show all your work.

Commentary on Question:
See above

The model solution for this part is in the Excel spreadsheet.

(c) Critique the appropriateness of this suggested design based on the stated goals of Company ABC.

Commentary on Question:
See above

Critique of Using Stated Assumptions from (b) to Define Everyone's Rate

- Determining the contribution % using average age, service and pay will not produce an appropriate DC replacement for every employee
- Generally, using plan average age, service and pay will produce too high a DC % for younger employees/new hires to replace future value of lost DB plan
- Using plan averages will produce too low a result for older employees to replace future value of lost DB plan
- Using 0% pay increase assumption is not reasonable
- Using the same average retirement age with no decrements may be appropriate for this type of analysis since a DC contribution target % must be pegged to a single age
- Using a date earlier than the normal retirement age (65) will build in the value of the retirement subsidy into the DC plan. Is this intended?

Critique of Appropriateness of Design of plan to Meet Sponsor's Stated Goals

- Future hires will determine long term cost profile of plan as current participants with the frozen DB benefit retire
- New hires receiving the high DC % contribution will be provided a higher benefit at retirement than the DB plan would have provided
- May exceed legislated DC limits for some participants
- The 3 goals stated by the company are not able to all be satisfied at the same time for a going concern company
- Goal a) and c) are possible to achieve together, but would need to provide a different DC % for each employee and it would need to change every year, which violates goal b)
- Goal b) and c) are possible to achieve together, but this will not produce the same DB plan value for all employees
- Goal a) and b) cannot be achieved together
- DC plan will have a larger P&L cost of annual accruals vs. that of the DB plan since the goal is to give all employees the same DC % AND replace DB lost value -> does not immediately meet plan sponsor goal

- This is because the DC plan does not build in decrements or discounting to determine the annual contribution provided; whereas, the DB plan cost does
- However, moving to DC plan will remove future volatility in Balance Sheet since shifting risks to employees (i.e. interest rate, return on assets etc.)
- The DB service cost will increase over a person's career in a final average pay plan due to shortening of discount period and be volatile due to different than expected salary increases and changing interest rates
- The DC contribution will increase due to salary increases but be more stable since not dependent on interest rates or past service impacts

RETDAC/U, Fall 2022, Q1

Learning Outcomes:
a) Describe ways to identify and prioritize the sponsor's goals related to the design of the retirement plan
b) Assess the tradeoffs between different goals
c) Assess the feasibility of achieving the sponsor's goals for their retirement plan
d) State relationships or recognize contradictions between a sponsor's plan design goals, retirement risks faced by retirees
g) Design retirement programs that manage retirement risk are consistent with sponsor objectives and promote employee behavior consistent with sponsor objectives.

Sources:
SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

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

Primer on Retirement Income Strategy Design and Evaluation

Commentary on Question:
This question contemplates DC distribution options and was designed to ensure candidates have a good understanding of the similarities and differences from a strategic perspective. Most candidates were able to provide valid points, though a lot of the discussions centered around the different types of risks (and who holds the risk for each option), whereas the question was looking for a more well-rounded analysis.

Solution:
(a) Compare and contrast the single lump sum and partial withdrawal distribution options from a defined contribution plan from the perspective of:

(i) Plan sponsor

(ii) Plan participants

<u>(i) From a Plan sponsor perspective:</u>

For both distribution options:
- Risks are primarily passed on to participants (in that employers are not guaranteeing payments for life)

For single lump sum option:
- Aligns with desire for separated participants to completely exit the plan
- Little control of potential unexpected large payouts will affect investment design/liquidity

For partial withdrawal option:

- Can set limitations on min/max withdrawal amounts each year to control expected distribution (and investment horizon considerations)
- Allows terminated/retired employees to take advantage of group investment benefits (lower fees, better access to investment managers and options)
- Need to consider fiduciary duties, and associated risks

<u>(ii) From a Plan participant perspective:</u>

For both distribution options:

- Offers a lot of flexibility for retirees: have access and control of retirement funds
- Easy to understand
- Can also be risky for retirement security if retirees do not have sufficient financial awareness, and overspend early on in retirement

For single lump sum option:

- Options of where to move the funds: roll over to another employer's plan, purchase own annuity, other retirement funds
- Have control over investment of own retirement asset

For partial withdrawal option:

- Have access to funds if need it, but still can take advantage of benefits of group investment (lower fees, better access to investment manager and options)

(b) Compare and contrast the installment payment program and annuity distribution options from a defined contribution plan from the perspective of:

(i) Plan sponsor

(ii) Plan participants

<u>(i) From a Plan sponsor perspective:</u>

For both distribution options:

