SOA Antitrust Compliance Guidelines

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The United States antitrust laws aim to protect consumers by preserving the free economy and prohibiting anti-competitive business practices; they promote competition. There are both state and federal antitrust laws, although state antitrust laws closely follow federal law. The Sherman Act, is the primary U.S. antitrust law pertaining to association activities. The Sherman Act prohibits every contract, combination or conspiracy that places an unreasonable restraint on trade. There are, however, some activities that are illegal under all circumstances, such as price fixing, market allocation and collusive bidding.

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Table of Contents / Agenda

- Fundamentals of Reinsurance
- Kinds of Reinsurance
- Reinsurance Treaties
- Reinsurance Regulation
- US Life Reinsurance Market
- Questions
ASK!
Fundamentals of Reinsurance
What is Reinsurance?

• SSAP 61 ¶2 definition is a good one

"Reinsurance is an agreement by which a reporting entity transfers all or part of its risk under a contract to another reporting entity. The entity that issued the policy is called the primary insurer, direct writer, or ceding entity, and the entity to which the risk is transferred is called the reinsurer or assuming entity. The process of transferring the risk from the ceding entity to the reinsurer is known as a cession."
Fundamentals

Why reinsurance?

• Risk transfer
• Volatility management
• Capital management, such as new business financing
• Technical assistance
Kinds of Reinsurance
Kinds of Reinsurance

Coinsurance: Think "Partnership"

- Reinsurance coverage ceded to the reinsurer on an individual policy is in the same form as that of the policy issued to the policyholder.
- “Same form” means that the ceding company and reinsurer are exposed to the same risks. They are essentially sharing responsibility for insuring the policy, hence the name co-insurance.
- Since the cedant generally continues to administer the policy, the reinsurer will allocate a portion of the premium to return to the cedant to cover a portion of these administration expenses.
- In addition to covering administration expenses, the reinsurer will also return a portion of the premium to the cedant to cover agent commissions and underwriting expenses.
- The absolute level of this expense allowance can vary from reinsurer to reinsurer.
- The larger the expense allowance, the more attractive the reinsurance to the cedant.
Kinds of Reinsurance

Yearly renewable term (YRT)

- Reinsurance coverage for which the premium rates are not directly related to the premium rates of the original plan of insurance
- YRT is generally thought of as “mortality only” reinsurance and is one of the cheapest forms of mortality risk transfer
- The premium rates are typically set as a percentage of a mortality table and are multiplied by the Net Amount at Risk (NAAR)
- NAAR is defined as the excess of the death benefit of a policy over the policy reserve or cash value
- Since mortality rates generally increase each year, the premium rates per $1,000 will be increasing
- There is generally not an expense allowance
Kinds of Reinsurance

YRT (continued)

- Can easily be utilized for any type of life contract
- Actual rates charged to the cedant are only guaranteed for one year, and the reinsurer has the right to increase rates
- YRT frequently has zero-first year premium
  - This helps cedants recover a portion of first-year acquisition costs
  - Exposes reinsurer to lapse risk
Kinds of Reinsurance

Other

• Stop-Loss
• Catastrophe
Ways of Apportioning Risk

Between cedant and reinsurer

- Excess of retention
- First dollar quota share
- Combination of the two

Among reinsurers

- Percentages
- Layers
- Alphabet split
Kinds of Reinsurance

Auto vs. Fac

• Automatic: inside the box
  • Cedant does the underwriting

• Facultative: all other
  • Reinsurer does the underwriting
Reinsurance Treaties
Treaty Provisions: Automatic Reinsurance Requirements

- Normal underwriting standards
- Age and rating ranges
- Retention limit
- Automatic binding limit
- Jumbo limit
- Other: US citizen; no prior fac; etc.

These can be viewed as conditions precedent to reinsurance coverage.
Treaty Provisions: Facultative Reinsurance

Cedant sends underwriting papers to reinsurer

Reinsurer underwrites; may make offer

Reinsurer must make an offer and cedant must accept for reinsurance to occur
  • Standard principles of contract law
  • Cedant must notify reinsurer of acceptance – variety of ways to do so
  • Facultative not covered by errors and omissions provision (see below)

Reasons for facultative submissions
  • Cases outside normal limits
  • Underwriting opinion from reinsurer desired
  • Cedant looking for best offer
Treaty Provisions

Premiums

Vast majority of US life reinsurance is self-administered by cedant

- Cedant prepares billings and submits with premium
- Cedant prepares listings of inforce risks
- Cedant prepares listings of transactions affecting reinsurance
- Cedant prepares statutory reserves
- Netting of claims against premium may be permitted

Inspection of Records

Errors and Omissions

Boilerplate

- Offset
- Insolvency
- Entire Agreement
- Arbitration
Reinsurance Regulation
Reserve Credit Security

NAIC Model Act/Reg on Credit for Reinsurance

• Establishes conditions that a reinsurer must meet in order for a domestic ceding company to take credit for reinsurance, either as an asset or as a reduction in liability for reinsurance ceded (“reserve credit”)

• Credit is allowed under the following conditions:
  • Reinsurer is licensed in the state
  • Reinsurer is accredited as a reinsurer in the state
  • Reinsurer posts collateral of some kind
    • Certified reinsurer status affects *amount* of collateral
Risk Transfer

Life & Health Reinsurance Agreements Regulation: the 10 Commandments

I. Adequate renewal allowances
II. Cedant cannot be deprived of surplus or assets
III. No reimbursement of losses
IV. No auto termination or recapture
V. No payments from outside the business reinsured
VI. Must transfer all significant risk
VII. Must participate in underlying asset risk
VIII. Settlements at least quarterly
IX. No warranties outside the business reinsured
X. No warranties about future performance
US Life Reinsurance Market
US Ordinary Life NB Cession Rates (recurring)

Note: Cession rates on new recurring ordinary life business

Source: Munich Re/SOA “2018 Life Reinsurance Survey Results”
Reinsurance Market: Cession Rate

Source: Munich Re/SOA “2018 Life Reinsurance Survey Results”
Reinsurance Market: Cession Rate

Market Ups & Downs

Source: Munich Re/SOA "2018 Life Reinsurance Survey Results"
Reinsurance Market: Cession Rate

Source: Munich Re/SOA "2018 Life Reinsurance Survey Results"
Reinsurance Market: Cession Rate

Source: Munich Re/SOA "2018 Life Reinsurance Survey Results"
# US Life Reinsurers

## 2018 Recurring New Business

<table>
<thead>
<tr>
<th>Reinsurer</th>
<th>Volume $M</th>
<th>Share</th>
<th>Change from 2018</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCOR Global Life</td>
<td>114,653</td>
<td>22.6%</td>
<td>+1.6%</td>
</tr>
<tr>
<td>RGA Re</td>
<td>94,151</td>
<td>18.6%</td>
<td>+0.8%</td>
</tr>
<tr>
<td>Swiss Re</td>
<td>93,730</td>
<td>18.5%</td>
<td>-0.7%</td>
</tr>
<tr>
<td>Munich Re (US)</td>
<td>93,015</td>
<td>18.4%</td>
<td>-0.2%</td>
</tr>
<tr>
<td>Hannover Life Re</td>
<td>56,300</td>
<td>11.1%</td>
<td>-2.1%</td>
</tr>
<tr>
<td>Canada Life Re</td>
<td>19,567</td>
<td>3.9%</td>
<td>Unch</td>
</tr>
<tr>
<td>Partner Re</td>
<td>13,644</td>
<td>2.7%</td>
<td>+0.4%</td>
</tr>
<tr>
<td>All Other</td>
<td>21,265</td>
<td>4.2%</td>
<td>+0.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>506,325</strong></td>
<td><strong>100.0%</strong></td>
<td><strong>+1.6%</strong></td>
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Source: Munich Re/SOA “2018 Life Reinsurance Survey Results”
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Source: Munich Re/SOA “2018 Life Reinsurance Survey Results”
US Life Reinsurers

• Two-tiered market by NB and IF
• Not much change in top tier for several years
• Bottom tier is a mixed group
• Different line-ups for other product lines
  • Group Life
  • Group LTD
  • Individual Disability Income
  • Long Term Care
  • Remote risk/structured solutions
Questions
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Regulatory Reforms

Key Regulations and Potential Reforms

1. Credit for Reinsurance: certified reinsurers and reciprocal jurisdictions
2. Reserve credit for YRT reinsurance under PBR
3. New York Regulation 210
4. Potential changes to the risk transfer regulation (aka L&H Reinsurance Agreements reg)
5. RBC longevity charge
6. Potential changes to RBC equity charges
7. Variances in permitted practices by state regulatory departments
2019 Reinsurance Seminar

Jason Kao
The Pension Risk Transfer-mation: Market Overview and Intro to Reinsurance
September 24, 2019
PRT Reinsurance Overview

Quota-share reinsurance can provide accretive pricing and improve competitiveness in PRT auctions. It also provides capital relief and longevity risk reduction given it is a full risk transfer solution.

