Klann

Outline

I. Introduction

Although reinsurance contracts may only cover policies written by the primary insurer over a short span of time (ex. twelve months), it may be years before the last claim is settled and fully reimbursed. For various reasons discussed in the next section, the primary insurer (i.e. cedant) or the reinsurer might choose to terminate the contract early. This termination is known as a **commutation agreement.** Formally, a commutation agreement is defined as "an agreement between a ceding insurer and the reinsurer that provides for the valuation, payment, and complete discharge of all obligations between the parties under a particular reinsurance contract." Under the commutation, the following occurs:

- The reinsurer makes an immediate payment to the ceding insurer
- The reinsurer is absolved from all future involvement with the claims or policies covered by the agreement

II. Motivations of the Parties

Commutations arise for **four** reasons:

1) The cedant or reinsurer wishes to exit a line of business. A commutation has the following impact on the cedant and reinsurer:
    - **Cedant** – commutation is only the first step. To actually exit the line of business, a loss portfolio transfer is required. Loss portfolios may be easier to transfer without the uncertainty of a reinsurance agreement
    - **Reinsurer** – commutation results in the immediate exiting of the line of business

2) The cedant or reinsurer may have concerns about one another's solvency:
    - If **cedant** solvency is uncertain – commutation provides cedant with an immediate cash in-lay and allows the reinsurer to avoid potential future problems with a liquidator who may take over the cedant
    - If **reinsurer** solvency is uncertain – commutation eliminates credit risk to the cedant since financial health is no longer tied to reinsurer
3) The relationship between the cedant and reinsurer may have deteriorated over time due to disputes over claim resolution or contract provisions
4) The cedant and reinsurer may have drastically different views concerning loss development for the underlying policies. Both sides may prefer a commutation at an intermediate price. Assuming the pessimistic side (i.e. high loss development) is the reinsurer, it would like the price because it appears lower than it should be. The optimistic cedant (i.e. low loss development) would like the price because it appears higher than it should be

III. Pricing

Commutation pricing can be summarized in the following steps:

1) The cedant and reinsurer independently estimate the future claim payments that would occur in the absence of a commutation. For the reinsurer, these are considered **loss reserves**. For the cedant, these are considered **reinsurance recoverables**. These future claim payments should include case reserves and IBNR (comprised of both incurred but not enough reported and incurred but not yet reported)
2) The cedant and reinsurer independently estimate when the future claim payments will occur and then discount those payments to account for risk and the time value of money. The discount factors chosen by each side will most likely be different. One reason for this is that reserves are considered a risky **liability** for the reinsurer and recoverables are considered a risky **asset** for the cedant
3) The cedant and reinsurer independently consider the effects of taxation on the commutation price
4) The cedant and reinsurer independently consider unique factors that also impact the commutation price. For example, when solvency is an issue, the two parties must consider

the full distribution of potential future claims as well as the expected value. Since extremely large losses may be possible, the healthy party may choose to accept a price that results in a small expected economic loss in order to avoid the major loss resulting from an insolvency

IV. Accounting and Reserving

This section details the example shown in the paper and explains how reserves are impacted by a commutation. The example assumes the following:

- The primary insurer has been writing a book of business for the past three years and ceding a portion of it to a reinsurer
- All of the primary insurer's policies have an effective date of January 1. Thus, policy years and accident years are identical
- The reinsurer reserves the ceded claims 10% higher than the primary insurer
- The SAP convention of offsetting ceded recoverables against gross losses is assumed (i.e. reduces a liability). This differs from the GAAP convention of setting up an asset equal to the amount of the reinsurance recoverable
- At the end of 2015, the two parties negotiate a commutation that applies to all claims within AY 2013. The agreed upon price is $400
- Even though it is receiving a payment from the reinsurer, the primary insurer is considered the **buyer** since it is assuming a liability by taking back the claims
- The transaction is assumed to close prior to the end of 2015

To emphasize the effects of the commutation on the reserves, let's begin with a summary of AY 2013:

Summary of AY/PY 2013 as of 36 months					
		Primary		Reinsurer	
		No Comm.	Comm.	No Comm.	Comm.
Paid	Gross	2500	2500	1250	1650
	Ceded	1250	1650	0	0
	Net	1250	850	1250	1650
Reserves	Gross	1000	1000	550	0
	Ceded	500	0	0	0
	Net	500	1000	550	0
Ultimate	Gross	3500	3500	1800	1650
	Ceded	1750	1650	0	0
	Net	1750	1850	1800	1650

