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# The effect of immigration on the school performance of natives: Cross country evidence using PISA test scores

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## ABSTRACT

We use aggregate PISA data for 19 countries over the period 2000–2009 to study whether a higher share of immigrant pupils affects the school performance of natives. We find evidence of a negative and statistically significant relationship. The size of the estimated effect is small: doubling the share of immigrant pupils in secondary schools from its current sample average of 4.2–8.4 percent would reduce the test score of natives by 1–3.4 percent, depending on the selected group of natives. There is also evidence that – conditional on the average share of immigrant pupils – reducing the dispersion of this share between schools has small positive effects on the test scores of natives. Whether these findings can be generalized to a larger sample of countries is an open question that we leave to future research.

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## 1. Introduction

Immigration flows have changed the composition of students in schools and classes. The integration of immigrants is often problematic, and these flows have triggered in some countries the flight of natives from public to private schools. A key question is whether the increased share of immigrants in schools and classes has affected the school performance of natives. In spite of the importance of this question for education policy, and of the abundance of research investigating the labour market effects of immigrants, relatively little is known about the impact of immigration on the education system (see Gould, Lavy, & Paserman, 2009).

To our knowledge, this paper is the first to address this important question using cross-country data covering 19

countries from Europe, the Americas, Oceania, Asia and the Middle East. Measuring the effect of immigrants on the school performance of natives is complicated by the fact that immigrants sort across countries and both immigrant and native students self-select into schools and classes. For example, the share of immigrants in the total population is typically higher in more developed countries, where economic opportunities are more abundant. At the same time, students in these countries tend to have a better performance, because their schooling systems are more effective. Therefore, in cross section data the average test scores of native students and the share of immigrants tend to be positively correlated across countries, but this correlation is spurious and driven by cross-country differences in economic development.

Due to economic conditions, immigrants usually concentrate in less affluent neighbourhoods, where housing prices are lower. Typically, the schools of these neighbourhoods are attended both by immigrant students with limited language proficiency and by native students with a relatively poor parental background (Jargowsky,

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2009). By virtue of this sorting, a negative correlation between the test scores of natives and the share of immigrants in the school is likely to emerge within each country, quite independently of whether immigrants have or have not any impact on the school performance of native students. Non random allocation of students to schools implies that it is difficult to tell whether the correlation between the performance of natives and the share of immigrants in a school can be treated as a causal relationship. For this, we would need a source of exogenous variation in the share of immigrants, which is very hard to find.

In this paper, we address sorting within countries by aggregating at the country level the key information on the test scores of natives and the shares of immigrant students, in line with [Borjas et al. \(1997\)](#), who suggest the country level as the appropriate unit of analysis. By virtue of aggregation, we remove the sorting of individuals across schools.<sup>1</sup> However, immigrants can also sort among different countries. Using data that vary by country and time, we control for between-country migration flows by conditioning on country fixed effects, country specific trends, per capita GDP, education expenditure and the stock of immigrants in a given country at a given time. Conditional on these covariates, changes in the share of immigrant pupils in each country depend mainly on demographic factors and are as good as random, as pointed out by [Gould et al. \(2009\)](#), in their study of the effects of immigration in Israel schools.

We find that a higher share of immigrant pupils reduces the school performance of 15-years-old natives. The marginal effect, however, is small and varies with the gender and the parental background of natives. Our evidence suggests that doubling the share of immigrant students from the current average 4.2–8.4 percent<sup>2</sup> would reduce the average school performance of natives by 1–3.4 percent, depending on the group of natives. The highest negative effect is found for native females.

We also find that the estimated negative effect of immigrant pupils on the school performance of natives is higher in countries where the segregation of immigrants in schools is higher. However, the quantitative impact of desegregation policies is small: we estimate that reducing the segregation index by 10 percent while keeping the foreign student share constant at its average sample value increases the test score of natives by only 0.11 percent.

We view these results as an interesting initial step in an important but understudied topic for the following two reasons. First, we have a small non-representative sample of 19 countries. Whether our results can be extended to a broader sample is an open issue for further research. Second, our empirical approach, which controls for a range of country and time varying effects, does not fully

guarantee that the identified effects are causal. For this, one would need exogenous variation in the share of immigrant pupils, which is very difficult to find.

The paper is organized as follows: Section 2 is a brief review of the relevant literature and Section 3 presents our empirical approach. The data and the main results are presented in Sections 4 and 5. Section 6 presents some robustness checks and Section 7 investigates how the distribution of immigrant students across schools influences their impact on native students. Conclusions follow.

## 2. Review of the literature

The influence of immigrant students on their native peers is a particular sort of peer effect: immigrants are peers with a different culture, a different way to interact with others and, most often, limited language proficiency. In a recent contribution to the vast literature on peer effects, [Lavy, Silva, and Weinhardt \(2009\)](#) have shown that the effect of peers is not constant but strongest when peers are students either at the very bottom or at the very top of the academic ability distribution. Since immigrant pupils typically perform less well than natives at school for several reasons, including difficulties with the language of instruction, less educated parents and problems of integration, they are often concentrated at the bottom of the distribution of academic ability. According to Lavy's work, their effect on native pupils should be stronger than the effect generated by native peers.<sup>3</sup>

While the economic literature on peer effects in education is extensive, there is surprisingly little being done on the influence of immigrant students on native students. The existing research includes both contributions which emphasize the negative impact of immigration on the school performance of natives and contributions that find small effects or no effects at all. Early papers in the first group include [Betts \(1998\)](#) and [Hoxby \(1998\)](#). Betts shows that immigration reduces the probability of completing high-school for American-native minorities (Blacks and Hispanics). The reason is that an influx of students with limited proficiency in English absorbs teaching resources especially at the expense of those native students who are at the margin of dropping out and typically belong to American minorities. No negative effect of immigrants is found for non minority groups.

More recently, [Betts and Fairlie \(2003\)](#) find that American native students fly towards private secondary schools in response to the influx of immigrants into public institutions.<sup>4</sup> At least two reasons might explain this flight

<sup>1</sup> [Borjas \(2003\)](#), [Mishra \(2007\)](#), and [Aydemir and Borjas \(2007\)](#) among others use a similar strategy to estimate the impact of the share of immigrants on wages.

<sup>2</sup> To illustrate, if immigrant students were evenly distributed across the schools in our sample, doubling their share would be equivalent to increasing the number of immigrants from 1 to 2 in classes with about 20 students.

<sup>3</sup> [Hoxby \(2000\)](#) identifies peer effects by exploiting the variation in the composition by gender and race of students attending a particular grade in adjacent years over a sample of schools. She finds that peer effects are stronger within races than across races, meaning that students of a given race are mainly influenced by students of the same race. This result is consistent with the findings by [Card and Rothstein's \(2007\)](#), indicating that segregation in racially homogenous schools widens the white-black gap in test scores. In their paper, the key issue of student sorting is resolved by aggregating micro-data by race and city and by taking first differences between races in each city. This strategy removes sorting both across schools and across cities.

<sup>4</sup> No flight has been observed out of primary schools.

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