

# Review of Actuarial Reports of Defined Benefit Plans



Al Kiel

Caribbean Association of Pension Supervisors

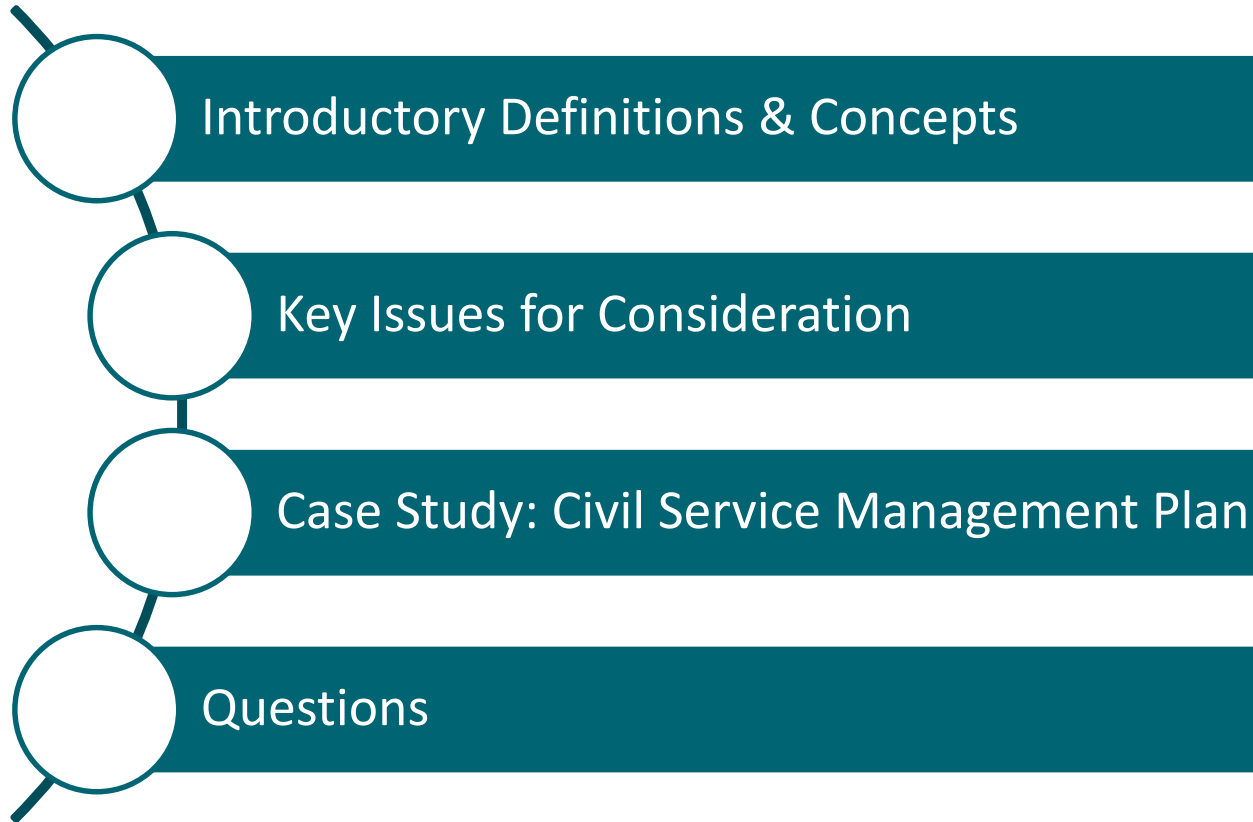
Tuesday June 19, 2018



# Acknowledgements

- **Marcia Tam-Marks**
- **Sekayi Campbell**
- **Joyce D'Souza**

# Agenda





## Introductory Definitions & Concepts

# Introductory definitions & concepts

- Several characteristics distinguish a Defined Benefit (DB) pension plan from a Defined Contribution (DC) pension plan including:

	Defined Benefit (DB)	Defined Contribution (DC)
Benefits	Determined by the formula specified in the plan's Trust Deed and Rules ("TD&R")	Dependent on the amount accumulated in the member's account at retirement
Members' Contributions	Specified in the TD&R	Specified in the TD&R
Sponsor's Contributions	Determined by an actuary	Specified in the TD&R
Funding Status	Determined by an actuary	N/A for a fully DC plan
Investment Risk	Borne by the sponsor	Borne by the members
Longevity Risk	Borne by the sponsor	Borne by the members

