

Secondary schools efficiency in the Czech Republic¹

Oleksandr Stupnytskyy

Center for Economic Research and Graduate Education,
Prague, Czech Republic

Non-technical summary

This paper analyzes efficiency of secondary schools in the Czech Republic using Data Envelopment Analysis. The DEA method constructs a measure of efficiency by comparing a given school with the best performing schools. The total efficiency is estimated as 0.83 (at constant return to scale) and 0.87 (at variable return to scale). The individual school efficiencies range from 0.6 to 1, which means that some schools performed significantly lower than they can. In the second stage the efficiencies estimated in the first part are related to school and teacher characteristics using Tobit model.

Three datasets are used – data on students performance on standardized exams at completion of gymnasium, data on success of students at admission to university and data on school characteristics. The three datasets combined provide excellent information on school performance. The following outputs were chosen - score in mathematics, score in Czech language and percent of admitted to university. These outputs capture different aspects of school performance. The school inputs include skills of students at entering gymnasium, number of classrooms per student and combined index of other school facilities. These variables capture different sides of school inputs such as school facility as measure of resources and students grades as initial input of skills.

It was found that teacher-student ratio, percentage of internal teachers, existence of student advice center, cooperation with foreign schools and sorting of students positively affect school performance. Teacher-student ratio was found to have negative effect, which means that schools with more teachers per student performed worse. There are two effects that

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teacher-student ratio has – it decrease class size or teaching hours and in consequence reduce wages, since teacher wage depends on number of students and his teaching hours. The second effect is probably overweighting the first one. However, the square of teacher-student ratio was found to have a positive effect which means that efficiency declines less than proportionately with teacher-student ratio. This may be explained by the fact that when the teacher-student ratio is high the effect of class size becomes stronger.

Cooperation with foreign schools was found to have positive effect. It shows that experience students and teachers receive from visiting foreign schools adds to their efficiency. Sorting of students was shown to have positive effect. Sorting allows students to follow material at their level of skills which leads to improved performance. Private schools performed worse than public ones. Gymnasiums with 6 or 8-years study performed better than ones with 4-years study, even after controlling for initial skills of students.

In summary, the DEA method was found suitable for estimation of school efficiency. It produces a robust measure of efficiency, which was proved by a jackknife procedure. The analysis show that there is a significant variation in efficiency between schools and this efficiency can be related to teachers and school characteristics. A proper handling of these characteristics may give educational policy makers a strong tool in order to improve efficiency of educational system.