



QUANTIFYING RISK, ENABLING OPPORTUNITY

Medical Scheme Investments

Why do Schemes adopt a Conservative Approach?

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Agenda

- **Why do Schemes Invest?**
- **Relevant Regulations**
- **Actual Asset Allocations (31 December 2013)**
- **Historical Investment Returns**
- **Medical Scheme Liabilities**
- **Where does the Investment Strategy fit in?**
- **Reasons for Schemes Adopting a Conservative Strategy**
- **Case Studies**
- **When is an Assessment of the Strategic Asset Allocation Required?**
- **Conclusion**
- **Acknowledgements**

Why do schemes invest?

“The primary obligation of a medical scheme is to ensure that it has sufficient assets to pay benefits to its beneficiaries when those benefits fall due. The management of its assets must therefore be structured to cope with the demands, nature, and timing of its expected liabilities.”

CMS Annual Report 2013/2014

- The investment strategy should therefore, at all times, reflect the liabilities of the scheme as well as the solvency requirements

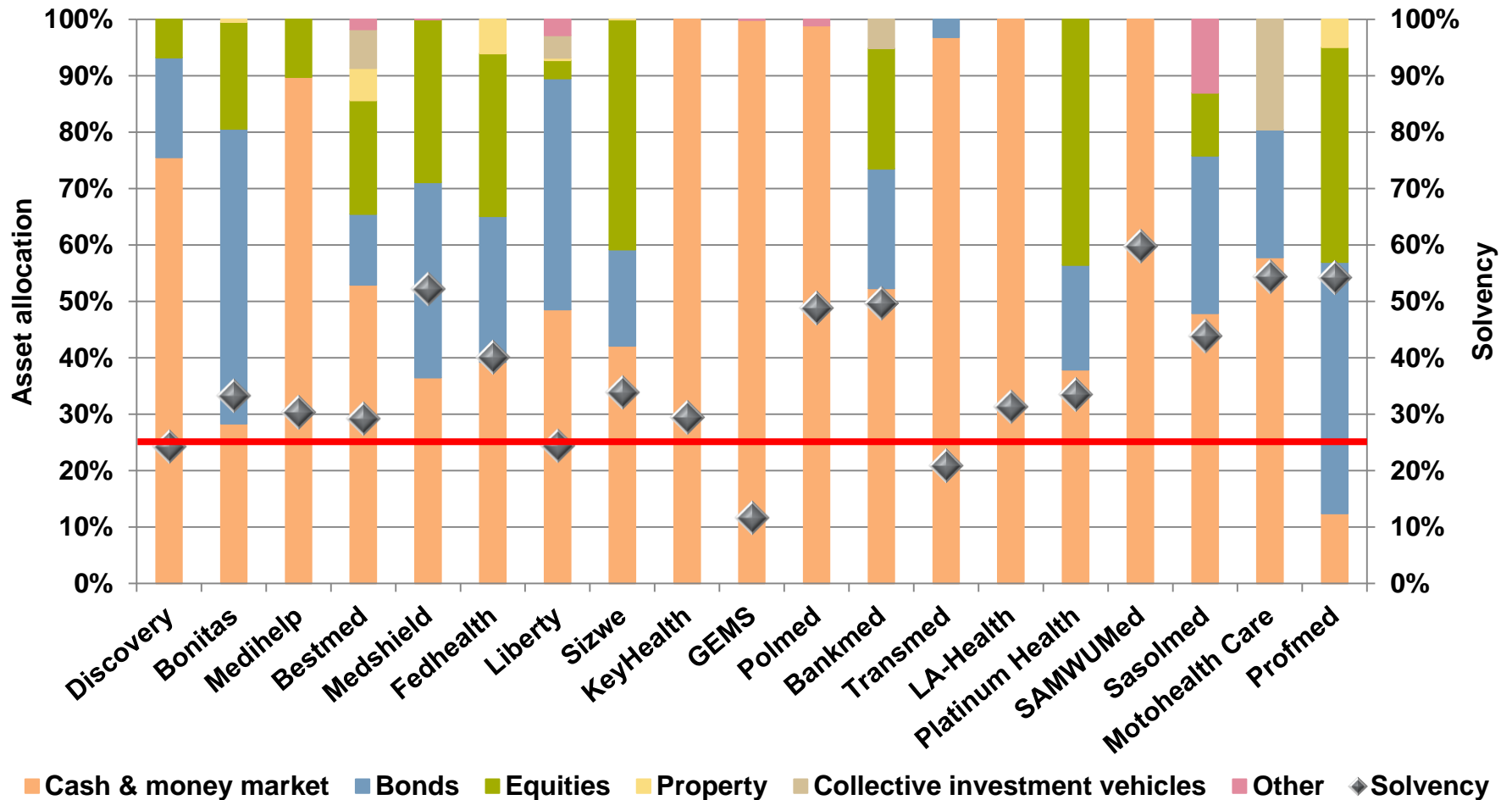
Relevant Regulations

- **Regulation 29:** Minimum accumulated funds to be maintained by a medical scheme
 - Accumulated funds must be at least 25% of annual gross contributions
 - Potential for this to be replaced with a risk-based capital requirement
- **Regulation 30:** Limitation on assets
 - Annexure B imposes limits on the maximum exposure to each asset class

Asset Class	Maximum Exposure (% of Minimum Accumulated Funds)
Cash and money market instruments	100%
Bonds	100%
Property	10%
Equities	40%

