The New “Schwankungsrückstellung” in Annual Statements of German Insurers An Application of the Theory of Risks* ?

by Walter Karten**

1. Subject and goal of this study

The word “Schwankungsrückstellung” (SR), an item shown as a liability on annual statements and which is quite unique to the German insurance industry, has a very special meaning. The term is not amenable to precise translation into English. Such terms as fluctuation reserve, adjustment reserve, equalisation fund or contingency reserve do not really get to the heart of the matter.

This “Underwriting reserve for the equalisation of fluctuations in annual underwriting claims” has been in existence for some 50 years. Its use was mandated by the Federal Supervisory Authority for the Insurance Industry and is recognized as a liability for the purpose of calculating taxable income by the Corporate Income Tax Law.

Throughout its existence this item has been a matter of dispute in industry literature and a subject of controversy and compromise between insurers, regulatory and fiscal authorities. A precise definition of its purpose or, rather, its function (which might, perhaps, be expressed in a mathematical formula), other than the preceding quote, cannot be found in official sources. Be that as it may, what we are dealing with is not in the truest sense a fund which requires stipulated (separated) assets. Neither is the problem of solvency directly addressed; SR is not – in my opinion mistakenly so – mentioned in the catalog of company capital to cover solvency margin in the EC-directive.

From the insurers’ viewpoint it has become almost exclusively a tax problem.

The basic idea is obvious and simple – in profitable years insurers establish reserves to cover excessive claims in adverse years.

In one form or another this idea is reflected in the assessment of underwriting reserves in other countries too. Insofar as I can determine, however, in no other country are there such detailed legal stipulations of requirements for such a balance-sheet item regarding its amount, and, in particular, its increase and decrease. Not the least of the reasons for this probably is that the accounting theorists’ explanation of the item as “borrowed capital” (debt), and the assessment based on the theory of risks are extremely convoluted and sophisticated when going beyond what is, at first glance, quite plausible.

* Translated from German by Brigitte Trotter, Glen Ridge, USA. The paper has been presented to the sixth seminar of the European Group of Risk and Insurance Economists, Geneva, September 1979.

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In jurisdiction and literature we find not only very different, but also quite contradictory explanations of the SR's function and definition.

In any case, there is no approved measure for rating the quality of the prescribed procedure. Neither shall this be attempted here. Rather, I should like to introduce — exclusive of the special regulations governing small mutual associations as well as hail and credit insurance for instance — the basic mechanics of the SR and present it for discussion by this international body of experts. My paper does not meet the scholarly requirements of a theoretical model. I feel, however, that this piece of empiric practice bordering on both risk theory and accounting may stimulate some basic deliberations.

In particular, I am hoping to elicit your comments on the following questions:

- Is there a necessity for a special equalisation fund over and above the reserves established by company capital? Could it have a unique purpose or is it just a gradually different anteceding leveling device?
- Can it be concluded, based on axioms of generally accepted accounting practices and on risk theory that this liability item is “borrowed capital” and, therefore, tax deductible? Or could this deductibility from income be seen only as a privilege for insurance companies?
- Is the technique which I am about to explain appropriate to the circumstances?

2. Some notes regarding the history of the SR

For many years the tax burden of German insurance companies had been rising steadily. Then, in the Twenties our liability item was “invented”, by an insurer. It received official recognition in two decisions made by the Reich's Fiscal Court in 1930. It was stipulated in those decisions that SRs must be calculated according to “mathematical principles”. Subsequently, that wording was widely disputed, but then attained a special significance in the rationalization of just the latest regulation in 1978. The attempt to read into it more than just recognition of the stochastic nature of fluctuations and application of risk theory methods quite frequently has led to misunderstandings and misinterpretations. The language of the initial decision concerning mathematical principles allows no conclusions to be drawn about the amount and substance of the SR.

In 1935 a tax ordinance first formulated some requirements for establishing an SR. Currently these requirements are — almost unchanged — the only legal basis for SRs (§ 20 Sect. 2 KStG 1977, i.e. Corporate Income Tax Act).