- Both great options in supporting retirees' financial security, by taking on (all or part of) the longevity risk (away from retiree)
- Additional effort required for long-term management/administration of employees' retirement funds, or the need to administer and purchase group annuities

For installment option:

- May be more attractive to employees (for recruitment) as an option which offers more flexibility

- Fiduciary responsibility for proper investment management

For annuity option:

- If purchased with insurer, then risk passed on to insurer

(ii) From a Plan participant perspective:

For both distribution options:

- Reduced longevity risk and better financial security in retirement
- Lack of control, and more complex; harder to understand

For installment option:

- Can take advantage of economies of scale of large asset pool investment (and typically lower per unit fees)
- Need to make proper decision on withdrawal intervals, and amount (it may not last for the retiree's lifetime (only until funds are depleted))

For annuity option:

- Guaranteed income for life; mimics a DB plan
- Can take advantage of better group annuity rates than if purchased by self

(c) Describe considerations for a plan sponsor's evaluation of defined contribution plan distribution options.

- Plan sponsor should determine if their objective is to maintain the assets of retired/separated participants in the DC plan
- Plan sponsor should determine if the DC plan currently has or should have overall retirement objectives – eg income replacement goal
- Plan sponsor should determine if the goal is to provide solutions based on how participants separate from service – eg retirement or termination
- Plan sponsor should determine what guidance, education or advice to be offered or made available to participants about their choices and options

RETDAC/U, Spring 2023, Q8

Learning Outcomes:
c) Assess the feasibility of achieving the sponsor's goals for their retirement plan
g) Design retirement programs that manage retirement risk are consistent with sponsor objectives and promote employee behavior consistent with sponsor objectives.
j) Recommend an appropriate plan type and plan design features for providing retirement benefits and defend the recommendations

Sources:
SOME SOURCES HAVE BEEN REMOVED THAT ARE NO LONGER ON THE SYLLABUS

RET101-115-25: An Improved Application of the Variable Annuity

Commentary on Question:
This question was designed to test candidates' understanding of how variable annuities work in a Defined Benefit pension scheme. To receive full credit, candidates needed to recognize the variable annuity provision was being added to the current Defined Benefit pension plan and have a strong understanding of the design of the variable benefit provision.

Solution:
(a) Describe how a variable annuity provision works.

A variable annuity provision that is being added to a career average defined benefit pension arrangement will allow pensioners the option to take on investment risk to earn future pension growth:

- Fixed defined benefit pension may be converted to a variable benefit pension
- Variable benefit will be increased and decreased when actual investment returns (or measurement) are greater and less than, respectively, the hurdle rate
- Plan document must define the assumed investment return to be used as the hurdle rate

- May apply to entire Plan Fund, designated subaccount, specific index or a specific fund
- A hurdle rate chosen to be the targeted real rate of investment return is expected to provide post-retirement inflation protection
- Floors or ceilings can be applied to annual variable benefit adjustments

(b) Describe two methods for adjusting accrued benefits payable under a variable annuity provision.

Commentary on Question:
The solution below provides formulas which could be used to adjust benefits. Candidates who successfully described the adjustments in words, vs. formulas, also received credit.

Method 1: Variable benefit provision benefits could be adjusted as follows:

$$Bn = Bn\text{-}1 * (1 + i_n) / (1 + h)$$

Whereas,
Bn = accrued annual benefit at beginning of nth plan year
Bn-1 = accrued annual benefit at beginning of previous plan year
i_n = investment return between year n-1 and n
h = hurdle rate

A smoothing technique could be adopted for the variable benefit adjustments to reduce larger fluctuations in benefits year to year.

Method 2: Variable benefit provision benefits could be adjusted as follows:

$$B_n = B_{n-1} * (1 + i_n - h)$$

This method has some theoretical basis for plans that pay monthly benefits but determine the adjustment annually. This method would produce larger gains or losses than realized.

(c) Explain the impact of adding a variable annuity provision on the following:

(i) Investment risk

(ii) Valuation of liabilities

(i) Investment Risk

Adding this designed variable benefit annuity (VBA) provision to the defined benefit pension plan will shift the investment risk to the pensioners selecting this option at retirement.

If VBA pensioners' accrued benefits at retirement are fully funded by the Plan Sponsor, the Sponsor's investment risk would be fully shifted onto the VBA pensioners for assets backing these obligations. If the accrued benefit is not fully funded at retirement, investment returns exceeding the hurdle rate would have an inverse effect and would deteriorate the funded position of the VBA obligation further.

