Retroactive Reinsurance

Information and Incentives

Nathan Lord
(561) 613 9669
nlord@jaffacorp.com

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Adverse Development Cover

Retroactive reinsurance protects against reserve risk

Retroactive reinsurance contracts cede unpaid losses from exposure already earned

An Adverse Development Cover (ADC) protects the cedant against adverse reserve development on historical losses

- An ADC may attach above, at, or below booked reserves, but must exit (attachment point + limit) above booked reserves
  - Exiting below booked reserves generally undermines risk transfer
  - ADCs attaching below, at, or above booked reserves are referred to as "in-the-money", "at-the-money", or "out-of-the-money" respectively
- A Loss Portfolio Transfer (LPT) is a first-dollar ADC

In retroactive reinsurance, a novation is usually referred to as an Insurance Business Transfer (IBT) in the US[1)], or a Part VII transfer in the UK[2)]

1) IBT and Part VII transfers are normally proceeded by an ADC.

ADC: Motivation and Value Generation

Generating value by reducing uncertainty

With volatile insurance returns, insurance investors are poorly situated (compared to company management) to differentiate between signal and noise

- Do negative results result from poor underwriting? poor claims handling?
- Are negative results random?

Information asymmetry between management and investors tends to depress an insurer's market value relative to book value

An ADC can potentially improve market value

- Reduces the risk to investors from information asymmetry
- Focuses firm on core operations
  - Ties future overall financial performance more closely to the performance of the current and future accident years
  - Reduces or eliminates the impact of changes in reserves for past accident years

1) IBT and Part VII transfers are normally proceeded by an ADC.

ADC: Motivation and Value Generation

Capital Reallocation & Deleveraging

An ADC can allow an insurer to reallocate capital to more productive uses

- Achieves economic finality on a cedent's back book
  - Removing the influence of the back-book strengthens the relationship between active underwriting and firm profitability
  - Focuses the firm it's core objectives -- underwriting and growth
  - Diminishes uncertainty and opacity, increasing firm value as an acquisition target
- Releases capital for redeployment
  - Removal of reserve risk improves economic, and rating agency capital ratios
  - Strategically structured reserve transfers can improve RBC ratios[1)]
- Can reduce insurer *beta* by transferring asset risk[2)]
  - Liabilities may be correlated with market conditions (e.g. inflation), contributing to firm *beta*

1) The standard RBC formula provides credit for internally ceded Retroactive Reinsurance that does not provide surplus relief (prospective accounting). RBC relief can be achieved by leveraging an alien affiliate, or through permitted practice granted by the insurer's regulator.
2) The beta measures the sensitivity of the insurer's economic performance to undiversifiable, systematic risk, as it arises from general economic conditions. The beta on an insurer is the difference between its asset beta and its liabilities *beta*.

ADC: Motivation and Value Generation

Comparative advantage creates value for both parties

Insurance companies specialize in specific portfolios or portfolio dynamics

- Insurers may specialize in specific lines, in UW, in claims handling, in risk structuring, or in asset mgmt.
- Insurer’s specialties may evolve over time as they enter/exit, expand/contract their exposures
- Insurer’s sensitivity to volatility may change over time as their leverage and market perception evolves

Many ADCs ceded to reinsurers with a comparative advantage by transferring:

- legacy lines to a reinsurer with active underwriting in a space (and requisite staffing & managerial focus)
- reserves and reserve assets to a reinsurer with comparative asset management advantage
- risk and claims management to a reinsurer with a comparative claims management advantage
- risk toward a firm with greater market confidence (lower discount)
- Risk and capital requirements to a reinsurer with greater diversification benefit or favorable regulatory environment

Moving to an advantaged firm generates economic value, improving relative profits for both parties

