УДК 519.21:378.2

THE DEVELOPMENT OF UNIVERSITY-BASED ACTUARIAL EDUCATION IN CANADA

Tetiana Fursenko
Kyiv National Economic University named after Vadym Hetman, Kyiv, Ukraine
ORCID: 0000-0001-7192-8867, e-mail: tanya_kostylova@ukr.net

The paper is aimed at figuring out the current state of actuarial education provided by Canadian universities tracing the peculiarities of its development and concentrating mainly on the process of the University accreditation program implementation. The academic novelty of the article lies in the fact that in national comparative pedagogy it is the first attempt to analyze Canada`s university-based actuarial education. Having studied the documents, we may conclude that the UAP is a set of the criteria and requirements having fulfilled which a university is granted the right to provide its actuarial students with the opportunity of exemption from the professional exams set by the SOA and the CAS on their way to the ACIA or FCIA designations. It is worth mentioning that in many ways Canada is the first country in North America which is now actively trying to bring the profession of an actuary into academic environment. The reasons for implementing such measures are obvious: university settings open wide prospects for research activities as well as provide more predictable route for becoming a qualified actuary as compared to its alternative of going through the set of the exams established by the above mentioned bodies. By integration of formal and informal actuarial education into a single whole it is possible to strengthen the profession. However, the main obstacle on the way to success of the UAP is the assumption that by shifting educational process to universities we are reducing professional standards. Under such circumstances the UAP policy is characterized by stringent selection criteria as for the syllabi, course outlines, faculty members, minimum exemption grades etc.. The main of them can be broadly summarized as follows. In order to be accredited a university has to provide 85 % coverage of the syllabus of the professional bodies, to have at least 4 full-time faculties, one of them has to be a fellow of the CIA, rigid testing and examination procedures are a must; for students to get the exemption, the grade on each of the courses in question has to be not lower than «B» or higher. In order to figure out whether a university satisfies the standards, lots of administrative bodies have been created or engaged: the Eligibility and Education Council, the CIA, the Accreditation committee, accreditation panels, appeal investigation panels etc. For the time being, there are 11 universities which comply with the given requirements. Overall, the UAP can be considered as a successfully implemented experiment.

Key words: Canada, actuary, actuarial education, The UAP, the CIA, exam exemptions, criteria for accreditation, accredited universities, the evolution of actuarial education, introduction to the profession.

Introduction.

Actuarial education around the world is characterized by a specific role of universities in the professional training of representatives of the profession. Apart from several countries, there is quite an unusual practice when actuarial university programs are staging initial steps of their introduction and successful completion of all academic requirements is not considered to be sufficient for entering the profession of an actuary. However, the main institutions which provide professional training to aspiring actuaries by setting requirements and standards that certify the quality of educational background are professional bodies. Despite this tendency being valid for a long time, the growing demand for qualified actuaries coming from the development of market economies and intensification of market volatility and fluctuations is the main factor stipulating the need for integration of academic and non-academic components into a unified and powerful system of professional training which will contribute to popularization of the profession among the young and will presumably enable to enhance research activities in actuarial science. It will undoubtedly facilitate the development of an actuarial profession. From the point of view of the above-mentioned peculiarities the Canadian experience of actuaries` preparation seems to be of interest. Thus, in the paper we are going to have a closer look at how the things are organized in this country.

The theoretical framework of the research is composed of the research papers by Rob Stapleford [5], John I. Mange [3] and Fred Szabo [6]. From our perspective, these authors highlight the system of actuaries` training in Canada in a fragmentary way concentrating on a number of important aspects, whereas our goal lies in the complex analysis of this issue in terms of determining cause and effect relationships and the main principles regulating possible ways of becoming a qualified and recognized actuary in Canada.

The aim of the paper is to single out peculiar features of the introduction of university-based actuarial education in Canada and to analyze the accreditation mechanism for universities offering actuarial programs in Canada.

The methods of the research consist of the analysis and synthesis of psychological and pedagogical scientific knowledge, the methods of comparative pedagogical analysis. Systematization and organization of existing scientific information, classification of forms and approaches are also used.