Example:

- Cedant and Reinsurer enter into a simple coinsurance transaction for [50]% of the block.
- Cedant will continue to issue the GAC and retain responsibility for 100% of the servicing of the business.
- Reinsurer will pay its quota-share of all liability outflows and expenses.
The “Case” for PRT Reinsurance

Quota-share reinsurance can provide accretive pricing and improve competitiveness in PRT auctions, where the difference between 1st and 2nd place can be as tight as 0.25% or 0.5% premium.

Example:

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Premium for 100%</td>
<td>$300</td>
</tr>
<tr>
<td>Primary Writer Premium for 50%</td>
<td>$150</td>
</tr>
<tr>
<td>Reinsurer Premium for 50%</td>
<td>$144</td>
</tr>
<tr>
<td><strong>Total Premium w/ Reinsurance</strong></td>
<td><strong>$294</strong></td>
</tr>
<tr>
<td><strong>$ Improvement</strong></td>
<td><strong>$6</strong></td>
</tr>
<tr>
<td>% Improvement on 100% of Deal</td>
<td>2.0%</td>
</tr>
<tr>
<td>% Improvement on 50% of Deal</td>
<td>4.0%</td>
</tr>
</tbody>
</table>

Other benefits to the primary writer include:

- **Laying off risk** e.g. longevity risk, deferred lives, asset risk
- **Consuming less capital**
- **Exchanging views on underwriting**
## Reinsurance of PRT vs. Typical Inforce Blocks

<table>
<thead>
<tr>
<th>Diligence Timing</th>
<th>PRT Cases</th>
<th>Typical Inforce Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2 – 3 weeks per case</td>
<td>3 - 6 months, or more</td>
</tr>
<tr>
<td></td>
<td>Added to single reinsurance / trust agreement</td>
<td>Reinsurance and trust agreements negotiated for individual transactions</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Process</th>
<th>PRT Cases</th>
<th>Typical Inforce Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Typically an auction process led by brokers/intermediaries</td>
<td>Can be auction or bi-lateral / direct</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Availability of Data</th>
<th>PRT Cases</th>
<th>Typical Inforce Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Census file (i.e. seriatim file)</td>
<td>Seriatim data</td>
</tr>
<tr>
<td></td>
<td>MED file (i.e. transaction data) sometimes available, but not always</td>
<td>Policy forms</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Asset Transfer</th>
<th>PRT Cases</th>
<th>Typical Inforce Blocks</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cash</td>
<td>Typically assets-in-kind</td>
</tr>
<tr>
<td></td>
<td>Assets-in-kind</td>
<td></td>
</tr>
</tbody>
</table>
The reinsurer holds assets backing the block in a comfort trust for the benefit of the Ceding Company.

1. **Initial Asset Transfer**
   - Ceding Company transfers assets to the reinsurer
   - Assets are transferred to the trustee that maintains the trust account

2. **Additional Assets, i.e., Overcollateralization (“OC”)**
   - Reinsurer deposits additional assets from its surplus into the trust as overcollateralization

3. **Ongoing Maintenance of Trust**
   - On an ongoing basis, the reinsurer maintains a minimum trust balance e.g. Reserves + [x]% OC

4. **Security Interest in Trust**
   - (Ceding Company is named beneficiary)
   - Ceding Company can draw on trust assets if reinsurer does not fulfill its obligations

**Description**

- **Ceding Company** transfers assets to the reinsurer
- Assets are transferred to the trustee that maintains the trust account
- Reinsurer deposits additional assets from its surplus into the trust as overcollateralization
- On an ongoing basis, the reinsurer maintains a minimum trust balance e.g. Reserves + [x]% OC
- Ceding Company can draw on trust assets if reinsurer does not fulfill its obligations
In order to provide risk mitigation to the Cedant, the Reinsurer may agree to a set of investment guidelines that govern the assets held in the trust account.

### Investment Guidelines

#### Examples of Investment Limits

<table>
<thead>
<tr>
<th>Category</th>
<th>Limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Credit Quality</strong></td>
<td>- Maximum allocation to non-investment grade securities</td>
</tr>
<tr>
<td></td>
<td>- Maximum WARF (Weighted Average Rating Factor) score</td>
</tr>
<tr>
<td><strong>Asset Classes</strong></td>
<td>- Maximum allocation to equity, EM, alternatives, structured products, etc.</td>
</tr>
<tr>
<td></td>
<td>- List of prohibited asset classes</td>
</tr>
<tr>
<td><strong>Duration</strong></td>
<td>- Cap on asset-liability duration mismatch</td>
</tr>
<tr>
<td><strong>Concentration</strong></td>
<td>- Maximum allocation to single issuers or industries</td>
</tr>
</tbody>
</table>
The Ceding Company typically has the right to recapture the block under certain conditions, such as:

1. Reinsurer fails to pay its share of liability cash flows
2. Cedant is not able to receive credit for reinsurance
3. Reinsurer fails to maintain the minimum asset balance in the trust account
4. Breach of material terms of contract e.g. investment guidelines
5. Reinsurer enters into insolvency or bankruptcy proceedings, or is placed into receivership
Defined Benefit Plans Are Diminishing¹

Private-sector DB Plan Assets - $3.2 Trillion²

¹ PBGC Insured Plans Single-Employer Program sourced from PBGC 2016 Pension Insurance Data Tables. 2015 figures are most recent available estimates.

Historical Group Annuity Sales Volume
Insurer Sales – Single Premium Products ($ Billions)

1 For 15 years between 1990 and 2004, sales were between $1B and $3B.

Annuity Buyout Providers¹

¹ Insurers shown on this page are currently active in the US PRT market.
Pension Risk Transfer Market Entry – Required Capabilities

1. Financial Strength:
   a) Meet standards of Department of Labor Interpretive Bulletin 95-1.
   b) 95-1 is minimum guidance. Plan fiduciaries are responsible for the choice of insurer and could use more criteria than just 95-1 guidance.

2. Investment Capabilities:
   a) Ability to manage long duration liabilities.
   b) Expertise in long duration fixed income investments and possibly alternative investments.

3. Risk Assessment:
   a) Underwriting judgment to evaluate unique risk characteristics regarding mortality, participant options, and all plan benefits.

