

EMPOWERING PARENTS TO IMPROVE EDUCATION: EVIDENCE FROM RURAL MEXICO

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Mexico's compensatory education program provides extra resources to primary schools that enroll disadvantaged students in highly disadvantaged rural communities. One of the most important components of the program is the school-based management intervention known as AGEs (Apoyo a la Gestión Escolar or School Management Support). The impact of the AGEs is assessed on intermediate school quality indicators (failure, repetition and dropout), controlling for the presence of other programs, including the conditional cash transfer program Oportunidades. Results prove that school-based management is an effective measure for improving outcomes, based on an over time difference-in-difference evaluation. Complementary qualitative evidence corroborates the veracity of such findings.

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1 Introduction

Starting in the United States, the United Kingdom, Australia and Canada, the decentralization of administrative responsibilities and levels of authority to the school level is a form of educational reform that has been gaining increasing support in developing countries. School-based management (SBM) programs – also known as school autonomy reform programs or school improvement programs – are currently being implemented in a number of countries, including Hong Kong (China), Indonesia, El Salvador, Nicaragua, Kenya, Kyrgyz Republic, Nepal, Paraguay and Mexico. They consist in shifting responsibility and decision-making to school actors: principals, teachers, parents, sometimes even students, and possibly other school community members (school councils).

The usual argument supporting the implementation of SBM programs is that they may be a low cost way of improving the efficiency of public spending on education to improve learning outcomes. The argument is analogous to the basic ideas favoring the decentralization of public services. Decentralization provides a more efficient and better tailored delivery of services given that it minimizes information asymmetries concerning tastes, improves the incentives scheme to provide the good, and reduces the top-down decision-making structure, thus increasing political accountability. Similarly, SBM initiatives give power to the end users of the service. This “voice” of the local agents creates a “pressure” to influence and alter school management and change the form of decision-making to favor students. This eventually leads to a better and more conducive learning environment for the students and improves learning outcomes.

Analogically, empowerment of the local agents might entail the same deficiencies in service delivery as those associated with the decentralization of public services: degradation in service provision. Resources might be misallocated given the increased scope for capture of resources by the local agents, or because they lack the technical abilities to provide the service or fail to internalize the positive externalities derived from its provision (Galiani et al 2005). It is thus crucial for the government to design incentive systems that will minimize the potential for conflicting interests and opportunistic behavior once decentralization is in place. This is why SBM programs empower school-level actors conditional upon conformance to a set of centrally determined operational policies. Moreover, there is substantial variation across interventions both in terms of the identity of the empowered agents and the level of shifted responsibility.

In 1992, the Mexican Government began a process of decentralization of educational services from the federal to the state level, the “National Agreement for the Modernization of Basic Education”. A number of reform measures at the central and state levels were implemented. Among others, these included the advancement of legally supported parental participation in schools and the development of innovative supply-side interventions to promote education. Some of these initiatives, like the Quality Schools Program (*Programa Escuelas de Calidad*, PEC) launched in 2001, started as pure SBM interventions. Others, like the Compensatory Education Program –initiated in 1992, combined a SBM component with other more common input provision interventions. The SBM component of the Compensatory Education Program –the Support to School Management (*Apoyo a la Gestión Escolar*) or AGEs, started only in 1996 and consists of monetary support and training (*Capacitación a la Gestión Escolar*, CAPAGES) to Parent Associations (*Asociaciones de Padres de Familia*, APFs). The APF can spend the money on the educational purpose of their choosing although spending is limited to small civil works and infrastructure improvements. Despite being a limited version of SBM, the AGEs represent a significant advance in the Mexican education system, where parent associations have tended to play a minor role in school decision-making. AGEs increase school autonomy through improved mechanisms for participation of directors, teachers and parents’ associations in the management of the schools. In 2005 more than 45 percent of primary schools in Mexico had an AGE.

In this paper, we examine the impacts of the AGEs on intermediate school quality indicators (grade failure, grade repetition and intra-year dropout) on the sample of rural general primary schools that received AGEs support from 1998 onwards. These schools are located in highly disadvantaged areas and present educational outcomes below the national average. We exploit the gradual phasing-in of the AGEs intervention over time to identify difference-in-difference average treatment estimate effects. Results prove that the AGEs are an effective measure for improving outcomes, grade failure and grade repetition in particular, even after controlling for the presence of other educational interventions. Qualitative work consisting of discussions with parents, teachers and school directors in beneficiary and non-beneficiary schools corroborate the quantitative findings. Furthermore, this piece of evidence from the field suggests that SBM interventions in general, and the AGEs in particular, are likely to affect student learning through increasing parental participation and say in school decisions, and thus favoring communication amongst educators (parents, teachers and principals) and a more conducive learning environment.

The remainder of the paper is organized as follows. The next section reviews the existing literature on SBM. Section 3 describes the Mexican Compensatory Program and its SBM component, the AGEs, in greater detail. In Section 4 we discuss the data and present the identification strategy used. Results and a discussion of potential biases are provided in sections 5 and 6. Section 7 provides a summary of the qualitative interviews assessment. Finally, section 8 concludes.

2. School-Based Management (SBM): A Deeper Look

SBM is the decentralization of levels of authority to the school level. Responsibility and decision-making over school operations is transferred to school-level actors, which in turn have to conform to, or operate within a set of centrally determined policies. SBM programs can take on many different forms, both in terms of who has the power to make decisions as well as the degree of decision-making devolved to the school level. While some programs transfer authority to principals or teachers only, others encourage or mandate parental and community participation, often in school committees (sometimes known as school councils). In general, SBM programs transfer authority over one or more of the following activities: budget allocation, hiring and firing teachers and other school staff, curriculum development, textbook and other educational material procurement, infrastructure improvement, setting the school calendar to better meet the specific needs of the local community, and monitoring and evaluation of teacher performance and student learning outcomes. SBM also includes school-development plans, school grants, and sometimes information dissemination of results (otherwise known as “report cards”).

The goals of programs vary, though they typically involve: (i) increasing the participation of parents and communities in schools, (ii) empowering principals and teachers, (iii) building local level capacity, and, perhaps most importantly, (iv) improving quality and efficiency of schooling, thus raising student achievement levels. Advocates of SBM assert that it should improve educational outcomes for a number of reasons. First, it improves accountability of principals and teachers to students, parents and teachers. Accountability mechanisms that put people at the center of service provision can go a long way in making services work and improving outcomes by facilitating participation in service delivery. Second, it allows local decision-makers to determine the appropriate mix of inputs and education policies adapted to local realities and needs.

The implied benefits of such a system are tremendous with only marginal costs. Among the benefits are included: increased resources from parents, such as time and in-kind contributions; more effective use of resources since the site-based actors know more about where the real need of resources is; higher school “quality” as a result of the previous; a more welcoming school climate since most of the community is involved in management; and increased performance of the students in the form of reduced repetition and drop out rates and eventually improved learning outcomes. The supposed costs are: payments for school committees’ time (sometimes); extra resources to be managed at the school level, which also creates extra work burden for teachers and principals; and parents’ and teachers’ time for administration. Note that the extra time devoted to school matters might be a significant cost for low-income parents likely to have to forego some wage-earning work time to be involved in school committees.

There are a variety of programs under the rubric of SBM, and the literature is voluminous. Yet rigorous impact evaluations are rare. Summers and Johnson (1994) review the evidence on the effects of SBM in the United States. In developing countries, evaluations of SBM programs offer mixed evidence of impacts. El Salvador’s EDUCO (*Educación con participación de la comunidad*) program gives parent associations the responsibility for hiring, monitoring and dismissing teachers. In addition, the parents are also trained in school management, as well as on how to help their children with school work. Despite rapid expansion of EDUCO schools, education quality was comparable to traditional schools. In fact, parental participation was considered the principal reason for EDUCO’s success (Jimenez and Sawada 1999, 2003). Nicaragua’s Autonomous School Program gives school-site councils –comprised of teachers, students and a voting majority of parents– authority to determine how 100 percent of school resources are allocated and to hire and fire principals, a privilege that few other school councils in Latin America enjoy. Two evaluations found that the number of decisions made at the school level contributed to better test scores (King and Ozler 1998; Ozler 2001).

In the case of Mexico, only one evaluation exists on the urban pilot of the PEC (Quality Schools Program) intervention. Using a panel of 74,700 schools and propensity score matching to create a control group, Shapiro and Skoufias (2005) used difference-in-differences models to estimate the impact of PEC on dropout, repetition and failure rates. They found that participation in PEC significantly decreases dropout rates by 0.22 percentage points, failure rates by 0.20 percentage points and repetition rates by 0.28 percentage points. These estimated impacts were

not sensitive to whether participation in PEC was measured as receiving PEC grants for all or for any one of the three school years covered by the study.

3. **The Mexican Compensatory Programs and the AGEs**

In the early 1990s the National Council of Education Promotion (*Consejo Nacional de Fomento Educativo*, CONAFE), a division of the Mexican Secretariat of Public Education (*Secretaría de Educación Pública*, SEP) started to implement the Compensatory Programs on behalf of SEP.¹ The Compensatory Programs aim to increase the supply and improve the quality of education in schools with the lowest educational performance levels in highly disadvantaged communities. The intervention channels extra monetary and in-kind resources to the state governments. It now serves about five million students in initial, preschool and primary education, and about 300,000 students in *telesecundaria* education (lower secondary schooling imparted by satellite and television), in 29,534 schools in marginalized rural and urban areas in all 31 states in Mexico.

Since its beginning, CONAFE has received substantial funding from international agencies to help finance the compensatory program. The World Bank's Basic Education Development Loan (PAREIB, 1998-2006) provides a nominal total of \$625 million to support the intervention. Previously, the World Bank had already operated several similar loans between 1991 and 1998 and the Inter-American Development Bank had operated the PIARE intervention (1995-2000). These loans provided a nominal total of nearly \$2 billion dollars between 1991 and 2003². CONAFE's real costs, despite having grown in the last decade, now are just over \$50 per student per year on average, an extremely low cost compared to a typical cost of \$527 per *telesecundaria* student and \$477 per general middle school student (Shapiro and Trevino 2004).

3.1 **Evolution of the Compensatory Programs: Targeting and Phasing-in**

Since their start in 1991, the Compensatory Programs have substantially expanded both to new geographical areas and to new school levels. From 1991 to 1996, the Program to Abate Educational Lag (*Programa para Abatir el Rezago Educativo*, PARE) operated exclusively in all indigenous and general primary schools in rural localities in the four states with the highest incidence of poverty: Oaxaca, Guerrero, Chiapas and Hidalgo. In 1993, the Program to Abate

¹ CONAFE also operates a community education program that leads instruction in highly isolated areas with very few children in school age. Since we only examine CONAFE's Compensatory Programs, subsequent mention of CONAFE will exclusively refer to this intervention unless otherwise noted.

² Costs are expressed in 2002 US dollars, using an exchange rate of 9.74 Mexican pesos to the dollar.

Basic Education Lag (*Programa para Abatir el Rezago en Educación Básica*, PAREB) included all general and indigenous primary schools in the poorest and educationally worst performing municipalities in the next ten poorest states, according to the National Council Population's (*Consejo Nacional de Población*, CONAPO) marginality index. Simultaneously, the Project for the Development of Initial Education (*Proyecto para el Desarrollo de la Educación Inicial*, PRODEL) started to support initial education in the 14 states attended by PAREB.

In 1995 the Integrated Program to Abate Educational Lag (*Programa Integral para Abatir el Rezago Educativo*, PIARE) consolidated the actions enhanced by the previous Compensatory Programs. It extended coverage to all indigenous primary schools and general primary schools with first year repetition rates above the state average in the next nine poorest states. In 1998, the PIARE was extended to the eight remaining Mexican states (PIARE-8). Worst performing schools in the PIARE-8 states were selected according to a targeting index constructed by CONAFE on the basis of: (i) CONAPO's community marginality index; (ii) teacher-student ratios; (iii) the number of students per school; and (iv) educational outcomes. All general primary schools falling in the third and fourth quartiles of the targeting index were selected as beneficiary schools. As in previous stages, all indigenous primary schools were automatically attended.

Finally, in 1998 and in order to integrate all previous Compensatory Programs and to provide integrated and continuous educational support to all children ages 0 to 14, the Program to Abate Educational Lag in Initial and Basic Education (*Programa para Abatir el Rezago Educativo en Educación Inicial y Básica*, PAREIB) was established. PAREIB targets for the first time pre-schools, general and technical junior high schools, and *telesecundarias*. It also extended its coverage to marginalized semi-urban and urban areas. General primary schools were targeted using the same criteria applied to target PIARE-8 schools. These were also extended to pre-school and junior high schools.³ Schools offering any form of indigenous or community education were automatically targeted. The PAREIB is the only Compensatory Education Program currently functioning.