Jumping ahead a bit, it is worth mentioning that in Canada there are several ways leading to the status of a qualified actuary. The first one implies studying at university at actuarial program and the requirement to set a number of further qualification exams. The alternative way to become a representative of the profession is to get a university degree in a related field: in economics, finance or math, for instance. In this case, to confirm the level of knowledge and competency one has to go through much of self-study work, attend a number of seminars and devote much time to hitting the books prior to taking the whole set of the preliminary and advanced exams. Independently of the chosen route the main establishments regulating granting of actuarial educational services are the North-American actuarial professional organizations: the Society of Actuaries – the SOA, the Casualty

Actuarial Society – the CAS, the Canadian Institute of Actuaries – the CIA. An important point to be mentioned is that membership in the above mentioned professional bodies serves as a validation of supreme professional skills and in fact is the final result of the long-lasting educational process.

It is the academic way of getting an actuarial qualification which our paper is going to be concentrated on. The analyzed materials showed us that in North America (in particular, in Canada) gaining actuarial education through universities was an unusual occurrence mainly due to a small number of higher educational establishments offering corresponding programs. In Canada the University of Toronto was the first one to introduce actuarial courses in 1875. In the USA it was the Universities of Michigan and Iowa. The expansion in the number of university actuarial programs took place in the 1950s [3, p. 12-13]. However, at that time an academic way of becoming an actuary was not considered the best option because the graduation from universities was not sufficient to enter employment as a qualified actuary. The confirmation of an individual being qualified enough was a successful examination only. That is why it is possible to draw a conclusion that the professional organizations were the only educational establishments granting recognized credentials which promoted professional development and a relatively mass scale of actuarial education.

In this regard, a defining attribute of actuarial education in the nineties was the fact that the main form of developing skills and proficiency was self-education. Nevertheless, it was also clear that the things couldn`t be left as they were and that the existing situation needed changing. Indeed, the attempts to find appropriate forms, methods and training resources as well as the intent to reach unification and complexity of the educational process have been a key objective since the introduction of actuarial education in Canada. On this point, in 1905 Arthur Hunter, the member of the ASA and the Faculty of Actuaries, worked out the recommendations for preparation of perspective actuaries for a successful sitting of the professional exams and working practice. Among the suggested proposals there were textbooks and course contents coherence and elaboration of lecture courses on the topics not covered appropriately in the available learning resources. Such a course was created in 1910 in terms of the ASA [3, p.13].

A rising tide of interest to the attempt to bring the professional training of actuaries into university settings took place in the 1960-1970s. In 1969 then-President of the SOA Wendell Milliman put forward the proposal to consider a successful completion of academic courses for a master`s degree in accredited universities and successful examination as an equivalent to passing the professional exams. One of his successors Charles Trowbridge in his speech in 1975 also emphasized the specifics of interaction between formal and informal components of actuarial education, namely the absence of university programs which would provide an enhanced system for future actuaries` training as specialists with high degree of proficiency and qualification like it is the case with health and legal professionals, just to name a few examples. According to Trowbridge, the creation of the appropriate academic environment would lead to strengthening of the actuarial profession in general and its reputation in particular. However, two years later the Advisory Committee on

Education and Examinations which previously promoted the development of university actuarial programs stopped supporting this idea which in turn led to the situation when there was no more interest in this approach [3, p. 13]. Since then the reasonability of the development of university-based actuarial education as an equivalent to the preparation organized by the professional bodies was discussed from time to time, but unfortunately no effective steps had been made to achieve this goal till the end of the XX century.

Nevertheless, in 2011 the Canadian Institute of Actuaries announced the decision to introduce the alternative way of entering the actuarial profession. This approach suggests that since September, 2012 the universities approved by the CIA have been offering the courses, completion of which grants graduates the right to apply to the professional body for the exemption from a number of written exams according to the SOA or the CAS systems which previously were a must to get membership in the CIA – an Associate of the Canadian Institute of Actuaries (ACIA) or a Fellow (FCIA) [3, p.13]. The necessity of such a pathway introduction results from the opportunity to open new prospects such as making the actuarial profession more attractive for talented young people and the creation of a unified and integrated Canadian system of actuarial education. Nonetheless, the introduction of university-based actuarial education is a long process consisting of a number of stages and procedures and is done under the principles of a constant monitoring and control by the local professional organization. Let's have a closer look at how the idea of making the profession of an actuary more academic has been put into practice in Canada.