# Introductory definitions & concepts

- The cost of a DB plan is:
  - Uncertain and, possibly, volatile
  - Dependent on a range of future outcomes including:
    - investment returns
    - members' life expectancy
  - Often a significant liability to the plan's sponsor
- Actuaries are relied upon to:
  - Quantify the cost of the promised benefits
  - Opine on the ability of the plan to pay promised benefits
  - Recommend funding strategies
  - Analyze the financial impact of any proposed benefit amendments

# Introductory definitions & concepts

- Actuarial reports on DB Plans are usually required for the following reasons:



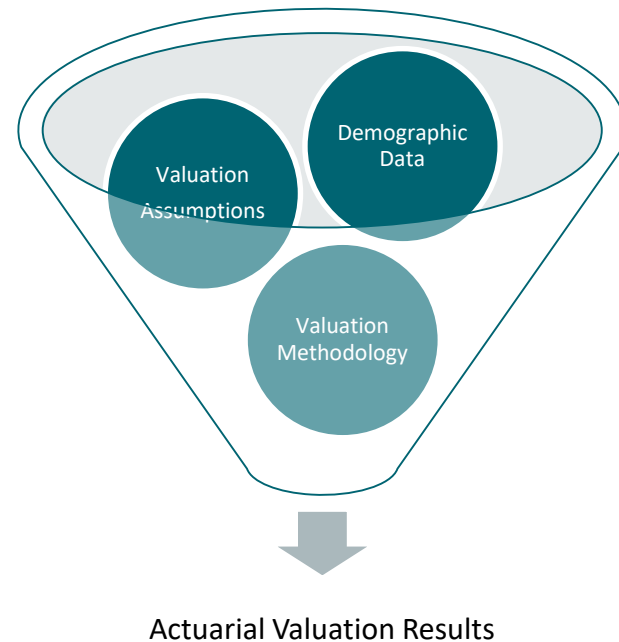
Annual/Triennial  
Plan Valuation

Conversion from  
DB to DC

Winding Up

# Introductory definitions & concepts

- **Normal Cost:**
  - Annual cost of benefits earned in the following year
- **Actuarial Liability**
  - Value of pension benefits already earned by plan members





# Introductory definitions & concepts



- **Plan Surplus:**
  - The excess of the plan's asset values over the plan's liabilities
- **Plan Deficit:**
  - The amount by which the plan's assets fall short of meeting liabilities

