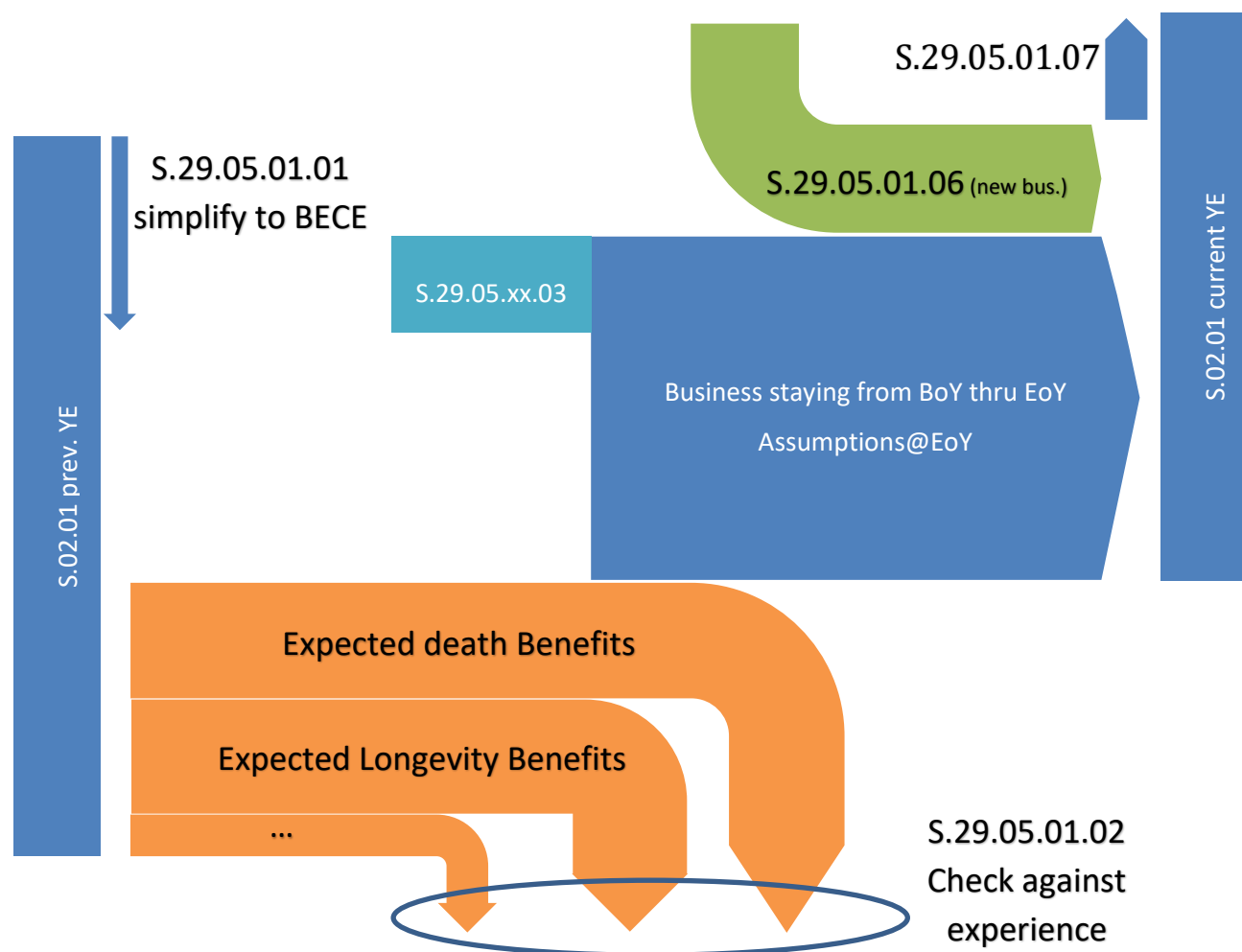


Annex XXII – Explanatory text for new template on VA

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Life template



1. This template supports supervisors in assessing the compliance of the best estimate with the principles laid down in Solvency II to determine whether the reserving is appropriate or not. The appropriateness then can be assessed by a lot of meaningful indicators which might be derived from the data provided by the template. It also allows supervisors to detect losses of the business in force hidden behind revaluations, reinsurances, or new business.
2. This template is intended to identify potential deviations of the assumptions versus actual experience in the calculation of the technical provisions that is taking place at market or entity level, i.e. which affects either a significant share of the market or a single insurer. Data collected at Solo-level will serve as the basis for monitoring on market-wide scale as well.
3. All assumptions used within the calculation of technical provisions are a potential source of profits or losses – depending on the choice of the assumptions compared

