

# Notes on the application of professional judgement by actuaries

## 1. Background

The field of work for actuaries has been broadening over the past years. In departure from their traditional roles in insurance and pensions, actuaries nowadays are professionals in high demand in all industries as experts in risk assessment and management. Obviously, **professional judgement** is a key factor in risk management. Hence, it is relevant to work out the distinguishing features of the professional judgement performed by an actuary<sup>1</sup>.

Much of the added value of actuaries has been, and will likely continue to be, the professional judgement they can make – in whatever practice area. Maybe repetitive tasks an actuary has been doing in the past and continues to do at this moment will be taken over by machines performing complex algorithms. However, **the professional judgement** will probably still be owned by the trained and experienced (fully qualified) actuary for quite a long period of time.

The **relevance of actuarial professional judgement** can be easily ascertained, for instance, in life and health insurance. These industries face an extreme time-lag between data used for modelling and the period of assessment of the outcome of the models, sometimes decades later. No matter the amount of data at their disposal and how sophisticated the algorithms they can use are, actuaries still must make judgement because they face the extreme risk of change over this extended time span. In contrast, other industries face just a very short time-lag between past data fed into models and the application period of these models.

In fact, regulation expects actuaries to make appropriate actuarial judgement according to the **relevance and materiality** of the subjects under analysis and take full responsibility for the outcome from their choices on data, assumptions and models.

*Hence, these notes have two main goals. Firstly, they aim at identifying the distinguishing features of actuarial professional judgement. These arise predominantly from the principles laid down in the **Code of Conduct** for actuaries.*

*Secondly, practical assistance is developed by means of a **self-assessment questionnaire** to check the consistency of professional judgement applied by the actuary with the aforementioned principles.*

Some relevant documents related to actuarial professional judgement have been identified during the development of these notes that could be used as additional support. A sample can be found in item '**10. Additional reference documents.**'

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<sup>1</sup>Note that in this paper an actuary is an individual fully qualified member of one of the full member associations of the AAE. Such actuaries are bound by the professionalism standards of their own member association which, in turn, need to be consistent with the professionalism standards of the AAE.

## 2. Introduction. Professional judgement and the actuarial profession

Actuaries in their daily work have always been involved in processes that require their professional judgement. In tariffing or reserving in insurance undertakings or making a quantitative assessment of a pension or employee benefit plan, they must 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 in the Solvency II framework.

Professional judgement is a term of wide comprehension. In any case, the result of this judgement can or will affect the outcome of calculations and influence management decisions. To enable a replicability or a posterior traceability, it is necessary to document relevant steps and assumptions underlying the judgement.

Because of the importance of this judgement, it seems to be necessary to elaborate first on a disambiguation.

What is the essence of an actuarial professional judgement? What distinguishes actuarial professional judgement from other expert judgement?

Expert judgement is based on specific training<sup>2</sup>, knowledge and expertise. Professional judgement of an actuary, however, is based not only on the same requirements (i.e. specific training, knowledge and expertise) but also on standards of professionalism and on 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.

### Definition:

*Professional judgement is the judgement of the actuary, based on actuarial (or other relevant) training and experience <sup>(3)</sup>, bound by the Standards and Code of Conduct of the profession.*

This very short definition of professional judgement implicitly requires compliance with the principles of professionalism and principles of professional conduct cited below.

Definitions or classifications of actuarial professionalism can be found in published Standards of Actuarial Practice, in IAA's publications or in the Code of Professional Conduct of the AAE.

**European Standard of Actuarial Practice 1 – General Actuarial Practice (ESAP1)** uses the same definition for professional judgement as the **Code of Professional Conduct**: 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**,

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<sup>2</sup>Including initial and continuous training.

<sup>3</sup>**Code of Professional Conduct** published by Actuarial Association of Europe in the year 2017 becoming effective on 1 January 2021

**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.

IAA's definition is more comprehensive than the short ESAP1 characterisation. Besides expertise and knowledge, 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.

This extended view is in line with the **Code of Professional Conduct** published by the Actuarial Association of Europe in **2017** becoming effective for Full Member Associations of the Actuarial Association of Europe (AAE) on **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. Purpose

The AAE's **Task Force on the Roles of Actuaries** considers that assistance could be useful for actuaries to apply their **professional judgement** on several issues related to their day-to-day tasks, namely,

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

This short set of considerations could well deserve further development in a standard that **Full Member Associations** (FMA) of the AAE might adopt according to their own specificities. Since professional judgement is a key component of actuarial duties, an internationally accepted standard on the issue might prove helpful.

### 4. The duties of the actuary when making professional judgement

As stated earlier, an actuary must abide the **Code of Professional Conduct** issued by his/her local Association, which in turn must be consistent with **the five principles** of AAE's Code of Professional Conduct.

Let us consider how an actuary could reasonably assess whether his/her activity is bound to develop in accordance with the principles. The following **self-assessment questionnaire** could be set up to help the actuary decide on the **soundness of his/her professional judgement**. The questionnaire is structured in accordance with the five principles.

#### 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 enjoy the knowledge and experience required to deal with the issues involved in the assignment?

#### 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?
- Can I guarantee the way compensation for the assignment is structured avoids bias in my judgement?
- Do I incur in any conflict of interest when accepting the assignment, namely, is my status or remuneration depending on the outcome of this assignment?
- Can I assure I can keep professional scepticism towards data provided by any party involved in the assignment?

## Communication

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

This 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 setbacks** for the actuary to achieve an **integral, competent, compliant, impartial** and **appropriately communicated** professional judgement, he/she may consider several courses of action, e.g.

