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Tackling Child Poverty in Latin America

Rights and Social Protection in Unequal Societies

Edited by

Alberto Minujin,
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The editors

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PRODUCTION AND REPRODUCTION OF CHILD POVERTY IN LATIN AMERICA. AN ANALYSIS CENTERED ON THE EDUCATIONAL DIMENSION

Jorge A. PAZ[1]*

I. Introduction

The main weapon used by national states in Latin America to fight poverty is the so-called Conditional Transfer Programs (PTC). These are interventions targeted at the socially vulnerable population, which hand their beneficiaries a sum of money in exchange for a (verifiable) commitment to make their children (NyN) attend school and to systematically control their health and nutrition.[2] The conditionality implies, precisely, that the economic aid granted is subject to compliance with these controls. Today, virtually all the countries in the region have one or more PTC in effect.[3] Although the history of such programs in Latin America goes back to the 1980s (Lavinas, 2013), it could be said that the first of its kind was Mexico's Education, Health and Nutrition Program (Progresa), which started in August 1997.

There are various premises, or rather axioms, held by the PTCs, many of which are not explicitly recognized, but it is clear that they work as a motivation, sustain their validity, and are the justification for the resources

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2 Conditions that mainly include keeping the vaccination schedule.

3 The *Oportunidades* program (formerly Progresa) in Mexico, the *Bolsa Familia* program in Brazil, the *Asignación Universal por Hijo* program in Argentina (and, more recently, *Progresar*) are examples of PTC in the region.

applied to execute them. The first of them is that it is morally correct to provide the poorest and the most vulnerable with an assistance that will allow them to subsist. A second axiom—derived from the preceding one—is that the PTC is the most effective social policy instrument to achieve this.[4] A third axiom is that PTCs not only relieve poverty today but they contribute to break the intergenerational reproduction of poverty and economic inequality. In turn, the latter axiom is based on a couple of hypotheses that schooling involves learning, and learning leads to increased welfare. The first hypothesis is related to children who attend school due to the assistance provided by the PTCs; the second one, to the adult stage of the children who join the labor market and obtain higher income due to their increased education. Acknowledging these premises, the problem then consists of providing equal opportunities to all the population, providing those who have less with the human capital required to face economic life, and waiting for the results in a few generations.

This paper goes further than discussing the possibility and efficiency of the PTCs in reducing poverty today in Latin America and seeks to research the potential in providing equal opportunities to impact the gap in educational results between poor and nonpoor children. If the said impact occurs, the challenge would then be to calibrate the current PTCs and to expect that, within one or two generations, the said interventions start to yield results. Education, as can be seen, is one of the focuses of PTC, and schooling is one of its main goals. That is also what the Millennium Development Goals propose and also what is sought by everyone who agrees in one way or another on the conceptual framework of the equalization of opportunities (IOP).

There is plentiful discussion on the equalization of opportunities (IOP) and literature on the subject abounds today (Ferreira and Gignoux, 2011). However, here we posit that acting in favor of IOP often causes the connection between IOP and equality of outcome (IRE) to be blurred, and it also blurs the processes that generate exclusion, inequality, and poverty, and which go way beyond the variables that are regularly observed and monitored (income, meeting basic needs, etc.) and which are used to identify opportunities. That is important because, as it was said before, the basic

4 In the words of Carlos Auyero: “Maximum focalization to minimize spending” (García, 2014).

purpose of the existing PTCs in ALC is the IOP under the seldom questioned belief (Paz, 2010) that IOP leads to IRE, after one or two generations.[5]

Thus, this paper seeks to reveal how the differences in living standards in opportunity variables (precarious housing and overcrowding) lead to differences in the level and the distribution of variables of outcomes, such as the scores obtained by children and/or by the interruptions to a process that the prevailing economic trend calls "accumulation of human capital." It will also emphasize variables that can be altered with the instruments provided by the democratic system, and many of which appear as rights that are guaranteed by the constitutions of the countries. But after this is completed, we will see what would happen if IOP took place in these variables to realize, surprisingly, that a good portion of the differences found could not be mitigated even with these measures, and that deeper actions, aimed at a longer term, would be required to achieve the IRE.

To achieve these goals, we analyze the Math and Language scores obtained by sixth-grade children in countries in Latin America and the Caribbean (ALC). We attempt to show that the intergenerational transmission of poverty and inequality through (in this case) education goes way beyond the IOP, thus revealing one of the many processes in which the rights of the children contemplated in the Convention on the Rights of the Child (CDN) are violated. A second goal is to identify relevant variables that allow us to list public policy actions, in the style of Conditional Transfer-Programs (PTC), aimed at breaking—or reducing the intensity of—the cycle of reproduction of poverty and inequality. For that purpose, it will be necessary to separate the opportunity restrictors (in this paper, "endowments") from others that operate independently, which cause identical opportunities to generate different results.

This paper has been structured according to the following plan: In the following section, we present the problem under review, proposing the conceptual base framework and the extensions made to address the problem of the reproduction of poverty and inequality. In Section III, we discuss the data, and we describe the methodology we used to handle them. In Section IV, we explain the results obtained. Section V presents, as final

5 The work of James Heckman (one of them is mentioned here: Heckman *et al.* 1996) addresses the issue, even though the results are provisional due to the lack of relevant data.

considerations, the public policy options that arise from the results obtained in the previous sections.

II. The addressed issue

This paper posits that the intergenerational transmission of poverty and inequality operates through two mechanisms: (a) poverty and inequality itself, which put children from poor homes at a disadvantage compared to those who come from nonpoor homes; (b) the way in which the educational process that serves populations in different socioeconomic sectors is generated. The first problem is the main focus of the IOP paradigm, according to which the playing field is not level; a major part of the solution is to provide poor children with the same opportunities provided to nonpoor children.

Here we argue that, due to some reason that is less intuitive than the above premise, children from poor and nonpoor households experience their educational process differently. We will call that "different experiencing" here: a different capacity to transform input into outcome, or opportunities into results (O→R), appealing to the concept of educational production function explained below in this same section. The idea is subtle, but simple: It may be so that more poor children than nonpoor children attend public schools, that those children are the children of parents with less education, that they repeat courses more frequently, that they work inside and outside their homes, and so on.[6] But it may also be the case that, due to some mechanism (or a set of mechanisms), children who are classified as "poor," who attend the same schools as nonpoor children, with parents of similar educational levels, and so on,are less likely to transform that input into an outcome of a similar "quality" to that obtained by children classified as "nonpoor." This internal segregation process may be generating inequalities that are harder to fight with the traditional public policy tools (e.g., the PTCs). A first challenge would then be to find out the weight of those processes in generating educational gaps and/or inequalities.