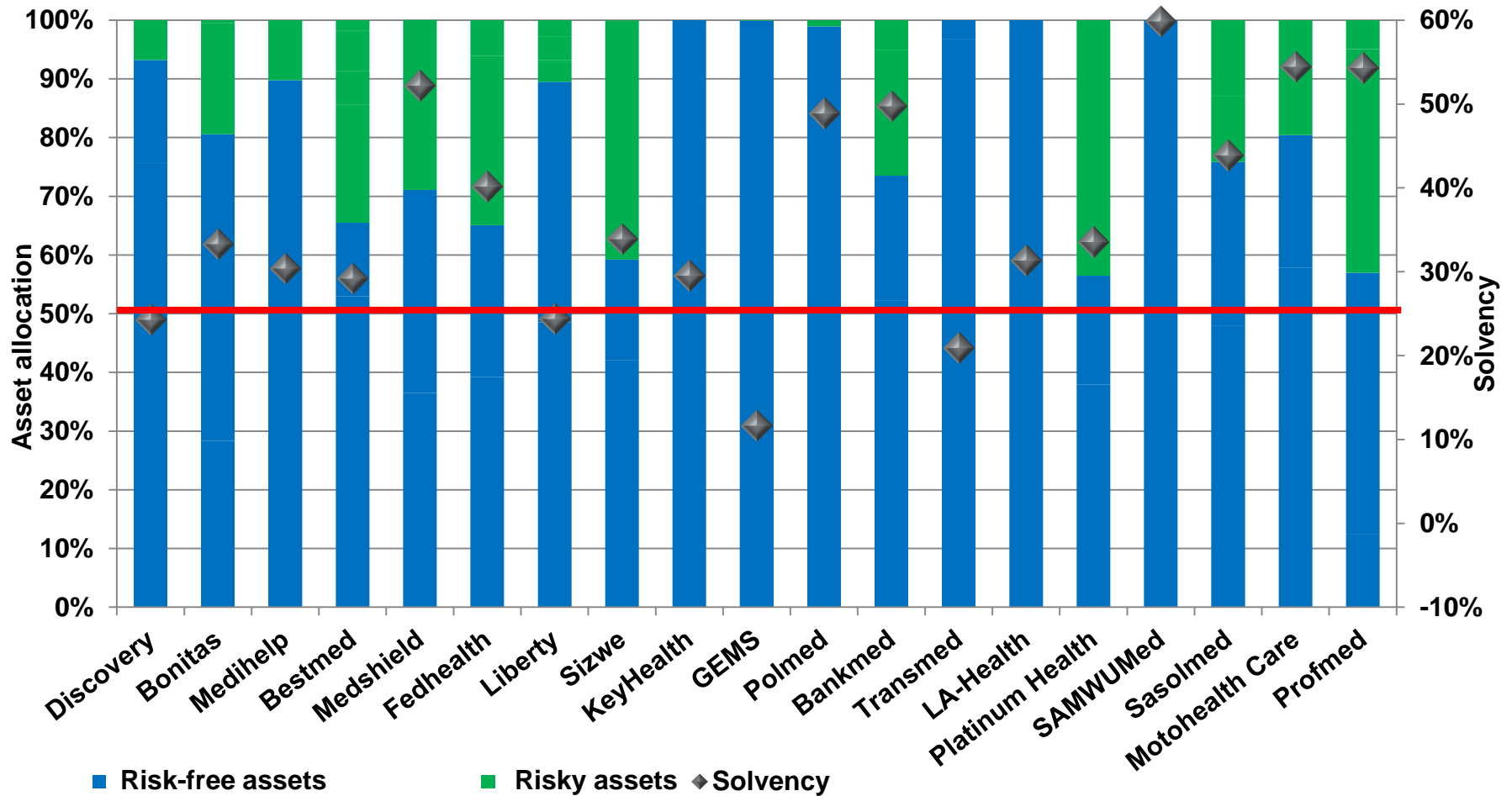
Actual Asset Allocations

(31 December 2013: Annual Financial Statements)



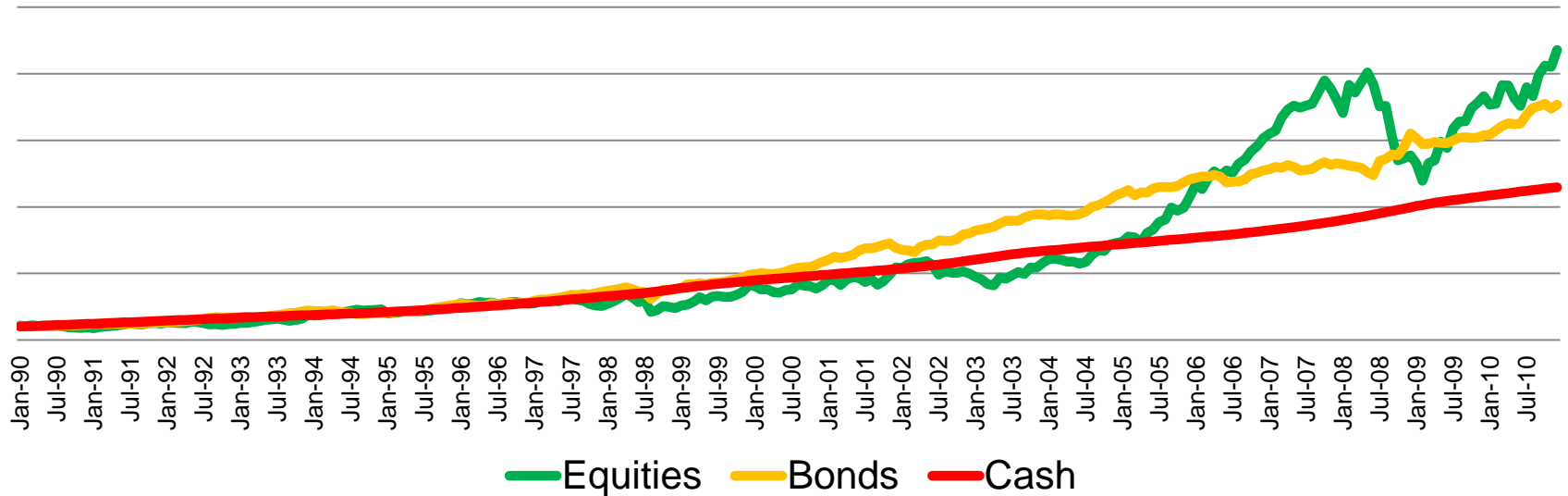
Actual Asset Allocations

(31 December 2013: Annual Financial Statements)



