Econometric Analysis of Factors which Determine a Choice of Entrants

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Abstract. In this article the factors determining a choice by entrants of a speciality and university are investigated. They include the correlation analysis of factors and an estimation of the statistical importance of the received results. The important purpose of research is the division of respondents on more homogeneous groups. Thus we have tried to estimate the factor of influence of parents on decision-making. This work is focused not only on direct use, but also on application in the educational process. It full realization is supposed in a subsystem "Analysis" of a site of Faculty of physics, mathematics and informatics, developed in the Kherson state university.

1   Introduction

In this article the factors determining a choice by entrants of a speciality and university are investigated. This work is focused not only on direct use, but also on application in the educational process. Really, the mentality, fixed in distributions received in this article, as a rule, does not undergo significant changes during study. Formally these distributions determine aim functions for optimization tasks, used for support of decision-making. Their realization is supposed in a subsystem "Analysis" of a site of Faculty of physics, mathematics and informatics, developed in the Kherson state university.

2   Results

2.1   Factors Determined a Choice of a Speciality

Further the histogram for distribution of the factors which have determined a choice of a speciality is shown. This is distribution for "typical" student of first year study of a speciality "informatics" (the exact sense of his typicalness is mentioned below).
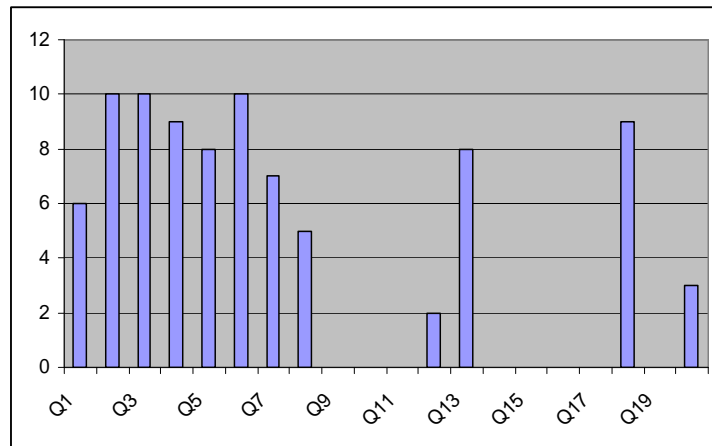

Fig. 18. Answers distribution.

Here
Q1. Reputation (prestigiousness).
Q2. I like to program.
Q3. I like to communicate with a computer.
Q4. I liked at school 1) computer science or 2) programming or 3) mathematics or 4) economy.
Q5. It in the future will provide highly paid work.
Q6. It in the future will ensure the job.
Q7. The big number of budgetary positions on this speciality.
Q8. Ease of receipt.
Factors of influence:
Q9. The type of preparation at school.
Q10. Familiars at faculty (students or employees).
Q11. The program of an exchange with foreign universities.
Q12. Advice of parents.
Q13. Advice familiars of parents.
Q14. Advice of friends.
Q15. Advice of teachers.
Q16. Speech in a class of teachers of the faculty.
Q17. Advertising of faculty.
Q18. Impression from probationers from the university.

Q19. Data from newspapers.
Q20. Data from the Internet.

1) These factors have been chosen in result of "brainstorming" where as experts students of first and fourth year study of a speciality "informatics" acted. This expert interrogation has been constructed by a technique of " six thinking hats " E. Bono [1], which provides the maximal openness and relaxedness of participants. In all cases the opinion has unanimously been expressed, that the given set of factors is full and fair. Then students of first year study of specialities "informatics" and "program engineering" has been interviewed under such essential factors. The respondents estimate the importance for them each factor points from 0 (at its full insignificance) up to 10. He arbitrarily sets a name of the file containing his interrogation (i.e. his key). The volunteer - a participant of interrogation - collects all files in a folder and sorts them (i.e. shuffles). Only after that the folder was transferred to the senior student, who conducts the interrogation: this simple and open procedure guaranteed to participants anonymity of interrogation. 3) Results of interrogation then will be worn out in table of a database of a site of faculty. The queries realizing now on the basis of pattern MVC (Model-View-Controller) [2] for a database control system MySQL give out results of the econometric analysis of interrogation. They include the correlation analysis of factors and an estimation of the statistical importance of the received results (see [3]).