3.2 Components of the Compensatory Programs

The supports the Compensatory Programs provide have varied substantially across school types and along the different program phases. Moreover, the final decision to allocate resources

³ Section 4.2 further details the targeting methodology applied to select beneficiary schools.

depends on the state government and is based on the school needs and on the availability of resources in each state. As a consequence, there is a substantial variation in the type, number and timing of the interventions each attended school receives.

In the school year 1996-97, the number of interventions was reorganized and reduced to the following: (i) improvement of existing and/or building of school infrastructure facilities (classrooms, workshop areas, labs, latrines, etc); (ii) provision of school equipment and updated audiovisual technology (computers, sound system, TVs, etc); (iii) provision of learning and other didactic materials for each student (notebooks, pens and other supplies); (iv) pedagogical training for teachers, institutional strengthening, and incentives to monitors (school supervisors); and (v) performance based monetary incentives to teachers in multiple grade schools and in schools with more than six teachers. In indigenous schools, CONAFE additionally supports the development of curricula, didactic materials and textbooks for bilingual education, and the development of intercultural education.

It was also in school year 1996-97 that CONAFE introduced its school management component, the so-called AGEs and primarily focus of this study. The AGEs financial support consists of quarterly transfers to APF school accounts, varying from \$500 to \$700 per year according to the size of the school. The use of funds is specified in the Operational Manual of the project and is subject to annual financial audits for a random sample of schools. Amongst other things, the parents are not allowed to spend money on wages and salaries for teachers. Most of the money goes to infrastructure improvements and small civil works. The intervention was complemented, starting in 2003, with a training component (CAPAGEs) aimed at guiding parents in the management of the school funds transferred through the AGEs. The CAPAGEs also provides parents with participatory skills to increase their involvement in school activities, and with information on achievement of students and ways in which parents can help improve their learning.⁴

3.3 Existing Evidence on the Impact of Compensatory Education

Results from previous Government supported evaluations show a significant impact of CONAFE in lowering the probability that school average repetition rates increase between 1998-

⁴ The AGEs component does not operate in *telesecundarias*. Although CONAFE is supposed to provide audiovisual materials and infrastructure improvements to all *telesecundaria* schools; in practice, the intervention has so far been limited to the delivery of one or two computers per intervened *telesecundaria*.

99 and 2001-02 in rural primary schools (Benemérita Universidad Autónoma de Puebla 2004). External evaluations show significant increases in Spanish test scores for indigenous students (López-Acevedo 2002). The author compares CONAFE (PARE) -supported schools between the school years 1992-93 and 1994-95 with comparable schools in the state of Michoacán that were not receiving the support. The evaluation concluded that the PARE program could result in increases of 45 to 90 percent on indigenous student performance, and of the order of 19 to 38 percent on aggregate rural school performance. A complementary evaluation by Paqueo and López-Acevedo (2003) used the same methodology to study the differential effects of CONAFE's PARE intervention on sixth graders' Spanish test scores between the poorest and the least poor children in indigenous and rural schools. The authors found that the poorest students benefited less from the intervention than the not so poor students. These findings raise the question of whether the very poor are able to fully take advantage of new opportunities in the form of school quality improvements as their ability might be compromised by malnutrition and lack of brain stimulation at early life stages.

More recently, Shapiro and Moreno (2004) conducted an impact evaluation of the PAREIB intervention on Spanish and math test scores at both the primary and junior-high school levels. Using propensity score matching techniques on student background data, the authors find that CONAFE is effective in improving primary school math learning and junior-high school Spanish learning. CONAFE also seems to lower primary school repetition and failure rates.

Evaluations of specific components of the Compensatory Program do not yet exist.⁵ This paper, while contributing to the nascent literature on the effects of SBM, also fills the existing gap in the evaluation of CONAFE's Compensatory Programs.

4. Estimation and Identification

Our objective is to estimate the impacts the AGEs on intermediate indicators of student performance and school quality; namely failure, repetition and intra-year drop out rates.⁶ We

⁵ In a previous study on the joint evaluation of the impacts of the Compensatory Programs (supply-sided intervention) and the *Oportunidades* scholarships (demand-sided intervention) on schooling outcomes, (Gertler et al 2006), we decomposed the CONAFE implemented intervention in its different components. Our findings motivated this piece of research.

⁶ Ideally, we would like to use test score data as a more direct measure of student performance. Unfortunately, because standardized national assessments were only collected on a sample representative of all schools (from all geographical and social strata) in Mexico, we had too little power to identify effects on test scores.

specifically focus on the impact of the AGEs support between 1998 and 2001. These years correspond to stages PIARE-8 and PAREIB (Phase I) of the CONAFE intervention. Section 4.1 lays out the econometric specification; section 4.2 describes the data; in section 4.3, we validate identification.

4.1 Econometric Specification

Let us assume that the probability that student i in school s at time t attains educational outcome $Y_{ist}=Y$ is a function of: the presence of the AGEs support in the school in the previous school year, $AGES_{s,t-1} = \{0,1\}$; given her vector of j individual characteristics, I_{isjt} , such as family background, ability and skills; and the k -th vector of school characteristics, X_{skt} , that includes school quality. More formally,

$$pr(Y_{ist} = Y) = f(AGES_{s,t-1}; I_{isjt}, X_{skt}) \quad (1)$$

We consider three educational outcomes: the probability that the student fails an exam, repeats a grade or drops out of school. Since we do not have individual student performance data, we are not able to estimate (1) directly. However, assuming that $f(\cdot)$ is a linear function, we can obtain the average rate of success/failure at the school level by adding up the student individual probabilities by school and normalizing them by the number of students in each school, N_{st} . Then, equation (1) re-writes:

$$pr(\bar{Y}_{st}) = f(AGES_{s,t-1}, \bar{I}_{sjt}, X_{skt}) \quad (2)$$

where $\bar{Y}_{st} = \frac{1}{N_{st}} \sum_{i=1}^N Y_{ist}$ represents the school s average failure, repetition or dropout rate at time t ;

and $\bar{I}_{sjt} = \frac{1}{N_{st}} \sum_{i=1}^N I_{isjt}$, the vector of the j school-averaged student characteristics.

From (2), we estimate the following reduced form for all $t=1997-2001$:⁷

$$Y_{st} = \alpha_s + \eta_t + \xi_{lt} + \sum_t \pi_{1t} trend * POTAGES_s + \beta_1 AGES_{s,t-1} + \sum_{k=2}^K \beta_k X_{skt} + \bar{\varepsilon}_{st} \quad (3)$$

where α_s and η_t are school and time fixed effects; ξ_{lt} are state specific time dummies introduced to capture state specific aggregate time effects (demographic trends or changes in government, for example) correlated with schooling outcomes. $POTAGES_s$ is a dichotomous variable equal to 1 if the school s is a potential treatment school; this is to say, if s will receive the

⁷ We take school year 1997-98 as the baseline year. Evaluation years are from 1998-99 to 2001-02.

AGEs support ($POTAGE_{s,t} = 1$) for some (or all) of the treatment years ($t = 1998-2001$). Thus, the term $trend * POTAGE_{s,t}$ is the time trend specific to potential AGEs-treatment schools, and attempts to control for the different evolutions that schools that receive and that do not receive AGEs might have experienced over time. $X_{s,kt}$ is the vector of time varying school characteristics. It includes the school student-to-teacher ratio and the average number of students per class (crowding index).⁸ In additional runs we will also control for the presence of other demand-side- and supply-side-oriented educational interventions, such as *Oportunidades* and *Carrera Magisteral*, as will be described in section 6.2. $\bar{\varepsilon}_{st} = \frac{1}{N_{st}} \sum_{i=1}^{N_{st}} \varepsilon_{ist}$ is the school averaged individual error terms that includes all the unobserved individual characteristics (learning ability, disutility from studying, etc.) that we assume uncorrelated with the explanatory variables for the time being.⁹ We compute robust standard errors clustered at the school level to correct for heteroskedasticity and serial correlation. Because of the inclusion of school fixed effects, all time invariant school observed and unobserved characteristics that could be correlated with both school outcomes and program placement are controlled for.

The dummy $AGE_{s,t-1}$ takes on the value of one if the school has received the AGEs support during school year $t-1$. Then, $\hat{\beta}_1$ is the difference-in-difference estimate of the one period lagged effect of the presence of AGEs in the school on educational outcomes. More specifically, it measures changes in school-averaged student performance trends between early intervened schools (treatment schools) and latter intervened or not yet intervened schools (comparison schools). Note that the specification assumes that the AGEs support requires at least a full school year to be effective. Thus, we take educational outcomes at the end of the school year (at t) and run them as a function of the presence of AGEs in the school for the entire school year; this is to say, starting at $t-1$. In a second specification, we will decompose the $AGE_{s,t-1}$ dummy by a set of dummies that will take on the value of one if the school has received AGEs for a specific amount of time at t (one year, more than one year, etc). This will answer whether the impact of the AGEs on outcomes cumulates over time.

⁸ We have replaced missing values for school regressors with the time specific municipality average (or state average in its default). We have included indicator variables to account for the replacement.

⁹ The intervention might alter the number of kids enrolling in school. If as a consequence the distribution of students' skills changes in treatment schools (with respect to comparison schools), then the estimated impact can be biased. We will explore the existence of this bias in section 6.3. Also, because of the lack of data on individual students' characteristics, we include the characteristics of the average student in the school $\bar{I}_{s,t}$ in the error term.

4.2 Data Sources and Sample Sizes

We use administrative data on CONAFE coverage from 1991 to 2003 to identify AGEs beneficiary schools and schools receiving any of the other CONAFE supported interventions. We use data from the Mexican School Census (*Censo Escolar*), an annual listing of background and outcome data for all schools in Mexico, to measure failure, repetition and intra-year drop out. Data on the number of *Oportunidades* beneficiary students in each school comes from administrative *Oportunidades* coverage data from 1997 to 2003. We also take advantage of the Mexico's 1990 and 2000 Population Census and the 1995 *Conteo* to construct socioeconomic locality indicators that will help identify the evaluation sub-sample. All data sources are combined using unique school and locality identifier codes.¹⁰

This study concentrates on the impact of AGEs in schools intervened between 1998 and 2001 which correspond to the PIARE-8 and the first years of the PAREIB Compensatory Programs. Although the AGEs intervention started in 1996, we concentrate on this reduced sample of schools as this maximizes the chances to identify a valid comparison group for two reasons. First, the majority of worse performing schools in more disadvantaged areas were phased-in within the first two years of AGEs activities, which reduces the likelihood of finding comparable schools significantly. Second, in stages PIARE-8 and PAREIB, schools were phased-in the Compensatory Programs in accordance with a well-defined targeting criteria (the 2000 targeting index). This index, which will exploit to identify comparison schools, is different to the criteria used to phase-in schools at earlier stages of the program.

Therefore, we define the set of AGEs treatment schools as the set of schools that started receiving the AGEs monetary support in the beginning of any school year between the school years 1998-99 and 2001-02, and that received it continuously ever since. The comparison group consists of those schools that started receiving the AGEs allowance from school year 2002-03 onwards. In some cases and because we only have coverage data until school year 2003-04 some of the schools included in the comparison group might not have yet received treatment. Ideally, this group of comparison schools would only differ from the group of treatment schools in their treatment status. However, given CONAFE's phasing-in criteria (CONAFE targeted indigenous schools, and schools in poorer and higher marginalized areas first), this is unlikely to be the case

¹⁰ For a non-negligible number of localities, locality and municipality codes as registered in the Population Census have changed over time. This prevents following these localities over time. To construct locality level indicators, we take the 2000 Census as the reference year and keep only those localities whose identifying codes have remained the same.

and less so if indigenous areas are systematically different from non-indigenous (Ramirez 2006). In order to achieve well-balanced (comparable) samples, we restrict our study to the balanced panel of 6,038 rural non-indigenous primary schools that we observe continuously between 1995 and 2003.¹¹ Out of these, 2,580 (42.7 percent) are AGEs beneficiary schools, and the remaining 3,458 (57.3 percent) are non-AGEs beneficiary schools. For all these schools we know the value of the targeting index computed by CONAFE in 2000.

The 2000 targeting index was constructed as a tool to target worst performing schools in less marginalized states during the phases II and III of the PAREIB. It used 2000 Census data on localities and School Census data for the school year 1999-00 on school characteristics (student density, student teacher ratio, etc.) and educational outcomes (failure, repetition and school drop out).¹² The targeting rule applied implied that (i) all rural schools in highly marginalized areas; and (ii) all schools falling in the third and fourth quartiles of the targeting index distribution in less marginalized areas would be selected as CONAFE beneficiaries starting in 2001. As in previous stages of the program, all indigenous primary schools were automatically attended. We basically exploit the index as a way of testing for balance between the constructed treatment and comparison groups of schools: schools with similar targeting indexes are likely to have similar values of the variables used in its construction. Hence, they are likely to be in similar environments and have similar educational outcomes and performance. Figure 1 shows that the index distributions for treatment and comparison schools overlap over the entire support.¹³

In an attempt to both find a better balanced sample and test the robustness of our results, we re-estimate all equations on the sub-sample of rural non-indigenous primary schools that we observe continuously between 1995 and 2003, and *with a targeting index that falls in quartiles three and four of the CONAFE 2000 targeting index*. Because comparison schools that fall in these two top quartiles comply with the PAREIB targeting criteria and will surely receive

¹¹ To allow comparison across outcomes, we restrict the analysis sample to those schools with non-missing observations for any of the dependent variables under study. Results are robust to the inclusion/exclusion of schools with missing information for one or more of the outcomes. We have also dropped those schools with extremely high numbers of students and/or teachers (top 0.5 percent of each distribution).