Unfortunately, the data available do not reveal the "invisible" mechanisms of the reproduction of poverty and economic inequality, which occur in parallel to the differences in opportunities for the children population. One theory could be that this is due to the conduct of the various

6 That is to say, that they face different opportunities.

actors involved in the educational system, the parents, teachers, directors, the state, and to aspects that are often contained in the curriculum. All of them, in one way or the other, produce and reproduce poverty and inequality schemes from within the system. Hanna and Linden (2009) discuss an example of how these discrimination processes are produced within the system in a group of children from India, whereas a great deal of chapter 5 of Banerjee and Duflo (2011) is devoted to explanations and contributions on these mechanisms that are not apparent in the quantitative information available.

As will be seen below, it is likely that these processes operate differently with children in different quality education sectors, so that those who tested poorly will show a different treatment from those who surpassed the average score of the group. It is easier to understand this idea by resorting to an analogy with labor segmentation. Let's assume that there is a labor market with two segments: a low segment and a high segment. For a worker who earns a lower salary of the secondary (disadvantaged) segment, crossing into the primary segment (the advantaged segment) may be an achievement (earning, e.g., social security payments and the status of a worker with a formal wage). But, what would be the position of this worker in the distribution of the income of this job? The second goal of the worker, earning a higher salary, may be very complicated.

1. Education and economy: Conceptual framework

The idea expressed in the educational production function, the main conceptual tool of this paper, is closely related to the concept of human capital, or the "canonical model" as it will be known here (Becker, 1964; Schultz, 1961; Heckman *et al.*, 1996; among others), and it may be expressed as follows: A person may learn to obtain certain skills and abilities that have a market value. Acquiring these skills and abilities takes time (time that is taken from other activities that may provide welfare) of other actors (parents, private teachers, etc.) and involves various inputs that may be purchased in the market or which are provided by the state as public services (education and health are the most common examples). The knowledge acquired is advantageous to the individual: It allows him or her to recoup what he or she invested during the process (the costs), which is the net "earning" derived from the human capital invested.

In the case of the preceding paragraph, it is shown that the result of the human capital investment process is the salary or compensation that the owner of the human capital sells in the market. If the said compensation is higher than the compensation, the same individual would have obtained without investing in that capital; the investment is not profitable, making the investment in human capital a key mechanism to extract people who perhaps would have otherwise been poor from their destitute situation, or of redistributing income to those who do not have any other asset than their innate skills and time.

It is useful to express the ideas above as a function to make it easier to understand them and to analyze their consequences and ramifications. The above concepts then can be written as follows:

$$R = \gamma H + X\beta + \varepsilon \qquad [1]$$

where (an example in parentheses) R is the result variable (income in the labor market), H is the human capital accumulated by the individuals (years of education), and X is the other determinants (occupation performed).

The key for this paper is in γ and β, which represent parameters of conversion of the skills, dexterities, and/or abilities (expressed in H and X) into results. In economic literature, γ and β represent "prices" of the "endowments" (H and X, respectively).

Last, ε is a term of error that includes all the factors that are impossible to observe and that affect the results.

A. The education production function

The problem in the preceding case consists of defining H, which is the human capital variable that is of particular interest for this study. Under Hanushek and Woessmann (2011), we will assume that H is determined by family factors (F), by the quality and quantity of the inputs provided by the school (qS), the individual skills and abilities (D), and other relevant factors (Z), in addition to those that cannot be observed with the information available. As variables, the above can be written as

$$H = \lambda F + \phi(qS) + \eta D + Z\pi + \mu \qquad [2]$$

This expression is what is called the "education production function." As correctly posited by Hanushek and Woessmann (2011), *H* is not directly observable, and it needs to be measured in some way to reveal its effect on other variables. The literature has suggested in this case that we should concentrate on the measure of educational performance, such as various test scores (Language and Math are most commonly used). The main advantage of these measures of *H* is to measure variations in knowledge and in the personal skills that transform knowledge into practical skills.

B. Differences in achievement

As has been said, the most frequently used examples of investment in human capital are the actions of people who seek to expand their educational level and their health benefits. From an individual economic perspective and in terms of expression [1], that would imply a higher *H* to improve *R*; from a more social perspective, it would mean more people obtaining access to higher *H*s to improve the *R*s they would have obtained if they did not have those higher human capital endowments. It may be argued that this is one of the goals of the conditions in the Conditional Money Transfer Programs (PTC): improving the distribution of the labor income of future generations by promoting school attendance or enrollment today and vaccinating the children population (higher *H*s).[7]

But, although school enrollment partially reflects the educational achievement of various countries, it does not adequately show what happens within the system: the way in which children are educated and the results they obtain from that process where inputs of various kinds intervene (professor work hours, materials computers, etc.), reflected in the educational production function described in expression [2]. Here, we propose an axiom and a hypothesis: (a) not all the students obtain the same *R*s, and they largely depend not only on the endowments (*F*, *qS*, etc.) but also on the conversion of the endowments into results (of the λ, ϕ, etc.); (b) the value of the parameters (λ, ϕ, etc.) depends on the socioeconomic sector of origin of children and their position in the distribution of scores.

Within this conceptual framework, the IOP would provide the children population with identical benefits, that is to say, to remove any barriers derived from an origin other than talent. This would lead to the equalization

7 An elaboration of this idea may be found in Paz (2010).

of results in the labor market and to "fair" differences that are based on talent, effort, and dedication. Since no longitudinal design is available enabling us to observe compensation for children who are subject to such treatment and controlled, here we analyze academic performance as a variable affecting their future labor position and compensation.

III. Data used and methodology

1. Data

The data are taken from the Second Regional Comparative and Explanatory Study (SERCE), performed by the Latin American Laboratory for Assessment of the Quality of Education (LLECE).[8] The databases available include information on the academic performance (scores) of third- and sixth-grade students in 16 countries in Latin America and the state of Nuevo Leon (Mexico). The areas analyzed here are Language (reading and writing) and Math, and we chose to exclusively work with sixth-grade students.[9]

In addition to strictly pedagogical aspects, the databases include information on the directors, the teachers, and the parents, which provides the opportunity to analyze school and social factors that are probably associated with the academic performance of the students. All the data correspond to the 2005–06 period, depending on the school calendar of each country, and since it comes from a single source, the information is strictly comparable.

The dependent variable used in this paper, indicative of the academic "result," is the standardized average score, a measure of performance with an average score of 500 and a standard deviation of 100. The socioeconomic sector was captured with variables that allow us to identify homes with structural deprivations such as availability of electric power and drainage in the homes where the children live.

8 The SERCE study is part of the global actions of the Regional Bureau for Education for Latin America and the Caribbean (OREALC) of the United Nations Educational, Scientific and Cultural Organization (UNESCO). The SERCE is the largest study of the quality of education in Latin America and the Caribbean.

9 This decision was made because we considered that school desertion occurs more frequently in that grade and because the processes analyzed herein start to generate the dissimilar results that are the subject of this document.

