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Non-technical summary: Evaluation of educational policy using twins data (RRC11_063)

In this project we constructed a longitudinal data set for the population of all students who passed obligatory lower secondary school exams in Poland between 2005 and 2011. The data were collected from all eight Polish Regional Examination Boards (REB). Specifically for this project, employees of each REB prepared unique identifiers for all twins using student surname, place of birth and date of birth. In total, we collected individual data for almost 3.3 million of students and almost 60 thousand of twins. For each student a primary school exam results were linked to the lower secondary school results to allow analysing student achievement progress.

Two papers were finalized in the project. First paper was written by Maciej Jakubowski and Artur Pokropek and titled "Do peers matter? Revisiting peer effects on academic achievement using twin data". Second paper was written by Francesca Borgonovi, Maciej Jakubowski and Artur Pokropek and titled "What's in a name? The causal effect of teacher attention on student achievement". The first paper was submitted to the *Journal of the Royal Statistical Society: Series A (Statistics in Society)*, while the second paper was submitted to the *Journal of Labor Economics*.

In the first paper, our goal is to estimate causal effect of peers achievement on individual student progress between primary and lower secondary school. We use twins sample to relate within twins differences in achievement progress to within twins differences in peer composition using the fixed effect regression model. We also narrow the sample to twins who experienced identical primary school environment. Although results from the typical fixed effects approach suggest that peers importantly affect individual achievement progress, we argue and provide simulation results showing that these results are seriously biased due to a measurement error in primary school exam scores. To address this issue, we employ the plausible values model correcting for the measurement error. We also present results that are representative for the population of monozygotic twins. Measurement error correction alone shrinks down peer effects coefficient to zero, suggesting that positive coefficients for peer effects reported in a typical fixed effects approach are artefacts driven by measurement errors in prior scores. The final results suggest that peer composition has negligible impact on individual student achievement progress.

In the second paper, we estimate the causal effect of teacher attention on student academic performance. Our data contain surname initials and the placement of students in the classroom registry. We use these indicators to assess - and cross-check - the probability that different students have of undergoing on the stop testing by teachers and adapt the amount of effort and attention

they put in their studies. We compare the performance of students who are at different positions in the classroom list, a fact that is purely random and solely determined by the alphabetical ordering of lists and the surname composition of different classes. As teachers employ student position in the classroom registry for "selective on the spot testing of students", and such position is uncorrelated with the underlying ability of students, we are able to indirectly measure the effect of teacher attention – and the resulting student effort and attention – on academic performance in the exam by relying on the random assignment of surnames to students and the alphabetical organisation of classroom registries in lower secondary schools in Poland. Our findings indicate that teachers affect student performance and that lack of attention is particularly detrimental to the performance of students who are the very end of the classroom registry. Performance is also lower for those who are in the very beginning of the classroom register and decreases between those who are around 15-20 percentile on the list towards those in the middle. We find that students who are at the bottom of the classroom registry are particularly disadvantaged, and that teacher attention is a particularly important determinant of performance in the humanities exam, for low-achieving boys and boys that attend large classes.