¹² See CONAFE (2000) for more details on the weighting of variables and construction of the targeting index. A previous index that used 1995 data was constructed to target PIARE-8 schools and PAREIB schools Phase I. Unfortunately, this index was only available for urban schools.

¹³ At first, it might seem surprising the fact that the distribution of treatment schools (targeted at earlier stages because of larger index values; i.e., lower efficiency levels) is more to the left than the distribution of control schools. Recall that this index was computed when most treatment schools had already been under treatment for a year or two, and therefore had had time to improve their educational outcomes with respect to control schools.

CONAFE benefits at a later date, they are more likely to constitute a better comparison group. A total of 4,132 non-indigenous rural primary schools have values of the targeting index in quartiles three and four of the targeting index distribution. 1,825 (44.17 percent) of them are AGEs treatment schools. Henceforth we will refer to this sub-sample of schools as the “Q34” sub-sample.

Table 1 shows sample sizes, means and standard deviations for a few school observable characteristics and for the dependent variables in 1997 (baseline) for AGEs treatment and AGEs comparison schools in both the entire and the Q34 sub-samples. Summary statistics on the intensity of the different education interventions across treatment years are also shown. We also report the test of difference in means across treatment and comparison schools. AGEs treatment schools are significantly smaller on average: they have less students (89 versus 164 in comparison schools on average), less teachers (between 3 and 4 in treatment schools versus 6 in comparison schools), and a smaller number of classrooms in use (6 versus 7). All these differences are statistically significant. Average grade failure at baseline is 10 percent in both types of schools. On the other hand, average grade repetition at baseline is significantly larger in AGEs treatment schools (9.6 versus 9.2 in comparison schools), which indicates that treatment schools were performing worse prior to the intervention. Average intra-year drop out at baseline is 0.4 points lower in treatment schools (3.8 percent in treatment schools versus 4.2 percent in control schools). This difference is highly significant and might reflect a higher mobility and school turnover in larger towns, where schools are less likely to receive AGEs earlier. Over the intervention period, schools in the comparison group have a significantly larger proportion of teachers in *Carrera Magisterial* but a significantly lower share of *Oportunidades* students. This is suggestive of a relatively high degree of overlap between CONAFE and *Oportunidades*, which is not surprising given that both interventions are targeting schools and populations in highly disadvantaged areas. Moreover, schools that do not receive AGEs are significantly less likely to receive any of the other CONAFE supported interventions. This suggests a high prevalence of AGEs support amongst CONAFE schools.

Table 2 provides similar descriptive statistics for schools both in the entire and in the Q34 sub-samples but compares schools that start receiving the AGEs support in different school years. The first column contains information on schools in the comparison group. Each additional column contains information on schools folded into the program in subsequent years, from school year 1998-99 to school year 2001-02. Note that larger schools are progressively incorporated into

the program through out time. It also seems that schools with larger failure and repetition rates are progressively being incorporated. Indeed, schools phased-in in the last treatment period considered (school year 2001-02) have larger failure and repetition rates than comparison schools, which were phased-in from school year 2002-03 onwards.

4.3 Sources of Variation and Balance in Pre-Intervention Trends

We rely on the phasing in of schools into treatment over time to generate sufficient variation in the treatment variable to achieve identification. Table 2 shows the number of schools that started receiving the AGEs support in each school year from school year 1998-99 to school year 2001-02. As noted earlier, we define the set of comparison schools as the set of schools that start receiving benefits at a later date, from school year 2002-03 onwards. However, the existence of a control group does not imply its validity. Given the non-experimental nature of our data, it might be the case that schools with the strongest (weakest) potential for improvement have been incorporated at earlier stages. Then, our estimates would overestimate (underestimate) the true program effects. Unbiased identification of the difference-in-difference estimates in this setting heavily hinges on the fact that post-intervention trends between intervened and non-intervened schools would have been identical in the absence of the intervention:

$$E[Y_{1t} - Y_{1,t-1} | T = 0] = E[Y_{0t} - Y_{0,t-1} | T = 0] \quad (4)$$

Assumption (4) is impossible to test as the counterfactual is never observed. We can nonetheless test whether pre-intervention trends of the educational outcomes under study were similar between the treatment group and the proposed comparison group. If pre-intervention trends (at $t' < t$) for the outcome measures were not significantly different between treatment and comparison schools, there is no reason to believe they would be significantly different in the post intervention periods (t) were the interventions not in place. Thus the identifying assumption re-writes:

$$E[Y_{1t'} - Y_{1,t'-1} | T = 0] = E[Y_{0t'} - Y_{0,t'-1} | T = 0] \quad (4')$$

We test the validity of (4') for the proposed treatment and control groups by running the following equation on pre-intervention data; i.e., for all $t' = 1995-1997$:

$$Y_{st'} = \alpha_s + \xi_{1t'} + \sum_{t'} \gamma_{t'} YR_{t'} + \sum_{t'} \delta_{1t'} POTAGE_{s_t'} * YR_{t'} + u_{st'} \quad (5)$$

where $POTAGE_{s_t'}$ is, as defined above, a dichotomous variable that equals 1 if school s is a potential treatment school $YR_{t'}$ are year dummy variables for all pre-intervention school years t'

=1995-1997 (pre-intervention years). As in equation (3), α_s are school fixed effects and ξ_{it} are state specific time dummies. Now, $u_{st'}$ denotes the heteroskedastic disturbance that allows for correlation within schools over time. If the $\delta_{it'}$'s are not significantly different from zero, then the pre-intervention trends for schools that will eventually become AGEs treatment schools are not significantly different from those in the comparison group at each time t' .

Table 3 reports results for school-averaged grade failure, grade repetition and intra-year drop out pre-intervention trends for the sub-samples of schools under study. For each dependent variable (reported in columns), the first column corresponds to the estimation on the entire sub-sample of schools and the second column corresponds to the Q34 sub-sample. All runs include school and time fixed effects and state-time specific trends. Estimates show no significant differences in pre-intervention trends between treatment and comparison schools in any of the intermediate educational outcomes examined and for either one of the sub-samples considered.

We also test the equality in pre-intervention trends between schools that entered the program in different years. In this case, the equation to estimate for all $t' = 1995-1997$ is:

$$Y_{st'} = \alpha_s + \xi_{it} + \sum_{t'} \gamma_{t'} YR_{t'} + \sum_{t'} \sum_j \lambda_{it'} INAGE_{s_{sj}} * YR_{t'} + \nu_{st'} \quad (6)$$

where $INAGE_{s_{sj}}$ is a set of dummies that take on the value 1 if the school s started benefiting from the AGEs intervention on year $j=1998-2001$. Thus, the coefficients on the interaction with the year dummies, the $\lambda_{it'}$'s, capture differences in pre-intervention trends for schools entering in the AGEs scheme at different years. Overall, results do not show significant differences in grade failure, grade repetition and intra-year drop out pre-intervention trends between schools that started receiving the program in different years (Table 4). The only significant difference is observed in year 1996 for schools that are folded into the scheme in school year 1999-00. These schools actually present larger *increases* in grade failure (first column) and grade repetition (third column) from school year 1995-96 to school year 1996-97 than schools in the comparison group. This suggests that, if anything, schools that start receiving AGEs in earlier years were experiencing worst dynamics in terms of schooling outcomes than schools phased in at later dates. Therefore, our estimates are more likely to underestimate the AGEs effect rather than overestimate it. Given the sets of estimates in Tables 3 and 4, pre-intervention trends seem well

balanced enough overall for endogenous program placement bias not be a serious threat to identification.¹⁴

Identification also relies in the inclusion of school fixed effects. These control for any differences in time-invariant characteristics across schools. In addition, the state-time dummies are meant to capture state-specific aggregate time effects that might be correlated with schooling outcomes: changes in state demographic trends that might affect enrollment; or changes in the state government characteristics, for example, shifts in tastes and priorities about education that might alter the allocation of resources. Treatment specific time trends are included to capture the different evolutions treatment and control schools might have experienced over time. Moreover, we control for other education programs currently operating in the school to avoid incorrectly attributing effects to the AGEs intervention. In the same spirit, we also use as many school varying characteristics we are able to construct as controls. Although there are only two (the student teacher ratio and the crowding index), it seems plausible to assume that schools do not change substantially in the span of 5 years. Given these, the estimated treatment effect will be unbiased as long as there are no unobserved time-varying characteristics or trends correlated with the treatment variables. We discuss potential biases in section 6.

5. Quantitative Evidence on Failure, Repetition and Dropout

5.1 Graphical Evidence

Albeit limited, graphs can provide suggestive evidence. Figures 2A, 3A and 4A present the evolution of school-averaged grade failure, grade repetition and intra-year drop out rates over time. For each figure the first graph plots the mean of the dependent variable at the end of every school year for AGEs treatment schools (solid line) and AGEs comparison schools (dashed line) for the entire sub-sample of non-indigenous rural primary schools considered. Similarly, graphs in the right hand side of each figure plot mean failure, repetition and drop out rates for treatment

¹⁴ Alternatively we could control for the program phase-in rule as a way of minimizing the potential for endogenous program placement. We did not implement this approach for three reasons. First, the targeting rule is computed at one point in time. Although we could construct a time-varying targeting index applying the formula to different years, we would first need to generate time variation to some variables by extrapolation which might add considerable measurement error. Second and more importantly, the targeting rule for primary schools is not unique. According to CONAFE, schools that were to be phased in under earlier stages (PAREB, PIARE) will continue to respond to the criteria associated with those stages, even if they start receiving benefits at later years. Third, the targeting rule does not determine when schools receive a particular CONAFE intervention (AGEs support or other).

and comparison schools on the Q34 sub-sample. The vertical line at 1997 marks the beginning of the intervention period.¹⁵

As shown in the descriptive statistics (Table 1), grade failure and grade repetition rates are larger for the group of treated schools during the pre-intervention years and until school year 1998-99. Intra-year drop out rates, however, are lower amongst treatment schools all the way through. During school year 1997-98, the higher average failure rate observed in treatment schools drops down to the failure rate level of comparison schools, at exactly 10 percent. Later on and in particular between school year 1998-99 and school year 1999-00, the average failure and repetition rates for treatment schools fall below those of comparison schools. Although these differences in levels are unlikely significant, they show some trend towards minimizing the gap between AGEs compensated and AGEs non-compensated schools in terms of intermediate quality of schooling indicators.¹⁶ However, the graphs clearly show a sharper decrease in failure and repetition rates for treatment schools by the end of school year 1999-00, when approximately 13 percent of the schools have already received the monetary support for a full school year and an insignificant 1 percent for two years (see Table 2). The plots do not show any effect concerning intra year drop out rates. Pre-intervention trends are more or less parallel which graphically supports the validity of the identification strategy. Estimation results in Table 3 confirm that the small differences in slopes between treatment and comparison schools depicted in these graphs are not statistically significant.¹⁷

The graphs in Figures 2B, 2C, 2D depict the evolution of school-averaged grade failure, grade repetition and intra-year drop out rates over time, based on the year the AGEs support was first offered in the school. For each figure, the first graph compares schools that first received treatment in school year 1998-99 to comparison schools; the second graph compares schools that were phased-in in school year 1999-00 to comparison schools; the third graph compares schools that first received AGEs in 2000-01 to comparison schools; and finally, the fourth graph compares schools incorporated in the last treatment year (school year 2001-02) to comparison

¹⁵ The intervention period starts in school year 1998-99. However, by construction outcomes are measured at the end of the school year. For instance, average failure plotted at $t=1998$ corresponds to average failure at the end of the school year 1998-99, once the program has already been in place for an entire school year had it started at the beginning of it. Hence, the vertical line separating pre- and post-intervention trends is drawn at $t-1=1997$.

¹⁶ Confidence intervals are not depicted to avoid overloading the graphs.

¹⁷ Note that the evidence depicted in these graphs is only partial. They plot raw means for AGEs treatment and AGEs control schools. As such, the effect of any other factors that might be altering the outcome evolution in any way is not netted out.

schools. As before, the solid lines represent treatment schools and the dashed lines characterize the evolution of comparison schools. All figures use data on the Q34 sub-sample of schools.

