Professional Certificate in Reinsurance Risk Analysis

Introduction to Reinsurance

Reinsurance is a critical component of the insurance industry, involving the transfer of risk from one insurance company to another. The following key terms and vocabulary are essential for understanding Introduction to Reinsurance in the course Professional Certificate in Reinsurance Risk Analysis.

1. Reinsurance: A contractual agreement between two insurance companies, where the ceding company transfers a portion of its risk to the reinsurer in exchange for a fee, known as the reinsurance premium.
2. Ceding Company: The insurance company that transfers a portion of its risk to a reinsurer.
3. Reinsurer: The insurance company that accepts a portion of the risk from the ceding company.
4. Reinsurance Premium: The fee charged by the reinsurer to the ceding company for accepting a portion of the risk.
5. Treaty: A reinsurance agreement that covers a specific period, such as one year, and typically includes a set of conditions and terms that govern the relationship between the ceding company and the reinsurer.
6. Facultative Reinsurance: A type of reinsurance where each individual risk is evaluated and accepted or rejected by the reinsurer on a case-by-case basis.
7. Proportional Reinsurance: A type of reinsurance where the reinsurer assumes a fixed percentage of each risk accepted by the ceding company.
8. Non-Proportional Reinsurance: A type of reinsurance where the reinsurer only assumes risk above a certain threshold, known as the retention limit.
9. Retrocession: The process of transferring risk from a reinsurer to another reinsurer.
10. Gross Premium: The total premium collected by the ceding company for a policy.
11. Ceded Premium: The portion of the gross premium transferred to the reinsurer.
12. Net Premium: The portion of the gross premium retained by the ceding company after the ceded premium is deducted.
13. Loss Ratio: The ratio of claims paid to premiums earned.
14. Expense Ratio: The ratio of expenses incurred to premiums earned.
15. Combined Ratio: The sum of the loss ratio and expense ratio. A combined ratio greater than 100% indicates that the ceding company is incurring losses, while a combined ratio less than 100% indicates that the ceding company is generating underwriting profit.
16. Excess of Loss Reinsurance: A type of non-proportional reinsurance where the reinsurer only assumes risk above a certain threshold, known as the deductible or retention limit.
17. Stop Loss Reinsurance: A type of excess of loss reinsurance that provides protection against large losses in a single policy or a portfolio of policies.
18. Aggregate Excess of Loss Reinsurance: A type of excess of loss reinsurance that provides protection against the total amount of losses incurred during a specific period.
19. Quota Share Reinsurance: A type of proportional reinsurance where the reinsurer assumes a fixed percentage of each risk accepted by the ceding company.
20. Surplus Share Reinsurance: A type of proportional reinsurance where the reinsurer assumes a fixed

percentage of the ceding company's surplus, which is the amount of capital above the minimum required by regulators.
21. Adjusted Loss Ratio: The loss ratio adjusted for reinsurance, which takes into account the portion of claims paid by the reinsurer.
22. Reinsurance Credit: The amount of claims paid by the reinsurer that is credited to the ceding company's loss ratio.
23. Reinsurance Recoverable: The amount of claims that the ceding company expects to recover from the reinsurer.
24. Gross Loss: The total amount of claims incurred by the ceding company.
25. Ceded Loss: The portion of claims transferred to the reinsurer.
26. Net Loss: The portion of claims retained by the ceding company after the ceded loss is deducted.

Example:

Assume that a ceding company writes a policy with a gross premium of $100,000 and a loss ratio of 70%. The ceding company transfers 50% of the risk to a reinsurer through a proportional reinsurance agreement. The reinsurance premium is 40% of the ceded premium.

Gross Premium = $100,000
Loss Ratio = 70%
Cession Percentage = 50%
Reinsurance Premium = 40% of Ceded Premium

Ceded Premium = Gross Premium * Cession Percentage = $100,000 * 50% = $50,000
Net Premium = Gross Premium - Ceded Premium = $100,000 - $50,000 = $50,000
Ceded Premium (after Reinsurance Premium) = Ceded Premium - Reinsurance Premium = $50,000 - (40% of $50,000) = $50,000 - $20,000 = $30,000

The ceding company's adjusted loss ratio is:

Adjusted Loss Ratio = (Gross Loss - Reinsurance Recoverable) / Net Premium

Assuming that the reinsurer pays 60% of the ceded loss:

Reinsurance Recoverable = Ceded Loss * Reinsurance Payment = $30,000 * 60% = $18,000
Adjusted Loss Ratio = (Gross Loss - $18,000) / $50,000

If the gross loss is $60,000, the adjusted loss ratio is:

Adjusted Loss Ratio = ($60,000 - $18,000) / $50,000 = 84%

Challenge:

Assume that a ceding company writes a policy with a gross premium of $200,000 and a loss ratio of 60%. The ceding company transfers 40% of the risk to a reinsurer through an excess of loss reinsurance agreement with a deductible of $50,000 and a reinsurance premium of 10% of the ceded premium.