- It must, following the prior experience of the respective branch of insurance, be anticipated that “considerable” fluctuations will occur (So called “Erheblichkeits-” clause).
- Such fluctuations must not be covered by premiums and have to originate from treaties in force at the balance-sheet date and must not be covered by reinsurance.

With the exception of the reinsurance clause, these requirements could be subject to criticisms which may be discussed later. However, and most importantly, they are subject to extremely wide interpretations. This has been demonstrated to the present day by the completely different practices adopted on the basis of these unchanged legal requirements.

In other respects, the early years of the Thirties were marked by the most intense difference of opinion and contradictory decisions by the highest courts with the tendency towards increasing restrictiveness. The result was a de-facto elimination of possibilities for establishment of SRs.

During the post-war years, capital shortages resulted in a rebirth of the SR in the initial balance-sheets following the 1948 currency reform, leading in 1952 to the first detailed regulation by the Supervisory Authority.¹

The procedure was rather simple: For specifically named branches, a percentage of underwriting profits (usually 20%, but, for example, as much as 80% in windstorm and hail insurance) had to be reserved until a specified percentage of annual premium for own account was reached (for instance 10% in health and 200% in windstorm insurance); underwriting losses were to be deducted.

This practice turned out to be lacking sufficient refinement; in some branches the SR almost invariably was at the upper limit while in others it was usually depleted.

In 1965 there was a complete reform.² The procedure became more complex and was linked more closely to individual underwriting results of the respective branches and companies extending over an observation period of 15 years prior to the balance-sheet date. The method, somewhat simplified, was as follows:

- Requirement of considerableness:
At least one annual loss ratio (claims incurred/premiums earned) within the observation period must have exceeded 18% of the average loss ratio for the period.
- Maximum reserve amount:
60% of the total underwriting losses during the previous 15 years converted by the premium income during the last fiscal year on an actual level.
- Additions to Reserve:
20% of the maximum amount or, at most, 75% of an underwriting profit.
- Decrease in Reserve:
100% of an underwriting loss insofar as is possible.

My principal objections³ to this practice were as follows:

- No guarantee existed that expected reductions would not be smaller than expected increases, with the possibility for a tendency towards continuous depletion of the SR.
- Due to the strict adherence to past experience, the reserve became more of a loss-carried-forward than a safeguard for major future losses.

¹Veröffentlichungen des Bundesaufsichtsamtes für das Versicherungs- und Bausparwesen. (VerBAV), 1952, p. 76 ff.;

²VerBAV, 1965, p. 254 ff.;

³Karten, Walter: "Grundsätzliche Bemerkungen zur neuen Schwankungsrückstellung", in *Versicherungswirtschaft* (VW), 1966, p. 1038 ff and 1089 ff.

- In the absence of a stated objective, the amount of increases, the maximum amount as well as the observation period were quite arbitrary.
- The considerableness clause bears no relation to risk theory and its definition is obscure.
- Finally, the impact of the SR was to be limited to the pure risk business in the theoretical sense and to stochastic fluctuations, which means that changes in operating expenses and long-term changes in losses (loss trends or cycles) must not influence the result.

3. Central points of current provisions

The latest directive⁴, dated 21 September 1978, has once more brought about a complete change on the same legal basis. Once again, it was a compromise worked out between insurers, regulatory and fiscal authorities over a period of many years. The directive still does not define the function and purpose of this balance-sheet entry. Something about the considerations behind it may, however, be learned from the commentaries of the co-authors. Yet more important, it seems to me, is the result and its compatibility with the principles of business administration.