The explanatory variables, many of them representative of different opportunities for children in the region, respond to the clustering (a) directly attributable to the child: age, sex, ethnic origin, course repetition, and labor status (works/does not work); (b) corresponding to the home where the children live: education of the mother; and (c) related to the educational institution: area of residence, public or private dependency, and characteristics of the faculty.[10]

2. Methods

To understand the relationship between the goals of the investigation and the methods applied, we reformulate the former in three sets of questions to be answered: How do the opportunity variables impact the scores of the children in the region? Is this effect similar among poor and nonpoor children? To answer these questions, we estimate a least-squares (MC) multiple regression, allowing us to evaluate the relationship of each independent variable on the Language and Math grades and for each child in different socioeconomic sectors.

Do the estimated coefficients (the β are representative of the O→R process) similarly impact students with low grades and those with higher grades? To obtain an answer to this question, we estimate a quantile regression (RC) and evaluate the stability and robustness of the β estimated.

What are the effects of inequality of opportunities and the conversion of opportunities into results on the academic results of poor and nonpoor children? In this case, two types of breakdowns are applied: the traditional Blinder–Oaxaca (Blinder, 1973) and Oaxaca (1973) for the values obtained in (a) and that of Machado–Mata (Machado and Mata, 2005) for the values computed in (b).

The RCs were estimated with the approach proposed by Koenker and Bassett (1978). This model involves that the *n*th percentile of the grades (in this case), conditioned by a set of control variables or opportunities (education, type of school, gender of the professor, etc.), is linear. With which, for a sample of a given size, the percentile is defined as the solution to a problem of optimization that may be resolved with linear programming. In

10 Many other variables could have been included, but we need to consider that, as they are incorporated, cases or observations are lost. Therefore, we chose the most economic model, from the perspective of the use of the information available.

this study, we estimated two RCs, one per each socioeconomic sector of the children, with the understanding that the traditional regression approach offers a partial image of the relationship between the grades and their determinants.

The Machado–Mata approach is similar to that of Blinder–Oaxaca, but it is based on the RC and not the parameters (β) obtained with MCO. It consists of estimating a counterfactual distribution of the grades, assuming that the opportunities are the same in both groups. Thus, we intend to determine what the grades of poor children would be if they had identical opportunity values as nonpoor children. If the difference in results is solely from the fact that poor and nonpoor children have different opportunities, then the counterfactual distribution would be equal to the distribution observed.

IV. Results

1. Poverty in ALC

The first step of this study consisted of obtaining an indicator that would allow us to stratify the homes of the sixth-grade children in ALC countries.[11] Graph 1 shows the percentage of children who live in homes without water and electricity services. Please note that, although the intervention measures based on the canonical model submitted and discussed in Section II treat the region as a homogeneous whole (Paz, 2010), it is possible to see a range of situations that clearly define and differentiate ALC from other, more developed, regions of the world.

The services of the household, as well as the quality of the materials it is built with, are frequently used as indicators to identify poor homes, both in the more traditional studies (Feres and Mancero, 2001) and in the recent contributions to multidimensional poverty [Comisión Económica para América Latina y el Caribe (CEPAL)-United Nations Children's Fund (UNICEF), 2010; Alkire and Foster, 2008; Delamónica and Minujin, 2007; Gordon *et al.*, 2003; among others]. Although the database available provides information on several of these indicators, only drainage and electric power

11 We also tested the highest educational level of the father, which is an indicator of the income generation capacity of the population (Mincer, 1974). The correlation between family income and the educational level of the head of the home is analyzed in Deaton (1997). The arrangement does not differ.

were used, because these services are the foundation for the others, and their absence excludes the access to many others.[12] With data from other studies, we were able to verify that the arrangement of the countries that results from using an alternative measurement of poverty (economic poverty, for example) is not modified in substantial terms [Comisión Económica para América Latina y el Caribe (CEPAL), 2013].

The indicator selected allows differentiating at least three large groups of countries: those with high poverty (such as Guatemala and Nicaragua), those in the intermediate level (such as Brazil, Paraguay, and Ecuador), and those with low poverty (such as Chile, Uruguay, and Cuba). As can be verified in brief, this indicator produces a similar arrangement of countries to that generated by the grades of the students, which suggests a correlation between poverty and the academic performance of children.

2. Grade level and distribution

In academic performance, Cuba leads the rest of the countries in the region (graphs 2a and 2b), particularly in Math.[13] It is followed by Uruguay, Nuevo Leon (Mexico), and Costa Rica, whereas a third group may include Mexico, Chile, Argentina, Brazil, and Colombia, which score as the regional average. Lastly, there are the lowest-performing countries: Peru, El Salvador, Paraguay, Nicaragua, Guatemala, Panama, and the Dominican Republic. The latter is placed, similarly to Cuba, at the top of the distribution, removed from the rest of the countries.[14]

Given the goals of this study, we are more interested in the grade differences in Language and Math by socioeconomic sector of origin of the children, than in their level. Graphs 3a and 3b show that the status of the home of origin of the children of ALC establishes important and significant differences in the grades obtained in international tests. The gaps range between 4.7 (Uruguay) and 63.3 (Peru) SERCE points in Language and between 0.7 (Cuba) and 64.7 (Peru) SERCE points in Math. Given that the

12 For example, it is not possible to have access to a computer if there is no electricity in the home.

13 This classification is based on the visual inspection derived from the data of graphs 3a and 3b and it matches the proposal of other studies based on this data source (for example Treviño *et al.*, 2010).

14 Please note that this classification, while arbitrary, may be applied to the average score of the countries in Language. The correlation of the grades obtained by the students in the two disciplines reviewed was very strong.

standard deviations computed for complex samples are below 3 (and almost always below 2), the differences obtained are highly significant, and it is not possible to reject the hypothesis that establishes differences between the groups.

Opening by discipline (Language and Math) does not change the arrangement of the countries in any substantial form. Cuba and Nicaragua appear as the countries with the smallest gaps in both disciplines; Uruguay and the Dominican Republic are countries with small gaps; Colombia, Chile, Argentina, and others have medium gaps; Peru, Brazil, and Mexico have the greatest gaps. Those graphs indicate the way in which educational results are analyzed and interpreted, given the significant heterogeneity of the situations presented by the region.

Lastly, another area of interest in this descriptive introduction is the focus on distributions rather than on mean values. In graph 4a and 4b, it is possible to see the Kernel densities obtained for the grades in Language and Math. An alternative to the graphic approach is to compute the values of table 1, which shows percentiles 5, 25, 50, 75, 95, and 99 of grades in the disciplines of Language and Math.