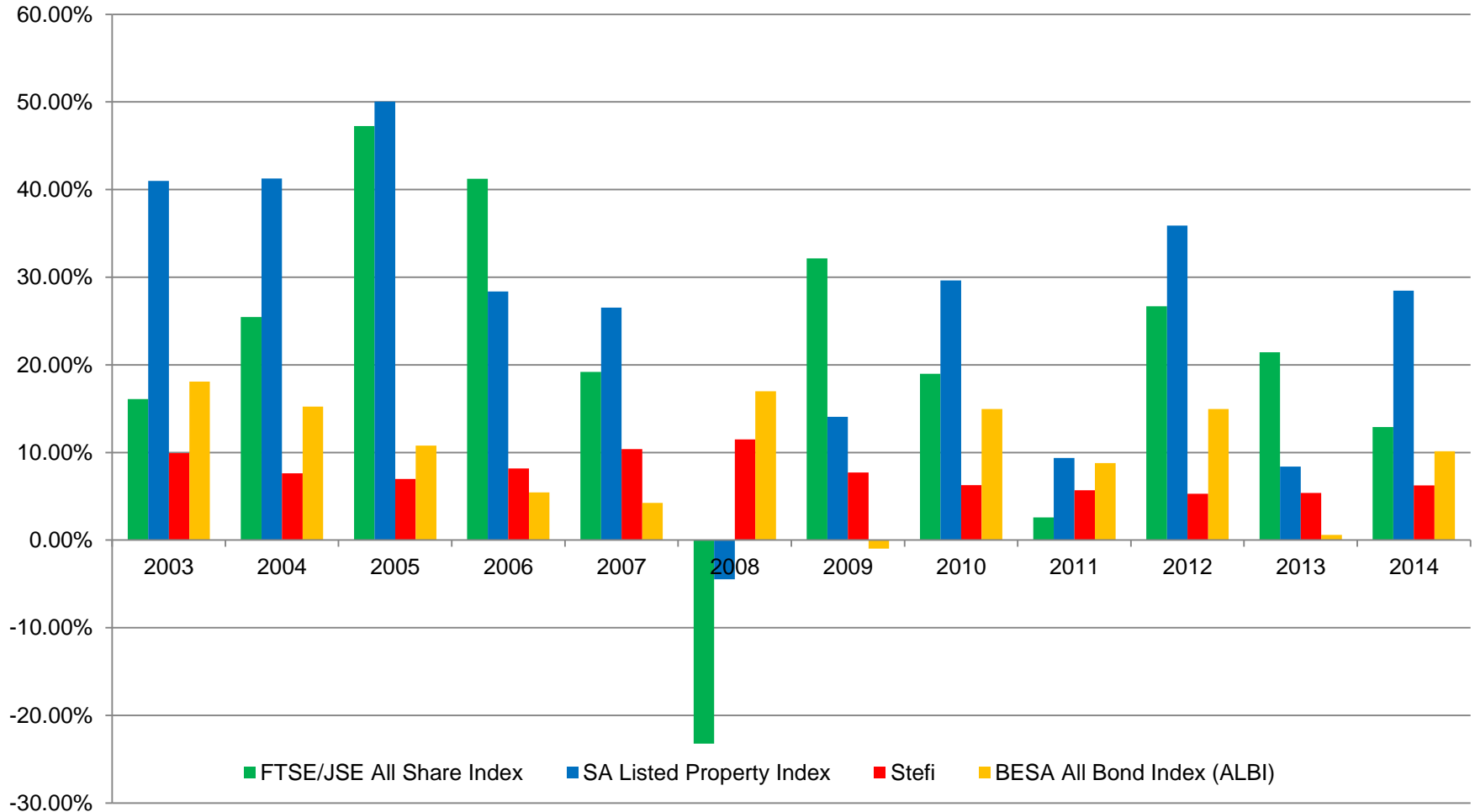
Historic Investment Returns

Cumulative investment returns by asset class (1990 – 2010)



- In the long run, equities outperformed both bonds and cash
- This excess return achieved by equities is compensation for the extra risk (in terms of volatility of returns) faced by the investor

Historic Investment Returns



Medical Scheme Liabilities

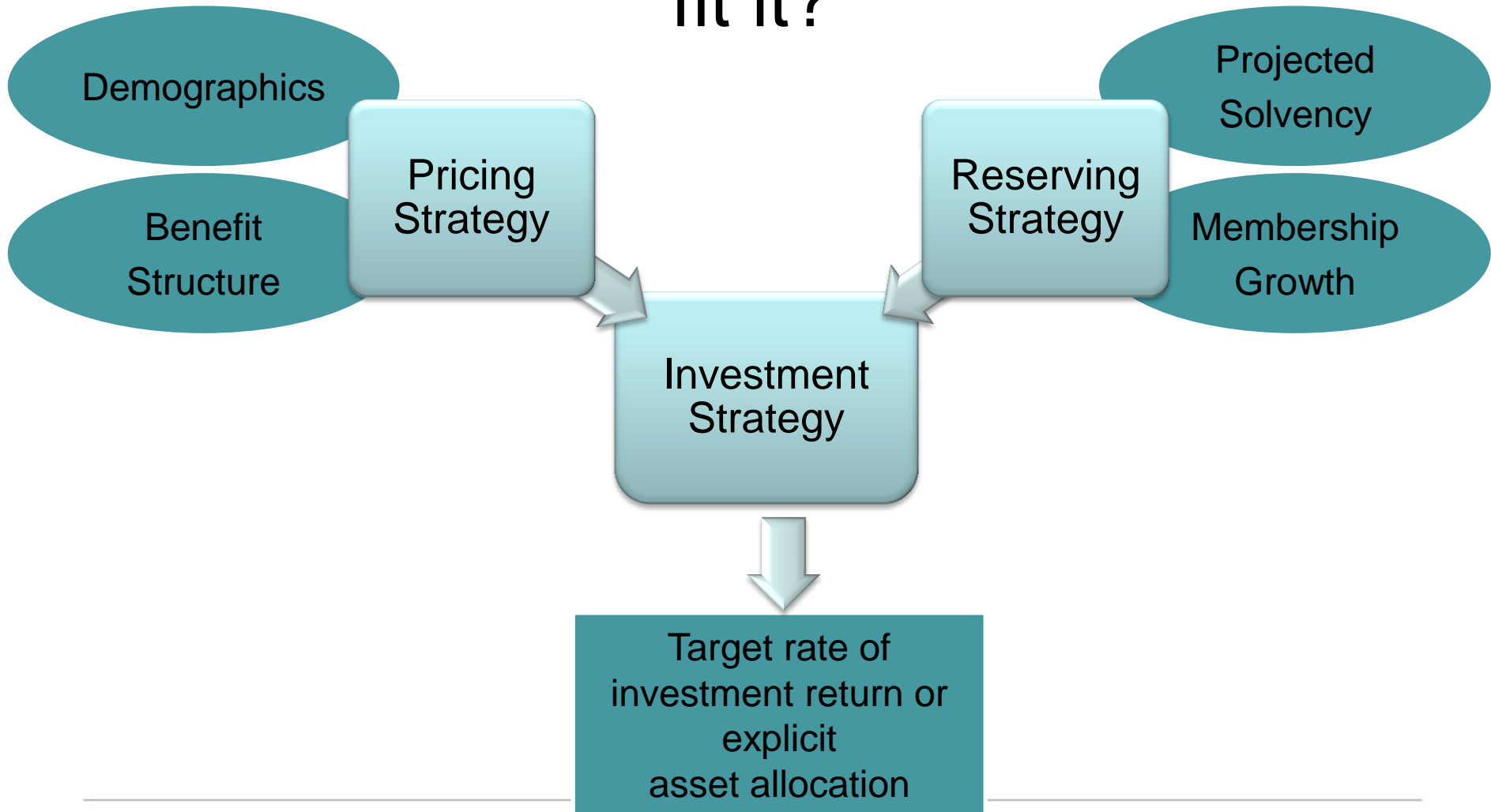
“The assets of a scheme should be spread in such a manner that they match its liabilities and minimum accumulated funds (reserves) at any point in time. Trustees need to monitor investments closely, not only to ensure compliance with legal requirements, but also to diversify risk appropriately.”

