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EUROPEAN ACTUARIAL NOTE (EAN 3)

PROFESSIONAL JUDGEMENT

Approved as educational material

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1. INTRODUCTION

1.1 DUE PROCESS OF THIS EAN

This European Actuarial Note (EAN) is an educational document on professional judgement performed by an actuary or by any other expert who would apply judgements that are considered professional. This EAN has been adopted by the Actuarial Association of Europe (AAE). For non-actuaries, this EAN may be used mutatis mutandis.

This EAN is not prescriptive and therefore does not contain words such as "should" or "must" unless such usage is justified for the purpose of this EAN. Rather, this EAN is descriptive and usually conveys its content by the use of examples of actual practice, without suggesting that any of these examples would be expected to be used or that these examples are comprehensive. The language of this EAN is more prescriptive if reference is made to one of the European Standards of Actuarial Practice (ESAP)[1], in particular to ESAP 1 (2019).

1.2 THIS EAN IS ON PROFESSIONAL JUDGEMENT

The field of work for actuaries has been broadening over the past years. In addition to their traditional roles in insurance and pensions, both in private and public fields, actuaries nowadays are professionals in high demand in all industries as experts in risk assessment and management. Furthermore, the nature of many services provided by actuaries (for example reporting under various accounting frameworks or capital standards) has changed from a rather "rules-based" to a rather "principles-based" approach and the latter very often requires judgement by the actuary. Hence, it is relevant to work out the distinguishing features of the professional judgement performed by an actuary.

Expert judgement is based on specific training, knowledge, experience and expertise. Professional judgement, however, is based not only on the same requirements, but also on standards of professionalism including the Code of Conduct of the profession. It is believed that there is a fundamental difference between judgements provided by an expert not belonging to a profession and by an expert who belongs to a profession and therefore is bound by the standards set by that profession.

1.3 EXECUTIVE SUMMARY

This EAN has two main goals. Firstly, it aims at identifying the distinguishing features of professional judgement, which arise predominantly from the principles of professionalism laid down in the Code of Conduct for actuaries. Secondly, it argues that the soundness of an actuary's judgement is enhanced by the suggested self-assessment questionnaire since it helps ensuring consistency of the professional judgement applied by the actuary in line with the principles in the AAE's Code of Professional Conduct. In line with AAE's Code of Professional Conduct, the high-level principles of professionalism considered in this EAN are knowledge and expertise; values and behaviour; and professional accountability. The self-assessment questionnaire is intended to help the actuary decide on the soundness of his/her professional judgement. It provides assistance for

1 Note, however, that ESAPs are not binding on any actuary. An ESAP is applicable on an actuary if it is promulgated by the relevant standard setter; it is binding on an actuary if the relevant standard setter categorized it as an obligatory standard.

the actuary to assess whether his/her professional judgement may become impaired when performing his/her assignment and has been structured in accordance with the five principles for the work of an actuary stated in AAE's Code of Professional Conduct (i.e., integrity, competence and care, compliance, impartiality and communication).

1.4 PURPOSE AND TARGET AUDIENCE

The EAN is produced in support for all actuaries exercising their actuarial activity.

That is why the assistance provided in this EAN could be useful for actuaries to apply their professional judgement on several issues related to their day-to-day tasks, such as,

- The duties of the actuary when making professional judgement.
- The choice of data for an assignment.
- How to deal with missing or inappropriate data.
- The selection and usage of the methodology and the model.
- The setting of key assumptions embedded in the model.
- The interpretation of the model outcome.

It goes without saying that the implementation of the different items can be different for specific roles.

Actuaries are working in different fields of actuarial practice and in different roles. The specificities of the particular role require an appropriate use of these issues and an adaptation to the concrete task. To provide support in this regard, this EAN might be extended in different ways, for instance by means of appendices dealing with the specificities in different fields of actuarial practice.

1.5 LIST OF ABBREVIATIONS USED

AAE	Actuarial Association of Europe
EAN	European Actuarial Note of the AAE
ESAP	European Standard of Actuarial Practice of the AAE
GDPR	General Data Protection Regulation
IAA	International Actuarial Association

2. BACKGROUND AND STANDARDS

2.1 GENERAL

Actuaries in their daily work have always been involved in processes that require their professional judgement. In pricing or reserving in insurance undertakings or making a quantitative assessment of a pension or employee benefit plan, they are expected to assess both the quality of data and the appropriateness of methods, assumptions, parameters, and models. More recently, the judgement of the Actuarial Function is explicitly required by the Solvency II and by the IORP Directives applied in the European Union.

