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Periodical Payment Orders: Case for a Risk Pooling ?

GIRO PPO Working Party

Market Solutions work-stream

Frank Chacko – British Gas Insurance

Miriam Lo – Marcuson Consulting Ltd

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Agenda

1. Background: Pooling PPO risks
2. Pooling PPOs – a simple model
3. Investment Strategy – Alternative Assets
4. Potential Pooling Arrangements
5. Conclusion and Next Steps
6. Discussion



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1. Background – Risk Pooling

- PPO – a brief recap
- Is there appetite for PPO risk transfer?
- Possible risk transfer solutions
- Why pool risks?

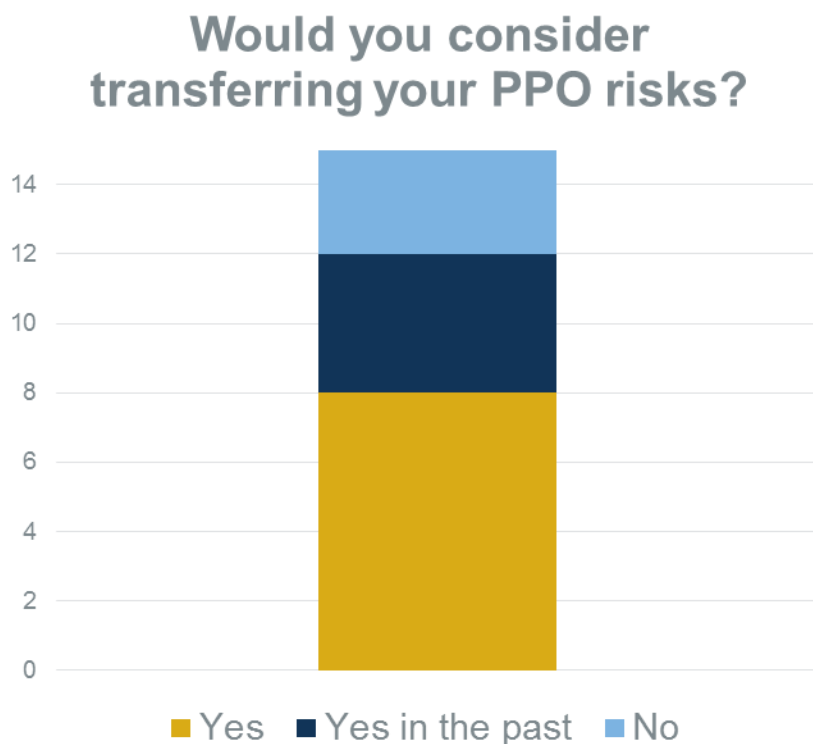
PPO – a brief recap

- Different **risks** from typical motor/liability insurance:
 - Mortality
 - Care-workers' earnings
- Longer **duration** than GI, resulting in different:
 - Investment
 - Administration
- No **matching** assets



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Is there appetite for PPO risk transfer?



- 2014 GIRO PPO Working Party Qualitative Survey results.
- **Cost** quoted as the key hurdle in constructing a transaction.



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Reinsurance availability

Changes in Reinsurance offerings due to PPOs	Number of Reinsurers
No longer write Motor RI business	1
Significantly reduced XoL Motor writing	1
No longer write uncapped XoL Motor	1
Capitalisation clauses apply to:	
• All PPO business	1
• 50% PPO business	2
Total number of reinsurers surveyed	4

Source: 2015 PPO Working Party Qualitative Survey



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So Why Pool Risks?

- **CAPITALISATION** (lump sum in lieu of future payments)
 - so no exit, **long tail risk reverts to the insurer**
- Risk is long term, substantial, un-hedgeable – suggests alternatives need to be explored
- Risk pooling – is there a case for grouping of separate firms' PPOs ? How will it help ?





2. Pooling PPOs – a Simple Model

- Model outline
- Diversification benefit
- Model sensitivities
- Interpretation of Results

Model Outline – Overall

A simulation model is built in R to quantify financial benefits of pooling.

For simplicity, the following is modelled:

- Settled PPOs only
- FGU losses (ie no RI)
- Assume investment in risk-free assets
- Ultimate time horizon

Charts/ figures are meant for illustrative purposes only.