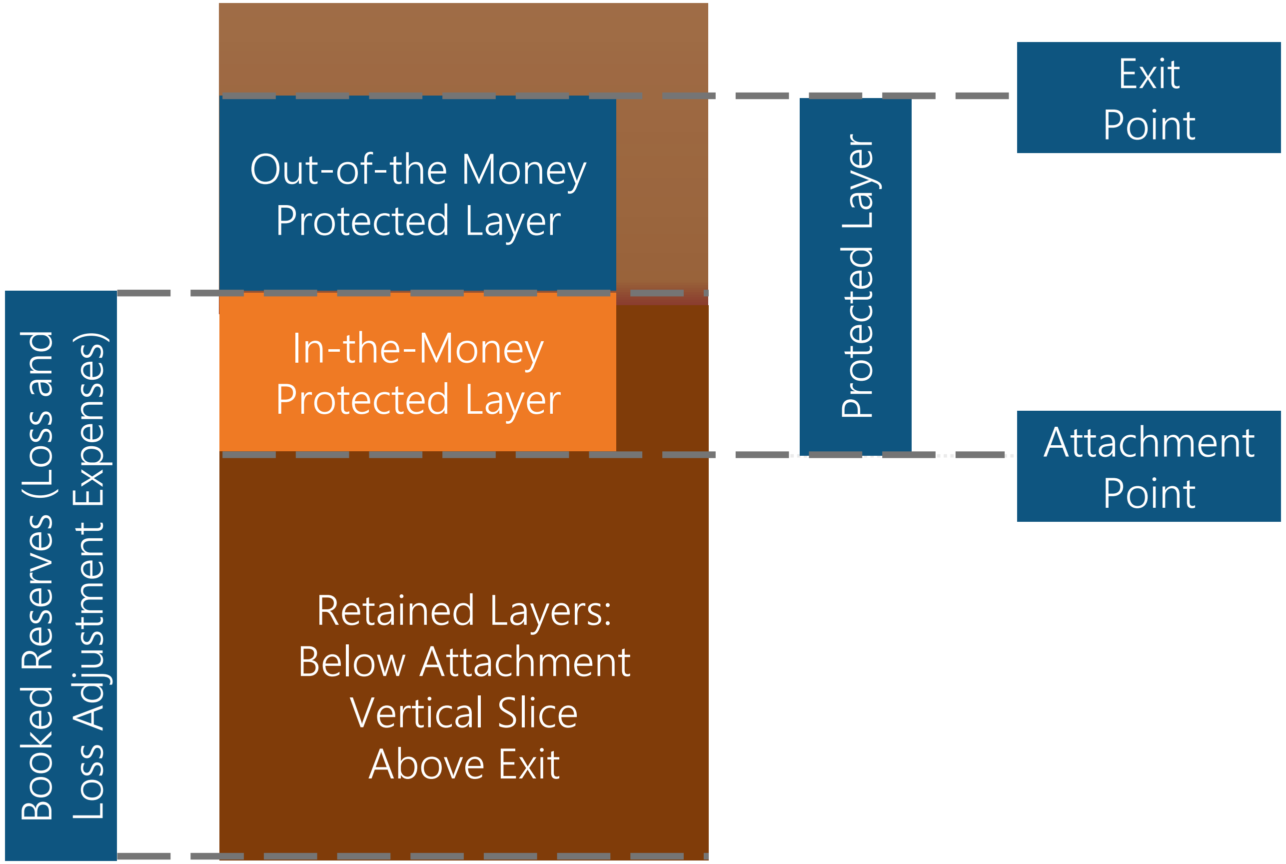
Three Deal Characteristics of Interest

The ADC, of which the LPT is a special case

- Funds transferred vs funds withheld
  - Perception of crediting rate as an interest rate
  - Economic “finality”
  - Risk of slower than expected payment trajectory
  - Asymmetry in uncertainty around the mean of the loss distribution
  - Securing reinsurance
- At-the-money vs in-the-money adverse development cover
  - Financing the deal
  - Reinsurance Leverage
- Claims control

Coverage Tower of an in-the-Money ADC

Vertical slice mitigates the moral hazard of suboptimal claims handling effort



Retaining a vertical slice leads to optimal alignment of incentives.

By ceding loss adjustment expenses[1)] together with losses, the cedent retains the same marginal proportion of both cost and savings from loss mitigation in the slice.

