"A survey of the Private Health Insurance in Germany"

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Summary

The paper deals with the main actuarial principles on which the calculation of premiums in the German private health insurance is based. These are the expectancy cover procedure (age provision) as well as the principle of equivalence (cash value of future benefits = cash value of net premiums, at time of calculation). Besides each of the fundamental factors is described. Furthermore the generation of surplus and its distribution is explained.
Ein Überblick über die private Krankenversicherung in Deutschland

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In contrast to other comprehensive private insurance systems the private health insurance in Germany is defined as a system which offers insurance cover for the whole life. This is an important point because it means, when calculating the premiums, you have to take into consideration all the different periods of life you are passing through. This includes the young ages as well as the old ages. From an age of 65 upwards, many people are confronted with two contrary developments. On the one hand becoming a pensioner mostly leads to a lower income. On the other hand, as far as health is concerned, these people have higher claims because they need more medical treatment.

The following paper summarizes the main characteristics of the private health insurance system from an actuarial point of view. The statements are applied to adults (minimum age 20) in the comprehensive health insurance which offers cover for the cost of outpatient, hospital and dental treatment.

The basic principle of premium calculation in the private health insurance is the so-called principle of equivalence. This means that over the entire period ensured (normally life-long) the total of the premiums must match the total of the benefits, including the expenses caused by the writing and administration of the policies, for each category of equivalent risk. The premiums are calculated for each insured person on the basis of the risks involved, according to the principle of equivalence and are thus always adjusted to the individual health risk. The magnitude of the individual health risk is determined by the benefits under the tariff, the person’s age at the start of the insurance cover (entry age) and the insured’s sex. The premium remains unchanged throughout the insured period if the actual benefits granted match those on which the calculation of the premium is based. In reality, caused by cost increases of public health, the benefits and (as a consequence) the premiums are changed throughout the insured period. The principle of equivalence is therefore only fulfilled at the moment of calculation and is thus static.

Since, on the one hand, health-related expenditure rises in step with age for almost all tariffs but, on the other hand, neither the premium may be raised nor the benefits may be reduced as the insured grows older, this must be taken into account when calculating premiums. Therefore the part of the net premium (description on page 2), which is not used for current benefits (risk premium), is accumulated with interest in the so-called age provision. Doing so, the increasing risk that accompanies rising age is taken into consideration. The calculation of premiums is thus based on a mathematical model that makes it possible to ensure constant fulfilment of an insurance contract.
Illustration 1: diagram of net premium and risk premium

The net premiums are calculated with actuarial principles using the following fundamental factors:

- mortality tables
- other pattern of lapses except of death
- technical rate of interest
- claims per capita

When determining these actuarial factors, due consideration have to be paid to any emerging trends.

Besides the probabilities of death the probabilities of abnormal lapses, which have a premium-reducing effect, have to be considered. The age provision accumulated up to that point is forfeited in favour of the insured community. The age provision is thus a collective reserve not belonging to an individual person. Because of this the insured is not entitled to the surrender value in case of withdrawal from the insured community.

Although general mortality tables are available, probabilities of abnormal lapses are company-specific. The level of these probabilities is particularly dependent on the age of the insured. (There seems to be a connection to the time spent in the tariff, respectively in the undertaking, since entry, too, as 'the higher the age provision the lower the probabilities of abnormal lapses', but this is not considered in the calculation directly); the sex and the type of insurance cover is less important. The determination of these probabilities is very important because on the one hand it must be ensured that they are not set too high so as to preclude as far as possible any drop to a lower level in future, which would lead to a lack in the age provision. On the other hand they must not be set too low that the age provision becomes unduly high since this jeopardizes recognition of the latter for tax purposes.
Illustration 2: Probabilities of lapses

The technical rate of interest must not exceed 3.5% (according to the order of calculation).