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Model Outline – Structure

1. Claimant details

Age

Sex

Mortality impairment

Annual PPO amount



2. Simulate unindexed cashflows

Individual mortality
mis-estimation

Systemic medical
improvement

Population mortality
improvement

Individuals' deaths



3. Simulate indexed, discounted cashflows

RPI

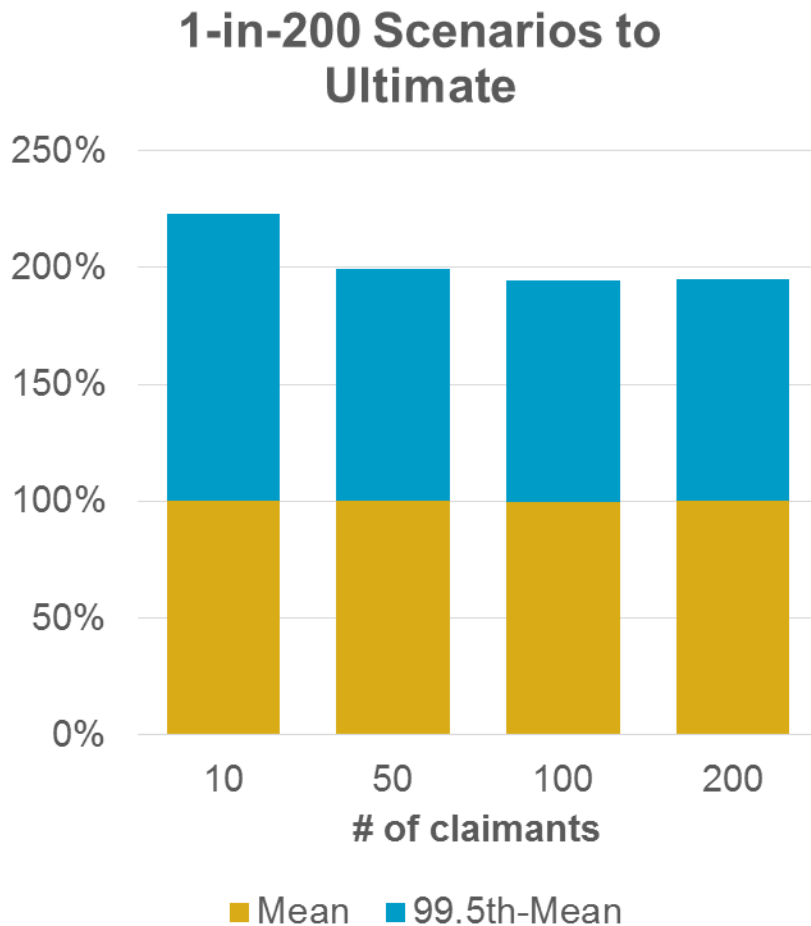
ASHE-RPI differential

Risk free yield curve



4. Aggregate discounted liabilities

Diversification Benefits



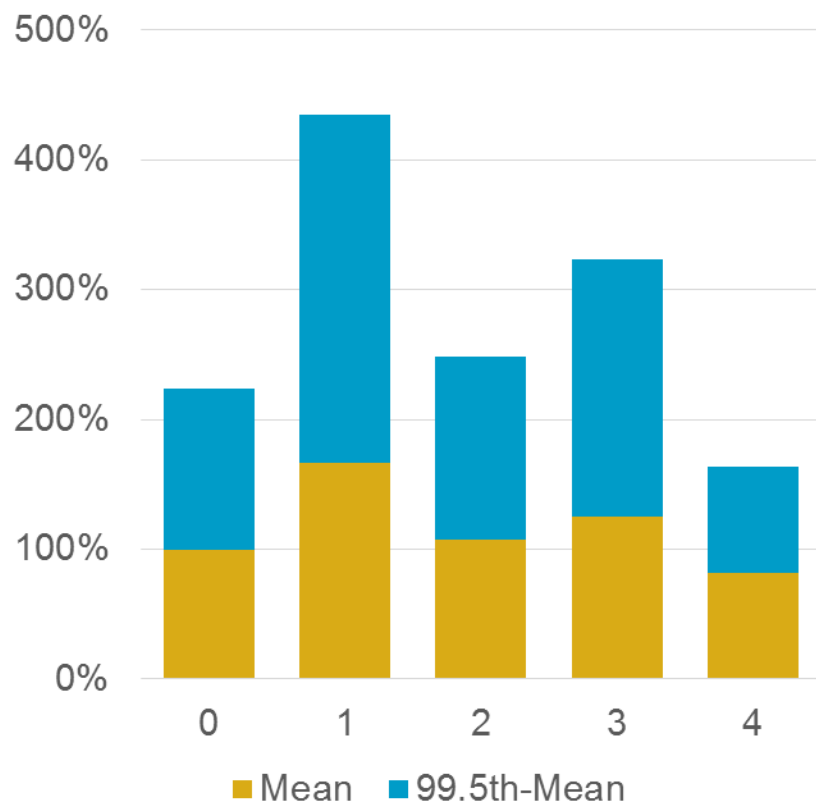
- Some diversification benefits from 10 to 50 claimants
- Very little diversification above 50 claimants
- Diversification limited by systemic drivers:
 - Medical improvements
 - Population mortality improvements
 - ASHE indexation
 - Discounting



