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Do Interventions at School Level Improve Educational Outcomes? Evidence from a Rural Program in Colombia

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Summary. — This paper evaluates the impact that the "Rural Education Project—PER" had on Colombian rural schools. This supply-side scheme program included the implementation of flexible educational models adapted to the needs of the rural community and the provision of specialized didactic material and teacher training. We find positive and significant effects on measures of efficiency (dropout, passing, and failure rates) and quality in the schools where PER was implemented. The estimation is based on census information comprising more than 21,000 rural schools and is robust to three different methodologies of estimation and different comparison groups.

Key words — South America, Colombia, education, rural, program evaluation

1. INTRODUCTION

Recent studies by FAO and UNESCO (2004a, 2004b) contend that rural zones are an underdeveloped sector inside developing countries. Approximately 75% of the 1.2 billion people who live in abject poverty (receiving less than $1 a day) are rural dwellers. More importantly, it is believed that these people are subject to a poverty trap. Their lack of access to suitable services of education, health, and nutrition does not offer them the necessary conditions to escape poverty. Thus, it is estimated that in 2020, 60% of the poor will continue to be found in rural areas.

Backwardness in the rural areas of developing countries is particularly evident in an analysis of the educational sector. [1] Taking into account the significant effects of education on individual development, programs aimed at improving the education of the rural population become an efficacious tool to reduce the existing gaps and combat poverty and inequality in these zones. [2] Normally, such education programs can be classified into two categories: subsidies to stimulate demand and supply-side interventions. The former are based on providing a certain sum of money to households on the condition that the children attend school. The latter ones, on the other hand, attempt to improve school characteristics through higher spending on inputs such as educational material, teacher training, and infrastructural improvements.

During the past decade large investments in the education sector of developing countries have concentrated in demand subsidies programs minimizing the implementation of supply-side interventions. [3] Such tendency may be explained in part by the strong association found between the socioeconomic characteristics of the students with their school performance, as well as the lack of robust evidence on the effects that school resources and infrastructure have on the main indicators of education. However, recently Banerjee, Cole, Duflo, and Linden (2007) show that supply-side subsidy programs can have significant effects on the academic achievement of students. In a randomized experiment in India, the authors find that supply-side inputs help to correct the poor quality of education, provided that the programs designed for this purpose take into account the specific needs of each group of students they serve. [4]

This article contributes additional evidence suggesting that supply-side intervention programs, specially designed in accordance with the characteristics and needs of the target population, are a viable and successful alternative to reduce educational inequities in the rural areas of developing countries. Specifically, we show that the Rural Education Project (PER), implemented in Colombia since 2002 with the support of the National Government and the World Bank, has had a positive impact on educational efficiency and quality in the country's rural schools. Considering the particular characteristics of rural students, the PER is based on the implementation of flexible educational models with materials and methodologies that are more suited to their needs, replacing traditional educational models designed for urban students. Providing specialized material for rural students' learning needs and a proper training of teachers, by 2006 this project had served more than 435,000 students in nearly 6,500 rural schools in Colombia.

Although previous studies have evaluated the effects of different educational programs this paper contributes to the literature in several respects. First, very few focus on programs specifically directed at the rural sector. [5] Moreover, unlike previous studies, this evaluation uses census information of rural public schools to determine program impact instead of relying on samples of

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control and treatment groups. The availability of measures of educational efficiency and quality, complemented with information on the socioeconomic characteristics of students and the municipalities where they live, allows the construction of a balanced panel of more than 21,000 rural schools for the years between 2000 and 2005, constituting 65% of Colombia's rural schools. In addition, we also have the results of a survey conducted to a random sample of PER schools that permits the identification of the channels through which the program has achieved the improved performance. Finally, it should be further mentioned that this is the first comprehensive program evaluation done to the PER Program.

