

The Difference Between the Average Score at the National Assessment Examination and the Average Score in Lower Secondary School Cycle – a Comparative Analysis for Romania Between 2019-2022

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Abstract

Education is the one of the corner-stones of a society and as long as this is not consolidated in the rural environment, nothing endures. Our research aims to explore the difference between the average score from national assessment examination and the average score in lower secondary school cycle. As such, a research variable, the “score discrepancy” is employed. The findings show that the average score at the National Evaluation exam is lower than the average score after completing the lower-secondary educational cycle. Furthermore, the ANOVA test results for the score discrepancy in 2022 and three years before, and by year and area of residency followed by year and sex reveal that there is a statistically significant difference between the series. The results for Romania depict that more effort has to be done in the education for the rural pupils to catch up the results of their counterparts.

Key words: returns to education, national examinations, lower secondary school

J.E.L. classification: I21, I26

1. Introduction

National examination tests are often used to “certify, classify, sort or select students” and “to make important decisions about them”, therefore all participants in the educational process must have a clear vision on the objectives of the test, its intended use as well as the characteristics of the students eligible for the test (Madaus, 1991 p. 227). Many experts, especially constructivists, argue that national examinations often lead to the narrowing of the curriculum and focusing on lower-order thinking skills in both instruction as well as assessment (Phelps 1999 p.18-22). Yet, “eliminating high-stakes standardized testing would necessarily increase our reliance on teacher grading and testing”, a process not always oriented towards higher-order thinking skills and often biased by teacher’s perception on student’s attitude towards the subject (Phelps 1999 p.32). However, Amrein and Berliner (2002, p. 2) demonstrated that a high score in high-stakes tests is often the result of a good preparation program that includes the exclusion of certain students and focusing only the test curriculum. Raising scores in high-stakes tests is a key element when deciding the instructional strategies for a certain topic (Boardman and Woodruff p.552).

For the purpose of this paper a research variable, called the “score discrepancy” is defined as the difference between the average score at the national assessment examination and the average score in lower secondary school cycle. The following research questions will be answered:

Q1. Is the score discrepancy significantly lower than 0 for the results in 2019, 2020, 2021 and 2022 respectively?

Q2. Is there a difference in the score discrepancy by year (2019, 2020, 2021 and 2022)?

Q3. Is there a difference in the score discrepancy by year (2019, 2020, 2021 and 2022) and by area of residency?

Q4. Is there a difference in the score discrepancy by year (2019, 2020, 2021 and 2022) and by sex?

2. Literature review

In Romania, the national assessment examination occurring at the end of the lower secondary school cycle (8th grade) is a high-stake exam for students, teachers and schools; based on the obtained score, students access the upper secondary school cycle, their teachers may obtain rewards and their schools are evaluated (Rado et al., p. 90-92). Students who are not prepared enough to enter the upper secondary school cycle and therefore are not able to obtain a good score in the national evaluation will have no choice but to enrol in less prestigious upper secondary schools, often failing the baccalaureate exam (Hâj and Țucă, p. 40). This reflects into severe inequalities between the educational institutions (Necula et al., 2022 p.1), revealing the need for new metrics to rank upper secondary institutions (Necula et al., 2022 p.1; Firescu et al., 2022 p.59-60).

Regarding the success rates at the national assessment examination, severe discrepancies between the eastern and western counties of Romania as well as between rural and urban areas were observed based on scores from 2015 to 2018 rounds (Muntele et al., 2018 p. 54). The COVID-19 pandemic deepened the inequalities in education due to the lack of access to online education for children from disadvantaged groups (Hosszu and Rughiniș, p. 34). Yet, in Romania, online education "is an effective sustainable learning solution" (Ionescu et al., 2020 p.1).

In 2020, the national assessment examination was organized according to the announced calendar, with special sanitary measures in place, in two sessions; this approach was supported by the National Federation of Parents and by students (Berceanu et al. p. 17-18). The results for this session show that female students from urban areas with good academic records perform better than other categories of students grouped by area of residency, sex and previous academic performance (Ceban et al. 2021a p. 75). Also, being a male from rural areas increases the probability of not attending the exam (Ceban et al. 2021b p. 3895).

3. Research methodology

For the purpose of this paper, data on the results of the National Evaluation Exam in Romania for 2019, 2020, 2021 and 2022 as retrieved from data.gov.ro (accessed May 15th 2023). In order to answer the first research question, a t-test was performed on the variable "score discrepancy" computed for each year. Moreover, the histogram for each series is presented and analysed.

