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COMPENSATORY EDUCATION FOR DISADVANTAGED STUDENTS:
EVIDENCE FROM AN IMPACT EVALUATION STUDY IN MEXICO

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Overview

The President of Mexico, Vicente Fox, proclaimed in 2001 that his top education priority was the provision of equal and high quality education to all Mexicans—a sentiment that reaffirmed the commitments of earlier Mexican administrations. But effectively educating all citizens is difficult in a geographically disperse and culturally heterogeneous country such as Mexico. How should Mexico educate the type of students who speak no Spanish, live in villages inaccessible by roads, or come from families that cannot afford school uniforms?

A similar question should concern education policymakers in most poor- and middle-income countries. High-quality basic education is necessary to end the transmission of poverty from one disadvantaged generation to the next. Health and infrastructure improvements can build a framework for every person to live a life free of poverty. But if a country's most disadvantaged students do not receive a good quality education, those students will be largely unable to escape the intractable and abject poverty that characterizes too many disadvantaged communities.

Mexico began to address this challenge as early as 1971 by creating the National Council of Education Promotion (CONAFE), a division of Mexico's Secretariat of Public Education (SEP). CONAFE provides extra resources to schools that enroll disadvantaged students. CONAFE's compensatory education (see Box 1) programs now support more than three million students in pre-primary and primary education, and about one million students in *telesecundaria* education, or secondary education delivered via satellite television to remote schools.

A recent evaluation of the impact of CONAFE's compensatory programs finds that CONAFE is most effective in improving primary school math learning and secondary school Spanish learning. *Telesecundaria* education and bilingual education for indigenous students are both shown to improve student achievement. CONAFE is also shown to lower primary school repetition and failure rates.

CONAFE and the World Bank

The Basic Education Development Program (APL) is in the second phase of a three-phase program that supports implementation of the Government of Mexico's compensatory education program. The Program supports the Government's efforts to raise the level and quality of schooling in Mexico, bringing the country's education indicators substantially closer to the other OECD countries.[1] The program has two main project components. The first improves quality in initial and basic education with financing for (1) expanding and rehabilitating education infrastructure in targeted communities; (2) providing educational materials and equipment for students, teachers and schools; (3) training teachers, supervisors, other administrative staff and other education promoters, including technical assistance and performance incentives for primacy school teachers; (4) support for community or parents associations for school-based management activities, and (5) improving school supervision.

The second component strengthens institutional capacity at the federal and state levels. This second component (1) coordinates national- and state-level evaluation of education outcomes; (2) consolidates the national school mapping system and its use in planning at the state level for basic

education; (3) supports educational research; (4) strengthens the role of the state-level Secretariats of Education to better provide basic education services by reinforcing the capacity of the Secretariats to plan, program, budget, monitor and evaluate service delivery, and (5) encourages education innovation (World Bank 2002).The Program's purpose is to ensure that children ages 0 to 14 in Mexico's most disadvantaged communities will begin and complete basic education. Phase II of the Program supports the most disadvantaged basic education schools in every state of Mexico. Phase II also seeks to consolidate and expand quality improvements and coverage of initial and basic education; to strengthen management of the education systems; to put in operation a competitive fund to support education innovations proposed by the states, and to continue strengthening states' institutional capacity.

Methodology

Prior evaluations imperfectly measured CONAFE's effect because student socio-economic backgrounds differ markedly between CONAFE and non-CONAFE schools. For example, practically all indigenous students attend CONAFE schools, so one cannot determine the effect of CONAFE on indigenous students by looking at only indigenous students—one would have no appropriate group against which to compare those students. Construction of a control group of non-indigenous students, however, is difficult—indigenous students are more disadvantaged than their non-indigenous peers, and indigenous students may lack Spanish as a mother tongue.

Therefore, a model is needed that can use available data on student test scores, CONAFE support, and student background to distinguish the effect of CONAFE on student achievement from the effect of student background – parent

illiteracy, community poverty, isolation from other learning institutions and other sources of disadvantage – on student achievement. Such a model was developed by estimating the probability that the school of a particular student received CONAFE support—a probability that depends on background characteristics of a student's community such as availability of public services, average literacy and average income. Although CONAFE supports a school and not a single student, one can model CONAFE support as a function of both student and community background. The effect of CONAFE, then, is the difference in performance improvement over time between students with similar backgrounds whose schools do and do not receive CONAFE support.

To identify students with similar backgrounds, a propensity score matching algorithm was used that identified comparable CONAFE and non-CONAFE students. Matching is particularly appropriate to evaluate programs where (a) some individuals received an experimental treatment, (b) selection of participants for treatment was non-random and based on background features of each individual, (c) few individuals in the non-experimental group had similar characteristics to

observations in the experimental group, and (d) selecting comparable experimental and non-experimental observations is difficult due to the high number of background features needed to determine comparability (Dehejia and Wahba 2002). CONAFE's support is nonrandom and based on complex background characteristics of students and schools, so evaluation of CONAFE is a good case for matching evaluation.

