Methodological Guideline
No 3/2020
of the financial market supervision units of Národná banka Slovenska
of 18 May 2020
on assessing the amount of premiums for
compulsory motor third party liability insurance

The financial market supervision units of Národná banka Slovenska (hereinafter 'NBS'), in accordance with point 3 of Section 1(3)(a) of Act No 747/2004 on financial market supervision, as amended, in order to specify the method of assessing whether premiums are determined in a way that takes into account the provisions of Act No 381/2001 on compulsory motor third party liability insurance (and amending certain laws), as amended (hereinafter 'the Compulsory MTPL Insurance Act'), have issued this Methodological Guideline:

Article 1
Premium

(1) In accordance with Section 8(1) of the Compulsory MTPL Insurance Act, the insurer shall determine the amount of a premium so as to ensure that all insurer's obligations, including the establishment of technical provisions pursuant to other legislation, can be met in full.

(2) The premium must be sufficient to cover insurance claims and costs related to motor third party liability insurance (hereinafter 'MTPL insurance'). In the assessment of the sufficiency of the premium to cover insurance claims, NBS considers the combined ratio of gross loss and gross expense ratios (not adjusted for reinsurance).

Article 2
Loss ratio

(1) 'Loss ratio' means a ratio of the costs of insurance claims, including the establishment of provisions, and the earned premium. For the assessment of premium sufficiency, it is appropriate to use the ratio of total insurance claims, known as an 'ultimate loss', and total earned premium.

(2) As total insurance claims in respect of individual loss years are only known after several years when all claims have been reported and paid, the total insurance claims need to be estimated using appropriate actuarial methods. Estimated values shall not be used for those periods for which observed (actual) values have already been available.

(3) Chain-ladder methods are appropriate for the estimation of total insurance claims. The construction of an insurance claims triangle and a chain-ladder method are described in Annexes 1 and 2. If possible given the scope of data, losses should be divided into homogeneous groups; in the case of MTPL insurance, this means breaking them down into property damage and health damage, since their frequency and payments can vary significantly. If appropriate for these purposes, it is also necessary to recognize annuities paid from the MTPL insurance. Where such breakdown is not appropriate, for example on the assumption that chain-ladder methods are not used, the breakdown is not required. The amount of insurance claims shall also reflect

compensations for insurance claims received by the insurer.

(4) The method of calculating total insurance claims shall be identical to the method of calculating provisions; however, in the case of a more prudent approach, technical provisions may be adjusted so that their value corresponds to the best estimate without additional prudence. Such adjustment shall be justified and documented. If several methods are considered appropriate, total insurance claims may be calculated based on the results of more methods. Alternative methods should also be used to verify the calculated value. This guideline does not describe all possible methods, however, methods not described herein may also be used. The choice of a method for calculating technical provisions, as well as possible adjustments of the method for the assessment of premium sufficiency, shall be documented by the insurer in accordance with Article 265 of Commission Delegated Regulation (EU) 2015/35 supplementing Directive 2009/138/EC of the European Parliament and of the Council on the taking-up and pursuit of the business of Insurance and Reinsurance (Solvency II).

(5) The earned premium shall be the sum of total premiums which the insurer is entitled to in connection with the coverage of insurance risks during the assessment period. The earned premium does not include the premium intended to cover future risks.

Article 3
Expense ratio

(1) Insurers providing MTPL insurance shall transfer a levy amounting to eight per cent of the insurance premium received in the previous calendar year to a separate account of the Ministry of Interior of the Slovak Republic (hereinafter 'the Ministry of Interior'). This levy is part of insurers' costs and essentially represents an equivalent of indirect insurance tax; therefore, these costs shall be considered within the expense ratio in order to assess premium sufficiency for the payment of insurance claims.

(2) Insurers providing MTPL insurance shall pay annual contributions intended for the operation of the Slovak Insurers' Bureau (hereinafter 'the Bureau'), which are partly used to cover the operating costs of the Bureau and to compensate for damage referred to in Section 24(2) of the Compulsory MTPL Insurance Act. Based on the abovementioned, the annual contribution and the cost of/income from a change in the provisions for the payment of liabilities to the Bureau are of a different nature. For the calculation of the loss ratio as a degree of premium sufficiency it is therefore appropriate to include in costs the annual contributions intended for the operation of the Bureau, including a change in the provisions for the payment of liabilities to the Bureau.

(3) 'Expense ratio' means the ratio of insurers' costs related to MTPL insurance, namely operating costs (e.g. acquisition costs and administrative expenses), expenses related to the Bureau (contribution to the Bureau, including provision changes) and the levy to the Ministry of Interior, and the earned premium. Where operating costs cannot be allocated directly to MTPL insurance by the insurer, they shall be allocated based on a suitable key. The method of cost reallocation should be documented, and any changes thereto must be justified. Operating costs may also include an expected increase or decrease in costs based on the business plan and insurance portfolio developments.

Article 4
Combined ratio

'Combined ratio' means the ratio of insurers' costs according to Article 3(3), including total insurance claims under Article 2(3), and the earned premium. A formula for the calculation of the combined ratio is set out in Annex 3.