Professional judgement is not only an issue in Europe.

Actuaries providing services to reporting under IAS 19 *Employee Benefits* have for long applied professional judgement when setting or proposing relevant assumptions.

The recent issuance of IFRS 17 *Insurance Contracts* also requires the preparer to apply judgement and actuaries will be in the forefront of preparing the financial statements under IFRS 17.

Professional judgement is a very broad term. In any case, the result of this judgement can or will affect the outcome of calculations and influence the decisions of the user of the actuarial services. To enable replication or a posterior traceability, it may be appropriate to document relevant steps and assumptions underlying the judgement.

1. The exercise of judgement is not clear-cut, except perhaps in hindsight. A judgement that is reasonable at its making may be unreasonable by later hindsight.
2. A judgement that is completely subjective would not be reasonable even though it may be based on honest belief. A reasonable judgement would be objective and demonstrably take into account the relevant code of professional conduct, standards of practice, common sense, and constraints on time and resources.

Because of the importance of this judgement, it seems to be necessary to elaborate first on what professional judgement means. What is the essence of professional judgement? What distinguishes professional judgement from other expert judgements?

Definition

Professional judgement is the judgement of the actuary, based on actuarial (or other relevant) training and experience, bound by the Standards and Code of Conduct of the profession.

2.2 PROFESSIONALISM

This short definition of professional judgement implicitly requires compliance with the principles of professionalism including the principles of professional conduct cited below.
Definitions or classifications of actuarial professionalism can be found in published standards of actuarial practice, in International Actuarial Association (IAA)'s publications or in the Code of Professional Conduct of the AAE.
ESAP 1 (2019) on General Actuarial Practice uses a similar definition for professional judgement as the AAE's Code of Professional Conduct i.e., it is the judgement of the actuary based on actuarial training and experience.

This rough description is enriched by two components in the definition provided by the IAA in the paper Principles of Professionalism that the reader can find below:

> **Definition**
>
> *Professionalism, for the actuarial profession, means*
>
> - *the application of specialist actuarial knowledge and expertise;*
> - *the demonstration of ethical behaviour, especially in doing actuarial work; and*
> - *the actuary's accountability to a professional actuarial association or similar professional oversight organisation on the basis of a code of conduct.*

IAA's definition is more comprehensive than the short ESAP 1 characterisation. Besides training and experience or knowledge and expertise, it encompasses principles concerning values and behaviour and professional accountability. High-level principles of professionalism considered in this definition are:

- **Knowledge and expertise:** An actuary shall perform professional services only if the actuary is competent and appropriately experienced to do so.
- **Values and behaviour:** An actuary shall act honestly, with integrity and competence, and in a manner that fulfils the profession's responsibility to the public and upholds the reputation of the actuarial profession.
- **Professional accountability:** An actuary shall be accountable to a professional actuarial association or a similar professional oversight organisation.

2.3 CODE OF PROFESSIONAL CONDUCT

This extended view is in line with the AAE's Code of Professional Conduct published in 2017 and effective for Full Member Associations of the AAE since 1 January 2021.

The following principles for the work of an actuary are part of this Code of Professional Conduct:

- **Integrity:** An actuary must act honestly and with the highest standards of integrity.
- **Competence and Care:** An actuary must perform professional services competently and with care.
- **Compliance:** An actuary must comply with all relevant legal, regulatory and professional requirements.
- **Impartiality:** An actuary must not allow bias, conflict of interest or the undue influence of others to override professional judgement.
- **Communication:** An actuary must communicate in an appropriate manner and meet all applicable reporting standards.

3. DUTIES OF AN ACTUARY WHEN MAKING PROFESSIONAL JUDGEMENT

As stated earlier, an actuary who is a member of a Full Member Association of the AAE must abide by the Code of Conduct issued by his/her local association that reflects at least the requirements of the AAE's Code of Professional Conduct.

