“Financial Reinsurance with Applications in Life Reassurance”
Reinhard Dehlinger
Germany

Summary

The main reasons for the growing interest in Financial Reinsurance (Fin Re) concepts are the lack of capacity and high reinsurance premiums for very volatile risks. The key questions of Fin Re are

- How does Fin Re differ from a pure credit or investment?
- What are the risks of the reinsurer?

In Fin Re treaties, often only a timing risk is transferred. This risk consists in claims that have to be paid out earlier than expected and so interest earnings are lost.

Fin Re agreements are often multi-year and involve the calculation of a yearly experience account with the result carried forward with interest to the next year; profit and losses are shared at the end of the duration. Examples of the functions of Fin Re for the insurer are the improvement of solvency parameters, financing or the acceleration of embedded profits.

Models of Fin Re may be retrospective (claims already incurred) or prospective (claims not yet incurred). An example of a retrospective cover is a loss portfolio transfer. A so-called funded cover or the financing of high 1st year commissions of a life assurer are prospective covers. The securitization, which is a financing provided by an investor of the capital market, will be described in more detail.
Zusammenfassung

Die Hauptursachen für das wachsende Interesse an Konzepten der finanziellen Rückversicherung (Fin Re) sind der Mangel an Kapazität und die hohen Rückversicherungsprämien für sehr volatile Risiken. Die Schlüsselfragen von Fin Re lauten

- Wie unterscheidet sich Fin Re von einem reinen Darlehen oder einer reinen Investition?

- Welche Risiken übernimmt der Rückversicherer?

In Fin-Re-Verträgen wird oft nur ein Timingrisiko übertragen. Das bedeutet, dass Schäden früher ausgezahlt werden als erwartet und deshalb Zinserträge verloren gehen. Fin-Re-Vereinbarungen laufen häufig über mehrere Jahre und sind mit einer jährlichen Verlaufsrechnung verbunden, bei der das Ergebnis ins nächste Jahr verzinslich vorgetragen wird und am Ende der Vertragsdauer Gewinn- und Verlust geteilt werden. Beispiele für die Funktion von Fin Re für den Versicherer sind die Verbesserung der Solvenzrate, die Finanzierung oder das Vorziehen zukünftiger Erträge.

Fin-Re-Modelle können retrospektiv (Schäden bereits eingetreten) oder prospektiv (Schäden noch nicht eingetreten) sein. Ein Beispiel einer retrospektiven Deckung ist ein Schadenportefeuille-Transfer. Ein sogenannter funded cover oder die Finanzierung hoher Abschlussprovisionen eines Lebensversicherers sind prospektive Deckungen. Die Verbriefung, die eine Finanzierung über den Kapitalmarkt darstellt, wird eingehender beschrieben.
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1. Introduction

During the last twenty years, casualty and catastrophe claim amounts have increased considerably which has resulted in a rise of reinsurance premiums for volatile risks. These changes in the reinsurance market have led to a growing interest in alternative risk transfer concepts.

Currently, approximately 5% of the world non-life reinsurance premium is from Financial Reinsurance. The key questions of Financial Reinsurance for supervisory and tax authorities are:

- How does a certain Financial Reinsurance contract differ from a pure loan or investment?
- What are the risks ceded to the reinsurer?

In this article you won’t find actuarial formulas, but the underlying concepts are based on actuarial methods.

2. Underwriting and Timing risk

For the definition of Financial Reinsurance we need to outline the meaning of underwriting risk and timing risk.

The underwriting risk is defined as the risk that the actual claims in a period of insurance deviate from the expected claims, which equal the pure risk premium. Deviations may occur from the number and size of claims as well as from the points of time of the claim events within the period of insurance.

The timing risk results from the uncertainty of time when claims have to be paid out. This is the risk that claims have to be paid out earlier than expected. That is why interest is connected to the timing risk.

Underwriting and timing risk are important criteria for supervisory and tax authorities as to whether a Financial Reinsurance contract is reinsurance or pure loan or investment.

In the U.S.A., official insurance authorities require a significant underwriting risk and the possibility of a loss to the reinsurer to acknowledge a Financial Reinsurance contract as reinsurance.

The term “Finite Risk Reinsurance” means a transfer of a timing risk and a limited underwriting risk to the reinsurer.
3. **Definition of Financial Reinsurance**

Financial Reinsurance is a proportional or non-proportional reinsurance treaty with reduced underwriting risk, but with a possible timing risk. The period of reinsurance is for several years, as the results between the direct insurer and the reinsurer are balanced out over a longer time period.

One further characterization of Financial Reinsurance is the consideration of interest in the price calculation. The interest may be calculated on the reinsurance premiums. Negative interest may be charged from the time of a claim payment to the end of the period in consideration.