The densities extend the analytical panorama and allow us to infer that the differences by socioeconomic sector of origin of the children occur not only in the average, but that they generate different masses, although with considerable overlap. It can also be seen that the greater gaps between socioeconomic sectors appear with students with better performance (located on the right side of the Kernel distributions) and that the dispersion is greater between children who come from a socioeconomic sector classified here as “high.”

To summarize, the socioeconomic differences in performance are amplified as performance increases, which implies that the children from the lower socioeconomic sectors face a “glass roof” of sorts in terms of academic performance, despite which there are also important and significant differences in children at the lowest end of the grades.

3. Different opportunities

Table 2 shows the mean values of the variables included in Language and Math in the academic performance test for children of ALC. The ratio of students repeating courses is higher among those who live in poor homes, compared with those who live in nonpoor homes. The former also have a

significantly higher incidence of workers, both inside and outside their homes, their mothers have a lower educational level, and they also have a greater percentage of speakers of indigenous languages. On the other hand, poor children who go to schools where there is a higher proportion of male teachers have less job stability and a lower educational level. In turn, the children who live in poor homes live in countries with lower income per capita than those who live in nonpoor homes.

Given that the aforementioned factors are related to academic performance (as will be proven below), it is logical to think that the average grades of children who live in poor homes are lower than those of the children who live in nonpoor homes: in Language 486 points *vs*. 521; in Math 481 *vs*. 515 (these values can also be seen in table 1).

If we resort to the IOP paradigm, a public policy alternative may be to provide poor children with endowments identical to those of nonpoor children: reducing course repetition and child employment, improving the educational level of their mothers and their teachers, promoting job stability for the latter, and economic growth, among other things. This reduces structural poverty to zero. The question is, if this were to happen, would the performance gap between poor and nonpoor children be closed?

4. Conditional analysis

To answer the question in the preceding paragraph, first it is necessary to know how each opportunity impacts the grades, independently from the rest. Then, we must consider whether or not the said impact differs between socioeconomic sectors.

A. Considerations for the median regression (tables 3a and 3b)

In very general terms (an inference that is valid for Language and Math, and for children from homes of both sectors), the average sixth-grade student has a lower academic performance the older he or she is, if he or she speaks a foreign or indigenous language, and if he or she has a male teacher. The educational level of the mother, the teacher's age, his increased dedication to school, academic training, and job stability significantly improve the performance of children in ALC. The general economic status, expressed in the GDP level per capita, also has a net positive effect. These findings apply to median students (percentile 50 of the distribution of the grades).

If children are classified as "poor" and "nonpoor" (columns 2 and 3, tables 3a and 3b), it can be seen that the Language grade is more sensitive to the education of the mothers among poor children (than among nonpoor children) and to the job stability of the teachers (among nonpoor children, the parameter estimated for this variable is not significantly different from zero). For Math, we find that the education of the mothers has a greater impact on the grades of nonpoor children, whereas the age of the teachers, their gender, and job stability favor the poor. The effect of the GDP of the country, in both cases, is more important for poor children.[15]

B. Different segments of the distribution

Now we will analyze the differential effect of each variable on the different portions of the distribution of the grades by running an RC for the two competencies—Language and Math—and for the two sectors—poor and nonpoor. With this, we attempt to find out whether the parameters considered behave in the same manner among those who obtain different grades in the SERCE in the countries of the region. Thus, a parameter is "neutral" if the difference in the grades between poor and nonpoor children is the same between those who obtain a low grade and those who obtain a high grade. That is to say, we analyze the gap between poor and nonpoor children not only in the average of the grades but also throughout the entire distribution.

The answer to this question for the entire sample can be found in the multiple graphs (graph 5a for Language and graph 5b for Math). Table 4 summarizes these findings differentiating by sector. The graph shows the coefficients estimated $\beta\hat{}\_i\ (\theta)$, $i=1,\ldots,k$ for $\theta \epsilon (L,M)$ (most of which are neutral to the segment of the distribution they impact) and the confidence intervals (95%) for each of them.

The number of non-neutral parameters in table 4 when differentiating by socioeconomic sector is remarkable. Thus, among the children from poor homes, there are more neutral parameters than among nonpoor children: 31/40 *vs.* 24/40 (last row, table 4). In addition, the parameters that affect performance grow in absolute value when they go from the low end (left) to the high end (right) of the distribution of the grades. The former implies that

15 This may reflect the resources available to each country for, among other uses, education.

there are less opportunities that generate the equalization of the results[16] among poor children. The latter means that when they are negative, they adversely affect those in the high end of the distribution, and they improve those in the lower end to a greater degree, and when they are positive, they improve those in the higher end of the distribution to a greater degree.

C. Breakdown of the differences

What would happen if poor children were to be placed in conditions identical to those of nonpoor children through public policy actions? In other words, what would happen to the quality of education if the former were provided with homes with electricity and drainage, similar to those where the latter live? Would the differences disappear, or would there still be a need to change public policy? This section proposes an exercise that aims to answer these questions, for which it uses two micro-econometric breakdown techniques: Blinder–Oaxaca and Machado–Mata.

The Blinder–Oaxaca breakdown (table 5) allows us to verify that in 40–42%, the mean gap in the grades is explained with the different endowments (opportunities) for poor and nonpoor children, whereas the rest would be better explained with internal processes for the conversion of opportunities into results. From a conceptual perspective, the above means that even after providing students with identical opportunities, the difference in performance would not be eliminated: For example, in Language, the 34 SERCE point difference between poor and nonpoor children would be reduced to 21 points (table 5), but it would not disappear.

Graphs 6a and 6b show the results of the Machado–Mata breakdown for Language and Math, respectively. The conclusions for both competencies do not differ in substantive terms, so below we provide the most interesting results that can be generalized.

First, the MCO estimate doesn't represent what happens throughout the distribution of the grades. The general gap between poor and nonpoor children increases as the grading scale progresses.[17] This is represented by the "Original" line in the aforementioned graphs. Both the characteristics (the "Carac" line) and the coefficients ("Coefic" and the two "IC 95%" lines)

16 It must be noted that, at least in this case, there is no discussion of the actions that generate equal opportunities.

17 The reasons of the O→R process for this behavior for each of the estimated coefficients can be found in Section III.2.

contribute to that behavior. The counterfactual distribution obtained (the "Predicted" line in the graphs), that is to say, the gap that would result if poor and nonpoor children had identical characteristics,[18] yields a smaller gap for all the quantiles. The difference between "Original" and "Predicted" is the part of the gap that could be explained with the opportunities provided to poor and nonpoor children.

