1. Classifications of reinsurance

There are many different ways in which reinsurance may be classified or distinguished. We will discuss briefly some of them.

Ceded/Assumed/Retroceded
Ceded means the transfer of an insurance risk from the company, which originally issued the policy, called the ceding company, to another insurance company, called the reinsurer. So the ceding company underwrites and issues an original policy and contractually transfers a portion of risk to an insurer. A reinsurer is not obligated to retain all risks, which it has assumed. It may decide to retrocede to another company all or some portion of risks it has assumed. A ceding reinsurer is reinsurer, which transfers a portion of the underlying reinsurance to a retrocessionnaire.

Indemnity/Assumption
Assumption means a form of reinsurance under which policy administration and the contractual relationship with the insured, as well as all liabilities, passes to the reinsurer. Indemnity reinsurance is a form of reinsurance under which the risk but not the administration is passed to the reinsurer which indemnifies the ceding company for losses covered by the reinsurance agreement treaty. The ceding company retains its liability to and its contractual relationship with the insured.

Proportional/Nonproportional
Reinsurance may be conducted on either a proportional or a nonproportional basis. Proportional is a form of reinsurance where the amount ceded is defined at the time of cession so the reinsuring company knows, before a claim arises exactly what its liability is. There are many methods of determining the proportion of reinsurance ceded, and the
proportion may vary by policy duration. Nonproportional is a form of reinsurance where the reinsurer’s liability is not fixed in advance, but is dependent on the number or amount of claims incurred in a given period.

**Automatic/Facultative**

A reinsurance treaty may allow business to be ceded on either an automatic or a facultative basis. An automatic reinsurance treaty provides that the ceding company is allowed to cede risks issued in excess of its retention limit, to a specific reinsurer at a predetermined cost without submitting underwriting papers to the reinsurer for approval. A facultative reinsurance treaty provides that a reinsurer must approve each individual risk before it has any liability. There exist also many variations of these two methods.

**Traditional/Financial**

Traditional reinsurance refers to reinsurance arrangements where the primary purpose is the transfer of risk. Financial reinsurance refers to reinsurance arrangements where the primary purpose is the achievement of a specific business objective such as increasing statutory surplus, reducing taxes, or acquiring blocks of business. The risk transfer is secondary to the business purpose.

2. **Proportional reinsurance contract**

   The main methods of proportional reinsurance contract may be categorised on coinsurance (original terms) and risk premium.

   a) **Coinsurance (original terms)**

      If the company adopt the coinsurance method of reinsurance, this can be one of the following basis – individual surplus arrangements or quota-share basis. These are two ways in which the amount to reinsured can be specified. Individual *surplus arrangement* results in the reinsurance of that part of original sum insured in excess of the ceding company’s retention on any individual life. Alternatively, the reinsurance may be on a *quota-share basis*, in which case a specified percentage of each policy is reinsured. A company may adopt a mixture of the above, retaining for itself a percentage of each policy
up to a maximum retention. For example a company might reinsure 25% of every policy up to a maximum original sum assured of 100,000 m.u., and whole of any amount in excess of 100,000 m.u.

When the coinsurance method is used, the company set up actuarial reserves for the original sum assured and can then deduct the actuarial reserves relating to the reinsured portion.

b) Risk premium (or Yearly renewable term) method

The ceding company reinsures part of the sum at risk, i.e. the excess of the benefit payable over the reserve, with the reinsurer on a yearly renewable risk premium basis. Reinsured is only the mortality element.

Mortality factor is \( q_0 S(1-V) \). If a company reinsures an amount of sum assured \( R \), using the risk premium method, then the reinsured amount in each year is

\[
R(1-V), \quad \text{pre} \quad t = 0,1,2,\ldots,n-1.
\]

So if the reinsured person died in the first year, the reinsurer pays an amount (\( q_0 V = 0 \)) \( R \) to the ceding company. If death occurs in the following years (because \( V_t \) is increasing) the amount paid to the ceding company by reinsurer is decreasing.