Let's show some results of the analysis. The histogram of distribution of average values of factors is resulted below.
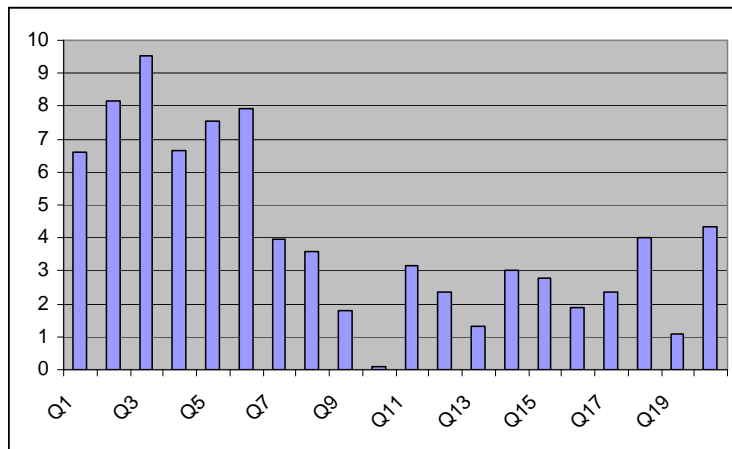

Fig. 19. Answers distribution.

1. The most significant factors appeared (in decreasing order) Q3, Q2, Q6 and Q5.
2. The most essential factors of influence on a choice with a significant separation from the others appeared (in decreasing order) Q20 and Q18. However both factors have the big dispersion: are essential to one and are indifferent for others.
3. The understanding has cleared up with respondents of the factor Q1 (reputation, prestigiousness). This factor strongly correlates only with two: Q5 and first of all

with the big separation Q6. Those respondents, who appreciably reacted to prestigiousness, reacted also to factors of influence Q18 and Q20 more essential.

If carry out the correlation analysis also between answers of respondents thus it is possible to reveal the most typical respondent (his interrogation is submitted above on the first histogram). This is that respondent at whom the average factor of correlation with other respondents is maximal.

2.2 Factors Determined a Choice of a University

Simultaneously and in the same way carried out research of mental factors and the factors of influence determining a choice of university by entrants. The histogram of distribution of the average importance of the factors, which have determined a choice of university, is resulted below.
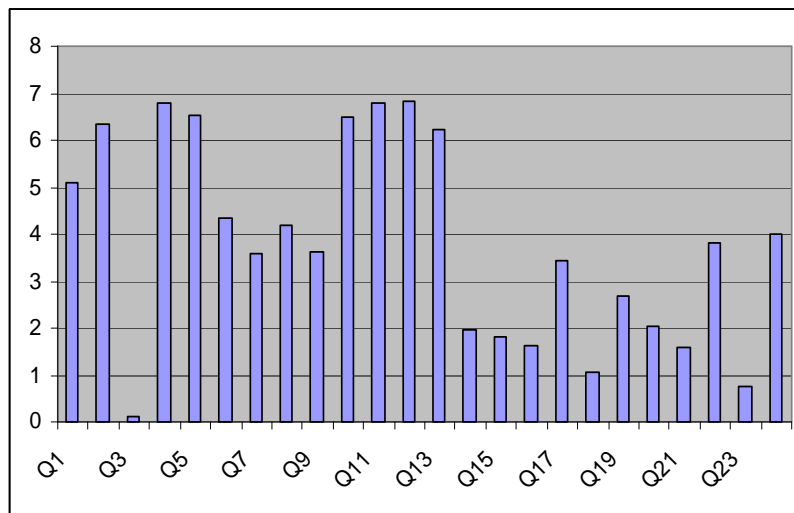

Fig. 20. Answers distribution.

Here
Q1. Distance from the university.
Q2. Reputation (prestigiousness).
Q3. Familiars at faculty (students or employees).
Q4. Teachers of this university really work with students and give real knowledge.
Q5. The student's life.
Q6. The big number of budgetary positions.
Q7. Comparative cheapness of study in comparison with other universities.
Q8. The program of an exchange with foreign universities.
Q9. An opportunity of training together with foreign students.
Q10. 4 days of training (presence of methodical day).
Q11. Wi-Fi.
Q12. Warm auditoriums.
Q13. Trainings in one building (" it is not necessary to run on buildings ").