against actual experience regarding their realisation. The new template design separates the variation analysis for life and non-life business. There is already relevant information for the non-life sector in S.29.03, with minimally invasive adjustments. Cells (Columns) referring to life business have been deleted from S.29.03, a new template S.29.05 added – specifically designed for life business in order to fill the gaps identified in the discussion paper of EIOPA.

4. The following measures define the overall level of granularity, mostly in line with the structure of the submodules of the life underwriting risk module:
 - Interest rate
 - Longevity/mortality
 - Lapse
 - Expenses
 - Disability/morbidity
 - Reinsurance
 - Currencies.
5. Interest rates usually have strong impact on the level of technical provisions, in particular for long-term life insurance. Currency is an element that could become relevant for significant cross-border business, but will not be material in most cases. The sub-modules catastrophe and revision are not part of this assessment, as catastrophe and revision assumptions are not typical assumptions used in life insurance. These are assumptions more typical to stress than the valuation of technical provisions. Comparing the stresses of the standard formula against the new template S.29.05 may support in flagging candidates of catastrophic events or revision effects.
6. The templates should be applicable to the lines of business set out in Annex I, D and E of regulation 2015/35 (i.e. life insurance obligations and life reinsurance obligations). As products which allow to amend the premiums in a timely manner via a premium adjustment mechanism according to article 60 of regulation 2015/35 bear a fundamentally different kind of risk w.r.t. under-reserving, these products should not be subject to the templates proposed.

From macro to micro

7. EIOPA's macroprudential policy focuses on four particular topics:
 - Enhanced monitoring against market-wide under-reserving
 - Additional reporting on liquidity risk
 - Capital surcharge for systemic risk
 - Concentration thresholds
8. This note addresses the first topic, i.e. the need for an enhanced monitoring against under-reserving. The mechanics of the macro-prudential perspective are equally relevant on a micro-prudential level. The actuarial function regularly compares against experience the best estimates, and the assumptions underlying the calculation of the best estimates. The new template S.29.05 defines a structure to support harmonization in the application and the supervision of this comparison against experience. The template is part of the regular annual quantitative reporting.

The mechanics of the new tables in S.29.05

9. The template starts with the best estimate of the previous year's end financial statement and ends with the best estimate of the current year's end financial statement.
10. The first templates S.29.05.xx.01/02 remove the complexities arising from stochastic valuation and future discretionary benefits. They reduce to the best estimate based only on guaranteed benefits, using the deterministic single risk-free interest rate term structure including their components such as VA/MA to value the reserves, sometimes referred to as the "certainty equivalent path"¹ in stochastic projections.
11. These templates compare the realized cash flows for the insured events against their assumed materiality with reference to mortality, longevity, disability/morbidity (including the increase of level of disability/morbidity), lapse, and a few further benefit types that are not typically part of actuarial assumptions for the business in force at opening date.
12. S.29.05.xx.03 focuses on a set of policies that are active on the current closing date *and* were active at the previous closing/opening date. Within this set, it compares variations of the BECE that result from changes in assumptions. Calculations in this table use the simplifications developed in the first two tables. This comparison should be executed on a gross level (i.e. without taking into account any reinsurance or derivatives – for example longevity swaps).
13. S.29.05.xx.04 then focuses on the effect of reinsurance. As reinsurance is usually not attributed to single policies, the variation is more easily calculated based on the actual BE, not the simplified BECE, and also on the entire business, not just the business in force at both, the previous and the current, closing dates. Effects of instruments with a similar economic effect as reinsurance should also be reflected in this table.
14. S.29.05.05 considers the surrendered policies and captures the economic impact of surrender to the company.
15. S.29.05.xx.06 includes the new business of the financial year, leading to the total BECE, i.e. the total best estimate based on the deterministic certainty equivalent path.
16. S.29.05.xx.07 takes the final step to re-include stochastics and future discretionary benefits to conclude the transition from the final BECE to the best estimate of the balance sheet at the current closing date.
17. These templates should be applied to the lines of businesses set out in Annex I of the delegated acts (regulation 2015/35), paragraph D and E as far as there does not exist a premium adjustment mechanism according to Article 60 in regulation 2015/35 which allows insurers to amend the premiums to an arbitrarily high level.