Furthermore, to answer the second research question, the ANOVA single factor test is used. The null hypothesis that is tested is: "The score discrepancies for 2019, 2020, 2021 and 2022 respectively are from different statistical distributions". The box-plot for the score discrepancy by each year is provided and analysed.

Next, the ANOVA two factor test is employed for answering the third and the fourth research question. The null hypothesis that is tested in order to answer the third question is "The score discrepancies for 2019, 2020, 2021 and 2022 respectively in urban and rural areas are from different statistical distributions". Answering the fourth question involves testing the following null hypothesis: "The score discrepancies for 2019, 2020, 2021 and 2022 respectively for males and females are from different statistical distributions". Box-plots are provided and analysed.

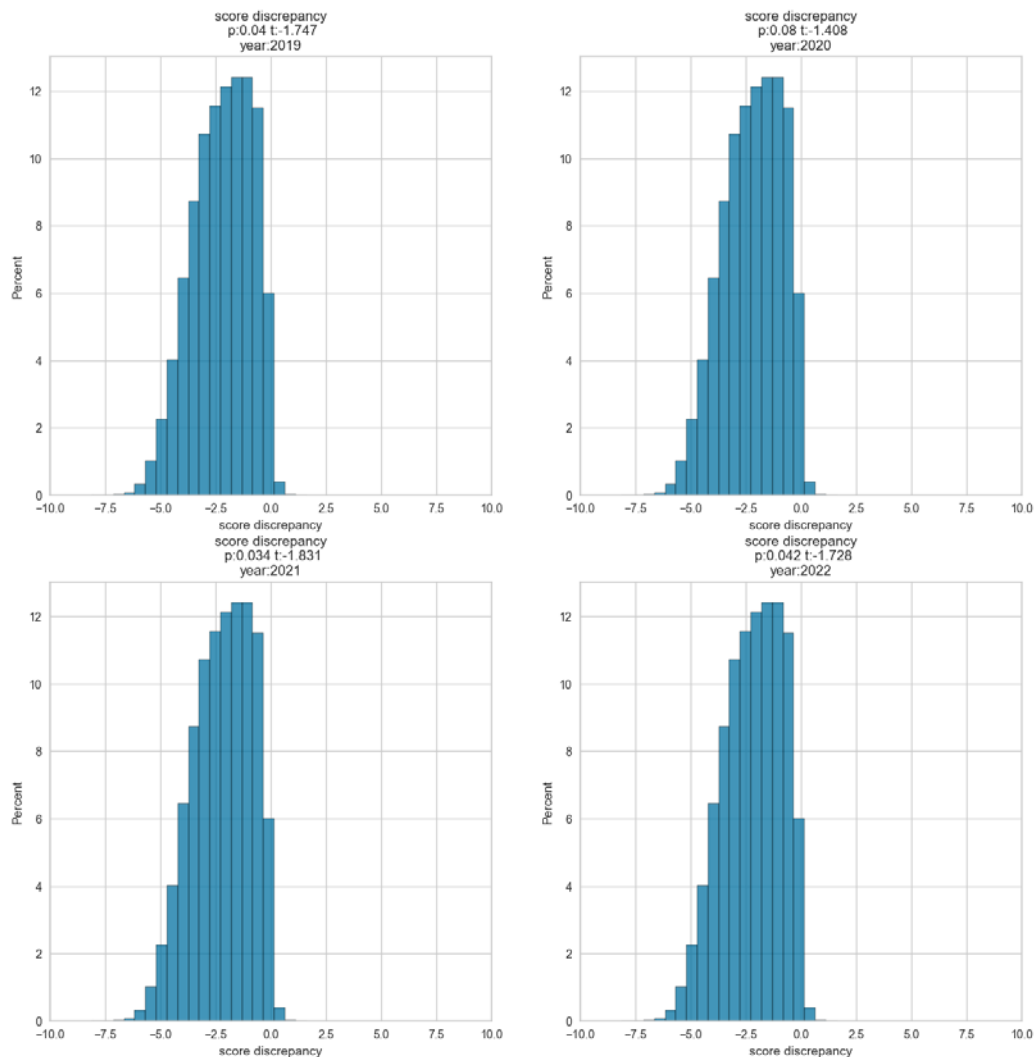
All computations were performed using Python. To interpret the results, a 5% level of significance was chosen.

