

Actuarial Function Assessment on Profitability and Underwriting under the Solvency II framework

Working group members: R. Bou Harb; G. Clause; L. Cornaert; J.-C de Pooter; A. Delwarde; Ph. Demol; K. Goossens; M. Henry; H. Herbots; J. Lokasso; B. Loonbeek; A. Miller; G. Nyssen; V. Tellier; V. Wellemans

Date of validation by the group members: 27.12.2017

DISCLAIMER

No responsibility or liability is accepted by the Actuarial Function Working Group, or any Committee of the Board constituted by the Institute of Actuaries of Belgium (IABE) or any of their respective members, officers, or advisors for any loss occasioned to any person acting or refraining from action as a result of any statement, fact, figure or expression of belief contained in this document or communication.

The IABE is aware that this guidance may be accessed by non-IABE members. IABE accepts no obligation to any non-IABE members or external parties for their use and further, no responsibility or liability for any decision or loss arising from this guidance.

Purpose

The analysis of the profitability and underwriting of Insurance Undertakings constitutes a key element of insurance risk management. It consists in verifying that the insurance company is profitable for all its activities as a whole but also, for each category of insurance products, so as to insure its future financial strength.

The profitability of a company and, finally, its solvency, are based on a correct pricing combined with an appropriate underwriting policy with respect to the limits and risk acceptance. The aim of the Actuarial Function in this analysis is to identify the key elements influencing the results by namely establishing, if insofar, the profitability expected in the tariff corresponds to the actual one and, if applicable, determining which corrective measures are required.

Principles

With respect to the assessment of the profitability and underwriting, the following 3 principles need to be considered:

1. Principle of proportionality
The Actuarial Function fixes the adequate quantity and level of detail of the analyses to be performed to evaluate the profitability.
2. Appropriate granularity
The Actuarial Function fixes the adequate number and granularity of homogeneous risk groups to perform the profitability analyses.
3. Product features
The method of analysis need to be adapted to the product features and the specificities of the covers like those of credit insurance, "claims made" contracts, multi years covers (as in Disability, Health and Long Term Care, ...), etc.

Data

Several sources of information are available to perform the monitoring of the profitability of the portfolio of the Undertaking:

- The annual accounts and its annexes;
- The annual QRT's;
- Other Internal reports;
- Existing internal and external actuarial function reports and opinions including their recommendations.

The Actuarial Function can base its works on the information delivered to the NBB. However, if a segment is – or could become – not profitable, it has to use other internal sources that it judges appropriate and will identify the causes of the losses.

The profitability of the New Business and its evolution need to be analysed separately. This particularly necessary in Life and Similar to Life Insurance as the regulation limits the possibilities to adapt the tariff and other conditions of long duration contracts.

The Actuarial Function assesses the data quality of the files that underlie its analyses as required by the circular NBB_2016_31.

Life Analysis

The profitability and underwriting analysis contains 2 parts: a retrospective one and a prospective one.

The retrospective analysis

The retrospective analysis is based on the results achieved in the past until the last full year closing. This is related to the complete portfolio (new and existing business of the undertaking).

The aim is to:

- perform an analysis by sources i.e. the technical, cost, financial and reinsurance results – where the 3 first results are originated by the difference between the assumptions of the tariff and underwriting rules and their realization;
- examine the different elements of the results and their evolution by calculating ratios and key performance indicators on several past years;
- make comparison with market figures.

The detection of the main trends and outliers and the explanation of the observed movements permit to conclude on the “health” of the portfolio and its sustainability regarding the profitability and the underwriting.

Some comments are given hereunder for specific insurance classes.

Life Products with interest rate guarantee

This category of products contains :

- Classical and Universal Life products of the so called branch 21 that cover insurance risks (i.e. mortality, disability, accident) and interest risk;
- Capitalization products of branch 26 that cover interest risk for moral entities;
- Dedicated assets funds products that cover interest risk.

The technical result comes from the difference between the risk premium and death outgo's.

The cost result comes from the difference between the actual expenses of the insurer for the acquisition, the administration of contracts and the claims handling costs and the loadings set in the commercial premium.

Remark that the surrender costs and transformation costs, that can eventually be invoiced to the customer, participate in the technical or financial result, according to the accounting rules applied by the company.

The financial result corresponds to the part of the financial return on the covering assets that remains after the deduction of technical interest, investment expenses and, if applicable, the profit sharing.

The reinsurance result depends on the reinsurance cover and the reinsurance treaty.

The analysis based on the Fouret recursive formula of the mathematical reserves contributes to this actuarial analysis by permitting the detection of eventual inconsistencies between the different components of the Profit & Loss Accounts. The setting of links between the accounting and various elements of the administration like the collection of premiums, the claims handling, the reserves, etc. is also useful in this task. We also refer to the section on opinion on the reserves for additional comments.