Analysis

18. From the macro-prudential perspective, enhanced monitoring against market-wide under-reserving is intended to identify potential deviations of the assumptions versus actual experience in the calculation of the technical provisions that is taking place at market level, i.e. which affects a significant share of the market.

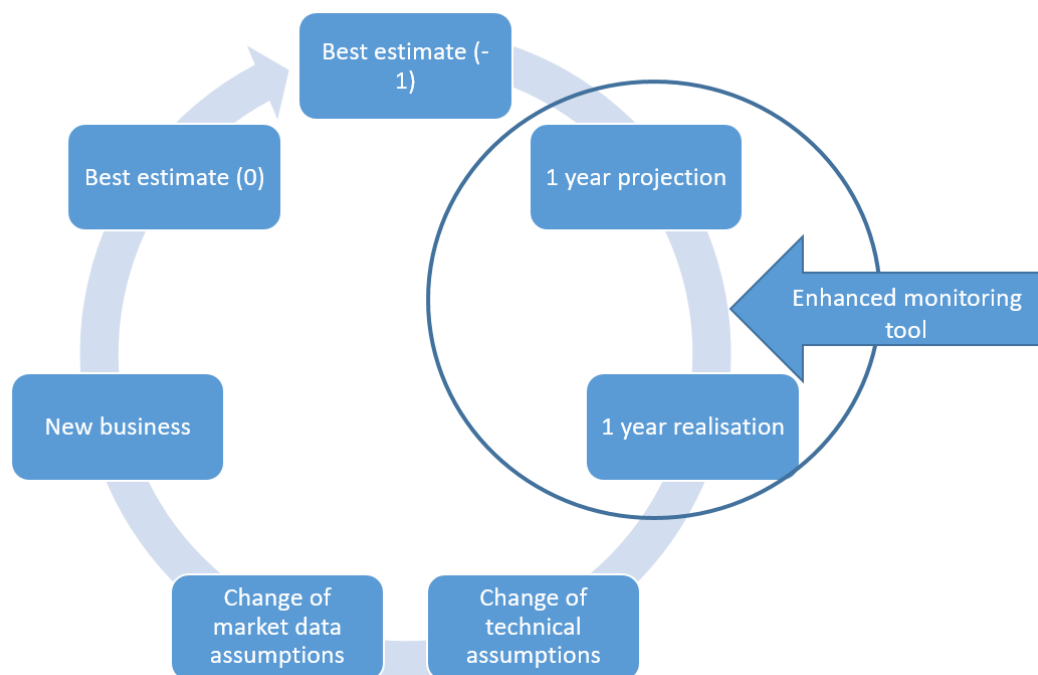
¹ This is the single "scenario" without randomness.

19. Where deviations are identified, not only the total of cash in-flows in comparison with the total cash out-flows across the market are relevant for the identification of potential market-wide consequences, but also significant deviations on a more granular level, e.g. country level or even at the level of a single undertaking.
20. From the micro-prudential perspective, compliance with the standards set out in the Solvency II directive needs to be reviewed in an effective manner. This template might not allow conclusions based on a single reporting date, but in the long run, as time series develop, it could be seen whether the assumptions meet the requirements of the directive at least at company level. These observations might trigger microprudential supervisory action as well.

- **Materialisation of a market-wide under-reserving**

21. Market-wide under-reserving materialises when the assumptions to calculate the technical provisions systematically diverge from the actual experience, providing losses that affect the whole market or a significant share of it. Factors such as the use of inaccurate mortality tables or strong competitive pressure may trigger a market-wide under-reserving as pointed out and proved by evidence in EIOPA (2018)².
22. Figure 1 illustrates the process to assess the appropriateness of the reserves, shows the variation analysis of the best estimate from one year to the next one.