The SR is allowed only in property and casualty insurance, but it is not permitted in life and health. It has to be established separately for each branch whose annual net premium income exceeds DM 250,000.—

Conditions for Establishment of SR (Considerableness Clause):

$$(1) \quad \sigma_{q_y} \geq 0.05 \bar{q}_y$$

and

$$(2) \quad q_i + c_i > 1 \text{ for at least one year of the observation period}$$

Explanation of terms:

$$\bar{q}_y = \frac{1}{15} \sum_{i=y-15}^{y-1} q_i$$

y = last fiscal year

$$\sigma_{q_y} = \sqrt{\frac{\sum_{i=y-15}^{y-1} (q_i - \bar{q}_y)^2}{14}}$$

$$q_i = \text{loss ratio } \frac{L_i}{P_i} \text{ of a given year } i$$

⁴ VerBAV 1978, p. 282 ff.

L_i = net claims

P_i = earned premiums for own account

c_i = operating cost ratio: $= \frac{C_i}{P_i^*}$ of a given year i

C_i = gross operating expense

P_i^* = gross premiums earned

$y - 1$ to $y - 15$ is the customary "observation period"

Budget Amount (= Maximum of SR):

$$X = 4.5\sigma_{q_y} \cdot P_y - P_y \cdot 3(q'_y - \bar{q}_y)^+$$

$$(q'_y - \bar{q}_y)^+ = \max \{0, q'_y - \bar{q}_y\}$$

$$q'_y = \text{"marginal loss ratio"} = 0.95 - \bar{c}_y^5$$

$$\bar{c}_y = \frac{1}{3} \sum_{i=y-2}^y c_i$$

$(q_y - \bar{q}_y)^+$ has been interpreted by Nies⁶ as safety-loading on the premium whereby $0.05 P_y$ is designed as a flat amount for general expenses not included in the individual operating expense ratio c .

Increase of SR up to "budget amount":

0.035X annually, regardless of losses occurred (called interest accretion ("Zinszuführung") by Nies⁷)

+ B (Below-average loss) = $P_y (\bar{q}_y - q_y)$ in case $q_y < \bar{q}_y$

Decrease of SR (if possible)

$$D = \max \{0, A - 0.6P_y (q'_y - \bar{q}_y)^+\}$$

$A = P_y (q_y - \bar{q}_y)$ in case $q_y > \bar{q}_y$ (= Above-average loss).

Consequently, the exact amount of the SR at the end of the fiscal year can be computed as follows:

$$x_y = x_{y-1} + 0.035X + B - D$$

$$0 \leq x_i \leq X.$$

⁵ It is $0.98 - \bar{c}_y$ for legal expenses and $0.99 - \bar{c}_y$ for reinsurance accepted.

⁶ Nies, H.: "Zur Neuordnung der Rückstellung zum Ausgleich des schwankenden Jahresbedarfs", in: VW 1979, p. 162.

⁷ Nies, H., *ibid.* p. 165.

With the exception of some special provisions, this is the process of an SR. The initial amounts P_i , P_i^* , L_i and C_i for all computations can be derived from the respective entries on the required forms. Should any of the preconditions no longer be valid, the SR is to be dissolved within a period of five years; likewise, the same is true for a decrease in the budget amount X .

The reasons behind the designation of the maximum amount for the SRs have not become known publicly. Nies⁸ states that the amount was set in such a way that it can cover, within a safety margin of 95%, the total of all possible "above-average" losses (A) during an "equalisation period". This "equalisation period" has not been defined and is not mentioned in the directive. Also, it must not be confused with the "period of observation" for the statistical computation of q and σ_q . It is stated, for instance, the equalisation period should be of such duration that the total of equitable commercial mark-ups could cover the "above-average" losses of such period. Why so? What is equitable? Many questions remain unanswered. In any case, it would appear that for branches not showing excessive claims fluctuations, an equalisation period of some ten years was deemed to be appropriate.

In case of all long-term underwriting reserves it seems reasonable that some consideration should be given to interest. It is difficult to comprehend, however, why the fictitious "budget amount" rather than the actual amount x_i should be the basis for interest.