If the predicted gap is compared to that obtained by MCO, three things can be verified: (a) that the gap persists even after equalizing the opportunities; (b) that the gap behaves differently depending on the segment of the distribution of the grades; and (c) the gap is greater as the grading scale progresses (the difference between "MCO" and "Predicted" is greater as we move from left to right on the data). Conclusion (c) could be considered a variation of conclusion (b). Lastly, the confidence interval indicates a greater variability of the grades at the ends of the distribution. But, despite this, the estimate for the median is outside the interval in the lowest end of the distribution, between approximately the 10th percentiles and 30th percentiles; therefore, the gap between poor and nonpoor children in the group with the lowest performance is significantly higher than the one found in the average.

V. Final considerations

This paper analyzed the relationship between academic performance, poverty, and the equalization of opportunities in Latin America, in the 2005–06 period, when SERCE data were available. That two-year period is right at the middle of a period of reduction of poverty in the region: 2000–2010/11. But despite the reduction, child poverty continues to be very high, as shown by the detailed study by Comisión Económica para América Latina y el Caribe (CEPAL) (2013). This means that the PTCs are not achieving, at least at the macrolevel, their own goals.

On the other hand, it could be seen that, if poverty is not reduced, the equalization of opportunities in variables that are targeted by the PTCs would not entirely eliminate the academic performance gaps between poverty sectors; therefore, it is feasible that poverty and the inequality that

18 The characteristics of the (pooled) average were considered to obtain this line. The methodological alternatives were to take those that correspond to poor NyN or nonpoor NyN.

school differences predict (Heckman *et al.*, 1996) and involve in the long term are reproduced. In other words, those gaps respond to factors that go beyond the social conditioning factors of the children of the region. Poverty not only affects the result (direct effect, or composition, as it was called in this paper) but also affects the process (parameter effect or conversion capacity of opportunities into results). This causes compensation policies to be unable to yield the expected effects, or to be completely effective. In addition, if we take school grades as a proxy of the conditions of the children who enter the labor market, even if poor children had the same opportunities as nonpoor children, they would arrive at a disadvantage. Very few of the former are able to obtain the same grades as the latter. In equal conditions (opportunities), poor children with a better performance obtain a lower grade than nonpoor children with better performance.

Among the policies that would have an effect on the average student, controlling household and external (or market) child work appears as a very important one. In school, it would be important to reduce children who are over their age for the school level and to reinforce work with children from indigenous homes. It would be important to design policies that promote job stability and dedication for teachers. This would help the children from the low-income sectors more, while teacher training would have an equalizing effect, as it would impact the higher sectors. All actions aimed at improving the education of the mothers would also have positive and important effects on the academic performance of the children in general, although the effect on poor and nonpoor children would be ambiguous: It would favor poor children more in Language and nonpoor children in Math.

General economic conditions favor the poorest children more. In other words, it would be necessary to incorporate a component related to the equalization of results among the children to the benefits of countercyclical macroeconomic policies, as well as (and very especially) those that promote growth.

A lot of these actions could be included in the conditions of the existing PTCs (e.g., controlling child labor, the school attendance of the mothers, etc.), whereas others need to be conceived as sector-based policies: labor markets for professors or grant programs aimed at certain demographic groups.[19] But

19 For example, in Argentina, the Ministry of Education implemented school completion programs for adults, although with other purposes, different to the equalization of

all of them share the same goal: equalizing the endowments or opportunities for children. In that sense, they are not very different from the goal of the existing PTCs of the region. What would be the result if the aforementioned actions were effective? It will be a gap of over 20 points between low-performance poor and nonpoor children and of over 40 points for high-performance poor and nonpoor children. That is to say, the glass roof for the poor persists. To select IRE policies and programs, beyond IOP, it would be necessary to consider the neutrality of the opportunities across the distribution of the results. Thus, among poor children, non-neutral opportunities are repeating courses, higher education of the mother, the dedication of the teachers, and the GDP per capita. It would be necessary to consider that the equalization of opportunities in these aspects would generate inequality in results; therefore, it would be necessary to have compensatory measures to prevent the differences between poor and nonpoor children. These compensatory differences should come from the schools, and they should mainly focus on children with grades above the average of the group.

This article reveals that poverty is the result of concrete actions by agents and processes that act in historical structural contexts over the long term (Cimadamore and Cattani, 2008). It is a product of the interaction between specific structures and agents (in this case, the teachers, parents, and directors) that produce and reproduce, at different levels, the conditions that generate and multiply poverty and inequality.

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opportunities for children. In this case, the programs should be targeted at women with children in primary school age, or women at risk of getting pregnant.

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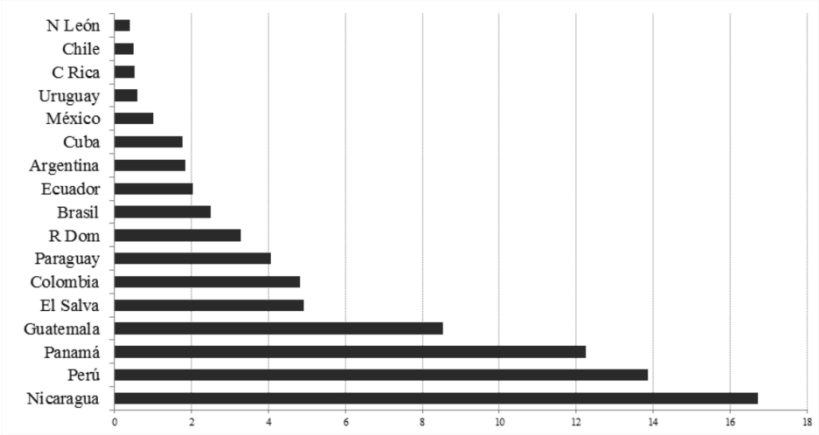
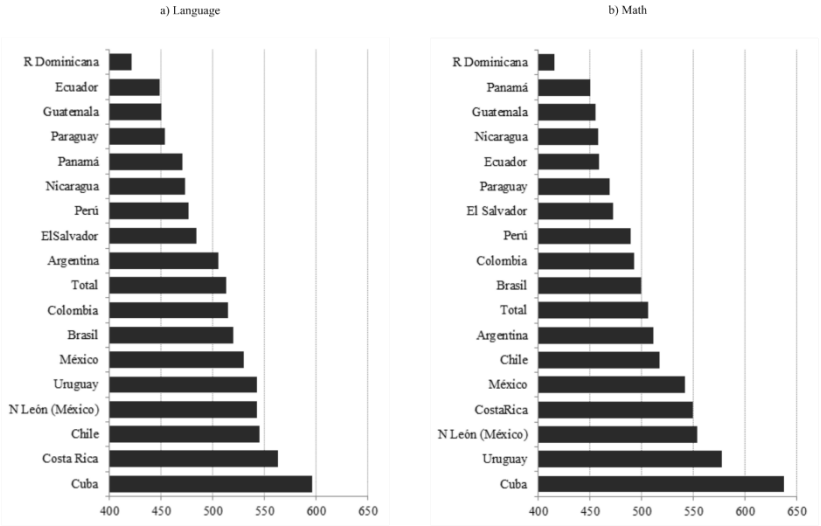
VII. GRAPHS APPENDIX