Consequently, the optimal level of loss mitigation by the cedent is unchanged by the ADC[2)]

1) Managerial oversight of claims will diminish as the firm shifts its focus to active underwriting. This lessening of oversight is asymmetrically borne by the assuming entity, distorting an otherwise symmetric alignment of incentives.
2) Ceded loss adjustment expenses may include unallocated loss adjustment expenses to the extent that these expenses can be allocated in bulk to the ceded book of reserves.

Book Cost of in-the-Money ADC

Ceding insurers strongly prefer near book neutral transactions

Book neutral transactions

- The ceded reserves represents an immediate reinsurance recoverable to the ceding insurer
- If consideration equals the ceded carried reserves, then the transaction is book neutral

Financing the deal

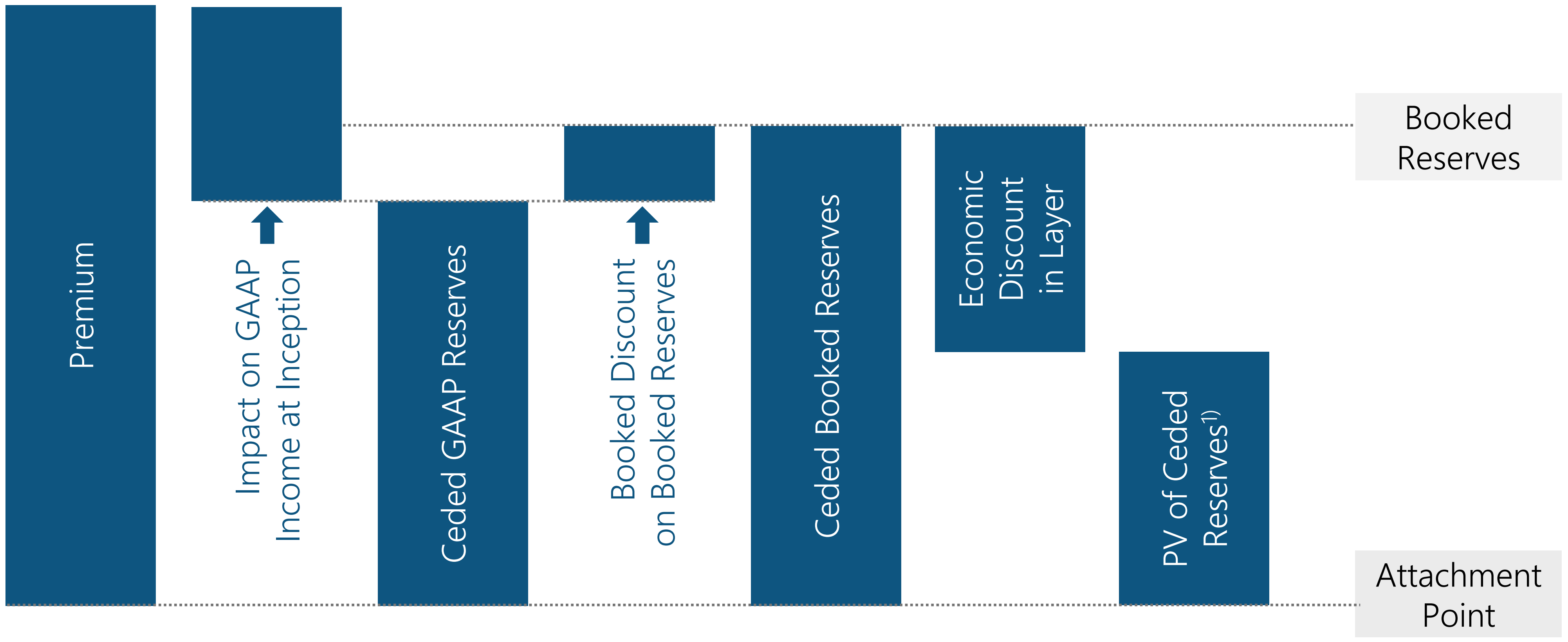
- An in-the-money adverse development cover (ADC) attaches below the carried reserves, generating an immediate reinsurance recoverable offsetting existing liabilities (book-gain)
- Where reserves are carried undiscounted, the time value of money in the ceded reserves contributes to the financing of the deal, lessening the US GAAP income hit
  - There is greater time value of money in higher layers, as the anticipated time to payment is longer
- Potential for favorable reserve development in the ceded reserve layer further contributes to the financing of the deal, lessening the consideration demanded and the US GAAP income hit
- In the presence of prior year adverse reserve development (adverse PYD), Rolling the PYD into the structure lessens the GAAP income hit, all else being equal

