



# No student left behind? Evidence from the Programme for School Guidance in Spain<sup>☆</sup>



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## ARTICLE INFO

### Article history:

Received 13 September 2016

Revised 16 August 2017

Accepted 29 August 2017

### JEL classification:

H52

I23

I28

J24

### Keywords:

Remedial education

PAE

Programme evaluation

PISA

Selection bias

## ABSTRACT

This paper evaluates the effects of a remedial education programme implemented in Spain between 2005 and 2012 that offered after-school classes for underperforming students from poor socioeconomic backgrounds. We use two different estimation strategies, re-weighting estimators and propensity score matching, and address the existence of selection bias. We find that this programme had a substantial positive effect on children's academic achievement: the probability of falling behind the general progress of the group declined by between 3.5 and 6.4 percentage points and mean reading scores increased by between 8.5 and 17.4% of one standard deviation. We also find that a larger exposure to the programme improves students' scores: whereas students in schools that participated in the programme for at most two years do not experience any significant positive effect, those in schools that participated for at least three years did. The programme significantly reduced the probability of belonging to the bottom part of the distribution (by between 3.2 and 7.7 percentage points) and improved mean scores (by between 8 and 21.5% of one standard deviation). Finally, we find that the impact of the programme is much stronger for students in rural schools than for students in urban schools.

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## 1. Introduction

Growing evidence shows that inequality has increased in many developed countries in recent decades.<sup>1</sup> Recent OECD data (OECD, 2013a) indicate that the global economic crisis reduced incomes and that this reduction is not shared evenly across the income distribution, as there are larger reductions in the bottom, thus suggesting further increases in inequality and poverty. In addition to the global crisis, this evidence might also reflect the

fact that both low-skilled workers and low-achieving students are being left behind by rapid technological change in a globalized world economy (see Freeman, 2008 or Kanbur, 2014). Indeed, poor-achieving students are more likely to be early school leavers, which has long-run negative effects, increasing the risk of social exclusion and poverty.<sup>2</sup> This recent evidence pointing towards a worsening of the education level of the workforce might have called the attention of policy makers and impelled them to improve it. In fact, one of the EU's education targets for 2020 is to reduce the rates of young people leaving early the education and training systems. In addition, the European Union's 2013 Social Investment Package focusses on policies designed to strengthen people's skills and capacities, including education and childcare, as well as active labour market policies (see European Commission, 2013a; 2013b). These developments leave us with the following question: how do we make education a success for disadvantaged students in developed countries?

Remedial education programmes are designed to help poor-performing students to satisfy minimum academic standards. This is usually achieved by means of a targeted increase in instruc-

<sup>☆</sup> We would like to thank Pedro Albarrán, Marianna Battaglia, Maria De Paola, Laura Hospido, Victor Lavy, Vincenzo Scoppa, Ernesto Villanueva and seminar participants at Alicante, Salamanca, 40th Simposio de Análisis Económico and FEDEA Workshop on Remedial Education for their very helpful comments and suggestions. Thanks are due to two anonymous referees for valuable comments that substantially improved the analysis of this paper. We gratefully acknowledge Ismael Sanz and F. Javier García Crespo (INEE) for their help with the data and Angelica Martínez Zarzuelo (INEE) for the assistance with the dataset. Financial support from MINECO/FEDER (ECO2015-65408-R and ECO2014-57413) and Junta de Andalucía (SEJ-5980; SEJ-426, P09-SEJ6882) is gratefully acknowledged. The usual disclaimer applies.

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<sup>1</sup> See, among others, Atkinson (2010) for the EU and Atkinson, Piketty, and Saez (2011) for the US.

<sup>2</sup> See Brunello and De Paola (2014) and references therein for a review of the private and social cost of early school leaving in Europe.

tion time combined with after-school individualized instruction in small study groups. Therefore, these types of interventions are currently subject to increasing interest. While remedial education is quite widespread in the US, there is less of a tradition in Europe.<sup>3</sup> Moreover, the evidence on the effectiveness of such programmes is scarce.<sup>4</sup> Providing such evidence is precisely the goal of this paper. Namely, our objective is to evaluate the effects of a multiyear programme implemented in Spain between 2005 and 2012 that offered remedial education for underperforming students from poor socioeconomic backgrounds. This remedial programme is the Programme for School Guidance (PAE, which is the Spanish acronym for *Programa de Acompañamiento Escolar*). In particular, we attempt to address the following two questions: does the programme reduce the number of students left behind the general progress of the group? Does the programme improve students' mean scores? We assess whether the intervention succeeded in achieving these two goals while it was being implemented. In addition, we analyze whether the programme was more effective in achieving both objectives the longer a school participated in it (we refer to this as the PAE-Intensity treatment). To do so, we use external evaluations of the schools: the PISA 2012 exams.<sup>5</sup>

Our main results suggest that the PAE had a substantial positive effect on students' academic achievement. It reduced the probability of falling behind into the bottom part of the reading score distribution by between 3.5 and 6.4 percentage points (p.p.). The estimated increase on mean reading scores is between 8.5 and 17.4% of one standard deviation. We also find that a larger exposure to the programme improved students' scores: whereas students in schools that participated in the programme for at most two years do not experience any significant positive effect, those in schools that participated in the programme for at least three years did. Indeed, for this group of students, the PAE significantly reduced the probability of belonging to the bottom part of the distribution (by approximately 7 p.p.) and improved mean scores (by approximately 21% of one standard deviation). Furthermore, our evidence suggests that there is heterogeneity in the impact of the programme across school types, namely, urban versus rural. In particular, we find that the impact of the programme is much larger among students attending rural schools than students attending urban schools. Finally, our results hold when we consider the school, instead of the student, as the unit of analysis.