Let us consider how an actuary could reasonably assess whether his/her activity complies with the principles. The following self-assessment questionnaire could be useful to help the actuary decide on the soundness of his/her professional judgement. The questionnaire is structured in accordance with the five principles of the AAE's Code of Professional Conduct.

Integrity

- Can I devote enough time and resources to perform the assignment?
- May the assignment contravene my ethical and/or moral principles?

Competence and care

- Do I have the knowledge and experience required to deal with the issues involved in the assignment?
- Do I have access to other knowledgeable / experienced professionals where needed and am I willing to use these professionals?

Compliance

- Does the completion of the assignment contravene any regulation or professional standard?

Impartiality

- Can I avoid undue pressure from any involved party to influence on the result of the assignment? Am I prepared to disclose actual or potential conflicts of interest to all involved parties?
- Can I guarantee that the way compensation for the assignment is structured avoids bias in my judgement? Am I prepared to disclose to the party all sources of income received in relation to the assignment?
- Can I assure that I can keep professional scepticism[2] towards data and any other piece of information provided by any party involved in the assignment?

Communication

- Do I feel confident as to communicate efficiently and clearly the outcome of the assignment under any circumstance or in any forum (say, in front of my principal, an individual customer, a board of directors, a press conference or, in particular, in front of a court)?

The questionnaire might provide assistance for the actuary to assess whether his/her professional judgement may become impaired when performing his/her assignment. If any answer reveals serious obstacles for the actuary to achieve an integral, competent, compliant, impartial, and

2 **Professional scepticism**: Attitude that includes an inquisitive mindset, special attention to circumstances that may be indicative of possible inaccuracies, and a critical assessment of the evidence.

appropriately communicated professional judgement, he/she may consider several courses of action, e.g.

- To clearly express the factors that may hinder his/her professional judgement when dealing with the assignment.
- To communicate to the parties with a vested interest in the assignment the setbacks that affect his/her professional judgement.
- To consider abandoning the assignment should the setbacks to appropriately apply his/her professional judgement seriously contravene any principle of the Code of Professional Conduct.

Once the presence of any factors that can negatively affect the performance of the actuary has been assessed and discarded, consideration can be given to the application of professional judgement to down-to-earth items such as data, methods and models, assumptions in models, and conclusions of the assignment.
Again, assistance in the form of a self-assessment questionnaire for each item can be developed. This way the actuary could decide whether, while duly considering materiality aspects, he/she is appropriately applying his/her professional judgement.

Some other expert professionals are mainly focused on what happened in the past and the consequences these past events might have brought about. In contrast, actuaries are mainly focussed on forecasting future performance, sometimes in the very long term, using past and current events only as input data and considering potential future probability-weighted scenarios. This fact emphasizes the relevance of applying appropriate professional judgement in all the steps involved in an assignment.

It is also relevant to emphasize that the use of professional judgement by actuaries in assessing accurate, appropriate, and sufficient data for their assignment does not replace the appropriate collection, processing and analysis of data. Rather, it supplements these actions where required.

4. DATA

Data constitute the basis for all quantitative actuarial work. The quality of the data base is crucial. An assessment of this quality is an important step for the actuary[3]. Available data sources for the particular task, quality and completeness of the required data should be analysed. In case of non-completeness, it might be necessary to find an appropriate treatment of missing or incomplete data.

The following paragraphs provide a list of questions that might help to check the quality of the data basis.

4.1 ASSESSING DATA SOURCES

- Are data sources for the assignment relevant, sufficient and reliable?
- Are the data internally consistent and complete?
- Do I need to proactively run a comprehensive data consistency check or look for any individual mistakes in the data and do I need to run a data cleansing exercise?
- Do I have a good understanding of the meaning of each data entry?
- Can I check the soundness of any data source?
- Do I suspect there might be any vested interest involved in a particular data source?
- How is the data collected in order to prevent any potential bias?
- Does it target a specific population or a sample of a population?
- On which period(s) have the data been collected?
- Did the underlying process of data production or the recording method change during the reference period(s) of the data collection?
- Was the data collected for another purpose of my business issue?
- How can I protect the data?
- Should I and if so how can I be compliant with the ESAP 1 (2019): 2.5?
- How can I assure that I am compliant with the GDPR?