There are two approaches commonly used to determine the amount of the sum at risk each year that is reinsured. In the case of the risk premium method the methods corresponding to the methods of coinsurance are

- the constant retention method - the excess, if any, of the sum at risk above a specified amount is reinsured

- the reducing retention method - a specified percentage of the sum at risk is reinsured.

Under the CRM the ceding company begins with retaining at \( S-R \) and reinsured amount decreases (as the reserves increase)

\[
(S-S_{0} V) - (S - R) = (R - S_{0} V).
\]
So at the beginning (reserve is zero) the retained sum is constant $S - R$ and is constant, but the reinsured amount is decreasing (and positive) till it reaches zero (reserves increase) at which time the reinsurance ceases.

Under the RRM insurer reinsures from sum at risk the part $R - R_r V$ and the retained sum is

$$\left(S - S_r V\right) - \left(R - R_r V\right) = (S - R)(1 - V).$$

So at the beginning (reserve is zero) is reinsurers retention limit $S - R$ constant and decreases over the full term of the policy as the reserve increases.

In summary, the retained sum at risk under RRM decreases at the same rate as the sum at risk under the retained portion. Under the CRM, the reinsured sum at risk decreases at the same rate at which the reserves under the original policy increase.

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<tr>
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<th>CRM</th>
<th>RRM</th>
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<tbody>
<tr>
<td><strong>Total sum at risk</strong></td>
<td>$S - S_r V$</td>
<td>$S - S_r V$</td>
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<tr>
<td><strong>Reinsured amount</strong></td>
<td>$\max{R - S_r V, 0}$</td>
<td>$R - R_r V$</td>
</tr>
<tr>
<td><strong>Retained sum at risk</strong></td>
<td>$\min{S - R, S - S_r V}$</td>
<td>$(S - R)(1 - V)$</td>
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Risk premiums are usually paid annually, irrespective of the frequency of payment of premiums under the original policy, but monthly risk premiums may be paid for certain unitised policies. The risk premium paid will reflect the probability of a claim arising in that year associated with the expected value of the benefits payable under that claim.
**Risk premium with financing commission.** The risk premium reinsurance method can be associated with a financing arrangement whereby the reinsurer relieves the ceding company of part of its new business financing requirement.

### 3. Non-proportional methods

The non-proportional reinsurance is used primarily to reduce fluctuations in total claims. Under each of these forms, the reinsurance risk and coverage applies to a block of risks, not to individual risks.

#### a) Catastrophe reinsurance

The aim of catastrophe reinsurance is to reduce the potential loss - to the ceding company - due to any non-independence of the risk insured. So it protects the ceding company against multiple single claims from a single event such as a plane crash, a fire or some other accident or natural disaster. The cover is usually only available on a yearly basis and has to be renewed each year. The covered events must be carefully defined and may exclude epidemics, wars, nuclear hazards or certain specified events. Reinsurance protects the company from unplanned random concentrations of risks or claims.

The reinsuring company will agree to pay out if a “catastrophe” - as defined in the reinsurance contract - occurs. There is no standard definition of what constitutes a catastrophe, but typically to qualify there needs to be a minimum number - say 5 - deaths from a single incident with the deaths occurring within a specified time - say 48 hours - of that incident. The reinsurance contract will also specify how much the reinsuring company will pay if a catastrophe occurs.

#### b) Stop loss

Stop loss coverage provides protection against an excessive number or amount of claims in any given contract period. It is a form of reinsurance under which the reinsurer pays some of all of a ceding company aggregate claims in excess of a predetermined amount (attachment point). For life insurance stop loss applies to a block of policies, not just to one life. It is used more commonly in conjunction with proportional reinsurance.
c) Spread loss

Spread loss is a form of reinsurance under which premiums are paid during good years to build up a fund from which losses are recovered in bad years. This agreement provides coverage if a company’s losses in a given year exceeded a specified attachment point. Which together with reinsurer’s participation can be defined in a manner similar to that used for stop loss. If a claim occurs, the reinsurer would pay the ceding company and the ceding company would repay the amount of claim with interest over a period of years, thus spreading the loss.

In this traditional form, spread loss reinsurance is not really a form of reinsurance, but is more a means of changing the timing of cash flows. In essence spread loss reinsurance is a type of loan.

References.