If the program was successful and if we allow a full school year for the program to affect outcomes, the graphs should show kinks in the treatment trends after a school year of benefits since first treatment: schools first treated at the beginning of school year 1998-99 should have a kink at the end of this same school year, for example. Once again, because outcomes are measured at the end of the school year, the value plotted at $t = x$ corresponds to the outcome value after a full school year of benefits, had the intervention began at the beginning of the school year (represented graphically at $t = x-1$). Hence, the vertical lines plotted at $t = x-1$, mark the points where we should observe breaks in trends. Figures 2B and 2C do show kinks in average failure and repetition rates trends for treatment schools, in particular for those schools that started receiving benefits in school years 1999-00 and 2000-01. As before, no effects on drop out rates are observed.

5.2 Average Treatment Effects

Table 5 presents the estimates of the average treatment effect in equation (3) on grade failure, grade repetition and intra-year drop out rates for schools in the entire sub-sample (first two columns) and in the Q34 sub-sample (next to columns). Models A typify the AGEs support as a single dummy. In Models B two dummies are included each one taking on the value of one if the school has received AGEs for one year or for over a year respectively. The objective of this specification is to identify potential heterogeneity in the AGEs impact stemming from having received benefits for different lengths of time. As noted earlier, we take the school year 1997-98 as the baseline year. All regressions include school and time fixed effects, state specific time trends, a treatment specific trend and all the time varying school characteristics listed above.

Results show a significant 0.4 percentage points reduction in school-averaged grade failure and grade repetition in AGEs beneficiary schools (Table 5, Models A). Given a mean failure rate of 10 percent and a mean repetition rate of 9.6 percent at baseline for these schools, these values imply a 4 percent and 4.2 percent decrease in the proportion of students failing and repeating a grade in the school, respectively. The magnitude of the effect is larger amongst treatment schools in the Q34 sub-sample, although there are small loses in significance. Results in Models B and in particular, those on the Q34 sub-sample of schools, show that the reductions in average failure and repetition are larger for schools that have received benefits for more than one

year.¹⁸ The test of joint significance between the two dummies (having received benefits for one year and having received benefits for over a year) fails to accept the null of equivalence at the 10 percent significance level. Consistent with the graphical evidence, no effects of AGEs on intra-year dropout rates are observed.

6. Potential Biases

6.1 Endogenous Program Placement Bias

Program placement biases might arise if the state authority decides to allocate programs non-randomly in response to political considerations. For instance, the state government could assign benefits to more marginalized schools first given budget constraints. In this case, estimates would be downward biased. There is enough variation in the time schools first receive the AGEs benefits and across the characteristics of the schools that start receiving benefits at different dates to raise such concern. We argue that the inclusion of state specific trends capture state specific aggregate time effects (shifts in tastes, changes in the allocation of resources, etc) and minimizes the potential for this bias.

It could also be that program placement responds to some specific characteristics of the school that are correlated with school performance. Indeed, the test of equality of the pre-intervention trends in Table 4 showed that better performing schools in school year 1996-97 were receiving the AGEs support earlier than schools in the comparison group, in school year 1999-00. If we assume these characteristics time-invariant, then the inclusion of school fixed effects corrects for the bias. What if the program placement responds to time-varying characteristics instead? If for instance better performing schools have more motivated teachers and students living in families where education is perceived as a priority, and if these characteristics both attract government support and generate better educational outcomes, then regression estimates are likely to overestimate the true program impact. These schools might be receiving the AGEs support first, for at least two reasons: (i) the state government decides to assign benefits to schools that are more likely to succeed in order to increase the chances of positive outcomes [and “its reputation as a good manager to the eyes of the federal government”]; (ii) more motivated and concerned parental associations might push the local authority to allocate benefits in their

¹⁸ In alternative specifications, we included four dummies to account for the different lengths of time the school had been under treatment (from 0 to 4 years) at a certain point in time. However, the joint test of equality of the coefficients accepted the null. We then aggregated categories until we came up with the specification presented in Table 5, where the F-test of joint significance cannot be accepted.

school.¹⁹ If we suspect that school time-varying unobserved characteristics are indeed correlated with outcomes, then we will have to rely on the identifying assumption in equation (4') to legitimate our estimates. The fact that pre-intervention trends in educational outcomes are not significantly different between AGEs treatment and AGEs comparison schools –as tested earlier, implies that endogenous program placement bias is not likely to be a serious threat to identification.

6.2 Presence of Other Educational Interventions in the School

A further concern is whether part of the observed effects are driven by alternative educational policies also directed to improve schooling quality and accessibility that are simultaneously operating in the school. To control for possible biases, information on the presence and the intensity of other interventions in the school are included in the regression equation. We specifically control for: (i) the ratio of *Oportunidades* beneficiary students in the school, which is a measure of the intensity of the *Oportunidades* program in the school – on the demand side; and (ii) the proportion of teachers under the *Carrera Magisterial* scheme, and (iii) the reception of other (sporadic) CONAFE supported interventions – on the supply side.

Oportunidades, formerly known as *Progresa*, combines a traditional cash transfer program with financial incentives for families to invest in the human capital of their children. Program benefits include cash transfers that are disbursed conditional on the household engaging in a set of behaviors designed to improve health and nutrition (preventive checkups, prenatal care, and health and hygiene education) and on school aged children attending school. See Skoufias (2005) for a review of evaluations on the program impacts. *Carrera Magisterial* is a voluntary pay per performance scheme targeted to all educators. Principals, teachers and teacher aides participate in a year-long assessment process that awards 100 points for education, experience and other factors. In particular, principals are awarded 20 points based on the mean test scores of the students and teachers in their school in standardized assessments. See McEwan and Santibáñez (2005) for an evaluation. As previously noted, the CONAFE intervention is composed of several different interventions besides the AGEs monetary support. These include: provision of school and student teaching and learning supplies (textbooks, notebooks, pencils and pens),

¹⁹ This raises the natural concern that the identified effect on AGEs may disappear over time as worse performing schools (less motivated, etc.) join the program. Probably in anticipation of this phenomenon, CONAFE started introducing, beginning in 2003, a new support called CAPAGEs (*Capacitación para el Apoyo a la Gestión Escolar*) aimed at providing guidance on the administration of the monetary resources provided by the AGEs support.

teacher training, improvement of existing or building of new facilities, provision of equipment (desks, bookcases, typewriters, etc.) and performance based incentives to teachers.

Many of these regressors are likely to be endogenous and so its effects on the outcomes of interest must be looked at with some reservation. Moreover, they are highly correlated with the existence of the AGEs support in the school as Tables 1 and 2 show. However, if their inclusion does not influence the coefficient on the AGEs, we will gain some additional confidence on the validity of its effect. The results in Table 6 demonstrate that the program impact remains unchanged after the introduction of these controls when the entire sub-sample of schools is considered. For schools in the Q34 sub-sample, the effects of AGEs on school-averaged grade failure and grade repetition are now slightly larger. Concerning the effect of these covariates on outcomes, we observe that the proportion of teachers under *Carrera Magisterial* significantly reduces repetition and almost significantly (at the 10 percent) reduces failure. The share of *Oportunidades* beneficiary students in the school appears to consistently and significantly reduce all of the educational outcomes considered, including intra-year drop out. The fact that the scholarships are conditional on attendance and on the student not repeating more than twice a grade, and increase with the grade she is enrolled in might help explain these findings. *Oportunidades* might also impact learning outcomes through the improved nutrition and better health practices the program enforces. This is consistent with the growing literature that establishes strong positive effects of health on school performance (Miguel and Kremer 2004; Glewwe and others 2004). Lastly, estimates show no significant impact of any of the other CONAFE interventions in any specification, except for an almost significant (at the 10 percent) increase in aggregate failure rate given teacher incentives in the school. This result might be driven by a few outliers since the teacher incentive support is received by very few schools which are for the most part amongst the schools that started receiving AGEs in school year 1998-99.

6.3 Changes in the Distribution of Students in the School

The error term in $\bar{\varepsilon}_{st}$ in (3) includes unobserved student characteristics (θ_{st} = skills, ability, motivation) that we have so far assumed uncorrelated with the observed treatment variables. However, treatment might affect the individual decision of enrolling in school. Assume, for instance, that through empowering local decision making, AGEs-supported schools

attract higher skill students or that more motivated parents enroll more motivated students.²⁰ Thus, if changes in total enrollment significantly alter the distribution of students' skills in the school, then treatment is correlated with unobserved ability and the estimated average treatment effect will likely be biased. In other words, if the intervention affects the individual probability of enrolling in school, $N_{st} = g(AGE_{s,t-1})$ and the skills of the marginal student attracted are different from the average pre-intervention distribution of skills in the school, $\theta_{ist} \neq \bar{\theta}_{st} = \frac{1}{N_{st}} \sum_{i=1}^N \theta_{ist}$, then $pr(\bar{Y}_{st}) = f(AGE_{s,t-1}, \bar{\theta}_{st}(N_{st} = g(AGE_{s,t-1})), \bar{I}_{s,t}, X_{s,t})$. Consequently, changes in the school aggregate rates can either come from: (i) changes in existing students' individual performance (changes in the numerator); (ii) changes in the distribution of students, which is affected by the total number of students (changes in the denominator). If better students are attracted, our estimates of the treatment effect will be upward biased; contrarily, if worse performing students are now enrolling in school, our estimates will likely be downward biased.

Although it is difficult to determine the direction of the bias, we can at least test for its existence by examining changes in enrollment in response to the AGEs treatment. Figure 5 plots total enrollment over time separately for AGEs treatment schools (solid line) and AGEs comparison schools (dashed line). We observe that enrollment is being mildly but consistently reduced over time, except for a small increase in school year 1998-99. These reductions seem to be larger amongst AGEs treatment schools. We test whether this difference in the pace of reduction of total enrollment is significant by running equation (3) on total enrollment. As usual, we first check for the equality in total enrollment pre-intervention trends. Table 7 shows results on aggregate pre-intervention trends (first two columns) and by year the school has started receiving benefits (last two columns) for both the entire sub-sample of schools and the Q34 sub-sample. In accordance with the graphical evidence provided in Figure 5, results indicate larger reductions in total enrollment across schools that start receiving the AGEs support earlier. Finally, Table 8 examines whether the AGEs intervention has affected total enrollment econometrically and finds no significant effects on either one of the two sub-samples of interest. Thus, and given that schools in the treatment group experienced larger reductions in total enrollment than schools in the comparison group before the intervention, it is plausible to think that the AGEs have actually reversed the pre-intervention pattern on enrollment. In other words,

²⁰ Note that on the other hand, a demand-side intervention like *Oportunidades* might be attracting lower skill (or less motivated) students with an opportunity cost of schooling large enough to not attend school without the subsidy.

the AGEs might have slowed down the larger reductions in total enrollment over time amongst beneficiary schools. Even if this is true, these pre-intervention larger reductions in AGEs schools – of between one and three students more than in comparison schools, are small enough to consider the potential for bias negligible. We therefore deem that the composition of students and consequently the distribution of students’ skills in the school are unlikely to account for the failure and repetition effects observed.

7. A Qualitative Assessment on the True Impact of AGEs

In an attempt to further justify the importance of the AGEs and identify the mechanisms through which they affect educational outcomes, we undertook qualitative work on two lines. First, on January 2006, we engaged in a series of discussions with parents, teachers and school directors of AGEs beneficiary and AGEs non-beneficiary schools in three communities in the Mexican state of Campeche.²¹ Later, in the May 2006 we undertook a larger qualitative survey and interviewed school directors in 115 rural schools with AGEs in the Mexican states of Campeche, Guerrero, Michoacán, Sinaloa and Tamaulipas.

The discussions were instructive as it became apparent what the main benefits of the AGEs are – mostly through the discussion with parents. In terms of economic and financial benefits, parents argued that the AGEs monetary support helped to reduce the household burden associated with sending their children to school. As a result, their children’s school attendance increases and their school work improves. They also noted significantly less child labor now, although parents acknowledged that *Oportunidades* helps. They also argued that the AGEs allow parents to buy materials and improve school infrastructure and maintenance, which is one of its main goals. It is important to note that before the AGEs, the parents would undertake “*faenas*” (tasks) informally. Thus, although the parents association used to participate and was somewhat organized, the AGEs catalyzed this nascent organization, and made it more formal and effective.

Another set of arguments from the parents focused on participation and other social aspects. That is, parents expressed the view that the AGEs helped generate significantly higher levels of school participation and communication – both amongst parents, and with teachers and school directors. Many parents believe that the AGEs put pressure on school directors and teachers to help their children. Moreover, it is believed that the AGEs may help reduce absenteeism among teachers as they are seen as an economic benefit to teachers. As a matter of

²¹ See Patrinos (2006) for full details.

fact, when asked about how the AGEs helped teachers and what impacts they had noticed, parents commented on the fact that teachers used to work from 8am to 1pm and now stayed until late afternoon to help students who were falling behind academically. Parents were pleased with the fact that they are now able to meet with their child's teacher and reported are careful to listen to teachers on how to improve their child's performance. Parents believe that the AGEs at least to some extent help motivate their children to study more, probably through the increased teacher's effort and motivation. Parents also report that they follow their children's progress more closely. Although parents may not be sure about how these things improve education; they see how school was before and contrast the situation now, and deduce that the improvement is, at least partly, due to the AGEs.²²

Overall, from these discussions we confirmed that the AGEs are well known by parents, and valued. We learnt that they reduce the household burden and help motivate teachers and educators. Moreover, we learnt that they are vocal representatives of the school community as they articulate demands, generate expectations and promote social participation. The AGEs meetings are important for the school as they facilitate dialogue between parents, teachers and school directors; consequently improving school climate. This is believed to further foster parental involvement in the school, as well as at home with their children's school work.