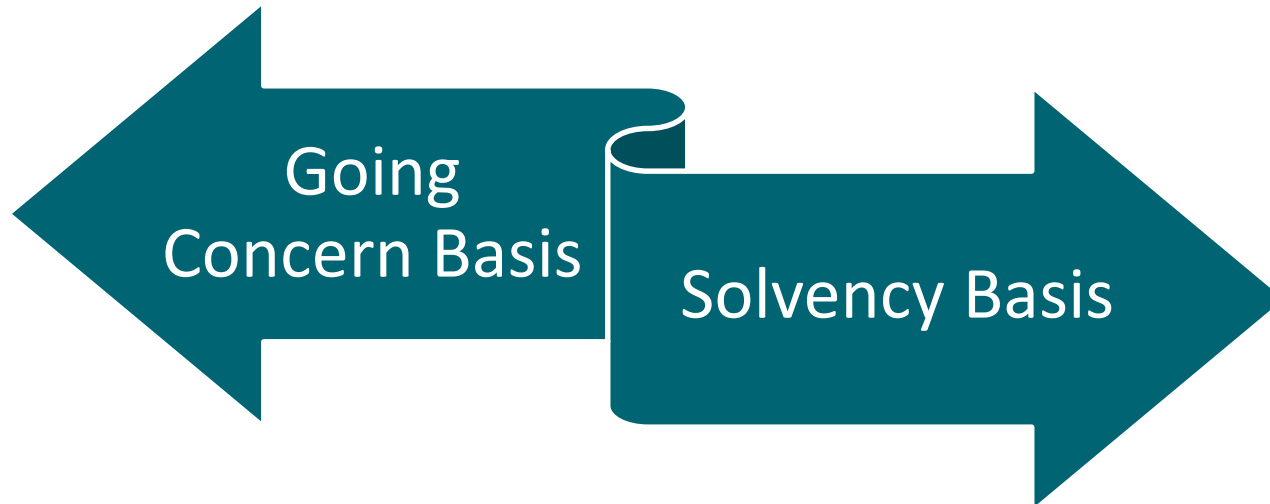
# Introductory definitions & concepts

- **Going Concern Basis**

- Valuation conducted as if the plan will continue operation indefinitely

- **Solvency Basis**

- Valuation conducted as if the plan is being liquidated as at the valuation date



# Introductory definitions & concepts

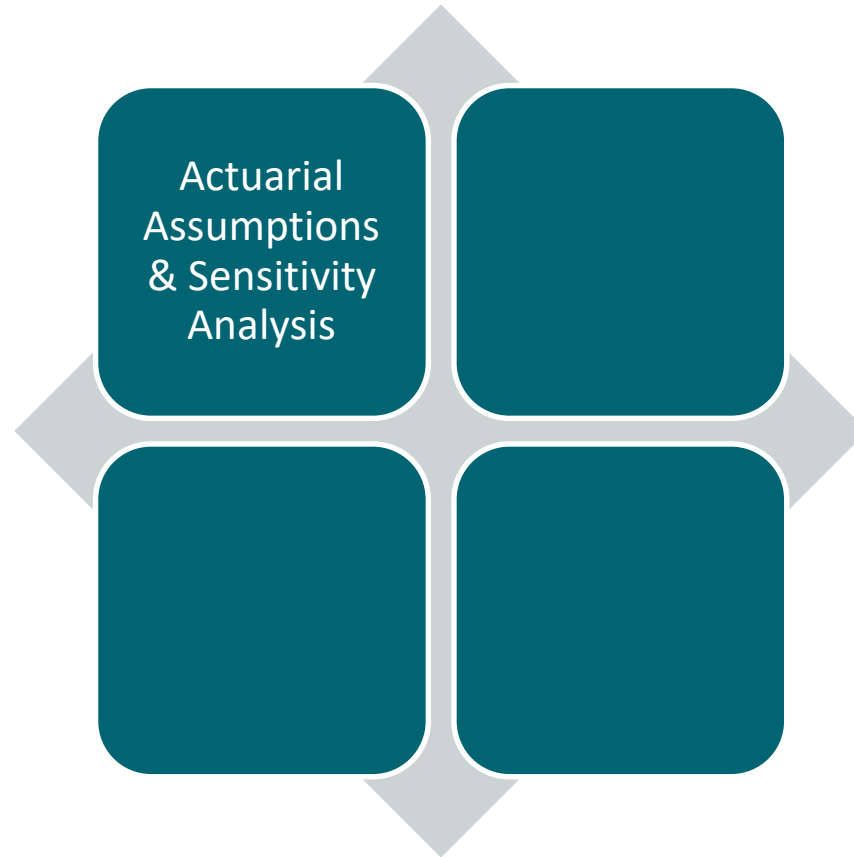
- **Funded Ratio**
  - The ratio of the plan's assets to liabilities on a going concern basis
- **Solvency Ratio**
  - The ratio of the plan's assets to liabilities on a solvency basis