(ii) Valuation of liabilities

For valuing the VBA obligation, the present value of the VBAs will be discounted by the defined hurdle rate as any investment gains or losses adjust the actual benefit payable to the pensioners. The VBA obligation is independent of market interest rates as the obligation is tied directly to the performance of the portfolio of assets; therefore, changes in market interest rates have no effect on the sponsor's obligation. If accrued benefits are fully funded, any remaining variation in VBA obligation will be associated with non-investment experience being different than assumed.

If other provisions that are difficult to measure are built into the VBA provision, such as floors or ceilings of the annual adjustment, other modeling techniques such as stochastic modeling, option-pricing techniques, or deterministic procedures may be a more appropriate valuation method.

RETDAC, Fall 2023, Q3

Learning Outcomes:
d) State relationships or recognize contradictions between a sponsor's plan design goals, retirement risks faced by retirees

Sources:
RET101-105-25: CAPSA Guideline No. 8: Defined Contribution Plans

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a) Assess the proposed plan provisions in respect of adverse amendments under *CAPSA Guideline No 8: Defined Contribution Plans*.

Commentary on Question:
Candidates needed to provide commentary on each aspect of the plan provisions to receive full credit. Many candidates did not provide enough information to receive full credit for this part.

Critique from Member of Company A Plan
- Employee contribution rates are increased prospectively for some employees as member options have changed from 3%-7% to 4%-6%
- For members who previously contributed 3%, this is an adverse amendment
- Employer match percentage is potentially reduced for members with higher points (e.g., older and high-service members) depending on their personal contribution rate
- The maximum employer match % has decreased from 7% to 4.5%
- The reduction is an adverse amendment
- Administrative expenses are being paid by members now, which is an adverse amendment

Critique from Member of Company B Plan
- Employee contribution rates are increased prospectively as member contributions are now required (at least 4%)
- This is an adverse amendment as contributions have increased
- The employer contribution has decreased from 3.75% to 3.0% for members who contribute less than 5%
- The reduction is an adverse amendment
- The vesting has lengthened from immediate to two years
- Lengthening vesting is an adverse amendment

(b) List what should be included in the notice to plan members to comply with *CAPSA Guideline No. 3: Capital Accumulation Plans*.

Commentary on Question:
Candidates generally performed well on this part.

The model solution below is an example of an answer that would receive full credit; it does not include all possible answers. Other reasonable answers also received credit.

The notice to members should include:
- the effective date of the change;
- a brief description of the change and the reasons for the change;
- how the change could affect the member's holdings in the plan (e.g., if the change affects the level of risk of an investment option, this should be described);
- the manner in which assets will be allocated to new investment options (where applicable).

RETDAU, Fall 2023, Q3

Learning Outcomes:
a) Describe ways to identify and prioritize the sponsor's goals related to the design of the retirement plan
g) Design retirement programs that manage retirement risk are consistent with sponsor objectives and promote employee behavior consistent with sponsor objectives.

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

- Ch. 14

Commentary on Question:
This question was intended to test whether a candidate understands how SERP plans are used to achieve the goals of the employer. The question proved to be more challenging than expected for most candidates.

Many candidates' responses were limited to plan design features only available to qualified defined benefit plans. Few candidates provided responses that considered the differences between the two groups of executives or how 75% of "income" should be determined.

The model solution shown is not an exhaustive list of all possible answers. Other reasonable answers would also receive credit.

Solution:
Company XYZ employs six executives.

- Three have over twenty years of service and participate in both the company's defined benefit pension plan and defined contribution pension plan.
- The other three have less than five years of service and participate only in the defined contribution pension plan.

The company is considering implementing a Supplemental Executive Retirement Plan (SERP) and has the following objectives:

- Provide internal equity
- Minimize impact on company financials
- Target 75% income replacement

Describe plan design features for the SERP that should be considered in order to achieve these objectives.

Internal Equity

- Objective is to provide the same level of benefit for all executives

- Consider designing a supplemental umbrella plan where the qualified plan benefits serve as offsets for the SERP benefit. The total benefit earned by all executives will be based on same formula but the piece from the SERP could be lower for the longer-service executives.
  - To appease and retain longer service executives, could provide additional accruals at a lower rate for service that exceeds some threshold (ex. 25 years). For example, if the target total benefit were achieved at 25 years of service and a 25 year cap were applied in the formula, then executives who have worked longer may not consider this plan equitable or fair

  Minimize impact on company financials
  - Consider the benefit payment options which will be provided by SERP: for example, lump sum payouts could lead to volatility and settlement accounting (if in a DB plan)
  - Consider what pay elements (ex. bonus) will be included in benefit formula: including bonuses (which could vary widely from year to year) could lead to more volatility
  - Consider whether SERP will be a DB, DC, or hybrid plan. A DB design will create much more volatility in P&L than a DC plan