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Sensitivity: Mortality and ASHE

Sensitivity results - 10 claimants



#	Description	Base	Change
0	Baseline	-	-
1	Mortality impairment load	Average 4.7x	1.0x
2	Population mortality improvement long-term rate	1.5% pa	2.5% pa
3	ASHE-RPI differential	0.5% pa	1.5% pa
4	Discount rate	Gilt	Gilt + 1% pa



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Interpretation of Results

- Pooling PPOs have some diversification benefits, but not significant
 - Little benefit for over 50 claimants
 - Small compared to uncertainty of other assumptions
- Key sensitivities include:
 - ASHE
 - Mortality impairment load
 - Discount rate/ investment return





3. Investment Strategy – Alternative Assets

- Infrastructure Assets: Background
- Infrastructure Assets: Some Examples
- ALM Illustration

Infrastructure Assets: Introduction

- New Infrastructure asset class under Solvency II
- Mostly long term and biased towards annuities
- Possible categories
 - Infrastructure debt
 - Real estate backed debt



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Infrastructure Assets: Some Examples

- Examples from IFoA WP paper ‘Non-traditional investments - key considerations for insurers Jan 2015’:
 - Date :July 13
 - Deal: Holyrood Student Accommodation PLC
 - Type: student accommodation, senior secured fixed-rate tranche and senior secured RPI-linked tranche of bonds, both due 2048,
 - Size: £63,000,000
 - Coupon: Fixed 5.5% & IL linked 2%
 - Fully amortising
 - Rating at issue: S&P AA, Moody’s A2
- Infrastructure loans: to date, default and the recovery rates on default much better (especially PFI/PPP) than corporate bonds.



ALM Illustration – Overview

- Simple model to illustrate impact of alternative investment strategy on VaR
 - 1-in-200 over ultimate horizon
 - Cashflow basis
 - Regulatory aspects not considered
- Liability cashflows from Baseline run for 50 claimants
- Infrastructure asset default probabilities extrapolated from 2014 S&P Global Corporate Default Study