**Assets/Liabilities**

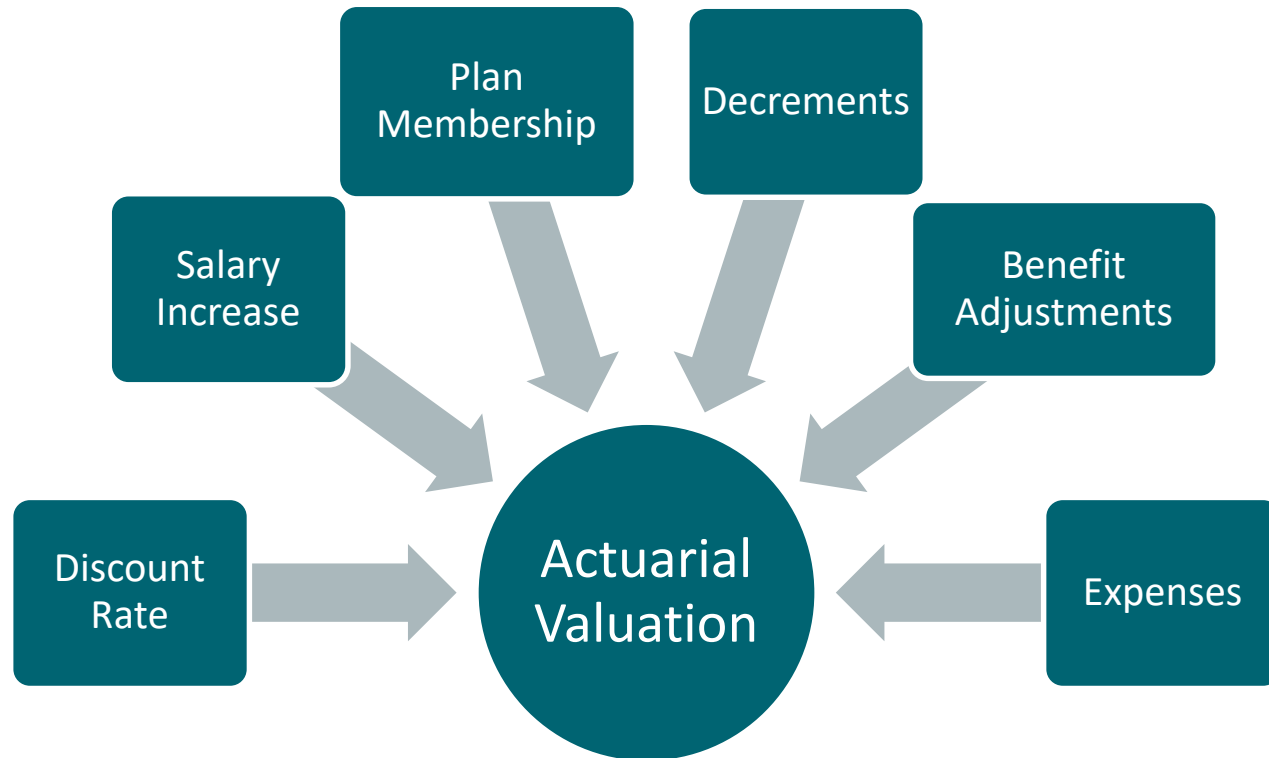


## Key Issues for Consideration

# Key issues for consideration



# Key issues for consideration



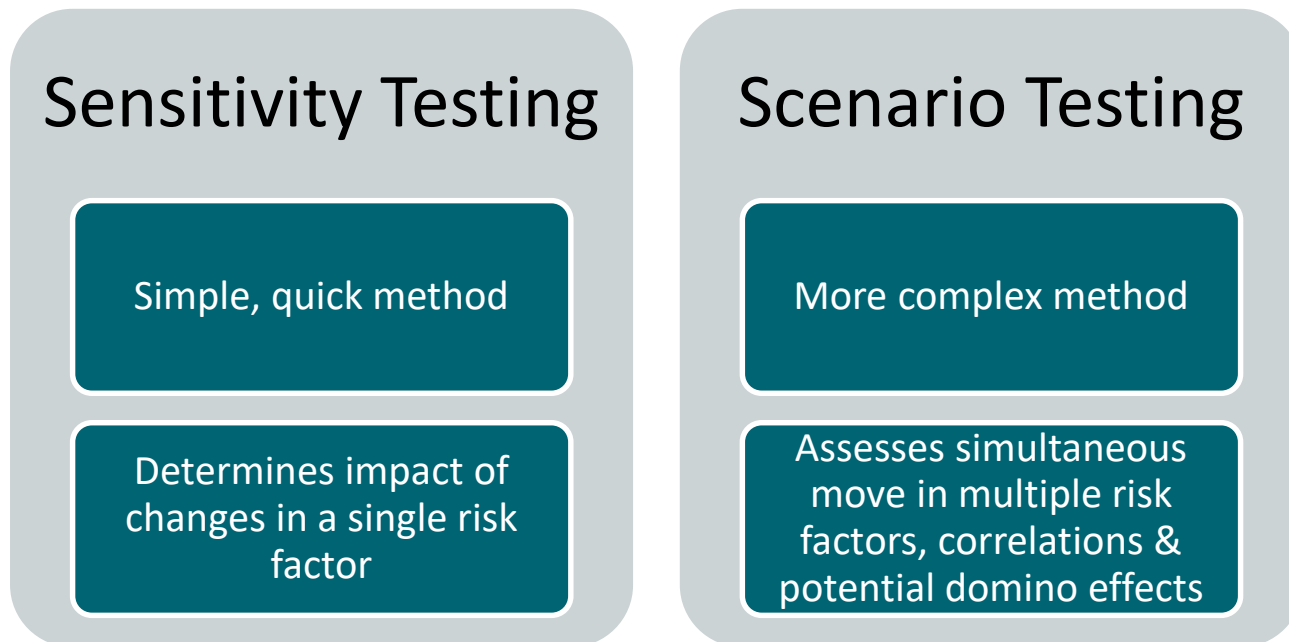
\* Discount rate is typically the most significant going concern valuation assumption.

