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ГРОМАДСЬКА ОРГАНІЗАЦІЯ

«ЄВРОПЕЙСЬКА НАУКОВА ПЛАТФОРМА»

ОО «ЕВРОПЕЙСКАЯ НАУЧНАЯ ПЛАТФОРМА» • NGO «EUROPEAN SCIENTIFIC PLATFORM»



ASSESSMENT OF THE CONNECTION BETWEEN THE COMPETITION SCORE AND THE RESULTS OF ADVANCEMENT IN HIGHER MATHEMATICS OF ECONOMICS DIRECTION STUDENTS

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The preparation of a bachelor's degree in economics in universities of the III-IV accreditation levels involves mastering of a cycle of natural and mathematical disciplines of this professional direction. In accordance with the curricula of the field of knowledge 07 "Management and Administration" to such normative disciplines of mathematical direction can be attributed: higher mathematics, probability theory and mathematical statistics, statistics, econometrics, optimization methods and models.

The foundation for studying these disciplines is undoubtedly the knowledge of elementary mathematics, that is, the knowledge gained by current students during their studies at secondary schools of the I-III degree. Determination of the level of such knowledge takes place during the external independent evaluation (EIE), after which the entrant's competition score is formed, which is necessary for participation in the general competition while the entry to the university. Positively, in such a selection, the university has the right to independently form the structure of the competition points using weight coefficients and determine the minimum value of the number of points in the entrance examinations with which the admission is allowed to participate in the competition.

The assessment of the adequacy of the applied competitive selection model is investigated by the indicator of the predictive validity of the competition score. Namely: by means of the correlation coefficient between the indicator of the competitive selection and the results of the student's progress are carried out during the first year of study. Therefore, when assessing the prognostic validity, one can investigate the effect of the results of the EIE in some subjects or their respective weighting factors on the success and build on them the best models of competitive selection.

In this paper, we study correlation relations between the competition score, the EIE score in mathematics and the rating point of current progress in higher mathematics of the students of the field of knowledge 07 "Management and Administration".

The data analysis of the entrants external studies showed that, despite the fact that mathematics is a profile item with the highest weighting factor, its score is much lower and has significant fluctuations compared to the competition score. Such a pattern, within the framework of the sample, is related to the following factors: artificial increase of the applicant's competitive score as a result of the introduction of the regional and rural coefficients; the general tendency of deterioration of quality of

school physical and mathematical preparation of entrants, observed in recent years; Branch of Knowledge 07 "Management and Administration" (despite the fact that mathematics is a profile subject with a fairly large weighting factor) is more attractive for humanitarian-oriented entrants, for which the score of the external EIE from the second and third subjects is significantly higher than the score of the EIE in maths.