4. Administrative and Operational Capabilities:
   a) Operational elements in place to administer the business efficiently and accurately.
   b) Administration quality also has relevance to DOL IB 95-1.
## PRT Insurer Competitive Landscape

<table>
<thead>
<tr>
<th>Provider</th>
<th>Small (&lt;$100M)</th>
<th>Mid ($100M-$500M)</th>
<th>Large (&gt;=$500M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prudential</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>MetLife</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>New York Life</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>AIG</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>MassMutual</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Principal</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Pacific Life</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Athene</td>
<td></td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Securian</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Western &amp; Southern</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Great American</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>OneAmerica</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mutual of Omaha</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mutual of America</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CUNA Mutual</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Legal &amp; General</td>
<td>✓</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes: (1) Providers ordered by size of US Life Insurance Group Assets; (2) The size breakpoints above are general guidelines. Each PRT insurer has minimum and maximum cases sizes that they will bid on. For example, an insurer with a check in the small category above may have a minimum case size of $5 million. Another one might have a minimum case size of $50 million. Most insurers do not disclose a maximum case size.
Reinsurance Market Development

Key Considerations

• The US is a strategic priority for many reinsurers. Key to success include:
  1. Strength of capital
  2. Size of company
  3. Credit ratings
  4. Jurisdiction of domicile of reinsurer
  5. Ability/interest in expertise and knowledge sharing

• As PRT direct writers continue to write business, we expect increasing interest in longevity reinsurance to balance their mortality/longevity books.

• Creditworthiness of the reinsurers looking to provide capacity will be a front and center issue.

• Reinsurers (and new fronting insurers) that are willing to offer capacity for deferred lives will have an advantage.
Reinsurance Market Development

Traditional reinsurers are considering entry into the market in two ways:

1. Reinsurance of Inforce Business
   - Structures primarily include coinsurance and longevity only reinsurance.
   - In coinsurance, the reinsurer shares in all of the risks (longevity, investment, etc.) with the ceding company.
   - Longevity only reinsurance
     - Not contemplated when reinsurance risk transfer requirements were developed by the NAIC and FASB.
     - Need to request a statutory accounting permitted practice, but there is no guarantee that the ceding company’s regulator will approve such practice.
   - Increased demand for reinsurance in the future
     - Growth of longevity-based products may encourage companies to reinsure PRT transactions to balance insurance (mortality/longevity) risk profile.
     - Upcoming longevity charge for risk-based capital may also cause ceding companies to consider some form of reinsurance.
Reinsurance Market Development

Traditional reinsurers are considering entry into the market in two ways:

2. Partnering with Direct Writers

• There is growing interest from both reinsurers and ceding companies in these partnerships as larger pension risk transfer cases are placed.
• There are few carriers willing to participate in the $500 million+ sector due to the size of these transactions relative to the overall size of their PRT business.
• Leveraging reinsurers’ capacity, investment expertise, and capital/tax advantages may allow ceding companies to participate in and be more competitive on larger cases where they cannot today on a standalone basis.
• Coordinating and preparing a combined bid on a timely basis could be a challenge.
• Ensuring that ceding company has appropriate security for its reinsurance counterparty exposure (through a trust or some other means) is also important.

¹ Reinsurers (when partnering with direct writers on new business opportunities) could also be subject to DOL IB 95-1.
Inaugural PRT Longevity Reinsurance Transaction

Deal Highlights

• The first of its kind longevity reinsurance transaction in the US was completed during the first half of 2019.

• The transaction was executed on ceding company’s inforce PRT business, covering a portion of its in-payment participants with ~$1 billion in statutory reserves.

• The ceding company had four objectives:
  1. Capacity to write more business in consideration of the balance of its risks between mortality and longevity risk;
  2. Protection against future mortality improvements being better than their expectations;
  3. An external validation of their internal view on longevity; and
  4. Receiving reserve and capital relief consistent with traditional reinsurance transactions.

• These objectives were achieved.
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Agenda

- Asset Intensive Products
- Market Drivers and rationale for Asset Intensive reinsurance
- Dynamics of the reinsurance market
- Reinsurance process
- Types of Annuity Reinsurance structures
- Challenges and considerations with Asset-intensive reinsurance
- Questions/next steps
Asset Intensive Products
What are Asset Intensive products?

- Annuity reinsurance is really the ultimate form of Asset Intensive (“A-I”) reinsurance, i.e. reinsurance of liabilities that are heavily weighted on asset/interest rate risk.

- Forms of reinsurance can be developed on the Asset Only component of these types of liabilities:
  - ISWL
  - Universal Life
  - Payout Annuities
  - Indexed Annuities
  - Structured Settlements
  - Disabled Life Reserves
  - Whole Life
  - Long Term Care

- Full Risk-transfer solutions would need to deal with all risks, and the investment risk would be just one aspect of all of these products.

- Separate account products (VA, VUL) would not be considered in this category, as those “assets” are policyholder related.

- Pension Risk Transfer (PRT) is the newest category of A-I Reinsurance.
Market Drivers and rationale for Asset Intensive reinsurance
Market drivers for A-I Reinsurance transactions

**Improved capital position**
- Unlock trapped value in the business
- Release required capital associated with the block

**Low interest rate environment continues to pressure life and annuity writers**
- Spread compression on general account assets
- Pressure on credited interest rates and profit margins
- Reluctance of companies to invest more capital

**Improve return on capital for overall block**
- Remove low return business to result in better overall returns

**De-risk portfolio to improve ERM metrics**

**Improve profitability or marketability of new business**
- Reinsurers can provide extra yield on investments
Closed Block transaction market – North America

Major transaction themes:

- New Capital continues to enter market
- Asset Accumulators dominate
  - Most activity has been focused on asset-intensive liabilities
- Difficult products continue to be evaluated:
  - including variable annuities, universal life with secondary guarantee, long term care and other highly complex products
  - Reinsurers and capital markets continue to explore creative solutions
- Traditional reinsurers still focused on mortality and not interested in investment risk
Many buyers have appeared, with differing motives
New entrants have created a seller’s market

We can broadly categorize four types of buyers:

- Private Equity/Financial buyers
- Professional consolidators
- Niche Consolidators
- Asian (Chinese/Japanese)

Each has different characteristics.

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Recent large North American annuity reinsurance transactions

Based on publicly available data – over $1b in reserves

<table>
<thead>
<tr>
<th>Ceding Company</th>
<th>Reinsurer</th>
<th>Reserves (billions)</th>
<th>Block Description</th>
<th>Year Closed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Voya</td>
<td>Athene</td>
<td>$19.0</td>
<td>Fixed annuity</td>
<td>2018</td>
</tr>
<tr>
<td>Talcott</td>
<td>Global Atlantic</td>
<td>$9.0</td>
<td>FA, payout, SS</td>
<td>2018</td>
</tr>
<tr>
<td>Manulife</td>
<td>Jackson National</td>
<td>$8.0</td>
<td>US group payout annuities</td>
<td>2018</td>
</tr>
<tr>
<td>Lincoln National</td>
<td>Athene</td>
<td>$7.7</td>
<td>FDA, FIA</td>
<td>2018</td>
</tr>
<tr>
<td>Transamerica/Aegon</td>
<td>Wilton Re</td>
<td>$6.0</td>
<td>Payout annuity</td>
<td>2017</td>
</tr>
<tr>
<td>Symetra</td>
<td>Resolution Life</td>
<td>$5.7</td>
<td>SS, income annuities</td>
<td>2018</td>
</tr>
<tr>
<td>Manulife</td>
<td>RGA</td>
<td>$4.0</td>
<td>Individual payout annuities</td>
<td>2018</td>
</tr>
<tr>
<td>Horace Mann</td>
<td>RGA</td>
<td>$2.9</td>
<td>Fixed Annuity and VA (403b)</td>
<td>2019</td>
</tr>
<tr>
<td>Farmers New World</td>
<td>RGA</td>
<td>$2.3</td>
<td>Fixed Annuity, SS and VA</td>
<td>2017</td>
</tr>
<tr>
<td>Ameriprise</td>
<td>Global Atlantic</td>
<td>$1.7</td>
<td>Fixed Annuity (high GMIR)</td>
<td>2019</td>
</tr>
<tr>
<td>Mutual of Omaha</td>
<td>RGA</td>
<td>$1.1</td>
<td>Fixed Annuity (high GMIR)</td>
<td>2018</td>
</tr>
<tr>
<td>Undisclosed</td>
<td>F&amp;G Re</td>
<td>$0.9</td>
<td>Fixed Annuity</td>
<td>2019</td>
</tr>
</tbody>
</table>

Source: S&P Global Market Intelligence and company press release.

