

ACTUARIAL EDUCATION

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1 Introduction

The range of knowledge and skills needed by an actuary in an ever changing world is getting wider and wider. This happens also in Italy, where the extent of opportunities for actuaries is dramatically increasing, both inside and outside the insurance industry. Inside the insurance industry, the actuary is asked to cooperate, for example, in the implementation of new accounting standards, in the assessment of modern reinsurance arrangements and alternative risk transfers, in the financial management of the firm. Outside the insurance framework, the role of the actuary is gaining importance, for example, in the fields of financial analyses, risk evaluations, financial risk management.

The enlarging range of opportunities constitutes, on the other side, an important challenge for all institutions involved in actuarial education and actuarial training, and thus for the professional body and the universities.

When dealing with actuarial education and training, we should focus on (a) technical issues, (b) non-technical issues, (c) professional issues.

Technical issues are those strictly related with the actuarial work in the various relevant fields: life insurance, non-life insurance, pensions, finance, risk management. These issues complement the basics of actuarial science, consisting of probability and statistics, actuarial mathematics, risk theory, economics.

Non technical issues mainly concern skills which are not unique to the actuary, for example communication and reporting skills, influencing skills and general management skills. Finally, professional issues originate from the standards expected by the public, employers and clients of members of the profession.

The actuarial education process in Italy is mainly university-based, whereas the profession at present intervenes in the educational process after qualification only. A practical implication of this arrangement is a sharing of educational tasks between the professional body and the academic institution. Universities are asked to provide the basic actuarial knowledge as well as the most important technical issues and some non technical issues such as communication and reporting skills. The professional body should be engaged in the process of continuing education and professional development, mainly aimed at updating the technical knowledge and

the professional skills of the qualified actuaries.

Performing an extended range of tasks, inside and outside the insurance industry, requires interfaces between the actuarial profession and non-actuarial jobs. Cooperation between actuaries and other professionals must be founded on improved communication skills as well as on a mutual knowledge of some basic technical issues. So, basic actuarial topics should enter the range of knowledge of non-actuaries operating in many economic sectors, whereas general accountancy principles, basics of company management, corporate finance, etc. should be included in the actuarial education process. Clearly, a further challenge for both the academic system and the professional body arises.

The following Sections aim at explaining how the Italian actuarial system and, in particular, its academic and professional components are facing the new challenges. Currently we are experiencing a reform of the Italian university system. As a consequence, an innovation in the qualification follows, as well as in the definition of “actuary”. In each of the following Sections we first describe the present situation and then the new issues. Comparing new issues to present ones can provide some insights on the possibilities of facing the new challenges.

2 University education

In the University system which has been in force in Italy up to the academic year 2000/2001 there is a four-year degree course in “Statistics and Actuarial Science” (“Scienze Statistiche e Attuariali”, briefly SSA), which is the only one allowing graduates to enter the actuarial profession. Precisely, people graduated in Statistics and actuarial science can apply for the qualification examination and then enter the profession.

The first degree course in SSA was organized by the University “La Sapienza” of Rome in 1927, followed by the University of Trieste in 1978; after them, the University of Florence, the University of Sannio in Benevento, the University of Calabria and, more recently, the University “Cattolica del Sacro Cuore” of Milan have offered similar courses.

To obtain the degree in SSA, several exams must be passed and a final dissertation thesis must be written and then discussed.

Most of the teaching topics are common to the degree courses offered by the six universities mentioned above, owing to the fact that the structure of degree courses in Italy must comply with a pattern worked out by the Ministry for University and Scientific Research. The common teaching topics are the following:

calculus and algebra, statistics, computer science, laws, foreign language (usually English), probability, economics, financial mathematics, actuarial mathematics, risk theory, insurance economics, life insurance, general insurance, pension funds, actuarial statistics.

For example, in the University of Trieste the degree course is organized as follows.

- I year: algebra, statistics I, calculus I, private law, English I, computer science I;
- II year: calculus II, probability, computer science II, fundamentals of economics, financial mathematics, statistics II, English II;
- III year: statistical multivariate analysis, demography, actuarial mathematics, actuarial statistics I, statistics for economics, risk theory, one free topic;
- IV year: insurance economics, mathematical statistics, four teaching topics chosen from life insurance, pension funds, general insurance, actuarial statistics II, insurance law or from modelling of financial markets, financial economics, decision theory I and II, econometrics.

Some international projects allow students to spend some time in foreign universities. For example, the Socrates/Erasmus program (organized within the European Union) enables students to attend some teaching courses in a European University, the exams passed being recognized by the parent University (stays abroad are allowed for a maximum period of one year).

From the academic year 2001/2002 a new University system will operate, which will give more freedom to each University in designing their degree courses. The new system is based on a three-year degree course, which should give the basic education on the topics dealt with, followed by a two-year degree course, which provides the student with a deeper knowledge of such topics. Formally, the two degrees are respectively referred to as “degree” and “specialization degree”. Speaking informally, the three-year degree is also called “short degree” (the “full” course of study taking hence five years). Moreover, the new degree structure is based on a credit system; the completion of the degree course is achieved when a given number of credits is gained, which are calculated on the type of examinations passed.

The new and the old University system will of course coexist until when there will be students attending the old degree courses (from 2001 on, however, new applications are accepted only for the new system).