CMS Annual Report 2013/2014

- Outstanding claims:
 - Short-term, fixed liquid assets required

- Maintaining solvency and pricing strategy:
 - Long-term, keep pace with medical contribution inflation
 - Investment returns need to provide inflation protection

Where does the investment strategy fit it?



Reasons for Schemes adopting a Conservative Strategy

- Regulatory restrictions – annual review and monitoring by CMS?
- Schemes are taking a short-term view – managing solvency levels on an annual basis
- High fees
 - Asset consultants
 - Investment management fees
 - Focus on NHE
- Not meeting solvency requirements (25%) – RBC could encourage aggressive strategy
- Lack of trustee expertise
- “Employer” influence, specifically for restricted schemes

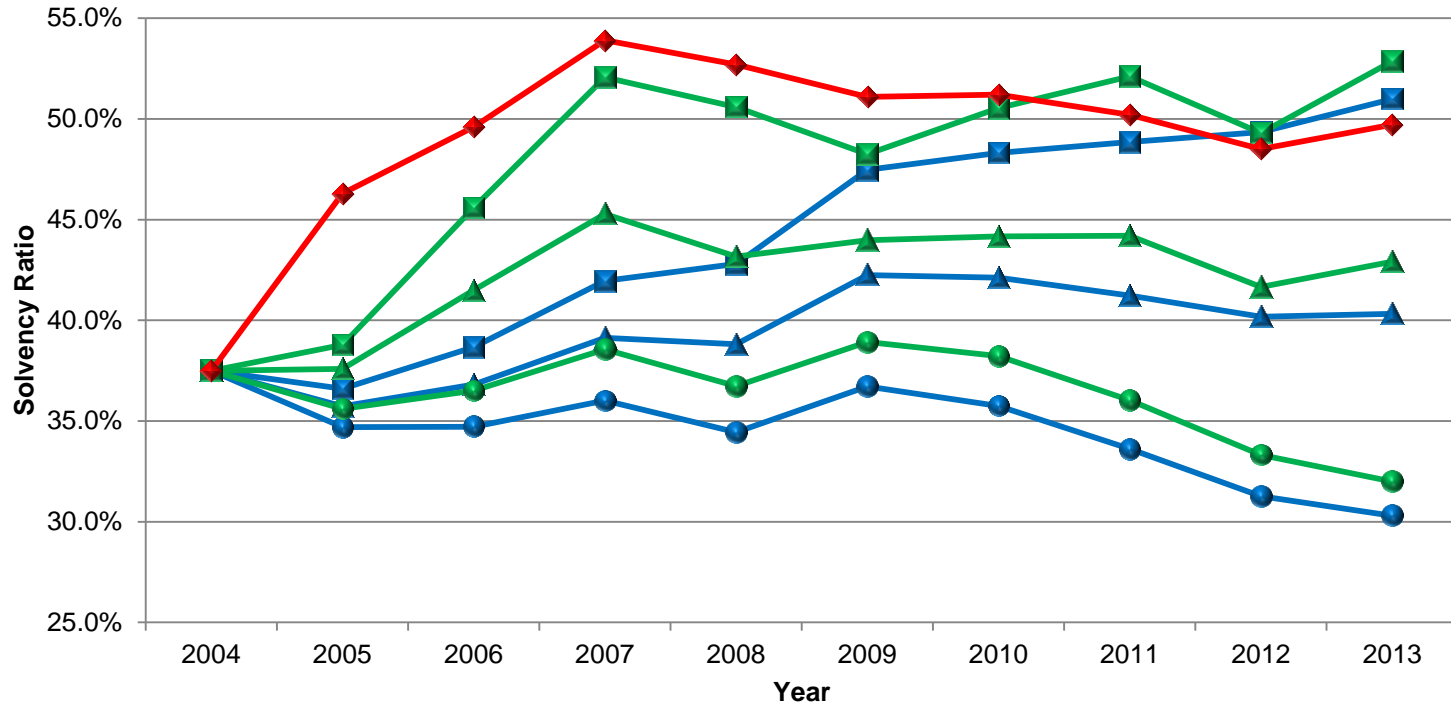
Quantitative Approach to Asset Allocation