In order to take account of the increasing risk with rising age, the average number of claims per capita is calculated per annum by age and sex. It is recommendable to express the claims per capita as a product consisting of a basic claims-per-capita value (so-called profiles) and an average claim per capita. By means of the profiles, which are greatly dependent on the type of benefits promised, one can realize the age dependency of the claims per capita. (Usually the age with the highest density is taken as a reference age, then its profile value is 1). Owing to a low density especially at the advanced ages, the values that occur often deviate considerably from a (anticipated) smooth curve. Therefore, in order to determine more accurately the extent to which the risk depends on age, the observed values are smoothed by applying a mathematical (compensation) procedure.
Illustration 3: diagram of typical profiles

The average claim per capita is age-independent but mostly sex-dependent. When determining the average claim per capita value, particular importance attaches to the assessment of the trend and to the period for which the calculation is to last (in the order of calculation it is required that the values should be calculated with such care that they can be assumed to be usable for at least one year).

When calculating net premiums, it must be taken into consideration that, in conformity with the principle of equivalence, the cash value of premiums and that of benefits must be equal over the entire period insured. The elements of the pattern of lapses must therefore be incorporated in the calculation.

In order to proceed from net premiums to gross premiums, account must be taken of the expenses incurred through the writing (subdivided into direct (e.g. commissions) and indirect acquisition expenses) and the administration (subdivided into loss settlement and other administrative expenses) of a policy. Parts of the direct acquisition expenses are covered by risk-related savings from the first years of a policy. These savings occur on the one hand as a result of the risk selection in the application form (generally 'good' risks are included in the portfolio). On the other hand insurance cover usually does not start until a qualifying period is expired. Another method to cover the direct acquisition expenses is the so-called zillmerization, at which the expenses are covered by parts of the premium in the first insured years, thus adjoining the building of the age provision. In order to compensate the lacking age provision the so called zillmer-additional must be paid over the prospective duration of the insurance policy.
An adequate contingency loading is also included in the calculation of the premiums. According to the order of calculation it must not be less than 5% of the gross premium. It is usual to use fixed loadings for expenses, only the contingency loading is used as a percentage loading.

Finally, one should state that all actuarial factors should be calculated in professional standards based on cautious assumptions. Because the insurer renounces the right of ordinary cancellation, which means that the insurer is required to provide cover if the policyholder continues to pay the premium, the insurer is liable to adjust the premiums adequately if necessary. The insurer’s obligation to adjust the premiums is an essential factor in order to guarantee the fulfilment of the contract particularly if an upward trend in the cost of the medical treatment can be recognized.

This compulsory adjustment of a tariff in line with changed actuarial factors is regulated in the so-called accommodation clause, which is set by law. Whether the accommodation clause may be applied to a special tariff, this is fixed in the so-called general insurance conditions, which exist for every tariff. According to this clause the average claims per capita have to be proved every year. Only if the ratio of the expected benefits in future compared with the calculated benefits deviates more than a laid down percentage, the insurer is allowed to review the premiums and, if necessary, to adjust the premiums. In addition, in order to protect the insured, the insurer is allowed to adjust a premium only under agreement of an actuarial trustee, who assures that the insurer does not act arbitrarily.

Another way of changing the insurance cover is the conversion to another tariff, which is requested by the insured.

Both types of change must be treated from an actuarial point of view as a contracting of a new policy for specific additional benefits. Since this is sometimes rather difficult to achieve in practice, the difference in benefits not always being properly quantifiable, a different method is frequently resorted to. The same result is achieved by determining the premium for the entire changed insurance cover up to the insured’s existing age and then reducing this premium by an amount (allowance) equivalent to the age provision, inclusive of interest, accumulated thus far.

In case of adjustments full allowance must always be made for the age provision accumulated and the allowance has to be converted exactly on the basis of any new actuarial factors (changed loading and/or pattern of lapses). In case of conversions full allowance must mostly be made for the age provision, too, except when reducing the insurance cover (according to the order of calculation, the premium should preferably not fall below that paid at the original entry age).

The premium the insured has to pay after changing the insurance cover, particularly in case of improvement, cannot be equal to the one assuming the insured has contracted to the new cover since original entry age. Although many insured expect to be classified at the original entry age, this expectation cannot be fulfilled because it would lead to a (considerable) lack in the age provision, as the following illustration shows.
Illustration 4: changing insurance cover with the age of 32, entry age 27

Theoretically, this lack in the age provision could be financed without additional increasing of the premiums. On condition that the achieved net interest return reduced by the technical interest rate (so-called exceeding interest), that falls to the age provision, exceeds the cost increases of public health, this would be possible. A more detailed description of this idea is given at the end of this paper (page 6).