Several fixed annuity blocks with high guarantees have traded with commissions in the range we have seen is between 5 to 10% of reserves.
## Recent North American life reinsurance transactions

Based on publicly available data – Reserve credit taken at EOY

<table>
<thead>
<tr>
<th>Cedant</th>
<th>Reinsurer</th>
<th>Reserves (billions)</th>
<th>Block Description</th>
<th>Transaction Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liberty</td>
<td>Protective</td>
<td>$13.4</td>
<td>Substantially all of the individual life and annuity business</td>
<td>May-18</td>
</tr>
<tr>
<td>Mass Mutual</td>
<td>RGA</td>
<td>$8.1</td>
<td>In-force universal life, variable life and 20-year term life</td>
<td>Dec-17</td>
</tr>
<tr>
<td>Transamerica</td>
<td>Wilton Re</td>
<td>$7.1</td>
<td>Bank owned / corporate owned life insurance business (BOLI/COLI)</td>
<td>Apr-17</td>
</tr>
<tr>
<td>Transamerica</td>
<td>SCOR</td>
<td>$1.7</td>
<td>Other Life</td>
<td>Oct-17</td>
</tr>
<tr>
<td>State Life</td>
<td>London Life</td>
<td>$1.0</td>
<td>Other Life</td>
<td>Oct-17</td>
</tr>
<tr>
<td>Symetra</td>
<td>Wells Fargo</td>
<td>$0.7</td>
<td>AXXX Life</td>
<td>Apr-18</td>
</tr>
<tr>
<td>Delaware Life</td>
<td>Sun Life</td>
<td>$0.7</td>
<td>AXXX Life</td>
<td>Oct-17</td>
</tr>
<tr>
<td>Aetna</td>
<td>Hartford</td>
<td>$0.7</td>
<td>US Group Life and Disability</td>
<td>Nov-17</td>
</tr>
<tr>
<td>National Life</td>
<td>Hannover</td>
<td>$0.7</td>
<td>AXXX, and XXX Life</td>
<td>Dec-17</td>
</tr>
<tr>
<td>Transamerica</td>
<td>SCOR</td>
<td>$0.6</td>
<td>Other Life</td>
<td>Jul-18</td>
</tr>
</tbody>
</table>

2019: Great West and Protective*

- Great-West Life & Annuity Insurance Company has agreed to sell, via reinsurance, substantially all of its individual life insurance and annuity business.
- Protective notes that the transaction price is expected to be roughly $1.2 billion.

*Source: S&P Global Market Intelligence and company press release.
## Reasons for Reinsuring Closed Blocks

<table>
<thead>
<tr>
<th>Reasons</th>
<th>Descriptions</th>
<th>Downstream Impact(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divest Non-Core Business</td>
<td>No appetite for on-going management of non-core business</td>
<td>Focus on growing core business</td>
</tr>
<tr>
<td>Capital Base</td>
<td>Release of EV within closed blocks</td>
<td>More readily support and grow new business for core products</td>
</tr>
<tr>
<td>Diversification</td>
<td>High concentration of risks</td>
<td>Diversify risks to protect balance sheet, in particular during adverse environments</td>
</tr>
<tr>
<td>New Business Competition</td>
<td>Improve competitive position through reinsurer’s expertise</td>
<td>Share in expertise</td>
</tr>
<tr>
<td>Investment Experience</td>
<td>Annuity reinsurers consider investment management one of core strengths</td>
<td>Share in expertise</td>
</tr>
</tbody>
</table>
Dynamics of reinsurance market
Annuity Reinsurance Reserve Credit Taken + Modco Reserve Trend

Combined total ($000s) through 2017

Source: S&P Global Market Intelligence
Various types of Reinsurers

Reinsurance of Asset Intensive business is very different than traditional mortality reinsurance…and the interested parties are different as well.

Types of Reinsurers:

- Established, highly rated, well capitalized
  - Generally, most have pulled back from capital driven reinsurance – but some movement back.

- Newer, annuity focused reinsurance entities
  - Growing – but capital situation is varied
  - Generally bring Investment expertise

- Off-shore vs. On-shore – tax reform and SII impacting this

- Unauthorized vs. Authorized

No less than 30 different companies currently working in the U.S.
Many buyers have appeared, with differing motives

- New entrants have created a seller’s market

We can broadly categorize four types of buyers

- Private Equity/Financial buyers
- Professional consolidators
- Niche Consolidators
- Asian (Chinese/Japanese)

Each has different characteristics
Drivers of growth in A-I Reinsurance

- Diversification – organizations looking to diversify their earnings, and view the “life” market as having stable earnings
- Growth – for most, they are looking for growth in assets under management (AUM) and are willing to be aggressive to see this growth
- Rising rates – even slightly has caused positive movement
- Stable markets – no volatile market disruptions has been favorable to newer entrants
- New Capital sources – looking for ways to deploy capital more quickly than through organic growth
Non-Domestic Reinsurance Amount by Country

- Bermuda
- Cayman Islands
- United Kingdom of Great Britain and Northern Ireland
- Republic of the Marshall Islands
- Barbados
- Turks and Caicos Islands (Amount not available)

Source: S&P Global Market Intelligence

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TO BE UPDATED
Reinsurance market segments to consider

- AM Best rated NAIC Reinsurers: US Statutory accounting and US tax/less flexible investment strategy
- AM Best rated non-NAIC Reinsurers: GAAP accounting, non-NAIC regulations, non-US tax, collateral structure / moderately flexible investment strategy
- Unrated Reinsurers: GAAP accounting, non-NAIC regulations, non-US tax, collateral structure / flexible investment strategy
- Other variations exist – there are no less than a dozen

Reinsurers in each category can be categorized as follows.

- Highest Rated – “A” or better (by A.M.Best)
- Strong Ratings – “A-” or “B++”
- Non Rated – but some with strong experience
- Traditional Reinsurers– some may have interest in A-I Re, but generally not competitive

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Annuity Reinsurance by Type

- Based on Reinsurance Reserve Credit Taken and Modco as of 12/31/2017

**Individual Annuity 74%**
- Individual annuity coinsurance: 43.3%
- Individual annuity coinsurance with funds withheld: 0.1%
- Individual annuity combination coinsurance/modified coinsurance: 9.6%
- Individual annuity guaranteed minimum death benefit: 7.7%
- Individual annuity modified coinsurance: 10.7%
- Individual annuity other reinsurance: 23.5%

**Group Annuity 26%**
- Group annuity coinsurance: 72.0%
- Group annuity coinsurance with funds withheld: 0.0%
- Group annuity combination coinsurance/modified coinsurance: 18.9%
- Group annuity guaranteed minimum death benefit: 4.8%
- Group annuity modified coinsurance: 2.3%
- Group annuity other reinsurance: 2.0%

Source: S&P Global Market Intelligence

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Reinsurance Process
Choosing a suitable partner
Key considerations for reinsurer negotiations

Running a competitive transaction process is most typically the preferred route from the seller’s perspective

If it is decided to go forward with a competitive process, we would recommend including a few of the lesser-rated entities. This will facilitate two benefits:

- Educate on the potential risk mitigants each reinsurer is willing to put forward
- Knowing there is competition will push each reinsurer, including the higher rated reinsurers, to improve their competitiveness

Relative to pricing, with more restrictive investment guidelines and collateral comes less competitive pricing

- Can be examined through some preliminary pricing
Approach for Annuity Reinsurance – similar, but not the same

When you embark on a new reinsurance process around annuities or other asset-intensive products, there are a number of considerations.