  75% Income replacement target
  - Consider which pay elements will be used to determine "income" and if pay used for the SERP formula should be the same
  - Determine accrual rate/period
    - How will benefit service be measured?
      - Total service at Company XYZ?
      - Executive service only?
      - Grant any past service with a former employer (to attract mid-career executives)?
    - Are accruals front-loaded, back-loaded, or level?
    - Consider capping the service that is included for the formula

  Determine at what age the 75% income replacement should be met (ex. age 62 or 65).
  Determine what other sources of income will be used to judge if objective met. These could be offsets to the total benefit formula:
    - Social Security
    - Broad-based benefits from XYZ's defined benefit and defined contribution pension plans
    - Vested benefits from prior employer
      - Helps facilitate mid-career recruiting

RETDAC/U, Spring 2024, Q9

Learning Outcomes:
b) Assess the tradeoffs between different goals
c) Assess the feasibility of achieving the sponsor's goals for their retirement plan
g) Design retirement programs that manage retirement risk are consistent with sponsor objectives and promote employee behavior consistent with sponsor objectives.

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

Commentary on Question:
Commentary listed underneath question component.

Solution:
(a) Propose supplemental executive retirement plan provisions that plan sponsors can consider to address the following goals.

(i) Midcareer recruiting

(ii) Retention

Justify your response.

Commentary on Question:
Candidates generally did well on this question if they provided full justification for their proposed responses.

The model solution below is an example of an answer that would receive full credit; it does not include all possible answers. Other reasonable answers also received credit.

(i) Midcareer recruiting
- Provide additional years of service as part of pension formula – to attract ppts that may be missing out on benefit accruals from past employer so not starting from scratch with their new organization since they could become ineligible for earning a benefit if they leave a prior company to come to the new company

(ii) Retention
- Benefits are available only upon termination after age 62 – this will encourage participants to leave only after they have reached retirement age and will be discourages from looking for other opportunities.
- Benefits subject to forfeiture if an executive works for a competitor after retirement – this will provide a type of non-compete for the

individual so that they are not incentivized to look for other similar opportunities; Prospect of losing benefits may deter an executive who is thinking of leaving the organization

(b) Describe the advantages and disadvantages of the options from the perspective of:

(i) Company ABC

(ii) The executive

Commentary on Question:
Candidates generally did well on this question if they thought through the implications of the two potential options from both perspectives. Advantages and disadvantages from both perspectives needed to be provided for candidates to receive full credit.

(i) Company ABC:
Option 1:
- Company doesn't have to provide retirement dollars, and all of the cash is up front
- there is little incentive provided for the employee to stay with the company for all 8 years of their employment

Option 2:
- Company pays less cash up front for the employee
- If the employee leaves before the 8 years are up, then they will miss out on all retirement dollars, saving the organization money.
- Provides retention protection

(ii) The executive
Option 1: $8.32M is potential salary earned over 8 year period
- less money to be earned if stay for the 8 years
- Money provided is more flexible, and if they decide to leave in the 8 year period, they will have more "guaranteed money" in their pocket
- bonus earnings are not guaranteed like the other contract

Option 2: $8.60M is potential salary (and retirement payment) earned over 8 year period
- executive has the opportunity to earn more "guaranteed" money under this option, assuming they say for the full 8 years
- the benefit in retirement isn't funded, so there is always a risk that the money may not end up being paid
- If they leave the organization before 8 years are up, will receive much less

RETDAC/U, Fall 2024, Q3

Learning Outcomes:
a) Describe ways to identify and prioritize the sponsor's goals related to the design of the retirement plan
b) Assess the tradeoffs between different goals
c) Assess the feasibility of achieving the sponsor's goals for their retirement plan
d) State relationships or recognize contradictions between a sponsor's plan design goals, retirement risks faced by retirees
g) Design retirement programs that manage retirement risk are consistent with sponsor objectives and promote employee behavior consistent with sponsor objectives.
j) Recommend an appropriate plan type and plan design features for providing retirement benefits and defend the recommendations

Sources:
RET101-104-25: The Hybrid Handbook: Not All Hybrids are Created Equal

Retirement Plans - 401(k)s, IRAs and Other Deferred Compensation Approaches, Allen et al., 12th Edition, 2018 , Chapters 2 and 17 (pp. 314-323)

CIA Report of the Task Force on Target Benefit Plans, Jun 2015, excluding sections 4, 5 & Appendices

Morneau Shepell, Handbook of Canadian Pension and Benefit Plans, 17th Edition, 2020, Chapters 1, 3 and 11

Commentary on Question:
This question sought to utilize knowledge acquired in the syllabus by asking the candidate to design a pension arrangement that met conflicting objectives between the employer and the participants.