A loss portfolio transfer (LPT) is an ADC that attaches at first dollar

- An LPT maximizes funding from potential for favorable PYD and from the time value of money

Financing the in-the-Money ADC

In-the-money structure makes use of the discount for GAAP financing



1) The expected ultimate value of the loss in the protected layer exceeds the booked reserves in the protected layer, unless the in-the-money ADC is an LPT with no exit point and a few unusual circumstances.

Leverage: In-the-Money vs. Out-of-the-Money

Leverage increases the risk of mispricing to the reinsurer

The expected ultimate loss in the protected layer increases as the expected ultimate total unpaid loss increases

- Under most structures[1], the expected ceded loss increases monotonically and convexly[2] with the underlying loss

Higher leverage makes the transaction more sensitive to mis-estimating the mean of ultimate total loss

- Leverage in the protected layer can be expressed as:

$$\frac{\text{limit (net of vertical slice)} - \text{premium}}{\text{premium}}$$

- As a result, the economic success of the transaction becomes "more binary"
- Out-of-the-money ADCs have higher leverage, and in-the-money ADCs have lower leverage

1) Exceptions include 1) an LPT, the ceded loss is not convex with the underlying loss, and 2) very low limits structures with specific fat-tailed loss distribution can result in a decrease in ceded loss as the underlying expected losses increase, as the losses expected to move out of the layer exceed the losses moving into the layer.
2) The second derivative is positive. The expected layer losses increase at an increasing rate as the expected loss of the ground up distribution increases.

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Funds Transferred vs. Funds Withheld

Asset Risk and Credit Risk

There are three options for allocating asset risk and credit risk

- In a funds withheld structure, the cedent trades reserve risk for comparatively little credit risk
    2) If the investment rate credited to the reinsurer is fixed, the cedent retains asset risk
    3) Alternatively, asset risk can be transferred by crediting to the reinsurer the total investment return (usually with the reinsurer managing the investment of funds within certain guidelines)

- In a funds transferred structure,
    1) The cedent trades reserve and asset risk for credit risk

Funds Withheld Transaction

Slower than expected payment trajectory combined with adverse PYD

Risk of slower than expected payment trajectory

- The slower the payment trajectory of the subject reserves, the more funding a given crediting rate generates
  - This is exacerbated by correlation between PYD and a lengthening of the payment pattern in many lines
- If the payment trajectory turns out slower than the cedent anticipated, then the cedent, via crediting rate, will effectively finance some of the layer loss that it expected to be funded by the reinsurer
  - Cedent self funding of future PYD is exacerbated by an overfunded[1)] funds withheld account
- There are scenarios where a combination of future adverse PYD and a slowdown in the payment trajectory disincentives the cedent to commute, as the cedent's crediting to the funds withheld account contributes to the funding of a layer that was originally expected to be solely funded by the reinsurer
  - The cedent remains exposed to reserve uncertainty via uncertain payment patterns and the crediting rate

1) "Overfunding" means that the starting funds withheld balance exceeds the present value of the mean of the ultimate outstanding loss, discounted at the crediting rate

Funds Transferred vs. Funds Withheld

Transaction costs create economic finality, incentives to commute do not

Funds transferred transactions create economic finality

- Funds transferred structures create a hurdle for commutation
  - The hurdle establishes a high degree of economic finality
  - Combined with a sufficiently high limit, the cedant is no longer subject to material reserve risk
- Economic finality supports the argument for RBC (risk-based capital) relief
  - Retroactive reinsurance does not provide RBC relief without permitted practice[1)]

Funds withheld transactions are often expected to end in commutation

- In a funds withheld transaction, commutation remains a reinsurer's bargaining chip in future business dealings
- Incentives to commute the transaction make the funds withheld transaction a less credible signal of a firm's commitment to resolve reserve risk