- Counterparty credit and potential markets
  - No less than 25-30 potential reinsurers and markets for Asset-Intensive reinsurance
- Non-Disclosure Agreements (NDA)
  - To allow for free-flow of information
- Data sharing with markets
  - Fairly intensive for inforce business
  - May want to discuss product features for new business
- Meetings with interested parties
  - Many are not well known and are newer to the market
- Transaction objectives and motivations
  - Most important as you embark on an evaluation of potential reinsurance for your asset-intensive business.
Ceding company considerations when choosing a Reinsurer

- Credit Rating of reinsurer
- Capital levels or over-collateralization
- Experience in market
- Investment expertise
- Pricing / Competitiveness
- Regulatory concerns
- Rating agency reactions
- Reinsurance structure proposed
- Partnership Approach
Considerations – choosing a reinsurance partner

Pricing assumptions

- Annual full surrender ("lapse") rate assumptions (assuming current low interest environment remains during projection period):
  - Review of experience of company
  - Benchmark to competitor rates
  - High lapse at end of SC period – older business may be stable
- Investment yield (per investment guidelines)
- Expenses (for administration – typically paid to ceding company)
  - Commissions are an expense on new sales - shared
- Taxes, cost of capital, etc. – all different by reinsurer

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Considerations – choosing a reinsurance partner (cont’d)

Viewing all of the economic factors in a block transaction:

- Ceding allowance is only one consideration
  - Reinsurers have been offering “negative” ceding allowances on blocks of fixed annuities with relatively high minimum interest rate guarantees
- Liquidation of assets to provide a cash transfer to the reinsurer often results in releasing unrealized gains that can be used to off-set the negative allowance
- 100% coinsurance transaction may also release a portion of the Interest Maintenance Reserves – both existing and new
  - Treatment of this varies by company / off-shore vs NAIC entity.
## Case Study (1/2)

**Zurich’s divestiture of the U.S. Annuity Business**

### Background

- Capital pressure on Zurich was growing, and the U.S. annuity business was determined to be non-core to the company.
- The M&A team in Europe began a process to sell the U.S. Annuity business – **Project West**
- Over the years, Farmers New World Life in Seattle had sold around $2.5 bil of fixed annuities, variable annuities and structured settlements
- Zurich began a process to find an advisor to run a process and develop an actuarial analysis of the business

### Book Analysis

A review of the book of business was commissioned, including validation of projection assumptions and appraisal development:

- Most of the annuity business was straightforward (fixed products), but structured settlements required a more in-depth review
- A price (ceding commission) estimate was derived, with projections shared with interested parties

### Market Analysis

A competitive auction started with broad analysis of the span of potential markets, including 17 different entities:

- Proposals from 15 companies representing a variety of reinsurers, capital markets, on-shore and off-shore entities
- A conventional 2-round process was followed, and eventually was narrowed down to 5 companies for second round bids
Several key issues needed to be dealt with during this process, including:

- Evaluation of counterparties for risk exposure and counterparty credit considerations
- Detailed analysis of investment guidelines and investment approach of each party needed to be vetted and evaluated
- Reinsurance structures and impact to Farmers was extensively analyzed to ensure the expected outcome was achieved
- Collateral and trust structures were compared to ensure the maximum long-term protection was achieved for the insurer
- Even though two potential reinsurers were in final negotiations to the end, eventually RGA was chosen because of their strong pricing, counterparty considerations and execution certainty

Zurich realizes very large capital benefit from Project West, and announces this as a part of an overall $1.7bn capital benefit from released non-core businesses
Types of Annuity Reinsurance Structures
### Key Issues – Reinsurance Transactions

**A-I Reinsurance: More to consider than a typical reinsurance transaction**

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Form of reinsurance (Coinsurance, Mod-Co and Co-FWH)</td>
</tr>
<tr>
<td>2</td>
<td>Investment guidelines</td>
</tr>
<tr>
<td>3</td>
<td>Potential counterparty concerns and ways to structure protections</td>
</tr>
<tr>
<td>4</td>
<td>Level of protections (collateral, LOCs, etc.)</td>
</tr>
<tr>
<td>5</td>
<td>Obtaining full reserve credit and capital release from reinsurance</td>
</tr>
<tr>
<td>6</td>
<td>Regulatory approval</td>
</tr>
<tr>
<td>7</td>
<td>Expense coverage and administrative controls (if applicable)</td>
</tr>
<tr>
<td>8</td>
<td>Treatment of deal from an accounting (Statutory, GAAP, IFRS) and tax perspective, as well as the potential capital relief obtained</td>
</tr>
</tbody>
</table>
Forms of Annuity Reinsurance

- Coinsurance
  - Reinsurer assumes risk for quota-share portion of asset performance, disintermediation, expense and persistency
  - In force vs. new business
    - Ceded premium is either defined as a quota share of the annuity deposits (new business) or a quota share of the reserves (inforce)
    - Ceding commission is generally calculated to support the ceding company. For IF, it’s the value. For NB, offsets cost of writing business.
- Assets backing reserves – held by reinsurer
  - Does not require a separate investment management agreement
  - Acceptable investment guidelines are defined in treaty.
Forms of Annuity Reinsurance

- ModCo or Coins funds withheld (Co-FWH)
  - Risks are still transferred from cedant to reinsurer.
  - Key difference - Assets remain on ceding company’s balance sheet
    - Usually put into a trust or separate account, to the benefit of the reinsurer, but not always in trust
    - Ceding company maintains more control over assets – still “on balance sheet” – or perception of control
    - Reinsurer likely will want separate investment management agreement between two parties – to manage the interest risk.
  - Viewed as less risky; qualifies for reserve credit.
    - Ceding company has access to assets at all times.
  - Assets are maintained at Book Value – preferred by reinsurers
# Asset-Intensive Reinsurance Structures

<table>
<thead>
<tr>
<th>Reinsurance Form</th>
<th>Collateralization</th>
<th>Investments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coinsurance</td>
<td>No collateralization</td>
<td>Investment guidelines</td>
</tr>
<tr>
<td>Coinsurance with comfort trust account</td>
<td>Collateralization level (up to 100% of reserves)</td>
<td>Allowable investments</td>
</tr>
<tr>
<td>Modified Coinsurance</td>
<td>Over-collateralization (in excess of 100% of reserves)</td>
<td>Due diligence of investment approach</td>
</tr>
<tr>
<td>Coinsurance funds-withheld</td>
<td>Forms of collateral</td>
<td></td>
</tr>
</tbody>
</table>
### Forms of A-I reinsurance (1/3)

<table>
<thead>
<tr>
<th>Structure 1</th>
<th>Description</th>
<th>Protection</th>
<th>Likely Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coinsurance – No Trust</td>
<td>Creditworthiness of counterparty</td>
<td>Large, highly-rated reinsurers</td>
</tr>
</tbody>
</table>

### Explanation
- For well-established and strong credit counterparties, they want to maximize their flexibility in managing the risk by simply holding all the assets and liabilities on their own balance sheet without restrictions.
- Does not require separate investment management or guidelines
- Very little transparency into reinsurers approach
- Limited ability for on-going review of security of the deal by cedent.

### Potential Structure

- **Cedent**
  - Premiums and claims settled monthly or quarterly
- **Reinsurer**
  - Reinsurance Agreement

- No separate structure or special arrangements
Forms of A-I reinsurance (2/3)

<table>
<thead>
<tr>
<th>Structure 2</th>
<th>Description</th>
<th>Protection</th>
<th>Likely Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coinsurance – w/ Comfort trust</td>
<td>Pre-defined asset amounts (90-105% of reserves) held in separate trust</td>
<td>Highly capitalized, experienced reinsurers</td>
</tr>
</tbody>
</table>

Explanation

- Similar to straight coinsurance, but experience asset-intensive reinsurers have agreed to holding assets in a segregated trust account for the benefit of the ceding company.
- Gives an extra level of protection, as the assets are kept separate, and usually subject to a separate set of investment or collateral guidelines.
- Trustee is assigned, and subject to a separate trust agreement.
- Monthly or quarterly settlements are defined and settled between the parties.
- Offers more protection than Structure 1, but the lower level of flexibility for the reinsurer may impact their ability to price competitively.

Potential Structure

Cedent will receive (pay) net cash flows from (to) the trust ongoing.