- **Green** – the green boxes demonstrate the conservatism of the reinsurer. The reinsurer believes that the future payments for AY 2013 will equal $550. This is 10% higher than the primary insurer's opinion of $500 on future claim payments
- **Blue** – the blue boxes demonstrate the direct impact of the commutation. For the primary insurer, ceded paid losses **increase** by the price of the commutation ($1,650 – $1,250 = $400) since the primary insurer is being paid by the reinsurer. In addition, the ceded reserves decrease to 0 since the primary insurer is no longer ceding policies to the reinsurer. For the reinsurer, gross paid losses **increase** by the price of the commutation since the reinsurer is paying the primary insurer. In addition, the gross reserves decrease to 0 since the reinsurer is no longer assuming claims
- **Orange** – the orange boxes show what happens in total. For the primary insurer, ultimate net losses increase by $100. This **reduces pre-tax income and statutory surplus** by $100. For the reinsurer, ultimate net losses decrease by $150. This **increases pre-tax income and statutory surplus** by $150

Now, let's examine how the commutation significantly impacts the loss triangles of both parties. Here are the loss triangles without the commutation:

Primary - Paid Losses

	AY	12	24	36
Gross	2013	1000	2000	2500
	2014	1000	2000	
	2015	1000		
Ceded	2013	500	1000	1250
	2014	500	1000	
	2015	500		
Net	2013	500	1000	1250
	2014	500	1000	
	2015	500		

Reinsurer - Paid Losses

	AY	12	24	36
Gross	2013	500	1000	1250
	2014	500	1000	
	2015	500		

Primary - Reserves (case + IBNR)

	AY	12	24	36
Gross	2013	2000	1500	1000
	2014	2000	1500	
	2015	2000		
Ceded	2013	1000	750	500
	2014	1000	750	
	2015	1000		
Net	2013	1000	750	500
	2014	1000	750	
	2015	1000		

Reinsurer - Reserves (case + IBNR)

	AY	12	24	36
Gross	2013	1100	825	550
	2014	1100	825	
	2015	1100		

Primary - Ultimate Losses

	AY	12	24	36
Gross	2013	3000	3500	3500
	2014	3000	3500	
	2015	3000		
Ceded	2013	1500	1750	1750
	2014	1500	1750	
	2015	1500		
Net	2013	1500	1750	1750
	2014	1500	1750	
	2015	1500		

Reinsurer - Ultimate Losses

	AY	12	24	36
Gross	2013	1600	1825	1800
	2014	1600	1825	
	2015	1600		

Here are the loss triangles with the commutation:

Primary - Paid Losses

	AY	12	24	36
Gross	2013	1000	2000	2500
	2014	1000	2000	
	2015	1000		
Ceded	2013	500	1000	1650
	2014	500	1000	
	2015	500		
Net	2013	500	1000	850
	2014	500	1000	
	2015	500		

Reinsurer - Paid Losses

	AY	12	24	36
Gross	2013	500	1000	1650
	2014	500	1000	
	2015	500		

Primary - Reserves (case + IBNR)

	AY	12	24	36
Gross	2013	2000	1500	1000
	2014	2000	1500	
	2015	2000		
Ceded	2013	1000	750	0
	2014	1000	750	
	2015	1000		
Net	2013	1000	750	1000
	2014	1000	750	
	2015	1000		

Reinsurer - Reserves (case + IBNR)

	AY	12	24	36
Gross	2013	1100	825	0
	2014	1100	825	
	2015	1100		

Primary - Ultimate Losses

	AY	12	24	36
Gross	2013	3000	3500	3500
	2014	3000	3500	
	2015	3000		
Ceded	2013	1500	1750	1650
	2014	1500	1750	
	2015	1500		
Net	2013	1500	1750	1850
	2014	1500	1750	
	2015	1500		

Reinsurer - Paid Losses

	AY	12	24	36
Gross	2013	1600	1825	1650
	2014	1600	1825	
	2015	1600		

- **Blue** – the primary insurer shows downward development in AY 2013 net paid losses, which is unusual. This is caused by the $400 ceded paid loss from the commutation
- **Green** – the primary insurer shows AY 2013 ceded reserves drop to 0 suddenly at 36 months
- **Yellow** – the primary insurer shows upward development in AY 2013 net ultimate losses despite the fact that gross losses remain unchanged

- **Orange** – the reinsurer shows downward development in AY 2013 gross ultimate losses solely due to the fact that the commutation price ($400) is lower than the previously booked reserves ($550)

In addition to distorting loss triangles, a commutation also distorts **claim closure rates** for a reinsurer since commuted claims are considered closed from a reinsurer's standpoint.