# Key issues for consideration

- Actuarial assumptions should be:
  - Compatible with accepted actuarial practice
  - Best estimates modified to incorporate appropriate margins for adverse deviations (MfADs)
- Any MfADs should be explicitly disclosed.
  - OSFI indicates that it would be acceptable to include the necessary overall margin entirely in the discount rate assumption.
  - Alternatively, the overall margin could be expressed as a multiplier to the liabilities.

# Key issues for consideration

- IOPS states that **Stress Testing** refers to:  
*“... testing beyond normal operational capacity, often to breaking point, and looking at the extent of potential large portfolio losses and the possible scenarios in which these losses can occur.”*





# Key issues for consideration

Stakeholder	Benefits of Stress Testing
Regulator	<ul style="list-style-type: none"><li>• Supplements other risk management tools</li><li>• Identifies risk concentrations</li><li>• Promotes proactive regulatory response</li><li>• Focuses resources on plans at risk</li></ul>
Trustees	<ul style="list-style-type: none"><li>• Promotes better understanding of plan risks</li><li>• Strengthens internal controls</li><li>• Supports investment decisions</li></ul>

# Key issues for consideration

Section 3.5.2 of the Caribbean Actuarial Association Actuarial Practice Standard 1 (CAA APS1) points to the importance of:

- Greater attention to the assumptions to which valuation results are sensitive (e.g. discount rates)
- Illustration of the sensitivity of results to assumptions
- Identification of events that may significantly increase funding requirements

# Mini case study

Balance sheet on Solvency Basis (\$ millions)	
Assets	200.2
Liabilities	197.4
Surplus (Solvency Basis)	2.8

Sensitivity Analysis (\$ millions)		
	Liabilities	Surplus
Base (discount rate = 2.5%)	197.4	2.8
Discount Rate decreased by 1%	203.0	(2.8)
Discount Rate increased by 1%	192.3	7.9

Independent Transport Company Limited sponsors a DB plan for its 1,000 members. The Plan's Actuary provided the following information as at 31-Dec-2017.

Additional Details	
Three year average returns on Plan assets	0.9%
Five year average returns on Plan assets	1.3%

# Mini case study

## Balance sheet on Solvency Basis (\$ millions)

Assets	200.2
Liabilities	197.4
Surplus (Solvency Basis)	2.8

- The Plan appears solvent.
- On a solvency basis, assets exceed liabilities by \$2.8 million.

## Sensitivity Analysis (\$ millions)

	Liabilities	Surplus
Base (discount rate = 2.5%)	197.4	2.8
Discount Rate decreased by 1%	203.0	(2.8)
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## Additional Details

Three year average returns on Plan assets	0.9%
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# Mini case study

Balance sheet on Solvency Basis (\$ millions)	
Assets	200.2
Liabilities	197.4
Surplus (Solvency Basis)	2.8

- However, a sensitivity analysis shows that the Plan would fall into a deficit position if the interest rate assumption is revised down by 1% from 2.5% to 1.5%.