Reinsurance Agreement

Excess trust funds to reinsurer

Short-falls funded out of reinsurer surplus

Reinsurance Assets Placed in a Segregated Account (Trust)
Cedent is beneficiary
Forms of A-I reinsurance (3/3)

<table>
<thead>
<tr>
<th>Structure 3</th>
<th>Description</th>
<th>Protection</th>
<th>Likely Companies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mod-Co or Co-FWH</td>
<td>Security of counterparty</td>
<td>Off-shore, unauthorized reinsurers</td>
<td></td>
</tr>
</tbody>
</table>

### Explanation
- Key to Mod-Co and Co-FWH is that the assets remain on ceding company’s balance sheet.
- Assets typically placed in trust or separate account, to ease external investment management and cedent operations and accounting, but not always.
- Ceding company maintains more perceived control over assets – still “on balance sheet”.
- Viewed as less risky; required for unauthorized reinsurers to qualify for reserve credit.
- Reinsurer most likely will want separate investment management agreement between two parties – with reinsurer named as a sub-advisor on these specifically allocated assets.
- Assets are maintained at Book Value.

### Potential Structure

Cedent will pay (receive) net cash flows to (from) reinsurer ongoing.
## Pros and cons of each reinsurance transaction structure

<table>
<thead>
<tr>
<th>#1 Coinsurance</th>
<th>#2 Coinsurance with Trust</th>
<th>#3 Mod-Co or Co-FWH</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pros</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Simple structure</td>
<td>Assets in trust provide cedent the ability to see the investments backing liabilities</td>
<td>Assets on cedent’s balance sheet provides full transparency and protection</td>
</tr>
<tr>
<td>Maximum flexibility to investments allows reinsurer most competitive pricing</td>
<td>Comfort trust reduces counterparty exposure</td>
<td>Provides least amount of counterparty exposure relative to the other structures</td>
</tr>
<tr>
<td>Straight forward accounting</td>
<td>Provides more negotiating leverage in case of problems</td>
<td>Provides more negotiating leverage</td>
</tr>
<tr>
<td><strong>Cons</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No transparency of investments</td>
<td>Less flexibility for reinsurer may result in slightly worse pricing</td>
<td>Investment accounting a little more difficult</td>
</tr>
<tr>
<td>Generates highest counterparty exposure relative to the other structures</td>
<td>Separate trust agreement needs to be put in place</td>
<td>Reinsurer will need to be designated as a subadvisor for investment management</td>
</tr>
<tr>
<td>Offers least amount of negotiating leverage during reinsurer breaches, defaults, or recapture negotiations – no collateral to seize</td>
<td>Requires on-going monitoring of compliance with collateral and investment limits</td>
<td>Requires more operational support by cedent (accounting)</td>
</tr>
<tr>
<td>Only suited for the higher rated, and authorized, reinsurers</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Collateralization to mitigate counterparty exposure

- In lieu of requiring certain minimum ratings by outside agencies, many ceding companies look to separate collateral structures as a means to help protect a transaction.
- Terms and features of collateralized transactions are highly negotiable and vary by deal, even with the same provider.
- Transactions can be collateralized at inception or triggered via a reinsurer credit event (ratings downgrades, breach of RBC ratio, etc.).
- From our past experience, confidentiality prevents us from sharing specifics. From what we have seen, the following might be reasonable expected collateralization levels by tier:
  - Highly rated firms typically do not expect to be required to post collateral, but more recently the experienced players have agreed to some minimal levels of specific collateral.
  - Posting levels can range from 0 – 3% of reserves.
  - Strong, but not A-rated reinsurers understand that they generally will be required to post collateral.
  - Posting levels can range from 1 – 4%.
  - Unrated and newer firms expect to collateralize at a sufficient level to offset.
  - Posting levels can vary broadly, and structures vary, but generally start at 4%+. 

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Collateralization to mitigate counterparty exposure, continued

- Collateralization parameters typically include:
  - Establishment of a bankruptcy remote trust (potentially separate from the core reserve-credit trust) with an independent trustee
  - Investment guidelines and collateralization levels by asset class or portfolio
  - Collateral can be posted on a book or market value basis
  - Authorized reinsurers typically prefer to offer a trust with assets carried at book value
  - If a reinsurer is unauthorized, regulations require collateral to be posted on a market value basis
  - Periodic mark-to-market of the collateral (relative to current reserves) due to collateral market or book value changes and/or changes in reserves (subject to a cure period)
  - Frequency of counterparty reporting on the value of collateral relative to reserves
Unauthorized Reinsurer – Trust requirement

How do new reinsurers qualify to provide valid reinsurance credit.

Two approaches:

- Coinsurance – with Reserve Credit Trust and over-collateralization
  - To obtain reserve credit, a market value trust is established
  - Assets held in trust are marked to market at all times – equal to 102% of statutory reserves
  - Fluctuations in market conditions that impact asset value are responsibility of reinsurer
  - Investment guidelines are agreed to for trust assets
- Modified Coinsurance or Co-FWH – also qualifies
  - May still provide a “comfort trust” to hold capital (over collateralization) to protect transaction.
Challenges and Considerations with Asset-Intensive Reinsurance
New Business vs. In-Force Reinsurance - Annuities

New Business

- Also called “Flow” reinsurance
- Monthly (or more frequent) credited interest discussions. Rates determined by mutual agreement.
- Ceding commission to cover new issue expenses and administration.
- Reinsurer likely will want to help with new product development.
- May allow a company to get into a new line of business easier by leveraging the reinsurers expertise.

In-Force

- Much more M&A oriented.
- Significant diligence required by the reinsurer on the business.
- Will need to understand how business was sold, experience, demographics.
- Existing asset portfolio critical to the success of a transaction.
- Ceding commission represents the reinsurers view of the “value” of the business – pays for a portion of future profits.
- Most of the discussion is around appropriate investments going forward.
Investment guidelines

- When considering what’s appropriate for investments backing the reinsured reserves, the ceding company generally will want to think about several items;
  - Protecting the policyholder – ensuring that good ALM practices are followed.
  - Assuring there won’t be adverse investment experience – but need to remember the reinsurer is really baring the risk.
  - In an adverse tail event, would the insurance company be comfortable taking back these assets.
  - For Mod-co or Co FWH, would there be any impact to overall company investment guidelines.
  - For Reinsurer – they will want sufficient flexibility to earn a good return!
Investment guidelines
Most reinsurance of asset-intensive business is focused around investments

- Early in the process of treaty term negotiation, either the cedent sets forth proposed guidelines, or the reinsurer defines the guidelines, subject to cedent approval.
- This becomes a very important part of each asset-intensive reinsurance negotiation. Some of the key considerations are:

<table>
<thead>
<tr>
<th>Concentration Limits</th>
<th>Portfolio Limits</th>
<th>Other Limits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Asset Class</td>
<td>WARF or other Overall Credit Limits</td>
<td>Downgrade or capital triggers further limiting risky assets or sectors</td>
</tr>
<tr>
<td>Sector</td>
<td>Duration and/or Average Life Mismatch Limit</td>
<td>Leverage (Derivatives)</td>
</tr>
<tr>
<td>Entity</td>
<td></td>
<td>Limited Partnerships</td>
</tr>
</tbody>
</table>

**Limits should not be overly conservative:**
Reinsurers should have some leeway in the management of their portfolio

*Experienced reinsurers for asset-intensive liabilities have established a specific investment expertise or strength that they are looking to put to work, to generate higher yields for the benefit of the reinsurance.*
Additional Items to be addressed in Investment Guidelines

- Appropriate Investment classes, with Maximums and Target allocations
  - Generally start with the cedent’s own investment guidelines, but consider areas that would be OK for additional allocations.
  - Alternative assets, CMLs, Structured Securities (CLOs), etc.