A variety of approaches were proposed by candidates, and most were valid and received significant credit.

To receive full credit, candidates needed to provide:

a) details on each feature
b) how each feature met the union and/or the sponsor's objectives, and
c) where union and employer objectives could not be fully met, a suitable compromise

Candidates who provided more details on each proposed plan feature received more points, while candidates who omitted features and justifications earned fewer points. Candidates who proposed a defined contribution plan received lower credit as this type of arrangement was less suitable.

The model solution below is an example of an answer that would receive full credit; it does not include all possible answers. Other reasonable answers also received credit.

Solution:
An employer is negotiating a defined benefit pension arrangement for the first time with the union representing its employees.

The union workforce has the following characteristics:

- Mix of full-time and part-time members
- High turnover in low service employees

The employer has the following objectives for the arrangement:

- Encourage workforce to stay to age 65
- Minimize administrative burden
- Share cost with employees
- Limit the employer's inflation risk

The union has the following objectives for the arrangement:

- Cover all employees and be easy to understand
- Provide protection if a retiree dies shortly after retirement
- Preserve benefit value for members who terminate or die before retirement
- Minimize investment risk for employees
- Allow employees to retire starting at age 55

Recommend plan features that will balance the employer's and union's objectives.

Justify your response.

Plan should be a cash balance plan, here is how it should be designed based on each objective:

- Employer (ER) wants: to encourage the workforce to stay to age 65.

The plan should have 65 as the normal retirement age. The plan will have early retirement starting at age 55 (see why below), but benefits will be reduced actuarially so as to not subsidize early retirement (and in a way, promote participants leaving before age 65).

The plan could further de-incentive pre-65 retirements by adding early retirement reduction factors for each month/year before age 65 retirement. However, this may be a determent, considering the union wants the ability for early retirement – and likely wouldn't appreciate significant (and potentially prohibitive) reductions

- ER wants: Minimize administrative burden.

Any DB plan is going to have a certain amount of administrative burden. Cash balance plans are at the lower end. To minimize this burden, I would recommend the plan sponsor offload the administrative responsibilities to a third-party provider.

- ER wants: Share cost with employees.

Require Employee contributions. This will have the added benefit of getting the employees to have a little "skin in the game" by way of their money being tied up in the plan. If the participant were to terminate prior to vesting, they would get their contributions back.

- ER wants: Limit the employer's inflation risk

Most cash balance plans use an inflation measure like the interest crediting rate (ICR), by increasing account balances with an index like CPI. This would leave the employer exposed to years with high inflation. I would recommend that the employer instead use a flat percentage, like 2%. 2% is a (conservative) estimate of inflation in the long term, so employees will be generally protected from inflation in the long term and employers avoid years of high inflation causing undue costs to the plan.

The plan should also avoid providing COLAs in retirement. If they do, they should also be a flat %, and not contingent on an inflationary index.

Note, the employer would be exposed to some inflation risk by way of pay increases. However, this is spread throughout the employees' career and is also subject to many other factors.

- Union wants: Cover all employees and be easy to understand

All participants, regardless of full time or part time status, will immediately start participating in this plan upon employment. Note, the part time employees will get smaller pay credits due to their likely lower salary.

Cash balance plans are linked to an account balance which is the sum of employee contributions, employer pay credits and interest (from ICR) gained over the years. This amount is easily trackable from the employee's perspective and feels a lot like a DC plans account balance (which they likely have a better understanding of).

- Union wants: Provide protection if a retiree dies shortly after retirement

The plan should have various optional forms to protect against this, such as Joint & survivor (where a percentage of the original retirement benefit is still available to the spouse for life after the retiree dies), a Certain and Life (where payments are guaranteed for a certain period of years, regardless of the status of the retiree).

- Union wants: Minimize investment risk for employees

During employment – Pay credits and employee contributions are based on compensation, and then are increased with a flat 2% increase. There is no direct exposure to investment risk for this time

After employment – the participant can take various forms of annuity. If there is no lump sum feature (which are common in cash balance plans), then the employees would not face investment risk in retirement either. The union should avoid asking for a lump sum option, even if their members want it.

- Union wants: Allow employees to retire starting at age 55

Allow early retirement starting at age 55. Benefits would be reduced based on the plans actuarial equivalence assumptions, until normal retirement age at age 65.