Sensitivity Analysis (\$ millions)		
	Liabilities	Surplus
Base (discount rate = 2.5%)	197.4	2.8
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Additional Details	
Three year average returns on Plan assets	0.9%
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# Mini case study

## Balance sheet on Solvency Basis (\$ millions)

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## Sensitivity Analysis (\$ millions)

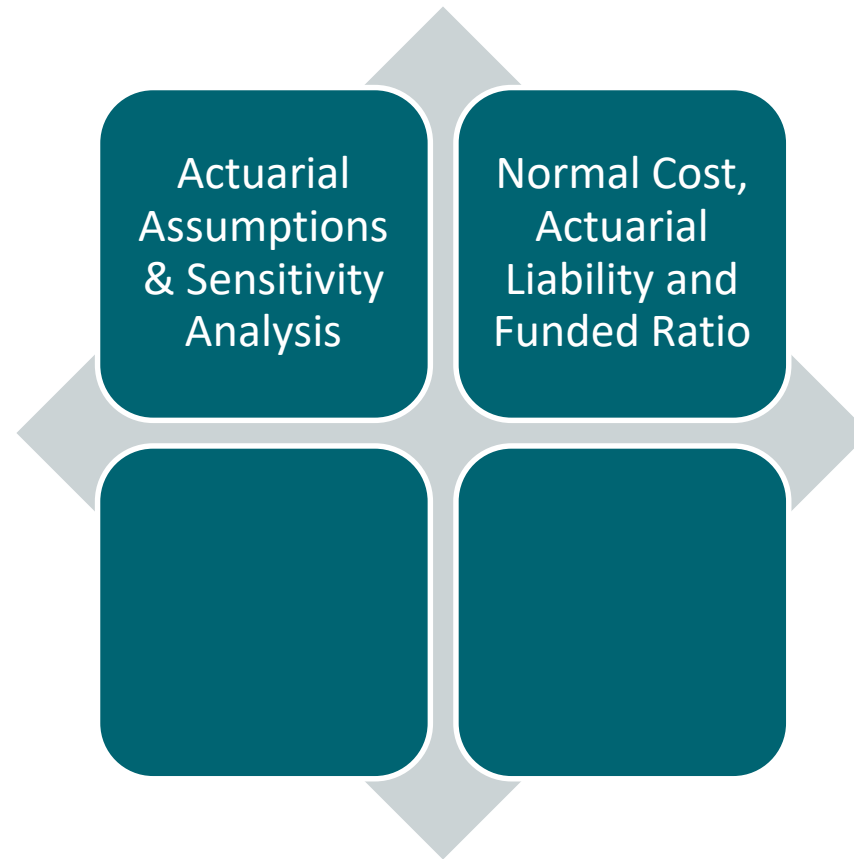
	Liabilities	Surplus
Base (discount rate = 2.5%)	197.4	2.8
Discount Rate decreased by 1%	203.0	(2.8)
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- This is noteworthy as, for the past 3 years, average returns were 0.9%, well below 1.5%. If low interest rates persist, the health of the Plan is at risk.

## Additional Details

Three year average returns on Plan assets	0.9%
Five year average returns on Plan assets	1.3%

# Key issues for consideration



# Key issues for consideration

“Any realistic assessment of a pension plan should include several measures, not just one.”

Don Fuerst, Senior Pension Fellow, American Academy of Actuaries



# Key issues for consideration

## Selected measures:

- Normal Cost
- Actuarial Liability
- Surplus (Deficit)
- Funded Ratio
- Solvency Ratio

## Consider, for each measure:

- Current level
- Evolution over time
- Sources of changes over time

# Key issues for consideration

- E.g. Funded ratio:
  - Is a measure of a plan's status at one time
  - Can vary significantly from one year to another because of external events
  - Should be examined over several years to determine trends
  - Should be viewed in light of the economic situation at each time
  - Should be viewed in light of the resources of the plan sponsor

# Key issues for consideration

- The funded ratio is most meaningful when viewed together with other relevant information including:

Size of the pension liability relative to the size of sponsor

Plan sponsor's financial health

Plan's adherence to its contribution policy

Investment strategy

State of the economy

# Key issues for consideration

- Some jurisdictions are silent on solvency/funding triggers and on mechanisms for funding deficits.
- However, exceptions exist within the region.
  - Bermuda
  - Jamaica (pending)

## Mini case study

- An extract from the valuation report of Hospital Management Pension Plan is copied below. The actuary has concerns with the health of the plan. What are your thoughts/questions?

