Reform of studies in mathematical statistics, actuarial mathematics and econometrics in Czechoslovakia

Aktuárské vědy, Vol. 8 (1948), No. 1, 35–38

Persistent URL: http://dml.cz/dmlcz/144712

is that of Pearson's χ^2 criterion where the condition is that χ^2 must be a minimum. Another method, elaborate and equally valuable from the theoretical standpoint, is that of Cauchy (Cauchy, Collected Works) which is not used probably only because no-one has taken the trouble to put it into a form suitable for computation (cf. the normal equations derived by Gauss, so useful for computation in the method of least squares).

(To be continued.)

REFORM OF STUDIES IN MATHEMATICAL STATISTICS, ACTUARIAL MATHEMATICS AND ECONOMETRICS IN CZECHOSLOVAKIA

Courses of study in Mathematical Statistics, Actuarial Mathematics and Econometrics in Czechoslovakia are provided in the Faculty of Science of King Charles' University in Prague and at the University of Technical Sciences in Prague; both these courses have been reorganised by the Act of May 16, 1946, No 122 of the Collection of Laws and Ordinances. The two years' course of lectures at the University of Technical Sciences — originally mainly devoted to the study of Insurance Technique and in existence since 1905 — has been fundamentally reformed and transformed into a four years course in the Department of Statistical and Actuarial Engineering. The course of lectures at the University, in existence since 1921 as a four year course, has also been reformed in view of the recent developments in actuarial science. The above mentioned act provides also for some facilities and lectures to be held jointly for students of both courses.

The subject matter covered by the course on Mathematical Statistics, Actuarial Mathematics and Econometrics in the *Faculty of Science of King Charles' University* may be seen from the Regulations concerning Examinations issued by the Ministry of Schools and Education on Feb. 12, 1947, No A-273.711-46-V.

According to these Regulations, the purpose of the course is to equip students with proficiency in carrying out mathematical-statistical, actuarial and econometric work; students must display this proficiency in two State Examinations taken before a Board of Examiners appointed by the Minister of Schools and Education from the ranks of professors and lecturers in the Faculty of Science as well as from outstanding experts active in practical profession.

The First State Examination must be taken not sooner than in the fourth semester (i. e. half-year term) of studies. To be allowed to enter for this exa-

mination the candidate must pass preliminary tests in General Statistics and Political Economy and attend tutorial classes in Mathematics. The required subjects of examination in the First State Examination are the following: Algebra, Geometry and Analysis to the same standard as is required in the First State Examination for secondary school teachers of Mathematics, and in addition Probability, and Numerical and Graphical Computing. The First State Examination may be taken by sitting each subject separately in succession. Candidates who have passed the First State Examination for secondary school teachers of Mathematics require to take, besides the preliminary tests mentioned before, only Probability and Numerical and Graphical Computing.

The Second State Examination may be entered not sooner than in the eighth semester of studies. Candidates must produce evidence of having attended in the last four semesters lectures and tutorial classes in Mathematical Statistics and its applications to subjects represented in the Faculty of Science, in Political Arithmetic (Compound Interest and Annuities Certain), Actuarial Mathematics (Mathematics of Private and Social Insurance), Econometrics, Probability, Finite Differences, General and Population Statistics, Insurance Law and Accountancy. A preliminary test in Insurance Law must be passed.

The Second State Examination consists of a homework paper, a written paper and an oral examination. It is permitted to take the examination in two parts one of which contains Mathematics as the first subject of examination, the other one Probability, Mathematical Statistics, Actuarial Mathematics and Econometrics jointly as the second subject of examination.

The standards required for the examination in Mathematics are the same as for the Second State Examination for secondary school teachers of Mathematics. Candidates who have previously passed the latter examination or the Rigorosa (Examinations for Doctor's Degree) with Mathematics as their main subject are exempted from the examination in Mathematics.

The homework paper must be completed within three months and must treat a special subject selected from the group of subjects comprising the second part of the examination.

The written papers consist of four-hour papers for each subject of examination.

The oral examination takes one hour for each subject of examination.

The syllabus of Econometrics as required for the Second State Examination is rather interesting. It is reproduced here since the subject is comparatively new.