In order to reduce the possible problems that arise from self-selection of rural schools into the program we evaluate its impact using fixed effects at the school level and difference in difference (DID), DID under common support and DID matching methodologies. The results of the evaluation are robust across the different empirical methodologies and show the beneficial aspects of supply-side intervention programs at school level that take into account the specific needs and conditions of students. The estimations based on DID matching and the complete balanced panel show that the program increased the passing rate by 4.7 percentage points, decreased the failure rate by 1.4 percentage points, and lowered the dropout rate by 3.2 points. No effect on total enrollment is found under any of the three methodologies. The evidence suggests that the program also improved test scores of a standardized exam in the language area. The main findings are maintained when the intervention is divided according to the school level the PER model implemented targeted. Specifically, the results are positive and significant for education models directed to primary and secondary levels which account for almost 80% of all implementations. [6]

Recent evidence from Hiseh and Urquiola (2006) show the important effects that education programs can have in the sorting of students across schools. Even though in principle the positive results found in this paper could be driven by the transfer of students across PER and Non-PER schools, we argue that such a scenario is not likely to have occurred. On the first hand, it should be kept in mind that school transfers in the rural Colombian sector are both difficult and costly. Students in the rural areas do not have the possibility to choose which school to attend and they normally study in the closest or only one available. Moreover, we find no effect of the program on the measures of student enrollment suggesting that a significant transfer did not take place under the period studied. Finally, as robustness check we carried out the three estimation methodologies using alternative control and treatment groups. The results are robust across the different groups and provide evidence in favor of the hypothesis that the positive effect that this supply intervention had was not driven by any sorting of students or self-selection of schools.

The article is divided into eight sections. Section two presents a brief description of the PER, whereas section three introduces the empirical methodology used in the evaluation. Section four describes the data, sections five and six present the results obtained and some robustness checks, while section seven analyzes the PER's pathways of success. Section eight is dedicated to conclusions.

2. THE INSTITUTIONAL ORGANIZATION OF THE RURAL EDUCATION PROJECT

In its original conceptualization, PER hoped to design and implement flexible educational projects in rural schools to achieve four main objectives: (i) increase enrollment rates and quality in the rural areas; (ii) strengthen the management capacity of municipalities and educational institutions in order to identify needs, handle information and engage in planning and evaluation of educational projects; (iii) improve security and co-existence in rural schools; and (iv) assess the issues and problems of rural technical middle school education. The PER's total cost was estimated in US$ 120 million, of which 50% would be supplied by the World Bank and the remainder financed by the Colombian National Government (37%) and the regions where it was implemented (13%).

Each different level of government (national, departmental, and municipal) had a defined role in the planning, implementation, and evaluation of the project. The Municipal Operating Units (UOMs) were set up at the local level, and Departmental Strategic Alliances (AEDs) were created at the departmental level. Finally, the National Coordinating Unit made up of technical personnel from the Ministry of Education (MEN) worked at the national level.

At the beginning of the project, the UOMs, whose members were local officials and members of the education sector, assessed the conditions of rural education in the municipality in order to establish priorities and carefully choose the most needed interventions in their rural schools. Specifically, the UOM could choose among nine different groups of flexible educational models, depending on the needs of the municipality. The models are designed to achieve different goals, such as improving the quality of basic education, expanding preschool enrollment, and helping over aged students to catch up. [7]

Once this first stage was completed, the UOMs designed and presented a project based on the municipality's needs and available educational models to the AED for its evaluation and possible selection. If a given project was chosen, the UOMs would assist the selected school in its implementation and monitoring. Under the program, each rural school that was selected to participate received a basket of goods that according to the model would include educational guides, libraries, laboratory equipment, televisions, videotape players, videos, and desks and chairs for the students. In addition, the school's teachers also received specialized training to implement the chosen model. The PER is designed so that only one implementation per model is needed in each school. This particular characteristic reduces any possible perverse incentive of teachers or school directors to change efficiency measures or to help students in test-scores. [8]

Officials of the municipal and departmental governments and representatives of the region's private sector (business, NGOs, universities, and so forth) comprise the AEDs. These alliances give technical and economic support to ensure the long-term sustainability of PER. In addition, the AEDs determine the goals for each department and pinpoint the most appropriate municipalities to participate in PER. The projects were selected for funding based on educational, socioeconomic, and institutional indicators of the municipality. Specifically, according to the CONPES document 3056 (Departamento Nacional de Planeación, 1999), which approved the government loan to start the project, three basic characteristics at the municipality level were taken into account when evaluating each proposal: illiteracy rate, poverty rate measured by basic unsatisfied needs and the percentage of rural population. Finally, the National Coordinating Unit guided and supported the PER implementation process in the departments. A technical group in the Ministry of Education (MEN) coordinated the training activities and the acqui-