4. Findings

Figure 1 presents the results of the t-test and histograms for the score discrepancy in 2019, 2020, 2021 and 2022 respectively. Most of the values of this variable are negative for all years, meaning that the average score at the National Evaluation exam is lower than the average score after

completing the lower-secondary educational cycle. Moreover, the mean is statistically significantly different from zero for 2019, 2021 and 2022. One possible explanation is that high stakes exams often affect teaching practices in subjects that are not covered by the exams, resulting in higher grades (Freitas, 2021p.15). Also, the National Evaluation exam in Romania covers only a narrow set of skills in Romanian literacy and language and mathematics. The discrepancy may be due to the lack of preparation in these specific skills during the school years. Also, narrowing the curriculum to specific language and mathematics skills, although it leads to better results in high-stakes exams does not necessarily imply that students master maths and language (West and Pennell, 2005 p.37).

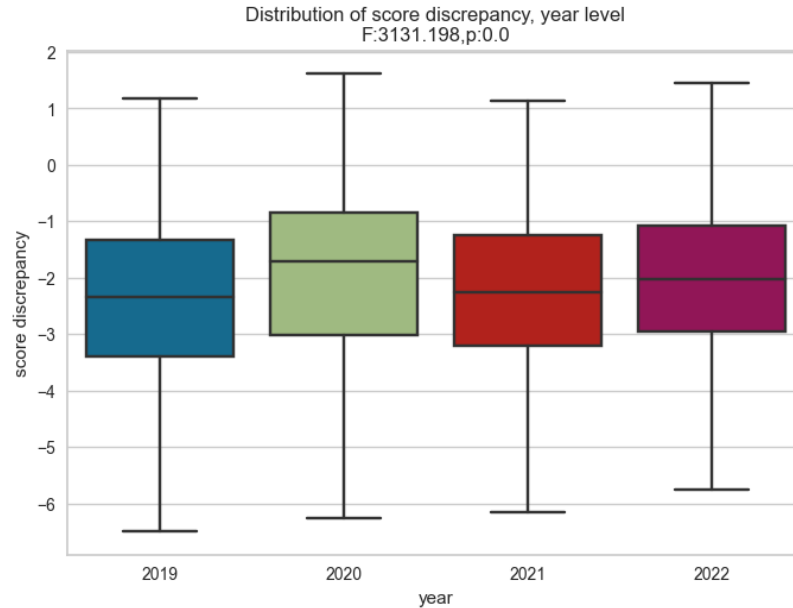
Figure no. 1. Score discrepancy in 2019, 2020, 2021, 2022 – results of the t-test and histogram



Source: designed by the authors

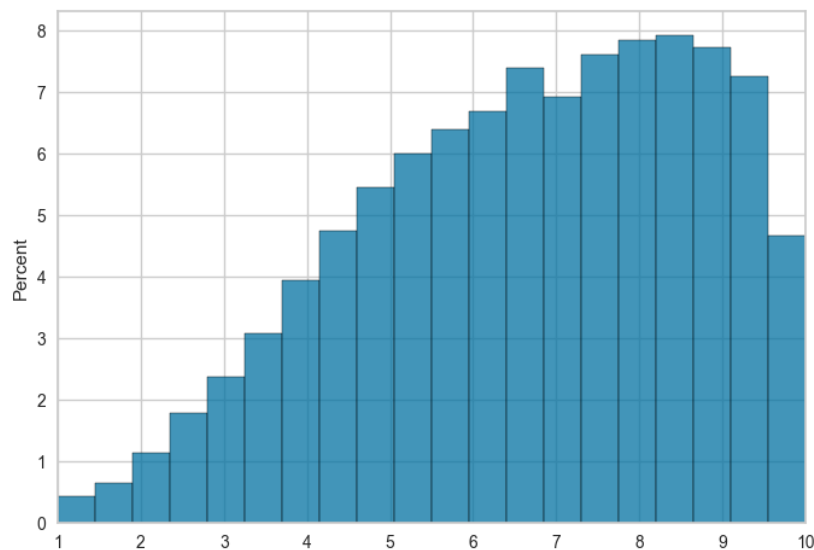
Figure 2 displays the box-plots for the score discrepancy in 2019, 2020, 2021 and 2022. Moreover, the results of the ANOVA test performed on these series are computed. There is a statistically significant difference between the series. Thus, the median of the score discrepancy has a value closer to zero in 2020 and the values in 2019 and 2021 are close to each other. No outliers can be observed. These findings should be interpreted together with the ones revealed by the Ministry of Education in its report on the results of the National Evaluation Exam in 2022. According to this report approximately 95% of the pupils were present at the exams in the analysed years (Ministry of Education, 2021, p.1). This high attendance rate makes the results relevant to our analysis.