There is often a calculation of an experience account. The basic scheme is the following:

<table>
<thead>
<tr>
<th>Income</th>
<th>Outgo</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reinsurance premiums</td>
<td>Claims</td>
</tr>
<tr>
<td>Interest earnings</td>
<td></td>
</tr>
</tbody>
</table>

The result is carried forward with interest to the next year.

If the balance at the end of the treaty period is positive, a large share of the balance will be returned to the insurer. Sometimes the insurer will retain a certain share of the balance, if it is negative.

A deficit account in a Reinsurance Financing agreement is an example of a balance carried forward. At the beginning of the reinsurance the reinsurer pays a commission to the ceding company, which results in a negative balance in the first year. The results are carried forward each year with an interest rate negotiated between the parties. If the deficit account becomes positive, the ceding company can withdraw the reinsurance. The introduction of a deficit account does not mean that the amortization at the interest rate will be certain.

4. **Functions of Financial Reinsurance**

One major function of Financial Reinsurance is to distribute an extraordinarily negative or positive expected underwriting result of the ceding company in a certain year over a time period. In this way, Financial Reinsurance stabilizes the business result of the year considered. Examples are Reinsurance Financing (if the ceding company expects a negative result) and a Funded Cover (if a high positive result is expected). In a Funded Cover, a reinsurance premium is funded with the reinsurer to cover reinsurance claims in later years.

The opposite approach is to create a highly positive underwriting result in a year by bringing future earnings forward. An example is “taking out a loan” on the embedded value of a life assurance company’s portfolio. In this case, the reinsurer pays a commission equal to the embedded value, which is amortized during the run-off of the
underlying portfolio. The Embedded Value Financing can be used by an investor in the acquisition of a life assurance company.

Another function of Financial Reinsurance is to improve key financial figures such as the amount of risk based capital or premium to surplus ratio, which have to be shown to rating agencies and market analysts, or to improve solvency parameters (Surplus Relief).

Sometimes Financial Reinsurance can take advantage of differences in taxes or supervisory rules of countries (country arbitrage).

Financial Reinsurance

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Functions

Distribution of positive or negative results over a time period

Bringing future earnings forward

Improvement of key financial figures
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5. Models of Financial Reinsurance

One distinction can be drawn between retrospective models, if claims have already been incurred before the beginning of the reinsurance treaty, and prospective models, if claims have not been incurred.

The standard example of a retrospective model is a loss portfolio transfer. The reinsurer accepts a 100 % quota share of the claim reserves of a portfolio and pays the sum of the discounted expected future claim payments to the ceding company. The insurer leverages the future investment earnings und converts them into current technical earnings. Loss Portfolio Transfers appear in long tail branches and are hardly known in life assurance. Also in life assurance, claim reserves, e.g. for long term disability, are calculated as the present value of future annuities with a technical interest rate, so future interest earnings are already brought forward to a large extent.

Examples of prospective Financial Reinsurance are Reinsurance Financing, Spread Loss and Funded Cover.

Reinsurance Financing is applied in long duration business like life assurance where high first year commissions are paid. The reinsurer refines the insurer by paying a first year reinsurance commission. The amortization is provided by mortality gains or excess interest on deposits in modified coinsurance arrangements.
Spread Loss means simply that the reinsurer reimburses the insurer for a large claim, which is repaid with interest in the following years. In a pure Spread Loss there is no underwriting and timing risk for the reinsurer.

The idea of a Funded Cover is that the insurer builds up funds with interest with the reinsurer. These funds are used to pay large future claims for which there is a lack of capacity, e.g. for catastrophe risks. In life assurance Funded Covers might be applied in reinsuring the longevity risk. Funds are build up when the lives are active and are used when the lives receive their old-age pension.

A Funded Cover which involves an underwriting and a timing risk may be described as follows:

The insurer pays yearly premiums to the reinsurer. The reinsurer pays claims to the reinsurer according to the reinsurance agreement. All payments are booked in an experience account. Positive balances are credited with interest. Negative balances may be debited with lesser or no interest to include a timing risk for the reinsurer. If at the end of the reinsurance period the experience account is positive, the reinsurer will pay a large share of it to the insurer as a profit participation. If the experience account is negative, the insurer pays a smaller share of the absolute value to the reinsurer or no share as a loss participation to include an underwriting risk for the reinsurer.

Models of Financial Reinsurance

![Models Diagram]

6. Securitization

Most of the life assurance companies pay a first year commission to their sales representatives for any policy sold. The first year commission is amortized during the duration of the policy by an acquisition expense margin calculated in the premium. If a company’s new business is large and the first year commission cannot be activated in statutory accounting, the company will sustain a substantial surplus strain.