Gross Premium = $200,000
Loss Ratio = 60%
Cession Percentage = 40%
Deductible = $50,000
Reinsurance Premium = 10% of Ceded Premium

Calculate the ceded premium, net premium, reinsurance recoverable, and adjusted loss ratio.

Ceded Premium = Gross Premium * Cession Percentage = $200,000 * 40% = $80,000
Net Premium = Gross Premium - Ceded Premium = $200,000 - $80,000 = $120,000

The reinsurer only assumes risk above the deductible of $50,000. Therefore, the ceded loss is:

Ceded Loss = Max(Gross Loss - Deductible, 0)

Assuming that the gross loss is $120,000:

Ceded Loss = Max($120,000 - $50,000, 0) = $70,000

The reinsurance recoverable is:

Reinsurance Recoverable = Min(Ceded Loss, Reinsurance Limit)

Assuming that the reinsurance limit is $100,000:

Reinsurance Recoverable = Min($70,000, $100,000) = $70,000

The reinsurance premium is:

Reinsurance Premium = Ceded Premium * Reinsurance Premium Rate = $80,000 * 10% = $8,000

The adjusted loss ratio is:

Adjusted Loss Ratio = (Gross Loss - Reinsurance Recoverable - Reinsurance Premium) / Net Premium

Adjusted Loss Ratio = ($120,000 - $70,000 - $8,000) / $120,000 = 35%

In conclusion

Reinsurance is the practice of insurers transferring portions of their risk portfolios to other parties to reduce the likelihood of having to pay a large obligation. Reinsurance risk analysis is the process of evaluating the potential risks and uncertainties associated with a reinsurance contract or portfolio.

A reinsurance agreement is a contract between a ceding company (the insurer that transfers risk) and a reinsurer (the company that accepts the risk). There are several common types of reinsurance agreements, including:

* Proportional reinsurance: The ceding company and the reinsurer share the premiums and losses in a

predetermined ratio.
* Non-proportional reinsurance: The ceding company retains a certain amount of risk, and the reinsurer is only responsible for losses above that threshold.

Reinsurance agreements can also be classified as treaty reinsurance or facultative reinsurance. Treaty reinsurance is a long-term agreement that covers a specified portion of the ceding company's portfolio, while facultative reinsurance is a one-time agreement that covers a specific risk or policy.

A key concept in reinsurance risk analysis is risk capital, which is the amount of money that a reinsurer needs to hold in order to be able to pay claims. This is typically calculated using probabilistic methods, such as the Monte Carlo simulation, which uses random sampling to model the probability of different outcomes.

Reinsurance risk analysis also involves evaluating the credit risk of the ceding company, which is the risk that the ceding company will be unable to pay its obligations under the reinsurance agreement. This is typically done using credit rating agencies, which assess the creditworthiness of companies and issue credit ratings.

Another important concept in reinsurance risk analysis is exposure management, which is the process of identifying and quantifying the potential losses that a reinsurer may face. This can be done using a variety of techniques, including:

* Scenario analysis: This involves creating hypothetical scenarios that could lead to large losses and estimating the potential losses under those scenarios.
* Value at risk (VaR): This is a statistical measure that quantifies the potential loss that a reinsurer may face over a given period of time with a certain level of confidence.

Reinsurance risk analysis is a complex and challenging field, but it is essential for reinsurers to effectively manage their risk and ensure their financial stability.

Here are some examples of how reinsurance risk analysis is applied in practice:

* A reinsurer may use probabilistic methods to calculate the risk capital required for a portfolio of property and casualty insurance policies. This will help the reinsurer ensure that it has sufficient funds to pay claims, even in the event of a catastrophic loss.
* A reinsurer may use credit rating agencies to evaluate the credit risk of a ceding company. This will help the reinsurer determine whether the ceding company is likely to be able to meet its obligations under the reinsurance agreement.
* A reinsurer may use scenario analysis to evaluate the potential losses that it may face from a major hurricane or other natural disaster. This will help the reinsurer plan for potential losses and ensure that it has sufficient risk capital to cover them.

Here are some challenges that reinsurance risk analysts may face:

* Reinsurance risk analysis often involves dealing with large amounts of data and complex models. This can make it difficult to ensure accuracy and completeness.

* Reinsurance risk analysis often requires making assumptions about future events and outcomes. This can make it difficult to accurately quantify risk and uncertainty.
* Reinsurance risk analysis is constantly evolving as new risks and uncertainties emerge. This requires reinsurance risk analysts to stay up-to-date with the latest developments and trends.

In conclusion, reinsurance risk analysis is a critical component of the reinsurance industry. It involves evaluating the potential risks and uncertainties associated with a reinsurance contract or portfolio, and using probabilistic methods, credit ratings, and exposure management techniques to quantify and manage that risk. Reinsurance risk analysts face challenges such as dealing with large amounts of data and complex models, making assumptions about future events, and staying up-to-date with the latest developments. However, by effectively managing risk and ensuring financial stability, reinsurance risk analysis plays a vital role in protecting insurers and their policyholders.