Life Products without interest rate guarantee

This segment refers to Unit Linked products (Branch 23).

The result in this category is mainly due to the application of entry cost, administration and transfer loadings compared to the real cost. It is also possible to determine a technical result for those products with an insurance risk cover.

The prospective analysis

The annual accounts of an insurance company are based on occurred results and don't allow for future results of the existing portfolio and future new business that prevail in going concern. Therefore most of insurance companies have developed models to project future results, which allows the Actuarial Function to complete its profitability and underwriting assessment by considerations based on a prospective analysis of those projections.

Depending on the various objectives pursued by the insurance market players, several frameworks and projection models have been developed and coexist. They vary according to the following elements :

- The framework : Market Consistent – Solvency II – IFRS – ?;
- The aim : calculation of the insurance liabilities (and also the expected result), the value, the risk capital, etc.;
- The object of the analysis : business in force with/without projection of future premium (i.e. application or not of contract boundaries); new business with/without projection of future premium; future premiums.

The Actuarial Function chooses the framework and the object in function of the elements it wants to highlight in its report. Similarly to the guidance with respect to the reserves, it needs first to assess the appropriateness of the used data and its granularity, the model and the assumptions.

Once projections elements are available, it is possible to analyse the contribution of the different components of the result (e.g. by using the present value of future premiums, claims, cost, etc.) and to calculate key performance indicators (KPI). The last ones need to be adapted to the analysed portfolio (in force, new business w/wo contract boundaries, future premiums of in force portfolio) and may corresponds to standard definitions or internal definitions of the company. For instance, following KPI's are proposed in the actuarial literature and may be used:

- EV/EEV/MCEV (that refer to the same concept but differ, amongst other, for some financial assumptions) :
 - Market Consistent Embedded Value of a portfolio (MCEV) that represents the present value of shareholders' interests in the earnings distributable from assets allocated to the covered business after sufficient allowance for the aggregate risks in the covered business. The allowance for risk should be calibrated to match the market price for risk where reliably observable. The MCEV consists of the following components: Free Surplus (FS) allocated to the covered business; Required Capital (RC) and the Value of In-Force (VIF) of the covered business constituted itself by the Present Value of Future Profits (PVFP, post tax), the Time Value of Financial Options and Guarantees (TVFOG), the Frictional costs of required capital (FC), Cost of residual Non Hedgeable Risks (CNHR). The value of future new business is excluded from the MCEV.
 - Value of New Business (VNB) that is the value added by new business is calculated as difference between the economic valuation for the entire portfolio (including new business written in the year under consideration) and the economic valuation for the portfolio excluding said new business. It is calculated at point of sale (and is rolled up at the risk discount rate to the valuation date) using the same methods as for VIF.
 - Etc.
- Solvency II : Solvency II Appraisal Value of a portfolio; Solvency II New Business Value; Expected Profits arising from Future Premiums (EPIFP¹); ?;
- Internal Rate of Return (IRR) that represents the annualized effective compounded return rate" or rate of return that sets the net present value of all cash flows (both positive and negative) from the investment equal to zero. Equivalently, it is the discount rate at which the net present value of future cash flows is equal to the initial investment, and it is also the discount rate at which the total present value of costs (negative cash flows) equals the total present value of the benefits (positive cash flows);
- Return on risk-adjusted capital (RORAC) that is a rate of return where a portfolio is evaluated based on capital at risk. $RORAC = \frac{[\text{Present Value of Profit including 1st year result net of tax} + \text{TVOG}]}{\text{Present Value of SCR}}$. The RORAC is before Cost of Capital but after tac, TVOG and reinsurance;

¹ Report of the Task Force on Expected Profits arising from Future Premiums
https://eiopa.europa.eu/Publications/Reports/EPIFP_Report.pdf

- ...

The prospective analysis consists in examining the past and future evolution of the chosen measures and comparing them with market measures and with the thresholds defined in the risk appetite of the company. The detection of the main trends and outliers and the explanation of the observed movements permits to conclude on the sustainability of the portfolio and the products and their underlying tariff and underwriting rules.

The prospective view on the New Business is particularly useful to assess the current applied underwriting and product strategies as the company cannot terminate the contracts in force on its own and the regulation limits the possibilities to adapt their tariff and other conditions. If no prospective model or reporting is available, the Actuarial Function will recommend to develop them.

Non Life Analysis

The result analyses generally include a retrospective and a prospective part.

In the **retrospective analysis**, a certain number of pertinent ratios are calculated which will give a first idea of the profitability and its evolution. In addition to these calculations, a comparison of the company's ratios is performed with those of competitors or of the market as a whole (benchmarking). This analysis is generally based on statutory information.