So, the starting point of introduction of actuarial university programs in Canada was the formation of the Accreditation committee (the AC) on the basis of the Canadian Institute of Actuaries in 2010. The main objectives of the AC were the approval of universities ensuring the high quality of actuarial training provided by academic institutions. Besides, it was important to work together with the CAS and SOA representatives as it was their credentialing mechanism which was the subject to reforming. All these concerns were taken into account and the delegates from the US professional bodies were invited as supervisors. The AC in cooperation with the CIA representatives elaborated the University Accreditation Program (the UAP).

The main goal of the program is to give university graduates majoring in actuarial science the opportunity to get exemptions from the following exams: Financial mathematics (FM/2), Models for Financial Economics (MFE/3F), Models for Life Contingencies (MLC/3L), Construction and Evaluation of Actuarial Models (C/4). There is no way to get exemption from the Probability Exam, Statistics and Probabilistic Models (Exam S) and Models for Stochastic Processes and Statistics (Exam ST) of the CAS, thus those willing to get the Associate (ACIA) and Fellow (FCIA) designations are required to sit these and Fellowship exams plus several other modules and to meet other eligibility requirements [5, p.14; 2] which are specified in detail on the CIA website. However, maintaining high standards which were peculiar to the professional training of actuaries before the reform is a top-priority task for actuarial educators and the CIA is absolutely positive that such a pathway to the Fellowship designation will be more predictable and will greatly

contribute to the theory and methods of actuarial education.

The Accreditation Committee invited 16 universities to take part in the quality assessment of granting actuarial educational services. In order to set up a correspondence of each of 11 universities which responded to the offer to the set criteria, the Accreditation panel was created. It included members of the Accreditation Committee, researchers and Fellows and other representatives of the CIA. Among the membership requirements it was also specified that it was completely inappropriate for a member of the AP to work for or to be in other kinds of cooperation with educational establishments over the last three years. The panels held a-day-and-a-half on-site inspections [5, p.14-17]. During the visits a number of meetings with leading faculty staff and as far as it was possible with lecturers and instructors directly responsible for delivering courses leading to exemption to actuarial students were conducted. Indeed, much attention was given to the ideas teaching staff had as for how to organize the educational process in the best way, as for syllabi and whether it was necessary to have full-time Fellows of the CIA etc. Such an interaction with heads of departments and dean`s office representatives enabled to detect the level of preparedness of universities to future actuaries` training and the prospects of university-based actuarial education development.

One of the most important points for consideration was the necessity of establishing unified, rigid and objective criteria to students` academic performance. According to the UAP, students` academic progress in subjects from which exemption is possible has to be not lower that 80 per cent which corresponds to the grade of B and higher. An essential component of students` achievements monitoring has to be tests and exams. Written answer sheets are the subject of interest and have to be kept as evidence. More attention is also given to papers of top-performing students and students who failed exams [5, p. 15]. Such an approach is a good way to identify the level of task complexity and could possibly show that some corrective actions as for knowledge assessment system might need to be taken.

The requirements to university staffing are no less important. Thus, universities are obliged to have at least four full-time faculty members, one of them has to be a Fellow of the Canadian Institute of Actuaries and perform the functions of the university's accreditation actuary (AcA). Into the scope of his duties ongoing monitoring of actuarial courses giving exemptions from preliminary examinations for compliance with the CIA`s expectations is included. The university's accreditation actuary can be a part-time member for the period up to 4 years (so called transition period) [5, p.15-16]. The Committee and the accreditation actuary held meetings on a regular basis in order to clear up the situation in each university.

Moreover, it is an important point to mention that being based on the educational objectives of the main North American actuarial professional organizations, the universities developed syllabus drafts prior to the inspections by the representatives of panels. Universities were required to provide educational content with 85 per cent correspondence to the topics covered by exam programs. In case the coverage of the material by universities was less than 100 per cent in terms of similarity to the exam material, the latter had to justify the difference specifying what material would be used to compensate for it [5, p.15-16]. The way actuarial

courses were taught and delivered was also monitored and estimated with the aim to ensure quality and the unity of theory and practice.