All these explanations are plausible mechanisms through which AGEs can improve schooling outcomes, namely failure and repetition. Because *Oportunidades*, which operates in most schools where the AGEs are present, increases household income considerably, we believe that the AGEs are more likely affecting outcomes through empowering educators and increasing their participation in school related activities. The AGEs improve relations amongst parents and between parents and teachers and principals, thus improving overall school climate. There may also be less teacher absenteeism as a result of these better relations, social pressure and economic incentives for teacher and directors to benefit from the AGEs resources. Unfortunately, independent data on teacher absences is not available in Mexico.

However, it can still be argued that the outcomes we are analyzing here – reduced repetition and failure – are largely under the control of the teachers and directors at the school. Thus, they may be pressured to pass students regardless of their academic performance. We cannot check this possibility, and although we believe that it is unlikely, we undertook a separate

²² Note that in many cases the parents attended the same school where their children are currently students.

survey of 115 school directors. Over 70 percent of the directors interviewed also taught in the school. They had, on average, just about 8 years of experience in the school and almost 21 years in the area of education. Around 62 percent of them were under the *Carrera Magisterial* scheme and 70 percent were male. We interviewed a wide range of schools in terms of their size. This random sample of directors provided considerable insight into what it is parents ask of the school as a result of being involved in the AGEs program. Next, we provide a summary of the main findings stemming from the interviews with the school directors.

We reconfirmed that the AGEs led to an increase in parental participation in school matters: in fact, *all* (100 percent) school principals believed that this is the case. More importantly, the principals believe that the AGEs induced positive changes at the school: 40 percent believe that parents are now more concerned about their children's academic performance; another 30 percent believe that parents are more interested in the school; and the final 30 percent believe that parents interact more with teachers. Indeed, principals report that most parents are interested in the teachers' work, with a majority (60 percent) giving full leeway and respect for teachers. Still, more than half, according to the principals, follow closely the work of the teachers and will complain if they do not like what is happening. As to what parents might complain about, we asked the principals about the parents' attitude towards teacher attendance. They reported that more than 80 percent of parents will complain if teachers are absent from their classes.

On the specific concern about pressure on principals and teachers to pass students, over 91 percent of principals claim that parents, because of the AGEs, make more demands. But very few are likely to demand that undeserving children be allowed to progress. The majority of parents, according to the principals, accept it in the cases where their child is to fail a year or receive very poor grades (78 percent). A little less than 9 percent of the parents accept their children bad grades but blame it on the teacher's effort; while only a 3.5 percent of principals report that parents are not happy with their child not progressing adequately and exert pressure on the teacher to change the grades. But even amongst that small share of parents who do not accept the fact that their child might fail do not act in this way because of the AGEs. When principals were asked what the main reason was for not accepting poor results, although a large number responded that they simply did not want their children to lose a year (42 percent), an almost equally large fraction cited the fact that they would lose the scholarship (presumably from

Oportunidades) (41 percent). Note that half of the students in the surveyed schools were receiving an *Oportunidades* scholarship.

In summary then, according to the principals, the AGEs increase parental participation and make parents more demanding. But they are more likely to demand higher teacher attendance and more attention to their children's learning needs; not to change grades for undeserving students. Therefore, the qualitative results reconfirm our findings and contention that AGEs improve outcomes through increased parental participation, and probably through increased attention to teacher attendance and student's academic performance.

7. Conclusions

Mexico's AGEs –school-based management in rural, disadvantaged schools– are part of a large Compensatory Education Program and are aimed to empower parent associations through a small grant. They have been proven to substantially improve intermediate schooling outcomes, namely grade repetition and grade failure. The strong and significant effects persist even after controlling for *Oportunidades* – Mexico's large conditional cash transfer program, and other supply-side interventions aimed at increasing the quantity and quality of education. Thus, results suggest that increasing parental participation in school matters and improving relations between parents and teachers, and overall school climate; can have positive impacts on outcomes. A series of discussions with parents, teachers and principals and data gathered from interviews to school directors in beneficiary and non-beneficiary AGEs schools support these findings.

The AGEs are a very cost effective intervention. While the unit cost of the compensatory education program overall is \$50, the AGEs are a much less costly component. Parents at each participating school receive between \$500 and \$700 a year depending on school size. There are over 45,000 schools and over 4.5 million students participating in the AGEs. The total cost of the AGE school grants is about \$26 million a year; for 4.4 million students this comes to \$5.86 per student annually. *Oportunidades*, which is also very effective and has other important benefits, pays students at the primary school level between \$100 and \$200 depending on which school grade they attend.

Also, given the low cost of AGEs, pouring more resources into schools may not be necessary to improve outcomes if parental participation exists and is strong. The results suggest that it may be wise to increase decision-making power to local levels and schools and increase

parental participation at schools. All this will improve the school climate. Moreover, as it has been pointed out in the literature, socioeconomic, cultural and family backgrounds exert a very strong influence in the perception and (good) use of education. Results found go along these lines. That is, increasing the demand for education involving parents in the school decision-making process (AGEs support) seems to have a larger effect on children's learning.

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APPENDIX 1: TABLES

Table 1: Descriptive Statistics by Treatment Status -Subsample of General Rural Primary Schools (All and Q34)

<i>All Schools</i>	AGEs Treatment Schools			AGEs Comparison Schools			t-stat
	N	Mean	SD	N	Mean	SD	
<i>Dependent Variables at Baseline (1997)</i>							
Failure Rate	2580	0.100	(0.063)	3458	0.100	(0.055)	-0.047
Repetition Rate	2580	0.096	(0.061)	3458	0.092	(0.051)	2.662
Intra-Year Drop Out Rate	2580	0.038	(0.048)	3458	0.042	(0.042)	-3.315
<i>School Characteristics at Baseline (1997)</i>							
Number of Teachers	2580	3.517	(2.455)	3458	5.913	(3.807)	-29.657
Number of Desks	2580	59.398	(54.346)	3458	95.003	(101.979)	-17.468
Number of Classrooms	2580	6.206	(1.335)	3458	7.498	(2.555)	-25.442
Total Enrollment	2580	89.283	(69.370)	3458	164.250	(125.899)	-29.523
<i>Other Interventions over Treatment Period (1998-2001)</i>							
Proportion of Teachers in Carrera Magisterial	2580	0.505	(0.380)	3458	0.544	(0.350)	-8.011
Ratio of <i>Oportunidades</i> students in the School	2580	0.319	(0.216)	3458	0.204	(0.219)	40.550
Proportion of Schools with School Supplies Support (CONAFE)	2580	0.438	(0.496)	3458	0.023	(0.149)	82.365
Proportion of Schools with Teacher Training Support (CONAFE)	2580	0.209	(0.407)	3458	0.012	(0.108)	48.092
Proportion of Schools with Infrastructure Support (CONAFE)	2580	0.034	(0.181)	3458	0.005	(0.074)	15.009
Proportion of Schools with Equipment Support (CONAFE)	2580	0.010	(0.097)	3458	0.002	(0.049)	6.895
Proportion of Schools with Teacher Incentives Support (CONAFE)	2580	0.006	(0.079)	3458	0.000	(0.019)	7.397
<i>Q34 Schools</i>							
<i>Dependent Variables at Baseline (1997)</i>							
Failure Rate	1825	0.107	(0.062)	2793	0.105	(0.055)	0.951
Repetition Rate	1825	0.102	(0.061)	2793	0.096	(0.051)	3.177
Intra-Year Drop Out Rate	1825	0.039	(0.049)	2793	0.043	(0.042)	-3.110
<i>School Characteristics at Baseline (1997)</i>							
Number of Teachers	1825	3.567	(2.546)	2793	5.835	(3.814)	-24.235
Number of Desks	1825	61.069	(55.761)	2793	93.631	(102.179)	-13.955
Number of Classrooms	1825	6.245	(1.447)	2793	7.484	(2.526)	-21.153
Total Enrollment	1825	93.841	(73.025)	2793	165.561	(127.344)	-24.279
<i>Other Interventions over Treatment Period (1998-2001)</i>							
Proportion of Teachers in Carrera Magisterial	1825	0.499	(0.380)	2793	0.535	(0.353)	-6.449
Ratio of <i>Oportunidades</i> students in the School	1825	0.332	(0.209)	2793	0.209	(0.219)	38.192
Proportion of Schools with School Supplies Support (CONAFE)	1825	0.404	(0.491)	2793	0.018	(0.135)	65.577
Proportion of Schools with Teacher Training Support (CONAFE)	1825	0.187	(0.390)	2793	0.011	(0.103)	37.793
Proportion of Schools with Infrastructure Support (CONAFE)	1825	0.028	(0.165)	2793	0.005	(0.073)	11.060
Proportion of Schools with Equipment Support (CONAFE)	1825	0.008	(0.091)	2793	0.003	(0.050)	5.018
Proportion of Schools with Teacher Incentives Support (CONAFE)	1825	0.005	(0.068)	2793	0.000	(0.013)	5.550

Q34 Schools are schools in the third and fourth quantile of the CONAFE's Targeting Index distribution. AGEs treatment schools are schools that continuously receive the Apoyo a la Gestión Escolar (AGEs) starting in 1998 (or later) until 2001. Schools with extremely high values of the dependent variables have been dropped (top 0.5% of each distribution). Sample restricted to schools with no missing information on any of the dependent variables studied.

Table 2: Descriptive Statistics by Date the School Started Receiving AGEs -Subsample of General Rural Primary Schools (All and Q34)