As a result of the greater freedom in the design of educational products, the degree courses in actuarial science offered by universities may differ in many aspects. For example, it is possible to design alternative tracks, each one getting deeper in some subjects, such as financial mathematics, actuarial techniques, economics of insurance, or even in non strictly actuarial topics, such as accountancy, corporate finance, etc.

Actuarial education will involve short degrees as well as specialization degrees. In this context, various short degrees (not necessarily strictly actuarial) will allow graduates to attend a particular actuarial specialization degree; depending on the examinations passed on the three-year degree, a given number of credits are recognized at the beginning of the two-year degree course, with a full recognition in case a (short) degree on actuarial subjects has been attended.

3 Qualification

The professional qualification is based on examinations which are regulated by the State. The current structure is rather simple, owing to the strictness of the organization of the degree courses. The qualification involves two written and one oral examinations, based on the following subjects: statistics, financial mathematics, actuarial mathematics, life and non life insurance, pension funds, economics and finance of insurance companies, insurance law.

According to the new University system, two qualification levels will be designed: one for people with a three-year degree and one for people with also a two-year degree. As a consequence, two professional levels will be established: the “junior” actuary, for the three-year degree, and the “senior” actuary, for the three-year + two-year degree.

Given the greater freedom in the design of degree courses, deeper examinations are needed for the qualification; this is also required by the fact that the new University law admits to the qualifying examination a wider range of degree courses than before, such as for example degrees in finance. It is therefore necessary to ascertain the actuarial knowledge independently of the particular degree or specialization degree and the University where it was obtained.

4 Continuing education and continuing professional development

A continuing education and professional development project has been set up recently in Italy. Previously, the Italian Institute of Actuaries (“Istituto Italiano degli Attuari”) used to offer short (1 to 3 days) refresher courses; organizing seminars

and lectures is anyhow part of its scientific institutional activity. Recently, the Italian Institute of Actuaries and the Actuarial Professional Body (“Ordine degli Attuari”) have set up the SIFA (“Sviluppo Iniziative Formazione Attuariale”), which is charged of the organization on a regular basis of courses for the continuing professional development of actuaries. The SIFA started its activities in January 2000.

So far, courses have been organized (previously by the Italian Institute of Actuaries and then by SIFA) on a number of actuarial topics. In particular:

- Valuations in life insurance
- Pension funds according to recent legislation
- Projected mortality tables
- Unit-linked and index-linked products
- Risks and solvency in life insurance
- The actuarial work in general insurance
- Reinsurance techniques in life and non-life insurance
- Mathematical finance

Both practical issues and theoretical topics are dealt with, the latter in particular with the aim of updating actuaries on recent modelling techniques or giving a more modern view on traditional actuarial tools, depending on the market evolution. Some courses are 2 - 3 days long, while others are arranged as a sequence of units, each 1 - 2 days long.

University professors and lecturers, consulting actuaries and actuaries operating in insurance companies are charged of the teaching activities. The attendance is not compulsory neither for actuaries already belonging to the profession, nor for people applying or qualifying for it. However, in a near future SIFA will provide specific courses for people applying for the professional qualification, and this consistently with the future organization of qualification exams.

5 Actuarial education outside the actuarial training

Several initiatives aiming at actuarial education are available in Italy for non-actuaries, both within University (non-actuarial) degree courses and for graduates in subjects other than actuarial science. As far as (non actuarial) degree courses are concerned, traditionally the basics of actuarial mathematics are taught in degree courses in economics (usually the relevant exams are not compulsory but eligible). Also some mathematical degree courses involve topics such as actuarial

mathematics or risk theory.

At a post-graduate level, Masters in Insurance and short courses for executives are available, the latter in particular being offered by Business Schools (such as the SDA – “Scuola di Direzione Aziendale” – of the University “Bocconi” in Milan). Among the Masters in Insurance, we mention the Master in Insurance and Risk Management (MIRM) of the MIB School of Management of Trieste and the “Master in Assicurazione e Gestione dei Rischi” of the University “Bocconi” in Milan. Both Masters involve 9-10 months of teaching activities and a 2-3 months stage in an insurance company, an insurance consultant company, a risk management or a financial institution. People just graduated or with some working experience can apply.

6 Conclusions

In the context of a rapidly evolving scenario, a continuous evolution of the actuarial role and hence of the actuarial education and skills is needed. As far as Italy is concerned, the professional body could take great advantage from a more flexible academic structure but, at the same time, efforts should be devoted to provide technical education possibly complementing actuarial teaching offered by the universities, as well as to a rigorous ascertainment of technical and non technical knowledge in people applying for entering the profession.

Guidelines for technical education and for qualification standards are provided at an international level. Actually, a lot of work has been performed at an international level in order to define uniform educational standards to be implemented by each country, through universities and / or professional bodies according to country specific arrangements and traditions.

In particular, the "Groupe Consultatif des Associations d'Actuaires des Pays des Communautés Européennes" has approved a Core Syllabus, prepared by its Education Committee and devoted to education and training of the European actuary. The Education Committee of the International Actuarial Association is working about a world standard, to be implemented by 2005. Frequent joint meetings of the two Committees facilitate profitable interchange of information and opinions.

Finally, the regular implementation of appropriate schemes aiming at continuing education and continuing professional development is a mandatory task for the professional body. Actually, the evolution of the actuarial role must be supported by a continuous updating involving both practical knowledge and theoretical framework.