Figure no. 2. Score discrepancy in 2019, 2020, 2021 and 2022 respectively – Box-plot and ANOVA results



Source: designed by the authors

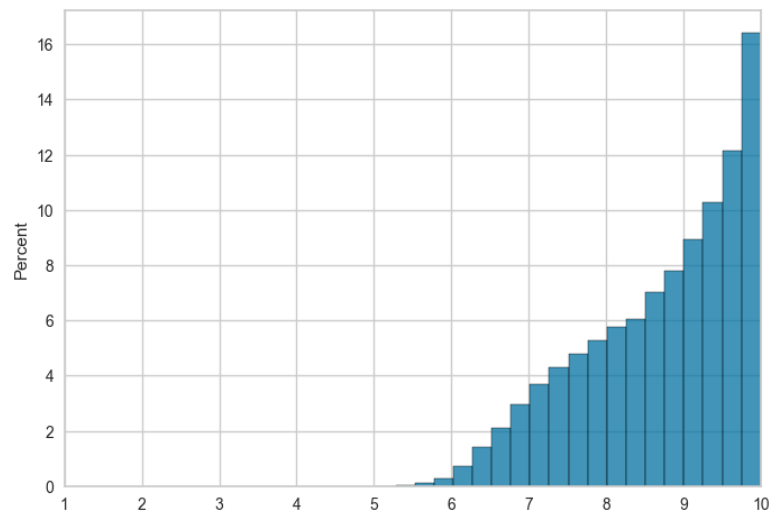
Figure no. 3. Histogram of the Score in National Evaluation Exams between 2019-2022



Source: designed by the authors

Also, in 2019 and 2020 approximately 39% of those attending the exam had an average score below 5 (which is considered the passing score) while in 2021 and 2022 the share of pupils with an average score below 5 was 28,5% and 26,3% respectively (Ministry of Education, 2021, p.1). These data are in concordance to our results displayed in figures 3. When corroborating the information with the results in figure 4, it can be concluded that many of the pupils who obtained a passing average score during lower secondary studies didn't manage to pass the national exam.

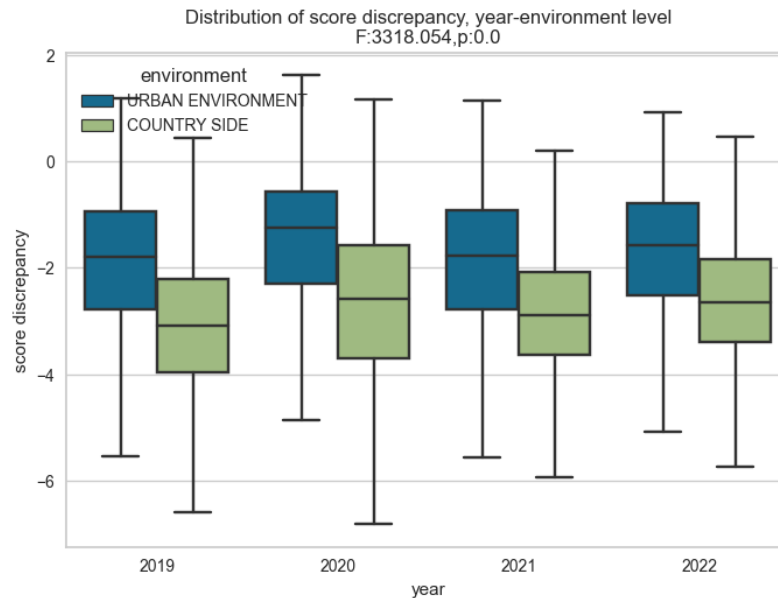
Figure no. 4. Histogram of the Score in National Evaluation Exams between 2019-2022



Source: designed by the authors

Figure 5 shows the results of the ANOVA test for the score discrepancy by year and area of residency (urban environment – urban area and countryside environment – rural area) as well as the corresponding box-plots.