<i>All Schools</i>	Comparison Schools			Treatment Since 1998			Treatment Since 1999			Treatment Since 2000			Treatment Since 2001		
	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD	N	Mean	SD
<i>Dependent Variables at Baseline (1997)</i>															
Failure Rate				72	0.082	(0.067)	801	0.098	(0.067)	1084	0.097	(0.061)	623	0.110	(0.057)
Repetition Rate	3458	0.092	(0.051)	72	0.078	(0.067)	801	0.093	(0.065)	1084	0.094	(0.059)	623	0.105	(0.057)
Intra-Year Drop Out Rate	3458	0.042	(0.042)	72	0.060	(0.062)	801	0.034	(0.051)	1084	0.045	(0.048)	623	0.029	(0.037)
<i>School Characteristics at Baseline (1997)</i>															
Number of Teachers	3458	5.913	(3.807)	72	2.306	(1.274)	801	2.382	(1.293)	1084	4.046	(2.898)	623	4.196	(2.289)
Number of Desks	3455	95.003	(101.979)	72	47.875	(37.154)	801	43.070	(37.530)	1084	66.638	(61.327)	623	69.136	(56.431)
Number of Classrooms	3458	7.498	(2.555)	72	5.972	(0.581)	801	5.979	(0.470)	1084	6.470	(1.685)	623	6.066	(1.383)
Total Enrollment	3458	164.250	(125.899)	72	53.167	(39.930)	801	61.729	(39.973)	1084	98.768	(79.175)	623	112.379	(70.577)
<i>Other Interventions over Treatment Period (1998-2001)</i>															
Proportion of Teachers in Carrera Magisterial	3458	0.544	(0.350)	72	0.541	(0.409)	801	0.431	(0.400)	1084	0.527	(0.370)	623	0.559	(0.350)
Ratio of <i>Oportunidades</i> students in the School	3455	0.204	(0.219)	72	0.286	(0.220)	801	0.345	(0.213)	1083	0.312	(0.216)	623	0.300	(0.215)
Proportion of Schools with School Supplies Support (CONAFE)	3458	0.023	(0.149)	72	0.962	(0.192)	801	0.365	(0.482)	1084	0.613	(0.487)	623	0.168	(0.374)
Proportion of Schools with Teacher Training Support (CONAFE)	3458	0.012	(0.108)	72	0.653	(0.477)	801	0.276	(0.447)	1084	0.250	(0.433)	623	0.002	(0.045)
Proportion of Schools with Infrastructure Support (CONAFE)	3458	0.005	(0.074)	72	0.160	(0.367)	801	0.036	(0.187)	1084	0.039	(0.193)	623	0.008	(0.087)
Proportion of Schools with Equipment Support (CONAFE)	3455	0.002	(0.049)	72	0.010	(0.102)	801	0.015	(0.120)	1083	0.009	(0.093)	623	0.004	(0.066)
Proportion of Schools with Teacher Incentives Support (CONAFE)	3458	0.000	(0.019)	72	0.035	(0.183)	801	0.006	(0.079)	1084	0.007	(0.084)	623	0.001	(0.035)
<i>Q34 Schools</i>															
<i>Dependent Variables at Baseline (1997)</i>															
Failure Rate	2793	0.105	(0.055)	41	0.096	(0.067)	595	0.107	(0.068)	753	0.104	(0.061)	436	0.114	(0.056)
Repetition Rate	2793	0.096	(0.051)	41	0.084	(0.063)	595	0.101	(0.065)	753	0.099	(0.059)	436	0.108	(0.058)
Intra-Year Drop Out Rate	2793	0.043	(0.042)	41	0.066	(0.069)	595	0.035	(0.052)	753	0.046	(0.050)	436	0.030	(0.036)
<i>School Characteristics at Baseline (1997)</i>															
Number of Teachers	2793	5.835	(3.814)	41	2.317	(1.556)	595	2.420	(1.296)	753	4.129	(3.055)	436	4.278	(2.350)
Number of Desks	2793	93.631	(102.179)	41	39.927	(38.952)	595	45.691	(38.336)	752	67.375	(62.923)	436	73.167	(58.887)
Number of Classrooms	2793	7.484	(2.526)	41	6.024	(0.689)	595	5.993	(0.519)	753	6.535	(1.867)	436	6.108	(1.443)
Total Enrollment	2793	165.561	(127.344)	41	55.463	(49.076)	595	65.439	(41.707)	753	103.489	(84.103)	436	119.546	(73.958)
<i>Other Interventions over Treatment Period (1998-2001)</i>															
Proportion of Teachers in Carrera Magisterial	2793	0.535	(0.353)	41	0.531	(0.406)	595	0.425	(0.398)	753	0.523	(0.368)	436	0.555	(0.356)
Ratio of <i>Oportunidades</i> students in the School	2793	0.209	(0.219)	41	0.331	(0.201)	595	0.355	(0.207)	752	0.328	(0.210)	436	0.308	(0.210)
Proportion of Schools with School Supplies Support (CONAFE)	2793	0.018	(0.135)	41	0.933	(0.251)	595	0.313	(0.464)	753	0.590	(0.492)	436	0.158	(0.365)
Proportion of Schools with Teacher Training Support (CONAFE)	2793	0.011	(0.103)	41	0.646	(0.480)	595	0.245	(0.430)	753	0.223	(0.417)	436	0.001	(0.034)
Proportion of Schools with Infrastructure Support (CONAFE)	2793	0.005	(0.073)	41	0.159	(0.366)	595	0.032	(0.176)	752	0.029	(0.168)	436	0.009	(0.092)
Proportion of Schools with Equipment Support (CONAFE)	2793	0.003	(0.050)	41	0.006	(0.078)	595	0.013	(0.115)	753	0.007	(0.083)	436	0.004	(0.063)
Proportion of Schools with Teacher Incentives Support (CONAFE)	2793	0.000	(0.013)	41	0.018	(0.134)	595	0.003	(0.058)	753	0.007	(0.083)	436	0.001	(0.034)

Q34 Schools are schools in the third and fourth quantile of the CONAFE's Targeting Index distribution. Schools with extremely high values of the dependent variables have been dropped (top 0.5% of each distribution). Sample restricted to schools with no missing information on any of the dependent variables studied.

**Table 3: Differences in Pre-Intervention Trends (1995 to 1997) between Intervened and Non-Intervened Schools
-Subsample of General Rural Primary Schools (All and Q34)**

	FAILURE RATE		REPETITION RATE		DROP OUT RATE	
	All	Q34	All	Q34	All	Q34
<u>Comparison Schools</u>						
Mean Dep. Var. in 1995	0.104** (0.001)	0.109** (0.001)	0.094** (0.001)	0.099** (0.001)	0.041** (0.000)	0.043** (0.001)
Difference in year 1996	0.012 (0.010)	0.029+ (0.016)	0.010 (0.011)	0.015 (0.022)	0.015+ (0.009)	0.028+ (0.015)
Difference in year 1997	0.005 (0.008)	0.011 (0.011)	0.003 (0.009)	0.002 (0.015)	0.004 (0.008)	0.008 (0.016)
<u>AGEs Treatment Schools</u>						
Difference in year 1996	0.003 (0.002)	0.002 (0.003)	0.003 (0.002)	0.003 (0.003)	0.002 (0.002)	0.000 (0.002)
Difference in year 1997	-0.001 (0.003)	-0.001 (0.003)	0.000 (0.003)	0.000 (0.003)	0.001 (0.002)	0.001 (0.003)
School Fixed Effects	Y	Y	Y	Y	Y	Y
State Specific Time Trends	Y	Y	Y	Y	Y	Y
Number of Observations	18114	13854	18114	13854	18114	13854
Number of Schools	6038	4618	6038	4618	6038	4618

Notes: +significant at the 10%, *significant at the 5%, **significant at the 1%. LS regressions with school FE. Robust SE clustered at the school level in parantheses. Q34 Schools are schools in the third and fourth quantile of the CONAFE's Targeting Index distribution. AGEs treatment schools are schools that continuously receive the Apoyo a la Gestión Escolar (AGEs), starting in 1998 (or later) until 2001. Extreme values for the dependent variables trimmed at the top 0.5% of the dependent variable distribution. Sample restricted to schools with no missing information on any of the dependent variables studied.

Table 4: Differences in Pre-Intervention Trends (1995 to 1997) between Non-Intervened Schools and Schools Intervened in Subsequent Years -Subsample of General Rural Primary Schools (All and Q34)

	FAILURE RATE		REPETITION RATE		DROP OUT RATE	
	All	Q34	All	Q34	All	Q34
<u>Comparison Schools</u>						
Mean Dep. Var. in 1995	0.104**	0.109**	0.094**	0.099**	0.041**	0.043**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.000)	(0.001)
Difference in year 1996	0.014	0.032*	0.012	0.017	0.014	0.026+
	(0.010)	(0.016)	(0.011)	(0.022)	(0.009)	(0.015)
Difference in year 1997	0.006	0.013	0.004	0.004	0.003	0.007
	(0.008)	(0.011)	(0.009)	(0.014)	(0.008)	(0.016)
<u>AGEs Treatment Schools by Starting Year</u>						
Difference in year 1996 * AGEs starting in 1998	0.001	-0.010	-0.002	-0.007	0.009	0.008
	(0.013)	(0.019)	(0.012)	(0.018)	(0.009)	(0.013)
Difference in year 1996 * AGEs starting in 1999	0.007+	0.006	0.008*	0.007	-0.001	-0.004
	(0.004)	(0.004)	(0.004)	(0.005)	(0.003)	(0.004)
Difference in year 1996 * AGEs starting in 2000	-0.002	-0.003	-0.003	-0.004	0.004	0.004
	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.003)
Difference in year 1996 * AGEs starting in 2001	0.004	0.006	0.004	0.007	0.002	0.002
	(0.004)	(0.004)	(0.004)	(0.004)	(0.003)	(0.003)
Difference in year 1997 * AGEs starting in 1998	-0.008	-0.014	-0.006	-0.015	0.004	0.006
	(0.013)	(0.018)	(0.011)	(0.016)	(0.011)	(0.017)
Difference in year 1997 * AGEs starting in 1999	-0.000	0.000	0.003	0.004	-0.003	-0.003
	(0.004)	(0.005)	(0.004)	(0.005)	(0.003)	(0.004)
Difference in year 1997 * AGEs starting in 2000	-0.003	-0.004	-0.004	-0.005	0.003	0.005
	(0.003)	(0.004)	(0.003)	(0.004)	(0.003)	(0.004)
Difference in year 1997 * AGEs starting in 2001	0.002	0.005	0.002	0.003	0.004	0.004
	(0.004)	(0.005)	(0.004)	(0.005)	(0.003)	(0.003)
School Fixed Effects	Y	Y	Y	Y	Y	Y
State Specific Time Trends	Y	Y	Y	Y	Y	Y
Number of Observations	18114	13854	18114	13854	18114	13854
Number of Schools	6038	4618	6038	4618	6038	4618

Notes: +significant at the 10%, *significant at the 5%, **significant at the 1%. LS regressions with school FE. Robust SE clustered at the school level in parentheses. Q34 Schools are schools in the third and fourth quantile of the CONAFE's Targeting Index distribution. AGEs treatment schools are schools that continuously receive the Apoyo a la Gestión Escolar (AGEs), starting in 1998 (or later) until 2001. Extreme values for the dependent variables trimmed at the top 0.5% of the dependent variable distribution. Sample restricted to schools with no missing information on any of the dependent variables studied.

Table 5: Effect of AGEs on School Aggregate Educational Outcomes from 1998 to 2001 -Subsample of General Rural Primary Schools (All and Q34)

	FAILURE RATE				REPETITION RATE				DROP OUT RATE			
	All A	All B	Q34 A	Q34 B	All A	All B	Q34 A	Q34 B	All A	All B	Q34 A	Q34 B
AGEs =1	-0.004*		-0.004+		-0.004*		-0.005*		0.000		0.000	
	(0.002)		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)	
AGEs Received During 1 year =1 (1)		-0.004*		-0.005+		-0.004*		-0.005*		0.000		0.000
		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)
AGEs Received Over 1 year =1 (2)		-0.004		-0.007*		-0.004		-0.007*		0.001		0.002
		(0.003)		(0.003)		(0.003)		(0.003)		(0.002)		(0.003)
School Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Time-Varying School Characteristics	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
State Specific Time Trends	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Treatment Specific Trends	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Prob > F-stat Joint Significance (1) & (2)	-	0.11	-	0.09	-	0.09	-	0.07	-	0.94	-	0.63
Number of Observations	30190	30190	23090	23090	30190	30190	23090	23090	30190	30190	23090	23090
Number of Schools	6038	6038	4618	4618	6038	6038	4618	4618	6038	6038	4618	4618
Mean Dependent Variable	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.04	0.04	0.04	0.04

Notes: +significant at the 10%, *significant at the 5%, **significant at the 1%. LS regressions with school FE. Robust SE clustered at the school level in parantheses. Q34 Schools are schools in the third and fourth quantile of the CONAFE's Targeting Index distribution. AGEs treatment schools are schools that continuously receive the Apoyo a la Gestión Escolar (AGEs), starting in 1998 (or later) until 2001. Extreme values for the dependent variables trimmed at the top 0.5% of the dependent variable distribution. Sample restricted to schools with no missing information on any of the dependent variables studied.

**Table 6: Effect of AGEs on School Aggregate Educational Outcomes from 1998 to 2001 Controlling for Other Educational Interventions
-Subsample of General Rural Primary Schools (All and Q34)**

	FAILURE RATE				REPETITION RATE				DROP OUT RATE			
	All A	All B	Q34 A	Q34 B	All A	All B	Q34 A	Q34 B	All A	All B	Q34 A	Q34 B
AGEs =1	-0.004*		-0.005+		-0.004*		-0.006*		-0.000		-0.000	
	(0.002)		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)	
AGEs Received During 1 year =1 (1)		-0.004*		-0.005+		-0.004*		-0.006*		-0.000		-0.000
		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)
AGEs Received Over 1 year =1 (2)		-0.005		-0.008*		-0.004		-0.007*		0.001		0.002
		(0.003)		(0.003)		(0.003)		(0.003)		(0.002)		(0.003)
<u>Other Interventions</u>												
Ratio of <i>Oportunidades</i> Students in the School	-0.010**	-0.010**	-0.008*	-0.008*	-0.008**	-0.008**	-0.005+	-0.005+	-0.013**	-0.013**	-0.015**	-0.015**
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
Proportion of Teachers under <i>Carrera Magisterial</i>	-0.003+	-0.003+	-0.003+	-0.003+	-0.004*	-0.004*	-0.005*	-0.005*	-0.001	-0.001	-0.002	-0.002
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
<u>Other CONAFE Interventions</u>												
Infrastructure =1	0.002	0.002	0.003	0.004	0.000	0.000	0.001	0.001	0.000	-0.000	0.003	0.002
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.004)	(0.004)	(0.003)	(0.003)	(0.003)	(0.003)
Equipment =1	-0.000	-0.000	0.001	0.001	-0.001	-0.001	0.000	0.000	-0.001	-0.001	0.001	0.001
	(0.005)	(0.005)	(0.007)	(0.007)	(0.005)	(0.005)	(0.006)	(0.006)	(0.004)	(0.004)	(0.005)	(0.005)
Incentives =1	0.009	0.009	0.018+	0.019+	0.013	0.012	0.018	0.018	-0.002	-0.002	-0.007	-0.007
	(0.012)	(0.012)	(0.010)	(0.010)	(0.011)	(0.011)	(0.013)	(0.013)	(0.007)	(0.007)	(0.010)	(0.010)
Student Supplies =1	-0.001	-0.001	-0.001	-0.001	-0.002	-0.002	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Training =1	0.001	0.000	0.001	0.001	0.002	0.002	0.003	0.003	0.002	0.002	0.002	0.003
	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.002)	(0.002)
School Fixed Effects	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Time-Varying School Characteristics	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
State Specific Time Trends	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Treatment Specific Trends	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
Prob > F-stat Joint Significance (1) & (2)	-	0.13	-	0.08	-	0.10	-	0.06	-	0.91	-	0.62
Number of Observations	30190	30190	23090	23090	30190	30190	23090	23090	30190	30190	23090	23090
Number of Schools	6038	6038	4618	4618	6038	6038	4618	4618	6038	6038	4618	4618
Mean Dependent Variable	0.09	0.09	0.10	0.10	0.09	0.09	0.09	0.09	0.04	0.04	0.04	0.04

Notes: +significant at the 10%, *significant at the 5%, **significant at the 1%. LS regressions with school FE. Robust SE clustered at the school level in parantheses. Q34 Schools are schools in the third and fourth quantile of the CONAFE's Targeting Index distribution. AGEs treatment schools are schools that continuously receive the Apoyo a la Gestión Escolar (AGEs), starting in 1998 (or later) until 2001. Extreme values for the dependent variables trimmed at the top 0.5% of the dependent variable distribution. Sample restricted to schools with no missing information on any of the dependent variables studied.