Figure 1: Variation analysis of the change of the best estimate from one year to the next one



23. Where this process identifies inappropriate exposures on the liability side, those may lead to the deterioration of the solvency position of insurance companies, potentially leading to insurance failure(s) as well.
24. With the aim of mitigating this risk, EIOPA proposed a tool for enhanced reporting and monitoring,³ which would add a more detailed analysis of the change of the

² Systemic risk and macroprudential policy in insurance – EIOPA paper, 2018

³ EIOPA (2018) previously quoted.

best estimate by providing not only more granular data on the changes of the assumptions but also by analysing the profits/losses due to the actual experience. To focus on the substance of reserving, instead of analysing a huge bunch of scenarios and their calibration at once, this approach here focusses on what is considered to be a certainty-equivalent scenario.

25. The certainty-equivalent scenario should assume yields on the asset side according to the curve used to discount the liabilities (RFR including features such as MA/VA for example) and from there derive a policyholder behaviour (mortality/surrender) as far as it is modelled as a function of these earnings. The cash-flows in this scenario should not take into account any future discretionary benefits.

• ***Deviations of the assumptions from actual experience***

26. As explained above, the first step consists of a transition to the best estimate based on the cash-flows of the certainty-equivalent scenario in order to get a better picture of the quality of the reserves, called "best estimate based on certainty equivalent – BECE". Then, the review of the expected cashflows against the actual ones follows.
27. The deviations of the expected from actual cash-flows describe only one part of the variation of the best estimate of the liabilities. In order to detect the quality of the assumptions made, these deviations have to be split up into their sources and observed for more than one year. According to the Solvency II Directive, best estimate assumptions have to be used. This implies deviations in a certain direction may occur, but not in a systematic way. As a deviation in one year may be non-systematic, only time series may provide sufficient information for the supervisory authorities.
28. As future business shall not be taken into account in the calculation of the technical provisions, the expectations at the opening date are related to the business in force at that time. When comparing these expectations with the actual development, new business must be separated from it.
29. To compare the best estimates with the actual experience is the task of the actuarial function according to Article 48 (1) d of the Solvency II directive. Additionally, according to Article 48 (1) h, the reinsurance contracts have to be assessed by the actuarial function. This implies to analyse whether the profits/losses due to these contracts fit to the risk profile of the undertaking.
30. The expected or actual living benefits may consist of benefits paid out during the period and a best estimate at the end of the period to be covered by the remaining assets if the insured survives. Therefore, living benefits may be more than the cash flow to the surviving insured.
31. Expected or actual death benefits may include a best estimate for a pension to survivors if the insured dies during the period. As for living benefits, death benefits might be more than just a cash-flow to the survivors during the period.
32. All insured which change their product in favour of another one shall be considered as a surrender and new business.
33. When reviewing expected benefits and premiums against actual ones, the assumptions of the opening date must be applied in order to assess the quality of the assumptions at that date. Therefore, it is useful to indicate the set of assumptions (either at opening or at closing date) to be used for the calculation.
34. In order to do this, it is necessary to apply a modified interest rate on the best estimates contained in the benefits: it is the RFR constructed from the 1-year

forwards beginning at year 1 (instead of $t=0$), because these benefits are to be covered 1 year after the opening date.

35. While expected costs can be calculated by using the cost charges, actual costs might not be accurately separable between those for new and existing business (e.g. investment into the IT). Therefore expected costs of existing business and new business together shall be compared with actual costs. The latter will not be distinguished by business.
36. The same holds for the distinction between acquisition and administration costs. As there exist cost charges which can be associated to both types of costs, a distinction is neither necessary nor useful.
37. Together with the unwinding of the interest rate by applying the interest rate of the first year to all expected/actual cash-flows paid or received during the year, the review of expected and actual experience (benefits/premiums) should describe fully the development of the best estimate in force at opening date if neither the assumptions were not changed nor any new business written.