Remedial programmes are often very difficult to evaluate due to sample selection. Students' individual and socioeconomic characteristics affect both their probability of being selected for the programme and its success, when the selection mechanism is not completely observable. Fortunately, the richness of our data, combined with access to schools' performance in 2009 (before a group of schools joined the programme) and in 2012 (after joining it) allows us to control for a variety of observable student characteristics and address unobservables that might affect the selection of schools for the PAE and their outcomes. Our first estimation strategy compares the PISA 2012 reading scores of those students that attended schools that participated in the PAE with the hypothetical outcome that these same students would have obtained had they not attended PAE schools. The counterfactual reading score is in-

ferred using a control group composed of students in schools that did not join the PAE but participated in PISA 2012. To ensure that treatment and control groups are comparable on observables, students in the control group are re-weighted by assigning relatively more weight to those students whose individual, family and school characteristics are similar to those in the treated group. As a second estimation strategy, we propose using propensity score matching to examine the impact of the PAE. In addition, we estimate the role of unobservable variables in the schools' decision to volunteer for the PAE. The availability of information on student performance in schools before joining the programme allows us to examine the existence of selection bias. This is one of the contributions of this paper.<sup>6</sup> We estimate the selection bias by combining, on the one hand, the information available in PISA 2009 exams with, on the other, the information regarding participation in the PAE one, two or three years later. We identify in the PISA 2009 sample those schools that volunteered for the PAE only after 2009. In this sample, any difference in reading performance among students in schools that volunteered for the PAE only after 2009 and those in schools that never participated in the PAE can be attributed solely to the existence of selection bias. We do not find any significant selection bias. A possible explanation is that, as the programme began during the 2005/06 academic year, by the 2009/10 academic year, and afterwards, its existence was quite widespread in the education community (the rate of programme participation exceeds 45% in some regions) and most schools with a low profile had already joined it, thus the "late-comer" schools are similar to the ones that never participated in the program.

Our paper contributes to the relatively scarce literature on the evaluation of remedial education programmes for teenage students in developed countries.<sup>7</sup> Only a few works address the identification problem and obtain evidence regarding the effectiveness of these programmes in the short run. [Jacob and Lefgren \(2004\)](#) analyze the effect of summer schools on the performance of 9–12 year-old students in Chicago and find that the net effect of these programmes was to substantially increase academic achievement among third-graders but not sixth-graders. [Lavy and Schlosser \(2005\)](#) evaluate the short-term effects of the Bagrut 2001 programme, a remedial intervention very close in spirit to that evaluated in this study, which provided additional instruction to underperforming high school students in Israel. Their study shows that it was more cost effective than alternatives based on financial incentives for pupils and teachers. [Holmlund and Silva \(2014\)](#) study a remedial education programme targeting English secondary school pupils at risk of school exclusion that, instead of targeting standard cognitive skills (as does the PAE and other programmes mentioned above), targeted students' non-cognitive skills, finding little evidence that the programme significantly helped treated youths to improve their age-16 test outcomes. A recent contribution is [Battaglia and Lebedinski \(2015\)](#), who analyze the impact of the Roma Teaching Assistant Programme in Serbia. However, their work differs somewhat from our study, as it is focused on a stigmatized ethnic group, Roma pupils. Thus, one of the contributions of this paper is that it is among the first to analyze the impact of a remedial education programme on students' academic achievement within the European context, which is crucial considering the current debate over the increasing

<sup>3</sup> See the [European Commission \(2013b\)](#) for a review of remedial programmes in Europe. Among several examples of remedial interventions at school in the U.S., see, for example, the Bell After-School Instructional Curriculum (BASICS) or that promoted by the 21st Century Community Learning Centers ([U.S. Department of Education, Office of the Under Secretary, 2003](#)).

<sup>4</sup> Among the few works on remedial program evaluation in Europe it is worth mentioning ([Battaglia & Lebedinski, 2015](#); [Holmlund & Silva, 2014](#); [Lavy & Schlosser, 2005](#)). We comment below in this section how this paper departs from previous works and contributes to the literature.

<sup>5</sup> PISA is the Programme for International Student Assessment. It measures students' skills in three areas: mathematics, reading and science.

<sup>6</sup> See also [Hospido, Villanueva, and Zamarro \(2015\)](#) who employ a similar approach to examine the impact of a financial education programme on students' scores.

<sup>7</sup> Evidence on the impact of remedial and analogous programme in developing countries is more common. See, for example, [Banerjee, Cole, Duflo, and Linden \(2007\)](#), who evaluate the Balsakhi Programme in India or, more recently, [Kremer, Brannen, and Glennerster \(2013\)](#) for a review of the existing evidence on programme impact in developing countries.

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