**Table7: Do the AGEs Affect Total Enrollment? Pre-Intervention Trends
-Subsample of General Rural Primary Schools (All and Q34)**

	TOTAL ENROLLMENT			
	All	Q34	All	Q34
<u>Comparison Schools</u>				
Mean Dep. Var. in 1995	133.222**	137.308**	133.222**	137.308**
	(0.166)	(0.195)	(0.166)	(0.195)
Difference in year 1996	2.659	3.073	2.518	2.848
	(2.060)	(2.870)	(2.098)	(2.939)
Difference in year 1997	5.502+	8.727+	5.259+	8.369+
	(2.890)	(4.589)	(2.938)	(4.676)
<u>AGEs Treatment Schools</u>				
Difference in year 1996	-1.460*	-1.598+		
	(0.697)	(0.841)		
Difference in year 1997	-2.764**	-3.531**		
	(0.998)	(1.205)		
<u>AGEs Treatment Schools by Starting Year</u>				
Difference in year 1996 * AGEs starting in 1998			0.480	1.615
			(2.926)	(4.591)
Difference in year 1996 * AGEs starting in 1999			-1.490*	-1.663*
			(0.640)	(0.752)
Difference in year 1996 * AGEs starting in 2000			-1.361	-1.566
			(0.936)	(1.174)
Difference in year 1996 * AGEs starting in 2001			-1.855*	-1.922+
			(0.897)	(1.089)
Difference in year 1997 * AGEs starting in 1998			-0.386	1.112
			(3.650)	(5.502)
Difference in year 1997 * AGEs starting in 1999			-2.766**	-3.481**
			(0.933)	(1.108)
Difference in year 1997 * AGEs starting in 2000			-2.449+	-3.443*
			(1.301)	(1.624)
Difference in year 1997 * AGEs starting in 2001			-3.671**	-4.413*
			(1.419)	(1.782)
School Fixed Effects	Y	Y	Y	Y
State Specific Time Trends	Y	Y	Y	Y
Number of Observations	18114	13854	18114	13854
Number of Schools	6038	4618	6038	4618

Notes: +significant at the 10%, *significant at the 5%, **significant at the 1%. LS regressions with school FE. Robust SE clustered at the school level in parantheses. Q34 Schools are schools in the third and fourth quantile of the CONAFE's Targeting Index distribution. AGEs treatment schools are schools that continuously receive the Apoyo a la Gestión Escolar (AGEs), starting in 1998 (or later) until 2001. Extreme values for the dependent variables trimmed at the top 0.5% of the dependent variable distribution. Sample restricted to schools with no missing information on any of the dependent variables studied.

**Table 8: Do the AGEs Affect Total Enrollment? Post-Intervention Trends
-Subsample of General Rural Primary Schools (All and Q34)**

	TOTAL ENROLLEMENT			
	All A	All B	Q34 A	Q34 B
AGEs =1	0.386 (0.385)		0.536 (0.480)	
AGEs Received During 1 year =1 (1)		0.431 (0.399)		0.581 (0.498)
AGEs Received Over 1 year =1 (2)		1.251 (0.796)		1.327 (0.997)
School Fixed Effects	Y	Y	Y	Y
Time-Varying School Characteristics	Y	Y	Y	Y
State Specific Time Trends	Y	Y	Y	Y
Treatment Specific Trends	Y	Y	Y	Y
Prob > F-stat Joint Significance (1) & (2)	-	0.27	-	0.41
Number of Observations	30190	30190	23090	23090
Number of Schools	6038	6038	4618	4618
Mean Total Enrollment	131.23	131.23	136.53	136.53

Notes: +significant at the 10%, *significant at the 5%, **significant at the 1%. LS regressions with school FE. Robust SE clustered at the school level in parantheses. Q34 Schools are schools in the third and fourth quantile of the CONAFE's Targeting Index distribution. AGEs treatment schools are schools that continuously receive the Apoyo a la Gestión Escolar (AGEs), starting in 1998 (or later) until 2001. Extreme values for the dependent variables trimmed at the top 0.5% of the dependent variable distribution. Sample restricted to schools with no missing information on any of the dependent variables studied.