The **prospective analysis** takes into account the profits and losses which will be generated in the future by the existing portfolio. Such an analysis implies making a forward projection and valuation of results (and profit sources) based on models. The reporting related to Solvency II, the Quantitative Reporting Templates, is a significant source of information estimated on a prospective basis.

Retrospective analysis of the Profitability

In a retrospective analysis, the evolutions of the different items and their contribution to the result are taken into account. In this case, the calculation of significant ratios over a period of some consecutive years will allow to express the main trends.

This analysis of ratios will be then completed by an **actuarial analysis** of the result.

The total result of the activity or of the products category will be subdivided into:

- a technical result,
- a cost result,
- a financial result and
- a reinsurance result.

The first three partial results are caused by the variation between the assumptions used for pricing, the underwriting rules and their realisation.

In order to explain the **technical result**, the starting point is the claims charge of the previous fiscal year (as well as the cost of occurrence years in the past). This claims charge can then be assessed in the light of:

1. Actuarial components as the frequency of claims and the average cost (per claim). A comparison with the (expected) theoretical values is possible if the underlying pricing methodology and its parameters are explicitly known;
2. The difference between new and existing contracts;
3. Tariff factors (or any other significant breakdown) used for pricing (segments, risk categories). It is possible to check the influence of the portfolio composition on the result via a scenario analysis. This analysis will allow to detect the possible existence of a positive or negative adverse selection on the company's result and will allow to simulate the likely outcome according to a market consistent portfolio.
4. An evaluation of the « actuarial claims charge » of the last fiscal year or, with other words, of the expected ultimate cost of the current year claims after treatment of all open claims of this year. This valuation is part of the study related to the claims reserve adequacy (cf. notice related to technical reserves).

The comparison with results of preceding years is recommended.

The variations of technical reserves can play an important role in the result. Therefore abnormal variations and their

influence on the result should be assessed and should be linked to the analysis on the technical reserves.

The **cost result** comes from the difference between the commissions and theoretical operational costs integrated in the pricing and the real cost.

The evolution of operational costs in parallel with the allocation system applied by the company (cost breakdown according to their nature and allocation to products or categories of products) can clearly impact the result of a branch. It is therefore very important for the Actuarial Function to be well informed about the allocation system of operational costs and about the justification of the drivers used for their repartition.

As far as the description of the system developed by the company is concerned, the Actuarial Function will refer to the contents of the questionnaire of the NBB regarding the « breakdown of operating expenses ». It will make a critical analysis of abnormal fluctuations but also of the cases where a product of a category of products would be systematically favoured.

If applied allocation keys are felt to be not realistic enough (compared to e.g. the market as a whole or to comparable companies), the impact on the result will be measured (“what-if” analysis). Based on the information provided, the Actuarial Function acknowledges the possible existence of advantages or disadvantages of scale.

The **financial result** of the « non-life » activity generally corresponds to the part of the financial return on the covering assets. If the pricing is based on an assumption of present value of the claims charge, the analysis of the financial result consists in verifying to what extent the actual return deviates from the assumption used.

In order to determine and assess the investment performance, special attention must be paid to gains and losses realized on investment performance. The Actuarial Function will have to estimate their possible exceptional nature and their impact on the financial performance and result.

The **reinsurance result** depends on the chosen reinsurance cover and on the terms of the reinsurance agreement. In addition to the Actuarial Function’s opinion regarding the adequacy of the reinsurance program, it will assess the influence of reinsurance on the result. If the reinsurance program is susceptible to have a significant impact on the result, this will be mentioned and possibly quantitatively assessed by the Actuarial Function.

Prospective analysis of Profitability

The annual accounts of an insurance company are essentially drawn up in a retrospective way.

The QRT’s present different prospective indicators, whereof triangles and the result of their ultimate development.

The evolution of these elements combined with the costs and commissions allows to set prospective Combined Ratio. In addition, the different components of the total SCR allow to determine the capital related to the underwriting risk of the non-life activity, and hence the cost of this capital which can be integrated in the profitability analysis.

In this prospective analysis, the interest of the « shareholder » and the going concern are taken into account.

Key Performance Indicators

Different indicators aiming at valuating the profitability of non-life portfolios will be presented in this section. It is up to the Actuarial Function to determine their relevance according to the portfolio concerned.

It is not the purpose of this list to be exhaustive. Moreover, depending on the size of the portfolios, an approximate method can be sufficient.

When deemed necessary, the Actuarial Function can ask the internal departments to develop additional indicators next to those which can be inferred from the regulatory reporting (e.g. claims frequency, risk profiles indicator, « GAP duration »,...).