Factors of influence:

Q14. The type of preparation at school.

Q15. Advice of parents.

Q16. Advice familiars of parents.

Q17. Advice of friends.

Q18. The book " High schools of Ukraine ".

Q19. Advice of teachers.

Q20. Speech in a class of teachers of the university.

Q21. Advertising of the university.

Q22. Impression from probationers from the university.

Q23. Data from newspapers.

Q24. Data from the Internet.

Here results of the correlation analysis of the factors, determining a choice, turned out such.

1. The most significant factors with a great separation from the others appeared: Q2, Q4, Q5, Q10 - Q13 (conditions for study). Distinctions of the importance between these factors the tenth shares of a point, it can be neglected in comparison with root-mean-square deviations of these factors.

2. The most essential factors of influence on a choice of university is the same, as at a choice of a speciality: it is Q24 (Internet) and Q22 (probationers of university at schools).

3. At a choice of university prestigiousness (reputation) was included in number of major factors. As the correlation analysis has shown, prestigiousness is strongly connected to all significant factors specified in item1, both factors of influence from item 2, and poorly connected to other examined factors.

4. Interrogation has shown that the significant majority at first chooses a speciality and then university: a ratio of points approximately 7 : 3.

2.3 Factor of Influence of Parents on Decision-Making

The important purpose of statistical research is the division of respondents on more homogeneous groups. In this case, however, results appeared very homogeneous for factors at a choice of a speciality (with high coefficients of mutual correlation) and a little less homogeneous at a choice of university. In the latter case we have tried to estimate the factor of influence of parents on decision-making.

3   Conclusions

A direct question the significant majority have answered, that the decision they accepted independently or with small participation of parents: a ratio of points $\approx$ 8,5 : 1,5. We have separated answers of 14 respondents from 21, asserting that their decisions were accepted practically without influence of parents (a ratio of points 10 : 0 or 9 : 1) and have compared answers of this group to answers of an additional subgroup. The most significant factors and essential factors of influence appeared all same in both subgroups. At the same time, the ratio of the importance of these factors

has changed. In a subgroup of the respondents asserting about independence of parents, the importance of factor Q4 has increased on a point in comparison with the data for all group. In result this factor (teachers of this university really work with students and give real knowledge) became leading (mean mark $\approx$ 7,57, a mean score on all group $\approx$ 6,85). In other subgroup the importance of this factor has accordingly decreased (mean mark $\approx$ 5,28).
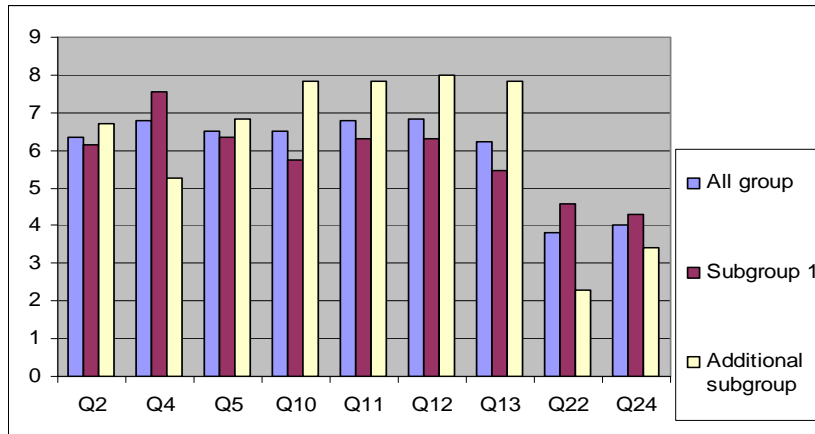

Fig. 21. Answers distribution.

At the same time, in this subgroup the importance of factors of conditions of training Q10 - Q13 have grown on a point in comparison with the data for all group. So Q13 in second subgroup $\approx$ 7,83, for all group $\approx$ 6,21, for independent of parents respondents $\approx$ 5,46. The factor of influence Q22 (probationers of university) for independent of parents respondents $\approx$ 4,57, for all group $\approx$ 3,8, for second subgroup $\approx$ 2,28. Mean scores of all other factors do not differ essentially in both subgroups. The comparative histogram of distribution of significant factors for subgroups is resulted below.

References

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2. Django Book, http: //www.djbook.ru.
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