An unbiased propensity score match would use sufficient background information of students to ensure that the assignment of CONAFE support among students with equal propensity scores is purely random. Unfortunately, limited background data available to do this match suggests that negative score bias towards CONAFE students remains in this methodology, meaning that CONAFE students must overcome extra obstacles to show the same achievement as non-CONAFE students. A propensity score is the probability, given a school's background, that the school receives CONAFE support. A score could more simply be interpreted as the correspondence of a school's background with the profile of a typical CONAFE school.
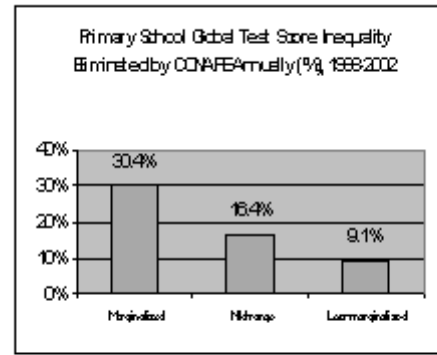
General Findings

CONAFE's compensatory programs seek to support the most disadvantaged schools in all Mexican states. CONAFE appears to be highly effective in this targeting, as CONAFE includes the most disadvantaged schools and nearly all indigenous schools. CONAFE support is relatively static, as 70% of schools in the five-year sample received support for all five years of the sample. But background indicators show that CONAFE has given the most years of support to the most disadvantaged communities. The communities in which CONAFE schools are located have significantly lower levels of literacy, access to public services, and industrial development than do the communities of non-CONAFE schools. Furthermore, CONAFE's coverage of every Mexican state has not diluted CONAFE's targeting mechanism. The portion of schools that receive CONAFE support varies significantly by state and correlates strongly with poverty and presence of indigenous communities in each state.

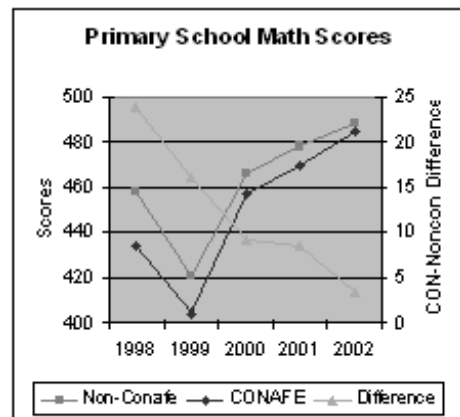**CONAFE Increased Primary School Test Scores and Decreased Inequality**

Composite Spanish and math scores of CONAFE students increased significantly over the sample period for all three disadvantaged groups (See Figures 1 and 2). In each group, CONAFE students gained on non-CONAFE students by 2.4 to 4.3 points per year in a math-Spanish composite score. Bias of methodology used in this analysis understates CONAFE's positive effect, so these numbers are the minimum positive effect attributable to CONAFE. CONAFE also decreased test score inequality between CONAFE and non-CONAFE students by 9% for the less-disadvantaged group and by 30% for the disadvantaged group. These results are particularly encouraging, as they show that CONAFE is most effective in eliminating learning inequality for students

Figure 1

Primary School Global Test Score Inequality Eliminated by CONAFE Annually (%), 1998-2002

Inequality is average score difference between CONAFE and non-CONAFE students over the 1998-2002 period.

Figure 2

Primary School Math Scores

Source: Estándares Nacionales 1998-2002

with the most disadvantaged backgrounds. In all three groups, however, CONAFE was slower to close the Spanish test score gap than to close the math test score gap. Though CONAFE's Spanish and math programs both improve student learning, it appears that CONAFE's math program may be more effective than CONAFE's Spanish program is. This difference in math and Spanish performance exists even when controlling for the presence of indigenous students.
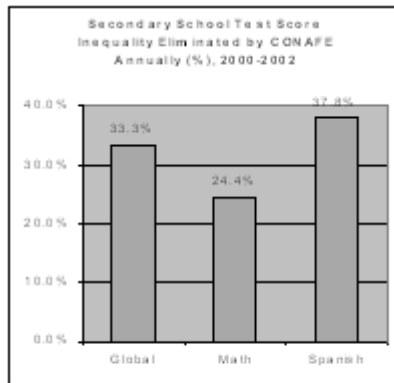
CONAFE Improves Indigenous Student Primary School Performance

Indigenous student exam performance rapidly increased over the sample period by an annual average of 27 points on math exams and 12 points on Spanish exams. CONAFE's instruction decreased the gap in math scores between comparable CONAFE and non-CONAFE students by 5 points annually. That annual 5 point increase is the minimum effect attributable to CONAFE. Since nearly every indigenous student receives CONAFE support, construction of an appropriate control group against which to compare indigenous students is difficult. Perhaps because the control group against which indigenous students were compared had a very different background than the typical indigenous student has, this analysis found no significant effect of CONAFE on indigenous Spanish scores.

CONAFE Improves Secondary School Math and Spanish Learning

Spanish and math scores of telesecundaria students rapidly

Figure 3

Source: Estandardes Nacionales 2000-2002. Inequality is average score difference between *telesecundaria* and non-*telesecundaria* students over the 2000-2002 period. This graph represents findings for the less-disadvantaged group.

increased over the sample period from a composite average of 499 points in 2000 to a composite average of 540 points in 2002 (See Figure 3). Furthermore, telesecundaria education caused much of this increase. Over the sample period for the less-disadvantaged group, telesecundaria education eliminated 24% of math score inequality and 38% of math score inequality between telesecundaria and non-telesecundaria students, controlling for variation in student background. This analysis defined inequality as the average test score difference between the telesecundaria experimental group and the non-telesecundaria control group. It appears that telesecundaria education is more effective for Spanish instruction than for math instruction, which is particularly interesting given that CONAFE's primary school programs appeared to be more effective for math than for Spanish instruction.

Conclusions

Overall, CONAFE's compensatory programs are effective and well-targeted. At the primary and secondary levels, CONAFE significantly improved student exam performance and decreased inequality between CONAFE and non-CONAFE students. These results were robust even when controlling for relevant background variables. CONAFE appears to be more effective in math instruction at the primary and in Spanish instruction at the *telesecundaria* level. Generally, this analysis shows that the World Bank is achieving its goal of improving and expanding educational quality in Mexico through its support of CONAFE's compensatory programs.

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Notes

[1] Mexico, the world's ninth largest economy, is a member of the Organisation for Economic Cooperation and Development (OECD).

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