- ***Changes of assumptions***

38. After comparison of actual and expected benefits/premiums as well as considering the interest rates corresponding to the 1-year-forwards applied to the best estimate, changes of non-economic and economic assumptions shall be taken into account in order to fully explain the change of the best estimate during one period.
39. The changes of the assumptions imply a change of the amount of the best estimate. If more conservative assumptions are applied at closing date, the best estimate will increase, if less conservative assumptions are applied the change of the best estimate will be negative.
40. While changing the assumptions the changes depend on the order the changes are executed. First, the non-economic assumptions should be changed and secondly, the economic ones. Therefore, to a certain extent, an order is given. In order to ensure comparability and consistency, even more guidance could be provided by giving an order to the changes of the single non-economic and economic assumptions as well.
41. In the approach followed here, the assumptions may be changed in an arbitrary order such that the sum of the changes fully explain the transition to the set of new assumptions applied to the business in force and not surrendered during the period. To have better comparability, one exception shall be made: first, the non-economic assumptions should be changed and secondly, the economic ones.
42. Although the economic assumptions are kept simple in the scenario of the BECE, guaranteed cashflows might change during the year because of the economic environment – for example if the guaranteed cashflows are linked to economic indicators like an index. The impact of this perceived development should be reflected in the changes of economic assumptions.

- ***Reinsurance***

43. Therefore, the profits/losses due to reinsurance contracts have to be monitored and should be available as well. This is done by comparing the planned incoming and outgoing cash-flows with the actual ones and the changes of reinsurance recoverables.

- ***Surrenders***

44. In order to assess to what extent a company is exposed to surrender risk, the best estimate of the surrendered contracts needs to be compared with the surrender benefits paid to the insured. Ideally, as pointed out in EIOPA's first report,⁴ the commissions to the agents should be taken into account as well. For sake of simplicity this aspect is let out here, even though the actuarial function needs to analyse it in more detail in its report in order to ensure the company is not vulnerable to surrender arbitrage.

- **New business**

45. If new business is reviewed separately, its influence on the solvency position of the insurer can be analysed. In the case (e.g. for a fast growing insurer) the solvency of a company relies on new business, it may indicate that the business already in force may be undercapitalised.

46. The template allows to quantify the capital relief due to new business and the impact of new business to the balance sheet.

47. All business in force at closing date

48. Here all is put together: the remaining business and the new business.

Table 2: Main elements of the proposal

- **Allocating profits/losses**

49. Once the assumptions have been determined and captured by an enhanced reporting, the next step should focus on how to allocate the profits/losses by decomposing the annual result to its sources. Here, a thorough and mathematically correct assignment of profits/losses to their sources is very important in order to develop suitable indicators/parameters. By evaluating these decompositions regularly, supervisors can/should assess whether an underreserving occurs.

50. Additionally, the enhanced monitoring should allow supervisors to determine which parts of the business are profitable and where problems might occur.

- **Addressing market-wide under-reserving**

51. The expected outcome of this measure is that supervisors enhance their overview on potential underreserving, which may become systemic if it occurs market-wide and on a large basis. Furthermore, it provides the basis to ask for corrections if deemed necessary.

52. Given that this tool is proposed for enhanced reporting and monitoring, this document does not address possible follow-up actions in case of market-wide underreserving.

53. A negative number in the templates shall not imply a reaction by the supervisory authority. But if losses occur regularly in connection with one specific source, one may conclude that the assumptions made are no longer best estimate ones. In this case, appropriate supervisory reaction should be triggered.

⁴ EIOPA (2018): "[Systemic risk and macroprudential policy in insurance](#)".

- **Simple Example fully worked out**

54. Financial balance sheet positions relating to future payments are valued based on three fundamental elements:

the contractually agreed amount to be paid,
the probability that this payment will materialise, earnings
and the discount rate to calculate the time value.

55. Elementary example:

Amount to be paid in case of death: 10 000€

Probability of death: 0,1%

Discount rate: 1% (not given)

Expected Death Benefit: $10\,000\text{€} \cdot 0,1\% = 10\text{€}$.

Discount: $\frac{10\text{€}}{(1+1\%)^1} = 9,90\text{€}$.

The BECE for this particular contract to cover potential death benefits of this particular person in this particular year would be 9,90€. At the end of the year, these will be 10€ if discounting assumptions have been met by actual interest rate earned. The 10€ are part of the insurer's pool for death benefit payments.

When comparing against actual experience, the probability disappears: at the end of the year, it is clear whether this particular person has died and received their death benefit, or not.

Single Contract perspective at the end of the year: the insurer's revenue is 10€ in either case (death or not). The insurer has to pay 10 000€ in case of death and nothing (0€) otherwise.

It is a single premium contract, i.e. the full premium is paid in advance.