Charts/ figures are meant for illustrative purposes only



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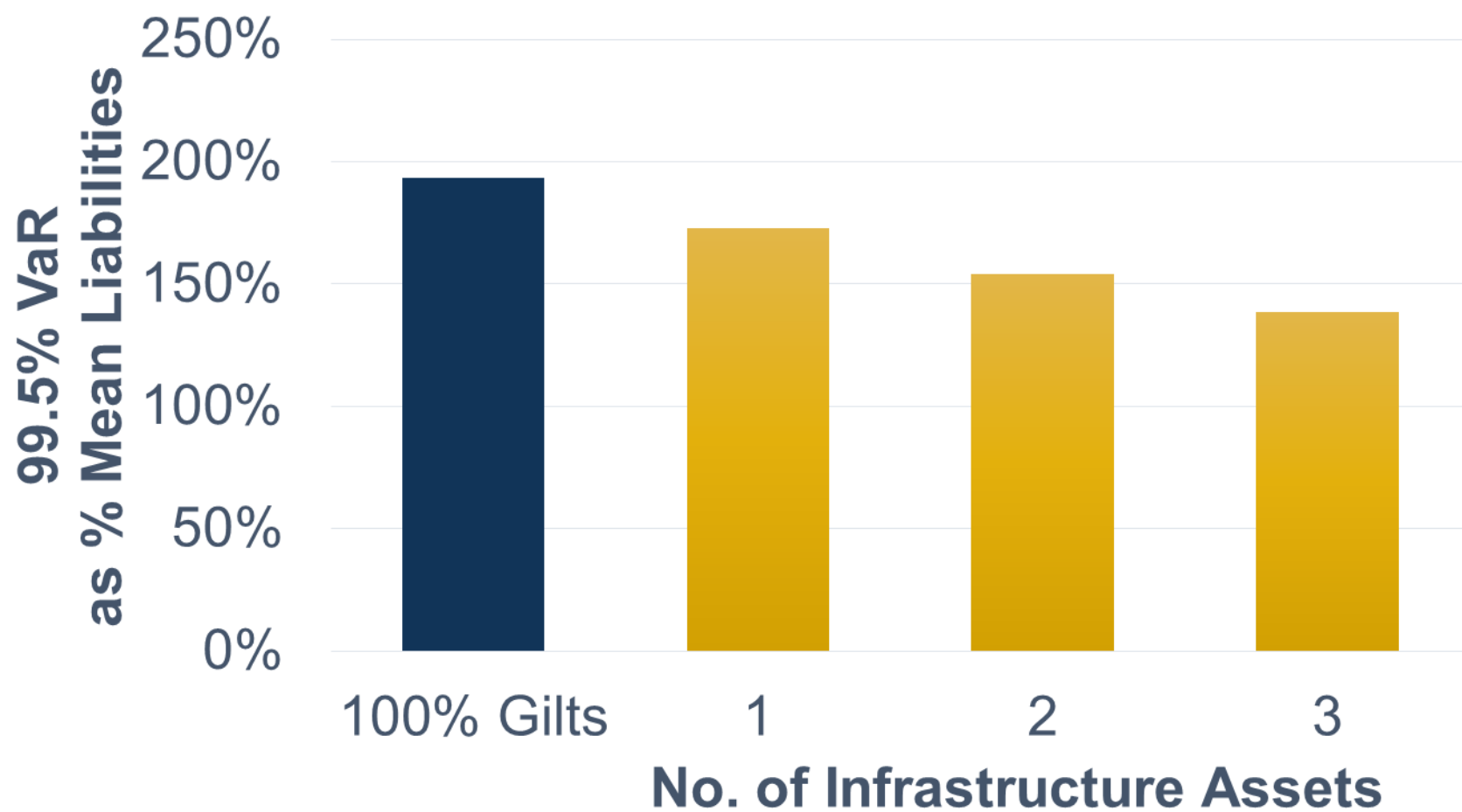
ALM Illustration – Asset Allocation

- Assets all invested in gilts and/ or infrastructure assets
 - Simple cashflow model – insolvent if assets do not meet payments;
 - Gilts assumed to be risk-free and liquid
 - All coupons and loan amortisation reinvested in gilts
 - Up to 3 infrastructure assets are invested in the scenarios
 - Infrastructure example from 2013

Infrastructure asset features	Baseline	Sensitivity 1	Sensitivity 2
Value as % Mean Liabilities	1/3rd	1/3rd	1/3rd
Amortised?	Yes	Yes	Yes
Rating	AA	BBB	AA
IL: Fixed yield	50:50	50:50	50:50
IL yield	RPI + 2%	RPI + 2%	RPI + 1%
Fixed yield	5.5%	5.5%	5.5%
Term	35	35	35