- A quantitative approach to asset allocation aims to quantify both liability and asset risks faced by the scheme
- In particular, the simultaneous variability of the assets and liabilities is analysed and quantified
- The future level and variability of claims and asset returns will, to a large extent, be derived from past experience
- Importantly, the frequency with which a chosen investment strategy produces adverse outcomes (poor investment returns and higher than usual claims) should be gauged
- In order to do this, an asset-liability model is required.
- In the model, claims and investment returns are modelled as random variables, simultaneously

Case Studies – Historical Analysis and Future Projections

- **Consider three schemes:**
 - **Scheme 1:** Large restricted scheme, significant equity investments
 - **Scheme 2:** Large open scheme, all investments in cash
 - **Scheme 3:** Small restricted scheme, all investments in cash
- **Consider impact of asset allocation on scheme's reserves and solvency level over the last 10 years**
 - Conservative allocation: 100% cash
 - Moderate allocation: 20% equity, 30% bonds; 50% cash
 - Aggressive allocation: 40% equity, 30% bonds; 30% cash
- **Two scenarios**
 - Retrospective stochastic modelling and actual historical investment returns
 - Prospective stochastic modelling of investment returns for the next 10 years

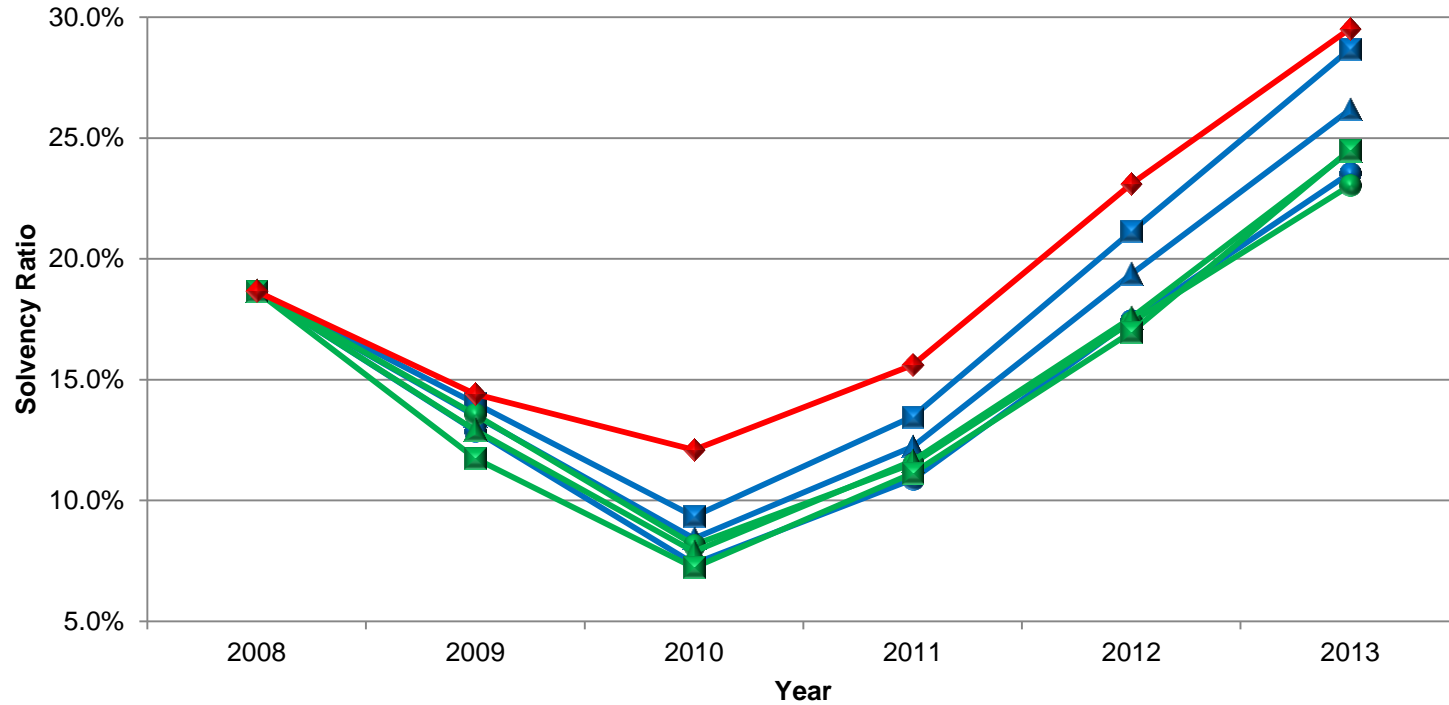
Scheme 1



- Conservative - Stochastic
- ▲ Moderate - Stochastic
- Aggressive - Stochastic
- Conservative - Actual
- ▲ Moderate - Actual
- Aggressive - Actual
- ◆ Actual Solvency

Asset Allocation	2005	2006	2007	2008	2009	2010	2011	2012	2013
Conservative - Stochastic	4.2%	5.5%	7.9%	12.3%	7.9%	5.1%	5.8%	6.4%	6.5%
Moderate - Stochastic	7.4%	8.7%	11.2%	15.8%	11.2%	8.3%	9.0%	9.6%	9.7%
Aggressive - Stochastic	10.1%	11.6%	13.9%	18.7%	14.0%	11.1%	11.8%	12.4%	12.6%