It is also recommended to go through the actuarial literature in order to follow the evolution of the indicators allowing to estimate the portfolios’ profitability.

Source	Indicators
Local Gaap Reporting	<ul style="list-style-type: none"> ○ Accounting result by product over the last 3 years (before financial income, gross and net of reinsurance) ○ Evolution of the following elements over the last 3 years: <ul style="list-style-type: none"> • Accounting claims / Earned premium • Costs (including commission) / Earned premium • Financial result / average reserve ○ Comparison of these indicators with the market standardized indicators (« standardized » meaning in accordance with a weighting depending on premium income by product identical to that of the company referred to)
Solvency II Reporting / QRT	<ul style="list-style-type: none"> ○ Loss ratio evolution by accident year via the result of triangles projection by Solvency II Line of Business ○ Profitability in relation to the capital of the portfolio concerned
Cash flow projection models	<ul style="list-style-type: none"> ○ Gap duration between assets and liabilities ○ Portfolio Fair Value
Internal Reporting (other than cash flow projection models)	<ul style="list-style-type: none"> ○ Verification of pricing assumptions ○ « New business » vs « existing portfolio » profitability ○ Evolution of the portfolio risks profile (by age group, geographical area, type of risk insured,...) ○ Claim frequency

Contents of the assessment

The Actuarial Function Assessment starts with all events that influenced the results of the year under review. For instance:

- The launch of new products of the adaptation of existing ones;
- The eventual adaptation of costs and/or financial product or charge distribution;
- The external events like the regulatory changes on reserving, taxes, or any market changes that impact the profitability of the undertaking;
- The transfers of insurance portfolios, merge & acquisition operations, ...
- The changes in the ceded reinsurance.

Thereafter, the Actuarial Function pursues with the results of the retrospective and prospective profitability and underwriting analyses by (group of) products. The movements, the trends and the outliers need to be explained and, if appropriate, placed in the insurance market framework (benchmarking). Additionally to this, the Actuarial Function will examine the evolution and the composition of the premium income by product and their contribution to the result. It examines as well how the additional (new) business and repricing do impact the solvency with respect to the Own Funds and/or the Risk Capital.

The Actuarial Function will pay a particular attention to the products with decreasing or negative results (retrospective view) or profitability (prospective view). It will identify the reasons of this situation and will recommend/propose mitigation actions on risk acceptance, pricing, cleaning of portfolio, cost, asset management, reserving policy, ... It can also use Plan figures to highlight future effect of measures, etc.

Notice that the fact that the results are negative doesn't imply that the tariff must increase. The proposed actions need also to take the following elements into account:

- The product strategy of the company;
- The importance of the loss itself;
- The fact that the loss is recurring or not.

If necessary, the Actuarial Function will make suggestions to improve the transparency and the profitability by branch like the cost or financial returns optimization.

The Actuarial Function will also verify the adequacy of the observed changes/decisions regarding the risk appetite of the insurance company and the pricing, the underwriting, the reserving, the reinsurance and the ALM.

Annex

According the Solvency II Law of 13th March 2016 - Art. 59 and the Delegated Acts 2015/35, Art. 272, the Actuarial Function has to provide an assessment on the global Underwriting Policy of the company:

76. Regarding the underwriting policy, the opinion to be expressed by the actuarial function in accordance with Article 48(1)(g) of Directive 2009/138/EC shall at least include conclusions regarding the following considerations:

(a) sufficiency of the premiums to be earned to cover future claims and expenses, notably taking into consideration the underlying risks (including underwriting risks), and the impact of options and guarantees included in insurance and reinsurance contracts on the sufficiency of premiums;

(b) the effect of inflation, legal risk, change in the composition of the undertaking's portfolio, and of systems which adjust the premiums policy-holders pay upwards or downwards depending on their claims history (bonus-malus systems) or similar systems, implemented in specific homogeneous risk groups;

(c) the progressive tendency of a portfolio of insurance contracts to attract or retain insured persons with a higher risk profile (anti-selection)."

The circular NBB_2016_31 specifies that the Actuarial Function:

- a. Provides an opinion on the tariff, the reserving and the reinsurance when new products are launched or when modifications having an impact on the profitability of the company are performed;
- b. Performs annually analyses on the profitability of different products on a market consistent way and within the annual accounts framework;
- c. Analyses the existing underwriting limits;
- d. Provides advices and recommendations on risk acceptance.

In this task, the Actuarial Function covers namely (i) the consistence between the underwriting policy and the risk appetite of the company; (ii) the appropriateness of the tariffs of different products; (iii) an assessment of the assumptions used for the calculation of the future profitability according the underwriting policy and (iv) le main risk drivers of the profitability of the products.