In the Regulations concerning Examinations the standards required in Econometrics are stated as follows: *Statics*: A Summary of Development and

Fundamental Concepts of Econometrics, Theory of Distribution of Wealth and Income, Static Theory of Demand and Supply, Pure Exchange, Monopoly, Economic Equilibrium, Theory of Taxation Systems, Mathematical Theory of Value and Surplus Value. *Dynamics*: Theory of Production and Consumption with respect to growth of populations, Mathematical Theory of Planning, Dynamic Theory of Exchange, Circulation of Prices, especially of Interest Rate, Index Numbers, Theory of Business Cycles and of International Trade.

After passing the Second State Examination the candidate is awarded a Diploma and the title of Magister of Mathematics (Mg. Math.).

The reform of studies in Mathematical Statistics, Actuarial Mathematics and Econometrics at *the University of Technical Sciences*, as has been mentioned above, consists in the establishment of a Department of Statistical and Actuarial Engineering.

According to the Regulations concerning Examinations issued by the Ministry of Schools and Education on January, 31st, 1947, No. A-6783-V, two State Examinations are held in order to test the scientific and technical knowledge attained by students who have studied in the Department of Statistical and Actuarial Engineering at the University of Technical Sciences in Prague. In these examinations, students must display their ability to carry out independent work in the fields of Statistics, Actuarial Mathematics, Econometrics and Industrial and Business Accounting. *The First (General) State Examination* takes place as a rule towards the end of the fourth or during the fifth semester and the subjects for examination are: Mathematics I, Mathematical Statistics I (including the Theory of Probability and General Statistics), and Economics (including the Theory of Finance and Industrial and Business Accounting). Before being admitted to this State Examination, candidates must pass qualifying examinations in the Mathematics of Economics and Finance, Industrial and Business Economics, Introduction to the Dynamics of Statistical Populations, Numerical Methods, Principles of Scientific Thought, Sociology, Principles of Organization and Rationalization, Elements of Legal Theory and the History of Mathematics.

After passing the First State Examination, students may then specialize in *one of three directions*. The first course of study prepares them to take up statistical work in the running of production, distribution and transport enterprises, in economics, in industrial and agricultural production, in research departments of industrial and business federations, of social institutes, etc. The second course trains specialists for technical and statistical work in the field of social insurance as well as private life and property insurance, and in the field of finance. The third course meets the need for specialist statisticians in public administration, government and public institutions. The three courses of study do not differ a great deal from one another.

The Regulations concerning Examinations require as conditions for admission to the Second State Examination, in addition to evidence of having passed the First State Examination, evidence of passes in certain qualifying tests common to all three specialist courses and in other tests peculiar to each course. The common examinations are in the subjects: Mathematics II, Dynamics of Statistical Populations, Biometrics, Psychometrics, Population Statistics, Insurance Technique, Insurance Accountancy, Reading and Analysis of Balance Sheets, Organization and Statutes of Social Insurance. The preliminary special examinations are:

a) Course I: Actuarial Mathematics, Statistics in Public Administration, Principles of Technology, Normalization, Social Industrial Policy.

b) Course II: Industrial and Business Accounting II, Technique of Insurance and Insurance Law.

c) Course III: Actuarial Mathematics, Industrial and Business Accounting II, Foundations of Technology, Social Industrial Policy, Law Relating to Conditions of Labour, History of Statistics.

The Second (Specialist) State Examination then includes the subjects: Mathematical Statistics, Econometrics and

a) for Course I students: Industrial and Business Statistics, including Statistics in Technical Practice;

b) for Course II students: Actuarial Mathematics;

c) for Course III students: Statistics in Public Administration.

The Second State Examination consists of a practical and a theoretical part. In the practical examination, the candidate has to work out problems which are chosen so that he can display his skill in applying the theories of the main examination subjects. After successfully passing the practical examination, the candidate is then admitted by the Examining Board to the theoretical examination in the above-mentioned subjects. After passing the Second State Examination the candidate is awarded a Diploma and the title of „inženýr" (Ing.), corresponding to the Bachelor of Science Degree in Engineering.

THE DEVELOPMENT OF SOCIAL INSURANCE IN CZECHOSLOVAKIA

Czechoslovak social insurance which, after the reestablishment of the independence of Czechoslovakia in 1918, had its beginnings in the former Austrian workmen's compensation (in operation since 1888), health (1889), miners' (1889), and pension insurance (1909), was successively enlarged in the years from 1918—1938 by the health insurance of public employees as well as by the workers' pension insurance, and was substantially reformed at