4.2 ASSESSING DATA COMPLETENESS

- Are relevant and reliable data readily available for every period and every magnitude considered in the assignment?
- Do I have all data that are needed to perform the assignment?
- If data are missing or there are data for which their reliability is not supported for a period or magnitude, how may this fact impair the reliability of the outcome of the assignment?
- Do I have at my disposal any proxies that could reasonably substitute for any missing data or data for which their reliability is not supported?
- If so, can I justify by evidence that using the proxy would not impair the reliability of the outcome of the assignment?

3 See ESAP 1 (2019): 2.5 Data Quality

4.3 ASSESSING DATA DISCLOSURE

- Are data in the assignment disclosed in the actuary's report in a way that allow any independent and knowledgeable party to check their sources, their completeness and their consistency? Is there enough granularity in disclosed data?
- Are data sources disclosed?
- Are any shortfalls in data quality, such as incompleteness or the use of proxies, appropriately disclosed?
- Do I appropriately disclose my assessment on the effects of missing, incomplete, inconsistent, false or outlying data on quality of the outcome and conclusions of the assignment?
- Was the data anonymised for disclosure purpose?

4.4 MISSING, INCOMPLETE, INCONSISTENT, FALSE OR OUTLYING DATA

In case any shortfalls in data quality are identified, several issues may be assessed.

4.4.1 MISSING DATA

- Can I perform the assignment without the missing data?
- Do I have appropriate ways to replace the missing data?
- In case I decide to perform the assignment even though some data are missing, can I reasonably assure the quality of the outcome of the assignment?
- Should I ask an independent party to verify the impact of missing data on the quality of the conclusions of the assignment?

4.4.2 INCOMPLETE DATA

We define 'incomplete data' as data which are not available for the desired period but can be estimated from other available data. For instance, we can be interested in assessing any given magnitude for monthly periods, but we only have annual data at our disposal. In this sense, we say no data are missing. Rather, we deem them to be just 'incomplete'.

- Can I reasonably estimate the relevant data from available data (e.g., monthly data from annual data)?
- Can I test the effect of the estimation on the quality of the outcome of the assignment?
- Can I describe in detail the model used for estimating the incomplete data?
- Are there any proxies that could be reasonably used instead of the incomplete data?

4.4.3 INCONSISTENT OR FALSE DATA

Data are inconsistent if one piece of the data contradicts another piece of the data (for example the date of a claim precedes the start of the contract) and thus some of the data might be false. In such a case, the actuary may wish to ask:

- Can I identify the root cause of the inconsistency and thereby rectify the problem?

- Can I resolve the inconsistency (for example by substituting the inconsistent data with other relevant and reliable data) so that the remaining inconsistency has no material impact on the quality of the outcome of the assignment?

4.4.4 OUTLYING DATA

Judgement is needed for identifying an outlier and, if it has been identified, for the treatment of the outlier. Both considering and completely disregarding the outlier without any adjustment may have a severe impact on the quality of the outcome of the assignment. Therefore, there might be cases in which the actuary may wish to adjust an identified outlier, rather than leave it unchanged or remove it from the data base. In such a case, the actuary may wish to ask:

- Can I justify by evidence that the data point in question is an outlier? If so, what are the underlying reasons?
- What is the way of adjustment that best helps to achieve the overall objective of the assignment?

5. SELECTION OF A MODEL

Several issues might be considered to assure the chosen model is only used for its intended purpose[4].

In this respect, the specific questions for this section intend to address some aspects of model risk, such as:

- Inappropriate methodology
- Too much complexity with no added value
- Model knowledge concentrated on key people
- Lack of suitable documentation

All the items above involve the use of professional judgement to some extent.

- Is the chosen model fit for purpose? Does it meet its specifications?
- Do I understand the model and its restrictions?
- Are there any test/validation procedures for assessing appropriateness?
- Is the model set up in a way to avoid unnecessary (relative to performance/business objective) complexity?
- Are simplifications and limitations properly tested and documented?
- Are the model and procedures documented to properly mitigate dependency on key people?
- Does it need any complementary interpretation tools like dashboarding / reporting or visualization to make it explainable? Which ones were used to achieve the explanations?

4 Note that the selection of models is covered by ESAP 1 (2019): 2.10; in fact, it also covers developing, modifying, and running models.

