Purpose

- To meet current and future medical aid scheme claims as they fall due:
  - Solvency
  - Manage Risks
    - Risk Based Capital
  - Medical aid inflation
  - Member financial security, confidence
Risk Issues

Medical aid scheme risk factor interactions can be complex

Risk Capital

Aggregate

- Credit Risk
- Asset Risk
- Operational Risk
- Business Risk
- Insurance Risk

- Contracting, Managed Care Organization
- Transfer Risk
- Investments
- ALM, Liquidity
- Growth
- Product Design Issues
- Pricing
- Anti-selection

Fit

- Investment policy
  - To what extent does it account for liabilities?
  - Is there a structured approach for liquidity risk management

- Asset liability management
  - Is there an asset liability model?
  - Does the actuary talk to investment issues?

- Investment management structure
  - Who manages the managers?
  - Accountability for asset allocation, ALM?

- Diversification
  - What for, what kind?

- Enterprise Risk Management
  - How and where does your scheme account for risks?
Liquidity Issues

- Random variations
- Fat tails, catastrophes
  - Individual
  - Prescribed Minimum Benefits (PMBs)
- Pricing inadequacies
- Default by third party contractors
  - PPOs, Managed Care Organizations, Administrators
- Membership movements

Liquidity Risks

- Drivers
  - Pricing,
    - Aggressive pricing
  - Membership Growth
  - Multiple options and anti-selection
  - Poor reserves planning
  - Inappropriate investments
Challenges

- Governance
  - BoT Governance Budget =
    - (Time, Resources and expertise)
  - Managerial Resources

- Groupthink
  - How much room innovation

- Regulation
  - Investment regulation
  - Solvency in times of stress

---

Risk Based Capital

An Alternative, Integrated Measure of Solvency
Why Risk Based Capital?

1. Medical aid schemes are subject to varying scheme specific, time dependant, strategic and business risks
   a. Liquidity demands on closed vs. open schemes
   b. Benefit options and product design
   c. Membership issues
      a. Age, migration and sector
2. Capital and solvency has to into account various categories of risks.
3. Capital required is specific to each scheme and reflects its risk profile.
4. Stress testing, probability of ruin informs proactive action for management and regulator

Risk Categories

The RBC formula defines 4 risk categories:

1. Asset Risk (H1)
2. Insurance Risk (H2)
3. Credit Risk (H3)
4. Business Risk (H4)
**Asset Risks**

Other (H1)
Decreased asset values leading to a reduction in surplus.

For example:-

- Investment management risks
  - risk of default of company issuing bonds or equity
  - reductions in market value in respect of equity investment
  - Concentration of assets.

**Insurance Risk (H2)**

Fluctuations in underwriting results
- Contributions may be insufficient to cover claims and expenses.

For example:
- inaccurate pricing
- random fluctuations in claims.

**Anti-selection risk and Product Design**

Healthy lives will be able to move to a cheaper product while unhealthy lives stay behind.

Products, benefit options may be re-priced, however it may be difficult for rates to catch up as more and more relatively healthy lives leave.

There will therefore be a pricing lag on the business.
Credit Risk (H₃)

Creditors, including reinsurers, may default.

Business Risk (H₄)

- Administration expenses
- Excessive growth risk
  - Impact of mergers, consolidation
  - Strain on capital and solvency of new volumes of business
**The Calculation**

- Using the RBC formula, the capital requirement can be reduced by up to a half depending on how the risk is distributed.

- The RBC calculation recognises the fact that the risk is very remote that surplus will be simultaneously reduced by all the risk categories.

  - Correlations and risk aggregations

**Levels of Capital**

In the US, the levels at which varying degrees of intervention is required are as follows:

- **Mandatory Control Level:** Assets/RBC < 70%
- **Authorised Control Level:** Assets/RBC = 100%
- **Regulatory Action Level:** Assets/RBC = 150%
- **Company Action Level:** Assets/RBC = 200%
In the US it is recommended that health insurers hold 400% of RBC or the Authorised Control Level. This will provide the necessary margin should experience be worse than expected. Similarly, in South Africa, different levels of assets relative to RBC will need to be determined together with the actions required at each level.