The possible presence of a safety-loading will cause a reduction in the amount to be withdrawn for "above-average" losses. This is probably an outgrowth of the tax law stipulation that the fluctuations must not be covered by premiums. It is doubtful whether the same conclusions have to be drawn for the reduction of the budget amount. It certainly cannot be deduced from the concept of insurance production based on the model of risk business.

My observations on the suspected and published background considerations may, for now, remain inconclusive. The simple facts governing size and development of the SR may suffice for the following general aspects of its function and its character within the balance-sheet.

A survey on the effects of the new directive on the annual statements for 1978 has not, as yet, been published.

4. Possible functions of the SR

All economic endeavours are uncertain and, consequently, the annual profits of all companies are subject to more or less significant stochastic fluctuations. The results of companies engaged in the raw materials trade or the foreign exchange business show to what extent they can go. If however, at least in Germany, there is nowhere any discussion

⁸ibid. p. 158.

of introducing a balance-sheet entry comparable to the SR, we may find the reason lies solely in the dissimilarity of the underwriting risk which is unique to the business of the insurer. You may judge yourself whether this is so. In any event, no basic difference can be found with regard to the other general business risks of insurers (e.g. sales or investment risks). One could say, in the core of the insurance industry (i.e. the stochastic process of risk business), risk is not part of the framework of its business activity, but is an outgrowth of the activity itself.

It need not be expanded upon that insurance can be seen as a period-related continuous process of risk-stabilisation within a portfolio (in size) and in time.

We keep in mind: If we recognize a risk situation peculiar only to insurers as a basis for the SR, we refer to only the quantity of risk-reserve increased by a scheduled risk premium (= expected claims + safety loading), decreased by losses incurred. All other influences would have to be eliminated.

The purpose of the SR focuses on two functions which partly complement and partly contradict each other. I have called them "equalisation function" and "safety function".

Equalisation function is the task of leveling-off the annual losses-incurred by increases and withdrawals towards an average amount. If we had to deal with a known deterministic quantity, an exact equalisation could be achieved by a simple deferral item which, of course, can also change over to the assets side of the balance sheet.

As a postulate for a pure equalisation of stochastic quantities the equation:

$$\begin{array}{lcl} \text{Expected amount} & & \text{expected amount} \\ \text{of scheduled} & = & \text{of scheduled} \\ \text{increase} & & \text{withdrawals} \end{array}$$

should be used as a model for determining the process of reserve. This could be achieved most effectively (completely) by adding the exact amount of "below-average" claims and deducting the exact amount of "above-average" claims; in this case the periodic claims burden would be equal to the expected claims.

Initially, the maximum amount and the content of the item are irrelevant. But the balance of the equation will be upset as soon as the SR drops to zero and further reductions become impossible. With an upper-bound, equalisation of expected amounts of increases and decreases ⁹ can, finally, also be achieved especially by invariable collectives in the long run; however the claims figures can only be levelled to a more limited extent (SR as a random walk with two reflecting bounds).

Contrary to the equalisation function the safety function is directed exclusively at the coverage of "above-average" claims. The task is to prevent ruin of the risk business, or at least diminish its probability, by supplying adequate financial means. Naturally, this is primarily the task of funds derived from company capital and in so far subject to the question of sufficient solvency.

⁹ Halmstad introduces such a model; see *Halmstadt*, B.G.: "Most efficient fluctuation reserve", In: *ASTIN - Bulletin*, Vol. VIII, 1974, p. 66.

On the other hand, in underwriting, the necessity to provide safety-loadings in risk business in order to increase the premium influx, has been established. These loadings cannot, however, completely fulfil their function in the process of providing insurance coverage if they, just as “below-average” claims, are considered to be realized profit immediately and thus subject to taxation.

No doubt, equalisation function and safety function can be thought of separately. In practice, however, they are interdependent. Each amount reserved for the purpose of equalisation simultaneously increases the safety of the business and each financing of “above-average” claims from “safety” funds (risk reserve) has an equalising effect.