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

## 5. The choice of data for an assignment.

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 just as input data and considering potential future **possibly-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 actuaries should ensure the use of expert judgment in assessing accurate, appropriate and ~~sufficient complete~~ data for their assignment does not replace the appropriate collection, processing and analysis of data. Rather, it supplements these actions where required.

Let us first consider **data**. Find below a proposed questionnaire to tackle the assessment of issues that might arise in relation with this item.

#### **Assessing data sources**

- Are data sources for the assignment relevant and reliable?
- Can I check the soundness of any data source?
- Do I suspect there might be any vested interest involved in a particular data source?

#### **Assessing data completion**

- Are data available for every period and every magnitude considered in the assignment?
- If data are missing 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?

#### **Assessing data consistency**

- Can I check internal coherence in data used for the assignment?
- Have I proceeded to check internal coherence in data used for each chapter of the assignment?
- Can I ask an external and independent party to check data consistency in the assignment?

#### **Assessing data disclosure**

- Are data in the assignment disclosed in a way that allow any independent party to check their sources, their completion and their consistency?
- Is there enough granularity in disclosed data?
- Are data sources disclosed?

- Are any setbacks in data quality, such as incompleteness or the use of proxies, appropriately disclosed?

## 6. How to deal with missing or incomplete data

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

### Missing data

- Can I draft the assignment without the missing data?
- In case I decide to draft the assignment even though some data are missing, can I reasonably assure the quality of the outcome?
- Do I appropriately disclose which data are missing?
- Do I appropriately disclose my assessment on the effects of missing data on the outcome and conclusions 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?

### 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 incomplete data from available data (e.g. monthly data from annual data)?
- Can I test the effect of the estimation on 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?
- Do I appropriately disclose which data are incomplete and how I deal with the issue?

## 7. The selection of a model for the data

Several issues might be considered to assure the right use and selection of models for the data.

In this respect, the specific questions for this section intend to address model risk:

- 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?
- Are there any test/validation procedures for assessing appropriateness?
- Is the model set up in a way to avoid unnecessary complexity?
- Are simplifications and limitations properly tested and documented?
- Are the model and procedures documented to properly mitigate dependency on key people?

## 8. The setting of key assumptions embedded in the model

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, ...)
- Capital management (Standard capital valuations 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 experience, the lack of relevance of data or the need for new facts or external variables that could make future experience different than past behaviour of the specific assumption. The actuary should consider all series of information while assessing reliability and appropriateness of the use of this historical data.**

**Assumptions** arise immediately when undertaking decisions on **methodology** (e.g. *correlations*), **non-economic variables** (e.g. *mortality and morbidity rates; lapses; expenses*) and **economic ones** (e.g. *interest and credit rates; inflation rate; equity and property indices*). The questions below might help the actuary to **check** and **back test consistency** in assumptions embedded both in the choice of **variables** and of **methodology**.



### **Checking assumptions on 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 and 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?
- Are data for each variable granular enough for the model outcome to be significant?
- Can I be sure about the involvement of the right people providing relevant data and feedback for each variable?

### **Checking assumptions on methodology**

- Are future trends and expectations properly assessed?
- Is professional judgement involved? Does this professional judgement agree with right standard practices and relevant guidance available in the market?
- Are methodology choices based on actuarial independent view and best practices?
- Is documentation on the process of assumption setting enough and complete? Can it be made available for a third party to understand the key steps of the process?
- How is the suitability of the methodology tested?

### **Back 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 either the Senior Management or the Board of Directors?
- Are any identified setbacks considered to improve the model?

## 9. The interpretation of the model outcome

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

### Relevance

- Are the results conclusive?
- Do the results answer the questions asked by the sponsors of the assignment?

### Disclosure

- Are any caveats that may affect the conclusions appropriately disclosed?
- Are all hypotheses and scenarios used to draw conclusions appropriately disclosed?

### Testing

- Which tests have been carried out to check the verisimilitude of the conclusions?
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- Has an independent party with no vested interest checked the verisimilitude of the conclusions?

## 10. Additional reference documents

As mentioned in item '**1. Background**', a few additional reference documents that have been identified during the development of these notes are stated below. The list will be enlarged in future extensions of this document.

- EIOPA's guidelines: EIOPA-BoS-14/166 (Valuation of Technical Provisions); EIOPA-BoS-14/180 (Use of Internal Models); EIOPA-BoS-14/178 (Undertaking Specific Parameters).
- Expert judgement. British Actuarial Journal, 21(2), 314-363. Ashcroft, M., Austin, R., Barnes, K., MacDonald, D., Makin, S., Morgan, S., . . . Scolley, P. (2016). Presented to the IFoA and the IAA in 2015.
- Expert judgement and scientific humanities / Jugement d'expert et humanités scientifiques (CHRISTIAN WALTER · 11/06/2016 )·

## 11. Summary

- The **distinguishing features** of actuarial professional judgement have been disclosed. Also, assistance has been drafted **to help actuaries** when applying their professional judgement in completing their assignments.
- Assistance has been drafted as a **self-assessment questionnaire** that actuaries might use in the different phases involved in completing an assignment, namely
  - Duties set up by the Code of Professional Conduct.
  - The choice of data to be used in the assignment.
  - How to deal with missing or incomplete data.
  - The choice of a model.
  - The selection of model's key assumptions.
  - The interpretation of the model's outcome.
- After completing the self-assessment, had the actuary identified **any serious setbacks** that may adversely affect the **coherence, relevance, soundness** and **impartiality** of the assignment's conclusions, he/she might consider several options, i.e., disclosing the setbacks, communicating them to the parties involved, or quitting the assignment.