Regulator becoming vigilant, proactive
  - Risk Aggregation
  - Solvency stress testing

Scheme Growth, Consolidation
  - Operational Issues
  - Credit and Counterparty Risk

Product Design, Pricing issues

Medical Savings Accounts

Asset allocation and investment
Part II

Asset Allocation and Investment Management Issues

From Asset Class Diversification to Risk Diversification and ALM Risk Management

The Truth about Cats and Mice

Is it
• Evolution
• A Virtuous cycles or
• Vicious Cycle

• This Time is Different
• Multi-million bonuses for quants, dealmakers and CEOs
• Greed is Good

Boom, Busts, Mkt Volatility

Regulation
• Pro-cyclicality
• Behind the curve regulation
• Mouse traps

Innovation
• Phds retire to business schools
• Old, New Research
• Atavistic gene recombination
• "Changed" mice

Client Demand Better
• Is my money safe
• Liquidity
• Activism
**OPM and other stories**

**Equity Risk Premium - 3 years relative to cash**

- **Fiduciary Capitalism, Shareholder activism, ESG**
- **Balanced Funds**
- **Derivatives, quantitative investing**
- **Multi-asset class investing**
- **Passive Core - Satellite investing**
- **AUM, Risk Management**
- **Dynamic Core Satellite investing**

**Asset Class Diversification Passe**

- Correlations between asset classes increase in crises
  - Globalization, policy issues
  - Macro-economic factors
    - Decade of debt issues (2008-2017)
    - Low yield, deleveraging
  - Behavioural issues
    - Flight to safety

**Rolling 3 year Equity-Bond Correlation**

- Result:
  - Balanced funds increasingly mirror stocks
  - Balanced funds offer little diversification, risks concentrating in times of stress
Core satellite strategies

1. Decompose portfolio in sum of "manageable", to be managed parts
   a. \[ P = w(C) + (1-w)S \]
   or
   a. \[ P = w_{1a}(C) + \sum_{i=1}^{n} w_{i}S_{i} \]

2. Determine optimal weights, w taking into account
   a. Risk aversion factor
   b. Covariance between satellite portfolios performance
   c. Information ratio as measure risk, manager skill

3. Use Mean Variance Optimization Program

Outcome, Model Illustration

Mean Variance Utility Maximization
\[ U = E(P - B) - \lambda \sigma^{2} \]
\[ \frac{\partial U}{\partial w} = 0 \]
\[ w_{1} = \{ 30\%, 40\%, 50\} \] depending on risk aversion factor, TE

<table>
<thead>
<tr>
<th></th>
<th>Enhanced Core</th>
<th>Satellite</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>50%</td>
<td>50%</td>
<td>100%</td>
</tr>
<tr>
<td>Tracking error</td>
<td>0</td>
<td>20%</td>
<td>5%</td>
</tr>
<tr>
<td>Management fee</td>
<td>14bps</td>
<td>40bps</td>
<td>32%</td>
</tr>
</tbody>
</table>
### Dynamic Core Satellite Outperformance

![Graph showing the performance of Dynamic Core Satellite Outperformance over time. The graph compares various investment strategies, including Balanced, Absolute Return, Core, Static core-satellite, Dynamic core-satellite, and SA Inflation + 5%. The y-axis represents the balance, while the x-axis shows the time period from May 01 to May 11. The graph includes lines for each strategy, illustrating their respective growth over time.](image)

### Performance Comparison

<table>
<thead>
<tr>
<th>Statistic</th>
<th>Balanced - median</th>
<th>Absolute Return</th>
<th>Core</th>
<th>Static core-satellite</th>
<th>Dynamic core-satellite</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Annual Return</strong></td>
<td>16.6%</td>
<td>13.9%</td>
<td>9.7%</td>
<td>13.2%</td>
<td>15.3%</td>
</tr>
<tr>
<td><strong>Annual Standard Deviation</strong></td>
<td>9.9%</td>
<td>4.0%</td>
<td>0.7%</td>
<td>4.9%</td>
<td>5.4%</td>
</tr>
<tr>
<td><strong>Sharpe Ratio</strong></td>
<td>0.8</td>
<td>1.3</td>
<td>1.3</td>
<td>0.9</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>Maximum Drawdown</strong></td>
<td>-17.3%</td>
<td>-4.3%</td>
<td>0.0%</td>
<td>-4.6%</td>
<td>-3.6%</td>
</tr>
<tr>
<td><strong>3 Year Annual Return</strong></td>
<td>14.5%</td>
<td>10.6%</td>
<td>7.1%</td>
<td>10.8%</td>
<td>10.8%</td>
</tr>
<tr>
<td><strong>5 Year Annual Return</strong></td>
<td>9.2%</td>
<td>11.2%</td>
<td>9.0%</td>
<td>9.2%</td>
<td>10.7%</td>
</tr>
</tbody>
</table>
Performance Comparison