6. SETTING AND CHECKING OF ASSUMPTIONS

The setting of key assumptions is of utmost importance for the outcome of models in all fields of the actuarial work, e.g.,

- Liability valuations (best estimate, margins, etc…)
- Capital management (standard capital requirements or internal models)
- Firm Valuations (embedded value, appraisal value, ...)
- Pricing activities

The actuarial role in the assumption setting process is usually affected by the lack of historical experience, the lack of relevant data or the need for new facts or external variables that could make future experience different than past behaviour of the specific variables. Assumptions on the latter effect (i.e., to what extent the future behaviour of a variable may differ from what can be projected relying purely on past experience) is especially sensitive to professional judgement. The actuary may want to consider all relevant information while assessing reliability and appropriateness of the use of historical data[5] for projecting future outcomes.

The need to make assumptions arises immediately in connection with undertaking decisions on methodology (*e.g. correlations*), non-economic variables (*e.g. mortality and morbidity rates; retirement rates; lapses; expenses*) and economic ones (*e.g. interest and credit rates; inflation rate; equity and property indices*). They also arise in instances such as the assessment of underwriting and reinsurances policies, or the conformity of models with Enterprise Risk Management principles. The questions in the paragraphs below might help the actuary to check and back test consistency in assumptions embedded both in the choice of variables and of the methodology and use of data.

6.1 CHECKING ASSUMPTIONS RELATED TO METHODOLOGY

- Would it make sense to do a sensitivity analysis and if so, which variables are to be tested?
- Are expected or potential future trends or sudden changes properly assessed?
- Are methodology choices based on actuarial independent views and best practices?
- Is documentation on the process of assumption setting thorough and complete? Can it be made available for a third party to understand the key steps of the process?

6.2 CHECKING ASSUMPTIONS RELATED TO VARIABLES

- Do I have enough information about the relevance of assumptions on variables in the model outcome, i.e., have I tested sensitivities or performed any stress or scenario testing?
- Do I have enough knowledge on sources, data quality, sample size, and any limiting factors for the choice of variables?
- Do I consider consistency with not identical but similar situations applicable to the specific assumption?

5 Note that according to 2.5.1 of ESAP 1 (2019), "The actuary should consider whether sufficient and reliable data are available to perform the actuarial services. Data are sufficient if they include the appropriate information for the work. Data are reliable if they are substantially accurate …."

- Are data for each variable granular enough for the model outcome not to be materially false?
- Even if assumptions on each variable seem to be reasonable, does the set of all assumptions seem to be reasonable on an aggregate level?
- Can I be sure about the involvement of the right people providing relevant data and feedback for each variable?
- Are the metrics used to assess the model quality relevant and in accordance to business issues?
- Once the results are obtained based on the assumptions undertaken, do the results make actuarial sense?

6.3 TESTING

- Are the process and methodology robust and consistent enough to assure the relevance of the outcome and conclusions?
- Are all relevant conclusions captured?
- Are the conclusions properly escalated to provide useful information to intended users e.g. the Senior Management or the Board of Directors?
- Are any identified setbacks considered to improve the model?
- Is historic reality / experience used to test the validity of the assumptions?

7. THE INTERPRETATION OF THE OUTCOMES OF THE MODEL

Several aspects might be tested in relation to the outcome of the model before the assignment is delivered.

7.1 RELEVANCE

- Are the results conclusive?
- Do the results support the decision-making process of the sponsors of the assignment?
- Are some ex-post interpretation tools used to enforce the model relevance?

7.2 DISCLOSURE

- If appropriate, are any caveats and constraints such as data limitations, methodology / model limitations that may affect the conclusions disclosed?
- If appropriate, are all hypotheses and scenarios used to draw conclusions disclosed?
- Is the uncertainty in the results presented by means, e.g., of confidence levels, standard deviations and so on?

7.3 TESTING

- Which tests have been carried out to check the credibility and reasonableness of the conclusions?
- Have test plans, test reports and test conclusions been available for independent review/audit?
- Were the test runs on an independent sample used for training?
- Were some scenario tests used to assess model relevance on controlled scenarios for which expected outcome can be controlled?
- Has the model been validated in real conditions?
- Has the necessary professional scepticism been used in the choice of data?

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