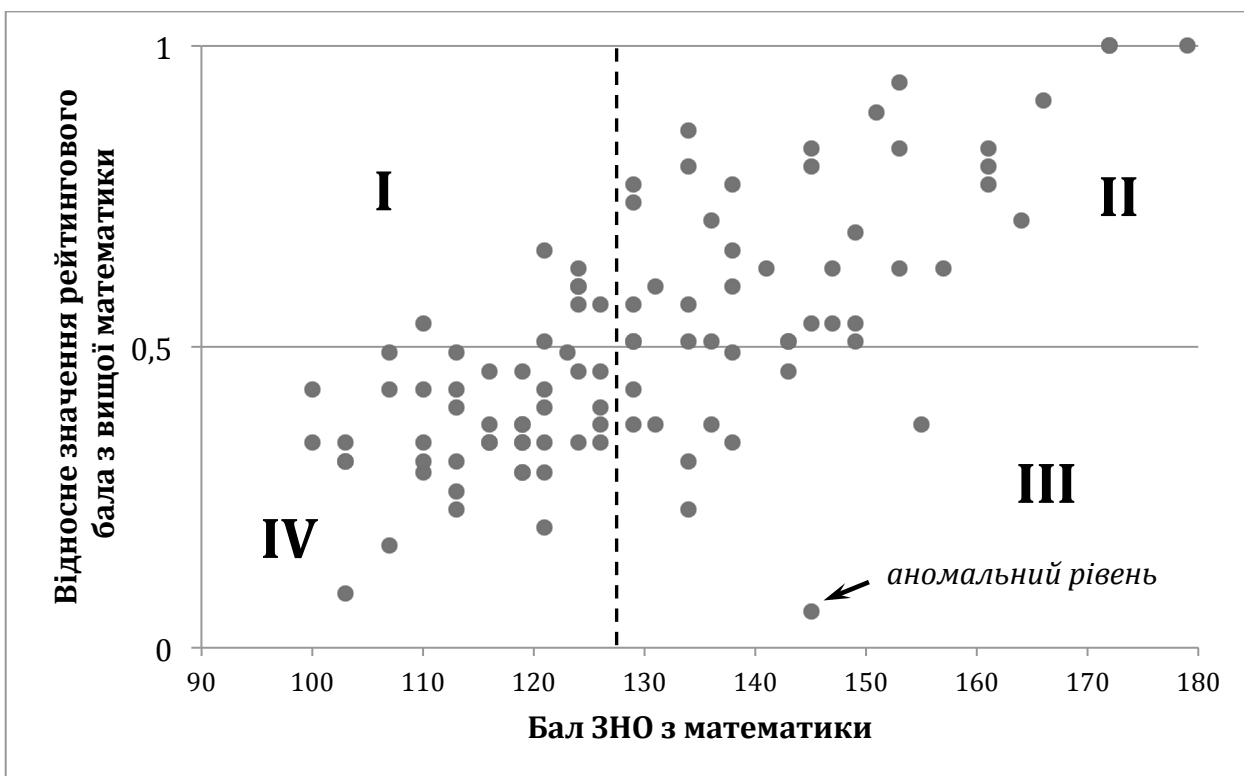
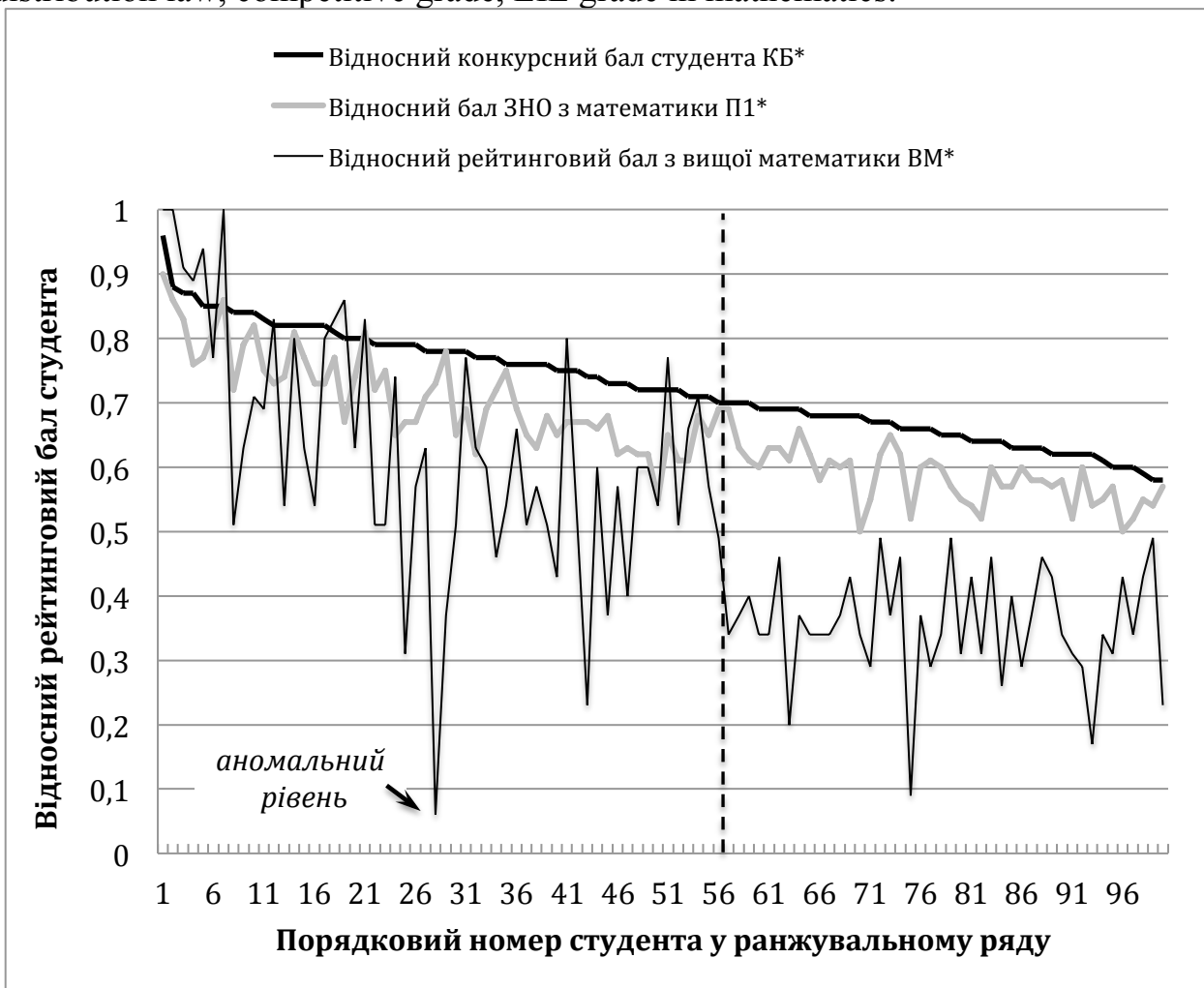
Comparison of the results of the training of first-year students of the field of knowledge 07 "Management and Administration" in higher mathematics with the competition score and an EIE score in mathematics, shows that in the first half of the ranking range there is a significant degree of agreement between the evaluation results, with the exception of several discharges and the pronounced significance of the abnormal character. But in the second half of the rank number, all values of the relative rank in higher mathematics do not exceed 0.5. This is typical for students who do not score half of the points of current control, which are the limit to obtaining admission to the exam.