Rubbing it in...
**Outcome**

- Dynamic core Satellite exhibit higher return, greater stability
  - Lower drawdown
  - Lower risk per return
- Can be managed at lower costs

**Advantages**

- Insight into investment decision making process, asset allocation
- Simplicity to focus on bigger strategic and managerial risks in scheme management
- Clarity and discipline in investments and manager process
  - Best of breed, opportunity to engage with specialist S, managers
- Reduced costs
  - 10 – 15bps for passive, enhanced cash core
  - Shop around, negotiate
**Fit for Purpose**

- Enhanced core performance should target, manage:
  - medical inflation
  - Solvency
  - ALM

- Satellite meet should match medium term reserves and smoothing

**Advantages**

- Put Option replicating strategies
  - Total portfolio should never risk solvency, risk capital
  - Better use of manager skill, judgement

- Reduced costs
  - 10 – 15bps for passive, enhanced cash core

- Shop around, negotiate
Caveats, Challenges

1. **Strong investment committee**
   a. ALM Oversight
   b. Solvency, RBC Monitoring
   c. Confidence in satellite manager selection
   d. Confidence in best of breed

2. **Investment Process Management**
   - Investment committee?
     - Would TAA be necessary?
   - A Single Dynamic Core Satellite manager?
     - Better management, simplified reporting
   - Multi-manager
     - Simplified oversight, manager monitoring and portfolio rebalancing, single reporting

Way Forward

Risk and Investment Management Embrace

**Today**
1. Products, mandates
2. Operational risk issues outsourced to administrators
3. Asset allocation, investment issues deferred to administrators and consultants
   a. Risk assessment completed on individual manager level
4. Risks are assessed independent of correlations, micro-correlations and co-dependent risks
   1. Poor ALM
   2. Poor Liquidity Management
5. Risk analyses relies on consultants

**Future**
1. Solutions, customization
2. Develop a risk management policy
3. Fund Risk Officer or Chief Risk Officer for
   1. ALM
   2. ERM
4. Operational due diligence team and a standardized process for ops due diligence
5. Enterprise Risk Management focuses on minds on aggregate risks, identifies co-relations and manages correlations and attenuates co-dependent risks
6. Utilize specially consultants where needed (in-sourcing/out-sourcing decision)
7. A keen understanding of regulatory environment
Oh Jerusalem, we need leadership...

"O Jerusalem, Jerusalem, the one who kills the prophets and stones those who are sent to her! How often I wanted to gather your children together, as a hen gathers her chicks under her wings, but you were not willing! See! Your house is forsaken and desolate"

Matthew 23:37-38

Risk on Risk Off, That’s all folks…..

Confidence - of fiduciary duty, thrives on honesty, on honour, on the sacredness of obligations, on faithful protection and on unselfish performance.

The Presenter, Donald T. Molema is an independent consultant to pension fund boards of trustees with a focus on trustee training and development, the selection and review of service providers and risk management for medical aid scheme-ERM. He has been in the employee benefits and pension fund industry for 14 years. He serves as an independent trustee and audit committee member of a few funds and was also a financial columnist for Sowetan Newspaper between 2001 and 2005—very often writing articles on pension fund governance, surplus and BEE from the backseat of a taxi from Soshanguve. In 2005, he launched SRI Focus, a magazine focused on socially responsible investing(SRI) and private equity investing for pension fund trustees and the industry. The magazine failed two months later. He also served a board member of Policy Board on Financial Services and Regulation (2002-2004/5) where he was appointed by Finance Minister Trevor Manuel.

Away from “work”, his key interests are reading classics, on finance and writing articles, listening to and collecting Jazz and Christian Hymns - Hymnmakers series – “…Love Divine all loves Excelling, Joy of heaven to earth come down!”. He is currently doing Risk Management and ASA exams at the Society of Actuaries. He hopes to preach about Moses and Jesus Christ some day.

22nd August 2012
Donald.Molema@gmail.com