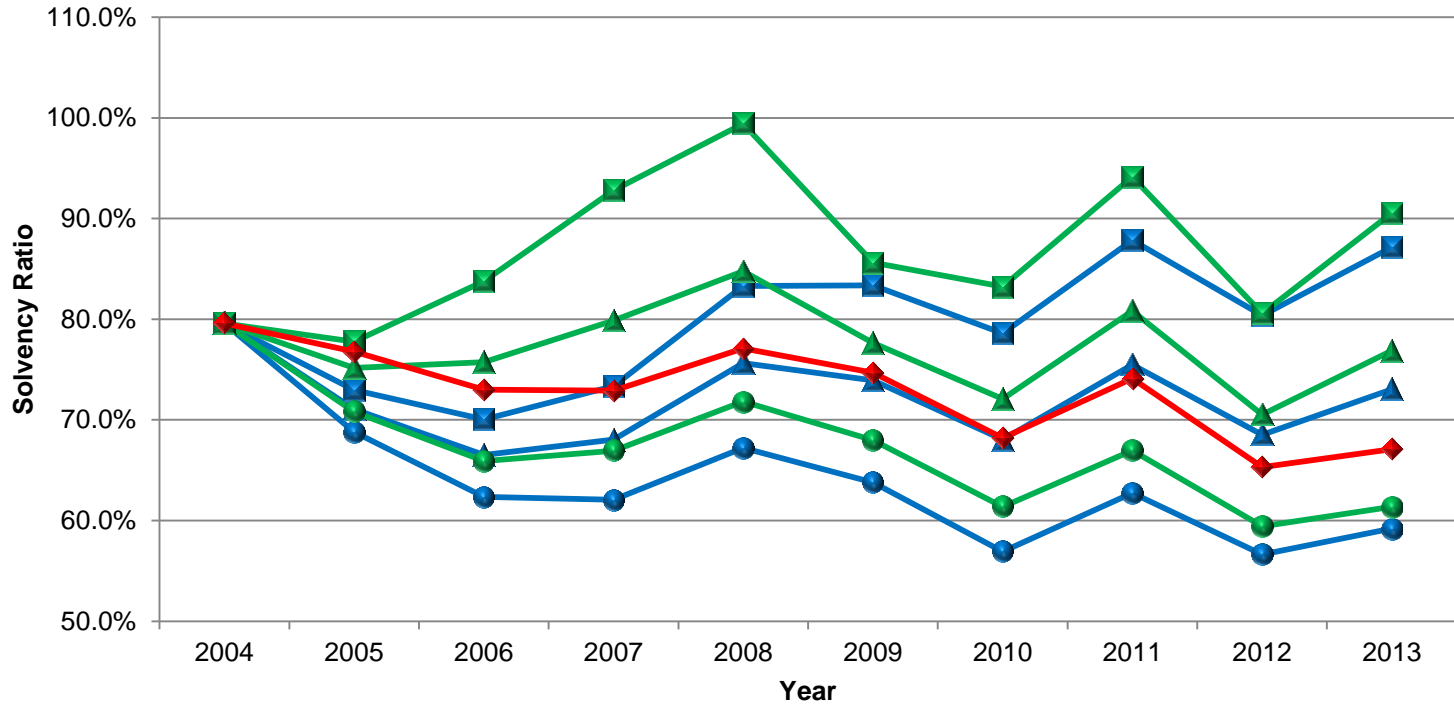
Scheme 2



- Aggressive - Stochastic ▲ Moderate - Stochastic ● Conservative - Stochastic
- Conservative - Actual ▲ Moderate - Actual ■ Aggressive - Actual
- ◆ Actual Solvency

Asset Allocation	2008	2009	2010	2011	2012	2013
Conservative - Stochastic	4.1%	5.5%	7.9%	12.3%	7.9%	4.1%
Moderate - Stochastic	7.4%	8.8%	11.2%	15.8%	11.2%	7.4%
Aggressive - Stochastic	10.2%	11.5%	14.0%	18.6%	14.0%	10.2%

Scheme 3



- Conservative - Stochastic ▲ Moderate - Stochastic ■ Aggressive - Stochastic
- Conservative - Actual ▲ Moderate - Actual ■ Aggressive - Actual
- ◆ Actual Solvency

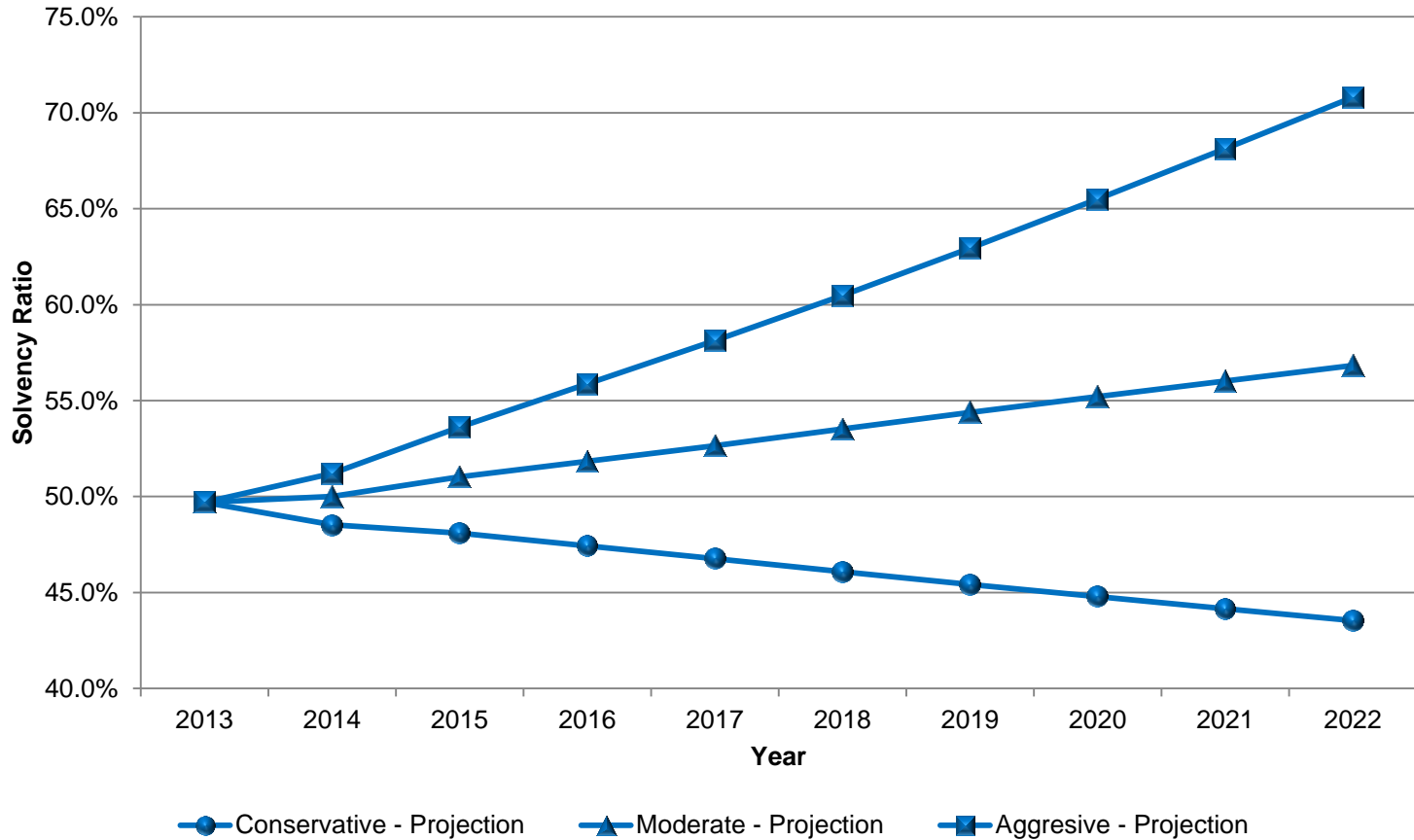
Asset Allocation	2005	2006	2007	2008	2009	2010	2011	2012	2013
Conservative - Stochastic	3.9%	5.1%	7.3%	11.5%	7.4%	4.8%	5.5%	6.1%	6.2%
Moderate - Stochastic	6.8%	8.1%	10.4%	14.8%	10.6%	7.9%	8.7%	9.4%	9.5%
Aggressive - Stochastic	9.3%	10.6%	13.1%	17.5%	13.3%	10.5%	11.2%	12.1%	12.2%