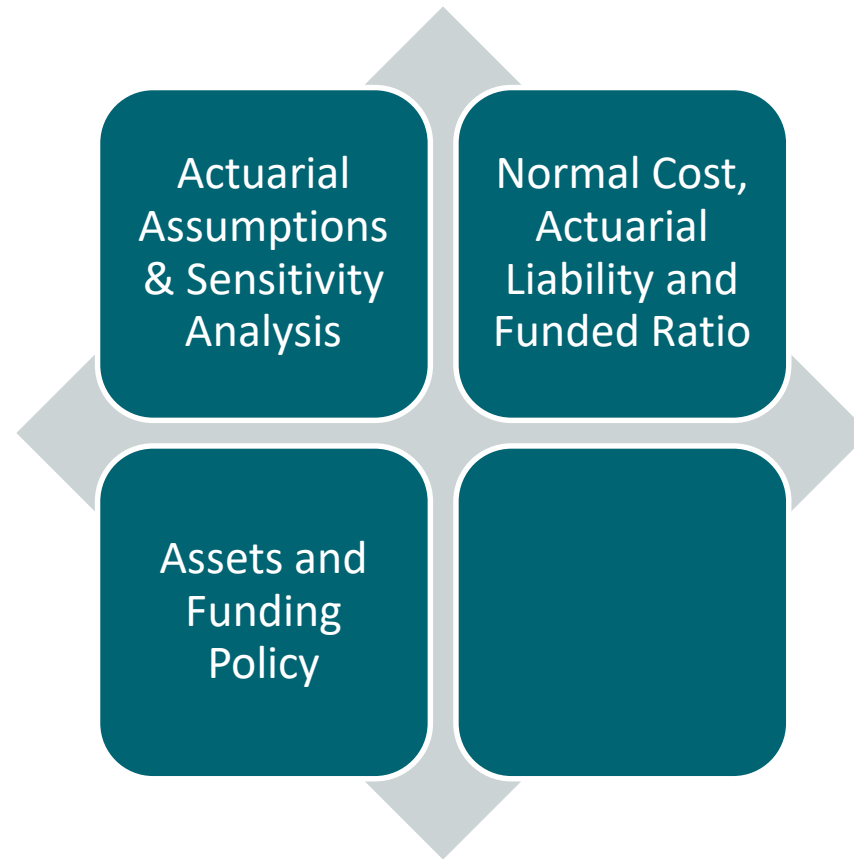
Funding Valuation (\$ million)				
	2000	2005	2010	2015
Government Securities	56	62	68	75
Equities	4	4	4	5
Contributions outstanding from Employer	0	4	8	20
Total Assets	60	70	80	100
Total Liabilities	55	64	73	91
Surplus	5	6	7	9
Funded Ratio	109%	109%	110%	110%

## Mini Case Study

- You see an article in the local newspaper that indicates the hospital is in dire financial straits. Does this have any impact on your assessment?

Funding Valuation (\$ million)				
	2000	2005	2010	2015
Government Securities	56	62	68	75
Equities	4	4	4	5
Contributions outstanding from Employer	0	4	8	20
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Total Liabilities	55	64	73	91
Surplus	5	6	7	9
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# Key issues for consideration



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- The regulator should pay keen attention to any statement from the Actuary regarding whether, in his/her opinion, the compliance with the statement of investment policy is appropriate.
  - Concentration of assets
  - Levels of self-investment
  - Mismatching
  - Nature of liabilities



# Key issues for consideration

- Consider:
  - Demographics of plan membership
  - Risk Tolerance
  - Available assets
  - Regulatory requirements