Graph 1. Percentage of children living in homes without electric power or drainage

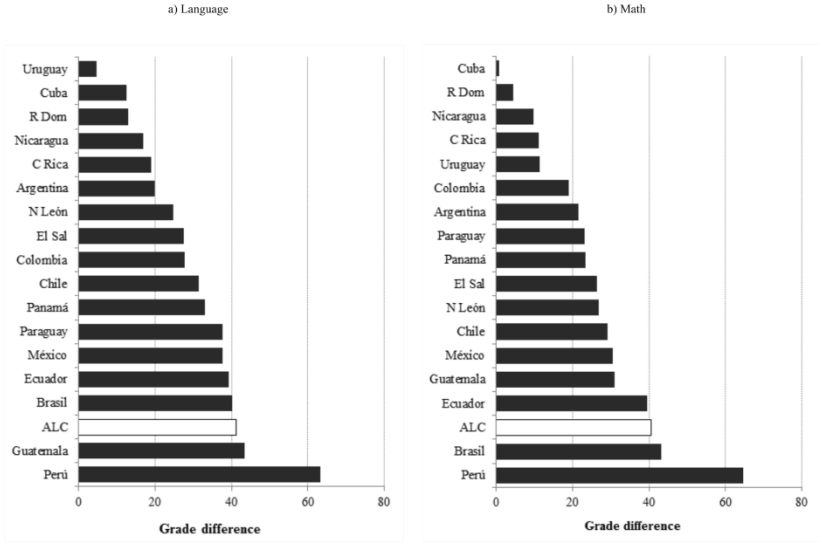


Source: Prepared internally with data from SERCE.

Graph 2. Average grades by country

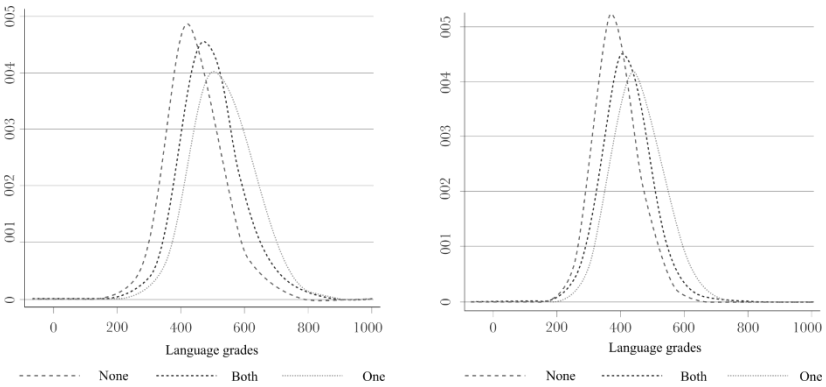


Graph 3. Socioeconomic grade gaps by country



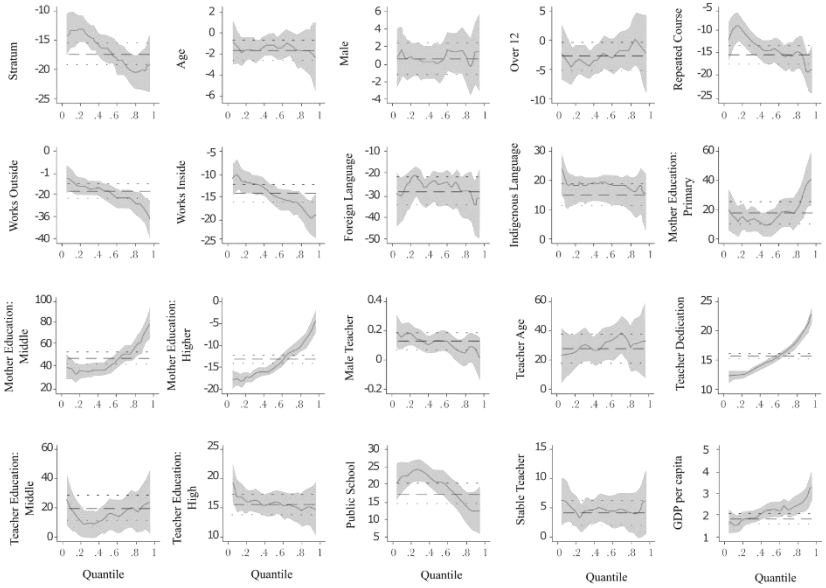
Source: Prepared internally with data from SERCE.

Graph 4. Kernel densities of the grades in relation to the services (electricity and drainage) of the homes: A. Language; B. Math



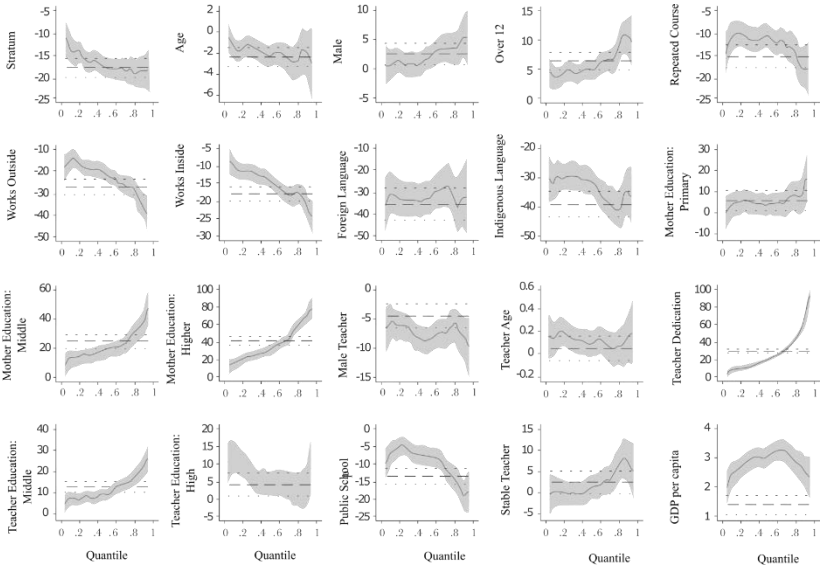
Source: Prepared internally with data from SERCE.