1) Retroactive reinsurance is subject to retrospective accounting by RBC unless specific conditions are met. As a result, RBC reserve risk factors are calculated gross of the retroactive reinsurance treaty recoverables. Prospective accounting treatment is available as permitted practice, or if 1) the counterparty is an affiliate and 2) the transaction doesn't result in material reserve relief. NAIC Statutory Issue Paper No.162, August 3rd, 2019, https://content.naic.org/sites/default/files/inline-files/162_a.pdf

Claims Control

Claims control falls on a spectrum

Legal aspects

- Levels of control may include (1) rights of association, (2) reinsured in consultation, (3) joint authority, (4) reinsurer in consultation, and (5) claims control

Alignment of incentives when not ceding claims control

- Cedent retains a vertical slice (e.g., 20 percent)
- The optimal level of effort that the cedent puts into claims handling (and cost containment) is maintained: the cedent bears 20 percent (previously 100 percent) of the marginal cost and earns 20 percent (previously 100 percent) of the marginal benefit

In certain lines, ceding claims control comes with significant cost savings as the runoff carrier accumulates exposure in the same coverage tower[1)]

- Operational savings, including legal expenses
- Increased bargaining power

Transferring claims control to the reinsurer creates a moral hazard, as the reinsurer does not bear reputational risk to the primary policy holders

1) This argument holds in particular for A&E (asbestos and environmental) exposure

Adverse Selection

Adverse selection in the presence of asymmetric information

Suppose there are two types of cedents (otherwise identical): adequately reserved ("low risk") and inadequately reserved ("high risk").

- The cedent is in a better position to evaluate reserve inadequacy and the degree of reserve inadequacy (where relevant)

Suppose the reinsurer is able to identify adequately reserved cedents, but is unable to identify the degree of inadequacy when inadequate (which varies on a spectrum)

In this case:

- The reinsurer is able to break even with low-risk cedents at a low premium
- But the reinsurer is unable to break even with the high-risk cedents (at any feasible premium), as a higher premium adversely selects for only the more inadequately reserved (Stiglitz and Weiss, 1981)

Reference: Stiglitz, Joseph, and Andrew Weiss (1981) "Credit Rationing in Markets with Imperfect Information," *American Economic Review* 71: 393-410.

Screening and Self-Selection

Structuring provides a solution to adverse selection

Suppose that the contract is an at-the-money ADC with a limit that is considered high

Adequately reserved cedents are relatively more willing to accept a lower limit for a lower premium, as the implied tail protection is comparatively less valuable

- In the spirit of Bester (1985), the cedent's short call position serves as collateral—the lower the exit point of the ADC, the more collateral the cedent provides

The same argument applies to the inadequately reserved cedents, who are relatively more willing to pay a higher premium in exchange for a higher limit

The optimal contract offering is a menu of premium and limit/exit point combinations

Rather than imitating a slightly inadequately reserved cedent, a highly inadequately reserved cedent will prefer to purchase a high limit for a high premium, as rolling reserve strengthening into an ADC offsets the GAAP income hit of the premium dollar for dollar.

Reference: Bester, Helmut (1985) "Screening vs. Rationing in Credit Markets with Imperfect Information," *American Economic Review* 75: 850-855.

Contact

For additional information, please contact:

Nathan Lord
Direct: 561-613-9669
Email: info@jaffacorp.com
Address: 136 Kingsland Road, #1118, Clifton, NJ 07014

Appendix: Funds Transferred vs. Funds Withheld

Crediting rate, portfolio yield, and new money yield

Funds withheld crediting rate often misperceived as an interest rate

- In a funds withheld structure, the crediting rate is a funding mechanism, not an interest rate
- The crediting rate can be financed by the yield of the assets that underlie the subject reserves

Funds transferred structures can force realization of asset losses

- The current new money yield his higher than the portfolio yield for many insurers
- Transferred assets must be marked to market, potentially triggering a book loss on assets purchased in a lower yield environment, causing realization of a book loss