HUK-Coburg Coburg, 31. Januar 2012

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Comments on the current pre-consultation paper on methods for the calculation of undertaking specific parameters including an alternative approach for the calculation of premium risk

Abstract. The purpose of the following elaborations is a discussion of the current pre-consultation paper on methods for the calculation of undertaking specific parameters. We shall mainly focus on premium risk. Moreover, we outline an approach for the calculation of premium risk, different to the one presented in the pre-consultation paper. There, the calculations are mainly based on expected loss ratios, which are strongly influenced by underwriting cycles and, hence, do not reflect premium risk appropriately. Our approach, which we believe is more appropriate for lines of non-life insurance with underwriting cycles, bases the calculation of premium risk mainly on the volatility of (ultimate) claims loads (average of ultimate claims cost per risk) taking into account existing trends. The volatility of premiums itself is assumed to be negligible. Premiums are based on management decisions and can therefore be predicted very precisely with low volatility.

According to Article 104 of the Directive 2009/138/EC, undertakings may replace a subset of the parameters used for the various risk modules by undertaking specific ones; such parameters shall be calculated using standardised methods. In the currently discussed pre-consultation paper on methods for the calculation of undertaking specific parameters (USP) such standardised methods are outlined. Undertakings are – when deciding to replace such parameters by USP's – obliged to choose from this given list. Moreover, adjustments to given methods – for example in order to better reflect the undertaking specific risk situation – are not allowed.

In the case of premium risk – which we shall be focusing on – the calibration is mainly based on the following assumptions. Firstly, the variance assumption uses a mixing parameter approach combining the approaches of it being linear or quadratic in exposure, with exposure being defined as earned premiums. Secondly, the expected loss ratio is constant over the years. And thirdly, aggregate losses follow a lognormal distribution.

From our point of view it should be stressed that this approach has not yet been tested widely. The existence of a mixing parameter in all cases is unclear and the question whether a lognormal approach is the most appropriate choice remains open. The main shortcoming, however, is the use of premiums as measure for exposure. Premiums strongly depend – for certain lines of business, e.g. motor insurance – on underwriting cycles, making them a rather poor proxy for exposure, since they are mainly driven by management decisions. Hence, premium risk will strongly depend on the variation of underwriting cycles, which will result in solvency capital requirements being unnecessarily increased. From our experience, the current approach will lead to an SCR in motor insurance being more than twice the amount actually required (here we compare the proposed method with our method presented in the latter part of this paper). This fact has already been acknowledged by the Joint Working Group on Non-Life and Health NLST Calibration (JWG) in their most recent report on "Calibration of the Premium and Reserve Risk Factors in the Standard Formula of Solvency II". However, a more suited approach to premium risk was not presented.

The arguments discussed above show, that the currently given standard method for premium risk will not be adequate for certain lines of business. Hence, from our point of view there should be more leeway as to what methods can be used for the calculation of premium risk

and for USP's in general. Fixing only a few **binding** methods – as it is currently done in the pre-consultation paper – is not adequate. Standard methods and the corresponding models need to be sufficiently flexible in order to be able to reflect aspects of different lines of business appropriately.
As a result of the above, we suggest that the list on methods for the calculation of USP's should be extended. Moreover, undertakings should be allowed to adjust given standard methods – following clear and well-defined principles – in order to appropriately reflect their specific risk situation.

An alternative approach for the calculation of premium risk

We shall dedicate the rest of this elaboration to outline a different approach to premium risk, based on the variation of (ultimate) claims costs with respect to existing trends. In this way, the influence of underwriting cycles is completely eliminated, hence, yielding a more adequate method for premium risk.

Premium risk covers the risk that earned premiums in the next 12 months are insufficient to cover claims incurred (including administrative expenses) during the year either by contracts in force or new contracts written in the next 12 months. Hence, we consider the following loss-function

$$L = P - C - E,$$

with premiums P, (ultimate) claims C (including claims management expenses) and expenses E all being independent. For simplicity, we shall consider P and C gross of reinsurance, which may clearly be refined in a second step to include reinsurance. Moreover, in order to eliminate effects induced by the varying size of the portfolio, we shall consider L^*, defined as follows

$$L^* = P^* - C^* - E^* = P/N - C/N - E/N,$$

where N denotes the size the underlying portfolio.

Premium risk is basically given as the volatility of L^* weighted with portfolio size N, which itself (as P, C and E are independent) is composed of the volatilities of P^*, C^* and E^*. We shall assume that the volatilities of P^* and E^* are zero. This assumption is based on our experience and mainly motivated by the following reasoning which is specific for the german market. We strongly believe that our assumptions hold true in general.

Volatility of N: Firstly, we need to consider the volatility of N. From our experience, the prediction of the portfolio over a one year period is not overly complicated. For this, based on our experience, a prediction error of less than 0.5% seems realistic. For example, for motor insurance the only difficulty arises in predicting new contracts and cancellations for the 1st January (due to main renewal date). The prediction of the portfolio for the rest of the year is more straightforward. Hence, only the portfolio changes on the 1st January constitute any real volatility in the size of the portfolio. This volatility however is of no importance, since when calculating the SCR (which is done well after the turn of the year) the 1st January will have happened. For other german portfolios, such problems do not occur, making the prediction even easier. Hence, no volatility of any materiality arises from N.