The statistical analysis of the correspondence of the results of the evaluation showed the existence of a rather close correlation between the competition score and the point of the current control of knowledge in higher mathematics (the indicator of the predictive validity of $R = 0.776$), as well as between the EIE point in mathematics and the score for higher mathematics (indicator of predictive validity $R = 0.747$) for students in the field of knowledge 07 "Management and administration". This, in turn, proves the adequacy and effectiveness of the chosen methodology for assessing the knowledge of students in higher mathematics and makes it possible to justifiably establish a minimum acceptable score for the entrant's participation in the competition. For this sample, it turned out that there are 141 competitive scores and 127 extra points in maths.

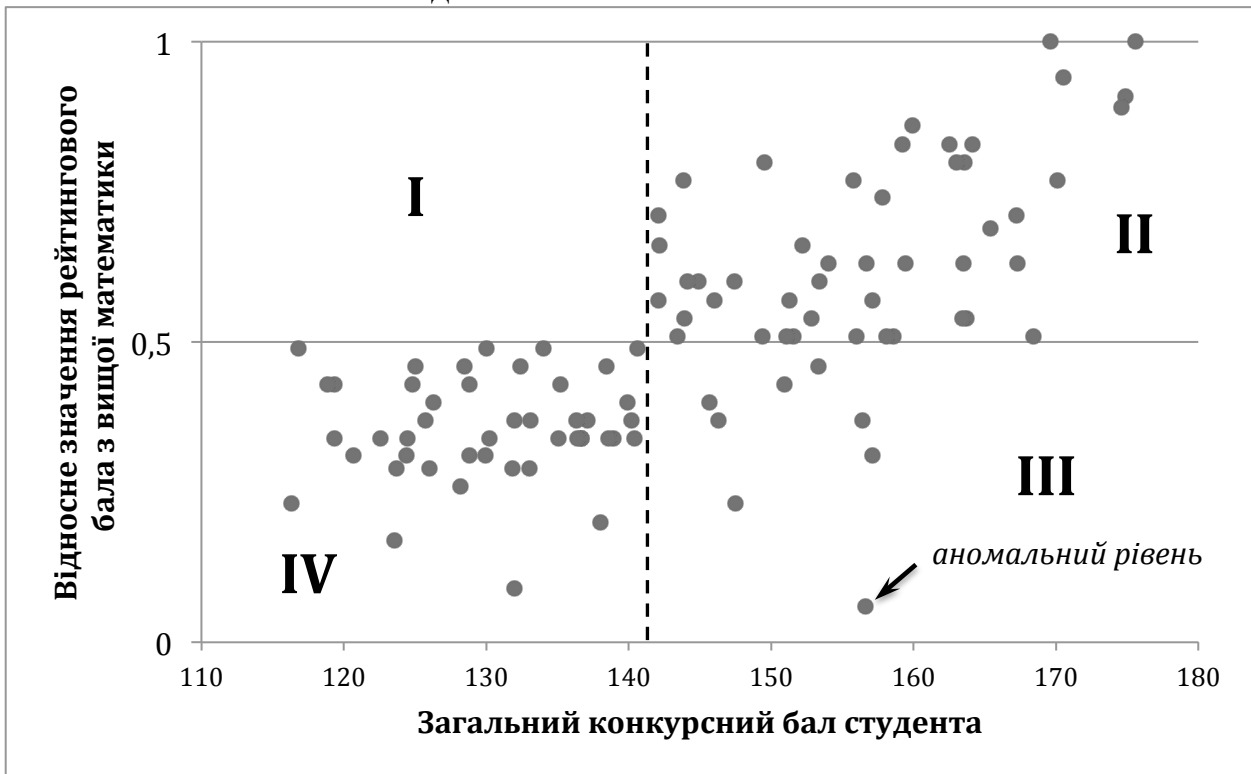
On the other hand, the discussed approaches can be used to identify a group of students with predictably poor performance. For such a group of students it is possible to plan the correction of curricula, namely: introduction of additional courses in elementary mathematics, increasing the number of practical classes in the disciplines of the economic and mathematical direction, as well as the use of innovation-oriented teaching methods with the introduction, for example, through electronic ebooks of professional orientation etc.

Studies have also shown that students may experience abnormal levels in assessing their knowledge, such as long-term illness or other factors. Such abnormal values in the estimation can be detected by controlling the implementation of the rule of "three sigmas" for the normalized deviations that arise between the competition score and the score of current control in higher mathematics. The proposed and practically tested algorithm for detecting such abnormal values of the current assessment of students' knowledge in higher mathematics proved its effectiveness, and hence the feasibility of its use in evaluating the results of the progress in other disciplines. The introduction of this algorithm in the automated control systems of the university like Sokrat VNAU allows you to obtain a new automated tool for controlling the level of knowledge of students.

Key words: correlation coefficient, prognostic validity, abnormal level, normal distribution law, competitive grade, EIE grade in mathematics.



**Кореляційне поле залежності відносного бала з вищої математики
від бала ЗНО з математики**



**Кореляційне поле залежності відносного бала з вищої математики
від загального конкурсного бала студента**



**Гістограма нормованих значень відхилень бала з вищої математики від
конкурсного бала студентів ВНАУ галузі знань 07 «Управління та
адміністрування»**



Гістограма нормованих значень відхилень бала з вищої математики від бала ЗНО з математики студентів ВНАУ галузі знань 07 «Управління та адміністрування»