Combining actuarial theory and practice with state of the art IT

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Two major issues in insurance and pensions

- Reserving
  - The Major challenge in Solvency II
- Pensions
  - Transparent, efficient and cost effective pensions
The role of academics

- **Solutions**
  - Find solutions of linear complexity of complex problems
- **Listen**
  - Make sure you understand the problem
The role of the industry

- Implementation
  - Implement within six months
- The knowledge loop
  - Reformulate problem to academics after implementation
First case study: pensions
The primary driving forces

• Low cost
• Flexibility
• Transparency
The moneyflow

Contributions:
- premiums
- deposits (member)
- deposits (new member)
- transfers (§41)

Outgoing payments:
- annuities
- lump sum benefits
- transfers (§41)

Optimal/Actual risk profile
- Convergence principle

Assettype distribution
- stocks + 200,000
- long bonds + 300,000
- short bonds + 0

Further asset distribution
- Nikkei 225 (+100,000)
- MSCI
- FTSE 100 (+100,000)
- S&P 500
- Other

Finanstilsynet, marts 2011
System overview

Optimal customer distribution of different assettypes

Age-controlled: Lifecycle

Optimal assettype distribution of different assets

Frequent changes: Actively managed

Customer Account
Customer Account
Customer Account
Customer Account
Customer Account

Assettype Account
Assettype Account
Assettype Account
Assettype Account
Assettype Account

Asset
Asset
Asset
Asset
Asset
Asset
Asset
Asset
Asset

Index tracker

Asset
Asset
Asset
Asset
Asset

Age-controlled:
Lifecycle

Frequent changes:
Actively managed
Unit link

Optimal distribution of different asset types: The customer chooses (100 %)
Individual trades

Optimal assettype (100 %)

Individual depot

Optimal asset distribution controlled by customer

Index tracker
With profit

Optimal asset type (100 %)

Investment controlled by company

Common portfolio

Index tracker
IT of linear complexity: all products included!
So, for the individual pension saver the system can be

- Collectively or individually based
- Unit linked or not
- With profit or not
- Rebalancing or not
- Live cycle based or not
- Aware of the savers current financial situation or not
- Actively or passively managed or both
- Algorithmically market timing based or not

Or any combination of the above at only minimal cost
And fully transparent
IT of linear complexity in reserving: all approaches included!

- Bootstrap
- Interactive web
- Single triangle approach
- Innovative kernel
- Including covariate information and expert opinion
- Granular approach
- Double triangle approach