- Asset-Liability Management constraints
  - Consider asking reinsurer to commit to a duration matching tolerance

- Defining specific investments that are not permitted
  - Items like derivatives, equities, hedges, etc.
  - For some reinsurers, they will generally use these instruments within their surplus accounts, to give cedent comfort.

- Reporting and Compliance – frequency of reporting, auditing, etc.
  - Cure period – need to allow reinsurer some time to make “right”.
Treaty issues

- Non-guaranteed Element management
  - Reinsurer does NOT have authority to determine non-guaranteed interest rates; must work in cooperation with the reinsurer.
  - “seek consent, not to be unreasonably withheld”
  - Agreement will specify process to be followed.
    - Should ideally address cure and compromise approach.
    - May be formulaic or indexed based.
Other issues in negotiations

- Quota share – how do you manage different profit objectives and investment approaches with new business reinsurance?
  - Example 60/40, with reinsurer assuming 5% yield and cedant assuming 3.5%.
  - If both have same profit objective, will need to discuss an on-going allowance from reinsurer to cedant to off-set the lower return target.

- Minimum capital requirements and recapture provisions
  - If market value of assets fall below a certain level, reinsurer must either top-up or may trigger recapture option.
  - Recapture could also be tied to RBC level of the reinsurer.
  - For overcollateralization levels, may consider tying to the reinsurers external rating (like A.M. Best) for determination.
Important Considerations when deciding to move forward

- An advisor can help you succeed from strategy to execution.

**Team Selection**
- Are there subject matter experts on your team?
  - Pricing
  - Modelling
  - Treaty terms
  - Risk Protections

**Data Preparation**
- Is your data available and organized to support the transaction?
  - Raw data
  - Experience data
  - Robust projections
- Are you positioning your business in the best light?

**Market Selection**
- Have all the appropriate markets been identified?
- Can you structure the transaction to leverage particular market strengths?
- Does your process mitigate counterparty exposure?

**Execution**
- How does the transaction get approved and completed?
- Issues will naturally arise; how are they solved?

**Negotiation**
- What is the best strategy and approach for your block?
- Will each bidder share their concerns, and how should they be addressed?

**Pricing and Risk**
- How do you know your bid is competitive?
- Did you receive the best possible terms and conditions?
- How do you evaluate the trade off between price and counterparty credit risk?
QUESTIONS???
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Analyzing Experience Data

Modeling and Assumptions
Analyzing Experience Data
Example: Variable annuity industry data

- 24 companies
- Seriatim monthly data
- January 2008 through December 2018
- $795 billion ending account value
Surrender charges work

The graph illustrates the surrender rate over the years remaining in the surrender charge period. The X-axis represents the years remaining in the surrender charge period, and the Y-axis represents the surrender rate. The graph shows a trend where the surrender rate increases significantly around the 0 year mark, indicating a peak in surrender activity, followed by a gradual decrease.

Key points:
- Surrender rates are highest around the 0 year mark, indicating a peak in surrender activity.
- The rates decrease gradually after the peak, showing a trend of decreasing surrender activity over time.
- The graph suggests that surrender charges work effectively by discouraging early surrenders, as indicated by the lower rates for longer periods.
Surrender rates have changed over the years

Years Remaining in Surrender Charge Period

Surrender Rate

GLWB

0% 35%

2008 2018 2016
Surrender rates are lower with living benefits

- None
- GLWB
- Hybrid GMIB
...and even lower with income utilization

**GLWB - Withdrawal Behavior**

<table>
<thead>
<tr>
<th>Years Remaining in Surrender Charge Period</th>
<th>Surrender Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>7 or more</td>
<td>0%</td>
</tr>
<tr>
<td>6</td>
<td>0%</td>
</tr>
<tr>
<td>5</td>
<td>0%</td>
</tr>
<tr>
<td>4</td>
<td>0%</td>
</tr>
<tr>
<td>3</td>
<td>0%</td>
</tr>
<tr>
<td>2</td>
<td>0%</td>
</tr>
<tr>
<td>1</td>
<td>0%</td>
</tr>
<tr>
<td>0</td>
<td>0%</td>
</tr>
<tr>
<td>-1</td>
<td>0%</td>
</tr>
<tr>
<td>-2</td>
<td>0%</td>
</tr>
<tr>
<td>-3 or more</td>
<td>0%</td>
</tr>
</tbody>
</table>

- Excess WDs
- No prior WDs
- Less than or full WDs
Surrender rates are lower when guarantees are more valuable

GLWB (nominal moneyness basis)
...but dynamic sensitivity has also changed over the years

![GLWB Shock Lapse Graph]

Surrender Rate

- ATM
- <25% ITM
- 25%-50% ITM
- 50%-100% ITM
How you measure value matters

Surrender Rate

GLWB

Shock - nominal

Shock - actuarial

Ultimate - nominal

Ultimate - actuarial

OTM 50+%
OTM 25 - 50%
OTM 5 - 25%
ATM
ITM 5 - 25%
ITM 25 - 50%
ITM 50 - 100%
ITM 100%+
Largest and smallest contracts behave differently

![Graph showing surrender rate vs. years remaining in surrender charge period for different contract sizes.]

- Surrender Rate
- Years Remaining in Surrender Charge Period
  - 7 or more
  - 6
  - 5
  - 4
  - 3
  - 2
  - 1
  - 0
  - -1
  - -2
  - -3 or more

Legend:
- under 50,000
- 50,000-100,000
- 100,000-250,000
- 250,000-500,000
- 500,000-1,000,000
- >=1,000,000
Withdrawals vary by age and tax status

Frequency

Attained Age Group

<50  50-59  60-64  65-69  70-79  80+

Non-Qualified  Qualified

GLWB
GLWB income commencement is highest at issue and after bonuses expire.
Withdrawal behavior is becoming more efficient
GLWB income commencement is dynamic

Dur 11+

Dur 3-10

Frequency

ITM 100+%  ITM 50 - 100%  ITM 25 - 50%  ITM 5 - 25%  ATM  OTM 5 - 25%  OTM 25+%
Hybrid GMIB annuitization rates are low and backloaded...
...and increase slightly in later years
Annuitization rates also depend on economic value of other benefits, such as continued income utilization.
2012 IAM does not fit VA mortality experience very well
Mortality is lower where longevity benefits are greatest

Actual vs. 2012IAM-G2

<table>
<thead>
<tr>
<th>Benefit Type</th>
<th>Actual</th>
<th>2012IAM-G2</th>
</tr>
</thead>
<tbody>
<tr>
<td>GMIB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GLWB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GMWB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GMAB</td>
<td></td>
<td></td>
</tr>
<tr>
<td>None</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

% of Table

- Non-qualified
- Qualified
- Total
Evidence of anti-selection for death benefit guarantees

Actual vs. 2012 IAM-G2

% of Table

Duration

LB
No LB
Income utilization affects mortality

\[ Actual \ vs. \ RVAM \ 2015 \]

<table>
<thead>
<tr>
<th>Category</th>
<th>Qualified</th>
<th>Non-qualified</th>
<th>Total</th>
<th>% of Table</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Year</td>
<td>150%</td>
<td>25</td>
<td>175%</td>
<td></td>
</tr>
<tr>
<td>No Prior Withdraws</td>
<td>150%</td>
<td>25</td>
<td>175%</td>
<td></td>
</tr>
<tr>
<td>Prior LT and/or Full WDs only</td>
<td>150%</td>
<td>25</td>
<td>175%</td>
<td></td>
</tr>
<tr>
<td>Any Prior Excess WDs</td>
<td>150%</td>
<td>25</td>
<td>175%</td>
<td></td>
</tr>
</tbody>
</table>
Modeling and Assumptions
Examples: SOA reports

Post-level term insurance lapses

Accelerated underwriting
https://www.soa.org/resources/experience-studies/2017/predictive-analytics-underwriting/
Other examples: deferred annuity industry studies

FIA

VA
https://ruark.co/ruark-consulting-releases-variable-annuity-mortality-study-results/
Regulatory example: VM-21 PBR for Variable Annuities