Figure no. 5. Score discrepancy in 2019, 2020, 2021 and 2022 respectively by area of residency – Box-plot and ANOVA results

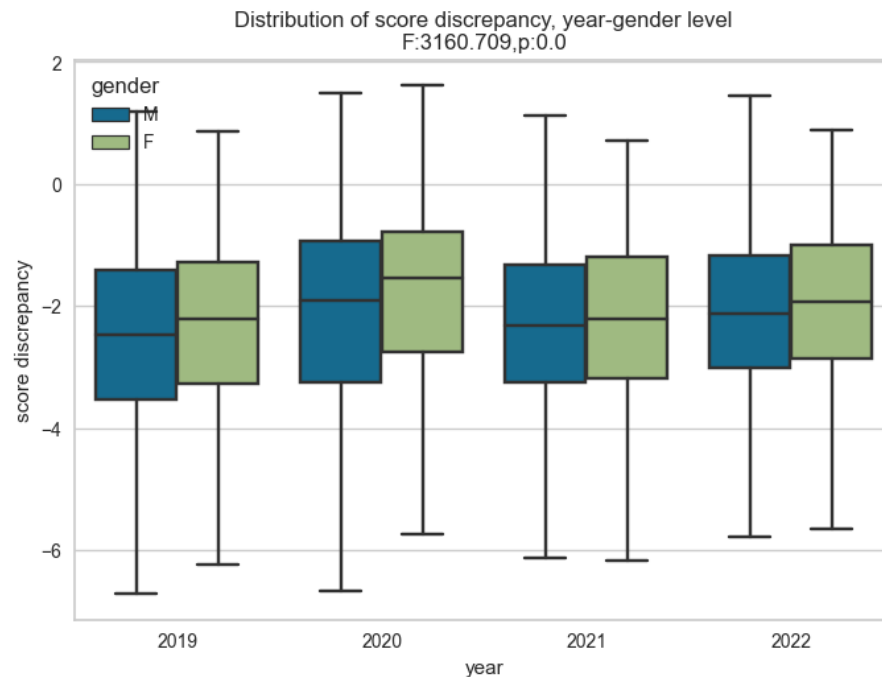


Source: designed by the authors

There is a significant statistical difference in the score discrepancy by these two variables. Moreover, the absolute values for the score discrepancy are higher in rural areas compared to urban ones for all years. Slight fluctuations were registered during the analysed period in both environments. These results are not surprising given that the share of pupils who do not pass the National Evaluation Exam is considerably higher in rural areas compared to urban ones – approximately 3 times higher in 2022 (World Vision Romania 2022). According to the same source, one third of the teachers in rural areas consider that 25% to 50% of the students in a class have serious flaws in their education (World Vision Romania 2022).

Figure 6 shows the results of the ANOVA test for the score discrepancy by year and sex as well as the corresponding box-plots.

Figure no. 6. Score discrepancy in 2019, 2020, 2021 and 2022 respectively by sex – Box-plot and ANOVA results



Source: designed by the authors

A significant statistical difference in the score discrepancy by these two variables can be observed. Values closer to zero for the score discrepancy is observed for females. Non the less, the difference between males and females was highest in 2020. This is in line to with research literature, for example Schlosser et al. (2019 p.25) concluded that the performance gap in high-stakes exams vs low-stakes evaluations is higher for males compared to females.

5. Conclusion

This present study adds value to the scientific literature in two ways. Given the results of the National Evaluation Exam in Romania for 2019, 2020, 2021 and 2022 available on the Ministry of Education open-data portal the analysis was performed accounting the difference between the average score at the national assessment examination and the average score in lower secondary school cycle.

First the computed ANOVA test highlights significant score discrepancies for the included dataset. Moreover, the median of the score discrepancy is almost zero in 2020 with values in 2019 and 2021 not far from to each other. Secondly, the absolute figures for the score discrepancy are lower in urban areas compared to rural ones for all analysed years.

As such, the findings show significant difference between the score discrepancy and also between two demographic characteristics, area of residency and sex.

To have a bright future, education should always stay in focus both from social perspectives and from economic sustainability, otherwise the existing score discrepancies in education may continue to grow. Analysing the role of education in Romania on the rural-urban wage gap, Petcu (2022, p. 223) reveals that rural workers get paid less than their urban counterparts. As such, investing more in the education for the rural Romania will have a significant contribution to the decrease of the migration phenomenon and furthermore decrease the burden on the Romanian economy.

An interesting further approach is to study the impact of “score discrepancy” across generations on the University admission exams.

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