Graph 5a. Differences in the parameters of Language grades for the entire distribution



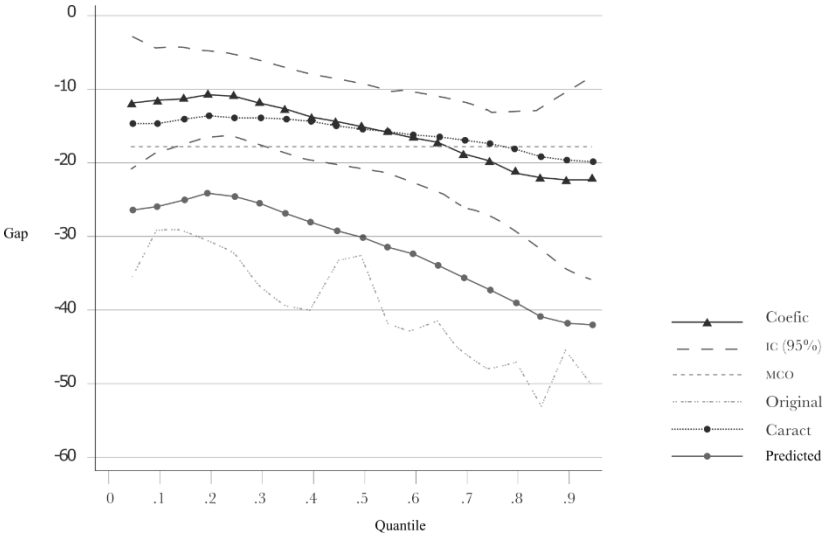
Source: Prepared internally with data from SERCE.

Graph 5b. Differences in the parameters of Math grades for the entire distribution



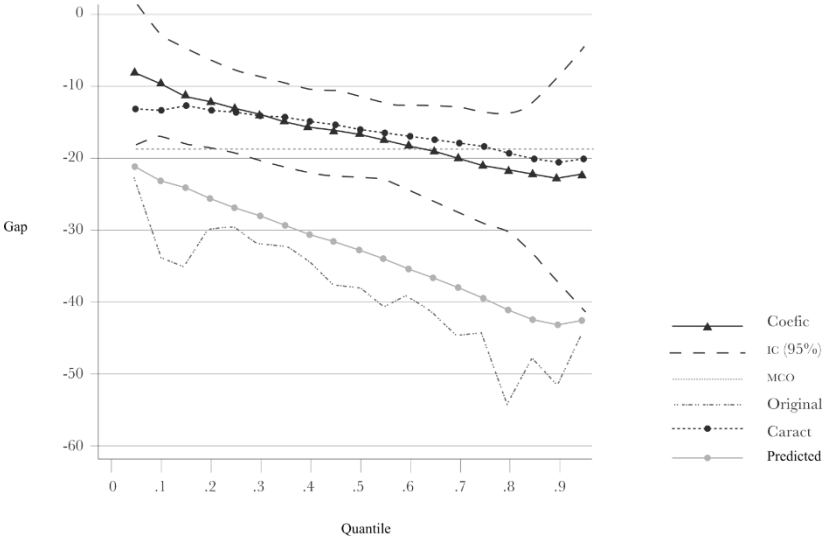
Source: Prepared internally with data from SERCE.

Graph 6a. Machado–Mata breakdown of the difference in grades: Language



Source: Prepared internally with micro data from SERCE.

Graph 6b. Machado–Mata breakdown of the difference in grades: Math



Source: Prepared internally with micro data from SERCE.

VIII. Tables appendix

Table 1. Grades by percentiles in relation to the socioeconomic origin of the children

Competence/services	*Grade percentile*				
	10	25	50	75	99
Language					
1. None	340.3	384.5	431.5	488.8	668.3
2. One	384.5	431.5	486.9	547.3	724.7
3. Both	413.8	459.4	522.1	595.2	786.9
Difference (3)–(1)	73.5	74.9	90.6	106.4	118.6
Math					
1. None	343.5	392.7	434.2	496.9	660.7
2. One	381.7	427.8	482.6	540.8	734.2
3. Both	406.2	459.5	518.3	582.6	787.4
Difference (3)–(1)	62.7	66.8	84.1	85.7	126.7

Source: Prepared internally with data from SERCE.

Table 2. Sixth-grade student descriptions, several countries in ALC

Variable	*Language*			*Math*		
	All	*Poor*	*Nonpoor*	*All*	*Poor*	*Nonpoor*
Poor home	0.344			0.345		
Children characteristics						
Average grade	505.701	486.590	521.140	508.209	481.073	515.054
Age	12.095	12.763	12.326	12.100	12.817	12.348
Boy	0.502	0.468	0.517	0.502	0.467	0.518
Under 12	0.329	0.201	0.213	0.330	0.199	0.213
Repeated course	0.244	0.356	0.249	0.244	0.356	0.250
Works outside home	0.091	0.137	0.094	0.092	0.138	0.095
Works at home	0.311	0.416	0.308	0.312	0.416	0.309
Foreign language	0.016	0.012	0.008	0.016	0.012	0.008
Indigenous language	0.056	0.058	0.013	0.056	0.058	0.013
Education of the mother						
Primary	0.343	0.456	0.355	0.343	0.454	0.355
Secondary	0.385	0.346	0.424	0.385	0.346	0.423
Higher education	0.221	0.102	0.192	0.222	0.101	0.192
Teacher characteristics						
Man	0.295	0.369	0.261	0.295	0.371	0.262
Age	40.880	38.256	40.111	40.876	38.239	40.091
Dedication	0.301	0.172	0.132	0.300	0.171	0.131
Stable in the job	0.837	0.753	0.807	0.839	0.752	0.807
Middle education	0.674	0.658	0.630	0.674	0.662	0.632
Higher education	0.168	0.221	0.267	0.168	0.220	0.267
Public school	0.837	0.706	0.756	0.837	0.708	0.757
GDP per capita	5,898.811	6,016.562	6,359.686	5,880.602	6,009.537	6,356.776
Total observations	44,882	15,422	29,460	44,847	15,458	29,389

Source: Prepared internally with data from SERCE.

Table 3a. Determinants of the performance in Language, sixth-grade students, several countries in ALC

Characteristic/variable	*Group considered in the RP*		
	All	*Poor*	*Nonpoor*
	(1)	(2)	(3)
Poor home	−20.119***		
	(1.759)		
Children characteristics			
Age	−0.665	−0.724	−0.225
	(0.533)	(0.710)	(1.162)
Boy	0.025	−0.803	−0.668
	(1.622)	(3.222)	(2.266)
Under 12	−8.186***	−7.125*	−8.098***
	(1.887)	(3.718)	(2.819)
Repeated course	−14.968***	−9.279**	−18.721***
	(2.081)	(3.776)	(3.167)
Works outside	−16.176***	−5.293	−18.301***
	(2.827)	(5.231)	(4.143)
Works at home	−16.869***	−12.772***	−17.084***
	(1.774)	(3.468)	(2.502)
Speaks foreign language	−22.927***	−1.046	−32.419***
	(5.613)	(9.405)	(8.525)
Speaks indigenous language	−37.888***	−33.219***	−45.868***
	(3.120)	(4.626)	(5.633)
Mother studied primary school	4.742	7.537	0.541
	(3.979)	(5.816)	(7.329)
Mother studied secondary school	9.918**	14.016**	5.354
	(4.068)	(6.214)	(7.340)
Mother with higher education	25.548***	25.583***	21.983***
	(4.283)	(7.096)	(7.530)