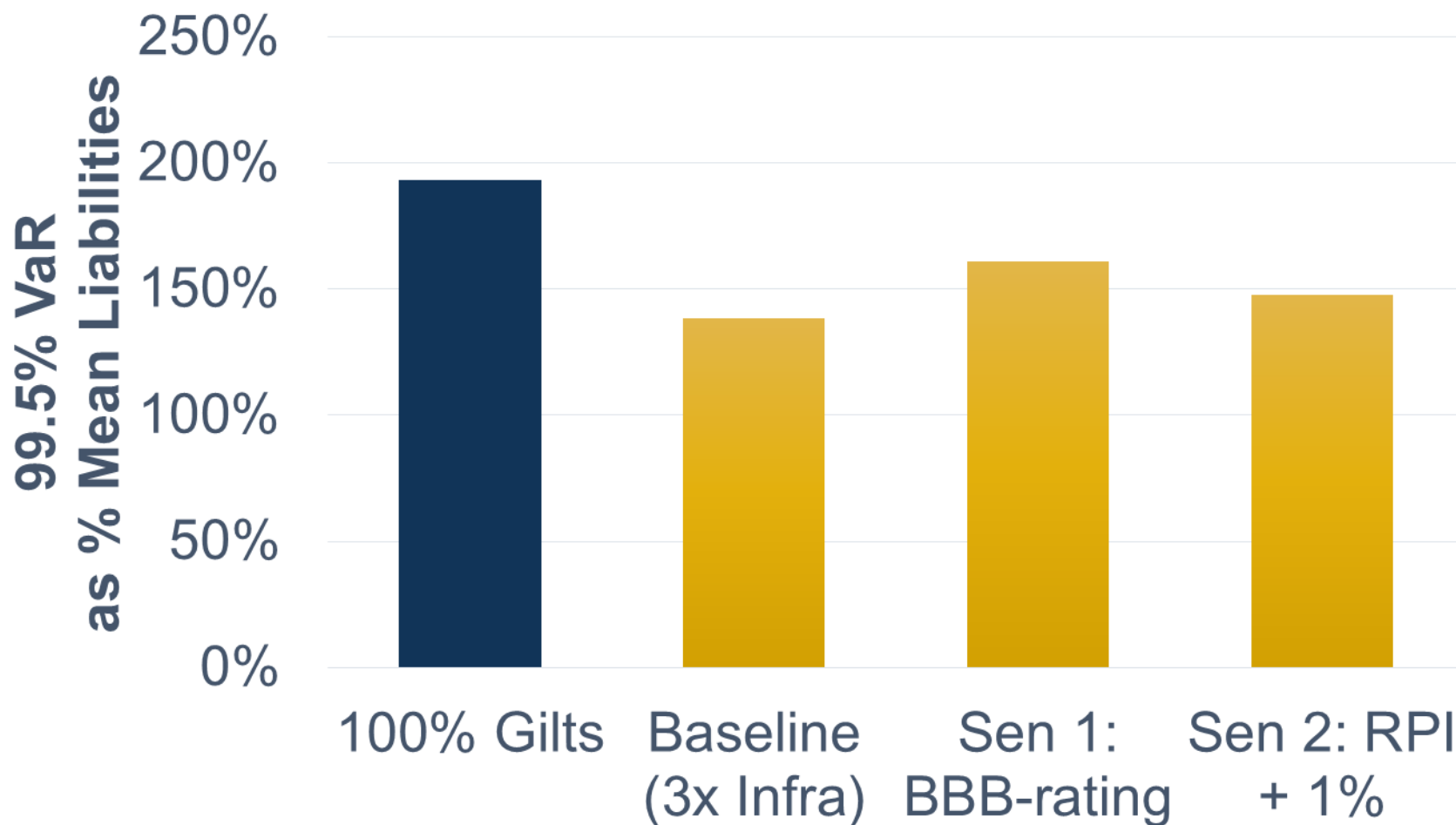
Effect of Infrastructure Investments

Baseline Illustration



Effect of Infrastructure Investments

Sensitivities (3 infrastructure units case)



Alternative Assets: Initial Findings

- Results indicate drop in VaR for PPOs when invested in investment-grade infrastructure assets
 - Increase in default risk more than offset by higher than expected investment return than gilts
 - Some inflation matching offered by some assets
- Infrastructure assets are illiquid and sold in large blocks
 - Need fund of certain size to invest
 - Time and expertise for identifying and managing investments
- **Economy of scale needed to benefit from infrastructure and other alternative assets**



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4. Potential Pooling Arrangements

- Operational features
- Outline structures

Pooling arrangements: operational considerations

- Criteria for entry – all PPO firms' cases to be in Pool
- Pricing basis – objective, eg set by Pool
- Investment policy
- Profit/shortfall
 - Tracking facility for each firm of cumulative P&L
 - Regular reporting
 - Analysis of surplus (mortality, investment, expenses etc)



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Pooling arrangement: general considerations

- Profit/Shortfall monitoring enables
 - Withdrawal terms
 - Wind up terms
- Rules for Deficit contribution/ apportionment
- **Prevent adverse selection/cross-subsidization**



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Pooling – outline solutions

(A) PPO Purchasing Facility

- Selective entry
- Firms pay Facility premium who pay PPO
- Shortfall/surplus can be called/returned

(B) Captive

- Selective entry
- Owned by Insureds
- Need start up capital
- Could register in tax/capital efficient countries



Pooling – summary

Advantages:

- Take advantage of better matching/alternative asset classes
- Benefit from diversification
- Benefit from economy of scale

Disadvantages:

- Start up costs/initial capital
- Risks of anti-selection



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5. Conclusions and Next Steps

Pooling risks worth further investigation, but also more work

- Sounding out of insurer interest
- More detailed ALM
- Drawing lessons from other pooling arrangements



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6. Discussion



Comments

Expressions of individual views by members of the Institute and Faculty of Actuaries and its staff are encouraged.

The views expressed in this presentation are those of the presenter.



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References

#	Author (Year)	Name of Publication	Link
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