Public redline exposure draft as of April 30, 2019
https://naic-cms.org/exposure-drafts

Section 10: Contract Holder Behavior Assumptions

1. Should examine many factors including cohorts, product features, distribution channels, option values, rationality, static vs dynamic
2. Required sensitivity testing, with margins inversely related to data credibility
3. Unless there is clear evidence to the contrary, should be no less conservative than past experience and efficiency should increase over time
4. Where direct data is lacking, should look to similar data from other sources/companies
Modeling and Assumptions

• Measuring goodness-of-fit for candidate models
• Testing predictive power on out-of-sample data
• Using external data to improve candidate models
• Art + science: choosing
Goodness of Fit

Predictive Power
Bayesian Information Criterion (BIC) vs. Number of Factors

- Number of Factors: 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10
- BIC Values: Approximately 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10

The graph shows the BIC values decreasing as the number of factors increases.
5-Fold Cross Validation
Measures the bias-variance trade-off

Calibrate model to each train subset

Measure the test error

Model's predictive power
More data and/or relevant industry data

Art + science, subject matter expertise and actuarial judgment

More statistically justifiable model factors and dramatically improved fit and predictive power
Predictive Analytics

PBR Compliance

Effective Risk Management
Discussion
2019 Reinsurance Seminar

Brendan Kearney FSAI FIA FSA
Mortality Improvement and Impact on Reinsurance – Europe Focus

September 25, 2019
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Mortality Improvement (MI) & Reinsurance – Europe

Outline

• Territories & Products
  • UK
  • The Netherlands

• MI Trends

• MI Models
Territories in Focus

• UK and The Netherlands

• Both of these countries have developed markets for pension schemes to de-risk their longevity exposures
  • Pension scheme is responsibility for paying all future pension / payout annuity amounts
    • Pension is payable for remainder of pensioner’s life
    • Pension amounts may increase with inflation, and may continue after death of first life if spouse is still living
  • Longevity risk represents the risk of paying pensions for longer than anticipated
    • Lower MI leads to higher liabilities
  • To de-risk, pension scheme enters a transaction with insurer, who in turn may be backed by 1 or more reinsurers
Territories in Focus

- UK:
  - Population is 66 million

- The Netherlands:
  - 17 million

- Ireland:
  - 4.8 million
(Re-) Insurance Products in Focus

- **Pension Buy-Out / Buy-In**
  - Pension scheme pays up-front premium to Insurer
  - Insurer takes on responsibility for all future pension payments

- **Longevity Swap**
  - Fixed Cashflow from Pension Scheme – expected future pensions plus fee
  - Floating Cashflow from Re-Insurer – actual future pensions
  - Customizable:
    - At the money / Out of the money at time-0
    - Simplify reference population / pension terms vs. basis risk
    - Collateralize if transaction becomes significantly in the money
## US vs. Europe – Life Expectancy

### Life Expectancy at Age 65

<table>
<thead>
<tr>
<th></th>
<th>In years</th>
<th>US</th>
<th>UK</th>
<th>Netherlands</th>
<th>Canada</th>
<th>Japan</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male Age 65</td>
<td></td>
<td>18.1</td>
<td>18.8</td>
<td>18.7</td>
<td>19.3</td>
<td>19.6</td>
</tr>
<tr>
<td>Female Age 65</td>
<td></td>
<td>20.6</td>
<td>21.1</td>
<td>21.2</td>
<td>22.1</td>
<td>24.4</td>
</tr>
</tbody>
</table>

*Source: OECD (2019), Life expectancy at 65*
US vs. Europe – MI Trends

5-year Average MI (Male Age 65 Only)

Note: Final data period is 2015-2017 for US and 2015-2016 for others

Source: Human Mortality Database
US vs. Europe – MI Trends

5-year Average MI (Female Age 65 Only)

Note: Final data period is 2015-2017 for US and 2015-2016 for others

Source: Human Mortality Database
MI Trends

UK 5-year Average MI Rate

• 1980-2003: Average MI rates oscillate between 1% and 2%
• 2004-2011: Improvements remain at around 2.5% (a “high and stable” phase).
• 2011+: Improvements begin falling, averaging around 0.5% from 2015

Source: Data from Office for National Statistics (ONS), UK
Trends in Top 5 Causes of Death

- **Red Line** (Decreasing): Ischaemic heart diseases
- **Blue Line** (Increasing since 2011): Dementia - increasingly important CoD
  - Note: Some recoding changes in 2011 and 2016 made dementia more likely to be selected as the single cause of death that is recorded in the presence of multi-morbidities

*Source: WHO Mortality Database, England and Wales Population; Age-standardised mortality rates*
MI Trends

• Comparing 2000-2011 to 2011-2017, there are observed reductions in population MI in the US and in many European countries
  • The size of the MI reduction varies by country
  • Japan is one of the few countries to demonstrate strengthening MI over the period

• MI trends by socioeconomic status

• 2011-2017 vs. 2018 vs. 2019 vs. the future?
  • US Population MI in 2018
  • UK Death Date for Early 2019
Setting an MI Assumption – Some Considerations

Mortality Base Table vs. MI

Age Cohort Effect in the UK (in particular)

Selection of Data

Population vs. Insured Lives vs. Pensioner Lives
UK CMI Projection Model

• CMI – Continuous Mortality Investigations
  • Subsidiary of the Institute & Faculty of Actuaries (IFoA)

• MI model first released in 2009
  • Annual updates published since 2019 – revisions for emerging data, and model refinements
  • Deterministic model dependent on user inputs & expert judgement
  • CMI_2018 published in March 2019
    • Based on 40 years of England & Wales population data, provided by the Office for National Statistics (ONS)
    • Calibrated for mortality data up to Dec. 31, 2018

• Recognized standard for MI analysis in the UK
UK CMI Projection Model

CMI Model Sample Output (Male)

Source: CMI_2018 (v02); Male; Core Assumptions; 1.25% LT Rate
UK CMI Projection Model

CMI Model Sample Output (Female)

Source: CMI_2018 (v02); Female; Core Assumptions; 1.25% LT Rate
UK CMI Projection Model

• Model Parameters
  • Calibration
    • Calendar Years; Age Range; Cohort Age Range
  • Long-Term MI Rate
  • Period Smoothing Parameter
  • Attained Age Tapering
UK CMI Projection Model

- Other Parameters
  - Adjustment for Basis Differentials
    - Population vs. Pensioner Lives
    - Differentiating factors such as Pension Amount, Gender, Blue/Grey/While Collar, Postal/Zip Code
  - Floor for MI Rate

- CMI Working Papers
Netherlands MI Model

• Royal Dutch Actuarial Association (Koninklijk Actuarieel Genootschap, AG)
  • AG Mortality Research Committee

• Projections Life Table: AG Series
  • Projection table published every 2 years since 2010; AG2018 is the latest model
  • Designed for use by pension funds and life insurers
  • 47 years of population mortality data from the Netherlands, and other European countries with similar prosperity levels
    • Data sourced for the Human Mortality Database, Eurostat and Statistics Netherlands
  • Methodology first derives a mortality projection for Europe, and then an assumption calibrated for the Netherlands population
Netherlands MI Model

AG2018: Life Expectancy at Birth

Source: Projection Table AG2018 Report
Netherlands MI Model

- Projection Table AG2018
  - Stochastic Model
  - Parameters and best estimate mortality rates are published, along with the input death and exposure data for Europe and the Netherlands
  - Model documentation allows for the results to be recreated and/or further customized
  - Correlation coefficient included for Male and Female MI

- Life Expectancy and State Pension Retirement Age
  - Life expectancy at age 65
Takeaways

• Learnings from Europe for the US
  • Models & Statistical Techniques
    • Use of industry models still requires expert judgement
    • Data will need to tailored to local requirements

• Applications in the US:
  • Insurance products with exposure to late durations and high attained ages
  • Emerging PRT market for insurers and reinsurers
Questions?

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References

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