56. Perspective of portfolio with 1 000 insured persons: the insurer earnings all the 10€ from all contracts, i.e. $1\,000 \cdot 10\text{€} = 10\,000\text{€}$, and pays only the death benefits of the insured persons who died. If the actuarial assumptions had perfectly matched with reality, 0,1% of 1 000 persons would die, i.e. one person. This person receives their death benefit of 10 000€. In total, the insurer leaves this year with a neutral profit/loss account: it has received a 10 000€ risk premium for assumed death benefits, and has paid a total of 10 000€ for actual death benefits.

- **Mathematical Representation of the specific example**

57. Financial balance sheet positions relating to future payments are valued based on three fundamental elements:

The contractually agreed amount A_y^R to be paid if risk R materialises in the first year.

The probability P_y^R of the materialisation of the risk in the first year (event) and the payments in the financial year y triggered by the event.

The discount r_y rate for payments in year y

58. For simplicity, we assume single premium that has already been paid in. The BECE is then the time value of the expected amounts to be paid. We split the amounts between those for the first year, and those for all years after the first year. The first year's amounts will be collected from all contracts, representing the risk premium assumed for each risk; the amounts for later years will be collected only

from those contracts where the risk has materialized. For death benefits, this will be the whole sum of all risks

$$BE = \sum_{\substack{y=1 \\ R \in \text{Risks}}}^{\omega} \frac{A_y^R \cdot P_y^R}{(1+r_y)^y}$$

59. The set "Risks" is defined by the rows in Table S.29.05.01.02, the amounts $A_1^R \cdot P_1^R$ plus the amounts $\sum_{y=1}^{\omega} \frac{A_y^R \cdot P_y^R}{(1+r_y)^y}$ of contracts that no longer exist at the end of the year are aggregated in column C0030, the actual payments are aggregated separately for each risk R in column C0040.
60. After removing discounting in the first year, the tabular representation for one individual contract would look like:

Contract#X	Risk R_1			...	Risk R_N		
Year	Amount	Probability	Expected cashflow		Amount	Probability	Expected cashflow
1	$A_1^{R_1}$	$P_1^{R_1}$	$A_1^{R_1} \cdot P_1^{R_1}$		$A_1^{R_N}$	$P_1^{R_N}$	$A_1^{R_N} \cdot P_1^{R_N}$
2 ... ω	$A_{\dots}^{R_1}$	$P_{\dots}^{R_1}$	$A_{\dots}^{R_1} \cdot P_{\dots}^{R_1}$		$A_{\dots}^{R_N}$	$P_{\dots}^{R_N}$	$A_{\dots}^{R_N} \cdot P_{\dots}^{R_N}$
Total _X	$A_1^{R_1} \cdot P_1^{R_1} + \sum_{y=2}^{\omega} \frac{A_y^{R_1} \cdot P_y^{R_1}}{(1+r_y)^y}$				$A_1^{R_N} \cdot P_1^{R_N} + \sum_{y=2}^{\omega} \frac{A_y^{R_N} \cdot P_y^{R_N}}{(1+r_y)^y}$		

61. Note the missing discount factors for the term relate to the first financial year. These amounts are known at the end of the financial year. The discounting effects will be respected separately in Table S.29.05.01.01. The separation of the discounting effects from the comparison of actual vs. assumed benefits helps to identify the deviation of the realisation vs. assumption for each risk type individually without cross effects from discounting.
62. In practice, the above table may not exist for each individual contract, but on the level of model points. Maybe, there would be no individual distinct value for each probability by risk by year, in which case the two separate columns for amount and probability would not be relevant, but only their product.

• **Mechanics of each table explained in the example of a single cash flow**

63. The following presentation intends to show for one particular cash flow, i.e. one combination of A and P and their product $A \cdot P$, as given in the table above.