In a Reinsurance Financing treaty, mostly a modified coinsurance arrangement with the company, a reinsurer may pay a first year reinsurance commission to refinance the company. The reinsurance commission will be amortized by mortality profits, interest
on a deposit, additional reinsurance premiums or commissions reduced. It is required
that the pay-back is not certain and under risk of mortality and lapse or of the
portfolio structure like entry age, duration and sex and sometimes of capital market
risks. Otherwise the Reinsurance Financing is similar to a loan and the company will
normally have to book the Financing as a debit in statutory accounting, which offsets
the whole deal.

If a reinsurer supports a lot of ceding companies with refinancing, he will also suffer
from a large statutory surplus strain. A large reinsurer might refinance himself by risk
profits or by amortizations of past Financing Reinsurance treaties. Smaller and
medium-sized reinsurers have to look for other refinancing facilities. If the reinsurer
asks his shareholders to provide capital for investment into Reinsurance Financing
treaties, the standard shareholder’s required rate of return will be 15 % after tax.

Another consideration of the reinsurer is the expected rate of return from Reinsurance
Financing. The rate of return required is

\[ i = a + x. \]

“a” is the low risk rate for the average expected duration of a newly reinsured
business. “a” may be equal to a state bond return with the same duration at the time
the reinsurer pays his first year balance to the company.

“x” is the margin, which is dependent on the risks involved in the reinsurance
amortization like mortality, lapse, entry ages, durations and sexmix of the underlying
policies or capital market risks like the performance of an investment fund under a
unit-linked policy. “x” will also include factors for the credit risk (rating) of the
ceding company, the expenses of the reinsurer and his capital costs, because the
investment of the reinsurer into a Reinsurance Financing treaty will employ capital to
cover risks involved. Normally the expected rate of return required will be below 10
%. Higher returns will not be accepted by the life assurers.

A reinsurer doesn’t operate as a bank. A bank can refinance his loans by using the
investments made by their clients into the bank and earn on the interest margin. A
reinsurer doesn’t have these kinds of funds available to use them for Reinsurance
Financing.

A reinsurer might retrocede his Reinsurance Financing treaties to another reinsurer
but then he loses a large part of his margin.

Finally the reinsurer might conclude that he should refinance via a securitization of
his Reinsurance Financing treaties. This means that refinancing is provided by the
capital market. The securitization will have a certain maximum refinancing volume
(e.g. 100.000.000 USD) for a number of underwriting years of new Reinsurance
Financing treaties.

Other forms of securitizations relate to a whole inforce portfolio of a life assurer. The
life assurer or a buyer of the life assurer wants to leverage the embedded value of the
portfolio. The whole portfolio is ceded in a block assumption and the reinsurer pays a
single commission to the insurer.
In a typical securitization, the reinsurer retrocedes his Reinsurance Financing treaties to a retrocessionaire located in a country where first year commissions can be activated in statutory accounting and where the retrocessionaire can issue commercial papers to investors of the capital market. Sometimes the retrocessionaire is a carrier established only for this transaction and is called special purpose vehicle (SPV). A part of the insurance technical risks like mortality is retroceded to guarantee a transfer of risk, the other part is retained. The retrocessionaire pays a first year commission corresponding to the original reinsurance commission to the reinsurer.

The retrocessionaire issues commercial papers to investors of the capital market. The total amount of these notes corresponds to the refinancing volume. The investment of the investors is amortized by the cash flow of the underlying Reinsurance Financing treaties.

A standard term of the commercial papers is a variable interest rate linked to 3 month Libor. The investors expect a certain shape of the cash flow and a guaranteed amortization including interest within 10 years. The terms of the retrocession agreement have to be defined so that the expected retrocession cash flow will meet these expectations with a certain probability, to some degree also in the case of negative deviations.

If the retrocessionaire cannot give the guarantee of amortization to the investors and doesn’t have a very good rating, a stop loss reinsurance of the retrocessionaire has to secure the cash flows. The stop loss reinsurer should be different from the reinsurer to make sure that the whole transaction is not seen as a loan to the reinsurer. It is important for the investors that the credit risk (rating) of the stop loss reinsurer is very good. The stop loss reinsurer has to guarantee also a shortfall of the reinsurer for the amortization.

The structuring investment bank and the retrocessionaire require a fee for their services; also the stop loss premium has to be financed. With the whole package the reinsurer will be able to earn a spread of interest between the original expected rate of return and the total costs of this securitization, but he has to keep a large part of the technical risks.

The whole process for closing the securitization is complex and time consuming. This comes from the fact that the different insurance and banking cultures have to be considered. It is also difficult to set up the guarantees required by the capital market investors. One year of preparation is not unrealistic.

Finally after closing of the securitization, the reinsurer has obtained an important tool to support his growth and to meet the financing needs of his clients.
Model of a Securitization
(Vehicles of Refinancing)

Ceding Company

Original Reinsurance Treaty

Reinsurer

Retrocession Treaty

Retrocessionaire

Issue of Commercial Papers

Investors of the Capital Market

Stop Loss Treaty

Stop Loss Reinsurer