Hindsight is a perfect science

Assumptions

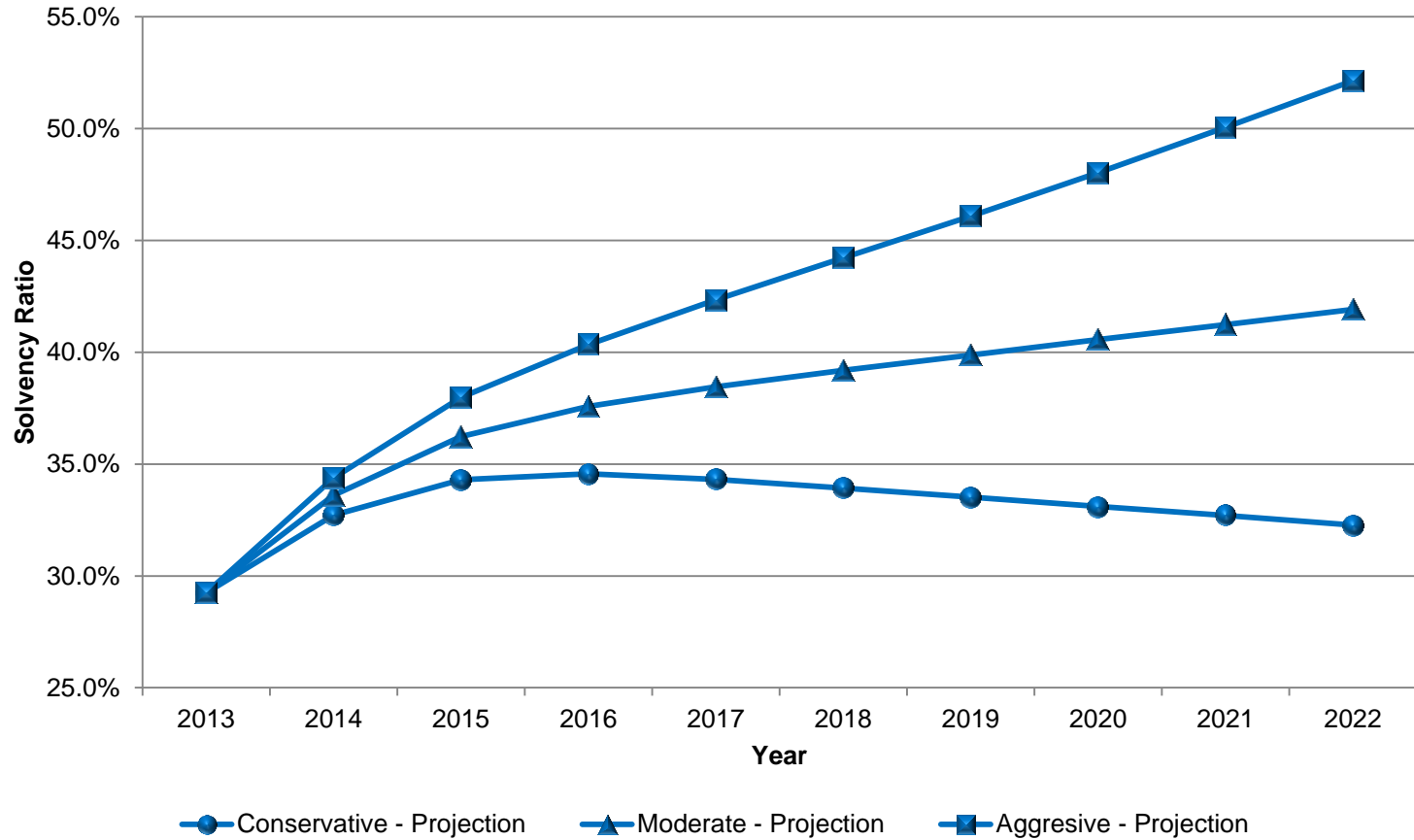
- Asset returns modelled on historical mean returns and standard deviations for asset class indices
 - ALSI – equity returns
 - ALBI – bond returns
 - Stefi – cash returns
- CPI modelled stochastically based on base CPI of 5.36%
- Claims inflation = $\text{CPI} + 3\%$
- Contribution increases - schemes modelled to achieve operational break-even position
- Stable risk profile
- No change in membership