Volatility of E^*: We assume that claims management expenses are included in C and E to consist basically of administrative expenses. Administrative expenses, however, are subject to management decisions and, hence, easily predictable. Their volatility is therefore of no materiality and shall be excluded from further consideration.

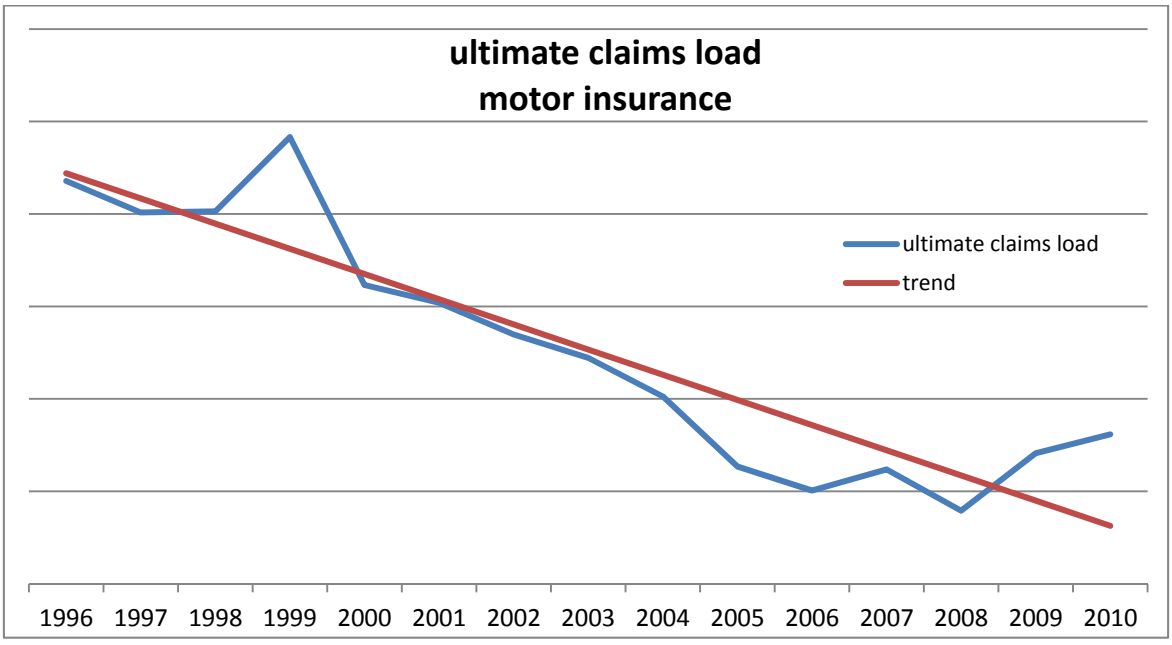
Volatility of P^*: The prediction of (average) premiums over a one year period (for SCR purposes) is directly linked to the size of the portfolio and not overly complicated either (see section on volatility of N). For this, based on our experience, a prediction error of less than 0.5% seems realistic.
Therefore, the volatility of (average) premiums for SCR-calculation purposes can often be assumed to be of no materiality and shall therefore be excluded from further consideration.
This draws a very clear picture for handling premiums itself in the context of premium risk. Namely, the volatility of premiums arises solely from the changes in the level of premiums. This, however, is partly a management decision and constitutes no real volatility and, hence, is not considered in the context of premium risk.

Since the volatilities of P^* and E^* are assumed to be zero, only the volatility of C^* needs to be considered for premium risk. Here, our approach is as follows.

Volatility of C^*: The only input that constitutes a significant volatility are (ultimate) claims loads (average ultimate claims cost per risk), since the prediction of claims volatility and claims costs is not straightforward.

As a result of the above, the volatility of L^* is given by the volatility of C^*. Hence, it only remains to determine the volatility of C^*.

Putting all this together, we see that in order to calculate premium risk, one only needs to consider the volatility of (ultimate) claims loads. This can, of course, be measured using the variance of (ultimate) claims loads. The ordinary variance will however (under certain circumstances) overestimate its volatility. This is for instance the case when (ultimate) claims loads show a distinct trend over the years. In motor insurance for example (ultimate) claims loads show a falling trend over the last two decades due to falling claims frequency (see the following picture).



In such cases, calculating the volatility via the variance with respect to existing trends should be favoured. This will yield a more adequate approach to premium risk, since only the actual and substantial volatilities are taken into account.

Summary. The arguments given above show that the currently proposed method for premium risk is not adequate for lines of business depending on underwriting cycles. The alternative approach presented mends the shortcomings of the proposed method, giving a better method for the calculation of premium risk. We propose that our approach should be included in the list of standardised methods. Moreover, we propose that undertakings are allowed to modify standardised methods in order to appropriately reflect their specific risk situation.