Teacher characteristics			
Male	−19.548***	−19.944***	−19.834***
	(1.724)	(3.274)	(2.473)
Age	0.222**	0.280	0.226*
	(0.093)	(0.187)	(0.129)
Dedication	8.759***	9.401**	8.753***
	(2.137)	(4.009)	(3.094)
Has job stability	4.807**	11.088***	0.668
	(2.209)	(4.147)	(3.177)
Middle education	25.823***	23.214***	29.294***
	(1.989)	(3.797)	(2.822)
Higher education	39.482***	37.337***	43.076***
	(2.685)	(5.201)	(3.802)
Other characteristics			
Public management	0.770	−1.220	3.409
	(2.226)	(4.242)	(3.178)
Country GDP	6.075***	8.480***	4.851***
	(0.293)	(0.604)	(0.402)
Arranged	451.444***	405.870***	457.902***
	(9.756)	(15.325)	(18.318)
Pseudo R^2	0.052	0.052	0.032
Observations	44,882	15,422	29,460

Note: Significantly different to zero by: ***1%; **5%; *10%. The standard error of the estimate is in parenthesis; its sign is unknown.
Source: Prepared internally with data from SERCE.

Table 3b. Determinants of the performance in Math, sixth-grade students, several countries in ALC

Characteristic/variable	*Group considered in the RP*		
	All	*Poor*	*Nonpoor*
	(1)	(2)	(3)
Poor home	−19.098***		
	(1.998)		
Children characteristics			
Age	−0.907	0.862**	−3.187***
	(0.637)	(0.434)	(0.912)
Boy	0.368	−2.897	1.248
	(1.840)	(1.870)	(2.162)
Under 12	−2.275	3.053	−6.015**
	(2.167)	(2.177)	(2.587)
Repeated course	−17.186***	−11.065***	−18.094***
	(2.359)	(2.178)	(2.938)
Works outside	−9.157***	−11.216***	−8.729**
	(3.208)	(3.013)	(3.944)
Works at home	−11.309***	−14.803***	−8.799***
	(2.014)	(2.014)	(2.391)
Speaks foreign language	−17.172***	−9.664*	−28.565***
	(6.376)	(5.422)	(8.395)
Speaks indigenous language	−29.348***	−24.335***	−41.433***
	(3.547)	(2.695)	(5.335)
Mother studied primary school	11.180**	11.250***	11.289
	(4.535)	(3.394)	(6.950)
Mother studied secondary school	19.500***	12.071***	23.674***
	(4.639)	(3.621)	(6.961)
Mother with higher education	31.106***	29.367***	33.215***
	(4.913)	(4.182)	(7.144)

Teacher characteristics			
Male	−12.389***	−14.133***	−11.767***
	(1.959)	(1.893)	(2.357)
Age	0.583***	0.816***	0.462***
	(0.106)	(0.107)	(0.124)
Dedication	−1.193	−5.658**	0.084
	(2.435)	(2.337)	(2.938)
Has job stability	−4.626*	−0.147	−7.162**
	(2.508)	(2.399)	(3.036)
Middle education	22.360***	15.444***	25.924***
	(2.259)	(2.208)	(2.701)
Higher education	25.737***	18.875***	27.751***
	(3.051)	(3.024)	(3.632)
Other characteristics			
Public management	11.096***	8.687***	12.391***
	(2.530)	(2.465)	(3.031)
Country GDP	7.324***	8.813***	6.197***
	(0.334)	(0.351)	(0.384)
Arranged	421.535***	370.337***	457.238***
	(11.419)	(9.087)	(15.387)
Pseudo R^2	0.052	0.045	0.037
Observations	44,847	15,458	29,389

Note: Significantly different to zero by ***1%, **5%, and *10%. The standard error of the estimate is in parenthesis; its sign is unknown.
Source: Prepared internally with data from SERCE.

Table 4. Neutrality of the parameters to the position of the student in the distribution of the grades

Parameter	Entire sample		Poor		Non poor	
	Language	Math	Language	Math	Language	Math
Arranged	*Non neutral*	*Non neutral*	*Non neutral*	*Non neutral*	*Non neutral*	*Non neutral*
Poverty sector	Neutral	Neutral	NA	NA	NA	NA
Children characteristics						
Age	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Boy	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Under 12	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Repeated course	Neutral	Neutral	Neutral	Non neutral	Neutral	Neutral
Works outside home	Neutral	Non neutral	Neutral	Neutral	Non neutral	Neutral
Works at home	Neutral	Non neutral	Neutral	Neutral	Non neutral	Neutral
Foreign language	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Indigenous language	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Mother studied primary school	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Mother studied secondary school	Non neutral	Non neutral	Neutral	Neutral	Non neutral	Non neutral
Mother with higher education	*Non neutral*	*Non neutral*	*Non neutral*	*Non neutral*	*Non neutral*	*Non neutral*

Teacher characteristics						
Male teacher	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Age	Neutral	Non neutral	Neutral	Neutral	Neutral	Neutral
Dedication	*Non neutral*	*Non neutral*	*Non neutral*	*Non neutral*	*Non neutral*	*Non neutral*
Stable in the job	Neutral	Neutral	Neutral	Neutral	Neutral	Neutral
Middle education	Neutral	Non neutral	Neutral	Neutral	Neutral	Non neutral
Higher education	Neutral	Neutral	Neutral	Neutral	Non neutral	Neutral
Other characteristics						
Public school	Neutral	Non neutral	Neutral	Neutral	Non neutral	Non neutral
GDP per capita	Neutral	Non neutral	Non neutral	Non neutral	Non neutral	Non neutral
Neutrals proportion	17/21=0.81	11/21=0.52	16/20=0.80	15/20=0.75	11/20=0.55	13/20=0.65
Both competences		28/42 = 0.67		31/40 = 0.78		24/40 = 0.60

Source: Prepared internally with data from SERCE.

Table 5. Blinder–Oaxaca breakdown of the difference in school performance, sixth-grade students

Scores and breakdown	*Language*		*Math*	
Score, nonpoor	521.140 (0.554)		515.054 (0.558)	
Score, poor	486.590 (0.743)		481.073 (0.732)	
Difference	34.550 (0.927)		33.981 (0.921)	
Breakdown				
Opportunities	14.565(0.528)	42.2%	13.550 (0.516)	39.9%
O→R conversion	20.649(0.991)	59.8%	18.662 (0.993)	54.9%
Interaction	−0.664 (0.634)	−1.9%	1.768 (0.643)	5.2%
Total		100.0%		100.0%

Source: Prepared internally with data from SERCE.

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