Actuaries must consider the distortions to loss triangles or claim closure rates when doing the following:

- Calculating loss development factors
- Assessing reserve adequacy
- Using Schedule P to review claim severity or closure trends

As one might expect, commutations come with **disclosure requirements.** Commutations are required to be disclosed by the cedant (no requirements for the reinsurer) in Section E of the reinsurance notes in the Notes to Financial Statements. This disclosure must include the following:

- List of reinsurers
- Amount of loss, LAE, and earned premium commuted from each of the reinsurers to cedant during the year

The disclosure is in aggregate and does not break down the amounts by AY or line of business. In order to properly adjust loss triangles, actuaries need more detailed information.

The example above assumes that the commutation applies to an entire policy year within an entire book. In reality, commutations may cut across lines of business and policy years. Thus, a single commutation price may need to be **allocated down to multiple lines of business, multiple years, and possibly individual policies** (ex. commuting an excess of loss reinsurance contract that only applies to specific claims). By allocating the price, we obtain a more accurate picture of profitability by line of business.

V. Accounting and Taxation

For tax purposes, unpaid losses are valued on a discounted basis rather than a nominal basis. Companies determine the appropriate discount factor by using one of the following:

- Company-specific payment patterns and IRS discount rates
- IRS payment patterns and IRS discount rates

Since discount factor determination differs by company, discounted unpaid claims will also differ by company. This contributes to asymmetrical taxable income results. As an example, assume that the primary insurer from earlier applies a discount factor of 0.85 and the reinsurer applies a discount factor of 0.875. Given a marginal tax rate of 35% for each company, the taxable income results are as follows:

- Primary – Achieves taxable income gain of \$400 – (\$500)(0.875) = -\$37.50 and a **tax decrease** of \$37.50(0.35) = \$13.13 (all in 000s)
- Reinsurer – Achieves taxable income gain of (\$550)(0.85) – \$400 = \$67.50 and a **tax increase** of \$67.50(0.35) = 23.63 (all in 000s)

In this example, the income and tax differences are caused by the following:

- Differing opinions on the appropriate reserve amounts (\$500 vs \$550)
- Differing opinions on the discount factor (0.875 vs 0.85)

Original Mathematical Problems & Solutions

MP #1

A mono-line insurer has a quota-share contract with a single reinsurer. Each entity has reported the following experience related to this agreement (before commutation) at the end of 2017:

	Gross Paid Loss for Primary ($000):		
Policy Year	12 mo.	24 mo.	36 mo.
2015	1200	2400	3000
2016	1300	2100	
2017	1400		

	Gross Paid Loss for Reinsurer ($000):		
Policy Year	12 mo.	24 mo.	36 mo.
2015	480	960	1200
2016	520	840	
2017	560		

	Gross Reserves (Case + IBNR) for Primary ($000):		
Policy Year	12 mo.	24 mo.	36 mo.
2015	2600	2100	1500
2016	2800	2200	
2017	2700		

	Gross Reserves (Case + IBNR) for Reinsurer ($000):		
Policy Year	12 mo.	24 mo.	36 mo.
2015	1040	840	600
2016	1120	880	
2017	1080		

- A 40% quota-share reinsurance agreement has been in place for all three policy years with the same reinsurer. The reinsurer does not place any additional reserves on top of the primary insurer's reserves
- The insurer's and reinsurer's discount factors are 0.875 and 0.85 for all years, respectively
- At the end of 2017, the two parties agree to commute the reinsurance contract for policy year 2015
- The insurer's and reinsurer's accounting entries are based on the SAP framework

a) Assuming the commutation price is $500,000, construct tables of gross, ceded, and net ultimate losses for the primary insurer after accounting for the commutation.

b) Identify an unusual entry in the triangles constructed in part a. caused by the commutation.

c) Provide one reason why the discount factors might differ between the primary insurer and the reinsurer.

d) Calculate the changes in taxable income for the primary insurer and the reinsurer resulting from the commutation.

e) Given a marginal tax rate of 35%, calculate the changes in tax for the primary insurer and the reinsurer resulting from the commutation.

f) In part e., the absolute tax amounts did not match between the primary insurer and the reinsurer due to the difference in discount factors. Briefly describe another reason why the absolute tax amounts may differ between the two entities.

Solution to part a:

The triangles are as follows:

Policy Year	Gross Ultimate Losses for Primary ($000): 12 mo.	24 mo.	36 mo.
2015	3800	4500	4500
2016	4100	4300	
2017	4100		

Policy Year	Ceded Ultimate Losses for Primary ($000): 12 mo.	24 mo.	36 mo.
2015	1520	1800	**1700**
2016	1640	1720	
2017	1640		

Policy Year	Net Ultimate Losses for Primary ($000): 12 mo.	24 mo.	36 mo.
2015	2280	2700	**2800**
2016	2460	2580	
2017	2460		

The triangles above are calculated as follows:

- Gross Ultimate Losses = Gross Paid Losses + Gross Reserves (both given in problem)
- Ceded Ultimate Losses = Ceded Paid Losses + Ceded Reserves **+ Commutation Effect on Paid Losses + Commutation Effect on Reserves**. Here is the calculation for Policy Year 2015 at 36 months:
    - Ceded Paid Losses = 1200 (from the reinsurer's gross paid loss triangle)
    - Ceded Reserves = 600 (from the reinsurer's gross reserve triangle)
    - Commutation Effect on Paid Losses = 500 (the commutation price)
    - Commutation Effect on Reserves = –600 (the ceded reserves go to zero since we are no longer ceding business)
    - Ceded Ultimate Losses = 1200 + 600 + 500 – 600 = 1700
- Net Ultimate Losses = Gross Ultimate Losses – Ceded Ultimate Losses

Solution to part b:

- The primary insurer shows upward development in PY 2015 net ultimate losses despite the fact that gross losses remain unchanged

Solution to part c:

Applied different payment patterns

Solution part d:

Primary

- Taxable income change of 500,000 – (600,000)(0.875) = **–$25,000**

Reinsurer

- Taxable income change of (600,000)(0.85) – 500,000 = **$10,000**

Solution to part e:

Primary

- Tax **decrease** of 25,000(0.35) = **$8,750** (the primary insurer's taxable income decreased; hence its taxes decreased)

Reinsurer

- Tax **increase** of 10,000(0.35) = **$3,500** (the reinsurer's taxable income increased; hence its taxes increased)

Solution to part f:

The absolute tax amounts may differ due to differences in reserve amounts (ex. the reinsurer places additional reserves on top of the primary insurer's reserves)

MP #2

A mono-line insurer has a reinsurance contract with a single reinsurer that has been in place for a number of policy years. At the end of 2017, the two entities agreed to commute the reinsurance contract for policy year 2015 for a price of $600,000. Given the following:

- At the end of 2017, the primary insurer's ceded reserves for policy year 2015 are equal to $625,000
- Due to the reinsurer's conservatism, the reinsurer's gross reserves for policy year 2015 are 20% higher than the primary insurer's ceded reserves
- The primary insurer's discount factor for policy year 2015 is 0.88

Calculate the discount factor for the reinsurer that would result in identical taxable income changes between the primary insurer and the reinsurer.

S**olution:**

- The reinsurer's gross reserves are equal to 625,000(1.20) = 750,000
- The change in taxable income for the primary insurer is 600,000 – 625,000(0.88) = 50,000
- The change in taxable income for the reinsurer is 750,000(X) – 600,000. We must set this equal to 50,000 and solve for X. Thus, 50,000 = 750,000(X) – 600,000 and **X = 0.867**

Original Essay Problems

EP #1

a) Define "commutation."
b) Briefly describe four reasons commutations arise.

EP #2

a) Commutations may arise due to a cedant's concern about a reinsurer's solvency. In this case, briefly explain why a commutation might be beneficial for the cedant.
b) Commutations may arise due to a reinsurer's concern about a cedant's solvency. In this case, briefly explain why a commutation might be beneficial for the cedant AND the reinsurer.

EP #3

a) Briefly explain why a commutation distorts claim closure rates for a reinsurer.
b) Identify three activities in which actuaries must consider distortions to loss/claim triangles caused by commutations.

EP #4

Fully describe the disclosures required by the primary insurer for a commutation.

Original Essay Solutions

ES #1

a) An agreement between a ceding insurer and the reinsurer that provides for the valuation, payment, and complete discharge of all obligations between the parties under a particular reinsurance contract

b) Four reasons are as follows:

- The cedant or reinsurer wishes to exit a line of business
- The cedant or reinsurer may have concerns about one another's solvency
- The relationship between the cedant and reinsurer may have deteriorated over time due to disputes over claim resolution or contract provisions
- The cedant and reinsurer may have drastically different views concerning loss development for the underlying policies

ES #2

a) The commutation eliminates credit risk to the cedant since financial health is no longer tied to reinsurer

b) Beneficial for the **cedant** because it provides the cedant with an immediate cash in-lay. Beneficial for the **reinsurer** because it allows the reinsurer to avoid potential future problems with a liquidator who may take over the cedant

ES #3

a) The commutated claims are considered closed from a reinsurer's standpoint

b) Three activities include:

- Calculating loss development factors
- Assessing reserve adequacy
- Using Schedule P to review claim severity or closure trends

ES #4

Commutations must be disclosed in the Notes to the Financial Statements. This disclosure must include the following:

- List of reinsurers
- Amount of loss, LAE, and earned premium commuted from each of the reinsurers to cedant during the year

The disclosure must be in aggregate (i.e. not broken down by AY/PY or line of business).