APPENDIX 2: GRAPHS

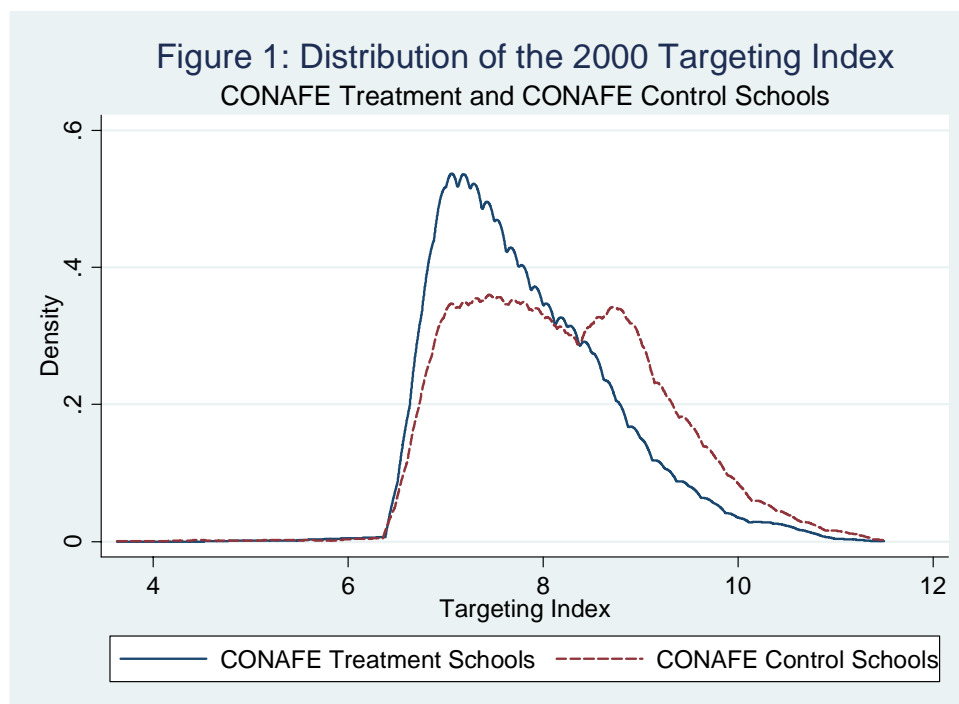


Figure 2A: Failure Rate Trends

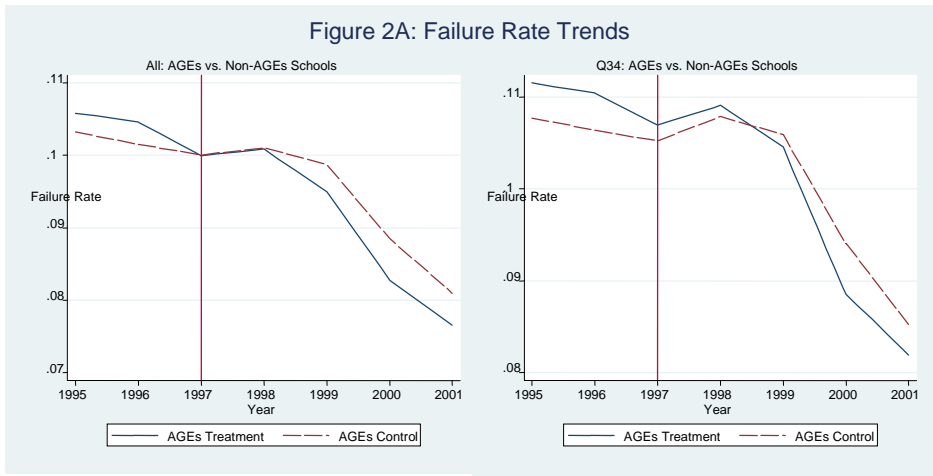


Figure 3A: Repetition Rate Trends

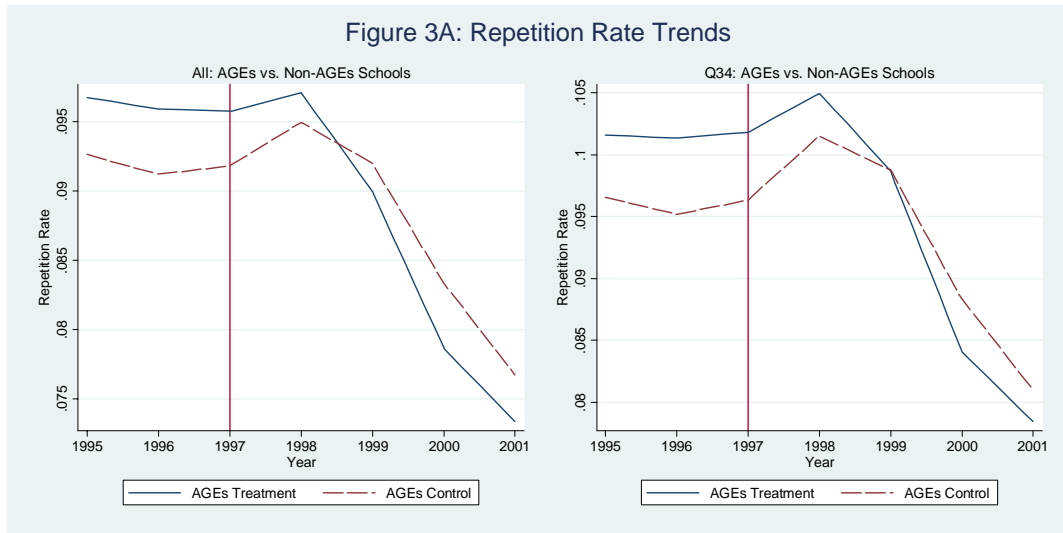


Figure 4A: Drop Out Rate Trends

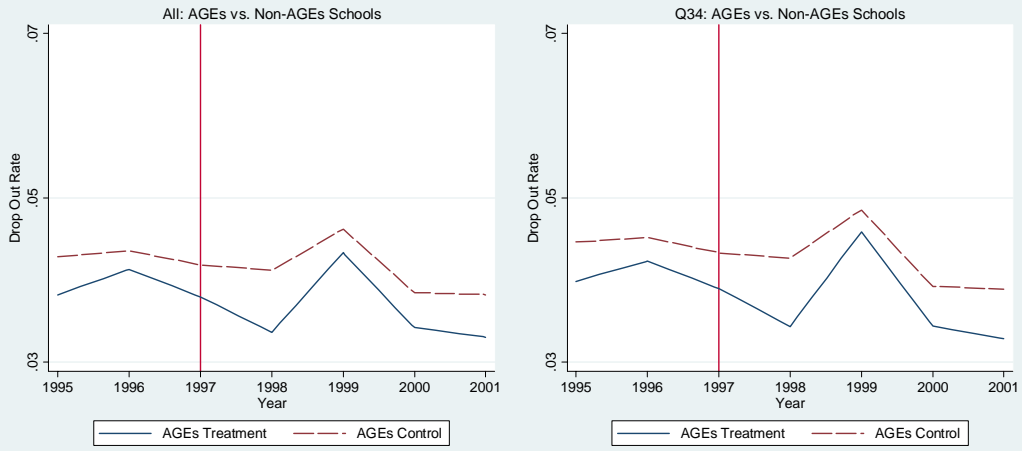


Figure 4A: Total Enrollment Trends

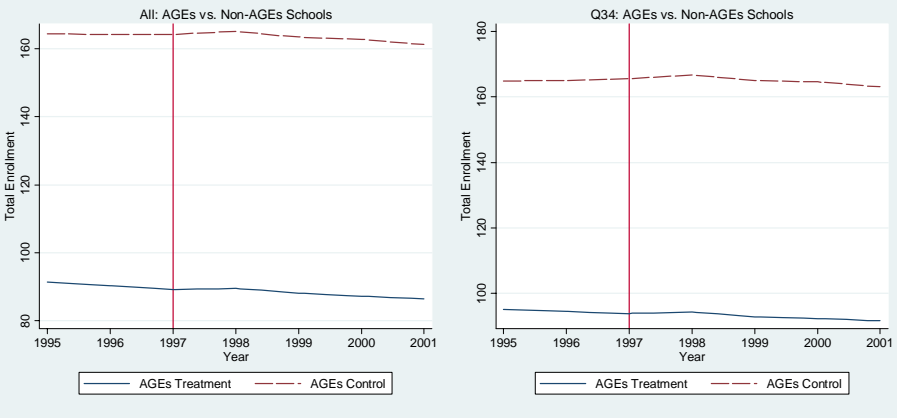


Figure 2B: Failure Rate Trends by Entering Year

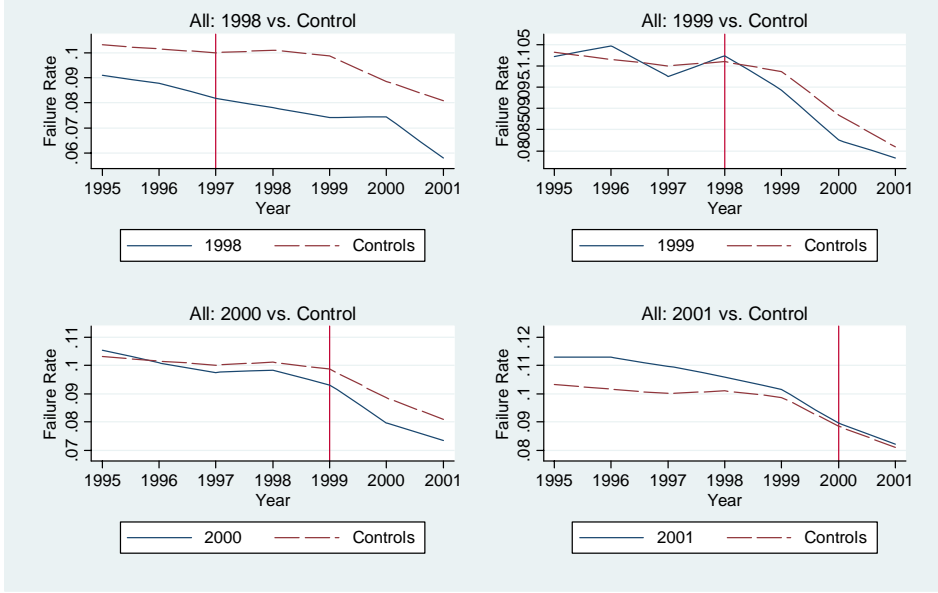


Figure 2B: Failure Rate Trends by Entering Year

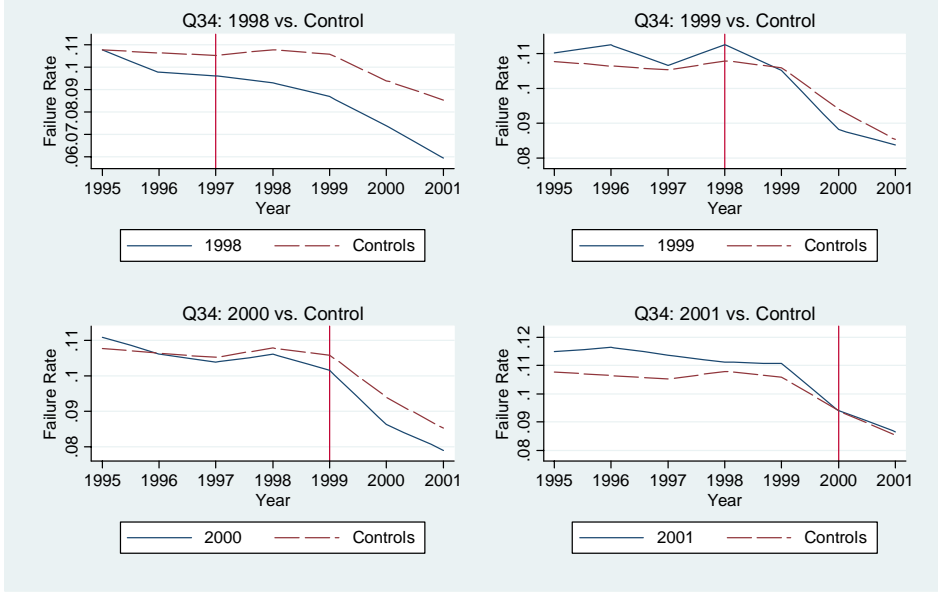


Figure 3B: Repetition Rate Trends by Entering Year

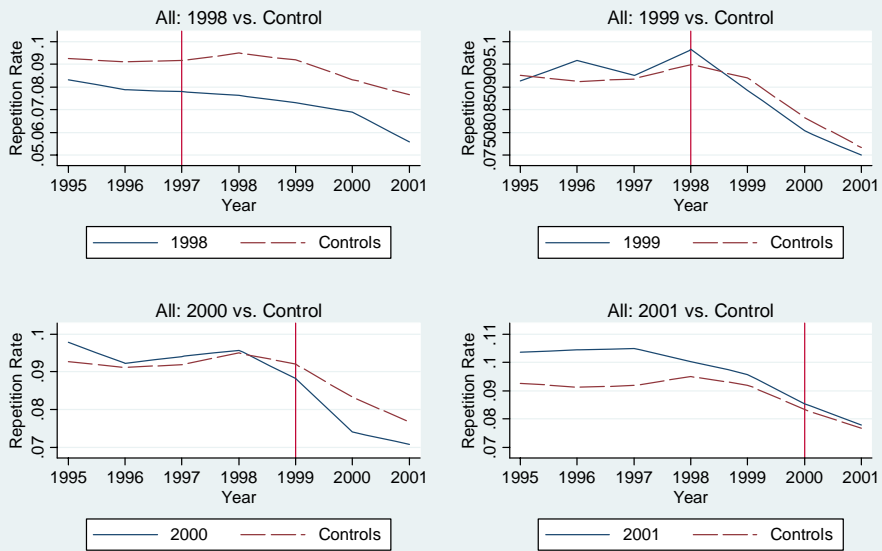


Figure 3B: Repetition Rate Trends by Entering Year

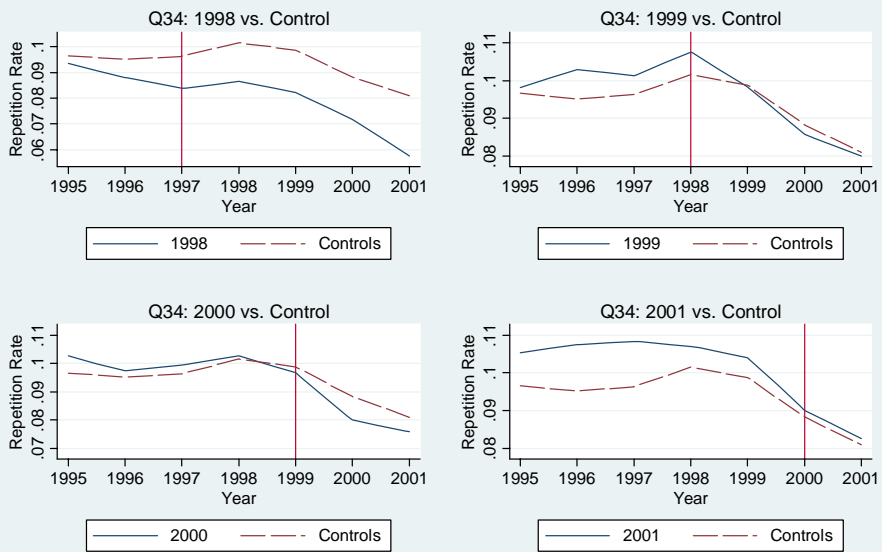


Figure 4B: Drop Out Rate Trends

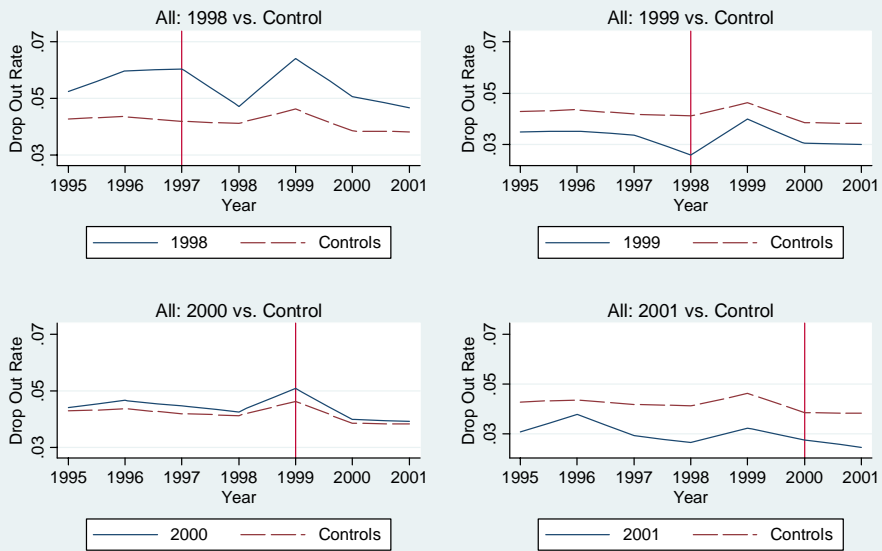


Figure 4B: Drop Out Rate Trends

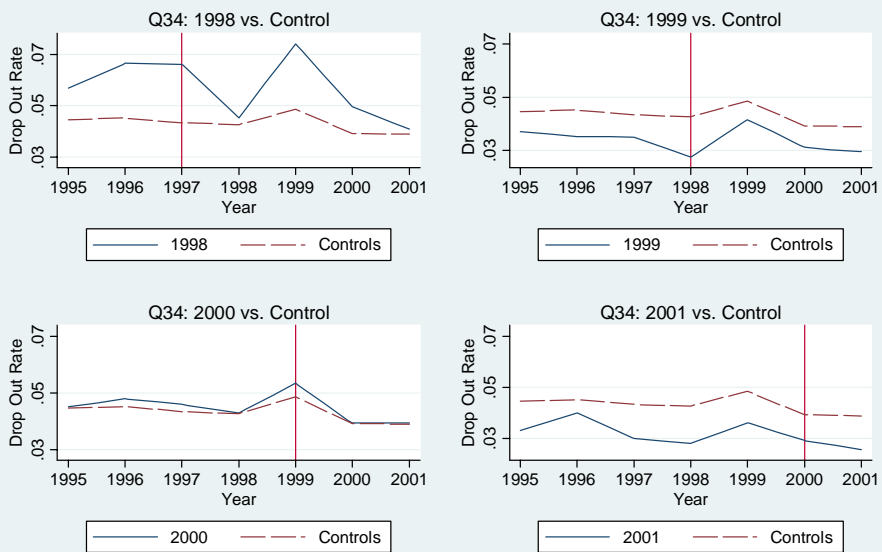


Figure 5B: Total Enrollment Trends

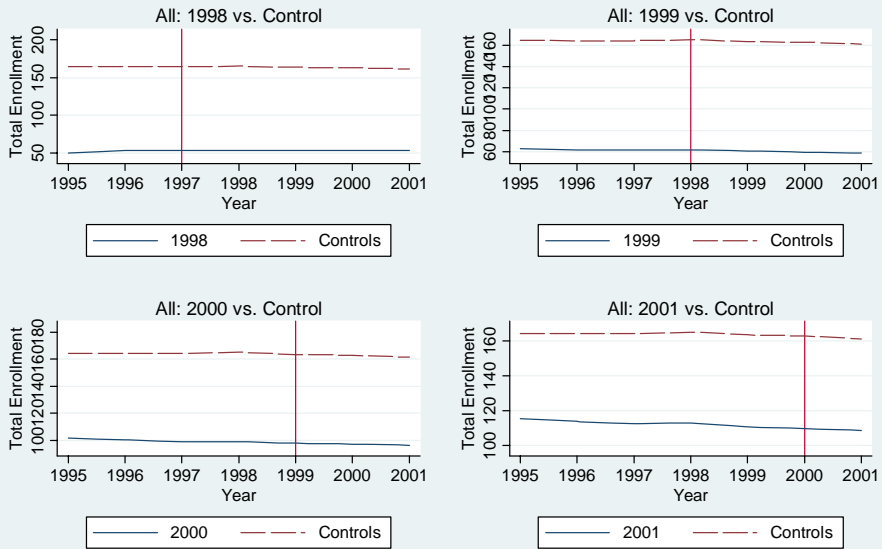


Figure 5B: Total Enrollment Trends