Scheme 1



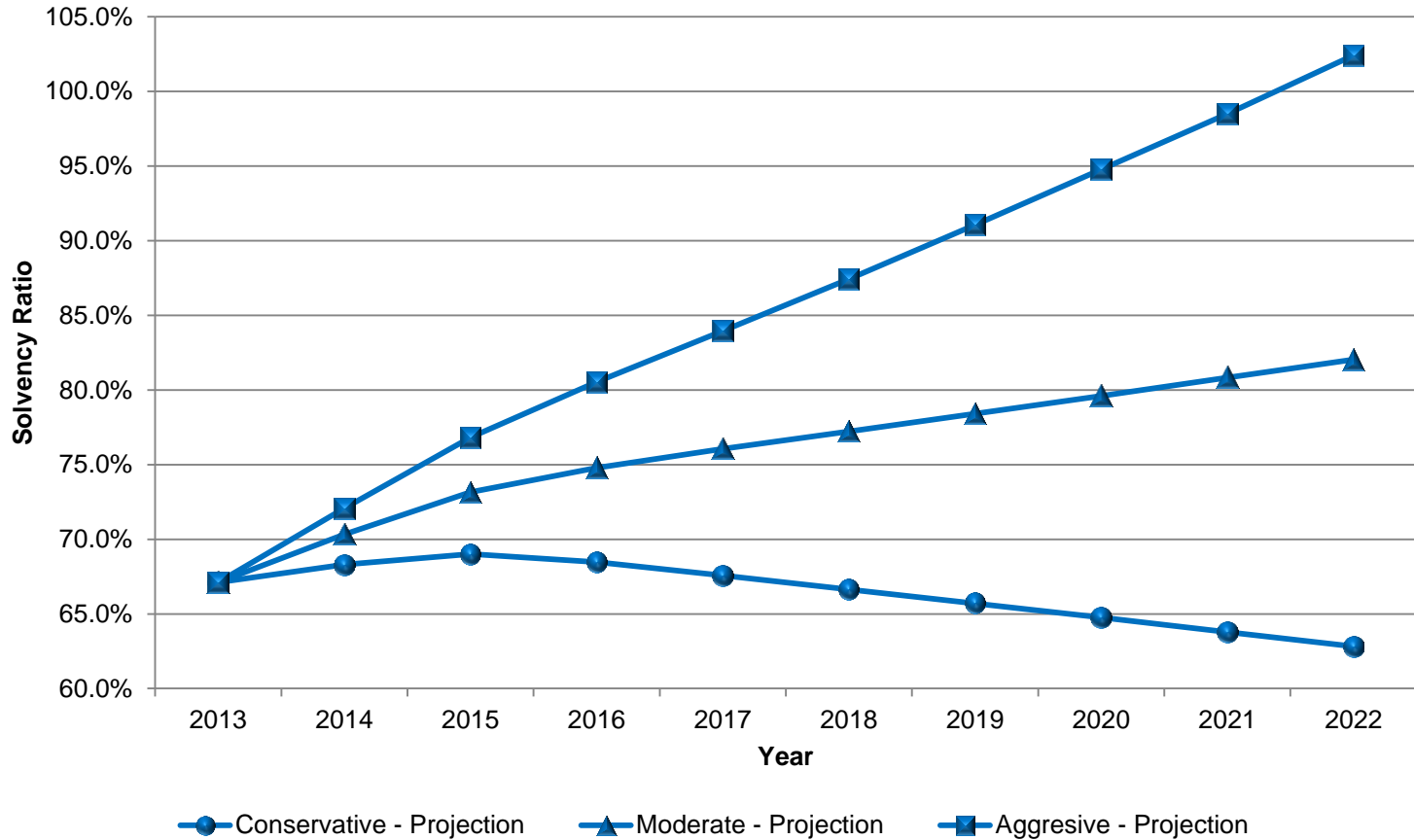
Asset Allocation	2014	2015	2016	2017	2018	2019	2020	2021	2022
Conservative - Stochastic	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%
Moderate - Stochastic	7.4%	7.4%	7.3%	7.3%	7.4%	7.4%	7.3%	7.3%	7.3%
Aggressive - Stochastic	10.0%	10.1%	10.0%	10.0%	10.1%	10.1%	10.1%	10.1%	10.0%

Scheme 2



Asset Allocation	2014	2015	2016	2017	2018	2019	2020	2021	2022
Conservative - Stochastic	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%
Moderate - Stochastic	7.4%	7.3%	7.4%	7.3%	7.3%	7.3%	7.3%	7.3%	7.4%
Aggressive - Stochastic	10.1%	10.1%	10.0%	10.1%	10.1%	10.0%	10.1%	10.1%	10.1%

Scheme 3



Asset Allocation	2014	2015	2016	2017	2018	2019	2020	2021	2022
Conservative - Stochastic	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%	4.1%
Moderate - Stochastic	7.4%	7.3%	7.3%	7.3%	7.3%	7.3%	7.3%	7.3%	7.3%
Aggressive - Stochastic	10.1%	10.0%	10.1%	10.0%	10.0%	10.1%	10.0%	9.9%	9.9%

When is an assessment of the strategic asset allocation required?

- The appropriateness of the strategic asset allocation should be reviewed continuously – at least as frequently as the characteristics of the liabilities change
- Factors affecting characteristics of liabilities
 - Change in membership base
 - Change in risk profile
 - Membership growth or losses
 - Change in benefit structure – mix of benefits between in and out of hospital
 - Surplus generated from contributions
 - Solvency ratio deviates from CMS minimum and Scheme's target
 - Change in regulation/legislation

Conclusion

- As healthcare actuaries, should we be providing investment advice to our schemes?
- Asset consultants generally more focused on pension fund investments
- Should the focus shift from annual solvency monitoring to a more longer term approach?
- Quantitative ALM can assess all risks to mitigate or eliminate adverse outcomes
- Quantitative ALM can also determine appropriate asset mix

Acknowledgements

- CMS Annual Reports 2004-2013
- Scheme Annual Financial Statements – 2013
- Investment Solutions
- Alexander Forbes Asset Consultants

QUESTIONS?