One of the basic actuarial principles of the private health insurance is that premiums may not be raised simply because the insured person is growing older. Parts of the premium, the investment elements, are therefore accumulated with interest, thus creating the age provision. If, with increasing age, the premiums are no longer sufficient to cover the current risk, the funds required are taken from the age provision. The annual net premium is calculated in such a way that the cash value of future benefits equals the cash value of net premiums (principle of equivalence at time of calculation). As a consequence, the age provision can be calculated from the cash value of the difference between the net premium up to the age attained and the annual net premium paid at the time of calculation.

The age provision, which represents the average risk expectation value, depends only on the tariff chosen, sex, age and policy duration.
Illustration 5: diagram of an age provision

Owing to the cautious assumptions on which the calculations are based, surpluses are achieved usually. The main sources of these surpluses are the 5% - 10% contingency loading and the exceeding interest, i.e. the achieved interest that exceeds 3.5% (technical rate of interest).

Altogether, at least 80% of all surpluses are distributed among the insured by means of orders set by law as well as by company-specific methods. The main part of the left surpluses has to be used for tax purposes. The remaining part – the profit - is partly distributed among the shareholders, the rest goes to the shareholders fund.

90% of the yield exceeding interest, that falls to the positive age provision at the end of the previous financial year, has to be credited to the insured directly. The majority of this amount has to be accumulated in an additional provision. This fund is used to reduce the increases of premiums when the insured attains the age of 65 (from this age onwards the insured can profit from this fund every year). The smaller part of this amount has to be used within 3 years to reduce the increases of premiums of the insured already being at least 65 years old (solidarity element).

The left surpluses are allocated to the provision for premium refund (so-called RfB).

A significant part of the funds available under the provision for premium refund is employed to mitigate the effects of the adjustment of premiums (so-called limitation). In this case the insured are – in the event of premium adjustments – granted a permanent premium rebate if the premium increase exceeds a predetermined percentage and/or sum; this single premium is taken from the provision for premium refund and allocated to the age provision.

Another way of distributing parts of the funds of the provision for premium refund among the insured is the direct premium return in form of a cash disbursement. For participation in such cash disbursement certain criteria have to be met, e.g. no benefits received at least in the year for which the premiums are returned. The cash disbursement should make the insured more cost-conscious and is therefore an important element of the insurer to influence the insured’s
behaviour. This controlling-element is applied most effectively to out-patient tariffs, because there it appears easiest to influence the insured, e.g. not to submit trivial bills.

Annotation:

A general cost increase of 10% leads in case of new business naturally to a rise of the premium of also 10%, because the premium to pay is equivalent to the tabular premium. This means a premium of 100 is increased to 110 (+10).

An equivalent portfolio premium may be given as 70 (that means the allowance is 30). On this portfolio premium the same cost increase (+10) leads – due to the refinancing of the age provision - to a premium of 80, which means an increase of more than 14%.

To restrict the overproportional increases of the portfolio premiums to the increases of the new business premiums in the long term, there have been carried out examinations, which calculate the 'necessary exceeding interest'. On condition that the achieved exceeding interest is directly and in full amount used to reduce the premium increases for the insured persons, one receives the following result:

To be able to pass an annual rise of tabular premiums not exceeding x% to the portfolio, one needs an exceeding interest of x% every year. If one assumes no future cost increase, i.e. a rise of 0%, the calculation interest (3,5%) is sufficient to fund age leaps and thus to guarantee life-long constant portfolio premiums. This case agrees exactly with the calculation principle in the private health insurance.

However, it is to consider that due to the '90%-law' the achieved exceeding interest cannot effectively be used directly in full amount, thus a proportional premium increase of the portfolio premiums and that of the new business is hardly to achieve, particularly not for the young ages (under 65).