Therefore a dilemma results if both functions were intended to be fulfilled at the same time. A risk reserve to guarantee a certain probability of ruin must, strictly speaking, be a fixed amount. It could never be used the same way as equalisation payments because the degree of safety would then be reduced. But on the other side it would not have to be increased by additional amounts since there is no need for more security. This is perhaps an over-simplification, but it is intended only to elucidate that here, in reality, a compromise has to be found.

The new SR shows a tendency towards growth due to regular yearly increases of 3,5% of the maximum over the “below-average” claims and the reduced withdrawals of “above-average” claims in the case of $\bar{q}_i$ smaller than marginal loss ratio. It surpasses the scope necessary for a scheduled pure equalisation according to the above mentioned postulate. Even if only vague notions of an adequate probability of ruin during an equalisation period are at the bottom of it, the new SR does fulfil a certain safety function.

5. Company or policy-holders capital

Following this sketchy background a few theses on the rightful place of the SR as a non-taxable provision shall be put forth as a starting point of our discussion. Sufficient premium income is assumed, i.e., the risk premium earned must at least cover expected claims. Or else, in case of continuously insufficient premium, we have to set up a so-called deficiency reserve in the amount of the cash value of the expected average future underwriting losses. But even in case of sufficient premiums the probability is always 1 that, in the future, “above-average” claims sometimes will occur which cannot be covered by premiums earned that year. Therefore everything speaks for keeping “below-average” claims in reserve in this instance. If however, a “below-average” loss does indeed occur, despite all that, nothing speaks in favour of carrying it to reserve since, because of the independent realisation of claims in time the expected sum of future deviations from claims expectation is again zero. Therefore, the amount of “below-average” claims can at once be considered an ultimate profit.

Some causal relationship between periods of incoming premiums and later periods of claims payments (comparable to the “unearned premiums” or mathematical premiums reserves in life insurance) does not exist. On the other hand, from the actual occurrence of an “above-average” loss cannot be concluded that the probability of future lower than expected losses has now increased. The “above-average” loss has to be considered as realised. From this point of view there is no justification for a tax-free provision.

It also follows that, for any kind of reserve for stochastic deviations from the expected quantity, every amount earned has to be considered as company capital (part of net worth) in case of an immediate liquidation. There is no creditor who could rightfully lay claim to it.

From the safety function, on the other hand, one cannot readily derive anything but a procurement of company capital (free reserves). Conceivably it could be said that, since the existing policies will in the future result in "above-average" as well as "below-average" claims, the "above-average" claims have to be assessed higher according to the principle of conservative accounting. Consequently, this would result however, in an inflexible amount comparable to a broader claims-reserve and it would not be in a position to fulfil the equalisation function.

In my view, what is left, is only the approach via the so-called realisation principle which requires that profits may only be shown when they are realised income. In manufacturing this would be the case when production and sale have been completed, that is, when the product has been definitely sold on the market. But when is a profit realised in insurance where production takes place after the sale?

Without giving detailed explanations¹⁰ it is my opinion that there again we have to return to the model of the risk-business. According to this, portions of premiums become realised profit when they are no longer needed to increase reserves because the process has reached a certain upper bound of sufficient safety.

Such an upper limit cannot be derived from some given norms, naturally. The sufficiently small probability of ruin and its suitable definition have to be decided upon from economic view points.

A consistent application of this principle would be relatively easy to achieve. All claims-exceeding portions of a scheduled risk premium (including safety loading) would have to be added and all "above-average" claims would have to be deducted. The fact, that for reasons of solvency, a minimum safety capital has to be maintained, does not directly touch upon that process of profit realisation.

It cannot be denied that the new SR in its consequence shows similarities to the above model- but with some logical breaks.

¹⁰ See *Karten, W.*: "Zur Begründung einer sachgerechten Schwankungsrückstellung", In: *Sorgen, Vorsorgen, Versichern*, Festschrift für H. Gehrhardt, Karlsruhe 1975, p. 215.