S.29.05.01.01	Amount A , probability P , expected cash flow $A \cdot P$
BECE (remove stochastics, FDB)	In BE, $A \cdot P = \text{avg}(A^s \cdot P^s)$ is an average across all economic scenarios, where A^s includes amounts related to future discretionary benefits and P^s may be different in each scenario s according to assumptions on dynamic policyholder or management behaviour (e.g. lapses) BECE removes the average across all scenarios, reducing to only one "scenario", the one given by the EIOPA risk-free rate curve, and within this

	path, ignoring future discretionary benefits.
S.29.05.01.02	
Actual vs. expected for contracts that do not persist throughout the financial year	<p>"Expected" amounts are simply the amounts $A \cdot P$ as part of the BECE. "Actual" amounts are given by setting $P = 0$ or $P = 1$, depending whether the insured event has occurred or not.</p> <p>The difference does not need to be calculated on each term individually. Instead, the sum of all expected amounts is usually compared against the sum of all amounts that have actually been paid.</p>
Actual vs. expected for contracts that exist at the beginning and end of the financial year	<p>To get exactly the contribution of only <i>changes in assumptions</i>, the set of contracts is the intersection of the set of contracts at the beginning and the set of contracts at the end of the year. Hence, from the beginning of the financial year, this table excludes unexpected <i>early</i> terminations (e.g. death, lapse) and expected terminations during the financial year. From the end of the financial year, this table excludes new business.</p>

Non-Life template

64. The objective of the revision of the variation analysis template S.29.03 for non-life insurance business is to simplify the template where necessary and to amend and adjust the template such that it better reflects the actuarial practice on the one hand and it provides better information for supervisory purposes.
65. The first main improvement of the template is achieved through the proposal to report on a line of business basis instead on an aggregated level as in the current S.29.03. As the actuarial analysis is performed on a line of business or homogeneous risk group level in the non-life business, the reporting on a lob level does not create any significant additional burden for the undertakings. A lob reporting would enable supervisors to much better analyse the effects driving the changes of the best estimate.
66. The proposed new variation analysis template for non-life business consists of four main parts.
67. The first part (R0010-R0130 in S.29.06 "Analysis of the variation of the Best Estimate-Gross of Reinsurance") consists of the analysis of the variation effects accounting for changes in the Best Estimate. This part of the template is almost the same as the corresponding counterpart of the current S.29.03 template (R0010-R0120 and R150 up to R0170 in the current S.29.03). As the proposed new template is reported on a LOB level separate tables are no longer necessary for an accident year (AY) and underwriting year (UWY) analysis. The current part just contains two minor differences. First the effect of the claims provisions and the premium provisions is better disentangled for the AY analysis for the risks

covered prior and during the reporting period containing two cells ("Variation of the premium provision" in R0050 and "Claims Provision-Current AY " in R0060). This makes the interpretation of the template easier. The second minor change is that the effects "experience" and "changes due to non-economic assumptions" ⁵ are considered jointly in this part of the table. These two main change effects accounting for the change of the Best Estimate claims provision for prior AY/UWY years are analysed separately in the undiscounted analysis of the claims provision (R0220-R0350). Moreover a simplification is proposed where interest rate and exchange rate effects and economic assumptions

68. The second part contains the Reinsurance recoverable (R0140-R0150 in S.29.06). This coincides with the current S.29.03 (R0280-R0290 and R0360-R0370).
69. The third part of the template (R0160-R0210) contains information on the premium provision calculation at year N. The required values are already mainly reported in the S.18.01 template on an aggregated level. These values are also consistent with the simplification for the calculation of the premium provision in the "Guidelines on the valuation of technical provisions" $BE = CR * VM + (CR-1) * PVFP + AER * PVFP$ and thus help to analyse the calculation of the premium provision.
70. The last part of the template (R0220-R0350) focuses on the analysis of the undiscounted movements in the claims provision excluding expenses other than ALAE. The analysis of the changes of the claims provision on undiscounted values better reflects the actuarial practice where Best Estimate movements are usually analysed on an undiscounted basis in the reporting currency. Moreover, the analysis in this template contains the well-known "Actual vs Expected" effect where the actual claim payments are compared to the expected claim payments for the current reporting (calendar) year (R0280). Finally the template differentiates between the movements of the non-life insurance claims and annuities stemming from non-life insurance and thus better aligns the variation analysis template with the templates S.19.01 and S.16.01.
71. To summarize the new proposed template contains some minor, at most moderate adjustments in comparison to the current S.29.03 template. The proposed template better reflects the actuarial practice in the analysis of the Best Estimate movements and at the same time it provides more meaningful information for supervisory purposes without increasing the burden for undertakings to report the required information. Overall, the reporting information for variation analysis purposes in non-life is even reduced.

⁵ Instead of using the terminology „non-economic assumptions“ the term „actuarial assumptions“ is introduced.