# Key issues for consideration

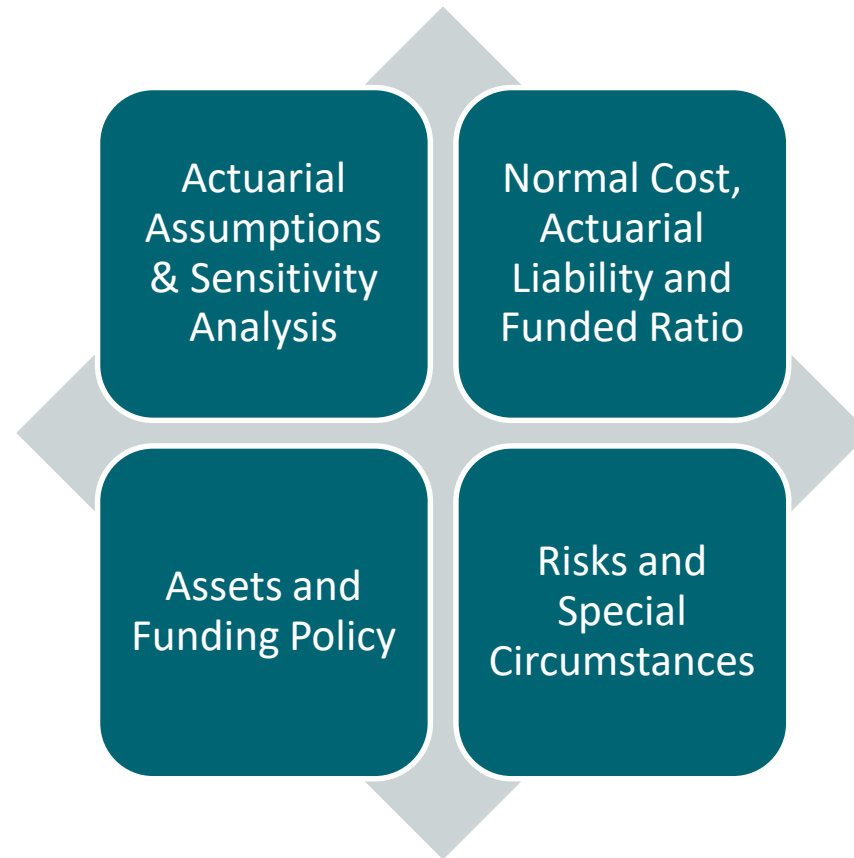
- The regulator should also review advice from the Actuary regarding the contributions necessary to attain or maintain an appropriate level of funding.
  - Level of contributions
  - Funding ratio over time

# Mini case study

- The regulator observes that a DB pension plan is invested almost exclusively in “low risk”, low return government securities. Could this impact the contribution rate required to restore the plan’s funding ratio above 100%?

Funding Valuation (\$ million)	
Assets	108
Liabilities	120
Funding Ratio	90%

# Key issues for consideration



# Key issues for consideration

- Any material events occurring after the valuation date which could have a significant impact on the results of the valuation if these events should come to light on or before the date of signing of the report.

# Key issues for consideration

## Report on Plan Conversion from DB to DC plan

- Provides each affected member's commuted value i.e. actuarial present value of the DB pension obligation subject to a minimum of the member's accumulated contributions
- Should comply with the existing regulation's / plan documents' position on:
  - Whether members affected by the conversion must be given the option of preserving their accrued benefits
  - Treatment of Salary Projections

# Key issues for consideration

## Report on Plan Winding Up

- Sets out:
  - Assets and liabilities of the Plan (including transfers)
  - Commuted values of benefit entitlements
  - Methods of allocating and distributing assets (including surplus)
- Should comply with the existing regulation's /plan documents' position on:
  - Priority of asset distribution

# Concluding remarks

- The future is uncertain.
- Actuaries are:
  - Relied upon to assign a financial value to a stream of cash flows whose timing and amount are unknown
  - Typically involved in actuarial valuation; plan conversion from DB to DC; and plan winding up.
- When assessing the actuary's report, it is beneficial to pay close attention to assumptions; trends in key measures; assets and funding; as well as any other special circumstances.





## Case Study: Civil Service Management Plan

# Case study: Part 1

Review the case study provided and answer the following questions.

- What are the key issues that the actuarial report should include.
- Based on the data provided, list some of your concerns.

# Case study: Part 2

Review the case study provided and answer the following questions.

- After reviewing the actuarial report, what concerns do you now have?
- Is there additional information that the actuary should provide?



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Thank you!  
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