Having finished on-site inspections, the Accreditation panel wrote reports with conclusions as for whether the inspected universities can be recommended for accreditation. All the reports were submitted to the Accreditation Committee. The latter together with the Eligibility and Education Council chose five universities which received the accreditation for 5 years. Three more universities were accredited for three years due to the fact that there were some drawbacks in syllabi which had to be eliminated during the given time [5, p. 15-17].

It should be noticed that the implementation of the UAP especially at the initial stages allowed for the right of universities which failed the inspection to file an appeal. For each of such requests special commissions were created which examined claims, Panels `reports taking into consideration a number of other factors. Following the results of such reexamination and review of the inspection results two more universities received accreditation (out of the three that applied).

Nowadays, the following 11 universities across Canada have been accredited to participate in the CIA's University Accreditation Program:- University of Calgar; Concordia Universit; Université Laval; University of Manitoba; Université de Montréal; University of Regina; Simon Fraser University; University of Torontol; Université du Québec à Montréal (UQAM); University of Waterloo; Western University [1]. An interesting point to be mentioned is the Accreditation Committee's decision on graduates who had completed university actuarial programs before 2012 – before the UAP was introduced and implemented. According to this approach there is no opportunity to get exemption from the preliminary exams. Such a step despite its inconsistence with the principles of democracy and equality seems to be reasonable, due to the fact that previous years` syllabi haven`t been inspected, that`s why their compliance with the current standards of actuarial education is open to question.

It is also worth pointing out that there are certain goals and expectations which are highly desirable to be achieved and met for the successful implementation of the UAP. Among such primary objectives there are enhanced cooperation with the American actuarial professional organizations, especially the SOA, recruiting and training of external examiners for continuous monitoring of the accredited universities` activity, curricula and syllabi, elaboration and development of administrative procedures executed by the CIA.

Conclusions.

Having analyzed the Canadian experience of actuaries` training, we may conclude that the development and implementation of the UAP is one of the major steps towards the introduction and strengthening of university-based actuarial education in the country. The main goal towards which the document is oriented is to change the age-old traditional pathway of becoming an actuary for making the system of professional training be in tune with the times satisfying the growing demand for qualified specialists in this field. Despite seeming simplification of the process of getting actuarial credentials which used to be a complicated many-level system – and let it be mentioned to a certain extent it is the case – these reforms

should not be confused and in any way associated with the reduction of educational standards. As it is evident the introduction of the UAP is a well-planned and well-coordinated process its most important aspects being elaboration of rigid criteria for assessing students` academic performance in actuarial courses as the key condition for getting exemption from preliminary exams. This is where the CIA`s considerable achievements in international collaboration are clearly seen. It is also worth noting that the process of the UAP implementation is characterized by the principles of continuous monitoring, openness, objectiveness, integrity, continuity, diagnostic and prognostic focus and validity.

Taking into account that the system of actuarial education in Ukraine is staging the initial phase of its development, among the directions for further research such aspects as determining and investigation of the reasonability of application of the Canadian experience to the theory and practice of actuaries` preparation in Ukraine are of interest and need further investigation.

References:

1. *Canadian institute of actuaries Accredited Universities, Canadian institute of actuaries Online. Available at: http://www.cia-ica.ca/membership/uap/accredited (last accessed April 9, 2017).*
2. *Canadian institute of actuaries CIA University Accreditation Program Policy, Canadian institute of actuaries Online. Available at: http://www.cia-ica.ca/membership/uap/accredited (last accessed April 9, 2017).*
3. *Mange, John (2012) The Evolution of Actuarial Education, The Actuary Magazine (4), pp. 12-13.*
4. *Michail, A., Huntington, C. and Mueller, H. (2000) Actuarial Education and Certification Around the World, The Record.*
5. *Stapleford, R. (2012), The Canadian institute of actuaries' university accreditation program, The Actuary Magazine (4), pp. 14-17*
6. *Szabo, F. (2013) Actuaries` Survival Guide : How to succeed in one of the most desirable professions, Academic Press. Available at: http://www.sciencedirect.com/science/book/9780126801460 (last accessed April 9, 2017).*

Received: June, 11
Accepted: July, 11