Vladimír Dvořáček
Member of the Bank Board and
Executive Director
of the Supervision and Financial
Stability Division of the
Financial Market Supervision Unit
of Národná banka Slovenska

Júlia Čillíková
Executive Director
of the Supervision and Financial Consumer
Protection Division of the
Financial Market Supervision Unit
of Národná banka Slovenska

Construction of the loss development triangle

Any loss in the portfolio of MTPL insurance contracts shall be paid either in the year when the insurance claim occurred or in the following years (hereinafter a 'development year'). If a breakdown by development years is not methodologically appropriate (e.g. due to a short history), the period of occurrence or development of the insurance claim may be broken down by quarters, or, where appropriate, an external data source may be used, e.g. market development factors. A loss triangle can either be constructed on the basis of data on payments of insurance claims only, or these payments can be supplemented by RBNS provision changes; in the latter case, the calculation shall be based on the 'incurred principle'. The salvages and subrogations received by the insurer shall also be considered in the triangle within the amount of insurance claims.

The relation between the year of insurance claim occurrence, the claim's development year and the year of its payment is as follows: occurrence year + development year = payment year.

Insurance claims for losses that occurred in the year 'i' and were paid in the year 'k', where i and k acquire values 0, 1, 2, ..., are referred to as $Z_{i,k}$. Where the last known year of payment is the year 'n', then the observed values are the values of $Z_{i,k}$, where $i+k \leq n$. Based on these values, a loss triangle of (incremental) insurance claims should be constructed as shown in Figure 1. If distorting the predictions, large-scale losses/payments should be excluded from loss triangles. Where necessary, the tail factor should be added. Any adjustments to the values of insurance claims must be documented.

Figure 1: Loss triangle of (incremental) insurance claims

Year of insurance claim occurrence	Development year (period between the occurrence and payment of the insurance claim)					
	0	1	2	3	...	n
0	$Z_{0,0}$	$Z_{0,1}$	$Z_{0,2}$	$Z_{0,3}$	...	$Z_{0,n}$
1	$Z_{1,0}$	$Z_{1,1}$	$Z_{1,2}$	$Z_{0,3}$	...	
2	$Z_{2,0}$	$Z_{2,1}$	$Z_{2,2}$	$Z_{2,3}$		
3	$Z_{3,0}$	$Z_{3,1}$	$Z_{3,2}$			
....	...	...				
N	$Z_{n,0}$					

Cumulative losses referred to as $S_{i,k}$ for the observed values are the sum of insurance claims $Z_{i,k}$ based on the following formula: $S_{i,k} = \sum_{l=0}^{k} Z_{i,l}$.

Figure 2: Loss triangle of cumulative insurance claims

Year of insurance claim occurrence	Development year (period between the occurrence and payment of the insurance claim)					
	0	1	2	3	...	n
0	$S_{0,0}$	$S_{0,1}$	$S_{0,2}$	$S_{0,3}$	...	$S_{0,n}$
1	$S_{1,0}$	$S_{1,1}$	$S_{1,2}$	$S_{0,3}$	...	
2	$S_{2,0}$	$S_{2,1}$	$S_{2,2}$	$S_{2,3}$		
3	$S_{3,0}$	$S_{3,1}$	$S_{3,2}$			
....	...	...				
n	$S_{n,0}$					

For the estimation of total insurance claims for the individual years of the occurrence of claims (the 'ultimate loss'), the unknown values of insurance claims must be estimated (the grey part of the triangle).

Estimating total insurance claims using the chain-ladder method

Chain-ladder methods are based on the assumption that there is a development trend between payments which depends on a development year, starting from the year of insurance claim occurrence, and which is represented by development factors.

1. Basic chain-ladder method

This section contains a description of a chain-ladder method. The term 'chain-ladder' may refer either to a basic type of chain-ladder methods or to a group of these methods.

Development factors must be calculated based on a cumulative loss triangle:

$$f_k = \frac{\sum_{i=0}^{n-k-1} S_{i,k+1}}{\sum_{i-0}^{n-k-1} S_{i,k}} , 0 \leq k \leq n-1$$

or if the triangle of development factors is calculated as $f_{i,k} = S_{i,k+1}/S_{i,k}$, then f_k is the average of all $f_{i,k}$ for $i = 0, ... , n-k-1$.

The loss triangle including total insurance claims are subsequently calculated based on the calculated development factors.

2. Modified chain-ladder method

As the development factors $f_{i,k}$ can indicate a trend, which can be easily detected based on a graphical visualisation, this trend should be reflected in the resulting development factor f_k; therefore a modified chain-ladder method should be used. There may be several reasons, e.g. the growth of a portfolio or a change in a claims settlement system. Different mathematical apparatus may be used to take into account possible trends in development factors, for example a weighted average or extrapolation.

3. Chain-ladder method with inflation

Inflation is not explicitly considered in the basic chain-ladder method. In order to take it into account, historical data must be adjusted for inflation and, conversely, projection should include the estimate of future inflation. However, it is necessary to determine what type of inflation affects total losses (disposal costs inflation, vehicle repair prices inflation or increase of health damage annuities).

Calculation of the gross combined ratio

The formula for calculating the gross combined ratio is as follows:

Gross combined ratio = Gross loss ratio + Gross expense ratio

Abbreviations used:
property damage (hereinafter 'PD')
health damage (hereinafter 'HD')

$$\textbf{Gross loss ratio} = \frac{\textbf{Gross claims incurred}}{\textbf{Gross earned premium}}$$

Gross claims incurred (if possible, divided into PD and HD) =
PD with prediction – received compensations of PD claims incurred (salvages and subrogations) + HD with prediction – received compensations of HD claims incurred (salvages and subrogations)

Expenses related to the Bureau = contributions to the Bureau + provision change for the payment of liabilities to the Bureau

$$\textbf{Gross expense ratio} = \frac{\textbf{Gross operating expenses + expenses related to the Bureau + levy to the Ministry of Interior}}{\textbf{Gross earned premium}}$$